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Academic Teacher Portal: AI-Driven Institutional Document Generation system

Dr. Harish Gorewar¹, Achal Nikhade², Anushka Pilare³, Bhuvneshwari Janbandhu⁴,
Mrunali Barsagade⁵

Professor & Project Guide, Dept. of Information Technology, KDK College of Engineering, Nagpur, India¹

Dept. of Information Technology, KDK College of Engineering, Nagpur, Maharashtra, India²⁻⁵

ABSTRACT: In today's educational environment, teachers are not only responsible for teaching but also for handling a large amount of administrative work such as preparing reports, notices, and feedback forms. This manual work consumes significant time and reduces productivity. To solve this problem, we propose an **Academic Teacher Portal: AI Driven Institutional Document Generation System**. This system uses Artificial Intelligence to automatically generate institutional documents like event reports, notices, and feedback forms in multiple languages.

KEYWORDS: Artificial Intelligence, Event Report Generation, Flask API, RAG Model, Automation.

I. INTRODUCTION

Teachers at schools and colleges have to do a lot of work that is not actually teaching. This includes making reports, notices and other official papers. Usually they have to do all of this by hand which takes a time and is not a good use of their time. Teachers often spend a lot of time making sure documents look right and correct.

The Academic Teacher Portal is a tool that can help with this problem. It uses Artificial Intelligence to make the process easier. With this system teachers can make looking documents very quickly. They just have to put in a bit of information. The system also makes sure that the documents look the same every time are formatted correctly and can be used in languages.

This project is trying to make a system that's smart and can help teachers do their jobs better. The goal is to reduce the amount of work teachers have to do make them more efficient and make sure the documents they produce are of quality. The Academic Teacher Portal is designed to help institutions, like schools and colleges by making the jobs of teachers easier.

Objectives:

- Automate event report generation
- Reduce manual effort.
- Ensure consistency and accuracy
- Provide a user-friendly system

II. LITERATURE REVIEW

[1] "Early Event Detection and Report Generation from Heterogeneous Data Sources" :- Previous studies focus on event detection using Twitter data and machine learning techniques. Methods like clustering, wavelet analysis, and RNNs have been used but face issues such as noise, limited data sources, and lower accuracy. The reviewed paper improves this by using multiple data sources and advanced models like K-means, LSTM, and GPT-2 for better event detection and report generation.

[2] "AI-Powered Event Aggregator System for Intelligent Event Recommendation":- Existing event management systems provide basic features like event registration and management but lack personalization and automation. Some studies use machine learning for event recommendations, while others focus on QR-based attendance tracking. However,



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these systems are limited in integration and real-time capabilities. The proposed system improves this by combining AI-based recommendations, real-time updates, and complete event management in one platform.

[3] “AI Powered Event Organize”:- Recent studies highlight the use of Artificial Intelligence in event management and recommendation systems to improve efficiency and user experience. AI techniques such as content-based and collaborative filtering are used to provide personalized event suggestions based on user interests and past behavior. Researchers have also explored machine learning algorithms like K-means, KNN, and matrix factorization for better recommendation accuracy. However, challenges such as system reliability, data handling, and user adaptation still exist. The reviewed paper addresses these by integrating AI-based recommendations with event management features to enhance user engagement and decision-making.

[4] “An AI Based Event Recommendation & Management System”:- Previous research on event recommendation systems focuses on event-based social networks (EBSNs) and uses techniques like content-based filtering, collaborative filtering, and hybrid approaches to provide personalized suggestions. Studies also consider factors such as user preferences, location, and social interactions to improve recommendation accuracy. However, challenges like cold-start problems, data complexity, and scalability still exist. The reviewed paper addresses these issues by using a context-aware hybrid recommendation model combined with event management features to enhance efficiency and user experience.

[5] “From images to insights: The role of AI in radiology report generation”:- Vaishali and Garg explore the role of AI in automating radiology report generation using deep learning techniques such as CNNs for image analysis and transformers for text generation. These approaches improve efficiency, consistency, and accuracy of reports. However, challenges like lack of explainability, data bias, and limited clinical reliability still need to be addressed for real-world adoption.

III. METHODOLOGY

The development of the Academic Teacher Portal follows a structured approach to ensure efficient system design, implementation, and testing.

◆ 1. Collecting and Preparing the System

1.1 Setting Up the Environment

- A virtual environment is created for project isolation.
- Required dependencies and libraries are installed.
- Environment variables are configured using the .env file.

1.2 Backend Development

- Backend is developed using Python framework (FastAPI).
- APIs are created for handling requests and responses.
- Database connection is established.
- Backend server is executed for processing.

1.3 Frontend Development

- User interface is developed using modern frameworks.
- Pages such as login, document generation, and preview are designed.
- Frontend is integrated with backend APIs.
- Frontend server is executed for user interaction.

◆ 2. Data Handling and Integration

2.1 Database Configuration

- Database is set up using MongoDB.
- User and document data are stored securely.
- Proper data management techniques are applied.



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2.2 API and AI Integration

- AI APIs are integrated for document generation.
- API keys are configured securely.
- Fallback mechanism is implemented for reliability.

3. System Workflow

- User registers or logs into the system.
- User submits input data.
- Backend processes the request.
- AI generates the document.
- Output is displayed to the user.
- Document is downloaded in required format.

4. Testing and Validation

4.1 System Testing

- Backend and frontend integration is tested.
- APIs are tested for accuracy and performance.

4.2 Error Handling

- Server errors are handled properly.
- Port conflicts are resolved.
- Database errors are managed effectively.

5. Deployment

- System is deployed on local or cloud server.
- Server configuration is completed.
- Scalability is ensured for future expansion.

6. Output Generation

- Documents are generated automatically using AI.
- Preview and editing options are provided.
- Documents can be downloaded as PDF.

7. Limitations and Future Scope

- System depends on external AI APIs.
- Scalability may be limited by server resources.
- Future enhancements can improve system features.

IV.WORKFL

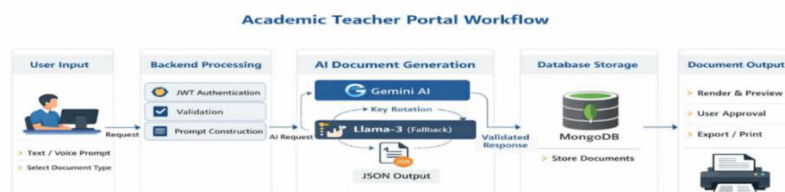


Fig. Workflow of system



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The workflow of the Academic Teacher Portal begins when a user (teacher or administrator) submits a text or voice input through the frontend interface. The request is sent to the backend, where it is authenticated using a JWT token and validated. After successful validation, the system generates a structured prompt and forwards it to the AI engine. The engine produces the required document in JSON format using Gemini, with Llama-3 serving as a fallback mechanism if needed. The generated response is then validated to ensure it conforms to the required structure. Subsequently, the document is stored in the MongoDB database and returned to the frontend. The frontend renders the content into predefined templates, such as notices or reports, for user preview. Finally, the user can review, edit, approve, and export the document as a print-ready file, thereby completing the workflow.

V. SYSTEM REQUIREMENTS

The Academic Teacher Portal requires both hardware and software components to function efficiently. These requirements ensure smooth document generation, AI processing, and system performance.

1. Hardware Requirements

- Processor: Minimum Intel i5 or equivalent
- RAM: Minimum 8 GB (16 GB recommended for better performance)
- Storage: At least 20 GB free disk space
- Internet Connection: Stable broadband connection for AI API communication

2. Software Requirements

- Operating System: Windows 10/11, Linux, or macOS
- Frontend Technologies: Next.js (v14), React (v18)
- Backend Framework: FastAPI (Python 3.10+)
- Database: MongoDB Atlas (Cloud-based NoSQL database)
- Browser: Google Chrome / Microsoft Edge (latest version recommended)

3. AI & API Requirements

- Google Gemini API (gemini-1.5-pro)
- Groq API (Llama 3 model for fallback)
- Multiple API keys for key-rotation mechanism

4. Development Tools

- Node.js (v18 or higher) with npm
- Python (v3.10 or higher) with pip
- Code Editor: VS Code or similar
- API Testing Tool: Postman (optional)

5. Security Requirements

- JWT-based authentication system
- HTTPS protocol for secure communication
- Password hashing using PBKDF2 + SHA-256
- Environment variables for storing API keys and secrets

6. Functional Requirements

- AI-based document generation (notices, reports, feedback forms)
- Multilingual support (English, Hindi, Marathi)
- Document preview and print-ready export (A4 format)
- User authentication and document management
- Real-time processing with fast response (< 20 seconds)



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7. Non-Functional Requirements

- High system availability (99.9% uptime using key rotation)
- Fast performance and low latency
- Scalability for multiple users
- Data privacy and secure storage
- User-friendly interface

VI. RESULT

VI.I. User Login Page

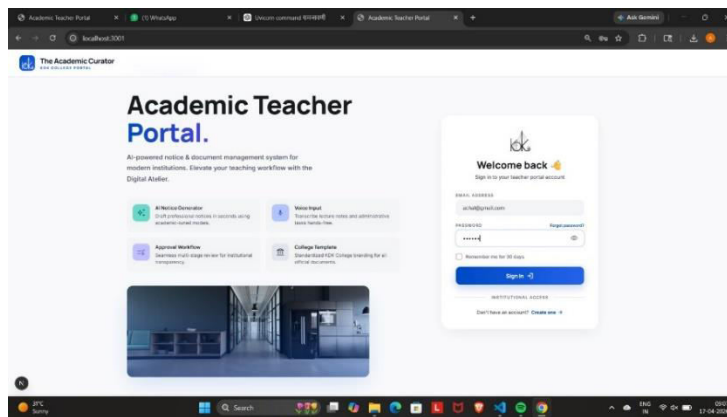


Fig. VI.I. User login Page

VI.II. User Interface

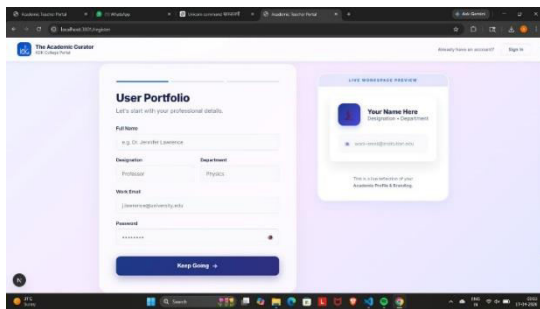


Fig. VI.II. (1) User portfolio interface

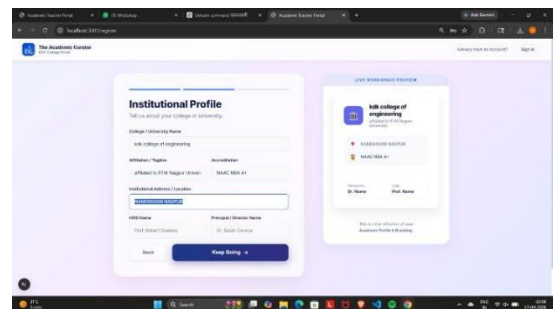


Fig. VI.II. (2) Institutional Profile

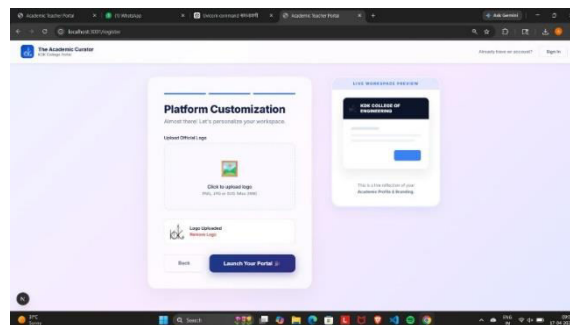


Fig. VI.II. (3) Platform customization



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VI.III. Feedback Form

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FEEDBACK & EVALUATION FORM

Shivaji Jayanti Celebration Feedback Form
This form is designed to collect feedback on the Shivaji Jayanti celebration held on [Date]. Your input will help us improve future events.

1. How would you rate the overall organization of the event?
 1 2 3 4 5 (1: Poor, 5: Excellent)

2. What did you think of the cultural performances?
 Excellent Good
 Fair Poor

3. Any suggestions for improving the food and beverage arrangements?

4. How would you rate the speaker's knowledge on Shivaji's life and legacy?
 1 2 3 4 5 (1: Poor, 5: Excellent)

5. What did you like most about the event?

6. Would you attend a similar event in the future?
 Yes No
 Maybe

7. Any additional comments or feedback about the event?

Fig. VI.III. (1) Generated feedback form

Thank you for taking the time to provide your valuable feedback. Your input will help us create more engaging and meaningful events in the future.

Fig. VI.III. (2) Generated feedback form

VI.IV. WhatsApp Message

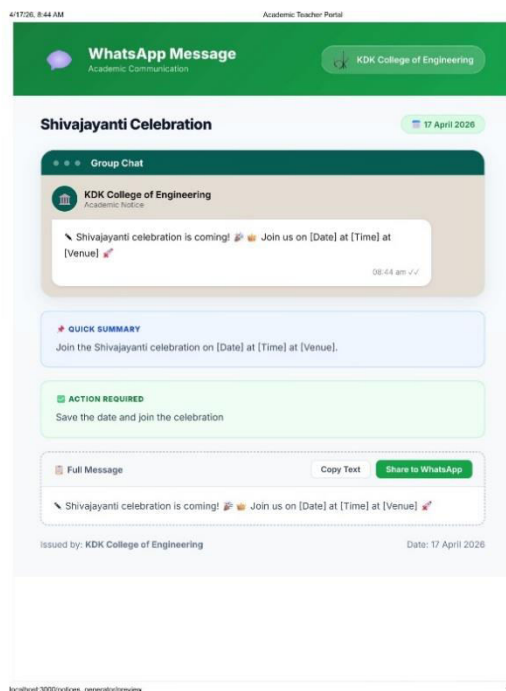


Fig. VI.IV. WhatsApp Message



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VI.V. Notice



Fig. VI.V. Notice

VI.VI. Report

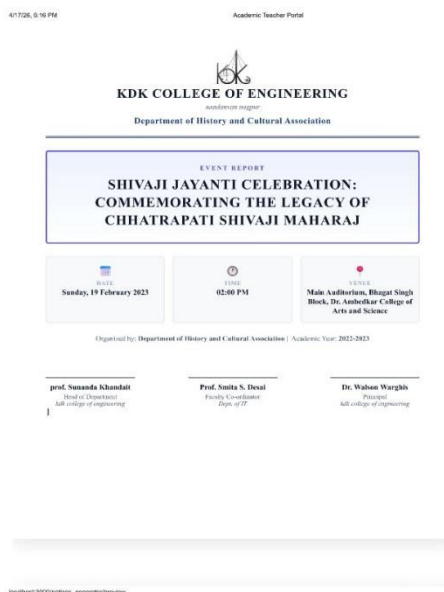


Fig. VI.VI. Report



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VII. CONCLUSION

The **Academic Teacher Portal: AI Driven Institutional Document Generation System** is a powerful solution to reduce the administrative burden on teachers. It automates document generation, ensures consistency, and saves time. With the integration of AI and modern technologies, the system improves productivity and efficiency in educational institutions.

This research demonstrates how Artificial Intelligence can be used effectively in the education sector to solve real-world problems. The Academic Teacher Portal successfully addresses the challenges of manual document creation in educational institutions by introducing an AI-powered, automated solution. By integrating advanced technologies like generative AI, full-stack development, and a multi-key resilience mechanism, the system transforms simple user input into structured, multilingual, and print-ready institutional documents within seconds.

The platform significantly reduces time, effort, and human error while ensuring consistency in formatting and compliance with academic standards such as NAAC requirements. Its robust architecture, secure authentication, and efficient data management make it reliable for real-world institutional use. Overall, the project demonstrates how intelligent automation can enhance productivity in academic administration, allowing educators to focus more on teaching and less on repetitive documentation tasks.

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