

Design and Development of Role Based ERP System

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Abstract

Enterprise Resource Planning (ERP) systems play a significant role in managing organizational operations by integrating multiple departments into a centralized digital platform. However, many traditional ERP systems suffer from complex interfaces, poor usability, and inefficient workflow management, which reduce user productivity and system accessibility. This research paper presents the design and development of a role-based ERP system focused on modern UI/UX principles and web development technologies to improve user experience, operational efficiency, and departmental coordination. The proposed system provides dedicated dashboards and functionalities for different organizational roles, including Admin, Sales Team, Installation Team, Inventory & Procurement Team, Operations & Maintenance (O&M) Team, and Customers. The system incorporates secure authentication, role-based access control, responsive dashboard interfaces, customer management, project tracking, inventory handling, financial monitoring, and analytics integration. The UI/UX design methodology emphasizes intuitive navigation, responsive layouts, reduced cognitive complexity, and user-centered workflow optimization. Modern web technologies were utilized to develop a scalable and interactive ERP platform capable of supporting real-time organizational activities. The proposed system enhances workflow transparency, simplifies departmental operations, improves customer interaction, and provides a flexible architecture suitable for future expansion and cloud integration. Overall, this project shows that in a fast-changing field like solar energy, businesses that invest in data analysis will have a strong advantage. They can make quicker, smarter decisions and build a more sustainable future.

Keywords: Enterprise Resource Planning (ERP), Role-Based Access Control, UI/UX Design, Web Development, Dashboard System, Responsive Web Application, Workflow Management.

1. Introduction

Enterprise Resource Planning (ERP) systems have become an essential part of modern organizations for managing and integrating multiple business operations within a centralized digital platform. These systems help improve workflow management, communication, data handling, and overall organizational efficiency. However, many traditional ERP systems suffer from complex interfaces, poor usability, and limited accessibility, making them difficult for users from different departments to operate efficiently. The lack of user-friendly design and role-specific functionality often increases operational complexity and reduces productivity within organizations.

This research paper presents the design and development of a Role-Based ERP System focusing on UI/UX design and web development technologies to improve user experience and workflow optimization. The proposed system provides dedicated dashboards and functionalities for different organizational roles such as Admin, Sales Team, Installation Team, Inventory & Procurement Team, Operations & Maintenance (O&M) Team, and Customers. The system incorporates secure authentication, role-based access control, responsive dashboard interfaces, and centralized workflow management. By implementing modern UI/UX principles and scalable web technologies, the developed ERP platform aims to provide an intuitive, efficient, and responsive solution for organizational management and digital transformation.

2. Literature review

- **Verma et al. (2024)**

Verma and the team explained that role-based ERP systems improve workflow management by providing department-specific access and functionalities. Their study showed that centralized ERP platforms help improve productivity, data management, and operational efficiency within organizations.

- **R. K. Sharma et al. (2023)**

Sharma and colleagues focused on the importance of UI/UX design in web-based ERP applications. They found that responsive dashboards, simple navigation, and user-friendly interfaces improve usability and reduce system complexity for users.

- **Daniel Joseph et al. (2024)**

Joseph and his team studied the use of modern web technologies in ERP development. Their research highlighted that frontend-backend integration and responsive web applications improve system performance, scalability, and accessibility across multiple devices.

3. Problem Statement

- ☐ Traditional ERP systems often have complex and difficult user interfaces, making them hard for employees to operate efficiently.
- ☐ Many organizations face difficulties in managing multiple departments through separate systems, resulting in poor workflow coordination and data inconsistency.
- ☐ Lack of role-based access control in existing systems can lead to unauthorized access and reduced data security.
- ☐ Conventional ERP platforms may not provide responsive and user-friendly dashboards for different organizational roles and responsibilities.
- ☐ Manual handling of customer records, inventory management, project tracking, and reporting increases operational delays and reduces productivity.
- ☐ Existing ERP systems often lack modern web-based architecture and scalable UI/UX design, limiting accessibility, flexibility, and overall user experience.

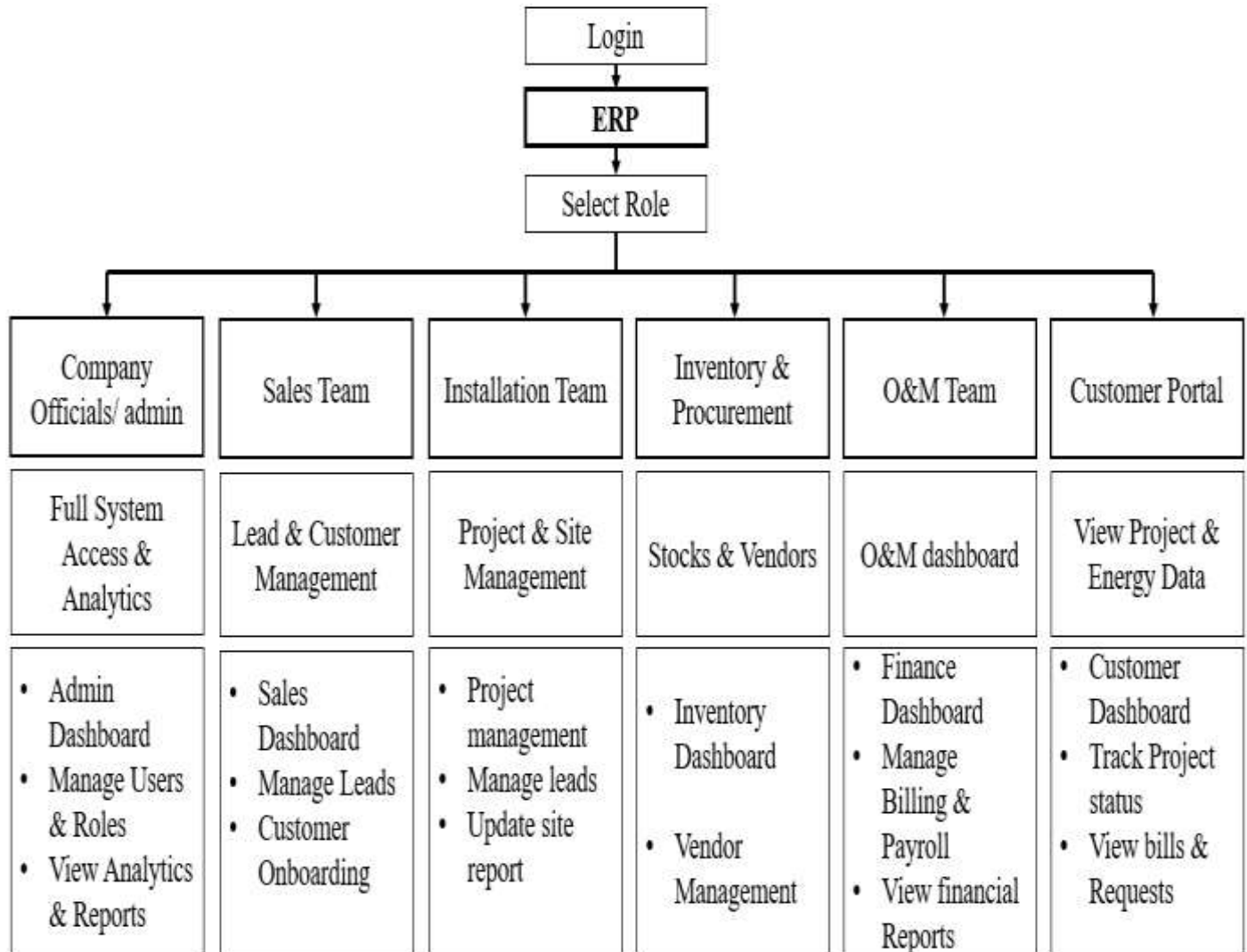
4. Proposed System

The proposed system is a web-based Role-Based ERP System designed to improve organizational workflow management through modern UI/UX design and web development technologies. The system provides secure authentication and role-based access control, allowing users to access only the modules and functionalities related to their responsibilities. Separate dashboards are developed for Admin, Sales Team, Installation Team, Inventory & Procurement Team, Operations & Maintenance (O&M) Team, and Customers to ensure better usability and workflow efficiency.

The ERP platform integrates multiple organizational operations into a centralized system, including customer management, project tracking, inventory handling, financial monitoring, and analytics. The UI/UX design focuses on responsive layouts, intuitive navigation, and user-friendly dashboards to reduce system complexity and improve accessibility across different devices. Modern frontend and backend web technologies are used to develop a scalable,

responsive, and efficient ERP solution capable of supporting future expansion and digital transformation within organizations.

5. Flow Chart



6. Working

The working of the proposed Role-Based ERP System begins with a secure login and authentication process where users enter their credentials to access the platform. After successful authentication, the system identifies the user role and redirects the user to the respective dashboard. The Role-Based Access Control (RBAC) mechanism ensures that each user can only access the modules and functionalities assigned to their department and responsibilities.

The Admin module manages user accounts, role assignments, analytics, and overall system monitoring. The Sales Team module handles customer management, lead tracking, and sales-related activities. The Installation Team dashboard is responsible for project management, site monitoring, and installation status updates. The Inventory & Procurement module manages stock availability, vendor details, and procurement operations. The Operations & Maintenance (O&M) module handles billing, financial reports, and maintenance-related activities. The Customer portal allows customers to view project updates, service details, and reports through a dedicated interface.

The system uses modern web technologies to provide responsive dashboards, real-time data updates, centralized database management, and smooth communication between different organizational departments. The UI/UX design ensures simple navigation, user-friendly interaction, and improved workflow efficiency across the entire ERP platform.

7. Software

- **Figma:**

Figma was used for designing the UI/UX of the ERP system. It helped in creating wireframes, dashboard layouts, user flows, and responsive interface designs for different organizational roles. The platform was used to design user-friendly dashboards and improve the overall user experience before the development phase.

- **HTML:**

HTML was used to create the basic structure of the ERP web application. It helped in developing webpages, forms, dashboards, navigation sections, and different user interface components required for the system.

- **CSS:**

CSS was used for styling and designing the ERP system interface. It helped create responsive layouts, attractive dashboards, proper color schemes, typography, and user-friendly web pages for better visual appearance and usability.

- **JavaScript:**

JavaScript was used to add interactivity and dynamic functionality to the ERP system. It enabled features such as form validation, responsive navigation, dynamic dashboard updates, and interactive user operations within the web application.

8. Result

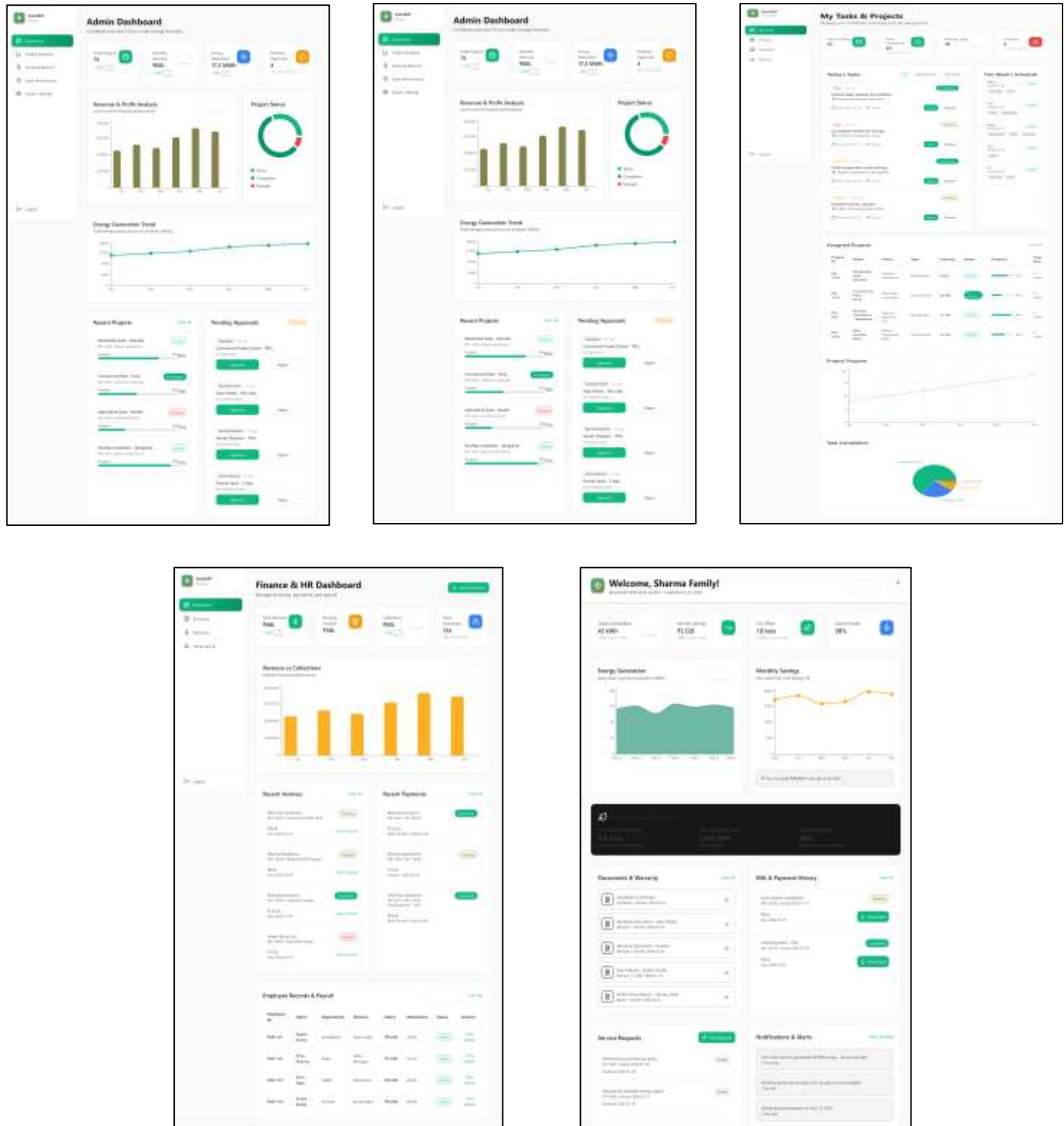


Fig. ERP System Design

9. Conclusion

The proposed Role-Based ERP System successfully demonstrates the integration of modern UI/UX design and web development technologies to improve organizational workflow management and user experience. The system provides separate dashboards and functionalities for different departments through secure role-based access control, helping improve usability, operational efficiency, and communication between organizational units. By integrating customer management, project tracking, inventory handling, and financial monitoring into a centralized web-based platform, the ERP system reduces manual complexity and supports efficient digital management. The responsive interface design and user-centered approach make the system scalable, interactive, and suitable for future enhancements and organizational growth.

10. References

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