



Sri Lanka Institute of Information Technology

Online System for a Building Construction Company Project Report

Information Technology Project 2021

Project ID: **KDY_2021_WD06**

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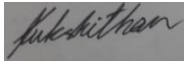



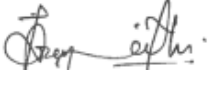

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Project Details

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Project ID	KDY_2021_WD06

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Abstract

This project is done to fulfill the requirements made by the business organization known as 'Kurunduwaththe Constructions', which is a small-scale building construction company located in the Kandy area. Its main requirement was to build a well-functioning information system to conduct its day-to-day business procedures efficiently and make better business decisions in the future. The development team conducted interviews with the administration and the stakeholders of the organization to gather information and to identify the requirements of the system. All the requirement details are elaborated under the 'requirements and analysis' chapter in the report. Then the development teams decided to come up with a well-functioning information system to keep all the relevant information of the business organization. Considering the amount of data that is going to be stored and the responsiveness of the system, the development teams decided to use React JS for the frontend and the Firebase-firestore for the backend of the system. All the technologies utilized and the structure of the system including the designing strategies are elaborated under the 'Design' and 'Implementation' chapters in this report. The system has its limitations since the stakeholders are not comfortable with new technology. But the development teams have suggestions to improve the functionality of the system and they are elaborated under the Conclusion chapter.

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1. Introduction

1.1 Problem Statement

The Kurunduwatte Constructions, which is a small-scale building construction company, has been there for around 25 years. It is located in the Ambatenna area in the Kandy district. The owner of the business organization is Mr. A.M.Kularathne. The main problem it faces today is, its growing complexity as a business organization and the business competition. Its business procedures have been conducted manually up to this date. The information of transactions, including employee salaries, project transactions, material supply information, and everything related to the company, is kept in lodge books. But with the recent growth of the company, its future ambitions, and the competition of the construction field today, it will be a huge disadvantage for the company to continue with this manual system. Especially, maintain lodge books to keep information is not recommended for a growing business. Hence, the owner of the company intends to build an automated system to conduct its business procedures.

the company does not intend to build a fully automated system due to some obstacles. For instance, employees are not familiar with new technology, hence access is not provided to them. The same was seen while gathering information from the stakeholders of the business organization. Mainly, the requirement is to build a good information system to keep all the transaction information of the organization, which allows the business procedures to be conducted efficiently and better business decisions to be made in the future.

1.2 Product Scope

Overall scope:

As per the requirements, access to the system is granted only to the administrator of the system. All the business procedures are conducted manually and then, the information is included into the system by the administrator.

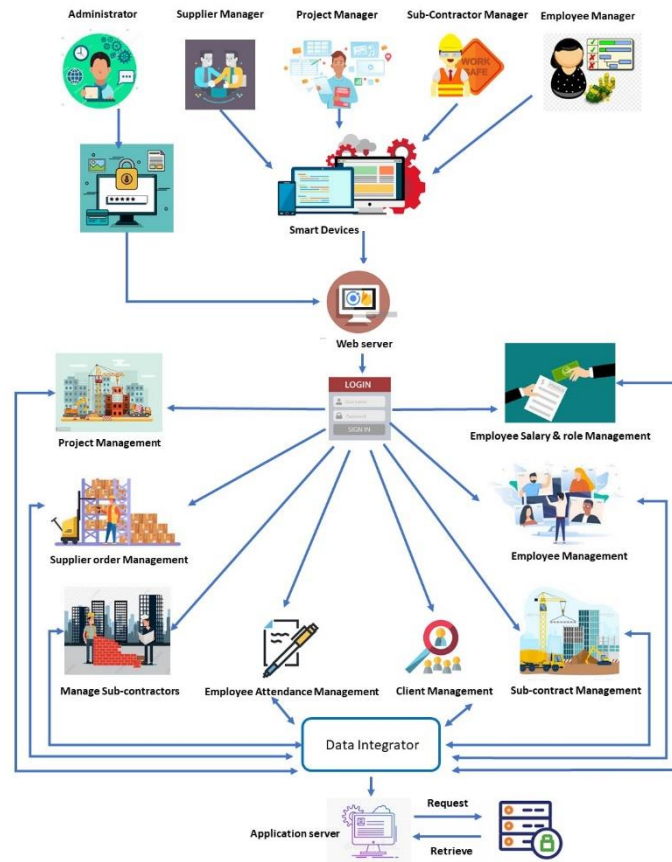


Figure 1.1 Overall scope

Individual scope:

Name	Function name	Scope
Lukshithan K.H.K	Client management	The client is not given access to the system. Hence, the agreement should be made manually with the client and then, the client details and the project payment details are

		<p>entered into the system by the administrator.</p> <ul style="list-style-type: none"> • Add, delete, update client details and payments made by clients. • Search for client details. • Generate reports on payments made by clients.
Ihshan I.M.M	Project management	<p>All the project-related details are inserted and maintained by the administrator.</p> <ul style="list-style-type: none"> • Add, delete, update project details including expenses, and other project-related matters • Generate summary reports for each ongoing project.
Wettewa R.M.B.A.N.K	Supplier order management	<p>All the supply order details for each project and supplier details are managed inside the system by the administrator.</p> <ul style="list-style-type: none"> • Add, update, delete supplier orders for each

		<p>project and supplier details.</p> <ul style="list-style-type: none"> • Generate supply order transaction report for a particular project in a specific period.
Jayasinghe J.M.R.M	Manage sub-contractors	<p>Sub-contractors are assigned to do sub-projects of a project like painting, tiling, etc. Details of the sub-contractors cooperating with the company, maintained by the administrator.</p> <ul style="list-style-type: none"> • Add, update, delete sub-contractor details. • Generate reports on payments made for sub-contractors in a particular project.
Sashmitha P.G.N	Employee attendance manager	<p>As the employees are not given access to the system, the employee attendance (arrival and leaving time, holidays) is marked by the administrator, which will be important in generating employee monthly salary reports.</p> <ul style="list-style-type: none"> • Mark arrival time, leaving time, and holidays of employees

		<ul style="list-style-type: none"> • Generate employee attendance reports for a particular day for each project, and monthly attendance reports for each employee.
Praneetha J	Employee management	<p>All the employee details must be maintained inside the system by the administrator.</p> <ul style="list-style-type: none"> • Add, update, delete employee details • Generate employee composition reports for available designations.
Dedunupitiya U.K.B	Designation and Employee salary management	<p>Designation details including basic salary are maintained by the administrator.</p> <ul style="list-style-type: none"> • Add, update, delete designation details. <p>Employee monthly salaries are counted at the end of the month, based on their attendance record and the basic salary of their designation.</p> <ul style="list-style-type: none"> • Calculate monthly salary for employees

		and generate monthly salary reports.
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Table 1.1 Individual scope

1.3 Project Report Structure

The process of requirement gathering, implementation, designing, and testing is comprehensively explained in this project report. All of these details are included in the ‘Methodology’ phase.

Under the ‘Requirement and Analysis’ chapter, the functional and non-functional requirements of the business organization are elaborated with the preferred solutions to archive them.

Under the ‘Design’chapter, The process of designing the proposed system is demonstrated with UML diagrams and wireframe. An EER diagram is used to identify the entities of the system and sequence diagrams are used to identify the flow of the functions available in the system.

Module structure, database management system, the programming language which is used to implement the system, and all the tools that have been utilized are comprehensively explained under the ‘Implementation’ chapter. The module structure (system structure) is demonstrated using a graph.

Tests cases that were used for the unit testing, are included under the ‘Testing’ chapter. Further, the development team’s suggestions to further develop the system functions are included under the ‘Conclusion’ phase.

2. Methodology

2.1 Requirements and Analysis

Requirement gathering is mainly conducted physically even though there were some obstacles due to the pandemic situation. Mainly, it was the owner of the business organization that was interviewed by the development team. In addition to that few main employees of the company were interviewed briefly. In the first phase of the requirement gathering, the main functions were identified. The followings are the main functional requirements identified by the development team.

- ❖ Only the system administrator should be given access to the system since all the other stakeholders are not keen to work with new technology.
- ❖ Client details must be managed and the administrator should be able to search for a client.
- ❖ Employee attendance records must be kept inside the system because the monthly salary of the employees is counted based on their attendance report in that particular month and their designations basic salary. Employee arrival time, leaving time, holidays and leavings should be able to be marked. A daily attendance report on each project with employee designations should be able to be generated.
- ❖ Employee salaries should be counted for each month based on employee attendance and their designations' basic salary (Salary per day) and monthly salary reports should be generated for each month. 8% of the monthly salary of contracted employees (permanent employees of the organization) should be transferred to the ETF account. Hence, the ETF amount should be calculated along with other calculations.
- ❖ All the employee details and the designations should be kept inside the system. Employees can be categorized into contracted and non-contracted. (permanent and non-permanent)
- ❖ All details of the projects conducted by the business organization including all the expenses (materials, subcontractors, etc.), working employees, and the payments made by the client should be maintained inside the system. The system administrator should be able to maintain the details and close the project when the task is completed.

- ❖ Orders made by the organization for each project should be kept with the system. Transactions made by the organization with suppliers in a specific period, in a particular project should be able to view because it is important to make business decisions.
- ❖ For business purposes, transactions made with each subcontractor in a particular project should be able to view.
- ❖ For business purposes, payments made by clients in the past should be able to view.

Since the client is not familiar with the nature of an online system, the development teams were granted permission to make changes to the system accordingly. Hence, in addition to the main requirements, some other features are also added to the system. The non-functional requirements are also identified during the interviews done by the development team. The followings are the identified non-functional requirement.

Non-functional Requirement	Solutions
High responsiveness and the scalability	<p>ReactJS is the language that is used to develop the front-end of the system. This language provides high responsiveness to the user.</p> <p>Implementing a local database is a disadvantage for the business organization. Firestore can store a huge amount of data, hence it was chosen as the database of the system.</p>
Security	<p>Firestore, the database used as the database and also the back-end of the system, is hosted by one of the secured companies, Google. If any kind of attempt is made to stole data, the server will be taken care of that.</p>

	Proper validations are implemented to prevent unauthorized access.
User-friendliness	Proper alignments and colors are used. The usage of the system is made simple using simple user interfaces.
Reliability	After the system was installed and functioning, it was put through a rigorous testing process. System designers and testers have ensured that the product is of high quality and free of errors.
Maintainability	The system can be modified accordingly in the future. Proper coding standards have been followed when developing the system.
Efficiency	Unit testing and integrity testing are done to ensure the system runs efficiently and smoothly.

Table 2.1 Non-functional requirements and solutions

2.2 Design

The following high-level architecture diagram (Deployment diagram) demonstrates the high-level structure of the system.

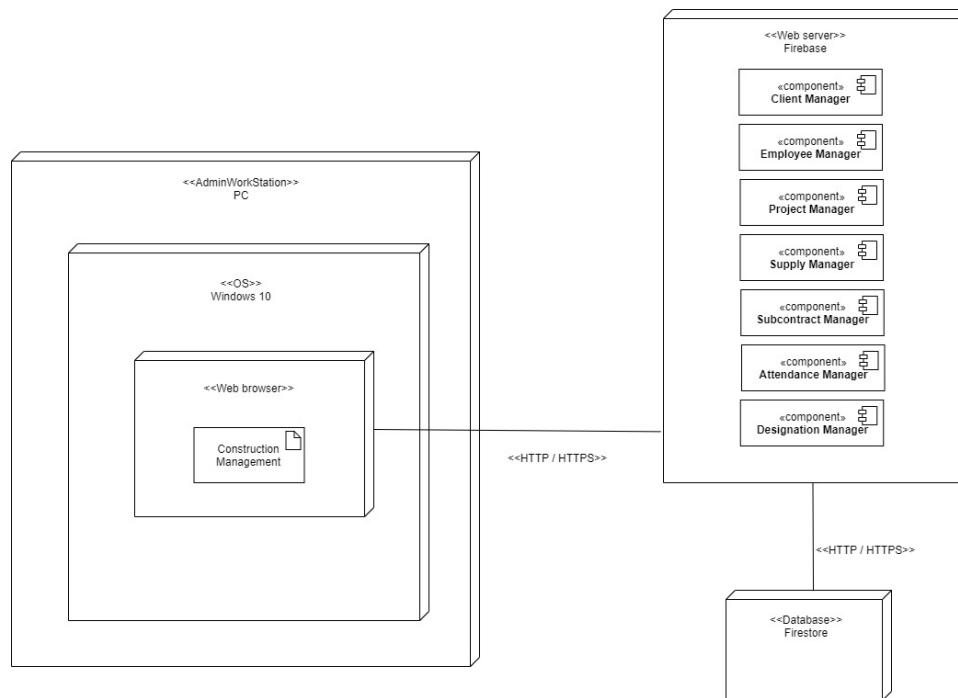


Figure 2.1 Deployment diagram

The following use case diagram demonstrates the main functions in the system.

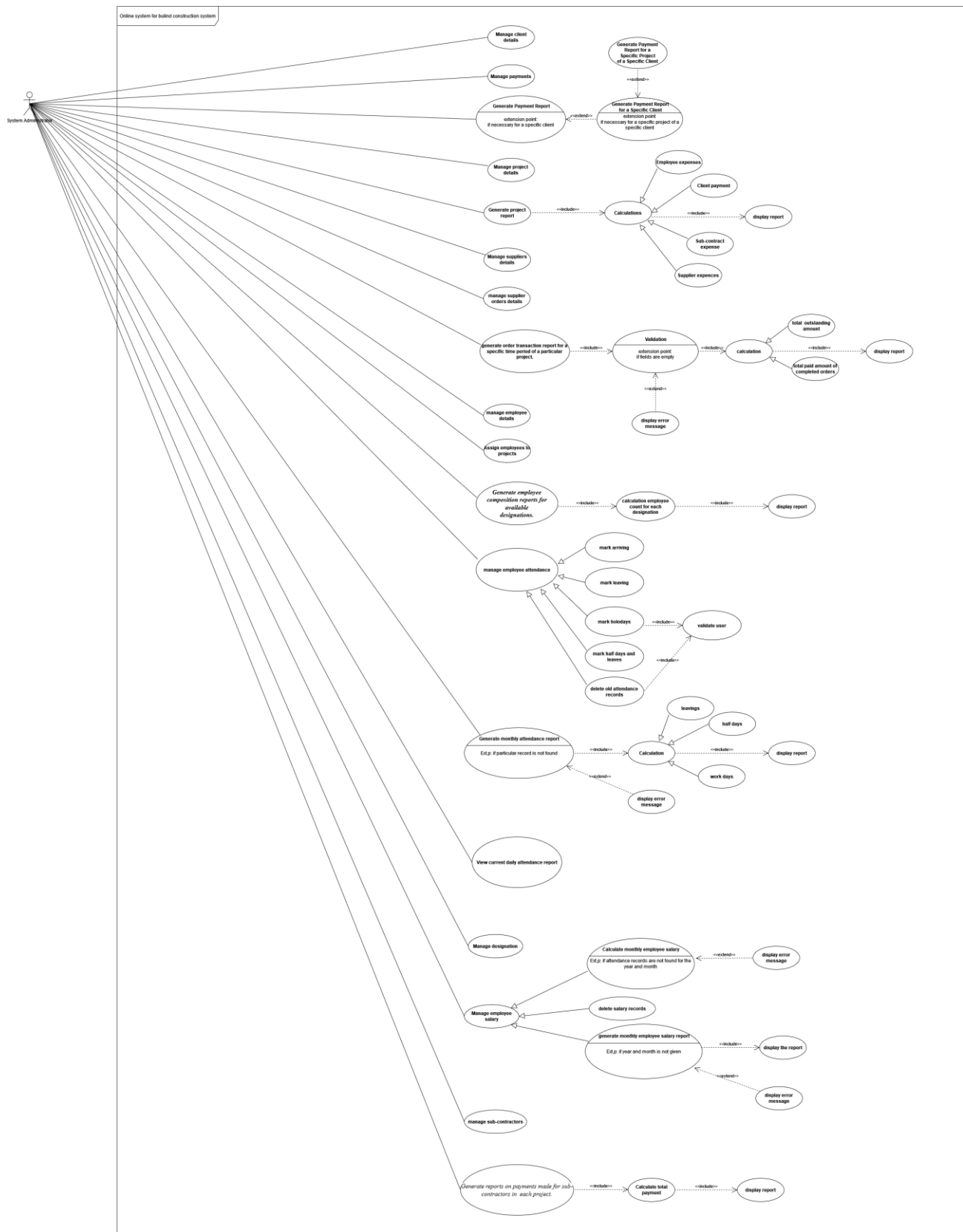


Figure 2.2 Usecase diagram

The structure of the system can be divided into 7 main functions. The designing of those functions is done according to the following sequence diagrams. The flow of the system functions is demonstrated in them. (Only the main functions are demonstrated using sequence diagrams)

System login:

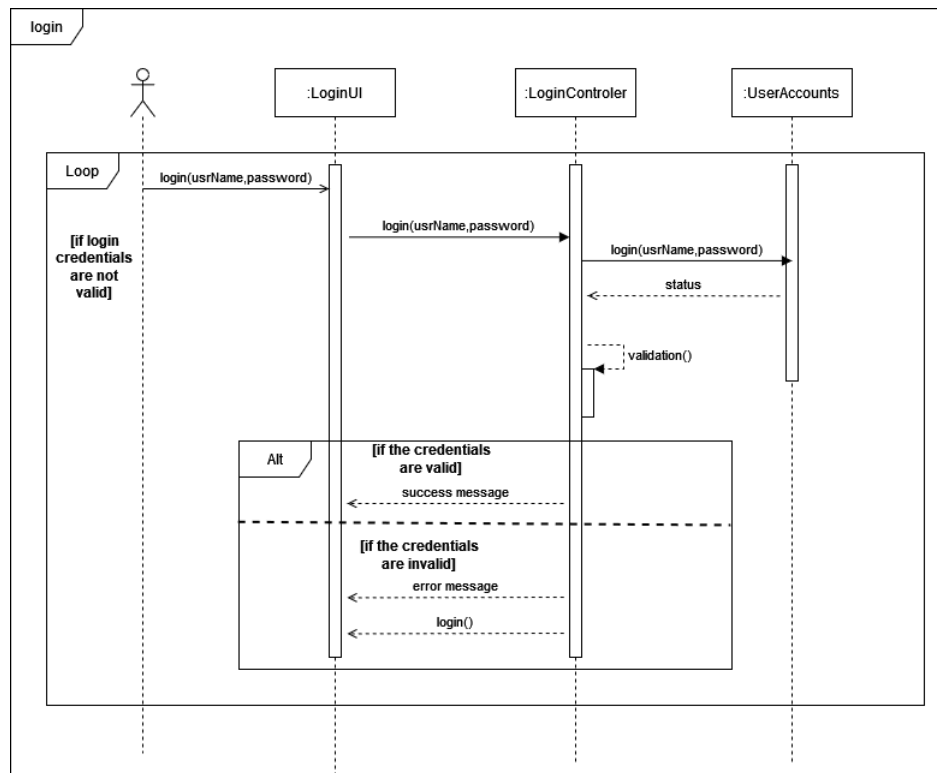


Figure 2.3 System login- Sequence diagram

Project Management: Delete ongoing projects

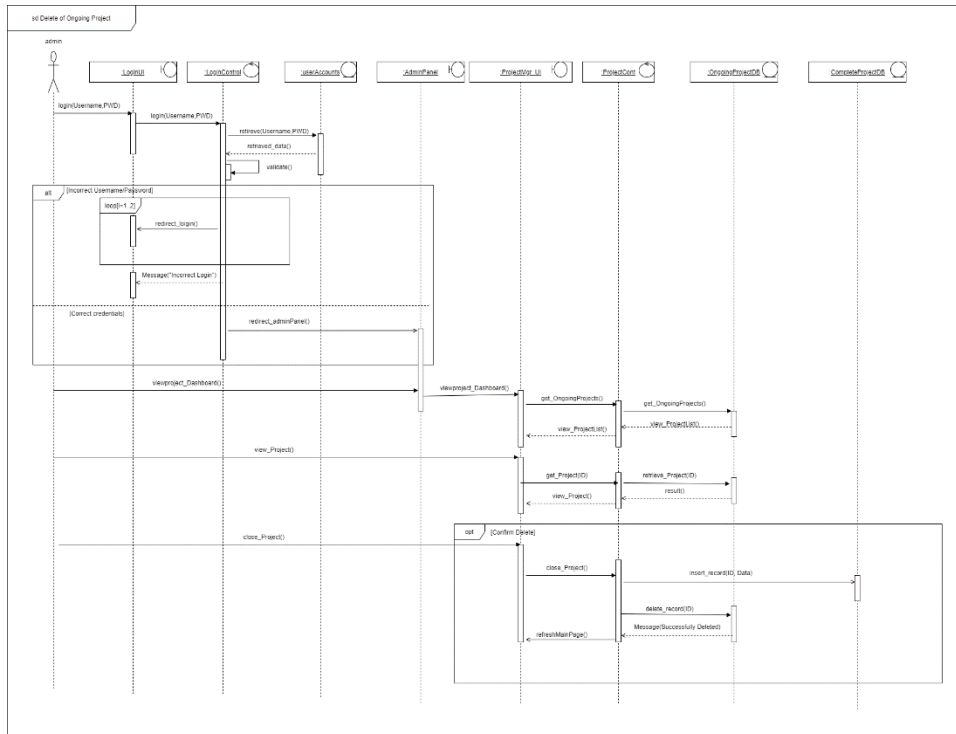


Figure 2.4 Delete ongoing projects-Sequence diagram

Supplier management: Generate transaction report

Salary management: calculate salary

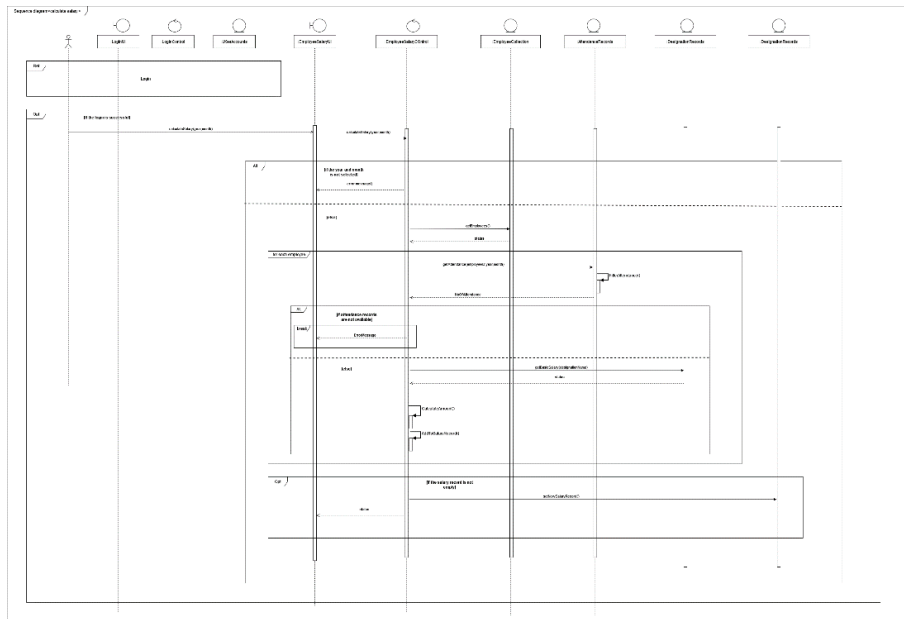


Figure 2.7 Calculate salary-Sequence diagram

Subcontractor management: manage subcontractors

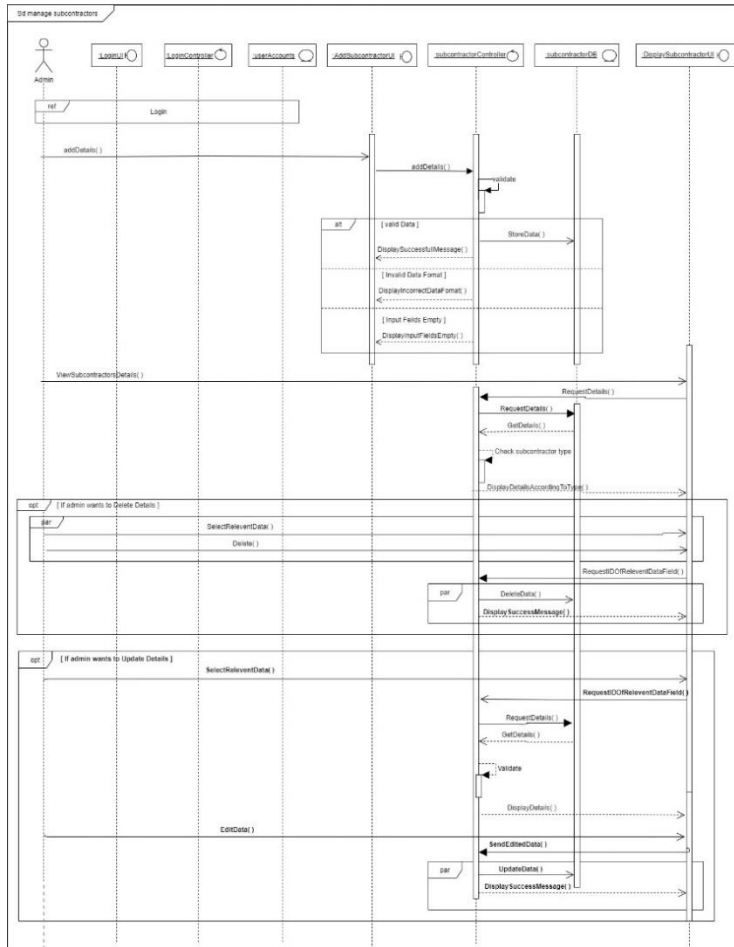


Figure 2.8 Manage subcontractors-Sequence diagram

Client Management: generate payment report

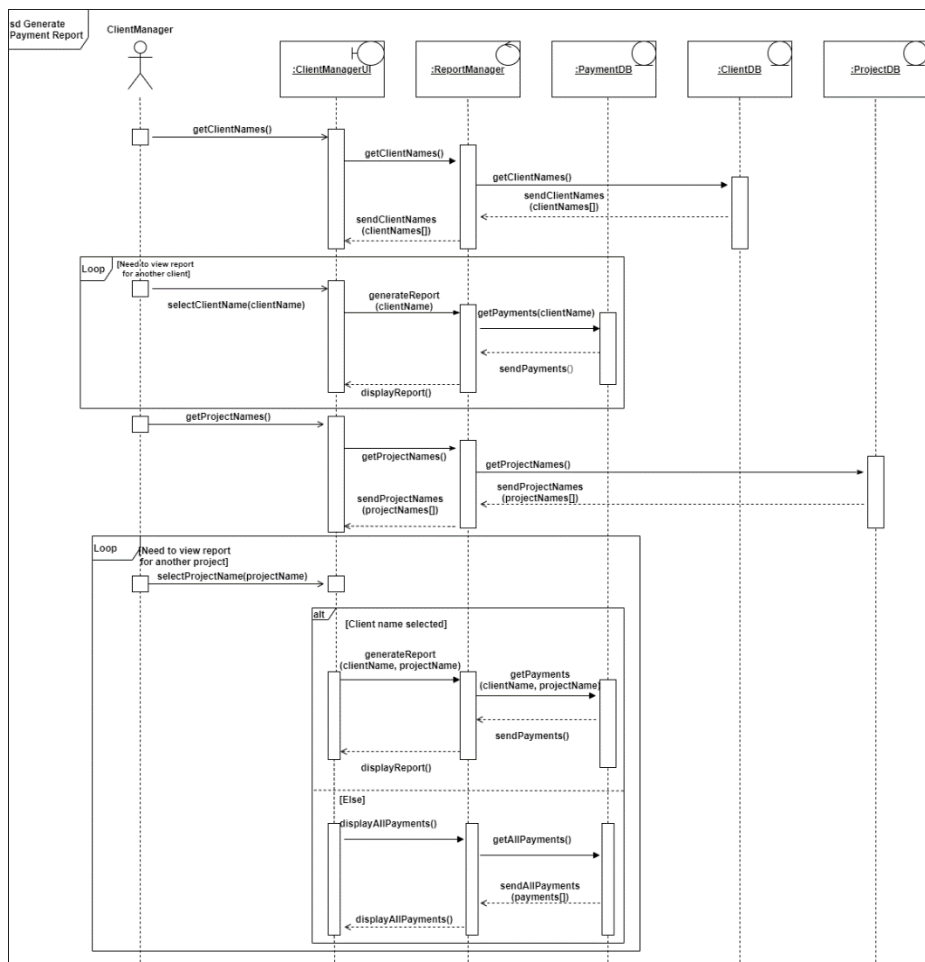


Figure 2.9 Generate payment report- Sequence diagram

Employee management: generate employee composition reports

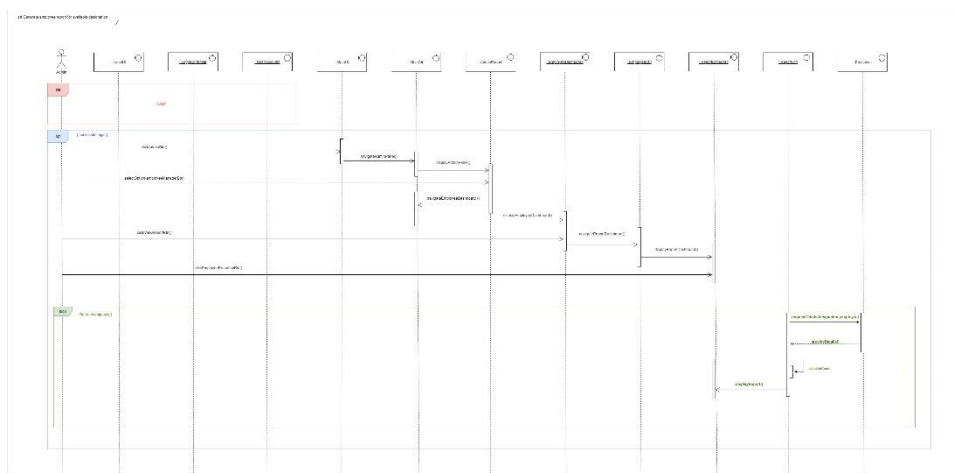


Figure 2.10 Generate employee composition reports-Sequence diagram

Firestore database is structured using the following EER diagram.

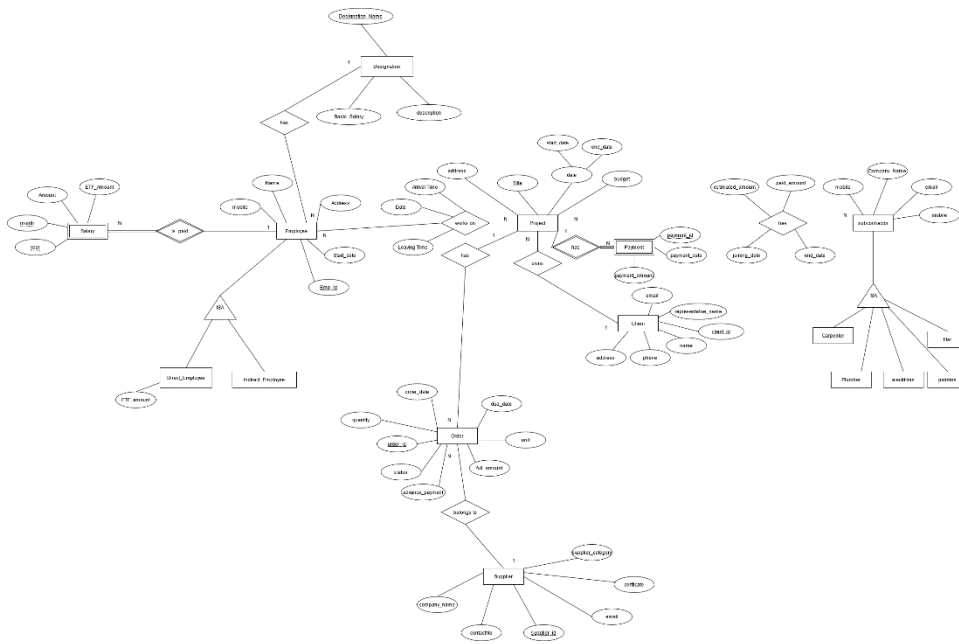


Figure 2.11 EER diagram

2.3 Implementation

The system is divided into 7 main components such as client manager, employee manager, project manager, supplier manager, subcontractor manager, designation and salary manager, and attendance manager. These components include more other sub-components as well. Main module structure of the system is demonstrated in the following hierarchy.

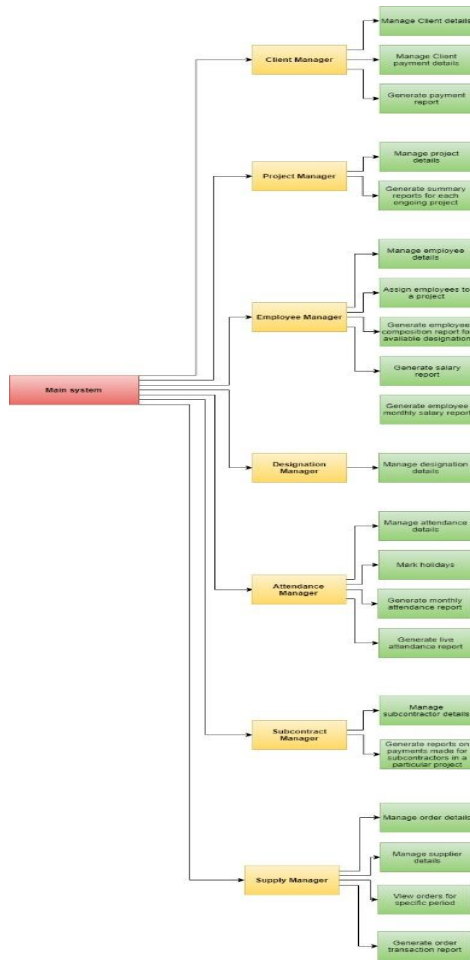


Figure 2.12 Main module structure of the system

Implementation techniques that were considered in developing this system are mainly React JS for the front-end and Firebase-Firestore as the database.

Reasons to choose Firestore :

- This web app consumes a huge amount of data. Implementing a local database is a disadvantage for the business organization. Firestore can store a huge amount of data, hence it was chosen as the database of the system.

- Firestore is hosted by one of the secured companies, Google. if in case of a security breach, if the database had been hosted in the local host, there would have been a higher chance for data thefts.
- Firestore is a No SQL database platform, which allows the owner to change the Database structure with minimum effort.
- Since the backend is handled by the Firestore what is required to do is to call the in-built functions and insert data to the function, which saves time in implementing the back-end.

[1]

Reasons to choose React JS:

From the Clients perspective:

- React JS is a trending and large community-based language, which is helpful for the client to modify the project without the help of the same developers in the future. [2]
- Many of the web application architectures developed have latency in loading and retrieving data, but React JS has overcome the issue maximizing and providing high responsiveness to the user. [3]

From the Developers perspective:

- React JS has a large number of in-built libraries which allows the developers to implement complicated functions with ease, such as Chart-js to plot graphs, Date-Differ to get the difference of a duration.
- React JS has a special feature where HTML syntaxes can be used within JavaScript syntaxes. Combining them allows the developers to implement the logic efficiently. [3]
- React JS uses a component-based architecture to implement the front end, which gives an advantage for the developers to separate the User Interfaces, then implement and modify them separately. [2]

Tools used:

- Visual Studio Code
- Github Bash (for integration)

- Firebase Database access (Browser aid)

2.4 Testing

2.4.1 Client Management

Test ID	Test Inputs	Expected Output	Actual Output	Result (Pass/Fail)	Description
CM01	Select project name which is not associated with selected client name when generating payment report.	The payment report is empty.	Expected Output	Pass	For a payment, its relevant client name and project name are recorded. Therefore, when the incorrect project name is recorded, there will be no information displayed.
CM02	Select project name without selecting client name when generating payment report.	The payment report is not generated. Instead, the standard log of payments is displayed.	Expected Output	Pass	The payment report has two filters. The client's name is followed by the project name. Therefore, when the client's name is not selected, all payments made are displayed as standard.

Table 2.2 Testing- Client management

2.4.2 Project Management

Test ID	Test Inputs	Expected Output	Actual Output	Result (Pass/Fail)	Description
PR01	Clicked on the 'Summary' button	Display all the expenditure on the current project	Expected Output	Pass	When the user wants to see the current running expenses on the project. It will display the client payments and all the other expenses
PR02	Click on the 'close project' button	A confirm dialog box will be popped asking for the confirmation	Confirmation message "Are you sure to close this project"	Pass	Whenever the user wants to close the project, it asks the user confirmation, if clicked cancel nothing happens

Table 2.3 Testing-Project management

2.4.3 Attendance Management

Test ID	Test Inputs	Expected Output	Actual Output	Result (Pass/Fail)	Description
AM01	Click the 'Mark as left' Button of a particular employee in employee attendance table. Before mark arriving.	The button is already disabled	Expected Output	Pass	Attendance marking is done through mark arriving time and mark leaving time. When the arriving time is not marked yet, the leaving marker should be disabled.

AM02	Click the 'Mark as arrived' button of a particular employee in employee attendance table.	<ul style="list-style-type: none"> • Pop up message is displayed saying 'Successfully updated'. • The 'marked as arrived' button is disabled. • The leaving marker & the unmarked arrival button is enabled 	Expected Output	Pass	When the "mark as arrived" button is clicked for a particular employee on the mark arriving page. The relevant messages are displayed, the leaving marker and unmark arrival button should be enabled. And the "mark as arrived" button itself should be disabled.
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Table 2.4 Testing-Attendance management

2.4.4 Salary Management

Test ID	Test Inputs	Expected Output	Actual Output	Result (Pass/Fail)	Description
SM01	Selecting Year=2021 Month =08	<ul style="list-style-type: none"> • 'Salary calculated' message is displayed. • Salary report for year 2021 month 08 is displayed with proper calculation 	Expected Output	Pass	Whenever the user selects an appropriate year (current working year) and month. The salary will be calculated for each employee
SM02	Selecting Year=2022 Month=01	<ul style="list-style-type: none"> • Alert displaying that: 'No attendance records are 	Expected Output	Pass	When the user selects an upcoming year there will be no

		available'			records since there is no attendance marked
SM03	Empty fields on the form	• Alert displaying that: 'Enter Year and Month'	Expected Output	Pass	If the user clicked on the 'Calculate Salary' button with empty fields, there will be no calculations performed unless the fields are selected.

Table 2.5 Testing-Salary management

2.4.5 Supplier Order Management

Test ID	Test Inputs	Expected Outputs	Actual outputs	Result (Pass/Fail)	Description
SO1	<u>Add new supplier with valid data</u> Supplier Category: Steel Company Name: SteelLanka Certification: ISO Contact No:0713467500 Email: stlLanka@gmail.com	Display Successful message which says that “Supplier added”	Expected output	Pass	If all required field are input with valid data, then when user clicked ‘Add Supplier’ button, data will be successfully added to database with proper successful message.
SO2	<u>Adding new supplier with existing company name with same category</u> Supplier Category: Cement Company Name: Helcium Certification: ISO Contact No: 0717898123 Email: helcin@gmail.com <i>(Assuming this company name with category is already exist)</i>	Display error message which showing “Company name is already exist within this category”	Expected output	Pass	When user added new supplier with same name and with same category which is already exist within the database, it will not allow to insert the record to database.
SO3	<u>Adding a new order</u> a) <u>Add order with quantity = 0</u>	Display error message showing “Quantity should be	Expected output	Pass	When user want to add new order, system will validate the inputs in quantity and full amount

	Supplier ID: T3oPUg2vT8WSf7Zu2Y5d Project Title: Trincomalee_Villa Status: Ongoing Unit: number Quantity:0 Order date:10/01/2021 Due date:10/16/2021 Advance Payment: 900 Full Amount:50000	greater than 0”			field and if invalid, display relevant error messages. <i>(Assuming other required fields are contained valid data)</i>
	b) <u>Add order with full amount= 0</u> Supplier ID: T3oPUg2vT8WSf7Zu2Y5d Project Title: Trincomalee_Villa Status: Ongoing Unit: number Quantity:700 Order date:10/01/2021 Due date:10/16/2021 Advance Payment: 900 Full Amount:0	Display error message showing “Invalid amount. Amount should be greater than 0.00”	Expected output	Pass	

Table 2.6 Testing-Supplier order management

2.4.6 Employee Management

Test ID	Test Inputs	Expected Outputs	Actual outputs	Result (Pass/Fail)	Description
EM1	Clicking the delete button in the row of single employee details	Pop up confirmation alert display mentioning “Do you want to delete the employee’s details?”	Expected output	Pass	When the delete confirmation alert pops up, if “YES” given employee’s details will be deleted. If “NO” is given no changes will occur.
EM2	After filling in the mandatory details of a new employee, clicking the Add Employee button.	The date of adding a new employee into the system should be displayed as “Start date”	Expected output	Pass	When adding the new employee into the system the data should not be entered as an input. Rather, it should be auto-updated, and display on the relevant employee’s start date column.

Table 2.7 Testing-Employee management

2.4.7 Sub-contractors Management

Test ID	Test Inputs	Expected Outputs	Actual outputs	Result (pass/fail)	Description
SBM1	Add new subcontractor with valid data	A dialog box will be popped saying “Added Successfully”	Expected output	Pass	Data will be added to the database at the click of the 'Submit' button and the Success message will appear only if only valid data is entered for all required fields.
SBM2	Clicked on the view button	Display all the assigned projects and the transaction details of projects.	Expected output	Pass	When the user wants to see the assigned projects and transaction details of a specific subcontractor. It will display all the assigned projects and the transaction details with the calculated total amount.

Table 2.8 Testing-Subcontractors management

3. Conclusion

The system intends to work as an information system for the business organization. As most of the stakeholders of the organization are not familiar with new technology, only the administrator of the system is given access to the information system. Archive the efficiency of the business procedures and improve the decision-making of the organization are the main goals of the proposed system. With the intended information system, the organization will be able to archive these two main goals. Had the organization continued with the manual system which had been there since the beginning, the business procedures would have been much complex, especially in a growing organization like 'Kurunduwatte Constructions'.

The proposed system, which is built based on the requirements of the business organization, has its limitations. For instance, only the system administrator is given access to implement the functions. The system acts more like an information system. But, this can be developed into a fully automated system, which can be accessed by clients, sub-contractors, suppliers, and employees. The following suggestions can be implemented to extend the functionality of the system to make it more efficient and valuable for the organization.

- ❖ Client access can be provided and the client profile can be updated with project feedback. The feedback can be a statement, photo, or video. It can help if a client is unable to see the project progress physically.
- ❖ As previously cooperated supplier details are available with the system, the system can be modified to update suppliers about new orders. Then the transaction can also be made online. To do that suppliers also should be given access to the system.
- ❖ Employees can be given access to the system to notify about their leaving and half-days. It would be beneficial to the employees. Based on the administrator's response, the attendance can be marked for the particular employee.
- ❖ Sub-contractors can also be given access to the system to update the organization about the progress of the sub-project. It would be helpful to the organization to keep their eye on the project progress and evaluate them.

4. References

- [1] J. Fijałkowski, "LeanCode," 02 12 2020. [Online]. Available: <https://leancode.co/blog/why-firestore-6-things-you-need-to-know-before-using-firestore>.
- [2] J. Mistry, "Monocubed," 04 06 2021. [Online]. Available: <https://www.monocubed.com/why-use-react/>.
- [3] N. Pandit, "c-sharpcorner," 10 02 2021. [Online]. Available: <https://www.c-sharpcorner.com/article/what-and-why-reactjs/>.

5. Appendix A : Design Diagrams

The following sketches are utilized to develop the user interfaces in the system.

Home page:

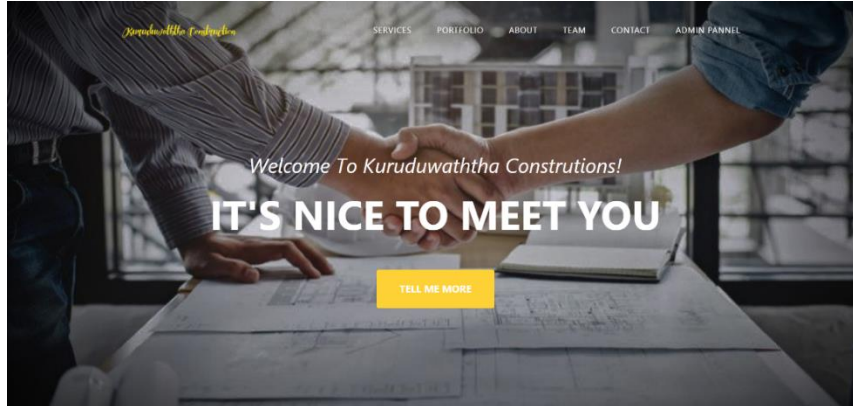


Figure 5.1 Home page

Client manager:

Kuruduwaththa Constructions

SERVICES PORTFOLIO ABOUT TEAM CONTACT ADMIN PANEL

Add New Client

Client ID	Client Name	Representative Name	Client's/ Representative's	Client's/ Representative's Email Address	Client's Physical Address	Actions
7zdlrB1JfaWyXJrpjKW0	Koch and Sons	Janice Monahan	+94 77 21 234 5432	Janice_Monahan@yahoo.com	Port Beulah, Iowa 90719, United States of America	Edit Delete
pRGM1skX6BEnNhfqf79h	Steuber LLC	Rollin Fadel	+94 77 21 234 5432	Rollin_Fadel@gmail.com	Lake Matilde, Tennessee 74062, United States of	Edit Delete
wygOIO4UTgHjYLBs1ZGY	Konopelski Group	Lera Stroman	+94 77 11 498 1398	Lera_Stroman3@gmail.com	Vicentaview, Mississippi 47576-9639, United States of	Edit Delete
kl1pNwJAKBqZHJGbhTRS	Lucky Roo	Ben Beckman	+94 77 42 042 0420	b.beckman@gmail.com	711-2880 Nulla St. Mankato Mississippi 96522	Edit Delete

Add New Payment

Payment ID	Client ID	Project ID	Payment Date	Payment Amount	Actions
3m7D2DRvA0S25dGmElkj	7zdlrB1JfaWyXJrpjKW0	9z4vVCFd0nCsFH9UGjIt	2021-4-5	200000	Edit Delete
eZgsbvDaE6ippFKqsO8n	pRGM1skX6BEnNhfqf79h	Dxt7G35mZjDWNBSHULq	2021-6-7	300000	Edit Delete
iNWuoFUZOpnXBga3cjgo	wygOIO4UTgHjYLBs1ZGY	iMW8VG0zHktmAsxNp4v	2021-4-3	250000	Edit Delete
eZgsbvDaE6ippFKqsO8n	kl1pNwJAKBqZHJGbhTRS	Z4xMmUTdzYeRKpG3Rldc	2021-7-8	350000	Edit Delete

kl1pNwJAKBqZHJGbhTRS

Generate Report

Client Name: Koch and Sons

2021-1-1 :- 100000

2021-2-3 :- 200000

2021-3-7 :- 450000

2021-4-4 :- 325000

2021-7-8 :- 350000

Figure 5.2 Client manager main dashboard

The image shows two side-by-side screenshots of a web application interface for 'Kurundawaththa Constructions'. The left screenshot is titled 'Add New Client' and features a form with five input fields: 'Client Name', 'Representative Name', 'Client's Representative's Phone Number', 'Client's Representative's Email Address', and 'Client's Physical Address'. A 'Back' button is in the top left, and a 'Submit' button is in the bottom right. The right screenshot is titled 'Edit Client' and shows the same form with pre-filled data: 'Lucky Rao' for Client Name, 'Ben Beckman' for Representative Name, '+94 42 942 0420' for Phone Number, 'b.beckman@gmail.com' for Email Address, and '711, 2889 Nulka St, Marikato Attisipppp 96022' for Physical Address. It also includes 'Back' and 'Submit' buttons.

Figure 5.3 Client manager add new client and edit client

The image shows two side-by-side screenshots of the same web application interface. The left screenshot is titled 'Add New Payment' and features a form with four input fields: 'Client ID' (a dropdown menu), 'Project ID' (a dropdown menu), 'Payment Date' (a date picker showing '25 July 2021'), and 'Payment Amount' (a text field). A 'Back' button is in the top left, and a 'Submit' button is in the bottom right. The right screenshot is titled 'Edit Payment' and shows the same form with pre-filled data: 'kUpHwJMBqZnJ0xHTR5' for Client ID, 'Zis6MemUtdreRKpGJ8Rdc' for Project ID, '25 July 2021' for Payment Date, and '1000000' for Payment Amount. It also includes 'Back' and 'Submit' buttons.

Figure 5.4 Client manager-add new payment and edit payment

Project manager:

The screenshot shows a web application interface for a project manager. At the top, there is a navigation bar with the logo 'Kandamallu' and three tabs: 'Home', 'Ongoing Projects', and 'Completed Projects'. Below the navigation bar is a search bar and a blue button labeled 'Add New Project'. The main content area displays two project cards. The first card is titled 'Katugasthota_TireShop' and contains the text 'Mr. Branwile Perera', 'Two story bulding near Katugasthota Main road', 'Duration:XXX', and an orange 'More' button. The second card is titled 'Asgiriya_House' and contains the text 'Ms. Wasanthi Lokugaye', 'Single floor with 4 bedrooms and Large Living area...', 'Duration:XXX', and an orange 'More' button. At the bottom of the page, there is a pagination control with buttons for '«', '1', '2', '3', '4', '5', and '»'.

Figure 5.5 Project manager main dashboard

The screenshot shows a web application interface for adding or updating a project. At the top, there is a navigation bar with the logo 'Kandamallu' and three tabs: 'Home', 'Ongoing Projects', and 'Completed Projects'. Below the navigation bar is a blue button labeled 'Add New Project'. The main content area contains a form titled 'Project Submission/ Update'. The form has the following fields: 'Project Name' (text input), 'Estimated Budget' (text input), 'Start' (date picker set to '12 May 2016'), 'End' (date picker set to '12 May 2017'), 'Client Name' (dropdown menu), and 'Project Address' (text input with a small icon). At the bottom of the form is an orange 'Submit' button.

Figure 5.6 Project manager add and update

CMS

Home Ongoing Projects Completed Projects

Project Name: [] Duration: [] Update

Image

Client Name: xxxx Client Phone: 081*****

Estimated Budget: \$\$\$\$\$ Current Paid: \$\$\$\$\$

Employee Project Manager: XXXXX
Supervisor: XXXX

Sub Contractors

Contractor Name: XXXXX Contractor Name: XXXXX
Price: XXXX Price: XXXX
Status: Completed Status: Ongoing

Suppliers

Company Name: XXXXX Quantity: XXXXX
Price: XXXX Status: Ongoing

Summary Close Project

Figure 5.7 Project Details

CMS

Home Ongoing Projects Completed Projects

Summary

Project Name: XxxXxxxxX
Date: XX/XX/XX
Client Name: XXXXX
Client Phone: 0*****
Duration: 11 months
Budget: \$ 00
Current Payment: \$ 00
Total Amount for Employee: \$ 00
Total Amount For Supplies: \$ 00
Total Amount for Sub Contracts: \$ 00
Total Remaining Amount: \$ 00

Done

Figure 5.8 Project manager Report

CMS

Home Ongoing Projects Completed Projects

Search

KandyTown_Restaurant

Mr. William Brasky
Family Restaurant near Dialog main branch

Details

Villa_Theldeniya

Mr. George Fonsy
Situated near town of Theldeniya

Details

« 1 2 3 4 5 »

Figure 5.9 Project manager Completed projects

Supplier manager:

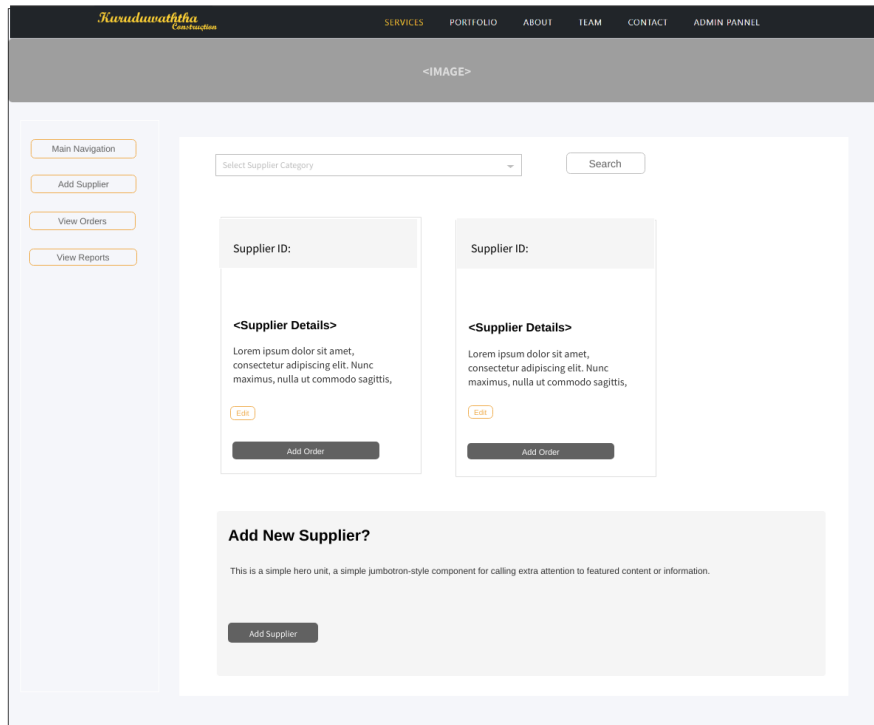


Figure 5.10 Supplier manager main dashboard

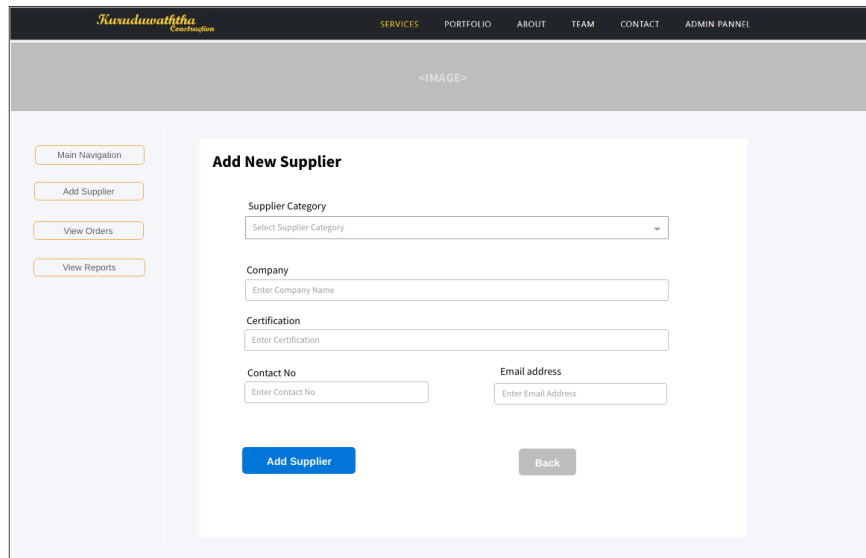


Figure 5.11 Supplier manager -add new supplier

Kuruduwaththa Construction SERVICES PORTFOLIO ABOUT TEAM CONTACT ADMIN PANNEL

<IMAGE>

Main Navigation
Add Supplier
View Orders
View Reports

Supplier ID : <id>

Supplier Category
Select Supplier Category

Company
Enter Company Name

Certification
Enter Certification

Contact No
Enter Contact No

Email address
Enter Email Address

Update Delete Back

Figure 5.12 Supplier manager- update supplier

Kuruduwaththa Construction SERVICES PORTFOLIO ABOUT TEAM CONTACT ADMIN PANNEL

<IMAGE>

Main Navigation
Add Supplier
View Orders
View Reports

Add New Order

Supplier
Supplier ID (read only)

Project
Select Project ID

Order Status
Select Order Status

Category
Select Category

Quantity
Enter Quantity

Ordered Date
12 May 2016

Due Date
12 May 2016

Advanced Payment
Rs.0.00

Full Amount
Rs.0.00

Add Order Back

Figure 5.13 Supplier manager-add new order

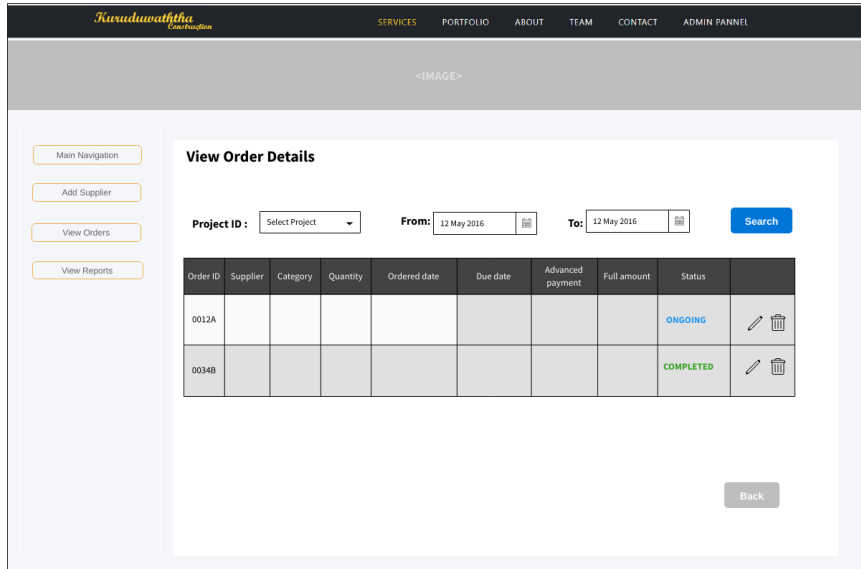


Figure 5.14 Supplier manager- order details

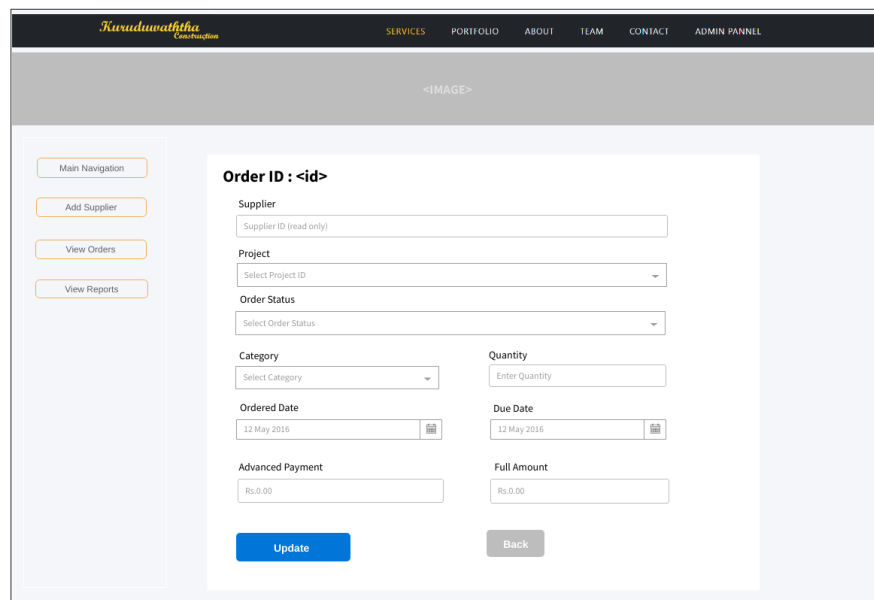


Figure 5.15 Supplier manager-update orders

Kuruduwaththa Construction

SERVICES PORTFOLIO ABOUT TEAM CONTACT ADMIN PANNEL

<IMAGE>

Main Navigation

Add Supplier

View Orders

View Reports

Transaction Report

Project ID: From: To:

Kuruduwaththa Construction	Project ID: <ID>	From: <Date>	To: <Date>
Completed Orders			
<Order details>			Total paid amount: <input type="text"/>
Ongoing Orders			
<Order details>			Total amount to be paid: <input type="text"/>

Figure 5.16 Supplier manager-transaction report

Attendance manager:

Kuruduwaththa Construction

SERVICES PORTFOLIO ABOUT TEAM CONTACT ADMIN PANNEL

Attendance manager

mark arriving attendance for today

mark leaving attendance for today

mark as a Holliday

finalize day

daily attendance report

clear old data

Figure 5.17 Attendance manager main dashboard

SERVICESPORTFOLIOABOUTTEAMCONTACTADMIN PANNEL

Mark Arriving Time

Date: 2021/21/22
Time: 08:00 PM

<div> ID:1000002 Name: Kasuni Dananjana Position: Kasuni Dananjana </div>	<div>mark as Arrived</div> <div>unmark</div> <div>more>></div>
<div> ID:1000003 Name: Kasuni Dananjana Position: Kasuni Dananjana </div>	<div>mark as Arrived</div> <div>unmark</div> <div>more>></div>
<div> ID:1000004 Name: Kasuni Dananjana Position: Kasuni Dananjana </div>	<div>mark as Arrived</div> <div>unmark</div> <div>more>></div>
<div> ID:1000005 Name: Kasuni Dananjana Position: Kasuni Dananjana </div>	<div>mark as Arrived</div> <div>unmark</div> <div>more>></div>

Figure 5.18 Attendance manager- mark arriving time

SERVICESPORTFOLIOABOUTTEAMCONTACTADMIN PANNEL

Mark Leaving Time

Date: 2021/21/22
Time: 04:00 PM

<div> ID:1000002 Name: Kasuni Dananjana Position: Kasuni Dananjana </div>	<div>mark as left</div> <div>unmark</div> <div>more>></div>
<div> ID:1000003 Name: Kasuni Dananjana Position: Kasuni Dananjana </div>	<div>mark as left</div> <div>unmark</div> <div>more>></div>
<div> ID:1000004 Name: Kasuni Dananjana Position: Kasuni Dananjana </div>	<div>mark as left</div> <div>unmark</div> <div>more>></div>
<div> ID:1000005 Name: Kasuni Dananjana Position: Kasuni Dananjana </div>	<div>still haven't arrived</div> <div>mark as left</div> <div>unmark</div> <div>more>></div>

Figure 5.19 Attendance manager- mark leaving time

Karuduwaththa
Construction

SERVICESPORTFOLIOABOUTTEAMCONTACTADMIN PANNEL

Edit attendance

Employee ID:100002
Name: kasuni Dananjana
Position: junior engineer

Arrived At :

left At :

Day Type :

Figure 5.20 Attendance manager-edit attendance

Karuduwaththa
Construction

SERVICESPORTFOLIOABOUTTEAMCONTACTADMIN PANNEL

clear old attendance details

this is a critical section!
you will lose all the attendance data the before the
date you select

please enter admin password for confirm

Figure 5.21 Attendance manager-clear old attendance details

attendance sheet 2021 May

Employee ID:100002
Name: kasuni Dananjana
Position: junior engineer

2021

May

Total Leaves	Total Half Days	Total working days
3	3	25

Date	Arrive At	Left At	Day Type	150px	
1	08:00 AM	05:00 PM	full day		Edit
2	08:00 AM	12:00 PM	half day		Edit
3			Leave		Edit
4			HOLLDAY		Edit
5	08:00 AM	05:00 PM	full day		Edit
6	08:00 AM	12:00 PM	half day		Edit
7			Leave		Edit

Figure 5.22 Attendance manager-monthly attendance report

Today attendance report

21 June 2021

Today attendance of company

working Now 61	On Half Day 3	On leave 10
-------------------	------------------	----------------

Today attendance for project 5

project 5

working Now 31	On leave 5
-------------------	---------------

Employees working now in Project 3

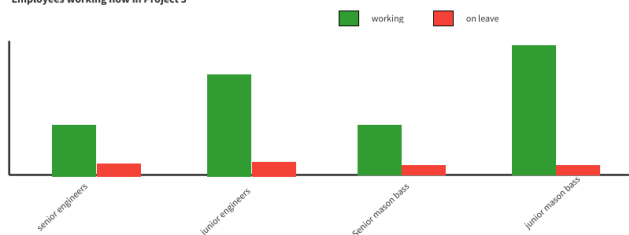


Figure 5.23 Attendance manager-daily attendance report

Subcontractor manager:

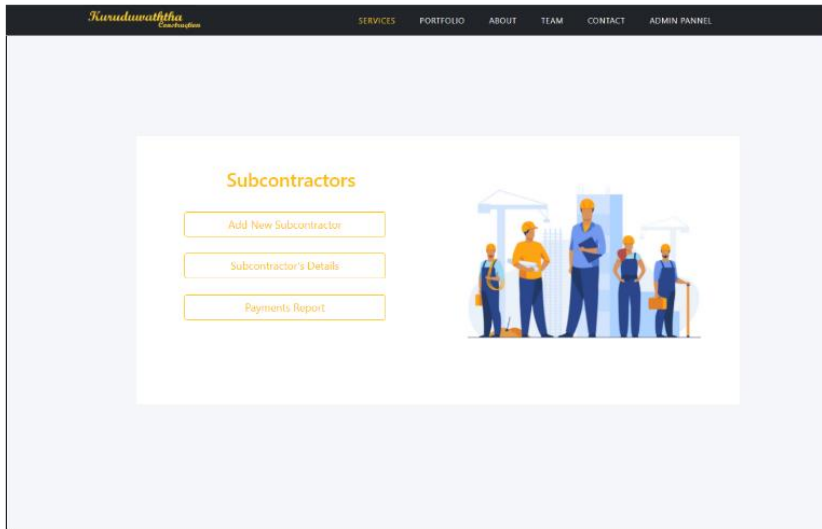


Figure 5.24 Subcontractor manager main dashboard

The 'Add New Subcontractor' form. It has a dark blue header with the logo and navigation links. The main content area has a light blue background with a central white box titled 'Add New Subcontractor'. Inside this box are several input fields: 'Company Name' (text), 'Select Type' (dropdown), 'Email' (text), 'Phone Number' (text), and 'Joining Date' (calendar). Below these fields is an orange 'ADD' button. To the right of the form is an illustration of five construction workers in blue and yellow uniforms standing in front of a building.

Figure 5.26 Subcontractor manager-add new subcontractor

The 'Edit Details' form. It has a dark blue header with the logo and navigation links. The main content area has a light blue background with a central white box titled 'Edit Details'. Inside this box are several input fields: 'Company Name' (text), 'Select Type' (dropdown), 'Email' (text), 'Phone Number' (text), and 'Joining Date' (calendar). Below these fields is an orange 'EDIT' button. To the right of the form is an illustration of five construction workers in blue and yellow uniforms standing in front of a building.

Figure 5.25 Subcontractor manager-edit details

The 'Subcontractors' Details' page. It has a dark blue header with the logo and navigation links. The main content area has a light blue background with a central white box titled 'Subcontractors' Details'. Inside this box are five sections, each for a different profession: Carpenters, Painters, Electricians, Tilers, and Plumbers. Each section contains a table with columns: Company Name, Email, Phone Number, Joined Date, and Assigned Projects. Below each table are 'Edit' and 'Delete' buttons.

Carpenters				
Company Name	Email	Phone Number	Joined Date	Assigned Projects
				Edit Delete

Painters				
Company Name	Email	Phone Number	Joined Date	Assigned Projects
				Edit Delete

Electricians				
Company Name	Email	Phone Number	Joined Date	Assigned Projects
				Edit Delete

Tilers				
Company Name	Email	Phone Number	Joined Date	Assigned Projects
				Edit Delete

Plumbers				
Company Name	Email	Phone Number	Joined Date	Assigned Projects
				Edit Delete

Figure 5.27 Subcontractor manager-subcontractor details

Transaction Reports

Search.....

Company Name	Type	
Kevilton	Electrician	View
Stone	Plumber	View
TS Tiles	Tiler	View
Colour Lab	Painter	View

Figure 5.29 Subcontractor manager-Report list

Kevilton

Project	Advance Amount	First Phase Paid Amount	Second Phase Paid Amount	Total Amount
Kandy ShoppingCenter	90000	30000	50000	170000
Kandy Mall	100000	150000	150000	400000

Figure 5.28 Subcontractor manager-Transaction report for a specific contractor

Employee manager:

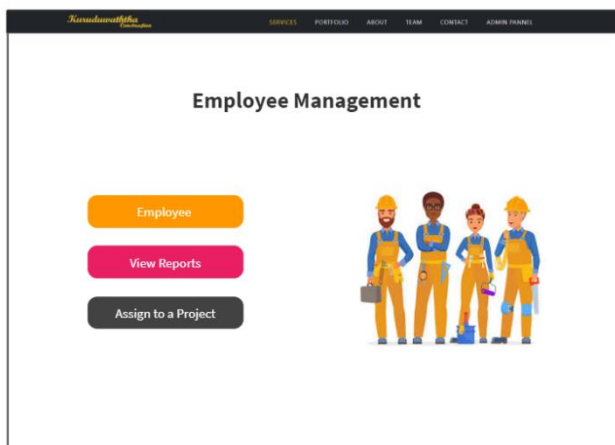


Figure 5.31 Employee manager main dashboard

Employee details

Search Employee

+ Add Permanent Employee

E_ID	Name	Address	Phone	email	Designation	ETP Amount	
0001	Amel Perera	5 Ampitiya	0715246583	amel@gmail.com	Supervisor	2500.00	View Edit Delete
0001	Kalun Perera	5 Ampitiya	0715246583	amel@gmail.com	Supervisor	2500.00	View Edit Delete
0001	Lakmal Perera	5 Ampitiya	0715246583	amel@gmail.com	Supervisor	2500.00	View Edit Delete
0001	Amel Perera	5 Ampitiya	0715246583	amel@gmail.com	Supervisor	2500.00	View Edit Delete
0001	Amel Perera	5 Ampitiya	0715246583	amel@gmail.com	Supervisor	2500.00	View Edit Delete

Figure 5.30 Employee manager-employee details

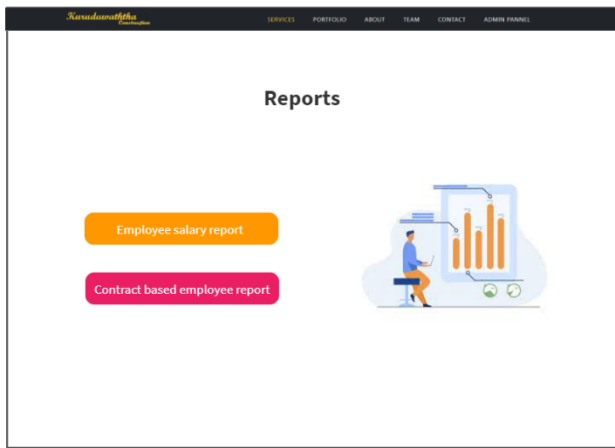


Figure 5.32 Employee manager Report dashboard

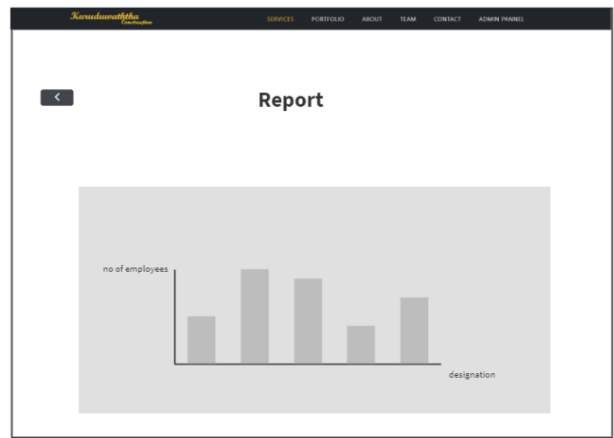


Figure 5.33 Employee manager Report

Figure 5.34 Employee manager - assign a project

Figure 5.35 Employee manager-add employee

Figure 5.36 Employee manager-employee profile

Designation and salary manager:

Employee Designations

Designation	Basic_Salary	Description
Contracted Labor	1000	Permanent employees of the co...
Non-contracted Labor	750	Temporarily hired employees
Supervisor	1500	Temporarily hired employees

Add designation +

Figure 5.37 Designation manager main dashboard

Edit Designation

Designation Name: direct labor

Basic Salary: 1000

Description: permanent employees

Update

Figure 5.38 Designation manager-edit designation

Monthly salary report for 2021.08.02 - 2021.09.02

Employee_Name	Designation	Basic_Salary	Preset_Full_Days	Present_Half_Days	Total_Salary	ETF_Amount	Salary_To_Be_Paid
udith Dedunupitiya	direct Labor	1000	10	5	15000	750	14250
Nisal Gamage	direct labor	1000	20	2	21000	1050	19950
Ihshan Mahmood	supervisor	1500	10	0	15000	750	14250

Total amount: 51000.00

Total ETF amount for month: 2550.00

Total amount to be paid: 48450.00

Figure 5.39 Employee salary report

6. Appendix B: Selected Code Listings

Calculation of employee monthly salaries for a particular month including their ETF amounts. EFT amount is calculated only for contracted employees.

```
async function CalculateSalary(e){
    e.preventDefault();
    //if the month and year is not entered, function not gonna execute.
    if(month==" " || year==""){
        alert("enter year and month");
    }
    else{
        //taking all the employee details to the 'employee' array
        db.collection("employees").onSnapshot((querySnapshot)-->{
            const array = querySnapshot.docs.map((doc)-->({
                data : doc.data(),
                key : doc.id,
            }));
            //run the for loop for each employee
            for(let i=0;i<array.length;i++){
                //filtering the number of worked days of the employee
                db.collection("attendance").where("employeeId","==",array[i].key).where("year","==",year).where("month","==",month).where("dayStatus","==","worked").onSnapshot(async (querySnapshot)-->{
                    const array2=querySnapshot.docs.map((doc)-->({
                        data : doc.data(),
                        key : doc.id
                    }));
                    //if the attendance record is empty, reload the page. the function is not going to execute further.
                    if(array2.length==0){
                        alert("No attendance records available for selected month");
                        window.location.replace("/admin/panel/employeemanager/employeetotal");
                    }
                    //taking the length of the 'array2'
                    let total=array2.length;
                    console.log("total of ",array[i].key," is ",total);
                    //filtering the basic salary of the designation of the employee
                    await db.collection("designation").where("designation","==", array[i].data.designation).onSnapshot((querySnapshot)-->{
                        const array3 = querySnapshot.docs.map((doc)-->({
                            //key : doc.id
                            let work_days=total;
                            let basic_salary=doc.data().basicSalary;
                            let amount= total*doc.data().basicSalary;
                            console.log("amount",amount);
                            let ETF_amount=0;
                            let employee_name=array[i].data.employeeName;
                            //only for the contracted employees, ETF amount is calculated
                            if(doc.data().status=="contracted"){
                                ETF_amount=amount*1/100;
                                console.log("ETF calculated for ",employee_name);
                            }
                            const salaryRecord = {
                                year,
                                month,
                                employee_name,
                                work_days,
                                basic_salary,
                                amount,
                                ETF_amount,
                            }
                            //sending the record to the database
                            db.collection("salary").add(salaryRecord).then(()-->{
                                console.log("record added for",array[i].key)
                            }).catch((err)-->{
                                alert(err.message);
                            });
                        }));
                    }
                }
            },alert("Salary Calculated"))
        }
    }
}
```

Figure 6.1 Calculation of employee monthly salaries code

Retrieve data to an array to print monthly attendance report. When the report is generated, sometimes there are no attendance data available for each day of the month in the database. Hence, this array identifies the month and the total days that month should have, and then it fills the array for all the days including the days for which no attendance data is available.

```

function fillTheArray(arr){
    setAttendanceList2([]);
    var ds=days(parseInt(month),parseInt(year))
    console.log("no of days",ds);
    var pd =0;
    var newarr =[];
    for(let i =0; i<arr.length; i++){
        let myArr = arr[i].date.split("-");
        let d = parseInt(myArr[2]);

        if(d>(pd+1)){
            newarr.push({
                ID:'null',
                date:myArr[0]+"-"+myArr[1]+"-"+("0" + (pd+1)).substr(-2),
                arriveAt:'null',
                leftAt:'null',
                dayStatus:'null',
                ProjectTitle:'null',
            });
            i--;
        }else{
            newarr.push(arr[i]);
        }
        pd++;

        if(d==ds){
            break;
        }
    }
    console.log("pd>>",pd);
    while(pd<ds){
        newarr.push({
            ID:'null',
            date:year+"-"+month+"-"+("0" + (pd+1)).substr(-2),
            arriveAt:'null',
            leftAt:'null',
            dayStatus:'null',
            ProjectTitle:'null',
        });
        pd++;
    }
    console.log("new array in function after make",newarr, "arr",arr);
    return newarr;
}

```

Figure 6.2 Retrieve data to an array to print monthly attendance report code

Supplier's, subcontracts, and employee salary expense and client's payments made to a particular project is calculated using the following code segment.

```

//calculating of subcontracts payments
function sum(advance,first,second,full){
  let x=advance+first+second;
  let tot=0;

  //checks whether amount paid exceeds the budget
  if(x>full){
    tot=x;
  }else{
    tot=advance+first;
  }
  Subamt=tot;

  return tot;
}

//Suppliers total amount calculation
function getSupAmount(){

  let suptot=0;
  sup.map(nst =>{
    suptot=suptot+amt.data.fullAmount
  })
  return suptot;
}

//Client payments calculation
function getPay(){

  let payment=0;
  pay.map(dl =>{
    payment=at.data.amount+payment
  })

  return payment;
}

```

```

//get salary and get the amount
function getEmpSalary(name){
  let employee="";
  let currentsal=0;
  client.collection("Emp_Project").where("Project","==",name).get().then((item) => {
    item.docs.map((doc) => { doc.data().Employee,
      console.log("Employee Data" ,doc.data().Employee),

      client.collection("Salary").where("employee_name","==",doc.data().Employee).get().then((item) => {
        item.docs.map((doc) => { doc.data().amount,
          console.log("Employee Retrieved Amount" ,doc.data().amount),
          calSalary(doc.data().amount),
          console.log("Salary Add Amount" ,currentsal)
        })
      })
    })
  }).catch(async(error) => {
    console.log("Error getting documents: ", error);
  })
}

```

Figure 6.3 Supplier's, subcontracts, and employee salary expense and client's payments made to a particular project calculation code