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GVP – MAAA (MULTI AGENT ACADEMIC ASSISTANT)

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Abstract

Educational organizations handle attendance details, scores, time schedules, communication data, and many other big data like a student, instructor, and a manager (or admin). These organizations depend on manual or worn structures or may be the current ones do not talk with the same member as far as making the work faster and simple the process. This helps towards an imperfect system that want more effort and a substantial size of a chance to handle.In this context, this paper suggests a web based multi-agent academic helper (GVP-MAAA) where multiple agencies include and give the helps to perform smoothly. The GVP-MAAA include role-based dashboards to student, instructor and the admin. Attendance handling, academic progress monitoring, and the notifications facility can be opened by the instructors. Performance analysis reports have been included to students and admin. Agents such as review agents, and notification agents has been used to help decision creating for a central body and include timely data to uses and administrative parties. The goal of system is to remove manual work and include effective use of the time that results into the effective overall management of the academic institute.

Keywords

Multi Agent Systems, Academic Management Systems, AI chatbot, Role Based Dashboards, Learning Analytics, Educational Data Automation.

1. Introduction

Academic institutions handle many essential functions, such as attendance tracking, grade management, timetable planning, and student communication, but these activities are often performed manually or through separate systems, resulting in delays, duplicated work, inefficiency, and limited access to real-time data. As a result, students struggle to monitor their

academic progress effectively, while faculty members spend substantial time on routine administration instead of teaching. To overcome these challenges, the proposed GVP-MAAA (Multi-Agent Academic Assistant) system introduces an integrated, web-based platform built on a multi-agent architecture with role-based dashboards. It unifies academic operations, insights, and communication in one environment and provides key capabilities including attendance monitoring, academic performance analysis, timetable support, and timely notifications on academic events and updates.

Research Objectives and Methodology

This study aims to design, implement, and evaluate GVP-MAAA (Multi-Agent Academic Assistant) as an integrated academic management platform for educational institutions. The research objectives are:

1. To identify major operational and academic challenges in existing manual or fragmented systems, including delays, data duplication, and limited real-time visibility.
2. To develop and deploy a unified multi-agent, web-based system with role-based dashboards for students, faculty, and administrators.
3. To evaluate the effectiveness of GVP-MAAA across core functions such as attendance tracking, academic performance monitoring, timetable support, and event notifications.
4. To analyze system outcomes and provide actionable recommendations for improving academic efficiency, communication quality, and decision-making in institutions.

2. Literature Survey

Academic institutions manage many essential processes, including attendance, grading, timetable planning, and student communication, but these are often handled manually or through disconnected tools, resulting in delays, duplication, and limited real-time access to academic data. This affects both stakeholders: students struggle to track progress consistently, while faculty spend significant effort on routine administration instead of teaching. To address these issues, GVP-MAAA (Multi-Agent Academic Assistant) is proposed as an integrated web-based platform that combines academic operations, communication, and decision support in one system. Built on a multi-agent architecture with role-based dashboards, it supports attendance monitoring, performance tracking, timetable assistance, and timely academic notifications.

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The objective of this research is to design and evaluate GVP-MAAA as a unified smart academic management framework for students, faculty, and administrators. Specifically, the study aims to identify key operational gaps in existing systems, implement a role-aware multi-agent platform for core academic workflows, assess its effectiveness across usability and performance dimensions, and derive practical recommendations for institutional adoption. The methodology follows a system engineering approach: requirement analysis from stakeholders, architecture design, module-wise implementation, and evaluation through functional testing and comparative analysis. Performance is measured using indicators such as response time, data consistency, task completion efficiency, and user satisfaction.

3. Methodology

The methodology of the GVP-MAAA project follows an end-to-end system development and evaluation approach in which institutional problems were first analyzed to identify gaps in existing manual and fragmented academic processes, then stakeholder-specific requirements were collected for students, faculty, and administrators to define core modules such as attendance tracking, performance monitoring, timetable support, intelligent query handling, and academic notifications; based on these requirements, a web-based multi-agent architecture with role-based dashboards was designed and implemented, where specialized agents handle alerts, insights, risk analysis, task assistance, and context-aware communication through NLP-driven routing and controlled prompting, while backend APIs and database services ensure secure, consistent, and scalable academic data operations; finally, the system was validated through functional testing of all modules and end-to-end workflows, performance testing for response time and operational efficiency, data consistency checks across records, comparative analysis against traditional workflows, and user-oriented feedback assessment to verify usability, effectiveness, and real-world readiness as a unified intelligent academic management platform.

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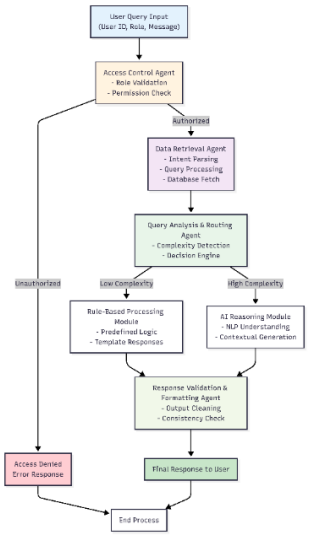

4. Experimental Setup and Implementation

The experimental setup for GVP-MAAA was carried out in eight steps:

1. **Requirement Analysis:** Identify the academic problems to be solved, including attendance management, grade tracking, timetable access, notifications, and student-staff communication.
2. **System Design:** Plan the overall architecture of the platform, including the multi-agent structure, role-based dashboards, and academic data flow.
3. **Database Structuring:** Design the database to store user profiles, attendance records, academic performance data, timetable details, notifications, and interaction history.
4. **Backend Development:** Build the server-side APIs to handle data processing, request routing, and communication between the frontend, database, and agents.
5. **Multi-Agent Integration:** Implement specialized agents for tasks such as query handling, alerts, insights, risk analysis, and academic support.
6. **Frontend Dashboard Development:** Create dashboards for students, faculty, and administrators with role-specific access and functionality.
7. **Feature Testing and Validation:** Test attendance updates, performance tracking, timetable access, and notification delivery to ensure correct operation.
8. **Performance Evaluation and Comparison:** Assess usability, response time, and reliability, and compare the proposed system with manual academic management practices. If you want, I can also rewrite this in a more formal journal style for direct use in the paper.

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5. Result Analysis

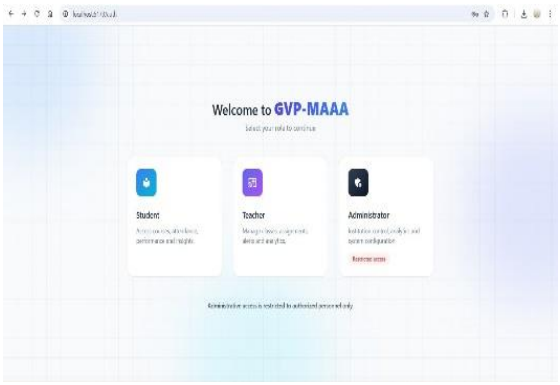

Fig1. Welcome Screen

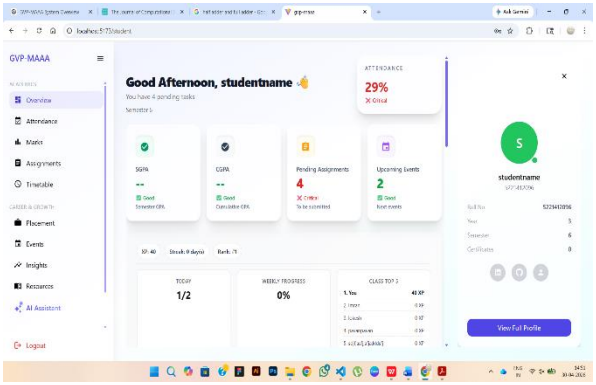

Fig2 . Student dashboard

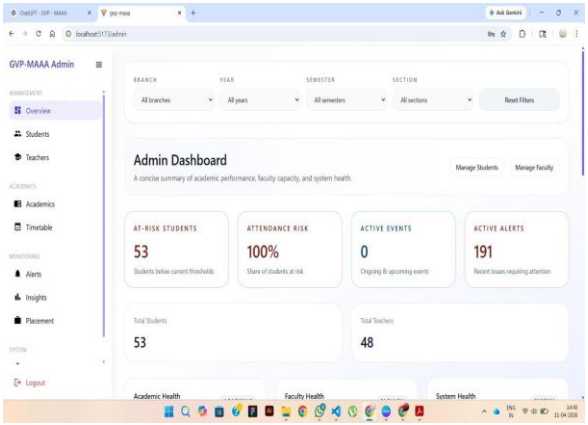

Fig 3. Admin Dashboard

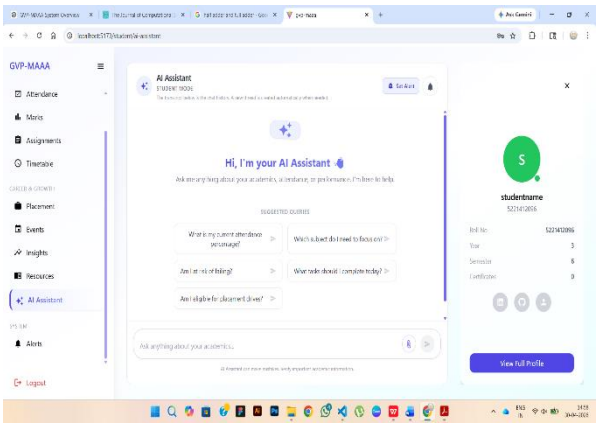

Fig 4 : AI Assistant

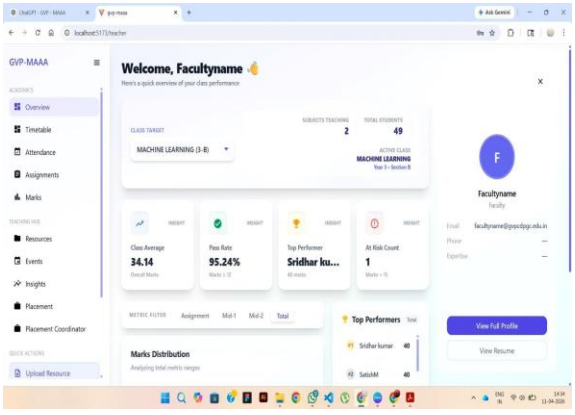

Fig 5. Faculty Dashboard

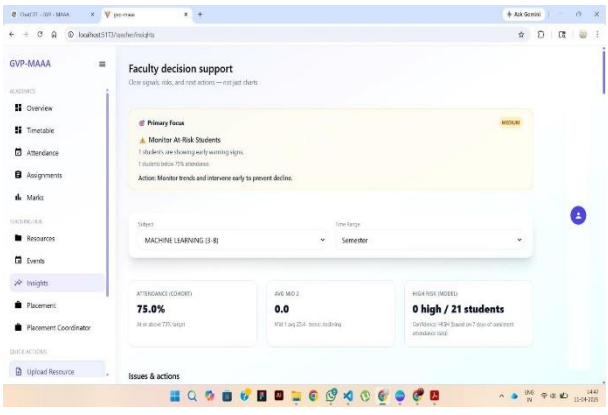

Fig 6: Faculty insights page

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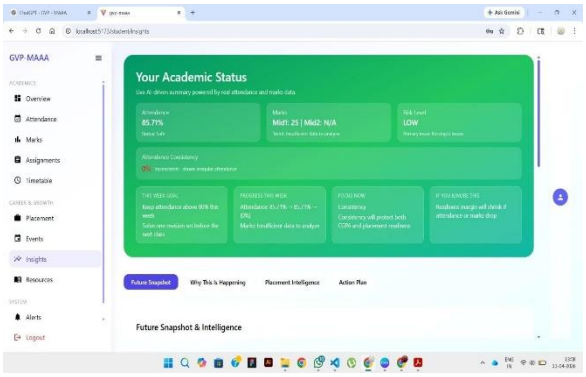

Fig 7: Student insights page

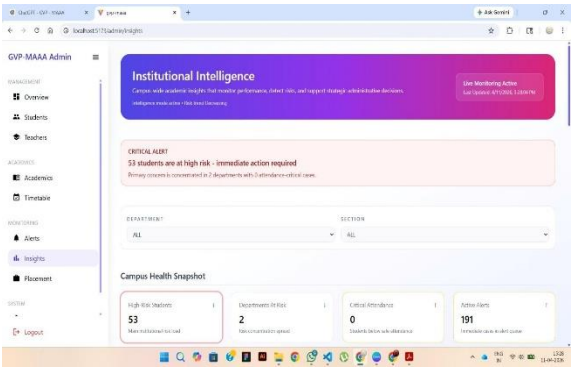

Fig 8: Admin insights page

Conclusion:

This research presented GVP-MAAA (Multi-Agent Academic Assistant), an integrated web-based platform designed to address fragmentation and inefficiency in academic management systems by combining multi-agent architecture, role-based dashboards, intelligent query handling, and automated academic workflows to provide a unified solution for attendance tracking, performance monitoring, timetable access, notification delivery, and student-staff communication. The implementation followed a systematic methodology including requirement analysis, system design, module-wise development, and comprehensive evaluation, demonstrating that GVP-MAAA effectively streamlines academic operations by reducing manual administrative work, improving response time for academic queries, and providing real-time insights for data-driven decision-making. The multi-agent framework enables specialized handling of different academic tasks while role-based access ensures secure and personalized user experiences for students, faculty, and administrators; comparative analysis with traditional manual processes reveals significant improvements in task completion efficiency, communication quality, and administrative burden reduction. The contributions of this work include the design of a scalable multi-agent academic framework, implementation of context-aware NLP-based query routing, development of automated academic workflows, and empirical validation of the system across multiple institutional use cases; future work should focus on extending the system with advanced analytics for predictive student performance modeling, integration of additional ML-based recommendation engines, support for mobile platforms, deployment across larger institutional networks, adaptive learning paths, real-time collaboration tools, and integration with external academic APIs to further enhance the system's capabilities and institutional value.

References

[1] Langchain, “Langchain Documentation: Building Applications with LLMS,” Available: https://docs.langchain.com, 2024.

[2] Fast API, “Fast API Modern Web Framework for Building APIs with Python, “Available: https://fastapi.tiangolo.com, 2024.

[3] D. Gasevic, S. Dawson, and G. Siemens, “Let’s Not Forget: Learning Analytics Are About Leaning,” Tech Trends, vol. 59, no. 1, pp. 64-71, 2015.

[4] N. R. Jennings, K. Sycara, and M. Wooldridge, "A Roadmap of Agent Research and Development," Autonomous Agents &Multi-Agent Systems, vol. 1, no. 1, pp. 7-38, 1998.

[5] G. Siemens and R. S. J. D. Baker, "Learning Analytics and Educational Data Mining: Towards Communication and Collaboration," in Proc. 2nd Int. Conf. Learning Analytics and Knowledge, Vancouver, 2012, pp. 252-254.

[6] G. Siemens and R. S. J. D. Baker, "Learning Analytics and Educational Data Mining: Towards Communication and Collaboration," in Proc. 2nd Int. Conf. Learning Analytics and Knowledge, Vancouver, 2012, pp. 252-254.

[7] P. Smutny and P. Schreiberova, "Chatbots for Learning: A Review of Educational Chatbots for the Facebook Messenger," Computers and Education, vol. 151, 2020.

[8] T. Alario-Hoyos, M. Perez-Sanagustin, and C. Kloos, "Analyzing the Deployment of Massive Open Online Courses and the Role of LMS," IEEE Trans. Learning Technologies, vol. 7, no. 4, pp. 380-391, 2014.

[9] M. Wooldridge and N. R. Jennings, "Intelligent Agents: Theory and Practice," The Knowledge Engineering Review, vol. 10, no. 2, pp. 115-152, 1995.

[10] R. Luckin, W. Holmes, M. Griffiths, and L. Forcier, "Intelligence Unleashed: An Argument for AI in Education," Pearson Education, London, 2016.

[11] M. A. Al-Emran, H. M. Malik, and M. N. Al-Kabi, "A Survey of Internet of Things (IoT) in Education: Opportunities and Challenges," Advances in IoT-Based Technologies for Smart Educational Environments, 2018.