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Work Management Tool Using Mern Stack

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ABSTRACT:

In today's fast-paced work environment, effective task management and smooth collaboration are essential for maximizing productivity and streamlining workflows. As organizations grow, manually handling tasks becomes increasingly difficult, leading to communication breakdowns and inefficiencies. To address these challenges, we propose the development of a Work Management Tool using the MERN stack (MongoDB, Express.js, React, Node.js). This platform is designed to simplify project oversight, enhance team coordination, and provide real-time visibility into project progress. Key features include role-based access control, task creation and prioritization, reminders, and dynamic dashboards—offering a comprehensive solution for cross-team task management. Real-time updates, integrated chat, and file-sharing capabilities further enhance team interaction and collaboration. Built with the MERN stack, the tool ensures a scalable, secure, and adaptable architecture that meets the evolving needs of modern organizations. This Work Management Tool minimizes manual workload, promotes accountability, and is especially valuable for software teams, marketing units, and educational institutions. Its mobile-friendly, scalable design makes it a dependable solution for boosting productivity and managing complex workflows.

Keywords-MongoDB, Express.js, React.js, Node.js, MERN

1. Introduction

In today's fast-paced and increasingly remote work environment, effective task management and seamless collaboration are essential for maintaining productivity and streamlining workflows. Traditional methods such as spreadsheets, paper-based checklists, and email chains are no longer sufficient, often resulting in inefficiencies, miscommunication, and missed deadlines. A centralized Work Management Tool becomes indispensable, offering a structured and unified platform to manage tasks, track progress, and facilitate communication across teams. Built using the MERN stack MongoDB, Express.js, React, and Node.js—this tool provides a robust, scalable, and fully JavaScript-based architecture. MongoDB handles dynamic project data, Express.js manages backend logic and APIs, React powers an interactive and component-based frontend, and Node.js supports high-performance, real-time features like live updates and chat. The tool offers comprehensive features such as task creation, assignment, and tracking with customizable attributes like priority, deadlines, and status. Role-based access control ensures secure and appropriate access for Admins, Managers, and Employees, while real-time collaboration through comments, file sharing, and notifications keeps teams aligned. Visual dashboards provide insights into project health with charts and KPIs, and integration with tools like Slack and Google Calendar embeds the platform into existing workflows. Security is addressed through JWT authentication, HTTPS encryption, input validation, and access control, ensuring data integrity and privacy. Performance is optimized with caching (e.g., Redis), efficient API design, and frontend enhancements like lazy loading and code splitting.

The system is designed for scalability, using Docker, Kubernetes, and cloud platforms like AWS or Heroku for smooth deployment and auto-scaling. Future enhancements can include AI-powered features for predictive analytics, smart task prioritization, and workload automation. By digitizing and automating work processes, this tool reduces manual overhead, promotes accountability, and empowers teams to focus on high-impact tasks. It ultimately enables organizations to work smarter, make informed decisions, and continuously improve their operational efficiency.

2. Literature Survey

Previous studies across various domains emphasize the rising adoption of the MERN stack for developing scalable, interactive, and efficient web applications. In the area of education management, MERN has proven effective in automating academic tasks such as course management, student records, and attendance tracking.[1]

Car rental systems have also utilized MERN to enable real-time bookings, secure authentication, and dynamic vehicle listings.[2]

For College ERP solutions, MERN provides enhanced modularity, better integration, and improved system responsiveness compared to conventional technologies.[3]

Additionally, comparative research between MERN and frameworks like Ruby on Rails indicates that while MERN excels in building flexible, dynamic user interfaces with React, Rails is preferred for its structured development and rapid deployment capabilities. When enhanced with machine learning, both stacks demonstrate potential in delivering intelligent, real-time user experiences through adaptive forms and feedback mechanisms.[5]

3. Methodology

The methodology begins with the user signing up or logging into the system, followed by authentication via an API request. Once authenticated, the dashboard displays the user's tasks. The user can then create a new task by entering its title, description, and deadline. This task is stored in MongoDB using a Node.js and Express.js backend.



Figure 3.1 Work flow of methodology

The React.js frontend fetches and displays tasks, allowing users to interact with them. Users can update the task status to either "InProgress" or "Completed," and this updated status is saved back into MongoDB. The system then generates reports based on the progress of each task. This structured process ensures efficient task tracking and reporting, concluding once all data is updated and reported.

4. Results and Discussion

The developed application implements a systematic process from user onboarding to task tracking. The detailed user interaction and system flow are outlined below:

Step1: Application Launch

The Python application is initiated, which displays a local port. Clicking the port opens the login interface.



Fig 4.1: Login Page

Step2: New User Registration

Users must register by entering their first name, last name, email ID, and password before accessing the platform.

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Fig 4.2: Registration Page

Step3: Logging In

After successful registration, users can log in using their credentials.

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Fig 4.3: Owner Logging In

Step4: Accessing the Dashboard

Once logged in, users are redirected to the Shey-Tracker home page displaying all available company projects.

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Step5: Creatinga Project

Owners can create a new project by selecting a company (e.g., "Pranesh") and adding its description. This functionality is exclusive to the owner.



Fig 4.5: Add Project

Step6: Viewing and Assigning Tasks

Selecting a project opens a task dashboard where managers can assign specific tasks to employees.

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Fig 4.6: Create Task

Step7:Registering Team Members

Team members must register on the platform. Only the owner has permission to add members and assign their roles.

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Fig 4.7: Members of the Project

Step8:Manager Registration and Access

Managers are required to register and then log in to view project details and assigned tasks.

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Fig 4.8: Admin Registration

Step9:Employee Registration

Employees must also complete their registration, including setting up a secure password.

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Fig 4.9: Employee Registration

Step10:Manager Login

Post-registration, managers log in to access their dashboards with project information.



Fig 4.10: Employee Login

Step11:Task Assignment Process

Managers assign specific tasks to employees by selecting project boxes and defining the task details.

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Fig 4.11: Admin Task Assigning and Updating

Step12:Task Progress by Employees

Employees can view the assigned tasks and update their status as "Pending" or "In Progress."

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Fig 4.12: Employee Progress Updation

Step13:Completion and Notification

Upon completing a task, employees update the status, triggering notifications for the manager or owner.

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Fig 4.13: Task Status Notifications

Conclusion

In summary, the proposed Work Management Tool provides a robust, scalable, and efficient solution to the increasing challenges of task management and team collaboration in today's fast-paced work environments. Developed using the MERN stack (MongoDB, Express.js, React, Node.js), the application ensures a seamless user experience, real-time interaction, and effective project tracking. It incorporates essential features such as role-based access control, task creation and prioritization, reminders, and interactive dashboards to help teams stay organized, focused, and accountable. Real-time updates, chat functionality, and file-sharing capabilities further enhance team coordination and productivity. The mobile-responsive design ensures accessibility across devices, making it convenient for on-the-go usage. With its secure and flexible architecture, the tool can easily adapt to various organizational needs. Whether deployed in software development, marketing, or education, it simplifies workflows, minimizes manual effort, and fosters transparency. Ultimately, this Work Management Tool serves as a future-ready platform for managing complex projects with efficiency and ease.

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