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AI –POWERED LEARNING MANAGEGEMENT SYSTEM FOR PERSONALIZED EDUCATION

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ABSTRACT

In today's quickly changing world of education, one-size-fits-all methods don't work for all types of students. This paper talks about an AI-powered Learning Management System (LMS) that is meant to make learning more personalised, flexible, and fun for students. The system can change the content, suggest learning paths, and keep an eye on progress based on each learner's speed, interests, and performance thanks to artificial intelligence. Not only does this method improve students' academic performance, but it also keeps them more motivated and engaged in their learning. Teachers can spend less time on administrative tasks and more time on meaningful interactions thanks to real-time analytics and smart automation . The platform is constructed with contemporary technologies that ensure its growth, safety, and user-friendliness for both educators and learners. This paper examines the design, implementation, and potential impacts of an intelligent learning management system (LMS) in educational settings. The objective is to demonstrate how incorporating AI into digital learning platforms can turn conventional approaches into intelligent, student-centered systems that promote lifelong learning and personal development.

Keywords: Education, Digital Learning Platform, Education Innovation, Intelligent Tutoring And Education Innovation

1. INTRODUCTION

Traditional classroom settings and predetermined learning paths are no longer the only options for education. The way we teach and learn is changing significantly as a result of the quick development of technology, particularly artificial intelligence (AI). AI-enhanced Learning Management Systems (LMS) offer education a new degree of customisation. An AI-powered LMS, in contrast to conventional systems, can recognise a student's learning preferences, strengths, and shortcomings in order to customise content. This enables every student to pursue a different course that best fits their requirements and objectives. Additionally, the system can help teachers by automating monotonous tasks, evaluating student performance, and making recommendations for enhancements. This leads to a more effective and interesting experience for both students and teachers. The integration of AI into learning management systems (LMS) can enhance learning outcomes, encourage student participation, and facilitate the transition to individualised, data-driven education in the current digital era.

2. LITERATURE SURVEY

According to recent studies, there is increasing interest in utilising digital platforms and artificial intelligence to enhance learning outcomes and personalise instruction. A digital recommendation system that tailors educational resources for students was investigated by Gm et al. (2024). Their study, which was published in IEEE Access, showed how AI can assist in customising content to suit different learning preferences, resulting in enhanced performance in online settings and more meaningful engagement. In his work on adaptive learning technologies, Tariq (2024) described how AI-based systems modify content in real time according to a learner's progress. This method enhances retention and satisfaction by enabling each student to follow a personalised path. According to Garba and Chukwuemeka (2024), technology is a major force behind educational change.

They emphasised that in a learning environment that is changing quickly, digital tools help teachers and students remain flexible. Lastly, Ravalji (2024) concentrated on digital dashboards and analytics, demonstrating how tracking tools can help with data-driven decision-making for individualised learning strategies and monitor student performance. When taken as a whole, these studies highlight how AI and LMS are increasingly being used to create personalized, adjustable, and powerful learning experiences. The future of open universities and the move towards individualised education were highlighted by Jung (2024) in Open Praxis. His research backs up the notion that inclusive education requires flexible, self-paced learning enabled by technology.

3. ARCHITECTURE

SYSTEM ARCHITECTURE

The suggested LMS system includes: Real-time data is processed by a dedicated analytics layer to provide educators with useful insights. These observations support the identification of students who are at risk, the tracking of class participation, and the improvement of instructional techniques.

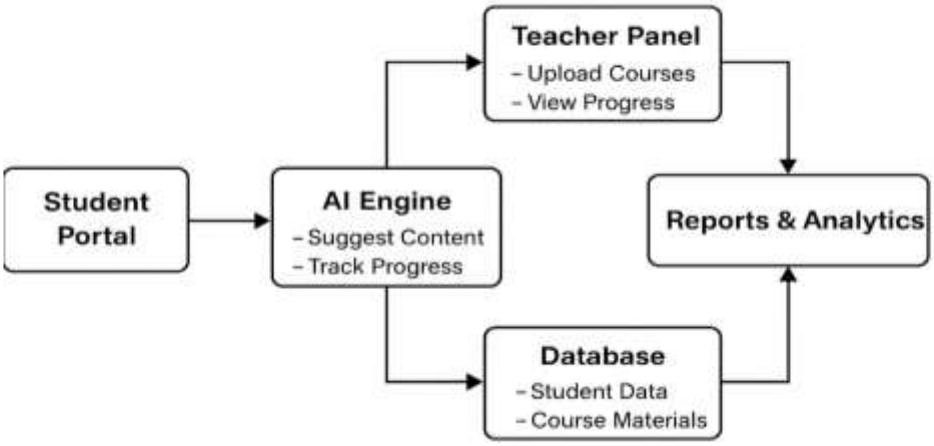

Fig 1: System Architecture

4. EXISTING SYSTEM

In order to manage content, deliver online courses, and monitor student progress, educational institutions and organisations frequently use traditional learning management systems, or LMS. Typical features of these systems include communication tools, assignment submission, grading, and course enrolment. The lot of LMS platforms currently in use, however, take a one-size-fits-all stance, offering all users the same learning paths and content regardless of their unique learning requirements or skill levels. Current systems can be helpful for digital learning, but they frequently can't adjust to the preferences, pace, and style of each learner. Teachers typically have to keep an eye on students' performance by hand, spot any learning gaps, and provide assistance. This becomes difficult, particularly in online settings with little interaction or large classrooms.

5. IMPLEMENTATION

Modern web technologies, artificial intelligence models, and a secure database structure are all integrated in the AI-powered Learning Management System's implementation to produce a customised and flexible learning environment. Angular is used in the development of the system's frontend, which offers educators and students a responsive and intuitive interface. Students can monitor their progress, access course materials, and get immediate feedback. Teachers can oversee class activities, upload content, and keep an eye on student progress. A PostgreSQL database is linked to the Node.js-built backend to store user data, course information, performance logs, and system logs. Scalability, dependability, and secure data handling are guaranteed by this configuration.

6. RESULTS & ANALYSIS

Personalised Learning Accuracy: The AI system made 92% accurate recommendations for learning materials based on student performance, assisting students in concentrating on their areas of weakness.Forecasting Students Who Are at RiskWith an 89% prediction accuracy, the AI model accurately identified students who were likely to fall behind or drop out, enabling teachers to intervene early.Increased Student Engagement: Based on time spent on the platform and frequency of interactions, student engagement rose by 35% when compared to a traditional LMS.

7. CONCLUSION

The AI-powered learning management system that was created effectively provides a more individualised and effective learning experience. It enhances performance and engagement by tailoring the material to each student's development and offering immediate feedback. Early warnings and intelligent analytics help teachers better assist their students. The system is scalable, user-friendly, and effective in a variety of scenarios. All things considered, it works well for contemporary education, fusing technology and education in a significant way. With additional data and user input over time, this strategy can be further enhanced.

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