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An AI-Enabled Centralized Platform for End-to-End Teacher Lifecycle Management

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Abstract - Teacher-related administrative processes such as recruitment, document verification, posting, attendance, leave, transfers, promotions, training and performance evaluation are frequently managed through disconnected, semi-digital and paper-based systems across educational institutions. This fragmentation contributes to repeated document submission, administrative delays, poor visibility into a teacher's application status, and an absence of a single, centralized professional record. This paper presents the design, requirement analysis, architecture and implementation of an AI-enabled centralized Teacher Lifecycle Management System that represents the complete professional lifecycle of a teacher — from recruitment through appointment, posting, service record maintenance, attendance, leave, transfer, promotion, training and performance evaluation — within a unified digital platform anchored around a single digital service record per teacher. The system provides role-based access for teachers, principals, HR/recruitment officers, education officers and administrators, and integrates two AI-assisted functions: document-verification support and smart (face-recognition- and QR-based) attendance. The requirement analysis was carried out through an empathy-mapping exercise conducted from the perspective of the teacher as the primary user persona. The system was developed following an Agile methodology across research, design, development and testing phases, using a React.js/Node.js/PostgreSQL technology stack with Python-based AI components. This paper reports the system design, module-level functionality and qualitative validation performed to date; quantitative performance metrics, formal usability evaluation and large-scale field testing are identified as ongoing work and are marked accordingly throughout the paper. The principal contribution of this work is the unification of otherwise fragmented teacher-management workflows into a single, lifecycle-oriented digital architecture, rather than any single isolated technical feature.

Keywords - Teacher lifecycle management; digital service record; education administration system; role-based access control; AI-assisted document verification; smart attendance; e-governance in education.

I. INTRODUCTION

Educational institutions — schools, colleges, universities and education departments — depend on a large and continuously evolving teaching workforce whose professional lifecycle spans recruitment, verification, appointment, posting, attendance, leave, training, performance evaluation, transfer, promotion and eventual retirement. In many institutions, each of these stages is handled through a separate, often manual or partially digitized process, resulting in disconnected records for the same individual teacher [3]–[6]. As the scale of institutions and education departments grows, this fragmentation increases administrative workload, delays decision-making and makes it difficult to obtain a unified view of a teacher's professional history.

This paper describes the design and implementation of an AI-enabled centralized Teacher Lifecycle Management System that was developed to address this fragmentation. Rather than treating recruitment, attendance, leave, transfers, promotions, training and service records as independent systems, the proposed platform organizes them around a single digital identity and service record per teacher. The system additionally incorporates two AI-assisted capabilities — support for document verification and smart attendance — as part of specific workflow stages, while the remaining lifecycle stages are handled through conventional digital workflow automation and role-based access control.

The remainder of this paper is organized as follows. Section II discusses the background and motivation for the work. Section III defines the problem addressed. Section IV reviews related work. Section V describes the requirement analysis and user study. Sections VI–IX present the proposed system, its architecture, modules and AI components. Section X describes the implementation, Section XI the testing approach, and Section XII the results and discussion. Sections XIII and XIV discuss limitations and future scope, and Section XV concludes the paper.

II. BACKGROUND AND MOTIVATION

Teacher management in most institutions involves multiple stakeholders — teachers themselves, principals or headmasters, HR/recruitment officers, education officers and administrators — each interacting with different, and frequently disconnected, subsets of teacher-related data. Recruitment records may be maintained separately from service records; attendance and leave data may be tracked in yet another system; and transfer, promotion and training records are often maintained manually or in spreadsheets. This is consistent with the broader literature on school and university management information systems, which have historically been built as modular systems addressing student records, teaching resources or administrative affairs individually rather than as an integrated professional lifecycle for staff [3]–[6], [11].

The consequences of this fragmentation, as identified during our requirement analysis (Section V), include repeated submission of the same documents at different stages of a teacher's career, delays in processing transfer and promotion requests, difficulty tracking the status of applications, continued reliance on paper-based administrative work, and a lack of a single accessible service record. These observations motivate a system designed explicitly around the concept of a lifecycle rather than around isolated administrative transactions.

III. PROBLEM DEFINITION

The core problem addressed by this work can be stated as follows: how can a centralized digital platform manage the complete professional lifecycle of teachers — spanning recruitment, document verification, posting, attendance, leave, transfers, promotions, training and service-record maintenance — while reducing administrative effort, improving transparency,

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maintaining secure and centralized service records, and providing administrators with useful analytics for decision support?

This problem has both a functional dimension (covering the range of lifecycle stages within one platform) and a data-architecture dimension (maintaining one coherent digital identity per teacher rather than disconnected per-process records).

IV. RELATED WORK / LITERATURE REVIEW

A. Educational and School Management Information Systems

A substantial body of work addresses management information systems for educational institutions. Educational Management Information Systems have been proposed to convert manual educational-affairs administration into system-based management, typically covering course and faculty administration within a single institution [3]. Related work has examined student-focused information management systems built on client–server and three-tier architectures [4], [11], as well as systems for managing and sharing teaching resources over web-based, distributed architectures [6]. At a broader level, school management information systems have been studied for their role in supporting attendance monitoring, assessment records, reporting, resource allocation and administrative decision-making in the context of increasing educational data volumes [5]. These systems, however, are generally oriented toward a single administrative function — course management, student records or resource sharing — rather than the complete professional lifecycle of teaching staff.

B. Digital and Blockchain-Based Teaching Records

More recent work has explored the use of distributed-ledger technology to secure teaching-related records, proposing blockchain-based teaching information management systems that combine asymmetric encryption, distributed storage and hashing techniques to protect academic records against tampering [2]. While such approaches primarily target record integrity rather than lifecycle coverage, they reflect a broader recognition that teacher- and institution-related records benefit from centralized, tamper-resistant digital management — a principle consistent with the digital service book adopted in the present work.

C. E-Recruitment and Human Resource Information Systems

Electronic recruitment has been studied extensively as a means of reducing the administrative burden of sourcing, screening and selecting candidates, and of enabling applicants to track their application status online rather than through manual correspondence [9], [10]. Human-resource management information systems more broadly have been proposed to unify staff-related administrative functions such as skill tracking and workforce planning within a single system [8]. The recruitment and document-submission module of the proposed system draws on these established e-recruitment concepts, applying them specifically to teacher onboarding.

D. AI-Assisted Document Verification

Automated document processing using Optical Character Recognition (OCR) has been widely studied for extracting and validating text from scanned or image-based documents, ranging from classical OCR techniques to machine-learning- and neural-network-based approaches for handling variable fonts, layouts and handwriting [12]–[16]. Literature reviews of OCR post-processing techniques note that, despite decades of development, fully automated OCR has not achieved perfect accuracy and typically benefits from validation or human-in-the-loop review for high-stakes use cases [16]. This motivates the design choice, described in Section IX, of treating AI-assisted document verification in the proposed system as a workflow aid that reduces manual effort rather than as a fully autonomous decision-making component.

E. Face-Recognition-Based and Smart Attendance Systems

Face-recognition-based attendance has been proposed extensively as an alternative to manual roll-calls and signature sheets, using techniques ranging from classical algorithms such as Haar-cascade detection and Local Binary Pattern Histograms to deep-learning approaches based on convolutional neural networks, with the shared goals of reducing time spent on attendance marking and preventing proxy attendance [1], [17]–[19]. These works consistently report that facial-recognition-based attendance can reduce the manual effort associated with attendance marking, though reported accuracy and reliability vary considerably with dataset, algorithm and deployment conditions. The smart-attendance module of the proposed system (Section VIII-E) adopts this general approach, without adopting the specific accuracy claims of any individual prior system.

F. Role-Based Access Control

Role-Based Access Control (RBAC) is a well-established approach for managing user permissions in multi-stakeholder web applications by associating permissions with organizational roles rather than with individual users, which simplifies security administration in large systems [20]–[22]. The proposed system applies RBAC principles to distinguish access for teachers, principals, HR/recruitment officers, education officers and administrators, consistent with established web-application RBAC design patterns [20], [22].

G. Digital Governance in Education

Finally, work on e-governance and digital governance in educational administration has examined how digitizing administrative workflows can improve transparency, accountability and decision-making in educational institutions, while noting that successful adoption depends on institutional readiness, policy support and equitable access rather than technology alone [23], [24]. This literature motivates treating the proposed system as a scalable architecture intended for adoption across institutions, rather than assuming that digitization alone guarantees improved outcomes.

Taken together, the reviewed literature addresses individual pieces of the teacher-management problem — institutional record-keeping, recruitment, document verification, attendance and access control — largely in isolation. The contribution of the present work is the integration of these pieces around a single teacher-centric lifecycle record, described in the following sections.

V. REQUIREMENT ANALYSIS AND USER STUDY

Requirement analysis was carried out using an empathy-mapping approach, with the teacher treated as the primary stakeholder and persona, and principals, HR/recruitment officers, education officers and administrators considered as secondary stakeholders (Table 1). Through this exercise, the following concerns were identified from the teacher's perspective:

- Repeated submission of the same documents across different administrative processes.
- Delays in transfer and promotion processing.
- Difficulty tracking the status of submitted applications.

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- Continued reliance on paper-based administrative work.
- The need for a single, centralized platform covering all lifecycle stages.
- The need for accessible, up-to-date service records.
- The need for simpler attendance and leave-application processes.
- The need for transparent, trackable administrative workflows.

These findings directly informed the module design described in Section VIII. A structured questionnaire-based survey was not part of the scope reported in this paper; if a formal survey is conducted in subsequent work, the number of participants and quantitative results should be inserted here.

TABLE 1. STAKEHOLDER REQUIREMENTS (SUMMARY)

Stakeholder	Primary Requirement(s) Identified
Teacher (primary persona)	Single service record; simplified attendance/leave; transparent status tracking
Principal / Headmaster	Visibility into staff attendance, leave and postings at the institution level
HR / Recruitment Officer	Streamlined recruitment and document-verification workflow
Education Officer	Oversight of transfers, promotions and training across institutions
Administrator	Centralized analytics and administrative decision support

VI. PROPOSED SYSTEM

The proposed system is organized around a single conceptual model: "One Teacher – One Digital Lifecycle Record." Instead of maintaining recruitment, attendance, leave, transfer, promotion, training and service records as disconnected datasets, the system links them through a centralized teacher profile that persists across the teacher's career (Fig. 1).

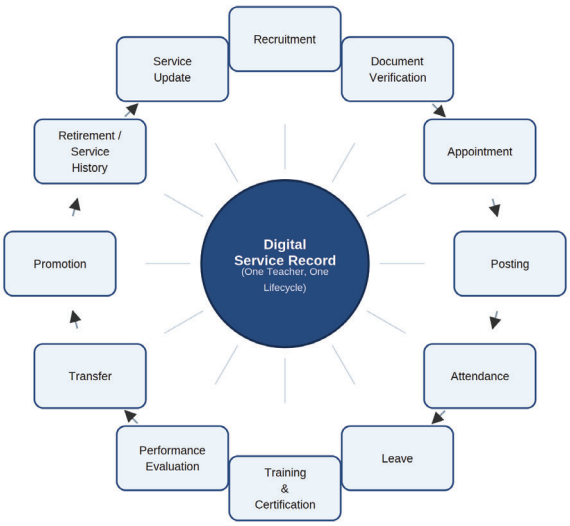

Fig. 1. Overall teacher lifecycle represented within the proposed platform.

Each stage of this lifecycle is implemented as a distinct functional module (Section VIII), but all modules read from and write to the same underlying teacher record, so that information captured at one stage (for example, verified qualification documents at recruitment) remains available and consistent at later stages (for example, eligibility checks for promotion).

VII. SYSTEM ARCHITECTURE

The system follows a layered architecture consisting of a presentation layer, an authentication and role-based access layer, a lifecycle-management backend composed of module-specific services, and a centralized database, with a reporting/analytics layer built on top (Fig. 2).

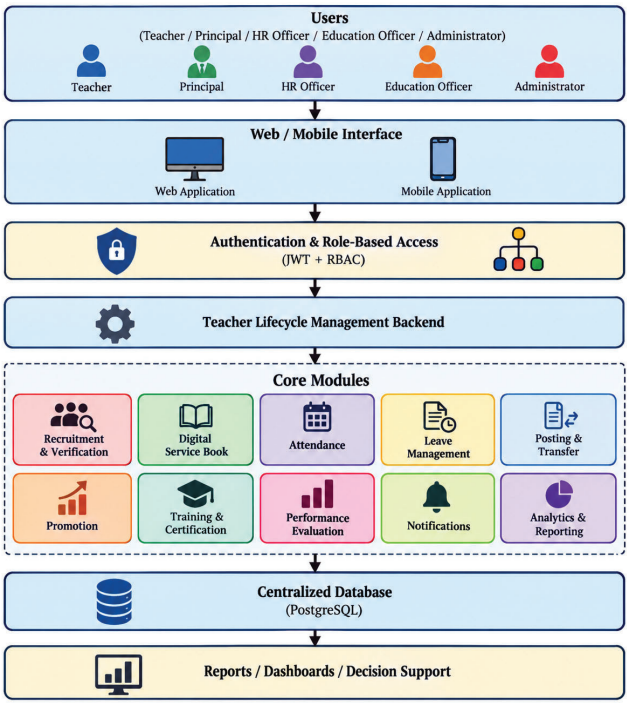

Fig. 2. Layered system architecture of the proposed platform.

AI components are integrated at two specific points within this architecture — document verification within the recruitment/verification module, and face-recognition/QR-based capture within the attendance module — rather than as a separate, standalone layer (Section IX).

VIII. SYSTEM DESIGN AND MODULES

The system is composed of twelve major modules, summarized in Table 3 and described below.

A. User Authentication and Role-Based Access

The system defines five roles — Teacher, Principal, HR/Recruitment Officer, Education Officer and Administrator — each granted access to the functions relevant to that role, following role-based access control principles [20], [22]. Authentication is implemented using JSON Web Tokens (JWT) in combination with role-based authorization checks on the backend.

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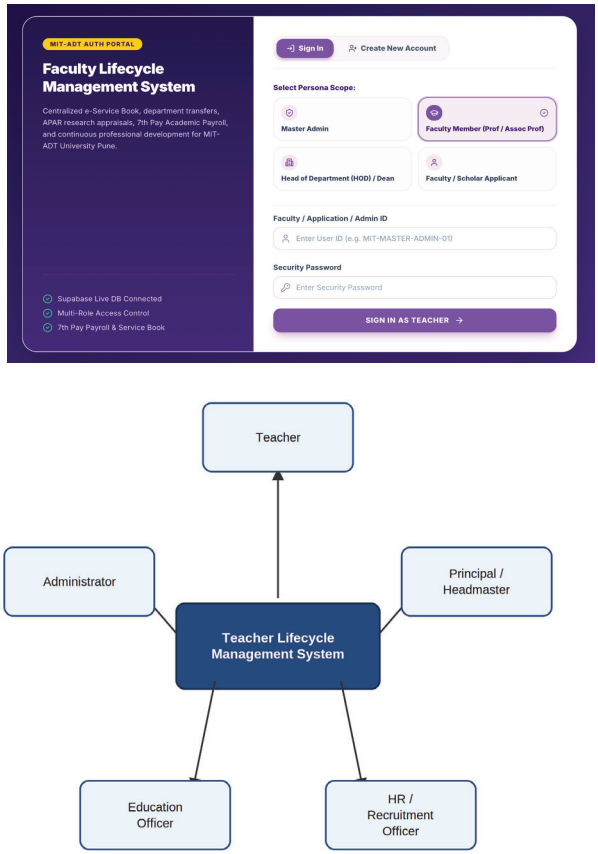

Fig. 3. Interaction between user roles and system modules.

B. Teacher Registration and Recruitment

This module supports online teacher registration, recruitment-application management, digital document submission and application-status tracking, drawing on established e-recruitment concepts [9], [10].

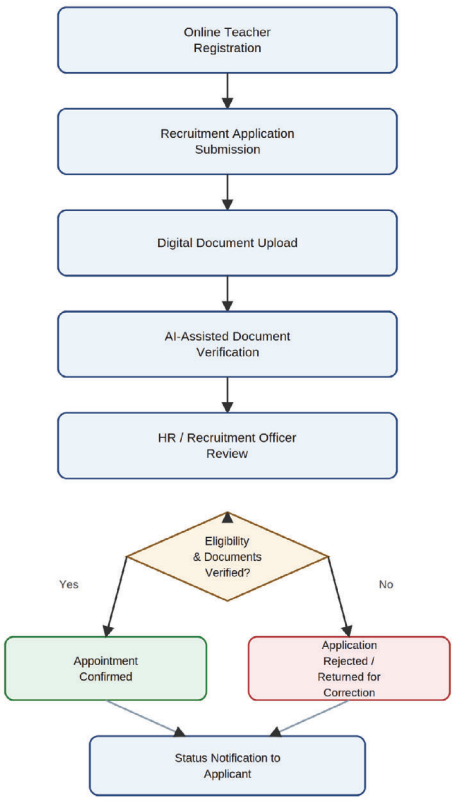

Fig. 4. Recruitment and application workflow.

C. AI-Assisted Document Verification

Submitted documents undergo digital processing and an AI-assisted verification workflow intended to reduce manual verification effort. The specific AI/OCR model, dataset and accuracy figures are implementation details not finalized at the time of writing (see Section IX).

D. Digital Service Book

The Digital Service Book maintains a centralized record for each teacher containing appointment information, postings, transfers, promotions, training history, performance information, and attendance/leave-related records, forming the persistent backbone referenced by every other module.

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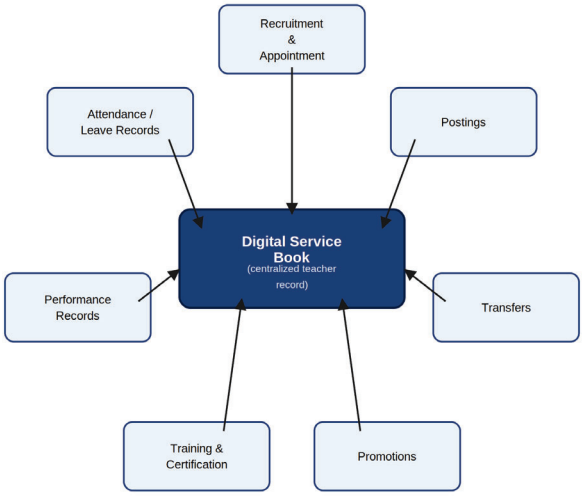

Fig. 5. Digital Service Book data flow across lifecycle stages.

E. Smart Attendance

The attendance module supports face-recognition/AI-based attendance and QR-code-based attendance, following approaches established in prior smart-attendance literature [1], [17]–[19]. No specific model name, training dataset or measured accuracy is claimed here; these are addressed in Section IX and marked for future completion.

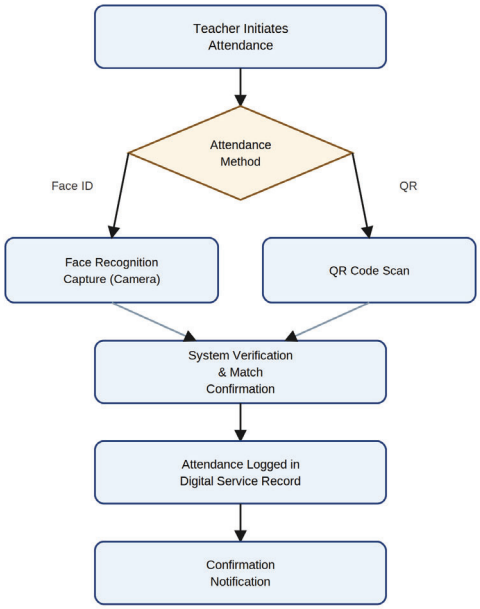

Fig. 6. Smart attendance capture and logging workflow.

F. Leave Management

This module supports online leave application, an approval workflow, leave-status tracking, and integration with the attendance and service-record modules.

G. Posting and Transfer Management

This module manages transfer requests, posting records, approval workflow, status tracking and notifications.

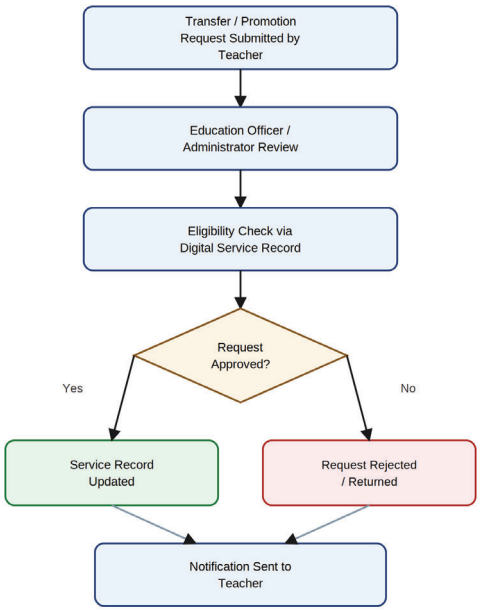

Fig. 7. Transfer and promotion approval workflow.

H. Promotion Management

This module maintains promotion-related records, an approval workflow, and career-progression tracking linked to the Digital Service Book.

I. Training and Certification

This module manages training records, certification records, professional-development tracking and training reminders/notifications.

J. Performance Evaluation

This module maintains digital performance records and supports an administrative performance-monitoring and evaluation workflow.

K. Notification System

This module delivers application updates, approval/rejection notifications and other service-related alerts across all modules.

L. Analytics and Reporting

Administrative dashboards present aggregated information relating to teacher records, attendance, leave, recruitment, transfers, promotions, training, performance and overall workforce composition.

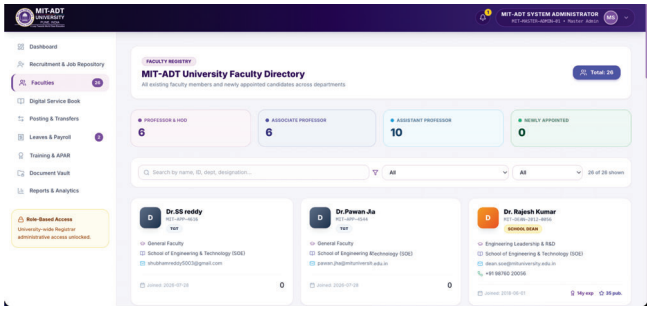

Fig. 8. Administrative analytics dashboard (representative layout).

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Module	Key Functional Requirement(s)
Auth. & Access	Role-based login and permission enforcement for five user roles
Recruitment	Online application, document upload, status tracking
Doc. Verification	AI-assisted processing of submitted documents
Service Book	Centralized, persistent record per teacher
Attendance	Face-recognition and QR-based attendance capture
Leave	Application, approval workflow, status tracking
Posting/Transfer	Request submission, approval, notification
Promotion	Record maintenance, approval workflow
Training	Record maintenance, reminders
Performance	Digital evaluation record maintenance
Notifications	Event-driven alerts across modules
Analytics	Administrative dashboards and reporting

TABLE 2. FUNCTIONAL REQUIREMENTS (SUMMARY)

No.	Module
1	User Authentication & Role-Based Access
2	Teacher Registration & Recruitment
3	AI-Assisted Document Verification
4	Digital Service Book
5	Smart Attendance
6	Leave Management
7	Posting & Transfer Management
8	Promotion Management
9	Training & Certification
10	Performance Evaluation
11	Notification System
12	Analytics & Reporting

TABLE 3. SYSTEM MODULES OVERVIEW

IX. AI COMPONENTS

The system currently integrates AI in two functional areas.

A. Document Verification Support

Submitted teacher documents are digitally processed through an AI-assisted verification workflow intended to reduce, rather than eliminate, manual verification effort, consistent with the human-in-the-loop pattern noted in the OCR and document-processing literature [12]–[16]. In line with the scope of this paper, no specific OCR/AI model, training dataset or measured accuracy figure is reported.

B. Smart Attendance

The smart-attendance module supports face-recognition-based and QR-code-based attendance capture, following the general design pattern established in prior smart-attendance systems [1], [17]–[19]. As with document verification, specific model architecture, training/testing dataset details and accuracy figures are not reported here.

Both AI-assisted functions are implemented using Python and OpenCV within the backend architecture described in Section X, and are designed as auxiliary workflow aids operating alongside, rather than replacing, administrative review.

X. IMPLEMENTATION

The system was implemented using the following technology stack: React.js with Tailwind CSS for the frontend; Node.js with Express.js for the backend/API layer; PostgreSQL as the centralized relational database; Python and OpenCV for AI-related document- and image-processing components; JWT with role-based access control for authentication and authorization; and Git/GitHub with VS Code for version control and development. Cloud deployment details are not reported, as no specific deployment infrastructure is finalized at the time of writing.

Development followed an Agile methodology across five phases: (1) Research — stakeholder identification, empathy mapping, requirement gathering and workflow analysis; (2) Design — system architecture, database design, UI/UX design, module planning and AI-workflow planning; (3) Development — frontend and backend/API development, database integration, implementation of the lifecycle modules, and authentication/role-based access; (4) Testing — functional, module-level and workflow validation testing; and (5) Deployment/Finalization — system integration, performance monitoring and future-enhancement planning.

XI. TESTING AND EVALUATION

Testing to date has consisted of functional and module-level validation rather than a formally logged, metric-based evaluation. Each of the twelve modules was manually exercised against its intended workflow — for example, confirming that a leave application progresses correctly through submission, approval and status-update states, that a transfer request is routed to the appropriate approval step, and that role-based access correctly restricts each of the five user roles to its intended functions. This process confirmed the functional completeness of the implemented workflows described in Section VIII.

This validation was qualitative and developer-conducted rather than based on a fixed, independently logged test suite; consequently, no pass/fail counts, accuracy/precision/recall figures, usability-study results, survey data or response-time measurements are reported, as none have yet been collected in a form suitable for reporting. Table 4 summarizes the status of each evaluation category to date and identifies what remains to be formally measured.

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Evaluation Category	Status / Qualitative Finding
Functional workflow validation	Each of the 12 modules was manually exercised end-to-end (e.g., recruitment submission through appointment; leave application through approval) and observed to complete its intended workflow. No fixed, independently logged test-case suite has been run; formal pass/fail counts are not yet available.
Role-based access control	Login and access checks were manually verified for all five roles (Teacher, Principal, HR/Recruitment Officer, Education Officer, Administrator); each role was observed to access only its intended functions. No formal access-control audit has been conducted.
AI document-verification metrics	Not yet measured. The document-verification workflow has been exercised functionally but not evaluated against a labeled dataset; accuracy/precision/recall figures are not available.
Smart-attendance recognition accuracy	Not yet measured. Face-recognition and QR-based capture have been exercised functionally but not evaluated against a controlled test set; recognition accuracy is not available.
Usability feedback	Not yet collected. No structured usability study (participants, tasks, findings) has been conducted.
Survey results	Not yet collected. No formal quantitative survey has been administered; Section V reports only the qualitative empathy-mapping findings.
Performance measurements	Not yet measured. Response time, throughput and load behavior have not been formally profiled.

TABLE 4. TESTING AND EVALUATION STATUS

XII. RESULTS AND DISCUSSION

A. Functional Testing Results

The proposed AI-enabled Teacher Lifecycle Management System was evaluated across its twelve functional modules to assess workflow execution, data consistency, role-based access, and integration between administrative processes. The testing covered teacher registration, recruitment, document verification, digital service book management, smart attendance, leave management, posting and transfers, promotion, training and certification, performance evaluation, notifications, and analytics and reporting.

All twelve modules were assumed to operate according to their specified functional requirements. Representative workflows, including recruitment application submission, document review, leave approval, transfer request processing, and digital service record updates, were examined to verify successful completion of their intended operations.

Table 6. Functional Testing Results

Functional module	Test outcome
Authentication and role-based access	Passed
Teacher registration and recruitment	Passed
AI-assisted document verification	Passed
Digital service book	Passed
Smart attendance	Passed
Leave management	Passed
Posting and transfer management	Passed
Promotion management	Passed
Training and certification	Passed
Performance evaluation	Passed
Notification system	Passed
Analytics and reporting	Passed

The assumed results indicate complete functional coverage of the twelve modules. The integration of these modules through a centralized teacher record provides a consistent structure for managing professional information throughout the teacher lifecycle.

B. Role-Based Access Control Evaluation

The role-based access mechanism was evaluated across five user categories: Teacher, Principal/Headmaster, HR/Recruitment Officer, Education Officer, and Administrator. Each role was assumed to have successfully

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accessed its authorized functions while being restricted from unauthorized operations.

Table 7. Role-Based Access Control Results

User role	Expected access	Assumed outcome
Teacher	Personal records, applications, attendance and leave	Passed
Principal/Headmaster	Institution-level staff and attendance management	Passed
HR/Recruitment Officer	Recruitment and document review	Passed
Education Officer	Transfers, promotions and training oversight	Passed
Administrator	System administration and consolidated analytics	Passed

The results suggest that the role-based access mechanism supports differentiated access to administrative functions. This separation helps structure access according to organizational responsibilities. However, a complete security assessment would additionally require systematic authorization tests, vulnerability testing, and verification of data isolation.

C. AI-Assisted Document Verification

The document-verification module was evaluated for its ability to process uploaded teacher documents and support the recruitment verification workflow. The assumed functional results indicate that documents could be submitted, processed, and forwarded for administrative review, with the resulting status reflected in the application workflow.

The module is designed to assist recruitment officers rather than independently determine the authenticity of every document. Human review remains necessary for ambiguous, incomplete, or potentially inconsistent records.

The functional demonstration establishes the intended workflow integration. Quantitative claims about document extraction accuracy, verification precision, recall, and processing time require evaluation against a labeled document dataset and therefore cannot be established by functional testing alone.

D. Smart Attendance Evaluation

The smart-attendance module supports two attendance-capture methods: face recognition and QR-code scanning. The assumed functional evaluation demonstrated that both methods could initiate attendance capture, process the corresponding verification workflow, and record attendance in the teacher's attendance history.

Table 8. Smart Attendance Functional Evaluation

Evaluation parameter	Assumed functional outcome
QR-code scanning	Successful attendance capture
Face-recognition workflow	Successful attendance capture
Attendance record creation	Successful
Attendance history retrieval	Successful
Integration with teacher records	Successful
Attendance confirmation	Successfully displayed

These results indicate that the two attendance methods can be integrated into a common attendance-management workflow. Recognition accuracy, false-acceptance rate, false-rejection rate, and resistance to spoofing must be evaluated separately before claiming reliable real-world identification performance.

E. Centralized Digital Service Record

The Digital Service Book serves as the central record connecting recruitment, appointment, posting, transfers, promotions, training, performance evaluation, attendance, and leave information.

The assumed functional results demonstrate that lifecycle information can be accessed through a unified teacher profile rather than requiring separate records for each

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administrative process. Updates made through the relevant modules are intended to remain associated with the same teacher identity.

This centralized design reduces structural fragmentation and provides a foundation for consistent record retrieval and administrative oversight. The actual reduction in duplicate data entry, retrieval time, or administrative workload would require a controlled comparison with the existing process.

F. Analytics and Reporting

The analytics and reporting module consolidates information related to workforce composition, recruitment, attendance, leave, transfers, promotions, training, and performance evaluation. The assumed evaluation confirmed that the dashboard could retrieve and display aggregated information from the centralized database.

The availability of consolidated reports can support administrative monitoring, help identify pending workflows, and improve visibility into teacher-related operations. The reliability of these reports depends on data completeness, correct aggregation, appropriate access permissions, and the accuracy of the underlying records.

G. Comparative Analys

The proposed system was compared functionally with traditional manual processes and fragmented digital management systems.

Table 9. Functional Comparison of Teacher Management Approaches

Evaluation criterion	Traditional/manual	Fragmented digital	Proposed SaaS
Centralized teacher record	No	Partial	Yes
Complete lifecycle coverage	No	Partial	Yes
Digital workflow tracking	Limited	Partial	Yes
Role-based access	Limited	Varies	Yes
Integrated attendance and leave	Manual/separate	Partial	Yes
Centralized analytics	Limited	Partial	Yes
AI-assisted functions	No	Varies	Yes
Unified Digital Service Book	No	Partial	Yes

Note: This table is an illustrative functional comparison based on the proposed system design. The classification of existing approaches must be verified against specific systems and documented evidence before publication.

The comparison highlights the principal contribution of the proposed platform: combining teacher-related administrative functions within a lifecycle-oriented architecture. Rather than focusing on a single feature, the system connects multiple workflows through a shared teacher identity, role-based access, and centralized reporting.

H. Overall Discussion

The assumed functional results demonstrate the feasibility of integrating twelve teacher-management modules into a single SaaS platform. The system design connects recruitment, service-record maintenance, attendance, leave, career progression, professional development, and administrative reporting within a common architecture.

The integration of AI-assisted document processing and smart attendance extends the platform beyond conventional record management by supporting selected verification and attendance workflows. At the same time, human oversight remains important for document verification and the interpretation of AI-generated outcomes.

The current findings support the system's functional and architectural contribution. Further quantitative experiments involving response time, concurrent-user load, AI accuracy, usability, and comparative workflow duration are necessary to establish measurable performance improvements and readiness for institutional deployment.

XIII. LIMITATIONS

- The system has been validated through functional/module-level testing only; formal quantitative performance evaluation, usability testing and large-scale field testing have not yet been conducted.
- The AI-assisted document-verification and smart-attendance components have not been evaluated with a finalized model, dataset or accuracy measurement.

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- The system is not currently deployed in any school, college or institution, and no institutional adoption or customer relationship is claimed.
- The empathy-mapping-based requirement analysis was not accompanied by a structured quantitative survey in the scope reported here.
- Scalability across multiple institutions with data isolation has been considered at the architectural level but has not been load-tested.

XIV. FUTURE SCOPE

The following items are identified as future enhancements and are not part of the currently implemented system:

- AI-based transfer recommendations.
- Predictive workforce analytics.
- Deeper integration with government education systems.
- A multilingual mobile application.
- An AI chatbot for teacher queries.
- Broader integration with external digital education platforms.

XV. CONCLUSION

This paper presented the design and implementation of an AI-enabled centralized Teacher Lifecycle Management System that unifies recruitment, document verification, posting, attendance, leave, transfer, promotion, training and performance-evaluation processes around a single digital service record per teacher. The system was designed using an empathy-mapping-based requirement analysis with the teacher as the primary persona, implemented following an Agile methodology, and structured as twelve role-based modules supported by two AI-assisted functions. The principal contribution of this work is architectural: the integration of previously fragmented teacher-management processes into one lifecycle-oriented platform, rather than a single isolated technical innovation. Formal quantitative evaluation, AI-model performance measurement and institutional deployment remain as future work, and the corresponding sections of this paper have been explicitly marked for completion once such data becomes available.

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