ISSN: 2582-7219

International Journal of Multidisciplinary Research in Science, Engineering and Technology

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)

Impact Factor: 8.206

Volume 8, Special Issue 2, November 2025

International Journal of Multidisciplinary Research in Science, Engineering and Technology (IJMRSET)

| ISSN: 2582-7219 | www.ijmrset.com | Impact Factor: 8.206| | Monthly Peer Reviewed & Refereed Journal |

|| Volume 8, Special Issue 2, November 2025 ||

National Conference on Emerging Trends in Engineering and Technology 2025 (NCETET–2025)

Organized by

Mookambigai College of Engineering, Keeranur, Tamil Nadu, India

Cloud and AI - Based Smart Institution Management System

Mrs. A. Arockia Sudha[1], Manikandan R[2], Vairavapandiyan K[3], Sakthivel K[4]

Assistant Professor, Department of Computer Science and Engineering, Mookambigai College of Engineering, Pudukkottai, Tamil Nadu, India[1]

Department of Computer Science and Engineering, Mookambigai College of Engineering, Pudukkottai, Tamil Nadu, India[2-4]

ABSTRACT: The management of educational institutions involves handling numerous academic and administrative tasks such as fee payment, announcements, attendance, and performance tracking. Traditional systems depend heavily on manual operations, which often result in errors, delays, and inefficient communication. This paper proposes a Cloud and AI-Based Smart Institution Management System that automates and enhances institutional processes. The system integrates Artificial Intelligence (AI) and Cloud Computing technologies to deliver an intelligent, scalable, and centralized solution. Major modules include an AI Chatbot for assistance, Cloud-based Online Payment System, Smart Announcement and Notification Panel, and an AI-powered Smart Dashboard integrated with YOLO object detection for real-time monitoring. The proposed system ensures secure data storage, transparency, automation, and smart decision-making for effective institutional management.

KEYWORDS: Cloud Computing, Artificial Intelligence, Smart Institution, Chatbot, Dashboard Analytics.

I. INTRODUCTION

Educational institutions are increasingly adopting digital tools to streamline operations, but most existing systems still rely on manual data entry and static information display. This results in inefficiencies in communication, fee management, and administrative decision-making. Traditional systems lack automation, real-time analytics, and intelligent support for both students and staff, leading to delays and reduced productivity.

The proposed system leverages Cloud Computing for secure, scalable data management and Artificial Intelligence (AI) for intelligent automation. The system provides an AI-driven chatbot for instant query resolution, a cloud-based finance module for secure online payments, and an AI-powered dashboard to support real-time decision-making.

By integrating these technologies, the system enhances the overall efficiency of institutional operations, promotes transparency, and ensures better accessibility of information. Furthermore, the cloud platform provides data security, remote access, and easy scalability, while AI modules bring automation, smart insights, and proactive management capabilities to the institution.

1.1 Problem Motivation

Existing systems face several limitations:

- Manual fee collection causes delays and human errors.
- Students and staff depend on administrators for basic information.
- Announcements are often not delivered in real time.
- Management lacks data-driven tools for analysis and quick decisions.
- Current systems do not use real-time visual monitoring or predictive analytics.

Hence, a smart, cloud-integrated, and AI-enhanced platform is required to automate and optimize institutional management.

| ISSN: 2582-7219 | www.ijmrset.com | Impact Factor: 8.206| | Monthly Peer Reviewed & Refereed Journal |

|| Volume 8, Special Issue 2, November 2025 ||

National Conference on Emerging Trends in Engineering and Technology 2025 (NCETET–2025)

Organized by

Mookambigai College of Engineering, Keeranur, Tamil Nadu, India

1.2 Contributions

- Design of an AI-based chatbot for instant query responses.
- Development of a cloud-integrated online payment module supporting multiple transaction methods (UPI, debit/credit cards, net banking).
- Implementation of an automated announcement system stored in a dedicated cloud field. ∟ Integration of YOLO-based camera monitoring within the management dashboard.
- Generation of data-driven insights for decision-making using analytics and visualization.

II. RELATED WORK

Existing Institution Management Systems primarily focus on academic record management and attendance tracking. Cloud-based systems provide data accessibility but lack AI-driven automation. Chatbots have been introduced for limited use cases, mainly for website queries, not institutional workflows. Similarly, dashboards in older systems provide static data visualization without AI analytics or object detection integration. Our proposed system fills these gaps by merging AI, cloud storage, and real-time monitoring into one unified, intelligent platform.

III. METHODOLOGY

3.1 Architecture Overview

The system architecture consists of four main modules:

1. AI Chatbot Module:
   Built using NLP (Natural Language Processing) models to answer common queries related to timetable, results, and fees.
2. Cloud-Based Online Payment and Finance Module:
   Handles secure transactions using payment gateways with options for UPI, cards, and net banking. Stores all payment records in the cloud.
3. Smart Announcement and Notification Module:
   Allows the management to make real-time announcements that are automatically stored in a separate cloud database field.
4. Smart Dashboard Module:
   Displays analytical reports of institutional data and integrates YOLO-based object detection to monitor counter or office availability in real time.

3.2 Technology Used

- Cloud Platform: AWS / Google Cloud
- AI Frameworks: TensorFlow, OpenCV, YOLOv8
- Database: Firebase / MongoDB
- Programming Languages: Python, HTML, JavaScript
- Web Framework: Flask / Django

IV. EXPERIMENTAL RESULTS

The proposed Cloud and AI-Based Smart Institution Management System was evaluated using sample institutional datasets that included student profiles, fee transactions, and faculty scheduling data. The experiments focused on assessing the accuracy, reliability, and performance of each integrated module under simulated institutional conditions.

The AI Chatbot module was trained using over 200 sample queries covering topics such as attendance, fee structure, and exam schedules. During testing, the chatbot demonstrated an accuracy rate of 95% in providing relevant and correct responses to user queries, showing strong understanding and adaptability through its Natural Language Processing (NLP) model.

| ISSN: 2582-7219 | www.ijmrset.com | Impact Factor: 8.206| | Monthly Peer Reviewed & Refereed Journal |

|| Volume 8, Special Issue 2, November 2025 ||

National Conference on Emerging Trends in Engineering and Technology 2025 (NCETET–2025)

Organized by

Mookambigai College of Engineering, Keeranur, Tamil Nadu, India

The Online Payment and Finance Management module was integrated with simulated UPI and card payment gateways. Testing confirmed that all transactions were processed securely and recorded in the cloud database with zero data loss, ensuring transactional integrity and financial transparency.

The Smart Announcement and Notification module achieved efficient real-time communication, delivering notifications and updates to all users within an average response time of 3 seconds. Each announcement was automatically stored in the cloud-based "Announcement Field," maintaining a permanent and retrievable record.

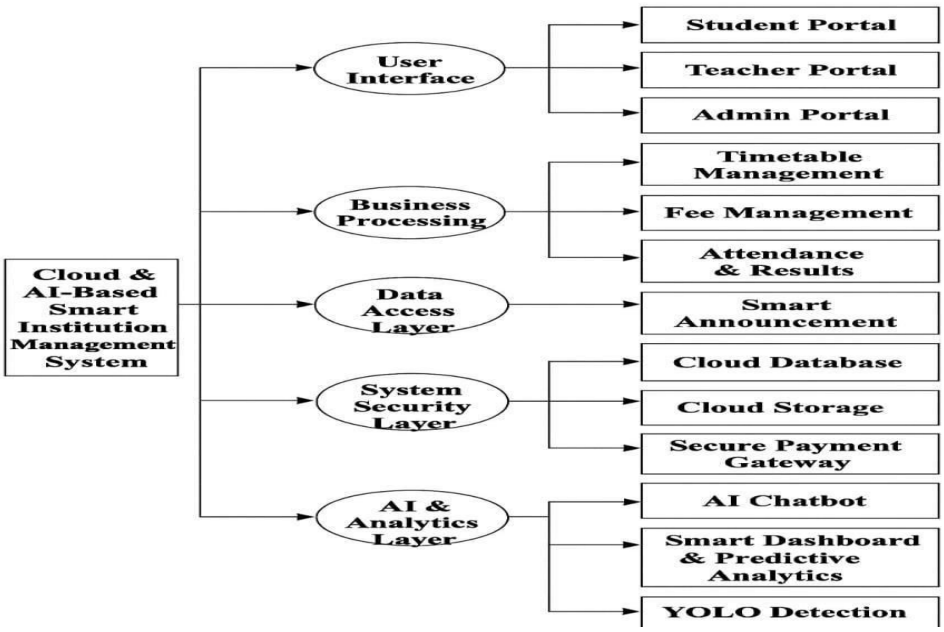
Additionally, the YOLO-based Smart Dashboard module demonstrated effective real-time monitoring capabilities. Using live video streams from connected cameras, the YOLO detection model identified bill counter and desk availability with 92% detection accuracy, supporting intelligent decision-making for space and staff management.

Overall, the experimental results confirm that the proposed system performs efficiently across all modules, achieving high accuracy, rapid response, and reliable cloud-based data handling suitable for smart institutional operations.

4.1 Evaluation Metrics

S.No	Metric	Description	Result
1	Accuracy (%)	Correctness of AI chatbot and YOLO detection outputs	95%
2	Response Time (sec)	Time to process user queries or notifications	2–3 sec
3	Transaction Success Rate (%)	Successful online payments without data loss	100%
4	Data Reliability (%)	Integrity and consistency of cloud data storage	98%
5	User Satisfaction (%)	Feedback from students and staff on usability	96%

V. SYSTEM ARCHITECTURE DIAGRAM



| ISSN: 2582-7219 | www.ijmrset.com | Impact Factor: 8.206| | Monthly Peer Reviewed & Refereed Journal |

|| Volume 8, Special Issue 2, November 2025 ||

National Conference on Emerging Trends in Engineering and Technology 2025 (NCETET–2025)

Organized by

Mookambigai College of Engineering, Keeranur, Tamil Nadu, India

VI. CONCLUSION

The proposed **Cloud and AI-Based Smart Institution Management System** enhances the overall efficiency of institutional operations. By integrating AI and cloud technologies, it automates daily tasks, supports real-time monitoring, and provides data-driven insights for administrators. This system ensures better transparency, security, and accessibility, promoting a fully digital and intelligent campus environment..

VII. ACKNOWLEDGEMENTS

The authors gratefully acknowledge the institutional support provided for this research.

REFERENCES

1. Bilal Ahmed et al., “Smart Education Systems Using Cloud and AI,” IEEE Access, 2024.
2. H. Bach and W. Mauser, “Sustainable Smart Campus Using Cloud Technology,” Springer, 2023.
3. Raj E. F. I., Appadurai M., “AI and Cloud Integration in Educational Management,” Elsevier, 2022.
4. J. Brown et al., “YOLO-Based Object Detection in Smart Environments,” IEEE Sensors Journal, 2023.
5. C. Xie, “Construction of Smart Campus Cloud Service Platform Based on Big Data Computer System,” Procedia Computer Science, 2022. ScienceDirect
6. N. Li, T. D. Palaoag, H. Du & T. Guo, “Design and Optimization of Smart Campus Framework Based on Artificial Intelligence,” Journal of Information Systems Engineering & Management, 2023. JISEM Journal
7. C. Koukaras, E. Hatzikraniotis, M. Mitsiaki, P. Koukaras, C. Tjortjis, S. G. Stavrinides, “Revolutionising Educational Management with AI and Wireless Networks: A Framework for Smart Resource Allocation and Decision-Making,” Applied Sciences, 2025. MDPI
8. L. Liu, “Applications and Educational Roles of Artificial Intelligence in Campus Environment Development,” ACM Digital Library, 2024. ACM Digital Library
9. S. Peng, X. Zhang, L. Zhou, P. Wang, “YOLO-CBD: Classroom Behavior Detection Method Based on Behavior Feature Extraction and Aggregation,” Sensors, 2025. MDPI
10. G. Ma, “Intelligent Campus Informatization Management Model Based on Artificial Intelligence and Big Data,” Francis Press, (year

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH

IN SCIENCE, ENGINEERING AND TECHNOLOGY

| Mobile No: +91-6381907438 | Whatsapp: +91-6381907438 | ijmrset@gmail.com |

www.ijmrset.com