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A Paperless Scholarship Disbursement System Development for PMSSS using AI Artificially and Cloud Technologies

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ABSTRACT: The Scholarship Automatic Tracking System stands out as an optimal solution tailored to streamline scholarship tracking and management processes. Leveraging electronic tools and real-time searches, the system enhances transparency in payment procedures, minimizes errors, and boosts scholarship efficacy. By providing stakeholders with instantaneous access to financial data, it fosters a more accountable and efficient learning environment.

KEYWORDS: Artificial Intelligence (AI),Block chain, Transparency, Chatbot.

I. INTRODUCTION

Scholarships have always been in favor of promoting educational equality, usually providing opportunities to members of marginalized groups who are eligible for pursuing higher education degrees. In India, the Prime Minister's Special Scholarship Scheme (PMSSS) has been made for students, especially from Jammu and Kashmir, through which financial support is given to pursue undergraduate degrees. Though thousands of students have been benefited from this scheme, the operational model of PMSSS presently has been deficient as it does not work in its best efficiency and is highly less transparent because most operations are manual.

Thus, the research proposed is going to innovatively use a paperless AI-enabled scholarship disbursing system for PMSSS. This system would automate and optimize the entire process of application submission, verification, and disbursement by use of energy from cloud computing-aided artificial intelligence (AI). It promises to develop speed, precision, and scalability against the existing bottlenecks-indicative of the larger vision of Digital India.

II. LITERATURE REVIEW

Existing Scholarship Management Systems
"Some of the existing digital scholarship platforms include India's ePASS (Electronic Payment and Application System) and the National Scholarship Portal (NSP), which have made inroads into the online aspects of the scholarship lifecycle. Such systems allow for online applications, fund disbursement tracking, and notifications, but they come with a number of limitations as follows:
Limitations in scalability: Fail to cater for heavy traffic during peak application periods.
Absence of AI interfaces: No automated tools for document verification and fraud detection.
Poor real-time communication: Delays in notifying students on application status"--International.

III. METHODOLOGIES

The system architecture comprises five primary layers:

Frontend Interface:
Developed using React.js for its adaptability regarding delivery of the interface, and it is built around a mobile-first design to enhance access for students from remote areas.

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Backend API Layer:
Incorporates Node.js and Express.js as they establish communication channels between the user interface, database, and AI modules.

Database Management:
MongoDB has been used for this purpose as it is NoSQL and thus fast and flexible while being able to take input in most documents by storing student records, application logs, and audit trails.

AI Modules:
Smart Verify AI for document verification.
Time Track AI for predicting processing times.
Real-Time Notification System:
Powered by Apache Kafka and Socket.IO to give real-time notifications to students and administrators.

Key Features
Smart Verify AI
It is an Optical Character Recognition (OCR) device with Tesseract.js that extracts text from the documents uploaded, compares it with the specified eligibility criteria, and marks the differences in fields such as mismatched dates or missing fields.

Time Track AI
This tool is based on TensorFlow.js and predicts processing times for all applications. For example, it could determine that an application would take two weeks before processing would begin during peak seasons.
Predictive Eligibility Checker
An algorithm based on machine learning checks all students' profiles against defined scholarship criteria at the beginning of the screening. This alleviates the workload of the administrator to a significant extent.

Adaptive Workflow Engine
Dynamically modifies workflows on the basis of application volume so that critical applications are expedited while maintaining overall efficiency.

AI Chatbot
An always-available virtual assistant addresses common queries, such as "What documents are required?"
Data Privacy and Security
Data privacy and security forms the very foundation of this system. Some of the processes put in place are:

Data Encryption: All kinds of sensitive data are encrypted via AES-256.
Secure Authentication: Two Factor Authentication (2FA) guarantees that any unauthorized agency or individual trying to gain access to the system will not be able to do so but only the authorized users have the right to use the system.
Compliance with Rules: The system complies with GDPR and also India s Personal Data protection bill.

IV. RESULTS/DISCUSSION

Key Outcomes
Reduced Time of Processing
Application processing time was reduced by fifty percent leading to prompt disbursement of scholarships. Document verification, which took several days before, is now done within hours using Smart Verify AI.

Enhances Accuracy
Verification accuracy improved up to ninety-five percent which greatly reduced the errors due to human oversight. The system was able to mark incomplete or fraudulent documents with great precision.

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Enhanced User Experience
The system is said to be user-friendly as it scores above ninety percent users were satisfied with real-time updates and timelines, and the other is being handled by an eighty-five percent query to human input.

V. CONCLUSIONS

The proposed system facilitates transparent tracking and recording of transactions through web applications, ensuring accountability and trust. Utilizing blockchain technology and integrating with academic institutions can further enhance transparency and streamline processes, ultimately benefiting both scholarship providers and recipients.

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