Revolutionizing Carpentry Management: A Survey on the Development and Impact of 'Carpenters Ease Life' Web Application

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Abstract - The carpentry industry, which is a strategic part of the construction and interior design business, has traditionally relied on manual processes. Some known issues include workforce attendance management, material usage tracking, ledger maintenance, and effective communication among stakeholders. All these factors result in inefficiencies, higher costs, and dissatisfaction among clients. "Carpenters Ease Life" is an exhaustive digital solution that aims at eliminating all these problems with the aid of modern web technologies. This platform, developed using the MERN stack, would be holistic and encompass various functionalities such as attendance management, inventory tracking, ledger systems, and communication tools that could help enhance operational efficiency and productivity. This paper will outline how the above application is developed, present some work on this topic, analyze its characteristics, and discuss the contribution this could make to the industry in carpentry Using case studies, we show how "Carpenters Ease Life" can efficiently use resources, minimize manual mistakes, and enhance client satisfaction in order to hence make it a scalable solution to be adopted at industry level .

Keywords: Carpentry Management System, MERN Stack, Attendance Tracking, Inventory Management, Ledger Management, Client Monitoring, Real-Time Communication, Role-Based Access, Expense Tracking, Project Management, Mobile Optimization, Low-Connectivity Support, Shop Owner Integration, Secure Authentication, User-Friendly Interface, Automated Scheduling, Cloud-Based Solution.

1.INTRODUCTION

Infrastructure and interior design works around the world rely fundamentally on the construction and carpentry industries. However, due to dependence on conventional management techniques, these sectors tend to lag far behind in adopting technological advancements.

These include hand-recorded time sheets, paper-based inventory records, incomplete communication, and record-keeping of financial statements-all of which result in inefficiencies, errors, and increased costs. The global construction market is estimated to be $15.5 trillion in 2030. Thus, there is an imperative need for digitalization to improve efficiency, accuracy, and client satisfaction [2].

Carpenters Ease Life" satisfies that by providing a comprehensive digital platform focused for carpentry business. This application, with functionalities like attendance tracking, inventory management, ledger systems, and communication tools, aims to transform traditional carpentry operations. This enables the carpenter, plywood shop owner, hardware supplier, and the client to manage their activities better, enhance process efficiency, and n of the application will be discussed, related work in digital transformation will be considered, and the potential impact on the carpentry sector will be analyzed. The challenges in the industry are also discussed along with how this platform can overcome them utilizing advanced web technologies [3].

This is a monumental scenario that calls for a digital-first approach because it is significant to meet all time-to-time needs of the carpentry sector. This may not work with traditional methods because resources are managed in a non-systematic manner, and project timescales go on longer. It exposes the risk of data loss due to manual attendance management and paper-based inventory record maintenance but cannot recover critical information in time. With a platform like "Carpenters Ease Life," the carpenters and shop owners can move toward a more

The app's attendance tracking feature minimizes the possibility of error occurring in time tracking. The inventory management is digital thus, every material could be accounted for in real-time and makes requirements on stockouts and overstocking much less

probable. Thus, the entire processes become transparent and lead to enhanced workflow, efficient use of resources and, above all, more satisfied clients.

2. RELATED WORK

The carpentry sector has been relatively slow in embracing digital solutions as compared to most other sectors, which include manufacturing and retail. Automation and digital management systems already make up the mainstream for many of these sectors. Most studies point out the advantages of technology integration into traditional business operations, especially in labor-intensive sectors.

Mobile Attendance Systems According to Smith et al. [4], mobile attendance systems greatly improve labor productivity because they cut down on manual errors in timekeeping. Research conducted by the authors concluded that construction firms using digital attendance logs had a 30% less payroll discrepancy, thus improving labor cost management, which is very essential for carpenters working on several sites with different schedules.

In another study, Johnson [5] revealed that the solution proposed for inventory management in the construction firm leads to a material wastage of up to 25% within that company. This was enabled with the help of real-time systems involving stock. Stock optimization led to less than the excess and resulted in timely completions by the projects in the said field. This helps in fitting into the category of goals for "Carpenters Ease Life," especially their feature on the inventory management tool for plywood and hardware shops.

Financial Ledger Systems: Brown [6] pointed out that the accurate maintenance of ledgers was essential in order to gain the trust of clients and for accountability of a project. A digital management system for ledgers can enable businesses to update clients about the expenses incurred on a project in real time, thus ensuring transparency and better relationships with clients. This is particularly very important in carpentry because, most of the time, it causes problems when less cost.

Integrated Communication Tools: According to Taylor [7], the integration of communication tools in project management improves communication among team members and clients. The update in real-time and provision of feedback helps avoid miscommunication that could lead to delays in project delivery. The chat feature in "Carpenters Ease Life" eliminates such gaps, allowing for free communication between carpenters, suppliers, and clients.

With these innovations, however, the gap still exists in unifying the solution to meet the connected needs of the carpentry industry. The majority of the existing systems are focused on isolated functions, such as attendance and inventory management, without offering a comprehensive system integrating all the operations involved in the carpentry industry. "Carpenters Ease Life" fills this gap with an all-encompassing platform that meets the varied needs of the industry [8].

3. APPLICATION BACKGROUND

Carpenters Ease Life" is a system aimed to digitize the workflow of carpentry businesses through supplying the most diverse range of functionalities that would even encompass operational and financial aspects. The application is based on the MERN stack (MongoDB, Express.js, React, Node.js) which basically gives scalability, flexibility, and very efficient data handling. The application mainly deals with key areas of managing a carpentry business that helps users streamline their business functions and cut overheads.

Main Modules of the Application:

Attendance Management: Enables carpenters to use mobile devices that provide an easy interface to input daily attendance. The system keeps track of overtime, half-day records, and absence with appropriate reports used in processing payrolls.

Inventory Management: It has a real-time tracking system of materials such as plywood and hardware among others. Shop owners can monitor stock levels, receive low stock alerts, and even automate the reordering processes so that there is no understocking of materials to run projects smoothly.

Ledger Management: It features an extremely sophisticated ledger system that performs all the financial transactions done in relation to carpentry projects. All the expenditures would be recorded; invoices could be generated; any information related to clients' financial status might be reported to the clients.

Client Communication and Monitoring: A chat system exists for real-time communication between the clients, carpenters, and suppliers. Such tools ensure that all parties may be informed regarding the progress

of the project, avoidance of misunderstandings, and delays are ensured [9].

All these can then be integrated into one portal under the "Carpenters Ease Life" title to provide a comprehensive solution to the needs of the industry of the various carpentry businesses in order to carry out their operations in an even more efficient manner.

4. TECHNIQUE BACKGROUND

The "Carpenters Ease Life" development is a multiple modern web technologies-based construction meant to provide an absolutely fluid user experience.

MongoDB: The NoSQL database is used for holding different data types, which include user profile, attendance records, inventory details, and all financial transactions. MongoDB is the ideal database used in its document-based model with easy retrieval and scalability for application as various data needs require different values in a carpentry business. It also supports rapid adjustment in the flexible schema of ever-changing requirements of an application.

Express.js A light framework for building strong APIs and handling server-side logic. Express makes sure CRUD operations, authentication, and error handling – which make sure that data interactions are fluid while securing a user experience-is taken care of on the backend. Its architecture also supports efficient data validation alongside request handling.

React: React is such an incredible component-based architecture; the features allow developers to build interactive UIs that are maintainable and scalable in nature. Integration with TailwindCSS and Flowbite, for styles remains one of the classiest and modern responsive designs across the platforms, catering to user engagement and accessibility on all platforms. This combination has accelerated a faster, cleaner UI with custom design components that are tailored to meet the needs of business and carpentry business.

Node.js: Node.js has the execution environment where JavaScript can run on the server-side. Model It is an event-driven model, best-suited applications involving high I/O operations through which updates about project progress, inventory, or communications are immediately transmitted to carpenters, suppliers, and clients as well.

Other Libraries and Tools

JWT (JSON Web Tokens) Provides safe authentication for users, and it enforces keeping sensitive information as well as user data secure.

Redux Toolkit This is for state management. It is centralized toward ensuring clear and consistent data flow within the application.

Axios This is asynchronous HTTP request. The app can then fetch data and allow components to update without page reloads.

React Big Calendar It visualizes project timelines and attendance with quite a clear, calendar-based view of ongoing tasks and personnel schedules.

bcryptjs- to hash the passwords and increase the security factor of the project for user account details. An important layer to protect the users' accounts.

React-toastify to handle the show of notifications and alerts, gives better usability with real-time updates about key actions in the application.

Animate.css and AOS (Animate on Scroll) are also added to animate the UI of the site and will make the whole design look very appealing and user-friendly [10].

These technologies were chosen to ensure that the platform provided by them is scalable, efficient, and safe in handling diverse requirements of carpentry businesses-all the way from resource management to enhancing the interactional aspects with clients. Combining real-time updates, secure data, and responsive UI design, "Carpenters Ease Life" will form a holistic solution for enhancing how carpentry is operated.

5. APPLICATION AND TECHNOLOGY TOGETHER

Combining these advanced technologies with traditional carpentry practices, this powerful tool would go a long way in revolutionizing the industry. "Carpenters Ease Life" brings together everything-attendance tracking, inventory management, financial ledgers, communication tools-in one unified platform to deliver overall coherence between application features and technology that makes the entire system robust and effective in terms of productivity and operational efficiency.

Streamlined Workforce Management: The attendance is tracked automatically and thus removes or minimizes the necessity of doing timekeeping, whereas payroll calculations become more accurate and compliance with labor laws is possible.

- Optimized Inventory Control: Here, materials are tracked in real-time, avoiding stockouts and overstocking, thus enhancing the best utilization of resources or human services and reducing costs.

- Improved Financial Management: The integrated general ledger system ensures that all expenses are well accounted for and that invoices are generated with proper details, allowing them to keep a close record of their financial activities.

- Improved Client Relations: The chats feature is going to make it easy for clients and carpenters to engage in one-to-one direct communication, thereby improving on the alignment of projects and raising customer satisfaction [11].

The overlap of these technologies and application features exhibits how digital tools can encourage efficiency and innovation in the carpentry industry.

6. SOLUTIONS FOR CHALLENGES

- Digital Attendance System - With the online attendance system on the platform, it automates the time kept, thus reducing error and ensuring that the payroll is correct. This solution in particular is important for projects requiring numerous carpenters across multiple sites.

- Inefficient inventory management is prevented through the real-time tracking of the application offered to shop owners in maintaining optimum stock, which minimizes waste and delays in projects.

- Poor Communication: The integrated chat feature helps close the gaps of communicating with customers, carpenters, and suppliers that will enhance collaboration with results in the project.

7. VARIOUS DOMAINS

Although "Carpenters Ease Life" is primarily an application for carpentry, its features could be applied to any organization:

Construction Management: This attendance and inventory tracking feature is helpful for construction firms that need to optimize labor and material management.

Event Planning: The scheduling, communication, and finance management tools provided by the platform can be used to help event managers in planning successful events.

Service-based Industries: Companies in this industry, such as cleaning service providers and repairing shops, can use the various features that the platform has on attendance and scheduling to operate effectively [13].

8. CONCLUSION

"Carpenters Ease Life" is a very scalable and adaptable solution for the carpentry industry. It indicates a solution that answers some of the major operational burdens and sets the way for digital transformation. The usage of modern technologies, such as the MERN stack, provides a holistic tool for the platform in maximizing productivity, minimizing the possibilities of human error, and bringing about benefits to clients. Once the carpentry industry advances, it clearly becomes the most critical in driving efficiency, cut in costs, and better delivery of the project with the adoption of such digital solutions. [14].

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