NON-TEACHING SKILLS & WORK ALLOCATION AND MANAGEMENT PORTAL

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Abstract - *The Non-Teaching Skills & Work Allocation and Management Portal is an innovative digital solution designed to optimize the allocation, tracking, and management of non-teaching responsibilities within educational institutions. Managing administrative, operational, and support tasks effectively is crucial for institutional efficiency, yet traditional manual allocation methods often result in workload imbalances, skill mismatches, and inefficiencies. This portal addresses these challenges by implementing a skills-based allocation framework, ensuring tasks are assigned based on staff competencies, availability, and workload capacity. The system utilizes sophisticated algorithms to match personnel with suitable tasks while maintaining equitable distribution across departments. Real-time monitoring allows administrators to track task progress, identify bottlenecks, and make data-driven adjustments. By digitizing task allocation, the portal enhances resource utilization, reduces administrative overhead, and improves overall task completion rates.*

***Key Words*: Non-Teaching Skills, Work Allocation, Management Portal, Educational Institutions, Skill-Based Allocation, Real-Time Monitoring, Resource Utilization, Operational Efficiency**

1.INTRODUCTION

The Non-Teaching Skills & Work Allotment and Management Portal is an innovative solution designed to optimize resource allocation, task management, and skill utilization in educational institutions. It streamlines the management of non-teaching responsibilities, ensuring efficient operations and improved productivity. Institutions often struggle with unstructured workload distribution, leading to underutilization of staff expertise and inefficiencies. This portal provides a centralized platform to identify and leverage staff competencies beyond teaching qualifications. It employs sophisticated algorithms for equitable work distribution, considering workloads, time constraints, expertise, and preferences. Key features include dynamic task allocation, automated scheduling, deadline management, progress tracking, performance analytics, and communication tools for collaboration.

1.1 Problem Statement

Educational institutions struggle with efficiently managing non-teaching staff resources due to fragmented, manual work allocation systems. Administrators face challenges in identifying staff with appropriate skills, leading to inefficient resource allocation and under utilization of talent. Uneven workload distribution results in some staff being overburdened while others remain underutilized. The absence of a centralized platform for skill mapping and task management reduces transparency and hinders administrative efficiency. Manual record-keeping is error-prone and outdated, making decision-making difficult. The Non-Teaching Skills & Work Allotment Management Portal addresses these issues by providing a digital solution with real-time staff profiling, smart task allocation, and progress tracking. By optimizing workload distribution and skill utilization, the system enhances operational efficiency, accountability, and data-driven decision-making.

1.2 Outcome

The Non-Teaching Skills & Work Allotment Management Portal enhances institutional efficiency by optimizing task allocation, skill utilization, and workload distribution. By providing a centralized digital platform, the system ensures that non-teaching staff responsibilities are assigned based on skills, availability, and workload capacity. With real-time tracking and smart matching algorithms, administrators can efficiently manage staff assignments, reducing inefficiencies caused by manual allocation. The portal improves transparency, allowing department heads to monitor staff workloads, track task progress, and make data-driven decisions. Staff members benefit from recognition of their competencies, ensuring fair distribution of responsibilities and opportunities for professional growth. The system enhances accountability by maintaining task completion records and performance analytics, leading to better operational outcomes.

2. LITERATURE SURVEY

The development of the Non-Teaching Skills & Work Allotment Management Portal is supported by prior research on task allocation and workforce management in educational institutions. Kumar et al. (2021) proposed a web-based task allocation system utilizing modern technologies like React and Node.js to enhance task assignments and real-time tracking. Their study demonstrated improved work efficiency and reduced task redundancy, validating the need for a digital solution in institutional task management. Similarly, Sharma et al. (2022) introduced a role-based workforce management system, emphasizing task tracking, performance monitoring, and automated notifications to streamline non-teaching staff workload distribution. Their findings highlight the importance of structured task allocation in reducing workload discrepancies and enhancing institutional productivity. These studies reinforce the significance of efficient task distribution, real-time monitoring, and technology-driven workforce management, which are key features integrated into the Non-Teaching Skills & Work Allotment Management Portal to enhance operational efficiency and transparency.

3. PROPOSED MODULES AND METHODOLOGY

The Non-Teaching Skills & Work Allotment Management Portal is a digital system designed to improve the efficiency of managing non-teaching responsibilities within educational institutions. The allocation of non-teaching tasks in academic settings is often unstructured, leading to issues such as uneven workload distribution, under utilization of staff skills, and operational inefficiencies. The proposed portal addresses these challenges by introducing a systematic approach to registering staff, tracking their availability, assigning tasks dynamically, and ensuring effective communication through real-time notifications and reporting mechanisms. The system is structured into multiple interconnected modules that facilitate seamless task allocation and monitoring while maintaining a high level of transparency and accountability.

3.1 User Authentication and Role-Based Access

Ensuring secure access to the system is crucial to maintaining data integrity and preventing unauthorized modifications. The portal implements user authentication and role-based access control (RBAC) to regulate permissions based on user roles. The authentication process requires users to log in with unique credentials, such as a username and password, before accessing the system. Multi-factor authentication (MFA) can also be integrated for added security, especially for administrative users who handle sensitive data. The Department Head role has moderate privileges, allowing them to allocate tasks to their respective staff members, monitor task completion, and make necessary adjustments. Finally, the Staff role is limited to viewing assigned tasks, updating task progress, and submitting reports upon completion. This hierarchical access control model ensures that each user interacts with the system in accordance with their designated responsibilities, preventing unauthorized data modifications and enhancing overall security.

3.2 Proposed modules

The system comprises multiple modules, each serving a distinct function to ensure efficient work management. These modules are designed to work collaboratively, creating an integrated ecosystem for seamless task allocation, tracking, and communication. The following sections describe the key modules in the system.

3.2.1 Staff Registration Module

The Staff Registration Module is a fundamental component that establishes a comprehensive database of non-teaching staff members. During registration, staff members provide essential details, including their name, department, designation, years of experience, and relevant skill sets. This information helps administrators match tasks with the appropriate personnel based on expertise rather than arbitrary assignment. The system also supports profile updates, enabling staff members to revise their skill sets and experience levels over time. By maintaining an up-to-date database, the institution can continuously optimize work assignments and ensure that staff members are engaged in roles that align with their strengths.

3.2.2 Staff Availability Module

The Staff Availability Module is designed to track the real-time availability of staff members, preventing the issue of workload imbalance. This module maintains a dynamic status indicator, showing whether a staff member is currently engaged in a task, available for new assignments, or on leave. Administrators can access the availability dashboard to see an overview of workforce distribution at any given time. When a new task needs to be assigned, the system automatically filters out unavailable staff members, ensuring that only those who can feasibly complete the task are considered for allocation.

3.2.3 Admin Work Allocation Module

The Admin Work Allocation Module is the core of the system, responsible for dynamically assigning tasks to non-teaching staff based on predefined criteria. Traditionally,

task allocation in educational institutions is conducted manually, often resulting in inefficiencies and uneven workload distribution. This module eliminates such issues by utilizing automated assignment algorithms that match tasks with the most suitable staff members. By implementing an intelligent and structured work allocation mechanism, this module enhances efficiency, reduces redundancy, and ensures that all non-teaching responsibilities are handled effectively.

3.2.4 Staff Notification Module

Effective communication is essential for seamless task execution, which is why the Staff Notification Module plays a crucial role in the system. This module ensures that staff members receive timely alerts and updates regarding their assigned tasks. When a task is allocated, the assigned staff member receives an automated notification via email, or the internal messaging system of the portal. These notifications include key details such as task description, deadline, and assigned priority level. This ensures that staff members are promptly informed of their responsibilities and can begin working without unnecessary delays.

3.2.5 Staff Reporting Module

Once a task is completed, it is essential to document its execution and assess overall efficiency. The Staff Reporting Module allows staff members to submit completion reports upon finishing their assigned tasks. These reports include details such as task completion time, challenges faced, and any supporting documentation required for verification.

3.3 Backend and Database Design

The backend and database design of the Non-Teaching Skills & Work Allotment Management Portal is a critical component that ensures the seamless execution of system functionalities, secure data storage, and efficient processing of task-related operations. The backend is responsible for handling user authentication, task allocation logic, staff availability tracking, notification management, and report generation. The database serves as the central repository, maintaining structured records of users, tasks, work progress, notifications, and historical reports. A well-designed backend and database architecture enhances system performance, data security, and scalability.

4. SYSTEM ARCHITECTURE

### Figure 1: Block diagram of System Architecture

The system architecture for the Non-Teaching Skills & Work Allotment Management Portal follows a structured workflow. It begins with User Authentication, determining user roles as Administrator, Department Head, or Staff. Key modules include Staff Registration, Work Allocation, Task Notification, and Reporting. Dynamic task allocation ensures efficient workload distribution, notifications, and performance tracking for institutional optimization.

4.1 User Interface (Frontend Layer)

The frontend layer of the Non-Teaching Skills & Work Allotment Management Portal is built using React.js, ensuring a highly interactive and user-friendly experience. The interface provides an intuitive and seamless experience for administrators, department heads, and staff members, catering to their unique roles and responsibilities. React's component-based architecture allows for a modular and reusable UI, reducing redundancy in development. The portal features a dashboard-based layout, displaying real-time updates on workload distribution, pending tasks, and staff availability. The UI comprises various components such as registration forms, task allocation panels, skill mapping interfaces, progress tracking dashboards, and notification alerts. These components communicate with the backend using RESTful APIs for data exchange.

4.2 Application Layer (Backend Processing)

The backend of the portal is powered by Node.js with Express.js, serving as the application layer responsible for processing business logic, handling API requests, and ensuring smooth system functionality. This layer manages
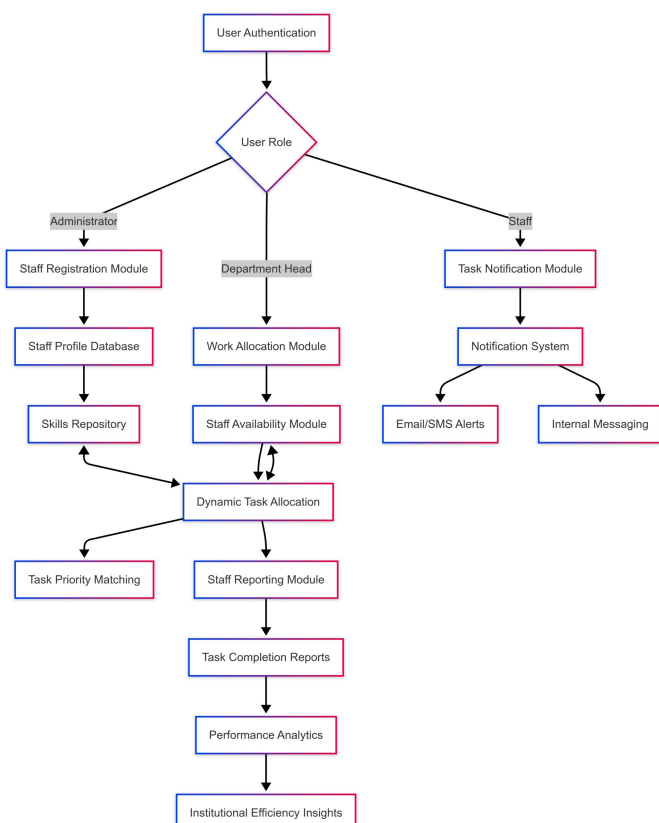
various operations, including user authentication, role-based access control, task allocation, skill mapping, notifications, and report generation. User Authentication APIs – Handles login, registration, and token generation using JWT (JSON Web Tokens) for secure access. Task Allocation APIs – Enables department heads to assign tasks dynamically based on skills and availability. Notification APIs – Sends real-time alerts via email/SMS when tasks are assigned or completed. Reporting APIs – Generates reports on task completion rates, staff workload distribution, and performance analytics.

4.3 Database Layer (Data Storage and Management)

The database layer utilizes MySQL, a relational database that efficiently stores and manages structured data. The database schema is designed to support various entities, including users, staff profiles, skills repository, task assignments, notifications, and reports. The Users Table stores login credentials, role-based access details, and authentication tokens to ensure secure user management. The Staff Profiles Table maintains detailed staff records, including their skills, experience, availability, and workload history, enabling efficient task allocation. The Task Allocation Table records assigned tasks along with timestamps, priority levels, and completion status, allowing administrators to monitor task progress. The Notifications Table logs all system-generated alerts and tracks whether they have been read by recipients, ensuring timely communication between administrators and staff. Lastly, the Reports Table stores essential data such as task completion rates, performance trends, and institutional efficiency metrics, helping in data-driven decision-making and process optimization.

4.4 Security Layer (Authentication and Authorization)

Security is a critical aspect of the Non-Teaching Skills & Work Allotment Management Portal, ensuring the protection of sensitive data and preventing unauthorized access. The system uses JWT-based authentication, securing user sessions with JSON Web Tokens (JWT) to allow only authenticated users access to system functionalities. Role-Based Access Control (RBAC) restricts user permissions based on their roles, preventing unauthorized modifications. Password encryption is enforced using bcrypt hashing to safeguard credentials. To prevent SQL injection, the system utilizes prepared statements for secure database queries. Additionally, XSS and CSRF protection is implemented by sanitizing user inputs and using CSRF tokens to block malicious requests.

5. RESULTS AND DISCUSSION

The implementation of the Non-Teaching Skills & Work Allotment Management Portal has significantly improved the efficiency of task allocation and staff workload management. By leveraging React for the frontend, Node.js for the backend, and MySQL for database management, the system ensures seamless communication between different layers, enhancing performance and user experience. The automated task allocation system has led to a more equitable distribution of work, ensuring that staff members with relevant skills are assigned appropriate responsibilities. Real-time notifications and reporting modules have improved communication and transparency within the institution, reducing delays and inefficiencies. Additionally, the performance analytics module provides valuable insights into staff contributions and institutional productivity. Security features such as JWT authentication, role-based access control, and data encryption have strengthened system reliability. Overall, the portal has transformed the traditional manual process into an efficient, data-driven system, improving administrative decision-making and optimizing the utilization of non-teaching staff.

6. CONCLUSIONS

 The Non-Teaching Skills & Work Allotment Management Portal effectively streamlines task distribution, skill utilization, and workload management in educational institutions. By automating task allocation and providing real-time insights, the system enhances operational efficiency while ensuring fair workload distribution among staff. The use of modern web technologies and secure authentication mechanisms ensures a robust, scalable, and user-friendly experience. The integration of performance analytics and reporting further enables data-driven decision-making. This portal not only optimizes staff resource management but also fosters better collaboration and transparency. Future enhancements could include AI-based task recommendations and mobile application support for greater accessibility.

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