

“CLOUD-BASED INTERIOR DESIGN AND RESOURCE MANAGEMENT SYSTEM”

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ABSTRACT

The Cloud-Based Interior Design and Resource Management System (CBIDRMS) is a centralized platform developed to manage the interior design project lifecycle. It integrates customer and lead management, quotations, projects, design, BOQ, procurement, site activities, finance, documents, dashboards, and reporting into a unified environment. The system uses centralized cloud storage, authentication, and Role-Based Access Control (RBAC) to provide secure and role-specific access to stakeholders. Developed using a structured approach involving system design, frontend and backend implementation, API integration, security, testing, and deployment, CBIDRMS aims to improve operational efficiency, resource coordination, project monitoring, data accessibility, and stakeholder collaboration.

Keywords: Cloud Computing, Interior Design, Project Management, Resource Management, BOQ, Procurement, RBAC, Project Monitoring.

1. INTRODUCTION

1.1 Background

Interior design project management involves coordinating customers, projects, designs, materials, vendors, finance, site activities, documents, and schedules throughout the project lifecycle. Managing these activities through spreadsheets, paper records, emails, or separate applications can lead to fragmented information, repeated data entry, communication gaps, and difficulties in monitoring

project progress. This creates a need for a centralized and integrated management system.

1.2 Digitalization and Cloud-Based Management

Digitalization enables interior design operations to be managed through structured digital workflows, while a cloud-based platform provides centralized storage, accessibility, synchronization, and collaboration. Since customer requirements, design, BOQ, procurement, site activities, and finance are interconnected, integrating these processes can improve information continuity and coordination among stakeholders.

1.3 Existing Challenges

Disconnected management practices may cause fragmented information, difficulties in quotation and BOQ management, procurement and vendor coordination issues, delayed site updates, scattered financial and project documents, and inadequate access control. These challenges highlight the requirement for an integrated project-management environment.

1.4 Proposed CBIDRMS

The Cloud-Based Interior Design and Resource Management System (CBIDRMS) is proposed as a centralized platform integrating customer and lead management, quotations, projects, design, BOQ, vendors, purchase orders, site activities, finance, documents, dashboards, and reports.

Workflow:

Customer → Lead → Quotation → Project → Design → BOQ → Vendor → Purchase → Site → Finance → Documents → Dashboard & Reports → Analytics and trends

The system incorporates authentication and Role-Based Access Control (RBAC) to provide secure, role-specific access. Overall, CBIDRMS aims to improve information management, resource coordination, project monitoring, operational efficiency, and stakeholder collaboration throughout the interior design project lifecycle.

2. PROBLEM STATEMENT

Interior design projects involve interconnected activities including customer and lead management, quotations, project planning, design, BOQ, procurement, vendor coordination, site execution, finance, documentation, and reporting. Managing these activities through separate or manual tools can cause fragmented information, data duplication, communication gaps, delayed updates, and difficulties in project monitoring.

Existing digital solutions often address individual project-management functions rather than providing an integrated workflow for interior design operations. There is therefore a need to connect related information across projects, BOQ, vendors, procurement, site activities, finance, and documents, while also ensuring secure and role-based access.

To address these challenges, the Cloud-Based Interior Design and Resource Management System (CBIDRMS) is proposed as a centralized cloud platform. The system aims to provide continuous information flow, secure access, centralized data and document management, improved resource coordination, project monitoring, and stakeholder collaboration, thereby reducing dependency on disconnected and manual processes.

3. OBJECTIVES

The primary objective of this research is to develop a Cloud-Based Interior Design and Resource

Management System (CBIDRMS) that provides a centralized, integrated, and secure environment for managing interior design project activities.

The specific objectives are:

1. To develop a centralized cloud-based platform for managing the interior design project lifecycle.
2. To integrate major functional modules including customers, leads, quotations, projects, design, BOQ, vendors, procurement, site management, finance, and documents.
3. To establish seamless information flow among interconnected activities while minimizing data duplication, manual effort, and communication gaps.
4. To provide centralized dashboards and reports for monitoring project progress, resources, procurement, site activities, and financial information.
5. To implement secure authentication and Role-Based Access Control (RBAC) for controlled access to system resources.
6. To evaluate the system in terms of functionality, integration, usability, security, and effectiveness in supporting interior design project management.

4. LITERATURE REVIEW

Raymond Levitt (2011) explored PMIS for project planning, scheduling, documentation, and monitoring, but its focus is mainly on large-scale construction. Chuck Eastman et al. (2011) presented BIM for visualization, collaboration, and project coordination, although it may be more comprehensive than required for lightweight project management. Omar O. El-Gohary et al. (2017) examined BIM-ERP integration for resource planning, budgeting, and procurement, but complexity and cost remain limitations. Manuel Castells (2019) highlighted MIS for decision-making, documentation, and performance monitoring, but without specific focus on interior design workflows.

Overall, existing approaches support different aspects of project management but lack a centralized, lightweight solution tailored to interior design. CBIDRMS addresses this gap by integrating customers, leads, quotations, projects, design, BOQ, vendors, procurement, site activities, finance, documents, and reporting within a unified platform.

5. PROPOSED METHODOLOGY

5.1 Proposed System Overview

CBIDRMS is a centralized cloud-based platform for managing the interior design project lifecycle. It integrates customer, lead, quotation, project, design, BOQ, vendor, procurement, site, finance, document, dashboard, and reporting activities, reducing manual work and data duplication through secure, role-based access.

Workflow:

Customer/Lead → Quotation → Project → Design → BOQ → Procurement → Site → Finance → Documents → Dashboard & Reports

5.2 System Architecture

CBIDRMS consists of four layers: User Layer for role-based access, Application Layer for system modules, Database Layer for centralized data, and Cloud & Security Layer for cloud access and security.

ArchitectureFlow:

Users → Application Interface → CBIDRMS Modules → Database → Cloud Services

This architecture supports centralized data sharing, reduces duplication, and ensures controlled access.

5.3 System Modules

CBIDRMS comprises 14 modules covering authentication, customers, leads, quotations, projects, designs, BOQ, vendors, purchase orders, site management, finance, documents, dashboards, and reports. Together, these modules support the complete project lifecycle from customer handling to project monitoring and reporting.

OverallWorkflow

Customer → Lead → Quotation → Project → Design → BOQ → Vendor → Purchase → Site → Finance → Documents → Dashboard → Reports → Analytics and Trends

6. RESULTS AND DISCUSSION

1.1 Results

The development of CBIDRMS has established a centralized platform for interior design project management. The implemented Authentication and Lead Pipeline modules provide secure login, role-based access, lead creation and tracking, assignment, status management, and lead-to-project conversion. The system is integrated using Flutter, Node.js, REST APIs, Prisma ORM, and Supabase PostgreSQL, providing structured data processing and centralized storage.

1.2 Discussion

The results indicate that the modular architecture provides a scalable foundation for further development. Integration between lead management and project creation improves workflow continuity and reduces data duplication, while authentication and role-based access ensure controlled system usage. Further evaluation will be conducted after integrating and testing the remaining modules, including customer and quotation, project and design, BOQ and procurement, site and finance, and document, dashboard, and reporting modules.

7. LIMITATIONS

The current development of CBIDRMS has certain limitations related to implementation scope, evaluation, cloud dependency, access control, and scalability.

7.1 Partial Implementation

The current system mainly implements the Authentication and Lead Pipeline modules, while the remaining modules are under progressive development. Hence, complete system functionality cannot yet be evaluated. [2], [6]

7.2 Limited Evaluation

Testing is currently focused on implemented modules. System-wide performance, usability, module integration, and end-to-end workflow require evaluation after complete integration. [6], [8]

7.3 Cloud and Network Dependency

CBIDRMS uses Supabase PostgreSQL and REST-based communication; therefore, system availability and data operations depend on reliable network and cloud services. [2], [4]

7.4 Access-Control Expansion

The existing role-based access control may require further refinement to support module-specific permissions and workflows as additional modules are integrated. [6], [2]

7.5 Scalability and Performance

Large-scale performance, concurrent users, and extensive data handling have not yet been fully evaluated. Future testing will require load testing, query optimization, and scalability assessment. [2], [6], [8]

7.6 Overall Limitation

These limitations reflect the current development stage. Completion and integration of the remaining modules, followed by comprehensive testing, will enable a complete evaluation of CBIDRMS in terms of functionality, security, performance, and scalability. [2], [6], [7]

8. References

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