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AI-Driven Project Guidance for Idea Execution and Collaboration

Prof. C.U. Chauhan[1], Head of the Department, Department of Computer Science and Engineering, Government College of Engineering Chandrapur, Maharashtra, India
Sumit Bhamkar[2], Kalyani Mogre[3], Sangharsh Ghadse[4], Pratiksha Bhandekar[5], Vaibhavi Kinnake[6]
[23456], Final year student, Department of Computer Science and Engineering, Government college of Engineering, Chandrapur, Maharashtra, India.

Abstract - VisionCraft is an AI-powered project management system designed to assist users from project initiation to completion. It provides technology stack recommendations, time and cost estimations, resource allocation, and real-time progress tracking to enhance efficiency. The system integrates a research paper recommendation tool to streamline academic exploration and a community forum for expert collaboration. By leveraging machine learning, predictive analytics, and workflow automation, VisionCraft ensures structured guidance, optimised decision-making, and increased project success rates.

Keywords: Project Management, AI-Driven Planning, Technology Stack Recommendation, Time and Cost Estimation, Resource Allocation, Predictive Analytics, Real-Time Tracking, Risk Assessment, Research Paper Integration, Community Collaboration, Expert Support, Machine Learning, Workflow Automation, Data-Driven Decision Making.

1.INTRODUCTION

Project management is a critical factor in determining the success or failure of any idea, yet many projects struggle due to a lack of structured planning, resource mismanagement, and inadequate guidance. Traditional project management tools often provide only basic task-tracking functionalities, leaving users without intelligent insights that could help streamline execution. As a result, many promising projects are abandoned due to inefficiencies, budget overruns, and missed deadlines. To address these challenges, there is a growing need for an AI-powered project management system that can provide structured guidance and real-time decision-making support.

VisionCraft is designed to bridge this gap by offering an intelligent, end-to-end project management solution. Unlike conventional platforms, VisionCraft does more than just task allocation and tracking; it provides technology stack recommendations, precise time and cost estimations, resource allocation strategies, and real-time progress monitoring to ensure smooth project execution. By leveraging AI and data analytics, it helps individuals and teams optimise workflows, reduce manual effort, and increase project success rates.

One of the most significant challenges in project execution is choosing the right technology stack. Many teams struggle with selecting appropriate tools and frameworks that align with their project requirements, leading to inefficiencies and technical bottlenecks. VisionCraft tackles this issue by recommending suitable technologies based on the project's scope, complexity, and industry standards. This ensures that teams use the best-suited development tools, reducing compatibility issues and enhancing overall productivity.

Beyond technology selection, accurate time and cost estimation is another crucial aspect of effective project management. Many projects face delays and budget overruns due to poor forecasting. VisionCraft integrates predictive analytics to provide realistic timeframes and budget estimates, allowing teams to plan better and allocate resources efficiently. By minimising uncertainties and financial risks, the system ensures that projects stay within scope and meet their deadlines without unnecessary expenditures.

To further enhance efficiency, VisionCraft incorporates real-time tracking and risk assessment. The system continuously monitors project progress, identifying potential obstacles before they become critical. With AI-powered predictive analysis, users receive alerts about potential delays, workflow bottlenecks, or resource constraints, enabling proactive decision-making. This feature helps teams address issues early, preventing disruptions and keeping the project on track.

In addition to execution, VisionCraft also supports knowledge-driven project development through its research paper recommendation system. Often, professionals and students working on innovative projects struggle to find relevant research materials that can provide insights into industry trends and best practices. VisionCraft simplifies this process by offering a curated list of research papers based on the project title and abstract, allowing users to gain valuable knowledge and improve their project outcomes.

Furthermore, VisionCraft fosters collaboration and community engagement through its integrated discussion forum. Many developers, entrepreneurs, and researchers face challenges that require expert guidance. By providing a platform where users can seek advice, share insights, and discuss challenges, VisionCraft ensures real-time problem-solving and knowledge exchange. This community-driven approach enhances innovation, facilitates peer learning, and strengthens project execution through expert input and shared experiences.

1.1 Problem Statement

In today's fast-paced and innovation-driven world, individuals and teams often struggle to execute their project ideas due to a lack of structured guidance, inefficient resource management, and limited access to relevant research materials. Many projects fail to reach completion due to poor technology selection, inaccurate time and cost estimation, and ineffective collaboration tools. Traditional project management solutions offer only basic task-tracking features, leaving users without intelligent insights to optimise execution. Additionally, the absence of a centralised knowledge-sharing platform hinders problem-solving and innovation.

To address these challenges, there is a need for an AI-powered project management system that provides personalised recommendations, real-time monitoring, and expert-driven collaboration. By integrating advanced technology stack

suggestions, cost and time estimation, research paper recommendations, and community-driven support, such a system can significantly enhance project execution and increase success rates.

1.2 Objectives

The primary objectives of VisionCraft are:

- Provide users with intelligent technology stack recommendations, accurate time and cost estimations, and structured guidance to streamline project execution.
- Help users discover relevant research papers based on project titles and abstracts, facilitating knowledge-driven project development.
- Track project progress with AI-powered insights, allowing users to identify risks, predict delays, and make data-driven decisions.
- Create an interactive platform where users can seek expert guidance, discuss challenges, and share solutions to foster peer learning and innovation.
- Implement AI-driven risk evaluation tools to identify potential issues early and prevent project failures through proactive decision-making.To facilitate faculty scheduling and notification systems for streamlined evaluations.
- Design an intuitive and easy-to-use platform that supports individuals, teams, and organisations in efficiently managing their projects.

By achieving these objectives, VisionCraft will revolutionise project management by providing a structured, AI-driven approach to project execution. Users will benefit from intelligent recommendations, real-time monitoring, and efficient resource allocation, ensuring that projects progress smoothly from inception to completion. The integration of research paper recommendations will empower users with the latest insights, fostering innovation and informed decision-making. Additionally, the community forum will create a collaborative ecosystem where developers, researchers, and industry experts can engage in knowledge sharing, leading to faster problem-solving and enhanced project outcomes.

With predictive risk assessment and AI-powered insights, VisionCraft will enable users to identify challenges before they escalate, reducing project failures and ensuring efficient time and cost management. The user-friendly interface and accessibility will make project management seamless for individuals, startups, and large organisations alike. Ultimately, VisionCraft will bridge the gap between project ideation and execution, ensuring that innovative ideas do not remain unfulfilled due to a lack of guidance or resources..

2.METHODOLOGY

The methodology of VisionCraft is designed to provide a structured project management system powered by AI-driven recommendations, research paper integration, and community support. The approach involves multiple stages:

- **Data Collection & Requirement Analysis:** VisionCraft gathers user inputs, including project title, description, domain, and requirements. It analyzes past project data, research papers, and technology trends to provide optimal recommendations. A database is maintained for storing project-related metadata and user interactions.
- **AI-Based Project Recommendation System:** The system utilizes Natural Language Processing (NLP) to interpret project descriptions and employs machine learning models to suggest suitable technology stacks based on project requirements. Additionally, it predicts estimated time and cost using historical project data and regression models.
- **Research Paper Integration:** VisionCraft implements APIs (e.g., Semantic Scholar, Google Scholar, or OpenAI embeddings) to fetch relevant research papers. Keyword extraction and similarity matching techniques are used to recommend papers aligned with the project's objectives.
- **Community Forum & Collaboration:** An interactive forum allows users to post queries and receive expert guidance. Real-time chat and discussion threads enable collaborative project development, fostering a knowledge-sharing ecosystem.
- **System Development & Implementation:** The backend is developed using Node.js with Express.js for efficient API handling. The frontend leverages React.js with Material-UI to create an intuitive user interface. MongoDB is used as the database for storing project data and user interactions. Machine learning models are implemented using Python, TensorFlow, or Scikit-learn for AI-driven recommendations.
- **Testing & Deployment:** VisionCraft undergoes unit testing and integration testing to ensure functionality and system performance. User testing is conducted to

collect feedback from beta users for usability improvements. Finally, the system is deployed on cloud platforms such as AWS or Firebase for scalability.

3.1 System Design and Development

The VisionCraft system is built in a structured way to help users manage projects efficiently. It consists of three main parts:

- **Frontend:** VisionCraft is built using React.js to create an interactive and easy-to-use website. It allows users to enter project details, search for research papers, and communicate in a forum, ensuring a smooth and engaging user experience.

- **Backend:** VisionCraft is developed using Node.js (Express.js) to efficiently process user requests and run AI models. This layer incorporates Machine Learning (ML) techniques to suggest suitable technology stacks, predict project costs, and estimate project timelines based on historical data..

- **Database :** VisionCraft is managed using MongoDB, which securely stores user data, project details, research paper links, and forum discussions. This ensures efficient data retrieval, seamless interaction, and scalability for handling multiple projects and users.

3.2 Implementation of VisionCraft

VisionCraft is designed with a structured development process to ensure seamless project management. The system integrates various technologies to enhance functionality, efficiency, and user experience.

- **Backend:** VisionCraft is developed using Node.js and Express.js, which efficiently manage API requests. The system handles user authentication, project storage, and AI-based processing, ensuring seamless communication between different components and providing a smooth workflow..

- **Frontend:** For a seamless and responsive user experience, React.js is utilized to create an intuitive interface. The platform is designed to display graphs, project status, and AI-driven recommendations, making project management more efficient and user-friendly.Testing and Debugging: Running usability tests, security audits, and performance evaluations to ensure the system runs efficiently.

- **AI Development:** To enhance the recommendation system, Machine Learning techniques are implemented, allowing the system to suggest the best tools and technologies based on project requirements. Additionally, Natural Language Processing (NLP) is used to interpret and analyze project descriptions, ensuring accurate insights and tailored suggestions.

- **Database Management:** Data storage and management rely on MongoDB, which securely stores project-related information, user queries, and research paper links. This enables efficient data retrieval, seamless interaction, and scalability to accommodate multiple projects and users.

4. SYSTEM DESIGN AND FEATURES

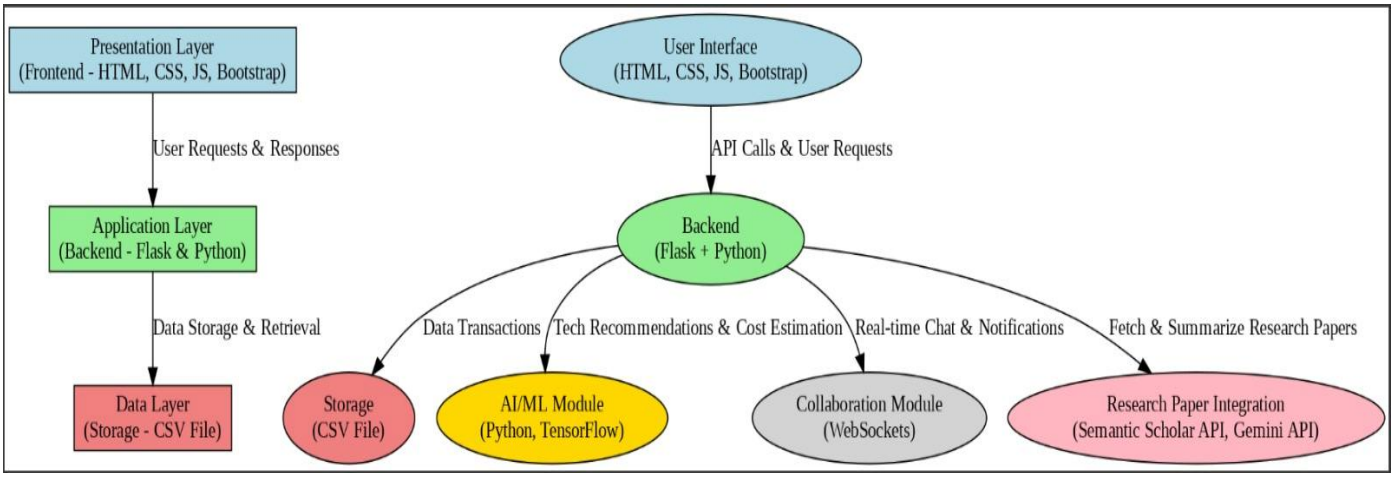
VisionCraft consists of the following key features:

- **AI-Based Project Recommendation:** VisionCraft incorporates an AI-Based Project Recommendation system that takes user inputs, such as project title and category, to provide optimal suggestions. By leveraging AI models, the system recommends the best technology stack, time estimates, and cost projections, helping users make informed decisions for their projects.

- **Research Paper Retrieval**: The platform also includes a Research Paper Retrieval feature that connects to external databases like Google Scholar to fetch relevant academic papers. Using smart search techniques, it identifies and matches research papers with project ideas, ensuring users have access to valuable insights and references.

- **Community Forum:** Additionally, VisionCraft offers a Community Forum, providing a dedicated discussion platform where users can ask questions and seek guidance. Experts and developers actively participate in discussions, offering solutions and sharing knowledge to support collaborative project development.

5. MODELLING



6. LITERATURE REVIEW

Sr. No.	Year and Author	Title	Finding	Limitation	Identified Gap
1.	2019, Qiankun Wang	How to Apply AI Technology in Project Management	AI is transforming project management despite controversy. The article analyses AI's pros and cons and recommends machine learning-based project management as the optimal choice through quantitative analysis	The study does not provide real-world implementation examples.	Lacks practical case studies showcasing AI adoption in real project management scenarios.
2.	2023, Ianire Taboada, Abouzar Daneshpajouh, Nerea Toledo, and Tharaka de Vass	Artificial Intelligence Enabled Project Management: A Systematic Literature Review	AI improves human-centric and sustainable production in Industry 5.0. The paper reviews AI's role in project management, especially in IT and construction projects, improving planning, measurement, and decision-making.	Lacks detailed information on AI adoption challenges in different industries.	Limited insights into how AI-driven project management tools can be optimized for smaller enterprises.
3.	2021, Thordur Vikingur Fridgeirsson and Helgi Thor Ingason	An Authoritative Study on the Near Future Effect of Artificial Intelligence on Project Management Knowledge Areas	A qualitative study on AI's impact on project schedule, cost, and risk management in PMBOK.	The study lacks quantitative data to support its claims.	Limited focus on AI-driven risk management frameworks for project planning.
4.	2020, Alia Al Mazourei and Jose Berengueres	Tools to Manage the Technology Stack	The paper examines tools for visualizing technology stacks, highlighting their features, benefits, and limitations while proposing a development roadmap for future tools.	Does not cover real-world case studies for technology stack management.	Lacks a comparative study on different technology stack management tools and their efficiency.
5.	2020, Rameesa K. & K. T. Veeramanju	Analysis of Software Industry: Natural Language Processing Approach	NLP enhances human-computer interaction in software. The paper highlights NLP's role in automating communication and its impact on software development	The study focuses on the software industry, limiting its applicability to other domains.	Does not explore how NLP can improve project management beyond communication automation

7. RESULT AND DISCUSSION

A. Project Guidance Result:

The given prompt specified an online education platform for students in the education domain. VisionCraft analyzed the input and provided project size (large), complexity (medium), cost estimate ($10,000 - $100,000+), and timeline (3-12 months). It recommended a technology stack including React, Angular, Vue (frontend), Node.js, Python, PHP (backend), SQL/NoSQL (database), DevOps, and UI/UX design. Key challenges identified were user retention, monetization, content quality, scalability, and security risks.

VisionCraft's Project Guidance feature structured the scope, budget, and timeline, aiding efficient planning. The AI-driven recommendations ensured a solid technology foundation, but further enhancements like adaptive learning AI, real-time scalability, and advanced security could boost effectiveness. Automated user engagement models and monetization strategies would further strengthen platform sustainability.

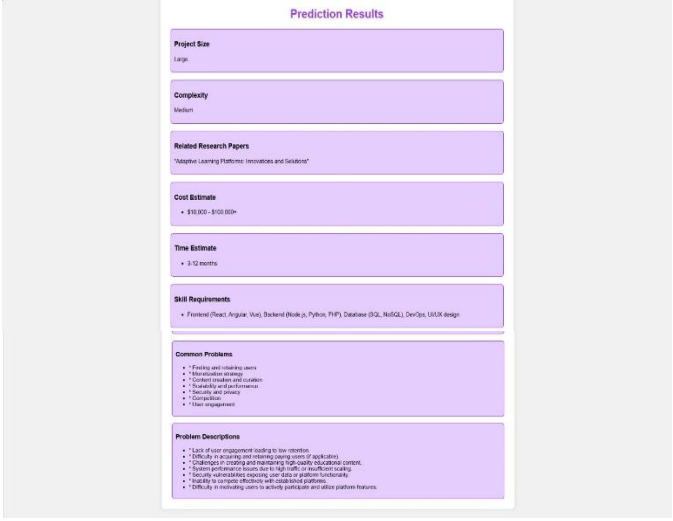
B. Research Paper Recommendation Result:

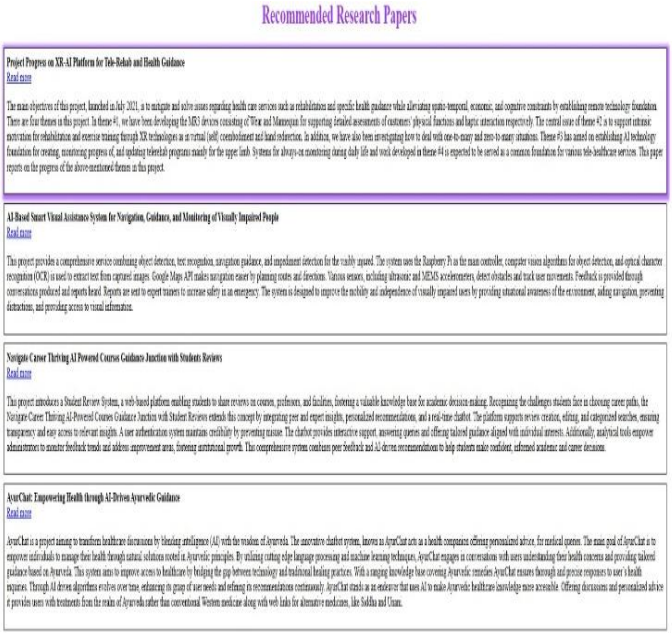
VisionCraft processed the prompt "AI-Based Guidance System" and retrieved relevant research papers covering various AI-driven guidance solutions. The recommended papers include XR-AI platforms for tele-rehabilitation, AI-based visual assistance for navigation, career guidance using AI-powered student reviews, and AI-driven Ayurvedic health guidance. These papers provide insights into leveraging AI for personalized recommendations, decision-making support, and real-time assistance in different domains.

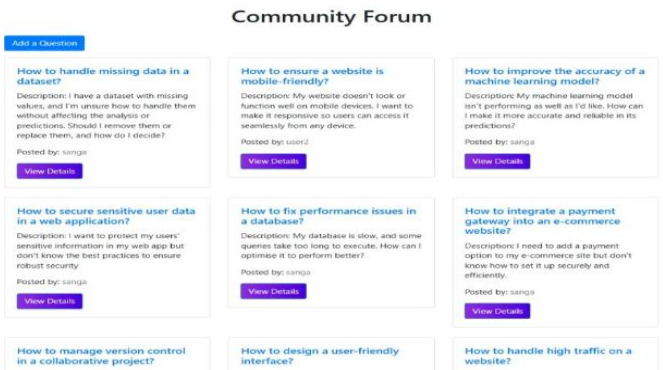
The research paper retrieval feature effectively reduced research time by fetching highly relevant academic resources. The selection of papers aligns well with the AI guidance theme, offering diverse applications across education, healthcare, career development, and accessibility. However, refining keyword ranking and similarity-matching algorithms could further enhance precision. Expanding the database to include more AI-based guidance domains, such as AI-driven tutoring or interactive learning assistants, could make the recommendations even more comprehensive.

C. Community Forum Result:

The Community Forum feature provides a dynamic platform for users to ask and discuss various technical topics, share insights, and seek guidance from the community. Users can post questions related to web development, database optimization, security, machine learning, and more. Each post includes a description and the author's name, ensuring transparency and engagement. The forum encourages collaboration by allowing users to explore detailed discussions, contribute answers, and enhance their knowledge. With an intuitive interface and easy navigation, users can seamlessly interact, making it a valuable resource for problem-solving and learning.







8. CONCLUSION

VisionCraft successfully streamlines project planning, execution, and collaboration by integrating AI-powered recommendations, research paper retrieval, and a community forum. The system significantly enhances efficiency by providing structured guidance, reducing research time, and enabling real-time expert interactions. While it has received positive feedback from users, further optimizations in search accuracy, scalability, and automation will improve its effectiveness

9. FUTURE WORK

Future work includes:

- **Enhanced AI Models:** Improve the accuracy of technology stack recommendations by integrating real-world project success data.
- **Optimized Research Paper Search:** Refine keyword extraction and ranking algorithms for better precision in retrieving academic resources**.**
- **Scalability & Performance Upgrades:** Implement distributed database management and optimize real-time interactions in the forum.
- **Advanced Collaboration Tools:** Introduce AI-driven task automation, project template suggestions, and an improved UI/UX for seamless project management..

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