

Automated System for Career Advancements of the Faculties of Higher Education

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Abstract

The current paper proposes an Automated System for Career Advancements of Faculty in Higher Education for enhancing the faculty performance appraisal and career advancement. It alleviates the demerits of the conventional manual approach of appraisal, which are ineffectiveness and inconsistency, and presents a new-age solution. The system includes secure authentication, real-time tracking of research output, and a template for self-assessment by the faculty to track their research papers, conference presentations, projects, and lectures. An event logging system provides accountability, and an admin panel provides administrators with a facility to view, sort, and download submissions. Technologically, the system takes on a full-stack approach: React.js as front end, Node.js with Express.js as back end, and MySQL as database. JSON Web Tokens or JWT is utilized to authenticate the user. Users can perform their appraisals, while admins can monitor and assess submissions. It is a role-based access control compliant approach to provide users various access levels for department heads, admins, and faculty. It provides fact-based information on decision-making at the institutional level, such as faculty and research productivity performance trends. The system also provides security against data security through multi-factor authentication and impartiality through even parameters of evaluation.

Keywords: web-based system simplifies with the process of career development by allowing scholars to document electronically their scholarly activities while making it easier for administrators to review, evaluate, and manage submissions in an effective way. The system is built upon React.js (front-end), Node.js using Express with python (back-end), and MySQL (database). It provides a secure authentication, role-based access control, and real-time report generation in order to validate correct, clear, and efficient faculty evaluation.

I. INTRODUCTION

The transition of higher education institutions from conventional paper-based processes to computerized environments has had a profound influence on the manner in which academic and administrative functions are performed. One of the most significant of these functions is the evaluation of faculty members, which is of utmost significance for career growth, institutional accreditation, and academic excellence.

Traditionally, faculty self-evaluation involves maintaining and submitting bulky files with certificates, publications, event details, and performance reports. These papers must be handled by administrative bodies, which are likely to lead to delays, inconsistencies, and a lack of transparency. Automation also inhibits the capacity to track yearly progress, compare performance, and identify developmental gaps.

With the development of web technology, machine learning, and database systems, institutions are now stepping into creating integrated platforms that not only collect data but also process, store,

and present it in actionable formats. This literature review explores theoretical underpinnings, existing practices, and limitations in existing systems used for faculty evaluation and performance tracking. The review also reiterates the case for a modular, secure, and scalable digital platform appropriate for Indian higher education institutions

II. LITERATURE REVIEW

Table.1

SL. NO	Title	Author(s)	Year	Remark
1	Faculty Performance Evaluation System	Meenakshi et al.	2018	Proposed a basic online system with weighted metrics
2	Academic ERP Systems: Review	Sharma & Mittal	2017	Reviewed ERP implementations but lacked faculty specific modules
3	Digital Appraisal in Universities	R. Thomas	2020	Discussed benefits of automation in academic evaluations
4	AI in Faculty Appraisal	Neeraj et al.	2021	Introduced AI models for performance prediction
5	Performance-based Incentive Models	Kaur & Mehta	2022	Integrated faculty performance with HRM systems

III. PROPOSED SYSTEM

The architecture planned for higher education academic staff career development uses a three-tier web pattern for scalability and ease of maintenance. The Presentation Layer (Client-side) is developed with React.js and has interactive dashboards for users. The Application Layer (Server-side), built based on Node.js with Express, manages authentication, authorization, and data processing. The Data

Layer (Database) uses MySQL to store faculty information, appraisal documents, and events securely. This structure ensures efficient operation, modularity, and safe handling of data. It optimizes the assessment process, reducing human intervention and enhancing decision-making.

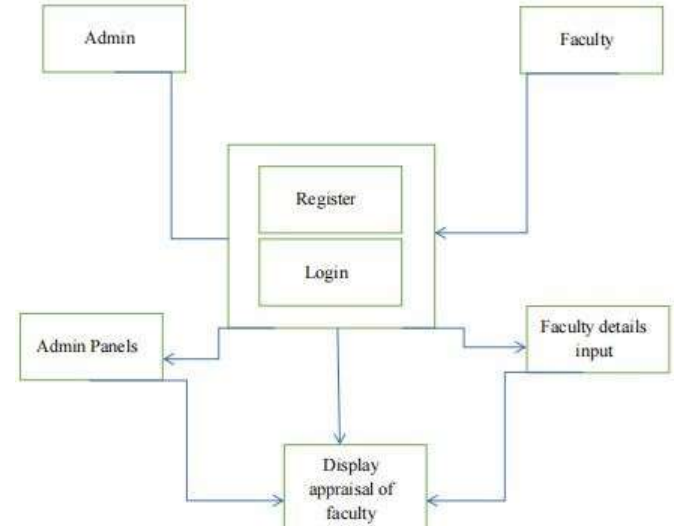


Fig 3.1: Architecture

It shows straightforward system architecture for a Faculty Career Advancement System. It differentiates between two primary users: Admin and Faculty, accessing the system in various manners. Faculty may access the system by registering themselves initially and then login authentication. After logging in, faculty members can input their details, such as self-appraisal information like academic achievement and contribution. The system tallies these details and presents them in a "Display Appraisal of Faculty" section, which likely sorts and categorizes their details. The Admin also logs into the system using login authentication, accessing Admin Panels. Using these Admin Panels, admins can see, review, and manage faculty appraisal submissions by faculty members. The Admin Panels offer functionality for approving, rejecting, or requesting changes in faculty submissions. The data is exchanged among Faculty, Admin, and the system, securely. The structure of the system maintains a clean separation of roles, keeping everything secure and efficient. Faculty are restricted to submitting and viewing their appraisal details. Admins, however, have additional permissions, such as viewing and managing

appraisals. The "Display Appraisal of Faculty" section shows a summary view of all faculty appraisals to users. The system likely uses a database (hidden) to store faculty details, admin activities, and user credentials. This structure makes the appraisal process simple, with transparency and role-based access control.

IV. OBJECTIVES

The proposed system for faculty career advancement in higher education aims to transform the traditional appraisal process by providing a digital, scalable, and secure platform. It eliminates manual paperwork and standardizes self-appraisal submissions through an intuitive interface where faculty can log academic activities such as publications, courses, projects, and conferences. Administrators can transparently review and evaluate submissions, with all actions recorded in an auditable system. Data is centrally stored, ensuring consistency and supporting compliance with UGC and NAAC guidelines. Real-time notifications keep users informed about pending tasks, while automatic report generation simplifies documentation for reviews. Role-Based Access Control (RBAC) secures user data, with each role assigned specific permissions. The modular architecture supports scalability, enabling deployment across multiple institutions and the addition of future modules without disrupting existing functionality. Long-term goals include promoting data-driven decision-making, standardizing appraisal practices, fostering inter-institutional collaboration, and enabling API-level integration with external systems like Google Scholar and Scopus. This approach not only modernizes faculty evaluation but also provides valuable insights for strategic planning, enhancing institutional credibility and competitiveness.

V. Results and Discussion

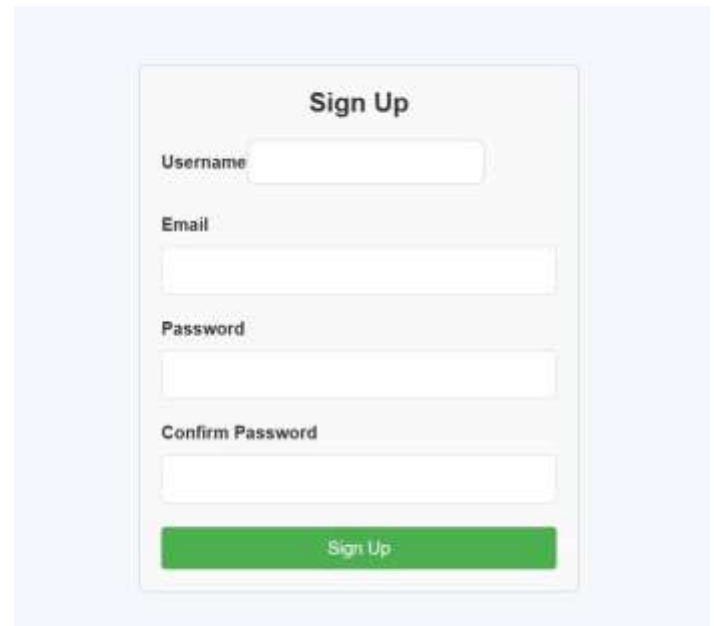


Fig 5.1:Output1



Fig 5.2:Output2



Fig 5.3:Output3

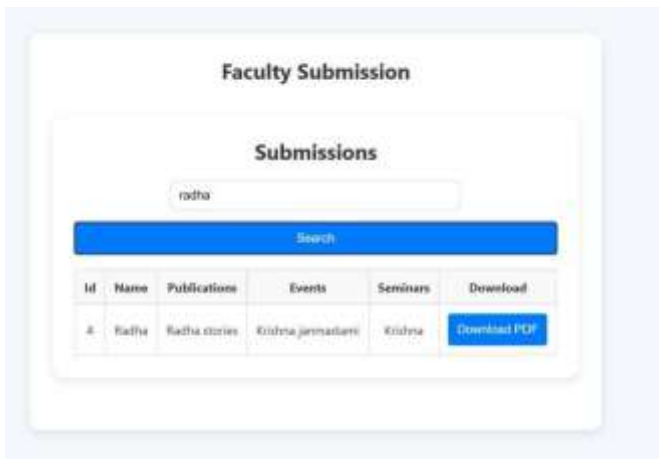


Fig 5.4:Output4

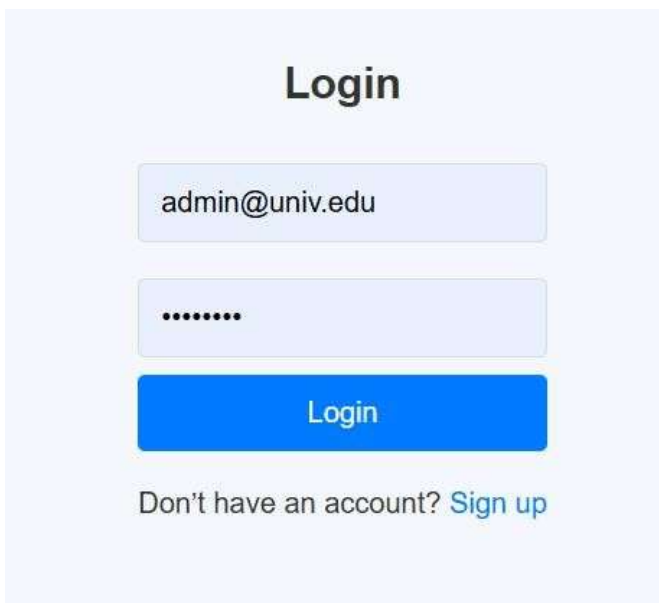


Fig 5.5:Output5

VI. Conclusion

The proposed system is an integrated automated system for faculty career development of higher education, with React deployed for the frontend, Node.js for the backend, and MySQL for database administration. It provides a secure, scalable platform for faculty self-assessment, auto-monitoring of performance, and report generation. The system enhances efficiency, precision, and convenience over traditional systems of appraisal. Through analytics integration, it enables data-driven decision-making for academic development and faculty promotion. Role-based access controls ensure data security, maintaining the integrity of faculty records. Although successful, the system may be further improved through AI-based analytics integration, integration with external databases of academics, and a mobile app. The project streamlines the process of faculty evaluation by allowing faculty to upload and track their scholarly contributions, while administrators can view submissions based on specified metrics and dashboards. It addresses problems like manual data management, uneven promotion processes, and delayed approvals.

A multi-level structure with user authentication, academic activity modules, backend logic, and analytics tools delivers transparency, fairness, and efficiency. The system accommodates UGC and NAAC guidelines to ensure policy conformity. It offers a data-informed, faculty-led design that accommodates continuous professional development and self-assessment. Progress can be monitored by faculty members through dashboard-based interfaces, whereas administrators are facilitated through a digital, traceable, and accountable assessment system.

It converts academic processes into strategic information, connecting institutional aspiration with operational reality.

The project is a broader digital transformation in higher education that promotes transparency and accountability. It is an environment of performance culture, whereby the faculty members work better by encouraging them to be actively engaged in teaching, research, and outreach.

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