19CSE204

Construction Company Management System

PROJECT REPORT

Contributors:

Amal Vinod (AM.EN.U4CSE20206)
Anagha Manoj (AM.EN.U4CSE20207)
Anjana Suresh (AM.EN.U4CSE20209)
Emeric C Alex (AM.EN.U4CSE20223)

CSE department
Amrita university
December 2021

ABSTRACT

Construction project cost is the key problem in the control and management of construction projects. For the existing cost system can not adapt to the development of the construction industry information needs of the status, this project based on the use case model technology to the construction cost system function demand analysis provides support for the system development. The research content is based on the construction cost structure, and design the use case model of construction cost system, design the construction project cost system function frame. The core function of the system is composed of “ Template information management, Supplier information management, Cost model management, Project cost management, Cost control management, System maintenance management" six modules, each of which contains a number of submodules.

INDEX

CHAPTER 1

Introduction

The idea of the project is to develop a construction management system that focuses on some modules of management of construction which allows the users to maintain the record of customers, builders, retailers and also allows doing the manual operation in an automated form. This project has been developed using java swings as the front end and Postgres server as the backend. Security is an important aspect of the project and is maintained using a username and password which is unique for each user or superuser, who can only log in by using the correct username and password assigned to them.

Client (CCMS) requirements:

The company constructs houses/offices for its customers. A customer can have multiple sites and he may wish to build multiple projects on different sites. Before starting a project the supervisor verifies the customer's site and approves the project. The company is divided into groups and each of these groups manages a particular type of project (commercial, residential). These project groups are headed by the manager who tracks the builder performance, project status and also allocates the projects to builders. The supervisor supervises the builders and their project progress, He also plays a major role in allocating the raw materials and subcontracts to the projects as and when required. The raw materials required for the projects are supplied by the retailers. The supervisor identifies the requirements(raw materials) for a project and proposes his statement accordingly, the accepting authority places the order with the retailer who has a good rating and whose materials are cost-effective. The accepting authority also takes care of the subcontracts required by the project. The builder updates his progress daily, this work is supervised by both the manager and supervisor. The manager and the supervisor keep the customer informed about the progress of his project.

Functional Requirements of the System

Project management

- Create a well-planned bid management process
- Examine your construction methodology
- Use software to execute your construction management plan

Cost management

- Plan budget by analyzing project scope and constantly monitoring expenses
- Use cost estimating tools that integrate with cost data books to create accurate estimates

Time management

- Use tools like Gantt chart to create project schedules
- Manage priorities by creating a risk management plan

Quality management

- Draft a quality standards program for your organization
- Ensure adherence to the program by using quality control measures

Contract administration

- Create a contract administrator role, who will manage the company's contracts and devise a communication plan
- Use contract management software to facilitate the contract administration process

Safety management

- Identify safety hazards on construction sites and improve awareness among employees
- Uses tools like BIM, drones, and wearable to improve job site safety.

Hardware Requirements:

- Intel Core i3 or equivalent
- 1 GB DDR3 RAM
- 100 MB HDD space

Software Requirements:

- Windows/ macOS/ Linux operating system.
- JRE and JDK.
- Postgres server

Use cases

- Login
- Project
- Builder Details
- Retailer Details
- Logout

ACTORS

1. Customer
2. Retailer
3. Manager
4. Supervisor
5. Builder
6. Accepting Authority
7. Admin

DATA

SerialNo	Use Case	Primary Actors	Description
1	Customer Login	Customer	Login to his account. If the credentials of the customer turn out to be incorrect then an error message is displayed in return otherwise he successfully logs in to his account.
2	Track Project Status	Customer	It shows the customer how far his projects have reached. That is the status of his projects.
3	Enter Site Information	Customer	The customer can enter the details of the new site which he wants to give to the company for construction. Now, these details are verified by the supervisor and if they are not authentic then it will lead to contract cancellation.
4	Customer	New Customer	Since a new customer will not have an

	Registration		account, he needs to create one.
5	Retailer Login	Retailer	Login to his account. If the credentials of the retailer turn out to be incorrect then an error message is displayed in return otherwise he successfully logs in to his account.
6	Enter new material details	Retailer	If a retailer has a new set of materials that can be used in construction then he can enter it and these details will be added to the database.
7	Order Reminder	Retailer	A Retailer will be informed if he is assigned to an order and he can ship that order to the respective site.
8	Retailer Registra tion	New Retailer	Since a new Retailer will not have an account he needs to create one.
9	Manager Login	Manager	Login to his account. If the credentials of the Manager turn out to be incorrect then an error message is displayed in return otherwise he successfully logs in to his account.
10	Project Allotment	Manager	The manager has the authority to assign the project type and all other details about the project once the site verification is completed successfully.
11	Builder Project	Manager	The manager has the authority to assign a particular project to a

	Allotment		builder.
12	Track Builder Performance	Manager	The manager tracks the performance and efficiency of the builder and if he performs well then the manager can give him a salary boost.
13	Supervisor Login	Supervisor	Login to his account. If the credentials of the Supervisor turn out to be incorrect then an error message is displayed in return otherwise he successfully logs in to his account.
14	Allocating Raw materials	Supervisor	A supervisor decides what all raw materials are needed for the construction of a particular project and depending on that he will create a list containing all raw materials.
15	Allocating Sub Contracts	Supervisor	A supervisor also decides what all requirements should be procured as subcontracts like any machinery, equipment, etc.
16	Builder Login	Builder	Login to his account. If the credentials of the Builder turn out to be incorrect then an error message is displayed in return

			otherwise, he successfully logs in to his account.
17	Update Project Status	Builder	A builder daily updates all tasks he has achieved on that day related to a particular project.

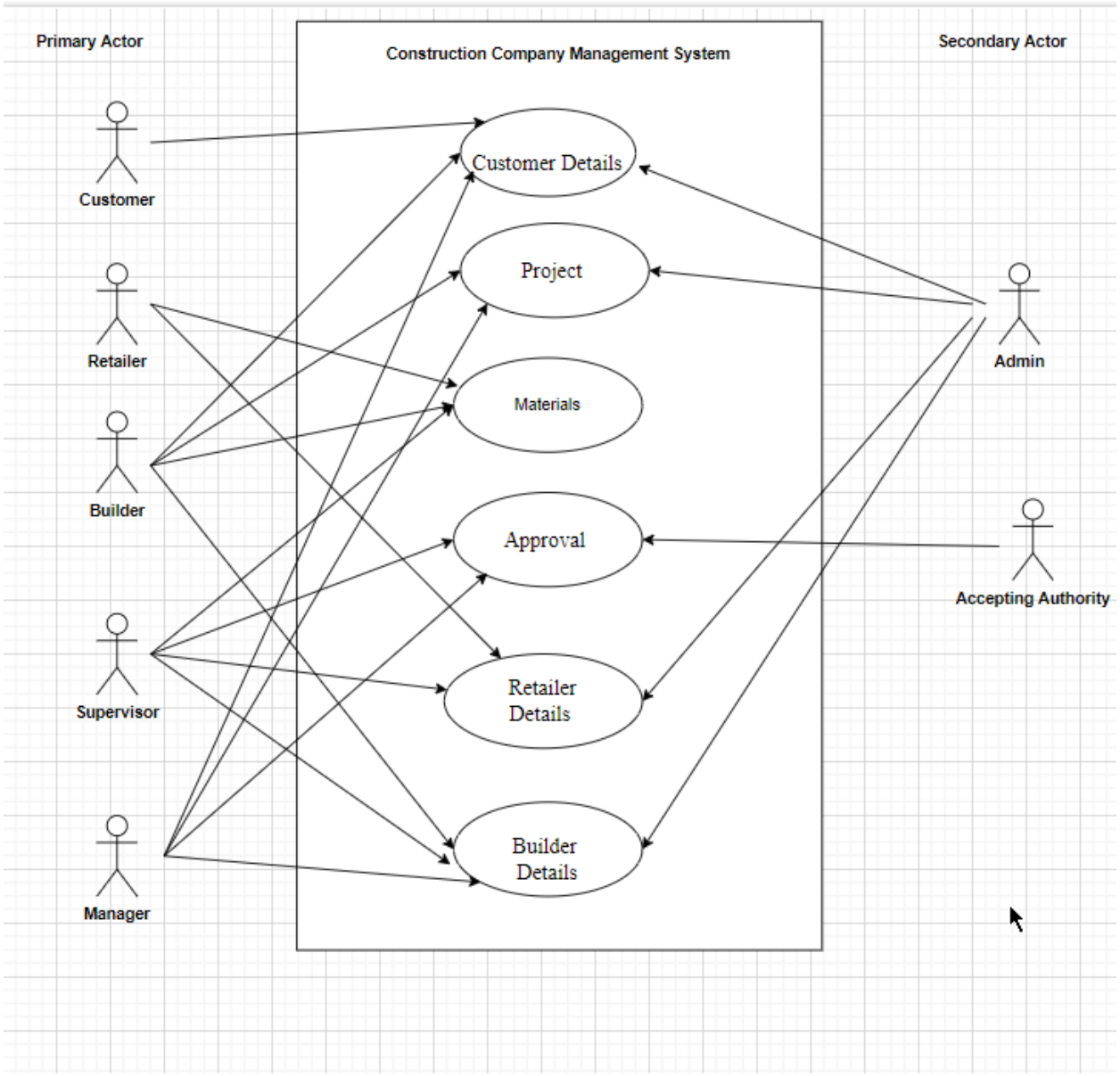
Serial No	Use case	Secondary Actors	Description
1	Verify Site Info	Supervisor	A supervisor verifies the site information and updates his response in the system.
2	Order Approval	Accepting Authority	An Accepting Authority places the order of raw materials to a particular retailer depending on the retailer rating, price, etc. And finally approves it.
3	Sub Contract Approval	Accepting Authority	An Accepting Authority selects a subcontractor based on the requirements.
4	Modify Builder Details	Admin	An admin has the job of keeping the database consistent and up to date so he has the authority to remove those builders who left the company.
5	Modify Retailer Details	Admin	He also has the authority to remove all the retailers who stopped supplying raw materials to the company.

CHAPTER 2

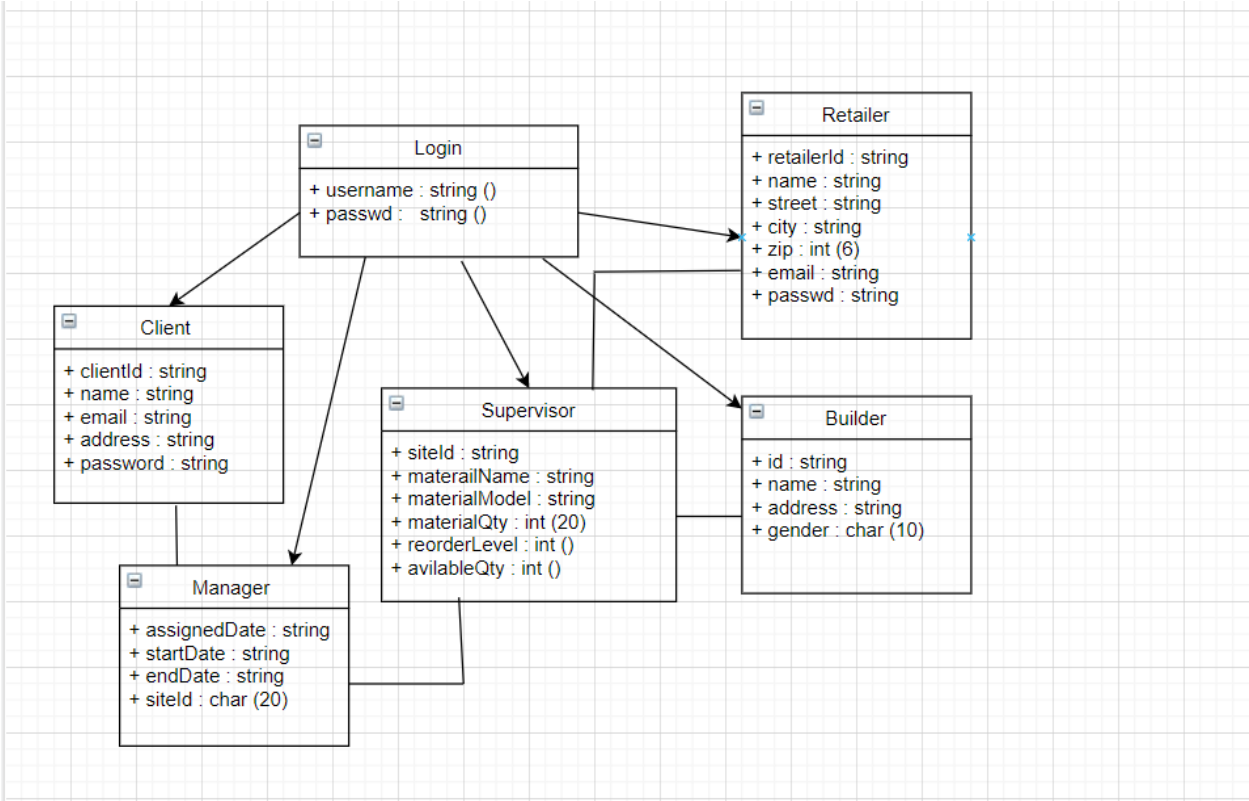
System Design

A use case diagram is used to represent the dynamic behavior of a system. It encapsulates the system's functionality by incorporating use cases, actors, and their relationships. It models the tasks, services, and functions required by a system/subsystem of an application. It depicts the high-level functionality of a system and also tells how the user handles a system.

USE CASE DIAGRAM



CLASS DIAGRAM



Tools Used:

- Microsoft Visual Studio Code (Code Editor)
- VS Code
- Eclipse 2021 -09
- IntelliJ IDEA 2021 (JAVA IDE)
- Java Swings
- Git
- PostgreSQL (Backend)

Database Details

Client(id,fname,lname,street_name,city,state,zip_code,passcode)

Builder(id,job_description,fname,lname,street_name,city,state,zip_code,gender,salary,supervisior_id,email,phone,passcode)

Retailer(id,name,Street_name,city,state,Zip_code,email,passcode,service_rating,

Retailer_material)

Groups (number , name , category, manager_id, Builder_id)

Project (number, name, assigned_date,start_date, end_date,tenure, group_number,completion_status)

Site (id, street_name, street_name, city, state,

zip_code, site_area, soil_type, project_no.)

Raw_materials (Retailer_id,site_id, material_name,material_model, reorder_level,

available_quantity)

OOPS CONCEPT USED IN THIS PROJECT:

We have used the oops concept like :

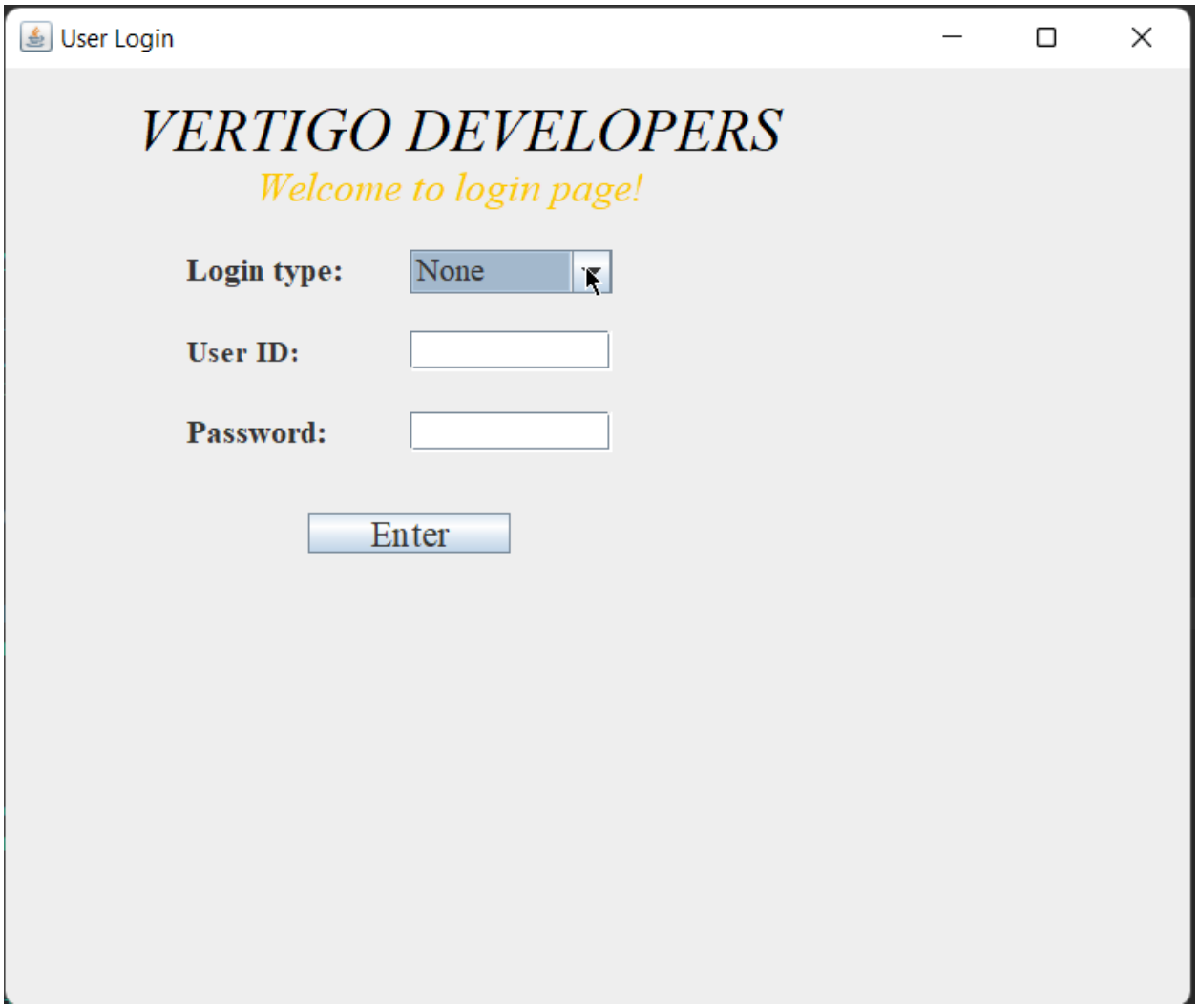
- Polymorphism
- Abstraction
- Inheritance
- Encapsulation.

CHAPTER 3

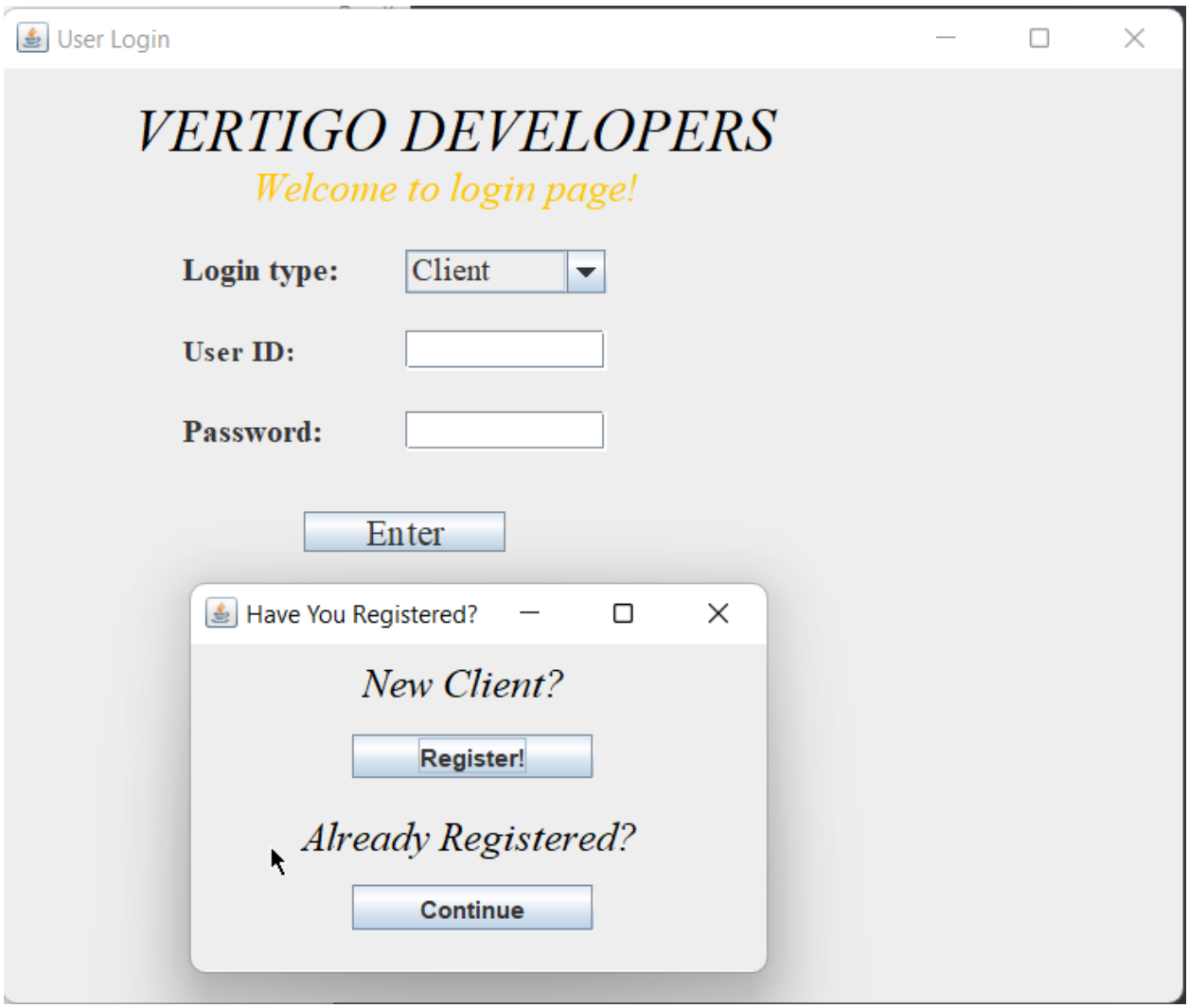
USER INTERFACE

Homepage:

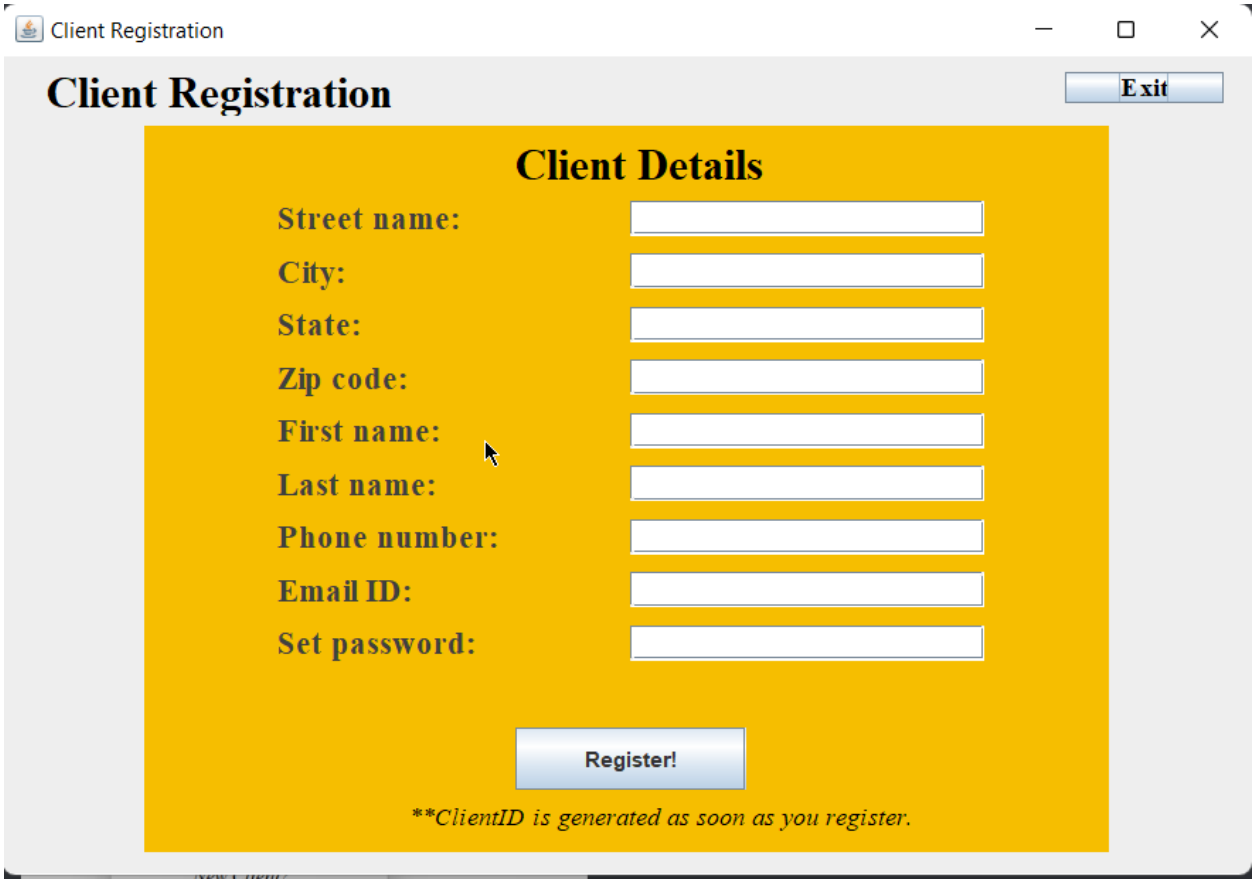
Login Page:


User Login
VERTIGO DEVELOPERS
Welcome to login page!
Login type:
None
User ID:
Password:
Enter

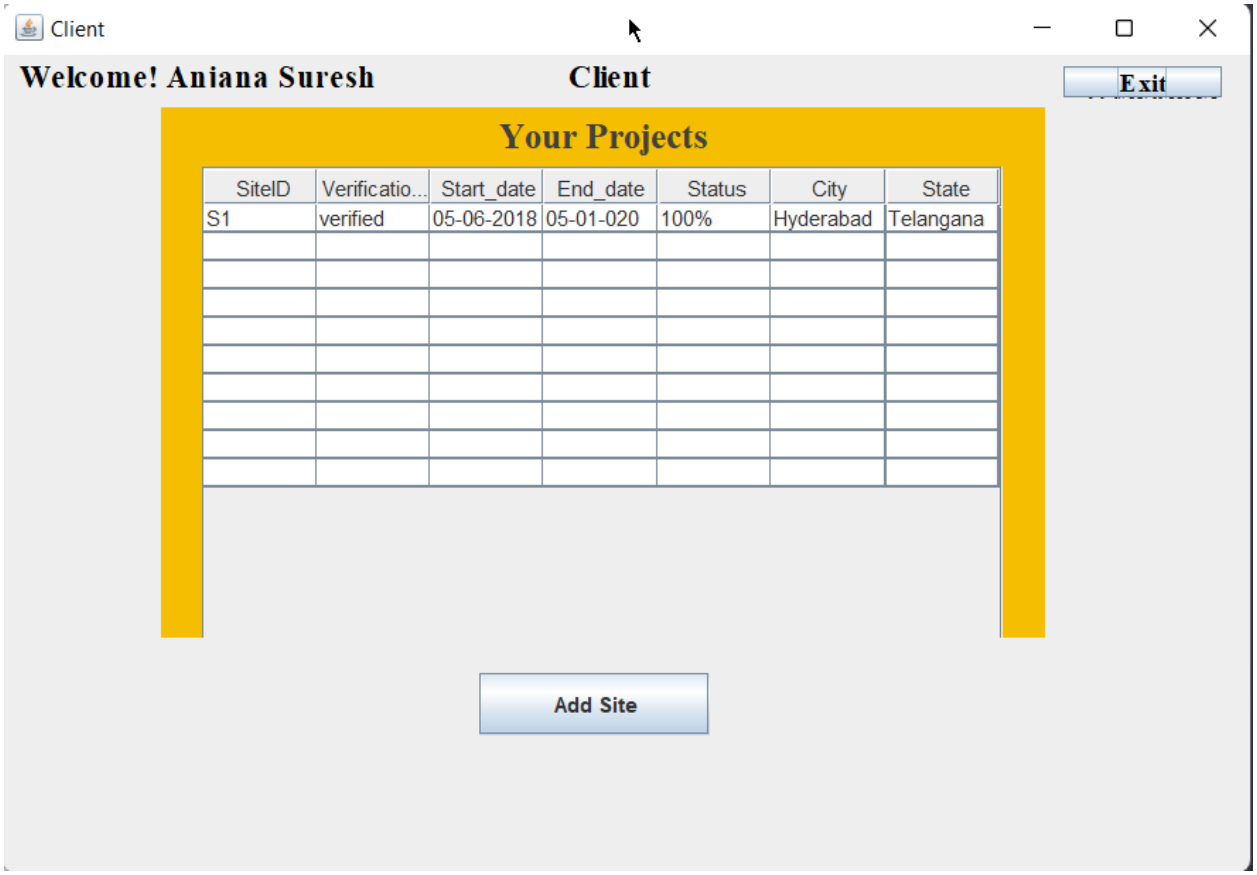
Client Login:



Client Registration:

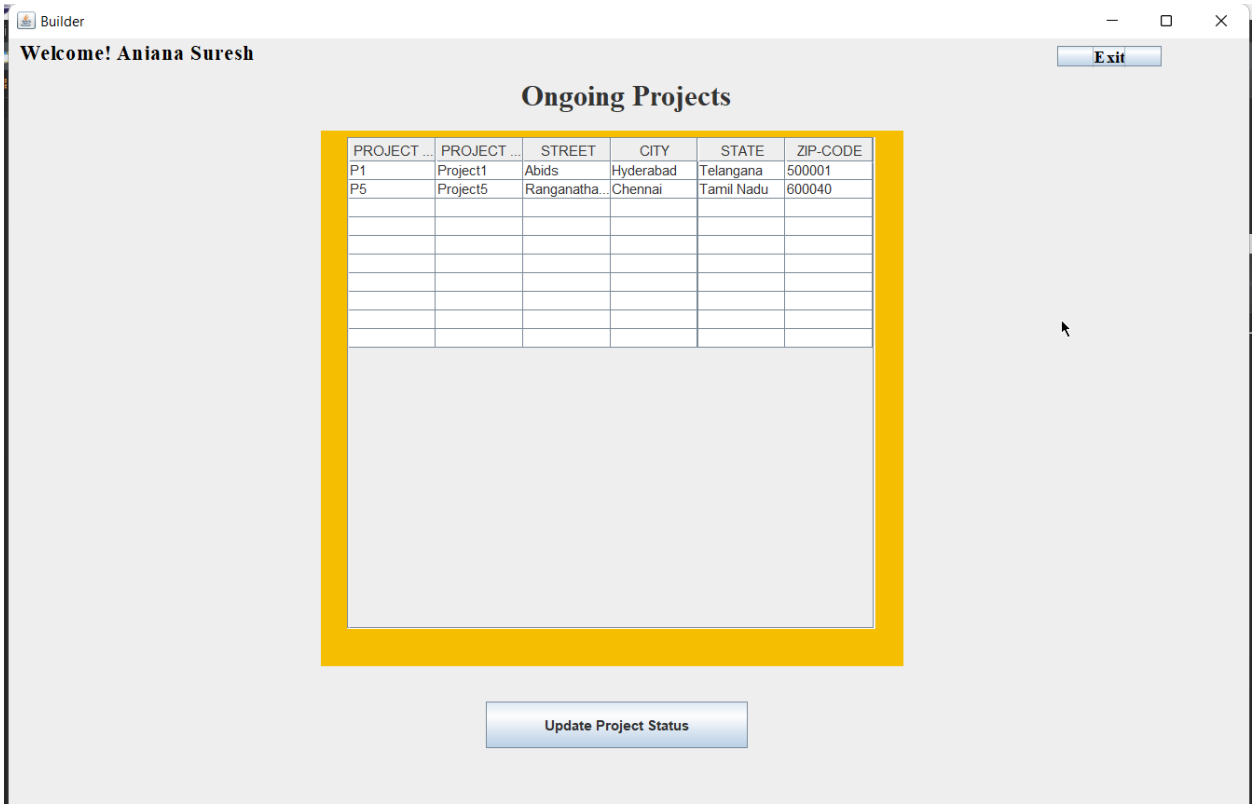


Client Page:

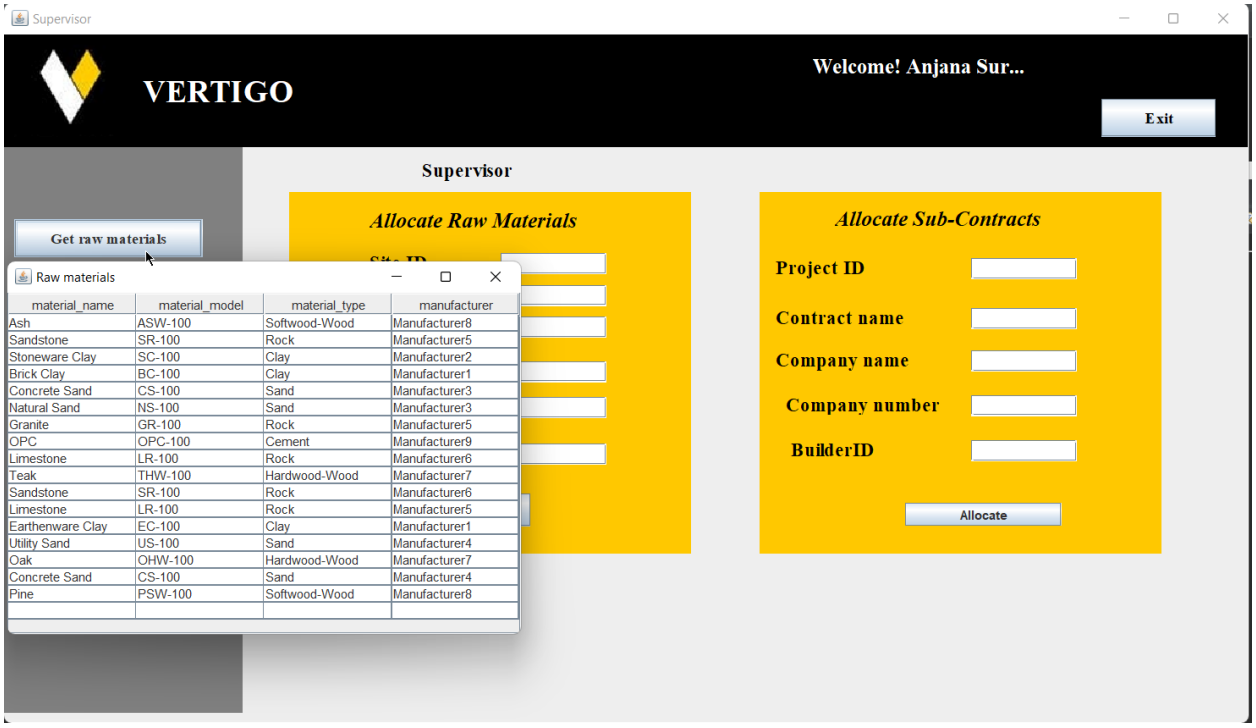

Client
Welcome! Aniana Suresh
Client
Exit
Your Projects
SiteID
Verificatio...
Start_date
End_date
Status
City
State
S1
verified
05-06-2018
05-01-020
100%
Hyderabad
Telangana
Add Site

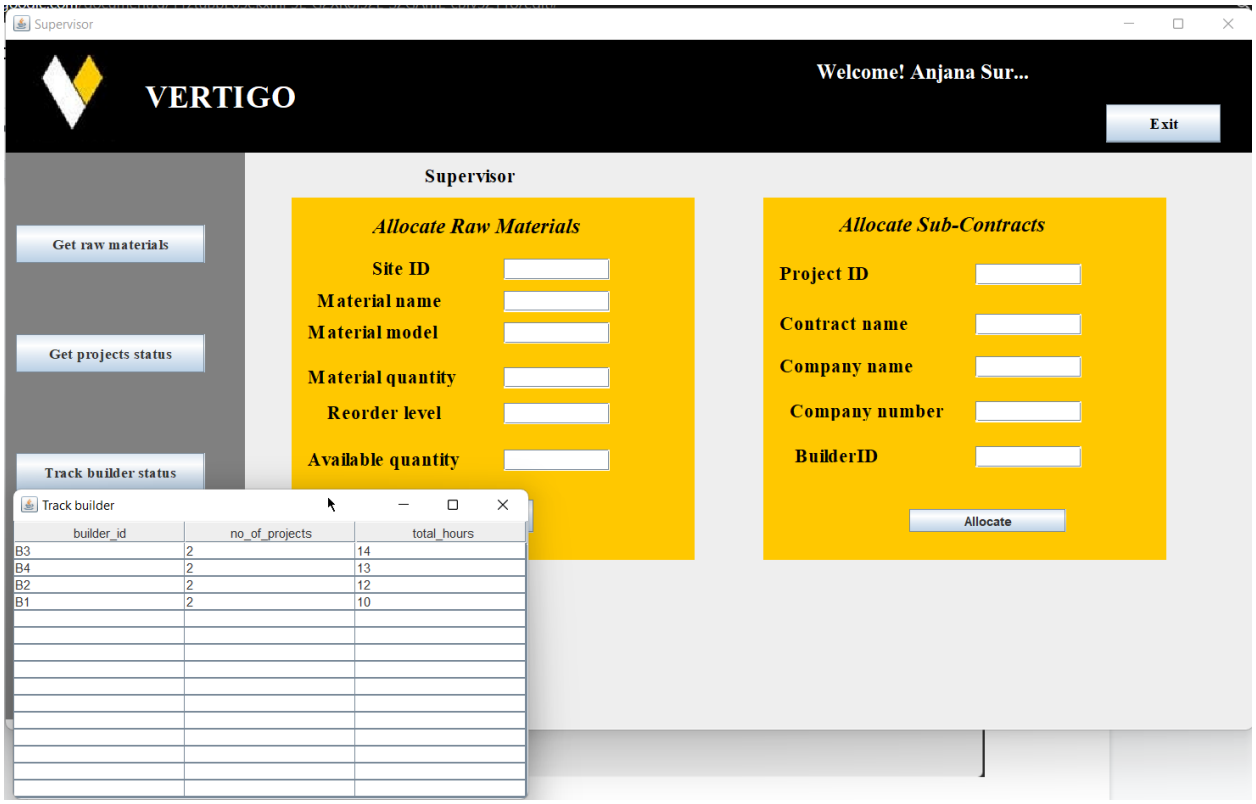
Accepting authority:

Builder :



Supervisor :


Supervisor
VERTIGO
Welcome! Anjana Sur...
Exit
Supervisor
Get raw materials
Allocate Raw Materials
Allocate Sub-Contracts
Project ID
Contract name
Company name
Company number
BuilderID
Allocate
Raw materials
material_name material_model material_type manufacturer
Ash ASW-100 Softwood-Wood Manufacturer8
Sandstone SR-100 Rock Manufacturer5
Stoneware Clay SC-100 Clay Manufacturer2
Brick Clay BC-100 Clay Manufacturer1
Concrete Sand CS-100 Sand Manufacturer3
Natural Sand NS-100 Sand Manufacturer3
Granite GR-100 Rock Manufacturer5
OPC OPC-100 Cement Manufacturer9
Limestone LR-100 Rock Manufacturer6
Teak THW-100 Hardwood-Wood Manufacturer7
Sandstone SR-100 Rock Manufacturer6
Limestone LR-100 Rock Manufacturer5
Earthenware Clay EC-100 Clay Manufacturer1
Utility Sand US-100 Sand Manufacturer4
Oak OHW-100 Hardwood-Wood Manufacturer7
Concrete Sand CS-100 Sand Manufacturer4
Pine PSW-100 Softwood-Wood Manufacturer8


Supervisor
VERTIGO
Welcome! Anjana Sur...
Exit
Supervisor
Get raw materials
Get projects status
Track builder status
Allocate Raw Materials
Site ID
Material name
Material model
Material quantity
Reorder level
Available quantity
Allocate Sub-Contracts
Project ID
Contract name
Company name
Company number
BuilderID
Allocate
Track builder
builder_id
no_of_projects
total_hours
B3 2 14
B4 2 13
B2 2 12
B1 2 10

CHAPTER 4

CONCLUSIONS AND FUTURE SCOPE

The construction industry is growing and it is possible that the effective implementation of project management may contribute to it reaching new levels of success and higher standards. There is already some knowledge and understanding of project management, its methods and benefits (transparency and increased productivity and efficiency with the modernisation of the industry) and how project management can improve standards. Due to the growing economy and demand, interest of foreign investors in India and ongoing major developments in India with more to come, the Indian construction industry is booming and there is a good balance of turnover and interaction among different professions. The qualities that project management offers (transparency, flexibility and modernisation) should change the image of the industry and also be appreciated by everyone including clients, stakeholders and end users. There is growing awareness of the drawbacks of current methods and practices while, and at the same time, there is a realisation of future challenges and milestones for the industry. A new generation of professionals is making an effort to put project management into practice, but the implementation of project management faces obstacles due to the traditional and labour intensive nature of the industry. For successful implementation of project management, there needs to be encouragement and support from construction organisations, such as training of existing staff and new recruitments on the basis of project management knowledge.

References

1. https://www.javatpoint.com/java-swing
2. https://docs.oracle.com/javase/7/docs/api/javax/swing/package-summary.html
3. https://youtu.be/mDxEGtMNPtA
4. https://www.tutorialspoint.com/postgresql/postgresql_java.htm
5. https://examples.javacodegeeks.com/core-java/sql/java-jdbc-postgresql-connection-example/

Appendix 1

Link to the GitHub Repository:

https://github.com/anjana02/Vertigo_Developers

****