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Construction Map

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Abstract: *The system 'Construction Map' is a web application developed with an aim to automate the manual proceduresc arried out in the field of construction. Using the application, every process that starts from searching and finding a consultancy can be automated. A client who wishes to construct a building can register with the application and search for a proper consultancy based on their requirements. The consultancies registered in the system can make quotations. Once a project is got, the consultancies can search or invite contractors to handle different fields of their project. The contractors registered in the system can make quotations for the proposal. Those who win the proposal can use the system to search for sub-contractors. Further the sub-contractors can find suppliers and so on.*

Keywords: Construction Map

I. INTRODUCTION

Now a days Majority of the construction field are deploying their Manpower on the contract basis through external outsourcing agency. In this study I have gone through various facilities available to the Contract Employees and sub employees and so on. The management of contracts with customers, vendors, partners, or staff is known as contract management or contract administration. Contract management entails negotiating contract terms and conditions and ensuring that they are followed, as well as documenting and agreeing on any changes or amendments that may occur throughout the implementation or execution of the contract. It is the systematic and efficient management of contract formulation, implementation, and analysis with the goal of maximizing financial and operational performance while minimizing risk. Purchase orders, sales invoices, utility contracts, letters of engagement for the hiring of consultants and professionals, and building contracts are all examples of commercial contracts. Construction projects, highly regulated goods or services, commodities or services with comprehensive technical requirements, intellectual property (IP) agreements, outsourcing, and international trade all necessitate complex contracts. Larger contracts necessitate the use of contract management software to assist in the administration of several parties. There are mainly six modules:

- Admin
- Consultancy
- Contractor
- Subcontractor
- User
- Supplier

In this paper, we have 6 logins such as for Admin, Consultancy, Contractor, Subcontractor, Supplier and for User. The admin module grants administrators control over all aspects of the platform. Admin manage data related to consultancies, contractors, sub-contractors, suppliers, employees, and users. Consultancies offer a range of design and engineering services encompassing architectural, structural, mechanical, electrical, and plumbing design. These services ensure projects adhere to client requirements, regulations, and operational efficiency. Contractors oversee the construction process, coordinating with sub-contractors, employees, and suppliers. Their role guarantees high-quality project completion and the swift resolution of issues. Sub-contractors collaborate with general contractors to devise project plans. They review specifications, coordinate with other sub-contractors, and formulate schedules. Sub- contractors are accountable for their project segment's quality and adherence to standards. This module empowers them to manage employee interactions and access controls for documents. Users register with the system to find suitable consultancies for project assignments. When a client proposes a

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new project, registered consultancies can bid through the system. The platform facilitates the invitation of contractors, subcontractors, and suppliers by respective parties. Suppliers source required materials and equipment from manufacturers or distributors. They may offer inventory
products for project needs. Suppliers handle transportation to construction sites and collaborate with the construction team to ensure timely and accurate deliveries.
The 'Construction Map' application integrates these modules to establish a comprehensive digital ecosystem thatoptimizes communication, collaboration, and project management within the construction industry.

II. METHODOLOGY

This paper proposes an effective method for automation, collaboration, and security enhancement within the domain of construction. The methodology is composed of the following key elements:

Modular Architecture and Stakeholder Roles:

- The application is structured around six distinct user roles: Admin, Consultancy, Contractor, Subcontractor, User, and Supplier. Each role is allocated specific functionalities, allowing for efficient task management and seamless engagement among the diverse set of participants.

Data Security and Accessibility:

- Within the Admin module, administrators hold the authority to manage data related to consultancies, contractors, sub-contractors, suppliers, employees, and users. This module ensures comprehensive access control, user verification, and data integrity measures to prevent unauthorized access and maintain the confidentiality of sensitive information.

Consultancy-Centric Interaction:

- Consultancies contribute a wide range of design and engineering services, spanning architectural, structural, mechanical, electrical, and plumbing domains. The profiles of these consultancies showcase their areas of expertise, enabling well-informed interactions with clients. This competitive edge is facilitated by a responsive bidding mechanism.

Contractor Collaboration and Oversight:

- Contractors play a pivotal role in overseeing construction operations, collaborating closely with sub-contractors, employees, and suppliers. Effective coordination among these stakeholders guarantees the timely and high-quality delivery of projects. Sub-contractors collaborate with general contractors, actively participating in project planning, review, coordination, and adherence to schedules and quality benchmarks.

User Engagement and Consultancy Selection:

- Users register on the platform to identify consultancies that align with their specific project requirements. The application streamlines project proposal and bidding procedures, simplifying the process of consultancy selection. Seamless communication among contractors, subcontractors, and suppliers ensures the smooth execution of projects.

Supply Chain Optimization:

- Suppliers assume responsibility for sourcing essential materials and equipment, ensuring their prompt delivery to construction sites. Collaborative partnerships with manufacturers, distributors, and the construction team maintain an uninterrupted supply chain. To achieve this, logistics and communication strategies are honed to ensure materials availability at the right time and location.

The integration of these core methodology components establishes a comprehensive digital environment, fostering improved communication, collaboration, and project management practices within the construction sector. The methodology behind the 'Construction Map' application seeks to elevate transparency, operational efficiency, and security standards, ushering in a new era of construction project execution

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III. EXISTING AND PROPOSED SYSTEMS

In the existing scenario, a client search and contacts a consultancy manually. It takes a lot of time to find an appropriate one that meets the requirements and budget. Once a consultancy got a project, they have to find the contractors for different works. Again this is time consuming. Thus incorporating the various sections; from consultancies to suppliers in a project itself takes a lot of time. Also in the existing system, there is no way to track the work progression. It is very difficult to follow up the updations and suggestions of the client.

Limitations of the Existing System

- Manual process
- Limited analytics
- Difficult tracking
- Lack of transparency

To overcome the drawbacks on the existing system a new system has to be implemented. In the proposed system , wecan bring the various fields of construction to a single platform.

Advantages and Features of the Proposed System

- Centralized platform
- Streamlined project assessment
- Efficient collaboration and document management
- Access privileges & security
- Clear employee structure

IV. BACKGROUND

Technologies used in this Project:

React.js, more commonly known as React, is a free, open-source JavaScript library. It works best to build user interfaces by combining sections of code (components) into full websites. Originally built by Facebook, Meta and the open-source community now maintain it. One of the good things about React is that you can use it as much or as little as you want! Forexample, you can build your entire site in React or just use one single React component on one page.

React.js is built using JSX – A combination of JavaScript and XML. Elements are created using JSX, and then use JavaScript to render them on your site. While React has a steep learning curve for a junior developer, it's quickly shaping into one of the most popular and in-demand JavaScript libraries. React is considered a JavaScript library rather than a framework, whereas the other options we'll consider today are considered frameworks. It helps to think of a library as a tool that developers could use in any project and a framework as a whole design.

PHP 8.1.12 (Laravel) is an open-source PHP framework, which is robust and easy to understand. It follows a model- view-controller design pattern. Laravel reuses the existing components of different frameworks which helps in creating a web application. The web application thus designed is more structured and pragmatic. Laravel offers a rich set of functionalities which incorporates the basic features of PHP frameworks like CodeIgniter, Yii and other programming languages like Ruby on Rails. Laravel has a very rich set of features which will boost the speed of web development. If you are familiar with Core PHP and Advanced PHP, Laravel will make your task easier. It saves a lot time if you are planning to develop a website from scratch. Moreover, a website built in Laravel is secure and prevents several web attacks

V. CONCLUSION

The 'Construction Map' web application serves as a valuable tool for automating manual procedures in the constructionindustry. It offers a streamlined process for clients to register, search, and find consultancies that align with their specific construction requirements. The system allows registered consultancies to provide quotations,

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facilitating a seamless interaction between clients and consultancies. Once a project is acquired, consultancies can utilize the application to search for contractors
or invite them to handle different aspects of the project. Contractors registered within the system have the ability to submit quotations for proposals, enabling effective communication and collaboration between consultancies and contractors. The application also extends its functionality to the winning contractors, who can use the system to search for sub-contractors to fulfill specialized tasks within the project. This creates a well-connected network of professionals, optimizing the process of finding suitable subcontractors and ensuring efficient project management. Furthermore, the 'Construction Map' application supports the sub-contractor phase by providing a platform for sub-contractors to find suppliers and access the necessary resources for their assigned tasks. By automating these manual procedures and facilitating seamless interactions between various stakeholders, the 'Construction Map' system enhances efficiency, reduces time consuming processes, and ultimately improves the overall effectiveness of construction projects

VI. FUTURE ENHANCEMENT

Enhancement means adding, modifying, or developing the code to support the changes in the specification. Here are some possible avenues for further development:

- Integration of Advanced Project Management Features: To provide comprehensive project management capabilities, the application could incorporate features such as task scheduling, progress tracking, resource allocation, and budget management. This would enable users to manage construction projects more effectively and efficiently within the application itself.
- Collaboration and Communication Tools: Enhancing the communication and collaboration aspects of the system can greatly improve coordination among clients, consultancies, contractors, sub-contractors, and suppliers. Integration of real-time messaging, document sharing, and project-specific discussion boards could facilitate seamless and transparent communication throughout the project lifecycle.
- Integration of 3D Visualization and Virtual Reality (VR): Implementing 3D visualization and VR technologies could offer clients and stakeholders a more immersive experience of the proposed building design. Users could virtually explore and interact with the architectural models, allowing for better decision-making and understanding of the project before it enters the construction phase.
- Expansion to Mobile Platforms: Developing a mobile application version of 'Construction Map' would provide users with the flexibility to access and manage projects on-the-go. Mobile compatibility would enable users to track project updates, review quotations, communicate with stakeholders, and manage project-related tasks conveniently from their smart phones or tablets.
- Integration of Artificial Intelligence (AI) and Machine Learning (ML): Leveraging AI and ML technologies can bring various benefits to the application. For example, the system could analyze historical data to generate accurate project cost estimations, suggest potential consultancies or contractors based on project requirements, and provide predictive analytics to identify potential risks or delays.
- Incorporation of Building Information Modeling (BIM): Integrating BIM capabilities into the application would allow for better visualization, coordination, and collaboration among different disciplines involved in construction. Users could access and share BIM models, enabling improved design coordination and clash detection, as well as facilitating better decision-making throughout the project lifecycle

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VII. RESULTS AND DISCUSSIONS

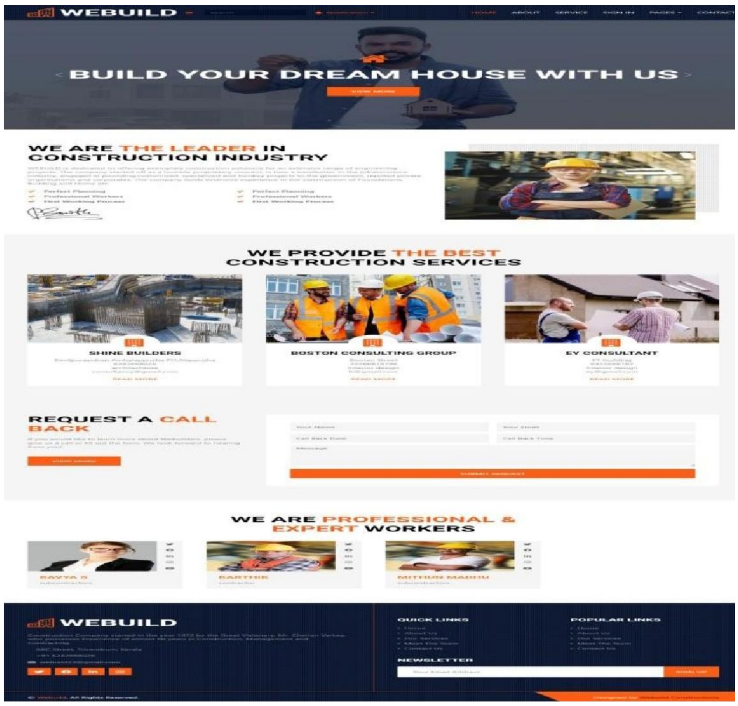

Figure 1: Home Page

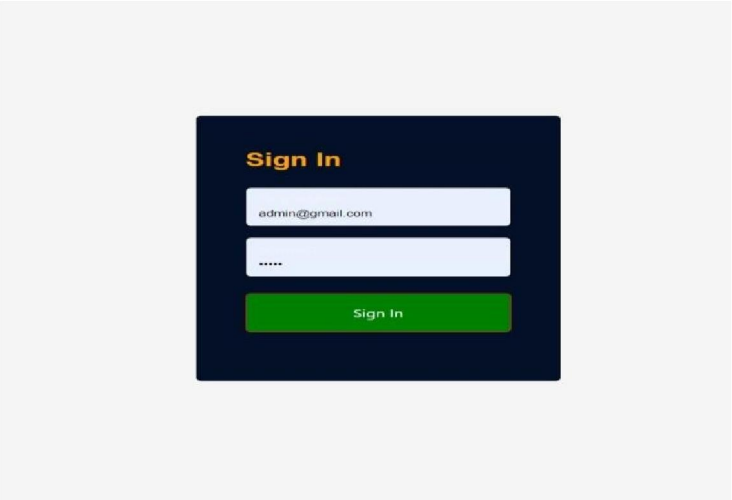

Figure 2: Login Page INSERT IN LOGIN PAGE

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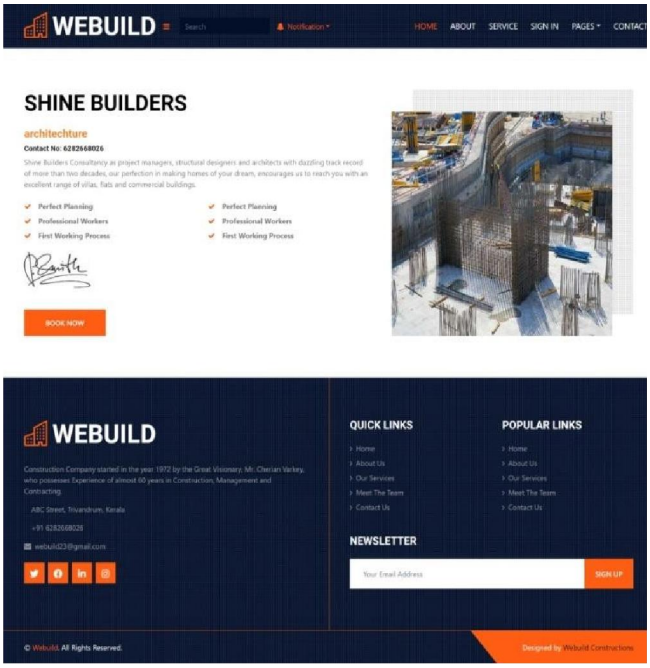

Figure 3: Consultancy Book Page

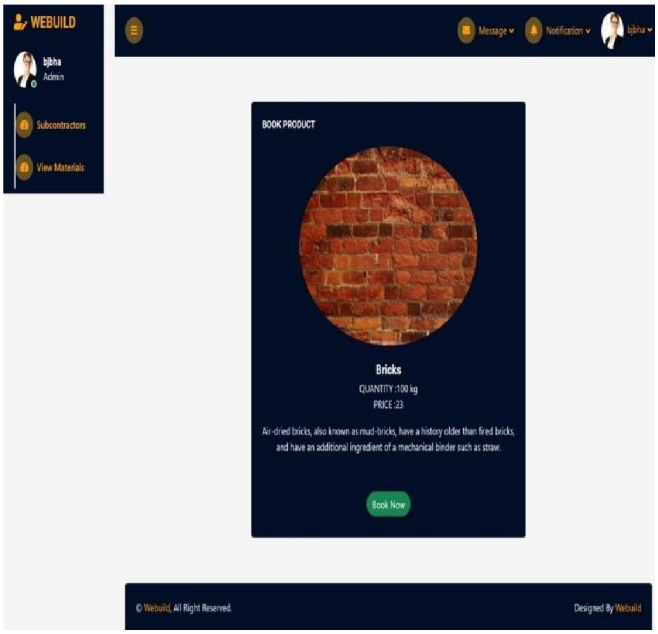

Figure 4: Material Booking Page

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