FUTURE UNIVERSITY SUDAN

Khartoum, Sudan

ONLINE COLLABORATION AND TRACKING SYSTEM ALNUBIA FOR INVESTMENT CO.LTD

A Graduation Project Presented to the Faculty of Postgraduate Studies

In Partial Fulfillment of the Requirements

For the degree of

Master of Science in Information Systems

With specialization in Management

By

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Project Supervisor

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DEDICATION

I dedicate this Project to my family and friends and special feeling of gratitude to my loving parents my strong pillar, my source of inspiration, wisdom, knowledge and understanding. They have been the source of my strength throughout this program. My sister and close friends who have never left my side every milestone every first they were there.

I also dedicate this project to my co-workers who have supported me throughout the process. I will always appreciate all they have done, my best friends Banan Yahia and Musaab Elameen who has encouraged me all the way and whom encouragement has made sure that I give it all it takes to finish what I have started.

AKNOWLEDGEMENT

I have taken efforts in this project; however, it would not have been possible without the kind support and help of many individuals and organizations. I would like to extend my sincere thanks to Future University and its entire staff for the help and support.

I am highly indebted to Alnubia For Investment Co.Ltd for their guidance and constant supervision as well as for providing necessary information regarding the project and also for their support in completing the project.

I would like to express my gratitude towards the professors of Future University Sudan for their kind co-operation and encouragement which help me in completion of this project. I would like to express my special gratitude and thanks to Dr. Yasir Abdelgader Mohamed for being my supervisor and giving me such attention and time.

My Thanks and appreciations also go to my colleague in developing the project and people who have willingly helped me out with their abilities.

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Abstract

Is online project collaboration and tracking system that helps project managers, team, and financial department to communicate and associate easily so that they can discuss issues openly, share ideas, share documents, files, designs and images with the team and clients at any time and from anywhere to deliver project successfully. The system also developed mobile application for project managers, site manager and civil engineers to communicate with the project manager and the general manager from the project field and send live feedback to project to track the project progress.

The site of the project is Alnubia For Investment Co.Ltd located in Khartoum-Sudan 38th 49street Khartoum (2), Sudan. Company is working in Construction business activities. The current system at Alnubia is a manual system they use excel sheets to record their administration tasks and communicate through emails and phone calls and it's hard to get live feedback and the process of request documents and information caused a delay in the progress of the project.

The methodology followed for developing the system is software development life cycle. The testing of the system has been conducted on two phases the first phase has been done during the development of the system and the second one after the completion of the development which shows the results and highlighted the project objectives.

CHAPTER I

INTRODUCTION

1.1. Background of the Study

Recently, IT technology has become a key component of technical development to improve productivity in construction fields. In the discipline of project management, there is and has been a strong emphasis on skills and techniques related to project planning and control. However, there is growing concern that when uncertainty is high, traditional techniques-based project management may not be sufficient and, if too rigorously applied, can impede the fulfillment of fundamental project goals. Any modern construction company will always have a substantial number of daily business tasks, as well as various projects that need to be implemented and controlled. Through effective collaboration and teamwork the company's success and profitability are ensured.

So there is a call for new project collaboration management approaches that are able to deal with increased flexibility and put people aspects more in focus.

This research project examines more in depth a much simpler solution would be to use collaboration techniques instead of using numerous communication channels. easily delegate tasks to your team members, control the execution and promptly make changes or amendments if they become necessary, keep track of the history of team during the whole problem solving process.

The system report allows project managers to control the business at an entirely new level, and track the current progress of the specific projects and always in total control of the situation.

1.1.1. Nature of the Project

Is online project collaboration and tracking system that helps project managers, team, and financial department to communicate and associate easily so that they can discuss issues openly, share ideas, share documents, files, designs and images with the team and clients at any time and from anywhere to deliver project successfully.

The system will help construction manager and their team starting from Execution phase which is the third phase after Initiation and Planning. In the Execution phase when the work begins after the kick-off meetings, then the project team begins to assign resources, Assign and publish tasks to team members. Set up tracking systems, execute tasks, update the project schedule, and modify the project plan. The system will also help project team during the Performance and Monitoring phase which is often happens at the same time as the execution phase. This step is all about measuring progress and performance to ensure that items are tracking with the project management plan. The last phase is the Closing phase which represents project completion. Project managers evaluate what went well in the project and identify failures. Then, the team creates a project punch list of any tasks that didn't get accomplished, performs a final budget, and creates a project report.

1.1.2. Site of the Project

- **Alnubia For Investment Co.Ltd**

Alnubia For Investment Co.Ltd. Is located in Khartoum-sudan38th 49street Khartoum(2), Sudan. Company is working in Construction business activities.

1.2. Problem Statement

1.2.1. General Problem

Residential and commercial constructions are becoming more complex. This is due to several factors, including advances in construction and engineering methods, an increasingly sophisticated workforce, rising labor and materials costs, and higher expectations of built assets. Project teams are larger; they all need to share project information and processes in a controlled environment and collaborate as well. As a result, project risk is higher and more difficult to manage.

1.2.2. Specific Problems

The system aims to solve the following specific problems:

- Lack of information in cost estimation, budgeting, construction pricing and contracting between construction project management departments and accounting department.
- It's hard to keep track of all the necessary documents in a construction project. Because construction projects are sometimes so large and involve complex information such as contracts, invoices, blueprints, and more.
- Lack of communication and collaboration between projects team specially those who are inside and outside the project location and the construction project manager there is always need for arranging a meeting or phone call in order to review documents and project details with all parties.
- Lack of track and update of construction project progress and current project status for the client itself.

- Unexpected delays of projects due to unclear scope and tasks that are not being specific enough with the scope of the project.

1.3. Project Objectives

1.3.1. General Objective

Main objective of this project to design and implement web based System and mobile application (Android) enables the member of project to perform the majority of their operations, while providing a report dashboard that enables the top manger to have complete visibility into all the important processes.

1.3.2. Specific Objectives

The system aims to achieve the following specific objectives:

- To design a system that track construction project cost, record and report expenditures to keep tasks and projects in line with cost projections between project department and accounting department.
- To develop modules that easily track, manage and store documents and reduce paper. Record and track all construction project incoming and outgoing documents and approval for all document-based processes online.
- To establish online collaboration modules that make possible for construction project team to be completely dispersed, while still working, Ease of reporting, live recording, set reminders and alerts, Documents are all stored in a single place and helps to keep everyone on the same page and keeps the project flowing.
- To create modules that keeps the client in the loop and allows clients to see real-time status about their project progress.

- To develop modules that track tasks automatically and share the most up-to-date timeline with team members, track change requests separately from the original project scope, and provide estimation on how it will affect the schedule.

1.4. Significance of the Study

This section will provide brief description on the various significances of the study given the following categories:

To future researcher: this study serves the students as their reference or guide in creating collaboration and construction systems. It will also help students to know more about programming language and tools for such kind of systems.

To construction company: the system easy to understand, enabling staff to ensure every project goes according to plan. Project management is a skilled task, but construction management software allows staff to create professional RFIs, transmittals, submittals, business letters and change requests. Clients, consultants, subcontractors and project managers can instantly share valuable information and the project budget can be tracked.

To project managers: the system serves as helpful tool for project managers to handle their task properly and have the ability to track and get live feedback from the project as they are far away from the project location and get in touch with all the project team members.

1.5. Scope and Limitations

Scope:

- System will aim to design modules for Mangers, Team mangers and Team members to control and monitor construction process.
- Mangers will track overall progress in projects through dashboard.
- Team leaders can publish task to members, monitor current stage/phase also can change in task scheduling.
- Team members get nonfictions about task, scheduling, and deadline.
- Live Feed will help managers, team leaders to have clear view about what going.
- Reports will give manger overall view about decision he should make.

Limitation:

- System will avoid deeply details about financial part, knowing project cost is enough.
- Initiating and Planning Stage is out of our scope, System will only control and monitoring all process through stages.
- System has no control on Human Resource (HR) department.

CHAPTER II

EVIEW OF RELATED LITERATURE AND STUDIES

This chapter presents the related literature and studies after the thorough and in-depth search done by the researchers. This will also present a comparison of these studies and the developed system.

2.1 Review of Related Literature

1) **Planning, Scheduling and Tracking of a residential Project using Primavera Software**[1]

Proper planning and scheduling is very important in construction projects for reducing and controlling delays of the project. Substantial amounts of time, money, resources are wasted each year in a construction industry due to improper planning and scheduling. With globalization the construction projects have become vast and complex. Planning of such

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projects requires huge amount of paperwork, which can be reduced with the help of project planning software. Providing good planning, proper organization, sufficient flow of resources to a project cannot automatically achieve desired result. A warning mechanism must be present which can alert the organization about its possible success and failures throughout the project. The main objectives of this study are to plan, schedule, and track a residential project with help of primavera software, study the results generated, it is possible to suggest which method is suitable for the selected residential project. Also to recommend measures to the organization for enhancing their project planning skills for similar projects in future.

Contrast and compare of the proposed system:

This paper focuses mainly on the planning and pre scheduling process of residential project. In contrast the proposed system will focus on tracking the actual work on the construction project and make it possible for dispersed parties to work together online, share approved related documents online and discusses and track the progress and documentation of the project.

2) Construction Project Scheduling with Time, Cost, Models and Critical Path Method[2]

This article evaluates the viability of using fuzzy mathematical models for determining construction schedules and for evaluating the contingencies created by schedule compression and delays due to unforeseen material shortages. Networks were analyzed Using three methods: manual critical path method scheduling calculations, Primavera Project Management software and mathematical Models using the Optimization Programming Language software.

[2]**Daniel Castro-LacoutureA.M.ASCE1; Gürsel A. Süer2; Julian Gonzalez-Joaqui3; and J. K. Yates4**
www.web.nchu.edu.tw

Fuzzy mathematical models that allow the multi objective optimization of project schedules considering constraints such as time, cost, and unexpected materials shortages were used to verify commonly used methodologies for finding the minimum completion time for projects. The research also used a heuristic procedure for material Allocation and sensitivity analysis to test five cases of material shortage, which increase the cost of construction and delay the completion Time of projects. From the results obtained during the research investigation, it was determined that it is not just whether there is a shortage Of a material but rather the way materials are allocated to different activities that affect project durations. It is important to give higher Priority to activities that have minimum float values, instead of merely allocating materials to activities that are immediately ready to start.

Contrast and compare of the proposed system:

This paper focus on optimization of project schedules considering constraints such as time, cost, and unexpected materials shortages. In contrast the proposed project covers the same tracking of time and cost with more additional features include the collaboration of all project management team and accounting department in the company to be able to remotely manage and track the progress of the project and all related documentation online and also issues approval of documents and generate alerts and online discussion for emergency and project meeting.

2.2 Review of Related Studies

1) A new idea in construction with software use and research directions [3]

This paper focuses on future research and the use of project management software in the construction industry. Data are drawn from an empirical study of project management professionals that yielded 240 replies, 42 of which were from the construction industry. Data were collected on: demographics and work environment, project management software usage patterns, analytical technique usage, data management, and suggestions for future research. The results indicate that construction professionals have different characteristics, needs and preferences, as compared to the overall sample. The study shows that construction professionals are more experienced and educated than the respondents in the overall study, they tend to work on fewer projects with larger numbers of activities, and they are more likely to use Primavera than Microsoft Project. Construction respondents are heavy users of critical path analysis for planning and control, resource scheduling for planning, and earned value analysis for control. The number of activities in a typical project and the use of software for all active projects were the key determinants of the usage of specific analytical techniques. These factors are also significant determinants of the types of information entered and updated, although the effect is weaker. Although construction professionals are generally satisfied with the quality of schedules produced by the software, they still expressed a clear interest in future research on resource scheduling/leveling in general and a net present value option in particular. To maximize the impact on practice, development of new planning and control methods should include their integration into project management software.

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[3] **B.PRASHANTH, KONDA RAHUL**
Students of UCEOU, Telangana ,India
www.ijesat.org

Contrast and compare of the proposed system:

This paper focus on the overall performance of project management software and the respondents of these kinds of software and this paper proves the fact that construction management and tracking work system are valuable to the construction company and this is exactly the advantages of the main features of the proposed system in addition to the features of online collaboration and visual tracking of the construction project details.

2) **Influence of Project Management Software Technology on the Performance of Construction Projects in Nairobi Country** [4]

The overall objective of this study was to investigate the influence of project management software technology on the performance of construction projects in Nairobi County. This study adopted a descriptive research design. The study targeted 1,391 registered contractors within Nairobi. Stratified and systematic random sampling was employed to obtain a sample of 139 respondents. The study employed questionnaire as the data instrument which comprised of open and closed ended questions. Primary data was collected and analyzed using quantitative and qualitative techniques and then presented using narratives, tables and graphs. Secondary data was obtained from journals, magazines, internet and textbooks. Data collected was analyzed using Statistical Package for Social Sciences (SPSS) version 21. Descriptive statistics and inferential statistics such as Pearson's correlation and Multiple Regression analysis were used. The study found out that majority of construction companies recognize the

[4] DIANA KERUBO OGERO

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need to move to a higher level of project management maturity. Companies that fully understand and leverage the project management software have a higher propensity to achieve project success. Additionally, the study established that many projects fail due to failure to utilize the appropriate project management software to manage the budget, schedule, project activities and labor. The study recommends that project management software training should be adopted in an organization and should be transformative in order to help employees share and support organizational vision, mission and goals. Likewise, the study recommends that organizations should come up with work policies that ensure that strategies adopted in response to project management software technology do not conflict with government policies and regulations.

Contrast and compare of the proposed system:

The paper investigates the influence of project management software technology on the performance of construction projects in Nairobi County.And the results of the study were that the majority of construction companies recognize the need to move to a higher level of project management maturity. In contrast the proposed project will apply these techniques in Sudan in addition to the advanced features that will enhance the overall performance of project managers and the team in collaboration and managing related documentation online and keep track of the progress of the project.

CHAPTER III

TECHNICAL BACKGROUND

3.1 Area of Application

This chapter focuses mainly on the technical specifications for the proposed system. The proposed system is a web-based and android platform; The Web offers unparalleled communication opportunities for the construction company, particularly its facility to accommodate a wide range of media types (text, voice, objects, etc). The access control and security measures available on the Internet can ensure data protection and integrity. Web-based and android platform construction collaboration and management system can make use of browsers, data handling devices and other Internet technology to create a network for sharing and manipulating corporate information in a way that will assist construction project managers to complete work on time and within budget.

3.2 Software Methodology

Development Life Cycle (SDLC) [5]:

There are various software development approaches defined and designed which are used/employed during development process of software, these approaches are also referred as "Software Development Process Models" (e.g. Waterfall model, incremental model, V-model, iterative model, RAD model, Agile model, Spiral model, Prototype model etc.). Each process model follows a particular life cycle in order to ensure success in process of software development.

[5] http://istqbexamcertification.com/what-are-the-software-development-life-cycle-sdlc-phases/

Software life cycle models describe phases of the software cycle and the order in which those phases are executed. Each phase produces deliverables required by the next phase in the life cycle. Requirements are translated into design. Code is produced according to the design which is called development phase. After coding and development the testing verifies the deliverable of the implementation phase against requirements. The testing team follows Software Testing Life Cycle (STLC) which is similar to the development cycle followed by the development team.

There are following six phases in every Software development life cycle model:

1. Requirement gathering and analysis
2. Design
3. Coding and implementation
4. Testing
5. Deployment
6. Maintenance

1) Requirement gathering and analysis: Business requirements are gathered in this phase. This phase is the main focus of the project managers and stake holders. Meetings with managers, stake holders and users are held in order to determine the requirements like; who is going to use the system? How will they use the system? What data should be input into the system? What data should be output by the system? These are general questions that get answered during a requirements gathering phase. After requirement gathering these requirements are analyzed for their validity and the possibility of incorporating the requirements in the system to be development is also studied. Finally, a Requirement Specification document is created which serves the purpose of guideline for the next phase of the model. The testing team follows the Software Testing Life Cycle and starts the Test Planning phase after the requirements analysis is completed.

2) Design: In this phase the system and software design is prepared from the requirement specifications which were studied in the first phase. System Design helps in specifying hardware and system requirements and also helps in defining overall system architecture. The system design specifications serve as input for the next phase of the model. In this phase the testers comes up with the Test strategy, where they mention what to test, how to test.

3) Coding and implementation: On receiving system design documents, the work is divided in modules/units and actual coding is started. Since, in this phase the code is produced so it is the main focus for the developer. This is the longest phase of the software development life cycle.

4) Testing: After the code is developed it is tested against the requirements to make sure that the product is actually solving the needs addressed and gathered during the requirements phase. During this phase all types of functional testing like unit testing, integration testing, system testing, acceptance testing are done as well as non-functional testing are also done.

5) Deployment: After successful testing the product is delivered / deployed to the customer for their use.

As soon as the product is given to the customers they will first do the beta testing. If any changes are required or if any bugs are caught, then they will report it to the engineering team. Once those changes are made or the bugs are fixed then the final deployment will happen.

6) Maintenance: Once when the customers starts using the developed system then the actual problems comes up and needs to be solved from time to time. This process where the care is taken for the developed product is known as maintenance.

3.3 Resources Requirements

The requirements are intended as a minimum for the development and the deployment of the system starting from the hardware and the software use in developing the system and the hardware and software for deployment. Resources Requirement for Development

3.3.1.1 Hardware

Table 3.1 Hardware Development

Requirement	**Description**
PC	Processor: Intel Core i3 RAM:4GB Hard Desk :300GB
Mobile Device	Processor: 1.5GHz quad-core Ram: 1.5GB Internal storage: 2GB

3.3.1.2 Software

Table 3.2 Software Development

Requirement	**Specification**
Operating System (Develop Environment)	Window 7,Windows 10 (64bit,32bit)
Server	WAMP
Software and Tools	Dreamweaver ,E-Clips

3.3.2 Resources requirement for deployment

3.3.2.1 Hardware

Table 3.3 Deployment Hardware

Requirement	Description
Server	Processor**:** Intel Core i7 RAM:16GB Hard Desk :10TB

3.3.2.2 Software

Table 3.4 Deployment Software

Requirement	Specification
Operating system (Deploy Environment)	Linux
Server	LAMP

3.3.2.3 Network infrastructure

The network infrastructure provides hardware and software resources of an entire network that enable network connectivity, communication, operations and management of an enterprise network. It provides the communication path and services between users, processes, applications, services and external networks/the internet.

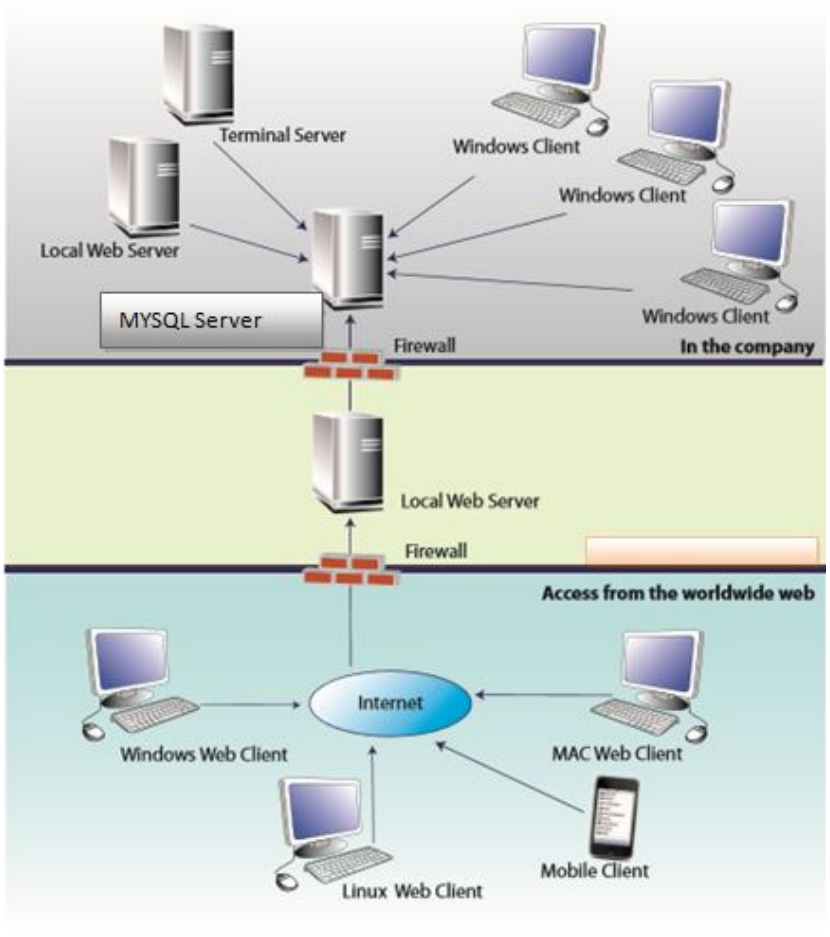

Figure 3.1 Network Infrastructure

CHAPT IV

DESIGN AND METHODOLOGY

This chapter is about the conceptual modeling which is depicted in UML within a use case driven approach. A use case driven approach describes the system from the external user's point of view and most suitable for domain knowledge analysis. The use case represents five different users of the system and the interaction between the users and the activity diagram represent the whole process of the system and highlight the important process of the system and the users.

4.1 UML Design

4.1.1 Use Case Diagram

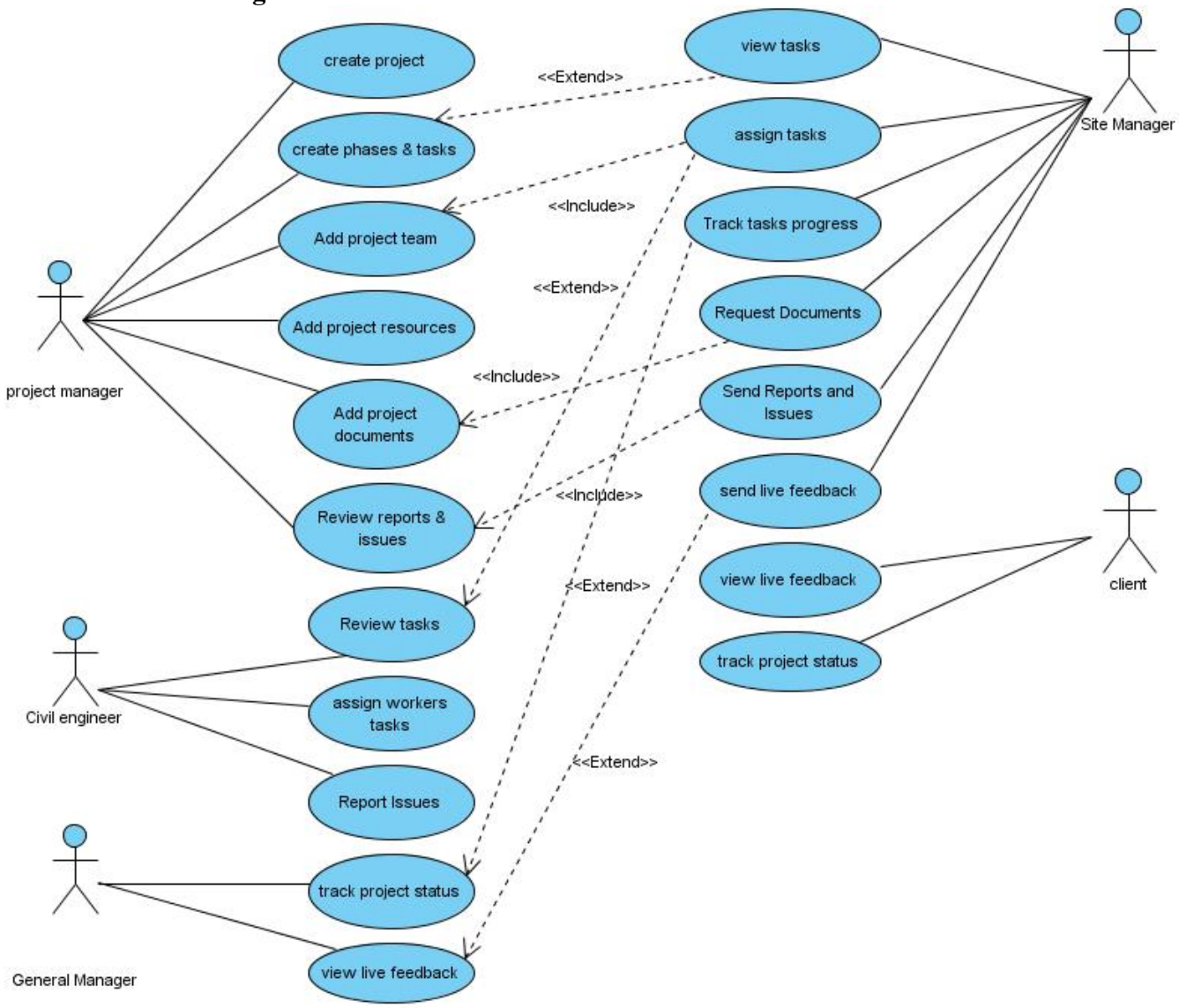

Figure 4.1 Use Case Diagram

4.1.2 Activity Diagram

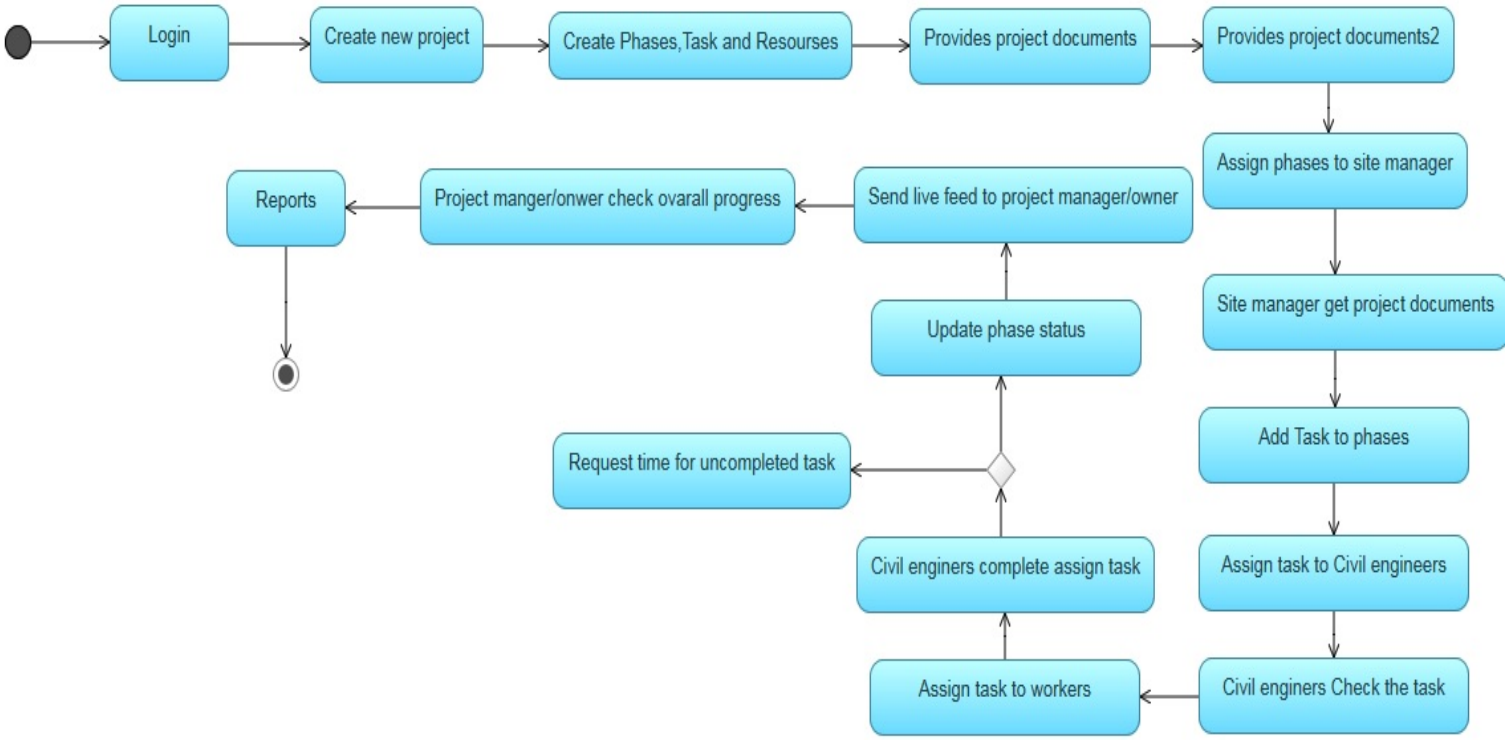

Figure 4.2 Activity Diagram

4.2 Database

4.2.1 Entity Relationship Diagram

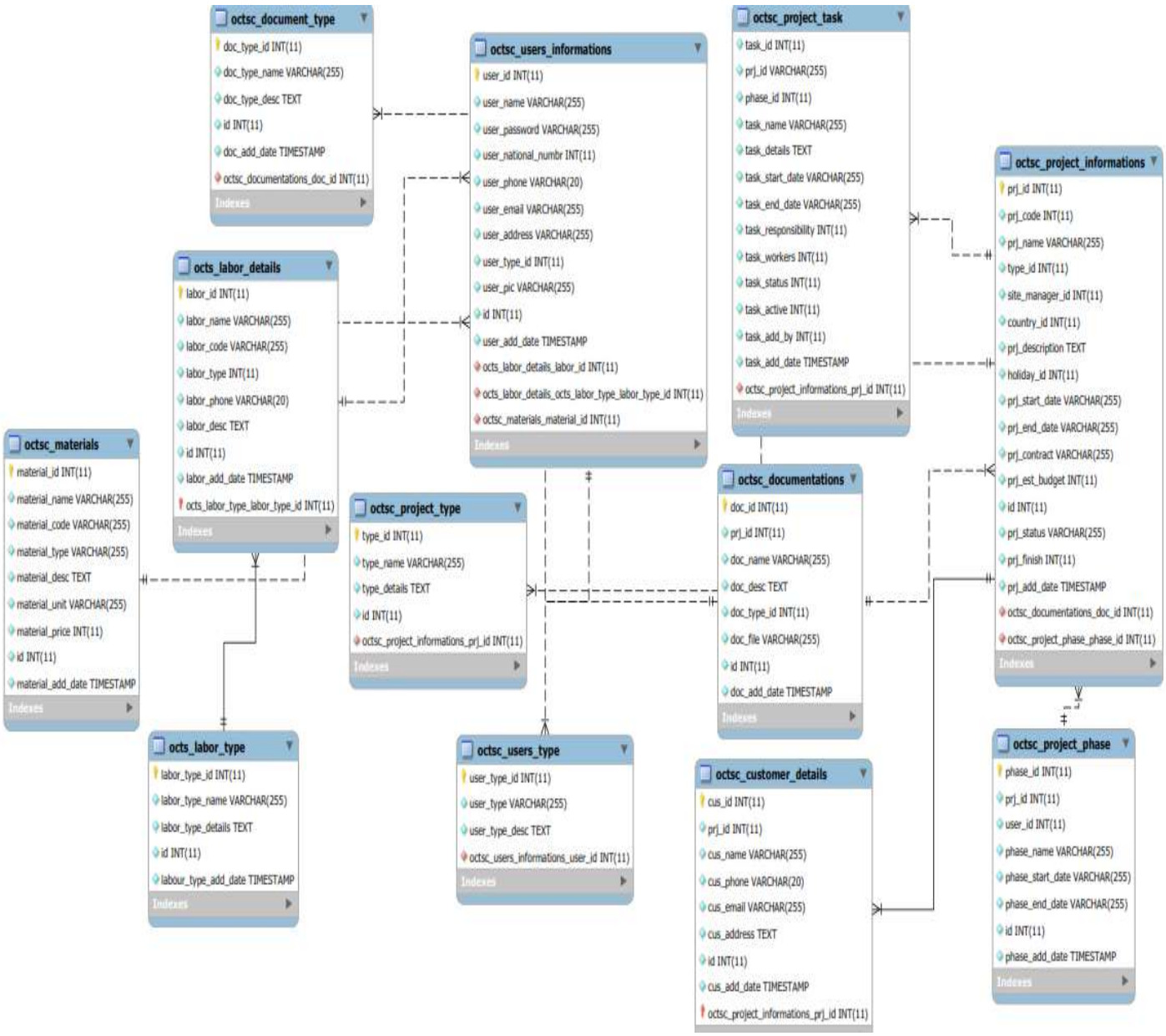

Figure 4. 3 Entity Relationship Diagram

4.2.2 Data Directory (Schemas)

Table 4.1 Labor Details

octs_labor_details

Table comments: octs_labor_details

Column	Type	Null	Default	Comments
labor_id	int(11)	No		
labor_name	varchar(255)	No		
labor_code	varchar(255)	No		
labor_type	int(11)	No		
labor_phone	varchar(20)	No		
labor_desc	text	No		
id	int(11)	No		
labor_add_date	timestamp	No	CURRENT_TIMESTAMP	

Table 4.2 Labor Type

octs_labor_type

Table comments: octs_labor_type

Column	Type	Null	Default	Comments
labor_type_id	int(11)	No		
labor_type_name	varchar(255)	No		
labor_type_details	text	No		
id	int(11)	No		
labour_type_add_date	timestamp	No	CURRENT_TIMESTAMP	

Table 4.3 Country

octsc_country

Table comments: octsc_country

Column	Type	Null	Default	Comments
country_id	int(11)	No		
country_name	varchar(255)	No		
country_state	varchar(255)	No		
country_city	varchar(255)	No		
country_zip	varchar(255)	No		
id	int(11)	No		
country_add_date	timestamp	No	CURRENT_TIMESTAMP	

Table 4.4 Document Type

octsc_document_type

Table comments: octsc_document_type

Column	Type	Null	Default	Comments
doc_type_id	int(11)	No		
doc_type_name	varchar(255)	No		
doc_type_desc	text	No		
id	int(11)	No		
doc_add_date	timestamp	No	CURRENT_TIMESTAMP	

Table 4.5 Holidays

octsc_holidays

Table comments: octsc_holidays

Column	Type	Null	Default	Comments
holiday_id	int(11)	No		
holiday_name	varchar(255)	No		
holiday_days_off	text	No		
id	int(11)	No		

Table 4.6 Project Informations

octsc_project_informations

Table comments: octsc_project_informations

Column	Type	Null	Default	Comments
prj_id	int(11)	No		
prj_code	int(11)	No		
prj_name	varchar(255)	No		
type_id	int(11)	No		
site_manager_id	int(11)	No		
country_id	int(11)	No		
prj_description	text	No		
holiday_id	int(11)	No		
prj_start_date	varchar(255)	No		
prj_end_date	varchar(255)	No		
prj_contract	varchar(255)	No		
prj_est_budget	int(11)	No		
id	int(11)	No		
prj_status	varchar(255)	No		
prj_finish	int(11)	No	0	
prj_add_date	timestamp	No	CURRENT_TIMESTAMP	

Table 4.7 Project Task

octsc_project_task

Table comments: octsc_project_task

Column	Type	Null	Default	Comments
task_id	int(11)	No		
prj_id	varchar(255)	No		
phase_id	int(11)	No		
task_name	varchar(255)	No		
task_details	text	No		
task_start_date	varchar(255)	No		
task_end_date	varchar(255)	No		
task_responsibility	int(11)	No		
task_workers	int(11)	No		
task_status	int(11)	No	0	
task_active	int(11)	No	0	
task_add_by	int(11)	No		
task_add_date	timestamp	No	CURRENT_TIMESTAMP	

Table 4.8 Project Type

octsc_project_type

Table comments: octsc_project_type

Column	Type	Null	Default	Comments
type_id	int(11)	No		
type_name	varchar(255)	No		
type_details	text	No		
id	int(11)	No		

Table 4.9 Users informations

octsc_users_informations

Table comments: octsc_users_informations

Column	Type	Null	Default	Comments
user_id	int(11)	No		
user_name	varchar(255)	No		
user_password	varchar(255)	No		
user_national_numbr	int(11)	No		
user_phone	varchar(20)	No		
user_email	varchar(255)	No		
user_address	varchar(255)	No		
user_type_id	int(11)	No		
user_pic	varchar(255)	No		
id	int(11)	No		
user_add_date	timestamp	No	CURRENT_TIMESTAMP	

CHAPTER V

RESULTS AND DISCUSSIONS

This chapter focuses on the results of the developed system, answered the questions of the research and existing knowledge, highlight and reinforces what is already known about the field.

5.1 User Prototype Interface

Testing and Implementation Before an evaluation of the system can be carried out it is vital that system testing is performed so that the requirements can be measured against the achievements made. For Diagonal Solutions, testing represents a more vital stage that ensures the development carried out fulfils their requirements and that the system is adept enough to deal with every user's requests.

- Login Form

A form for users to be able to access to the construction collaboration system according to users username and password.

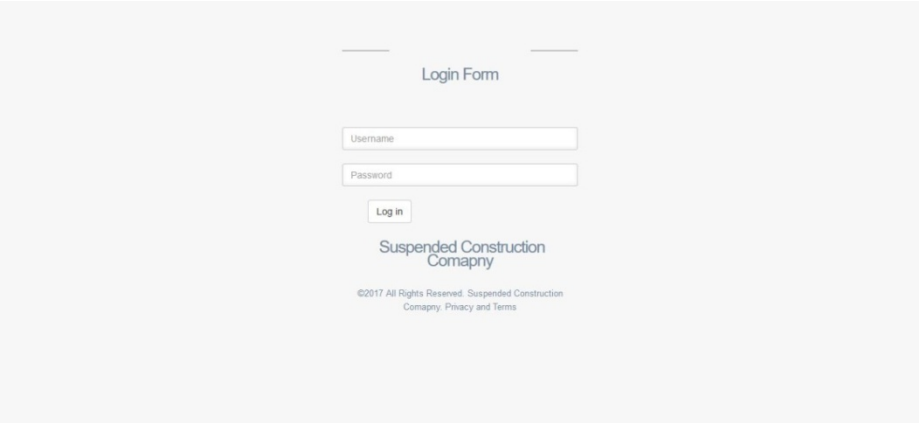

Figure 5.1 Login Form

- Project Information Form:

The project information form is where the project manager inserts all the different details of the new project starting from giving a code to the project and uploading the contract of the project and the start and end date of the project.

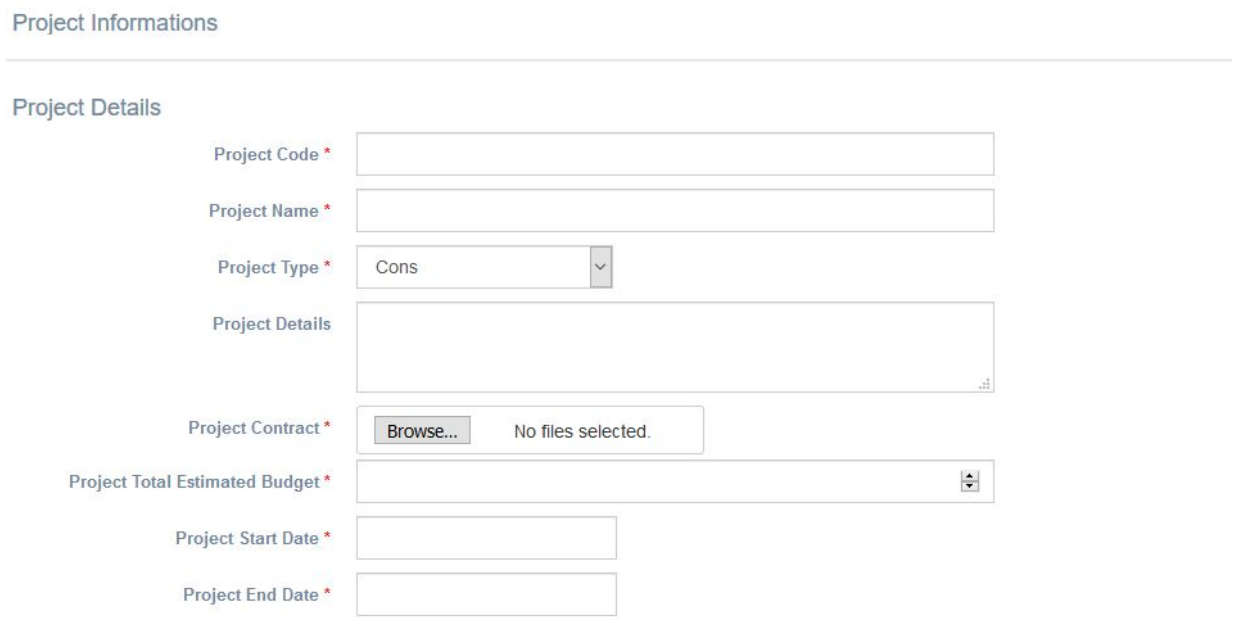

Figure 5.2 Project Information Form

- Customer Details Form

This form uses the project manager to insert the basic information of the project client.

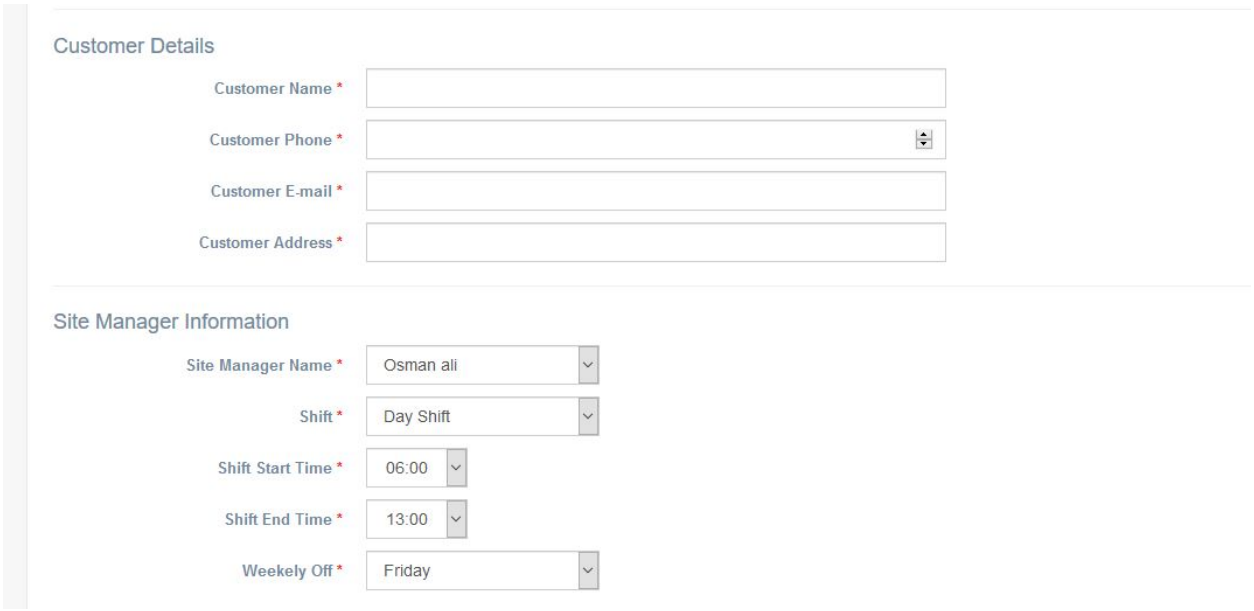

Figure 5.3 Customer Details Form

- Project Documents:

This form where the project manager inserts the project necessary documents and uploads the documents with details and description of each document and generate a report of the documents.

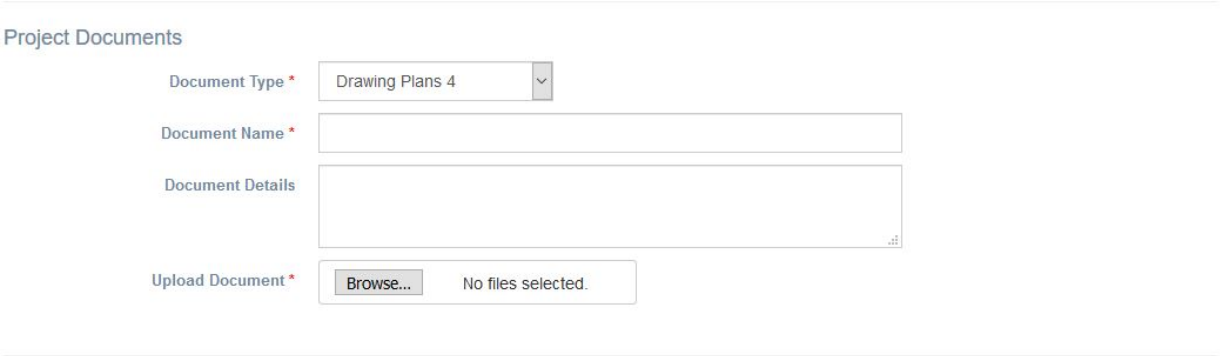

Figure 5.4 Project Documents

- Users Information form

This form is where the project manager inserts the basic details of project members and their positions to create a profile for each user on the system.

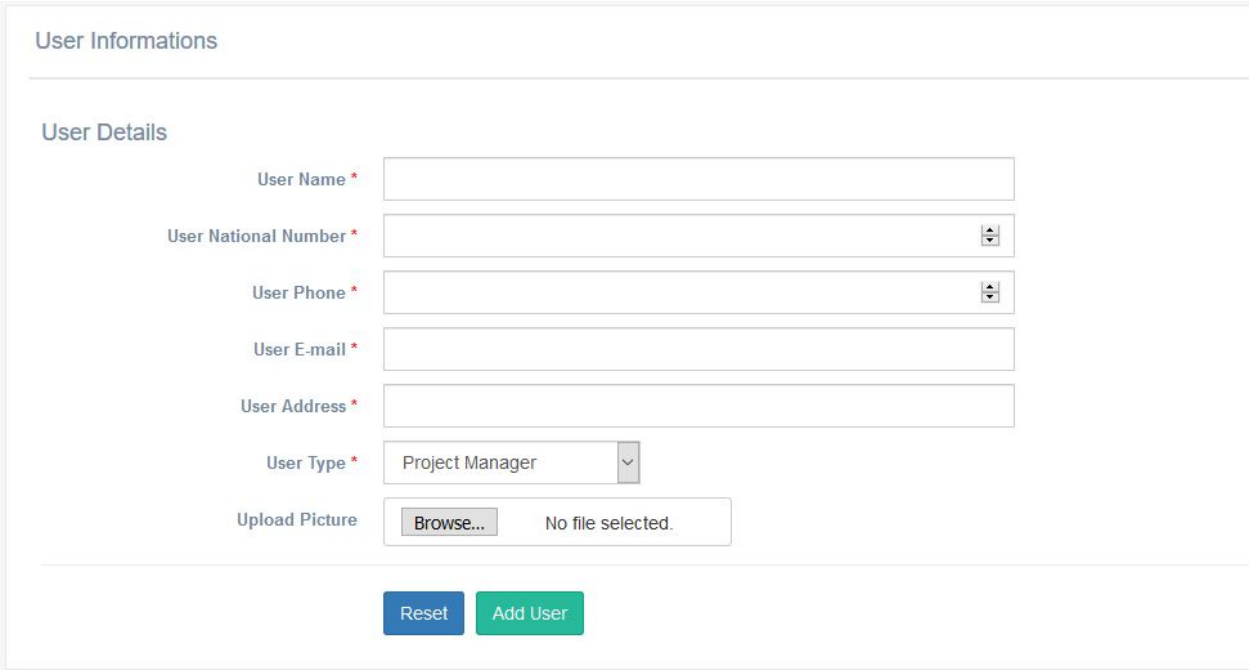

Figure 5.5 User Details Form

- Materials Information Form

This form is where the project manager inserts the materials needed for the project with the all the details the type, units and the price of materials.

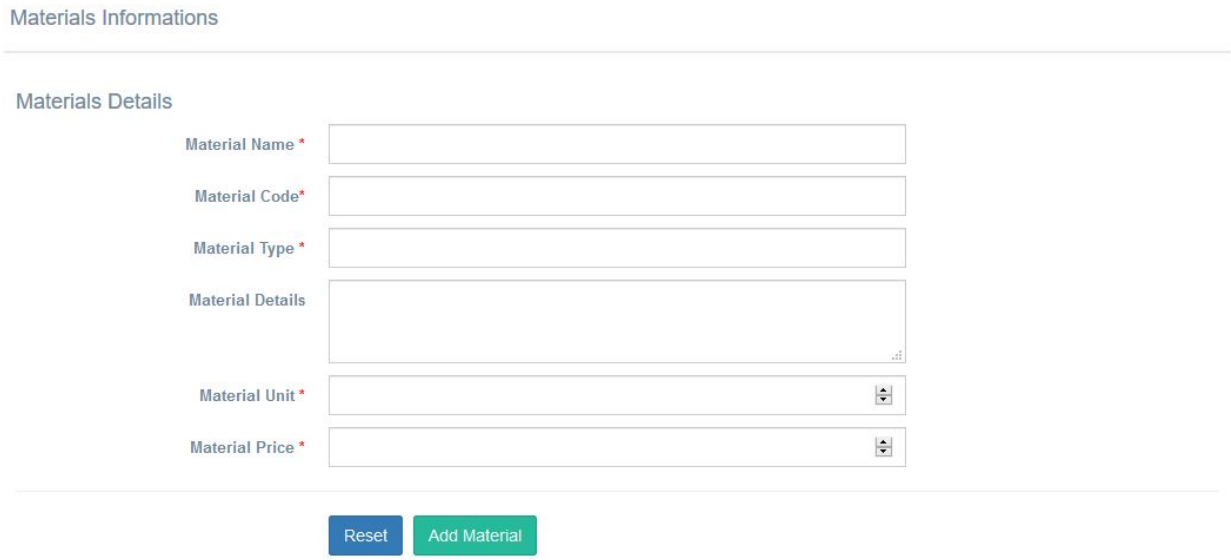

Figure 5.6 Material Information From

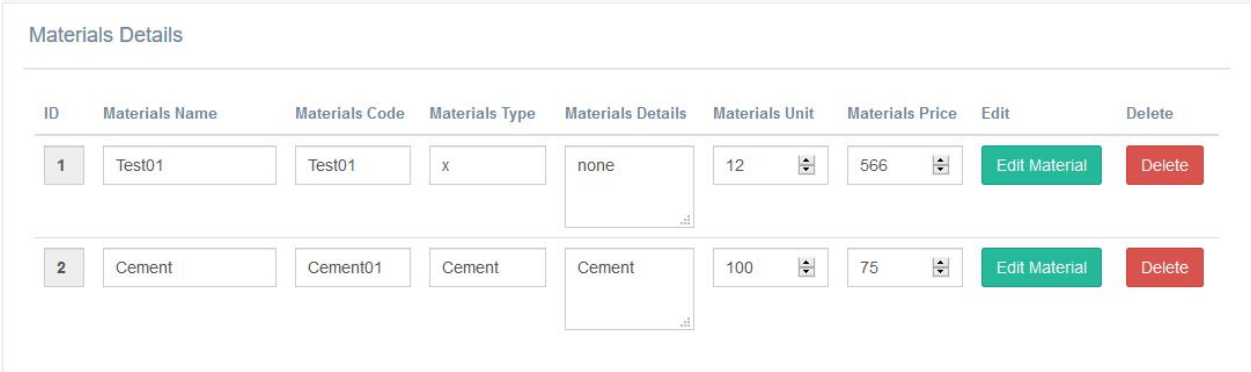

Figure 5.7 Materials Details

- Labor information Form

This form where the project manager inserts the basic labor information; labor name, code and select labor type and other details.

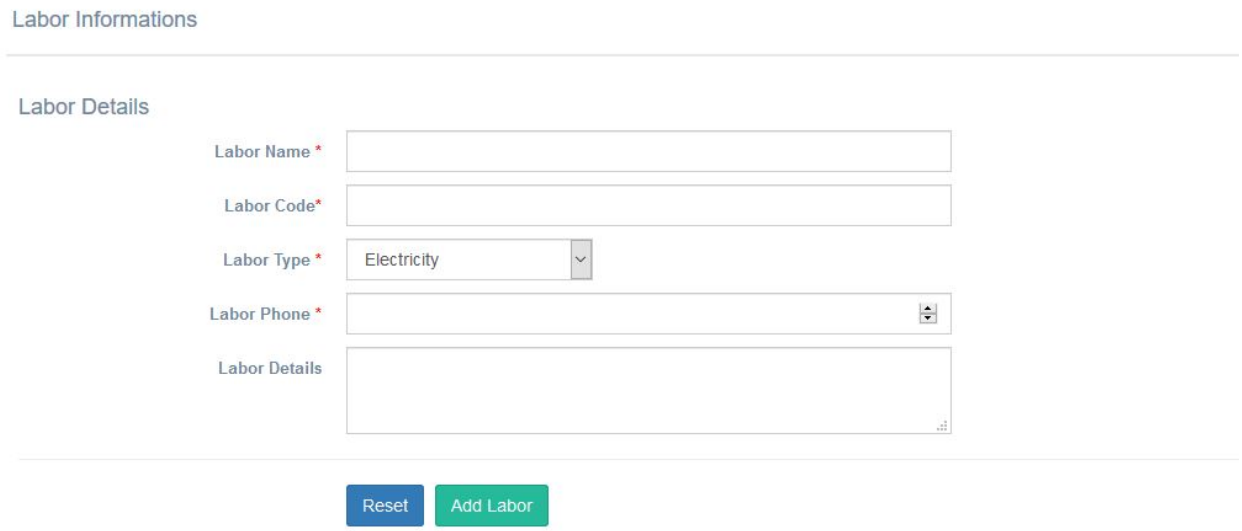

Figure 5.8 Labor information

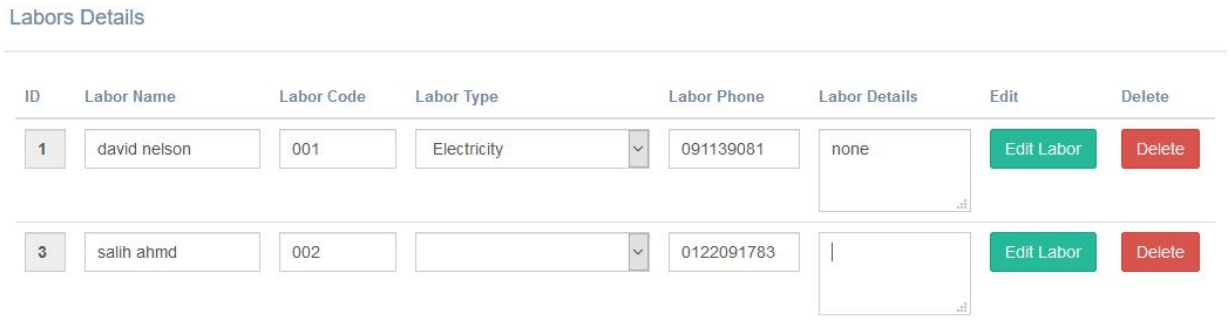

Figure 5.9 Labor Details Report

- project Phases From

This is where the project manager inserts the phase's details for the project; the number of phases and the start and end date of each phase.

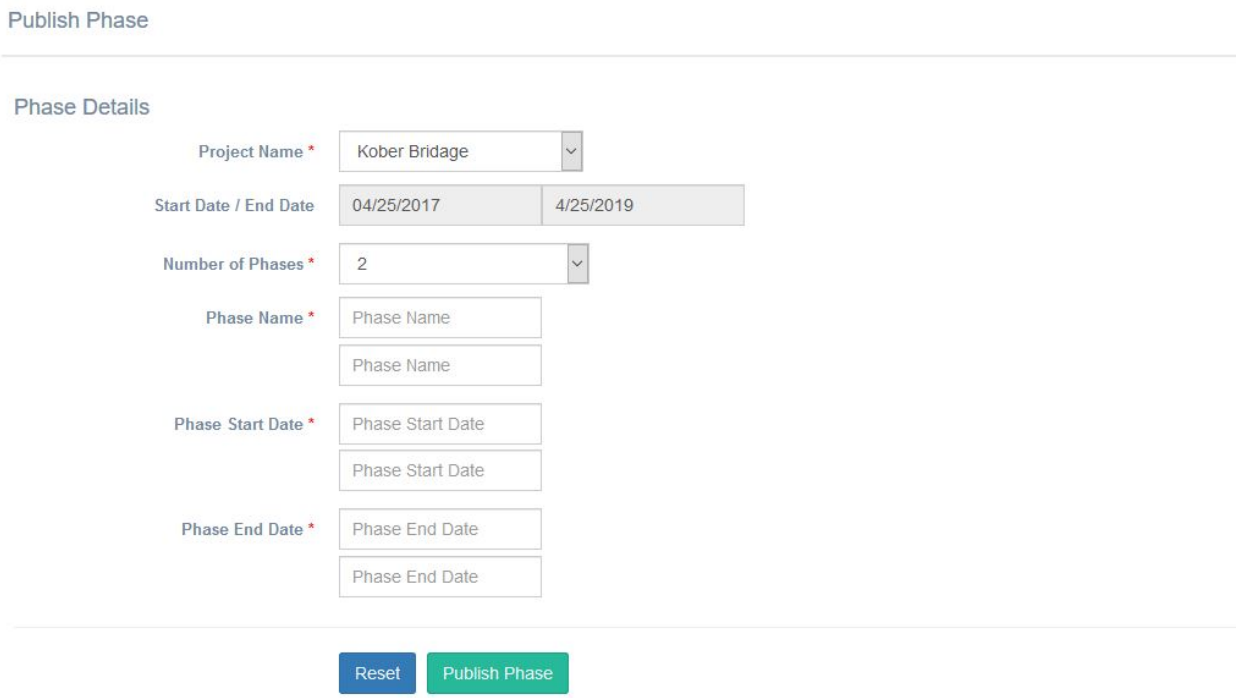

Figure 5.10 Project Phase Form

5.1.1 Alfa and Beta Test Results

1) Alpha Testing

The sole aim of the Alpha testing carried out is to ensure that the user cannot 'break' the system by entering erroneous data. The testing has been done by developers who have no participation on the development of the system to provide efficient testing results and explore different perspectives. The alpha testing highlights the following:

- The system has a modern user interface which look and feel comfortable and attractive and mobile application is easy to use.
- One of the most significant outcomes of the testing is the uncovering of the fact that field validation needs to be implemented on each of the forms. It was felt through the implementation of the system that, because of the amount of work required to incorporate the functionality requested, time would be better spent implementing the functionality that the users would recognize to be more beneficial to them.
- The system allows project managers to structure projects in as many phases as they like. Tasks within project phases are easily assigned to the employees.

2) Beta Testing

Beta test was taken from a total of 6 civil engineers form the company and the have been asked different kind of questions to test the functionality of the system and the results as shown below:

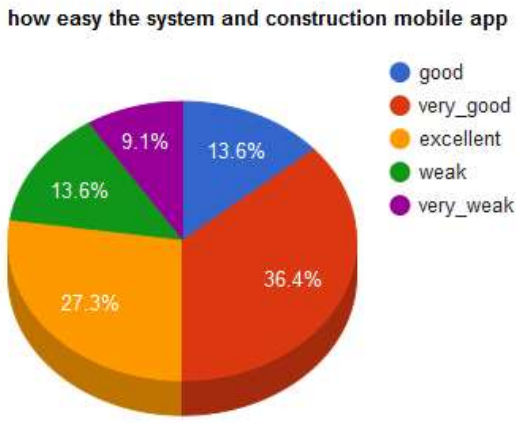

Figure 5.11 the Easiness of the system Chart

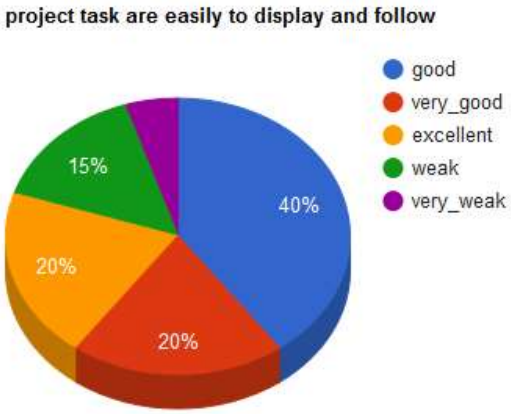

Figure 5.12 Project Task Display and Follow Chart

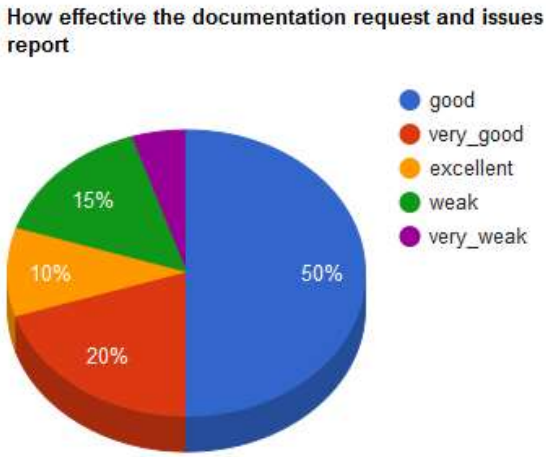

Figure 5.13 Documentation Effectiveness Chart

5.1.2 Sample Generated reports

User Reports

Users Details

ID	Usre Name	National Numbr	User Phone	User E-mail	User Address	User Type	Edit	Delete
4	tarig	11690117	911287901	tarig@gmail.co	Khartoum	Site Manage	Edit	Delete
5	ahmed	9877211	912234908	ahmed@gmail.(	Khartoum	Site Manage	Edit	Delete
3	Osman	123	916690189	osman@gmail.(	Khartoum	Civil Engine	Edit	Delete
6	Sami osman	1564564	91190381	sami85@gamil.	Khartoum	Civil Engine	Edit	Delete
7	Yasser Ali	8464601	91236590	aliyasser@hotn	Khartoum	Civil Engine	Edit	Delete
8	Ibrahim hassan	11893343	91190751	ibr22@gmail.cc	Bhari	Civil Engine	Edit	Delete
9	Hassan Mohammed	11808831	918990770	mohhassan201	Khartoum	Civil Engine	Edit	Delete
10	Ahmed Salih	11209981	919255661	ahmedsalih91@	Khartoum	Civil Engine	Edit	Delete
11	Faroug Mohammed	11340978	90911892	faroug141@gm	Khartoum	Civil Engine	Edit	Delete

Figure 5.14 User Reports

5.1.3 Acceptability test

The test shows the results of the system after the development and highlighted the main tasks of the system. The test has been conducted by the help of 10 civil engineers from the company and project manager from outside. Below is the schedule of the acceptability with description for each task and the results

Table 5.1 Acceptability Test

Task	Description	Success?	Accepted
Create project	Create new project and project details	Y	
Assign resources	Create project resources; material, labor and equipment		Y
Documentation	Upload project documents, assign document to tasks	Y	
Project phases & tasks	Divide project into phases and tasks and assign tasks to civil engineer and workers	Y	
Mobile application	Android app to track project task progress and communication between team members	Y	
Reports	Project members send reports to direct managers		Y
Live feedback	Site manager and civil engineer send live pictures form the project field to project manager	Y	
communication	Team members get notification and send request and report issues and start sessions with each others		Y
Progress tracking	Project manager track project progress	Y	
Client track	Client track the progress of the project and get live feedback	Y	

Note:

- **Y** : stands for yes as an answer for the acceptance of the functionality of the task

CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusion

The closure can be defined by four important aspects, which are:

- The system support systematic approach right from the beginning. When create a project managers are assigned and general project data (customer, project manager, contract etc) is stored.
- The system enables access to all project relevant data and documents.
- Project managers will be able to divide the project to phases and into tasks and subtasks and add the resources of the project.
- The construction Android mobile application plays a significant role in the communication of project team members and easily reports issues and sends live feedback from the project field.

6.2 Recommendations

The following points are the recommendation:

- The project concentrate on the process of communication and tracking of construction project which leave a space for more development to include financial and billing system of the construction project.
- Development of the rest of the construction project management phases such as planning and initiation which requires more administration attention and analysis.
- Mobile application development for IOS users.

CHAPTER VII

BIBLIOGRAPHY

THESIS

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Castro-LacoutureA.M.ASCE1, D., Süer2, G. A., & Gonzalez-Joaqui3, J. (n.d.). Construction Project Scheduling with Time, Cost, Models and Critical Path Method.

OGERO, D. K. (n.d.). Influence of Project Management Software Technology on the Performance of Construction Projects in Nairobi Country. *University of Nairobi* .

Polekar, U. Y. (2015). Planning, Scheduling and Tracking of a residential Project using Primavera Software. *Maharashtra Institute of Technolog, Pune – India* .

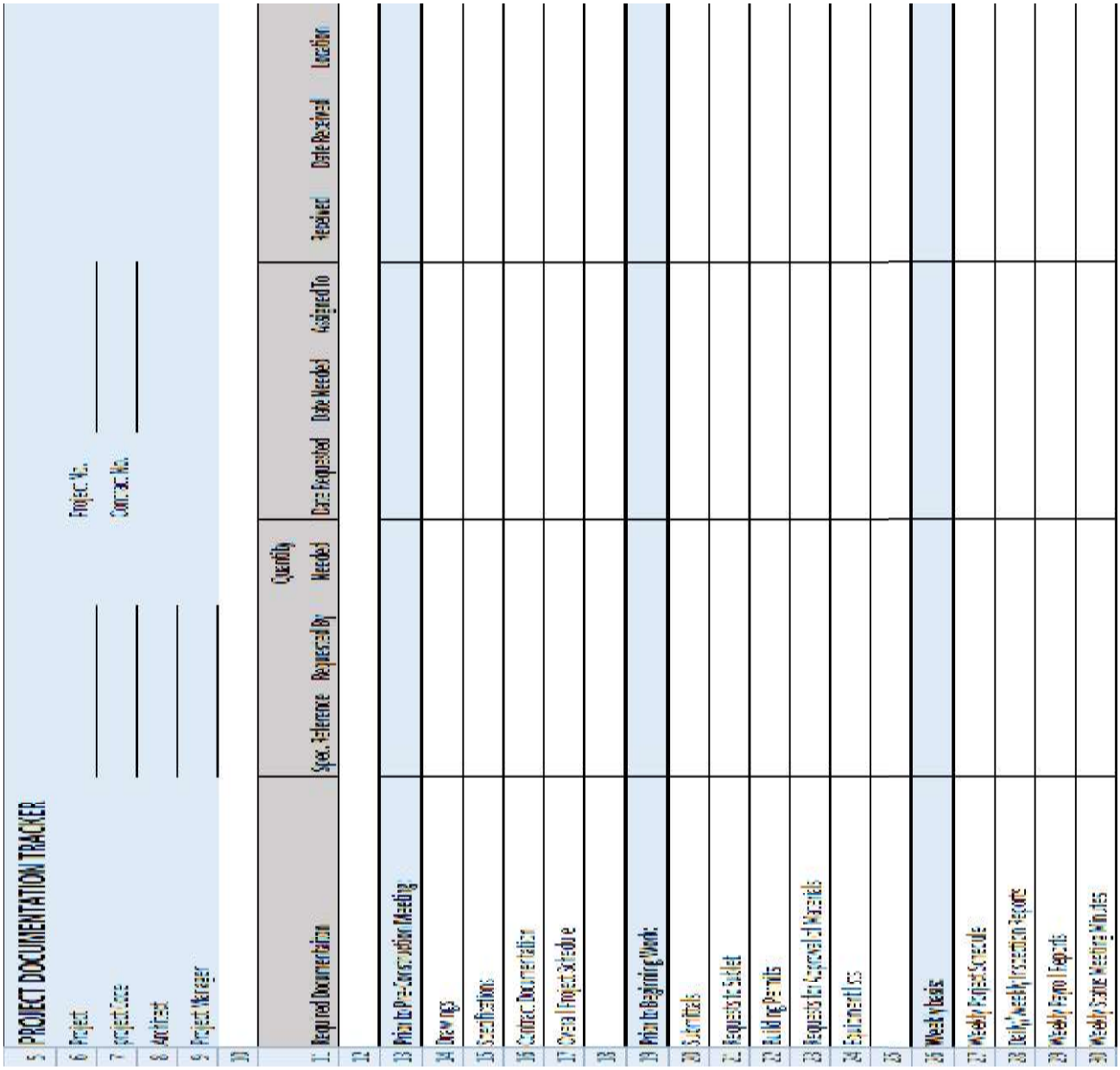
Electronic Sources

www.istqbexamcertification.com. (2017). System Development Life Cycle.

APPPENDICES

Appendix A

Project Documentation



5	PROJECT DOCUMENTATION TRACKER									
6	Project: _____			Project No.: _____						
7	Project Phase: _____			Contract No.: _____						
8	Architect: _____									
9	Project Manager: _____									
10										
11	Required Documentation	Spec. Reference	Requested By	Quantity Needed	Date Requested	Date Needed	Assigned To	Received	Date Received	Location
12										
13	Minute Pre-Construction Meeting:									
14	Drawings									
15	Specifications									
16	Contract Documentation									
17	Overall Project Schedule									
18										
19	Minute Beginning Work:									
20	Submittals									
21	Requisition Packet									
22	Building Permits									
23	Requisition Approval Materials									
24	Equipment Lists									
25										
26	Weekly Meetings									
27	Weekly Project Schedule									
28	Daily/Weekly Inspection Reports									
29	Weekly Payroll Reports									
30	Weekly Owner Meeting Minutes									

Appendix B

Project Progress Report

ALNUBIA FOR INVESTMENT CO.LTD

PROJECT PROGRESS REPORTS

PROJECT _____ PROJECT NO. _____

ARCHITECT _____ DATE _____

Contract Time Elapsed

Starting Date _____ Contract Time Calendar Days _____

Time Extension # Days _____ New Completion Date _____

% Completed _____ % Time _____ % Variation from Schedule _____

Controlling Work _____

(over)

Appendix C

Authorization for Extra Hours and Shift

ALNUBIA FOR INVESTMENT CO.LTD

AUTHORIZATION FOR EXTRA HOURS AND SHIFT

Name:_____Service Agreement No._____

Campus:_____Project:_____Project No.:_____

Date of Proposed Extra Hours to be Worked:_____

Number of Extra Hours Authorized:_____

Reason for Extra Hours:_____

Extra Hours Authorized By:_____
General Manager Date

Construction Mgmt.
702.33A

Appendix D

Request for Information

Request For Information

Project Name:

Project Manager:

Project Description:

RFI #	Current Status	Priority	Request Description	Requested By	Assigned To	Date Requested	Date Required	Date Responded	Notes
001	Open	Expedited	Status of Plans & Specifications	Prime Contractor	Project Manager	10/15/15	10/15/15		
002	Open	Critical	Need clarification on plans for interior deck door height:	Prime Contractor	Architect	10/15/15	10/15/15		
		Standard							

Appendix E

Daily Work Log

	DAILY WORK LOG			
	Project:			Name of Contractor:
	WEATHER		TEMPERATURE	Contact:
	DATE		TIME	Cell Phone:
	DAY			Contract No:
				Project No:
	BRANCH OF WORK	SKILLED WORKERS	HOURS	LOCATION AND DESCRIPTION OF WORK
	ELECTRICAL			
	MECHANICAL			
	DRYWALL			
	PLUMBING			
	CONCRETE			
	FIRE PROTECTION			

Appendix F

USER MANUAL

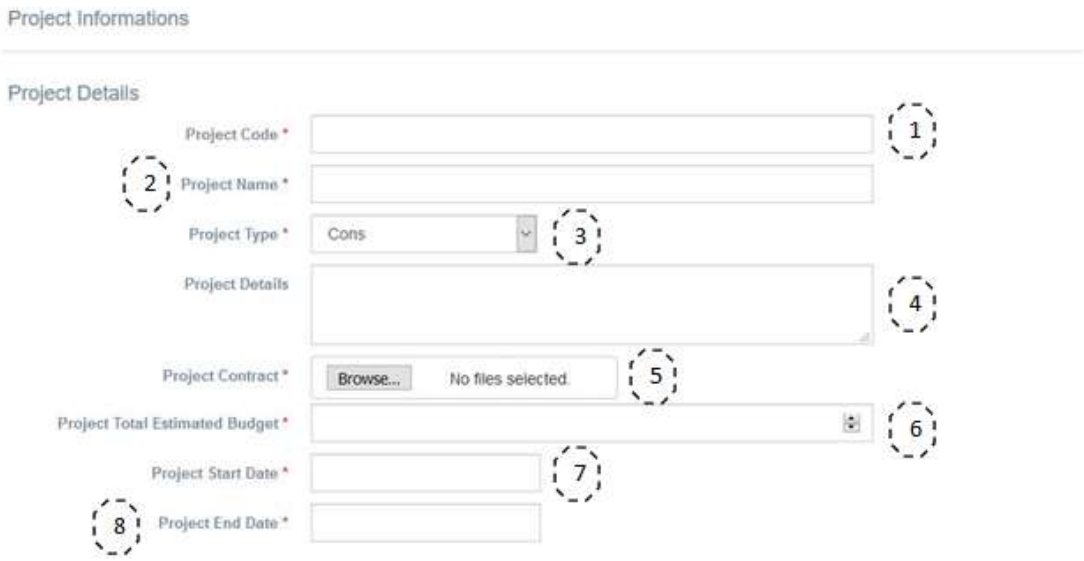
Login Form

1 – Users enter their username

2- Users enter their password

3- Users hit the login button to access their profile on the system

Project Information

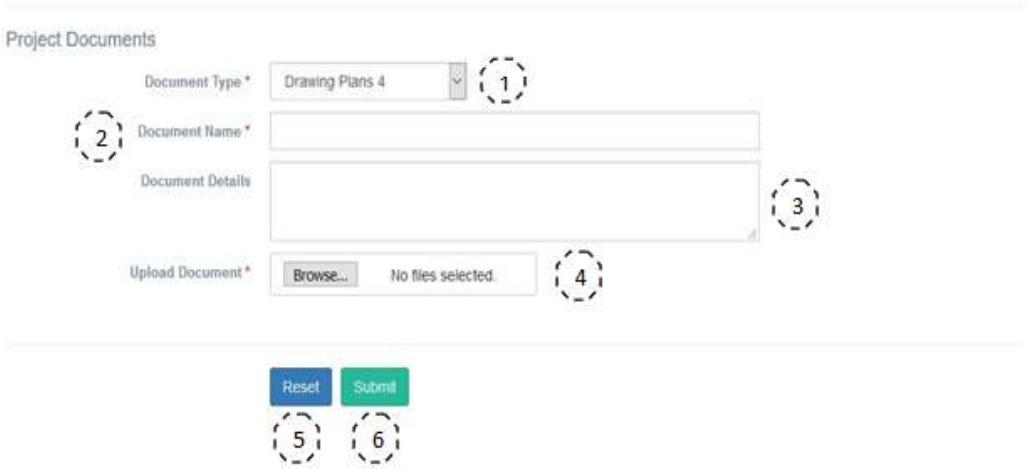


1- Project manager insert project code
2- Insert the name of the new construction project
3- Select the suitable project type
4- Insert project details
5- Upload copy form the original contract as a document
6- Insert the total estimated
7- Insert project start date
8- Insert project end date

Customer and Site Manager Details

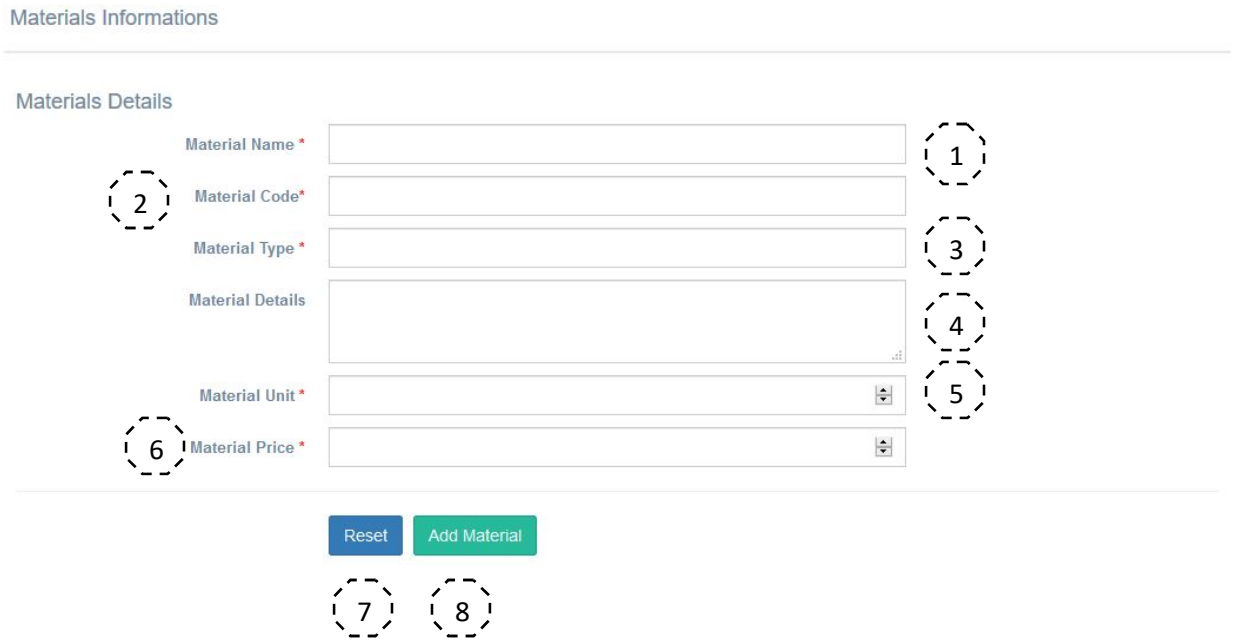
1- Insert customer name
2- Insert customer phone number
3- Insert customer E-mail
4- Insert customer address
5- Insert site manager name
6- Select site manager shifts
7- Select the start time of the shift
8- Select the end time of the shift
9- Select weekly off time

Project Documents



1- Select document type
2- Insert document name
3- Insert document details
4- Upload the document file
5- Rest the fields
6- Submit the inserted data to be saved

Materials Information

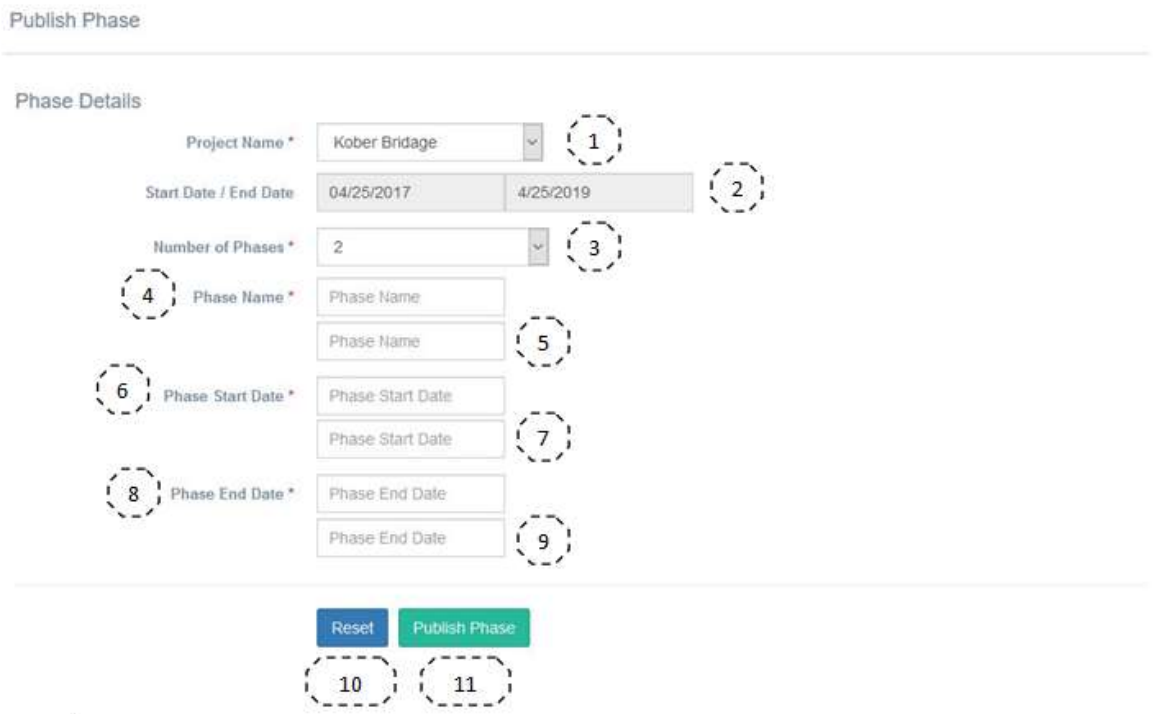


1- Insert material name
2- Insert a suitable material code
3- Insert material type
4- Insert material details
5- Select material unit
6- Select the price of the material

Labor information

1- Insert labor name
2- Insert appropriate labor code
3- Select labor type
4- Insert labor phone
5- Insert labor details
6- Reset fields button
7- Save inserted data into labor information table

Project Phases

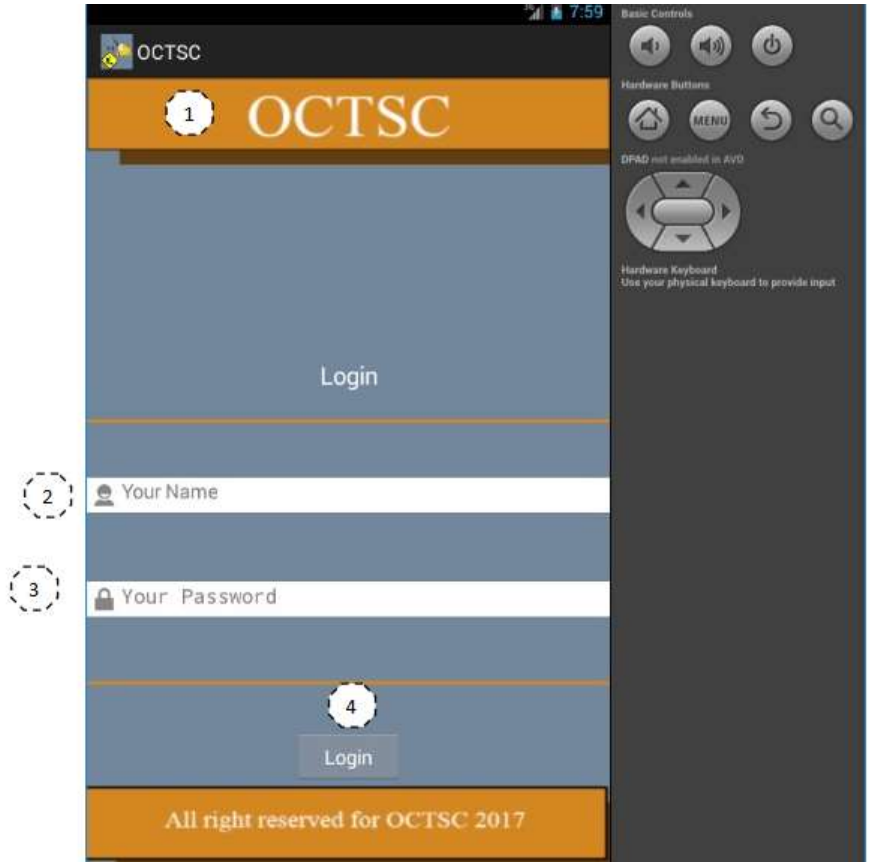


1- Select project name
2- Insert start and end date of the selected project
3- Select the number of phases to finish to the project
4- Insert the name of each phases
5- Insert the name of the other phases
6- Set a start date for the first phase
7- Set a start date for the second phase
8- Set an end date for the first phase
9- Set an end date for
10- Rest fields button
11- Publish phase to save the information above.

Appendix G

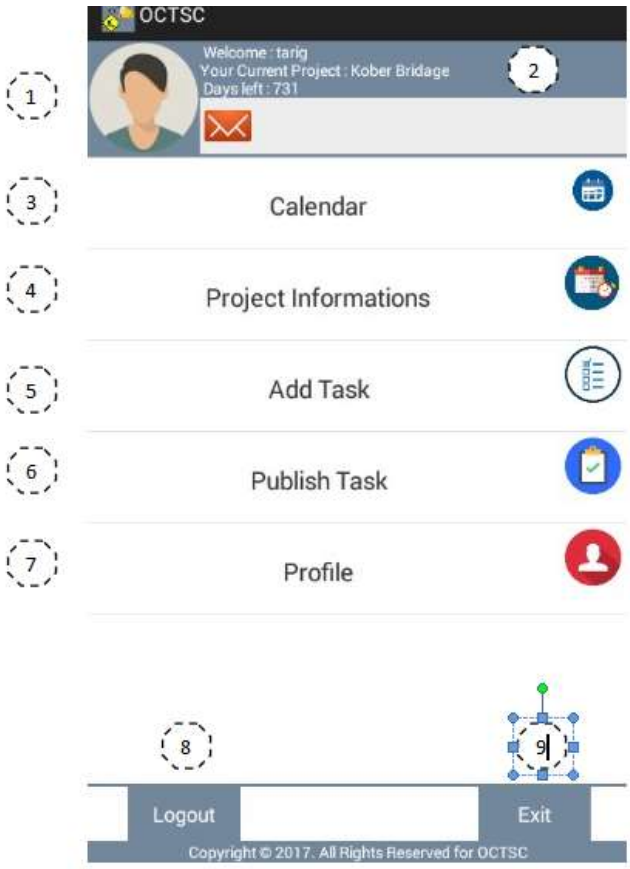
Construction Mobile Application

Login



1- An appreciation for the construction mobile application
2- Users insert their username
3- Users insert their password
4- Login to be able to access the application

User Profile

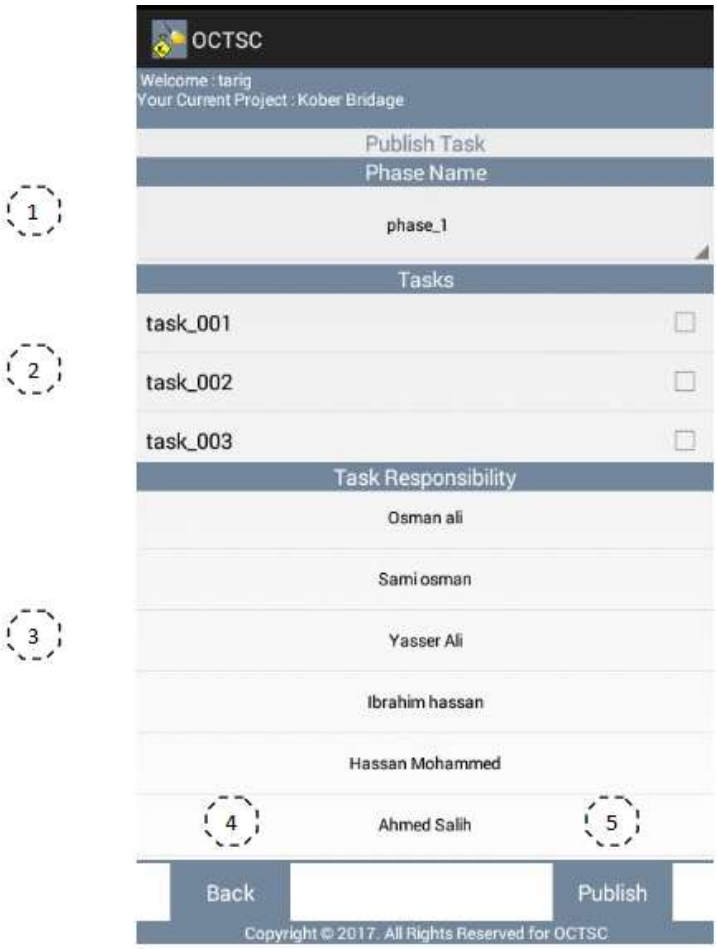


1- User profile picture and information
2- Summary information of the current project
3- Calendar of the current project
4- Current project details
5- Site manager and civil engineer add task to project phases
6- Assign task to civil engineers and workers
7- Edit user profile
8- Logout of user profile
9- Exit the application

Add Task

1- Current project information
2- Insert task name
3- Insert task details
4- Insert task start date
5- Insert task end date
6- Back to user profile
7- Submit inserted date

Publish Task



1- Phase information
2- Select of the different tasks of the phase to be assigned
3- Assign the selected task to civil engineers listed
4- Back to user profile
5- save the inserted data to be publish for civil engineers profiles

Construction System Code

```
<?php
//////////////////////////////////////////////////Functions/////////////////////////////////////////////////////
function Done()
{
  echo '<div class="alert alert-success alert-dismissible fade in" role="alert">
                <button type="button" class="close" data-dismiss="alert" aria-label="Close"><span aria-hidden="true">×</span>
                </button>
                <strong style="font-size:18px;">Done !</strong>
                </br>
                <b>Informations Inserted or Updated successfully !</b>
               </div>';
}
////////////////////////////////////////////////////////////////////////////////////////////////
function NotDone()
{
                                                                    echo '<div class="alert alert-danger alert-dismissible fade in" role="alert">

                <strong style="font-size:18px;">Error !</strong>
                </br>
                <b>Cannot add (Data,Informations) already exist !</b>
               </div>';
}
////////////////////////////////////////////////////////////////////////////////////////////////
```

```
function Erro01()

{

                                                    echo '<div class="alert alert-danger alert-dismissible fade in" role="alert">

                <strong style="font-size:18px;">Error !</strong>

                </br>

                <b>Project start date or Shift start time cannot be greater than Project end date or Shift end time !</b>

              </div>';

}

////////////////////////////////////Select * :D/////////////////////////////////////////

$sql = "select * from `octsc_project_type` ";

$query = mysql_query($sql);


$site_manager_sql = "select * from `octsc_users_informations` where user_id  != '{$user_id}'";

$site_manager_query = mysql_query($site_manager_sql);


$type_sql = "select * from `octsc_users_type` ";

$type_query = mysql_query($type_sql);


$doc_type_sql = "select * from `octsc_document_type` doc,`octsc_users_informations` usr where doc.id = usr.user_id";

$doc_type_query = mysql_query($doc_type_sql);


$users_sql = "select * from `octsc_users_informations` usr,`octsc_users_type` typ where usr.user_type_id = typ.user_type_id and usr.user_id != '{$user_id}' ";

$users_query = mysql_query($users_sql);
```

```
$mat_sql = "select * from `octsc_materials` ";

$mat_query = mysql_query($mat_sql);


$labors_sql = "select * from `octs_labor_details` lbr,`octs_labor_type` ltyp where lbr.labor_type = ltyp.labor_type_id ";

$labors_query = mysql_query($labors_sql);


$labor_sql = "select * from `octs_labor_type` ";

$labor_query = mysql_query($labor_sql);



$project_sql = "select * from `octsc_project_type` ptyp,`octsc_project_informations` pro,`octsc_users_informations` usr,octsc_customer_details cus ,octsc_shifts sht ,octsc_documentations doc

 where ptyp.type_id = pro.type_id and pro.site_manager_id = usr.user_id and cus.prj_id = pro.prj_id and sht.prj_id = pro.prj_id and doc.prj_id = pro.prj_id";

$project_query = mysql_query($project_sql);


$project_phase_sql = "select * from `octsc_project_informations`";

$project_phase_query  = mysql_query($project_phase_sql);


//////////////////////////////////////////////Add Project Info//////////////////////////

if(isset($_POST['submit']))

{

//////////////////////project Informations///////

$prj_code = mysql_real_escape_string($_POST['prj_code']);
```

```
$prj_name = mysql_real_escape_string($_POST['prj_name']);
$prj_type = $_POST['prj_type'];
$prj_details = mysql_real_escape_string($_POST['prj_details']);
$prj_budget = mysql_real_escape_string($_POST['prj_budget']);
$prj_start_date = $_POST['prj_start_date'];
$prj_end_date = $_POST['prj_end_date'];

$start_date = strtotime($prj_start_date);
$end_date = strtotime($prj_end_date);

if( ($end_date<$start_date))
{
                                                    header("location:add_project.p
hp?error01");
}
else
{
//////////////////////Cus//////////////////////
$cus_name = mysql_real_escape_string($_POST['cus_name']);
$cus_pass = $cus_name;
$cus_phone = mysql_real_escape_string($_POST['cus_phone']);
$cus_email = mysql_real_escape_string($_POST['cus_email']);
$cus_address = mysql_real_escape_string($_POST['cus_address']);
//////////////////////Site Manager////////////////
$site_manager = $_POST['user_id'];
```

```
$shift_id = $_POST['shift_id'];
$shift_start_time = $_POST['shift_start_time'];
$shift_end_time = $_POST['shift_end_time'];

$holiday_id = $_POST['holiday_id'];

$shift_start =  strtotime($shift_start_time);
$shift_end =  strtotime($shift_end_time);

if($shift_end < $shift_start)
{
                                                    header("location:add_project.p
hp?error01");
}
else
{
//////////////////Get Total hours///////////////
$hours = round(abs($shift_end - $shift_start) / 3600,2);
$total_hours = $hours+1;
//////////////////////Documents//////////////////
$doc_type_id = $_POST['doc_type_id'];
$doc_name = mysql_real_escape_string($_POST['doc_name']);
$doc_desc = mysql_real_escape_string($_POST['doc_desc']);
////////////////////////////////////////////////
if(isset($_FILES['prj_contract']['name']))
```

```
{
   $file_name_all="";
   for($i=0; $i<count($_FILES['prj_contract']['name']); $i++)
   {
        $tmpFilePath = $_FILES['prj_contract']['tmp_name'][$i];
        if ($tmpFilePath != "")
        {
           $path = "./Documents/Project_Contract/";
           $name = $_FILES['prj_contract']['name'][$i];
           $size = $_FILES['prj_contract']['size'][$i];
           list($txt, $ext) = explode(".", $name);
           $file= time().substr(str_replace(" ", "_", $txt), 0);
           $info = pathinfo($file);
           $filename = $file.".".$ext;
           if(move_uploaded_file($_FILES['prj_contract']['tmp_name'][$i], $path.$filename))
           {
             //date_default_timezone_set ("Asia/Calcutta");
             $currentdate=date("d M Y");
             $file_name_all.=$filename."*";
           }
       }
   }
   $prj_contract_filepath = rtrim($file_name_all, '*');
}
else
```

```
    {
        $filepath="";
    }
////////////////////////////////////////////
if(isset($_FILES['doc_file']['name']))
    {
        $file_name_all="";
        for($i=0; $i<count($_FILES['doc_file']['name']); $i++)
        {
            $tmpFilePath = $_FILES['doc_file']['tmp_name'][$i];
            if ($tmpFilePath != "")
            {
                $path = "./Documents/Project_Documents/";
                $name = $_FILES['doc_file']['name'][$i];
                $size = $_FILES['doc_file']['size'][$i];
                list($txt, $ext) = explode(".", $name);
                $file= time().substr(str_replace(" ", "_", $txt), 0);
                $info = pathinfo($file);
                $filename = $file.".".$ext;
                if(move_uploaded_file($_FILES['doc_file']['tmp_name'][$i], $path.$filename))
                {
                  //date_default_timezone_set ("Asia/Calcutta");
                  $currentdate=date("d M Y");
                  $file_name_all.=$filename."*";
                }
```

```
        }
    }
    $prj_doc_filepath = rtrim($file_name_all, '*');
  }
  else
  {
    $filepath_doc="";
  }
$check_project_query = mysql_query("select * from `octsc_project_informations` where prj_code = '{$prj_code}'");

                                                    if(mysql_num_rows($check_project_query))
                                                    {
                                                    header("location:add_project.php?error00");
                                                    }
                                                    if(mysql_num_rows($check_project_query)==0)
                                                    {
$prj_insert = "insert into `octsc_project_informations`
(prj_code,prj_name,type_id,site_manager_id,prj_description,holiday_id,prj_start_date,prj_end_date,prj_contract,prj_est_budget,id)
values('{$prj_code}','{$prj_name}','{$prj_type}','{$site_manager}','{$prj_details}','{$holiday_id}','{$prj_start_date}',
'{$prj_end_date}','".addslashes($prj_contract_filepath)."','{$prj_budget}','{$user_id}'
)";
```

```
$project_query = mysql_query($prj_insert);

$prj_last_id = mysql_insert_id();


$cus_insert = "insert into `octsc_customer_details`(prj_id,cus_name,cus_pass,cus_phone,cus_email,cus_address,id)

values

('{$prj_last_id}','{$cus_name}','{$cus_pass}','{$cus_phone}','{$cus_email}','{$cus_address}','{$user_id}')";

$cus_query = mysql_query($cus_insert);


$shift_insert = "insert into`octsc_shifts`(prj_id,shift_name,shift_start_time,shift_end_time,shift_total_hours,id)

values

('{$prj_last_id}','{$shift_id}','{$shift_start_time}','{$shift_end_time}','{$total_hours}','{$user_id}')";

$shift_query = mysql_query($shift_insert);


$doc_insert = "insert into `octsc_documentations`(prj_id,doc_name,doc_desc,doc_type_id,doc_file,id)

values

('{$prj_last_id}','{$doc_name}','{$doc_desc}','{$doc_type_id}','".addslashes($prj_doc_filepath)."','{$user_id}')

";

$doc_query = mysql_query($doc_insert);


                                                    if( $project_query && $cus_query && $shift_query && $doc_query )

                                                    {
```

```
header("location:add_project.php?done01");
                                                                    }
                                                                    else
                                                                    {
echo "ERROR !"."</br>"."Project SQL : ".$prj_insert."</br>"."Customer SQL : ".$cus_insert."</br>"."Shift SQL : ".$shift_insert."</br>"."Doc SQL  :".$doc_insert;
                                                                    }
                                                                  }
}
}
}
//////////////////////////////////////////////Add user Info//////////////////////////
if(isset($_POST['add_user']))
{
$user_name = mysql_real_escape_string($_POST['user_name']);
$user_national_number = mysql_real_escape_string($_POST['user_national_number']);
$user_phone = mysql_real_escape_string($_POST['user_phone']);
$user_email = mysql_real_escape_string($_POST['user_email']);
$user_address = mysql_real_escape_string($_POST['user_address']);
$user_type = mysql_real_escape_string($_POST['user_type']);

$check_user_sql = "select * from `octsc_users_informations` where user_name = '{$user_name}'";
$user_query = mysql_query($check_user_sql);
```

```
                                                    if(mysql_num_rows($user_que
ry))
                                                    {
header("location:add_users.php?error00");
                                                    }
                                                    else
                                                    {
                                                    move_uploaded_file($_FILES['
user_pic']['tmp_name'],"./Documents/Users_Pic/" .$_FILES['user_pic']['name']);
$user_insert = "insert into `octsc_users_informations`
(user_name,user_password,user_national_numbr,user_phone,user_email,user_address,user_type
_id,user_pic,id)
values
('{$user_name }','{$user_name}','{$user_national_number }','{$user_phone }','{$user_email
}','{$user_address }','{$user_type }','{$_FILES['user_pic']['name']}','{$user_id}')";
$user_insert_query = mysql_query($user_insert);

                                                    if($user_insert_query)
                                                    {
header("location:add_users.php?done01");
                                                    }
                                                    else
                                                    {
echo "ERROR !"."</br>"."Insert SQL : ".$user_insert;
                                                    }
                                                    }
}
```

```
//////////////////////////////////////////Add Privilege Info//////////////////////
if(isset($_POST['add_privilege']))
{
$privilege_type = mysql_real_escape_string($_POST['privilege_type']);
$privilege_details = mysql_real_escape_string($_POST['privilege_details']);

$privilege_check = "select * from `octsc_users_type` where user_type = '{$privilege_type}' ";
$privilege_query = mysql_query($privilege_check);

                                                    if(mysql_num_rows($privilege
_query))
                                                    {
header("location:user_type.php?error00");
                                                    }
                                                    else
                                                    {
$privilege_insert_sql = "insert into
`octsc_users_type`(user_type,user_type_desc)values('{$privilege_type}','{$privilege_details }')
";
$privilege_insert_query = mysql_query($privilege_insert_sql);

                                                      if($privilege_insert_query)
                                                      {
header("location:user_type.php?done01");
                                                      }
                                                      else
```

```
                                                    {
echo "ERROR !"."</br>"."Insert SQL : ".$privilege_insert_sql;
                                                    }
                                                }

}
//////////////////////////////////////////Add Documents Info//////////////////////
if(isset($_POST['add_doc_type']))
{
$doc_type = mysql_real_escape_string($_POST['doc_type']);
$doc_details = mysql_real_escape_string($_POST['doc_details']);

$doc_check = "select * from `octsc_document_type` where doc_type_name = '{$doc_type}' ";
$doc_query = mysql_query($doc_check);

                                                if(mysql_num_rows($doc_quer
y))
                                                {
header("location:project_doc.php?error00");
                                                }
                                                else
                                                {
$doc_insert_sql = "insert into
`octsc_document_type`(doc_type_name,doc_type_desc,id)values('{$doc_type}','{$doc_details
}','{$user_id}') ";
$doc_insert_query = mysql_query($doc_insert_sql);
```

```
                                                    if($doc_insert_query)
                                                    {
header("location:project_doc.php?done01");
                                                    }
                                                    else
                                                    {
echo "ERROR !"."</br>"."Insert SQL : ".$doc_insert_sql;
                                                    }
                                                }

}
//////////////////////////////////////////Add Materials Info//////////////////////////
if(isset($_POST['add_material']))
{
$mat_name = mysql_real_escape_string($_POST['mat_name']);
$mat_code = mysql_real_escape_string($_POST['mat_code']);
$mat_type = mysql_real_escape_string($_POST['mat_type']);
$mat_desc = mysql_real_escape_string($_POST['mat_desc']);
$mat_unit = mysql_real_escape_string($_POST['mat_unit']);
$mat_price = mysql_real_escape_string($_POST['mat_price']);

                                                $mat_check = "select * from
`octsc_materials` where material_name = '{$mat_name}' ";
                                                $mat_query =
mysql_query($mat_check);
```

```
                                                    if(mysql_num_rows($mat_quer
y))
                                                    {
header("location:add_materials.php?error00");
                                                    }
                                                    else
                                                    {
$mat_insert_sql = "insert into
`octsc_materials`(material_name,material_code,material_type,material_desc,material_unit,mater
ial_price,id)
values
('{$mat_name}','{$mat_code
}','{$mat_type}','{$mat_desc}','{$mat_unit}','{$mat_price}','{$user_id}')";
$mat_insert_query = mysql_query($mat_insert_sql);

                                                    if($mat_insert_query)
                                                    {
header("location:add_materials.php?done01");
                                                    }
                                                    else
                                                    {
echo "ERROR !"."</br>"."Insert SQL : ".$mat_insert_sql;
                                                    }
                                                    }

}
```

```
//////////////////////////////////////////Add Labor Info//////////////////////////
if(isset($_POST['add_labor']))
{
$labor_name = mysql_real_escape_string($_POST['labor_name']);
$labor_code = mysql_real_escape_string($_POST['labor_code']);
$labor_type = mysql_real_escape_string($_POST['labor_type']);
$labor_phone = mysql_real_escape_string($_POST['labor_phone']);
$labor_desc = mysql_real_escape_string($_POST['labor_desc']);

                                                    $labor_check = "select * from
`octs_labor_details` where labor_name = '{$labor_name}' ";
                                                    $labor_query =
mysql_query($labor_check);

                                                    if(mysql_num_rows($labor_qu
ery))
                                                    {
header("location:add_labor.php?error00");
                                                    }
                                                    else
                                                    {
$labor_insert_sql = "insert into
`octs_labor_details`(labor_name,labor_code,labor_type,labor_phone,labor_desc,id)
values
('{$labor_name}','{$labor_code
}','{$labor_type}','{$labor_phone}','{$labor_desc}','{$user_id}')";
$labor_insert_query = mysql_query($labor_insert_sql);
```

```
                                                                    if($labor_insert_query)
                                                                    {
header("location:add_labor.php?done01");
                                                                    }
                                                                    else
                                                                    {
echo "ERROR !"."</br>"."Insert SQL : ".$labor_insert_sql;
                                                                    }
                                                                  }
}
//////////////////////////////////////////Publish_Phase//////////////////////////
if(isset($_POST['publish_phase']))
{

$prj_id = $_POST['prj_id'];
$phase_number = $_POST['phase_number'];
$prj_start_date = $_POST['prj_start_date'];
$prj_end_date = $_POST['prj_end_date'];
$project_site_manager = $_POST['site_manager_id'];




$phase_sql = "select * from `octsc_project_phase` where prj_id = '{$prj_id}' ";
```

```
$phase_query = mysql_query($phase_sql) ;

                                                    if(mysql_num_rows($phase_qu
ery))
                                                    {
header("location:add_phase.php?error00");
                                                    }
                                                    else
                                                    {


for ($i = 0; $i < count($_POST['phase_name']); $i++)
{

                                                    $phase_name          =
$_POST['phase_name'][$i];
                                                    //$phase_task        =
$_POST['phase_task'][$i];
                                                    $phase_start_date    =
$_POST['phase_start_date'][$i];
                                                    $phase_end_date      =
$_POST['phase_end_date'][$i];

$phase_start = strtotime($phase_start_date);
$phase_end = strtotime($phase_end_date);

/*
```

```
if($phase_end >=  $prj_end_date)
                                                    {
echo '<script language="javascript">';
echo 'alert("Phase end date cannot be greater than project end date !")';
echo '</script>';
                                                    }
                                                    */
                                                    //else
                                                    //{
$phase_insert_sql = "insert into `octsc_project_phase`(prj_id,user_id,phase_name,phase_start_date,phase_end_date,id)
values
('{$prj_id}','{$project_site_manager}','{$phase_name}','{$phase_start_date}','{$phase_end_date}','{$user_id}')";
$phase_insert_query = mysql_query($phase_insert_sql);

                                                    if($phase_insert_query)
                                                    {
header("location:add_phase.php?done01");
                                                    }
                                                    else
                                                    {
echo "ERROR !"."</br>"."Insert SQL : ".$phase_insert_sql;
                                                    }

                                                    }
```

Construction Mobile Application Code

```
package com.android.octsc;



import java.io.File;
import java.io.FileOutputStream;
import java.io.InputStream;
import java.io.OutputStream;
import java.net.URL;
import java.util.ArrayList;
import java.util.List;

import org.apache.http.HttpResponse;
import org.apache.http.NameValuePair;
import org.apache.http.client.HttpClient;
import org.apache.http.client.ResponseHandler;
import org.apache.http.client.entity.UrlEncodedFormEntity;
import org.apache.http.client.methods.HttpPost;
import org.apache.http.impl.client.BasicResponseHandler;
import org.apache.http.impl.client.DefaultHttpClient;
import org.apache.http.message.BasicNameValuePair;
import org.json.JSONArray;
import org.json.JSONObject;
```

```
import android.app.Activity;
import android.app.AlertDialog;
import android.app.ProgressDialog;
import android.content.Context;
import android.content.DialogInterface;
import android.content.Intent;
import android.net.ConnectivityManager;
import android.net.NetworkInfo;
import android.os.AsyncTask;
import android.os.Bundle;
import android.os.Environment;
import android.util.Log;
import android.view.View;
import android.view.View.OnClickListener;
import android.widget.Button;
import android.widget.EditText;

public class Login extends Activity {

                                                    public Db OCTSC;
                                                    HttpResponse response;
                                                    HttpClient httpclient;
                                                    List<NameValuePair>
nameValuePairs;
                                                    ProgressDialog dialog = null;
```

```
HttpPost httppost;
ProgressDialog
mProgressDialog,Dialog;
EditText name,password;
Button login;
String imgurl ;
String User_Type ;
protected void
onCreate(Bundle savedInstanceState)
{
super.onCreate(savedInstanceS
tate);
setContentView(R.layout.login
);
name =
(EditText)findViewById(R.id.etUserName);
password =
(EditText)findViewById(R.id.etPass);
login = (Button)
findViewById(R.id.blogin);
login.setOnClickListener(new
OnClickListener()
{
public void onClick(View v)
{
```

```
final String sEdit1 =
name.getText().toString();
final String sEdit2 =
password.getText().toString();
if
(sEdit1.matches(""))
{
name.setError("Enter User
name !");
}
if
(sEdit2.matches(""))
{
password.setError("Enter User password !");
}
if
(!sEdit1.matches("") && !sEdit2.matches(""))
{
//if(CheckNetwork.isInternetA
vailable(Login.this))
//{
new SendingInfo().execute();
//}
//else
//{
```

```
                                                    //NOInternet();
                                                                    //}
                                                                     }
                                                      return;
                                                                     }
                                                    });
                                                    }
//////////////////////////////////////
                                                    class SendingInfo extends
AsyncTask<Void, Void, String>
                                                    {
                                                      protected void
onPreExecute()
                                                      {
                                                         super.onPreExecute();
                                                         dialog =
ProgressDialog.show(Login.this, "Please Wait","Checking Your Login Information...", true);
                                                       }
                                                    protected String
doInBackground(Void... arg0)
                                                            {
                                                      try
                                                            {
                                                    ArrayList<NameValuePair>
nameValuePairs = new ArrayList<NameValuePair>();
                                                    httpclient=new
DefaultHttpClient();
```

```
                                                    ////////////////////////////////////////////
////////////////////////////////////////////////////////////////////////////////////////////

                                                    //HttpPost httppost = new
HttpPost("http://10.0.2.2/OCTSC/Admin/App/login.php");

                                                    HttpPost httppost = new
HttpPost("http://192.168.43.105/OCTSC/Admin/App/login.php");

                                                    nameValuePairs = new
ArrayList<NameValuePair>(2);


                                                    nameValuePairs.add(new
BasicNameValuePair("user_name",name.getText().toString().trim()));

                                                    nameValuePairs.add(new
BasicNameValuePair("user_pass",password.getText().toString().trim()));


                                                    httppost.setEntity(new
UrlEncodedFormEntity(nameValuePairs));

                                                    ResponseHandler<String>
responseHandler = new BasicResponseHandler();


                                                    final String response =
httpclient.execute(httppost, responseHandler);

                                                    System.out.println("Response :
" + response);



                                                    //HttpPost httppost0 = new
HttpPost("http://10.0.2.2/OCTSC/Admin/App/Project_Informations.php");

                                                    HttpPost httppost0 = new
HttpPost("http://192.168.43.105/OCTSC/Admin/App/Project_Informations.php");
```

```
                                                    httppost0.setEntity(new
UrlEncodedFormEntity(nameValuePairs));
                                                    ResponseHandler<String>
responseHandler0 = new BasicResponseHandler();
                                                    final String response0 =
httpclient.execute(httppost0, responseHandler0);
                                                    System.out.println("Project
Informations Response : " + response0);


                                                    //HttpPost httppost1 = new
HttpPost("http://10.0.2.2/OCTSC/Admin/App/Owner_Informations.php");
                                                    HttpPost httppost1 = new
HttpPost("http://192.168.43.105/OCTSC/Admin/App/Owner_Informations.php");


                                                    httppost1.setEntity(new
UrlEncodedFormEntity(nameValuePairs));


                                                    ResponseHandler<String>
responseHandler1 = new BasicResponseHandler();
                                                    final String response1 =
httpclient.execute(httppost1, responseHandler1);
                                                    System.out.println("Project
Owner Response : " + response1);


                                                    if(response != null)
                                                    {


                                                    dialog.dismiss();
```

OCTSC = new Db(getBaseContext());

OCTSC.open();

OCTSC.Delete_User_Informations();

OCTSC.Delete_Project_Informations();

OCTSC.Delete_Owner_Informations();

JSONObject jsonResponse0 = new JSONObject(response0);

JSONArray jsonMainNode0 = jsonResponse0.optJSONArray("Project_Informations");

for (int i = 0; i < jsonMainNode0.length(); i++)

{

JSONObject jsonChildNode0 = jsonMainNode0.getJSONObject(i);

//

String prj_id = jsonChildNode0.optString("prj_id");

String prj_code = jsonChildNode0.optString("prj_code");

String prj_name= jsonChildNode0.optString("prj_name");

String type_id= jsonChildNode0.optString("type_id");

```
                                                    String          site_manager_id=
jsonChildNode0.optString("site_manager_id");
                                                    String          prj_description=
jsonChildNode0.optString("prj_description");
                                                    String             holiday_id=
jsonChildNode0.optString("holiday_id");
                                                    String          prj_start_date=
jsonChildNode0.optString("prj_start_date");
                                                    String          prj_end_date=
jsonChildNode0.optString("prj_end_date");
                                                    String          prj_contract=
jsonChildNode0.optString("prj_contract");
                                                    String          prj_est_budget=
jsonChildNode0.optString("prj_est_budget");
                                                    String          prj_add_by_id=
jsonChildNode0.optString("prj_add_by_id");
                                                    String             prj_status=
jsonChildNode0.optString("prj_status");
                                                    String             prj_finish=
jsonChildNode0.optString("prj_finish");
                                                    String          prj_add_date=
jsonChildNode0.optString("prj_add_date");


                                                    System.out.println("Project
Informations :  " + prj_id+prj_code+prj_name+type_id+site_manager_id+prj_description);
                                                    OCTSC.Project_Informations(
prj_id,prj_code,prj_name,type_id,site_manager_id,prj_description,holiday_id,prj_start_date,prj_
end_date,prj_contract,prj_est_budget,prj_add_by_id,prj_status,prj_finish,prj_add_date);


                                                    }
```

```
//////////////////////////////////////////////////////////////////////

                                                    JSONObject jsonResponse1 =
new JSONObject(response1);

                                                    JSONArray jsonMainNode1 =
jsonResponse1.optJSONArray("Owner_Informations");

                                                    for (int i = 0; i <
jsonMainNode1.length(); i++)

                                                      {

                                                    JSONObject jsonChildNode1 =
jsonMainNode1.getJSONObject(i);

//////////////////////////////////////////////////////////////

                                                    String cus_id =
jsonChildNode1.optString("cus_id");

                                                    String prj_id =
jsonChildNode1.optString("prj_id");

                                                    String cus_name=
jsonChildNode1.optString("cus_name");

                                                    String cus_pass=
jsonChildNode1.optString("cus_pass");

                                                    String cus_phone=
jsonChildNode1.optString("cus_phone");

                                                    String cus_email=
jsonChildNode1.optString("cus_email");

                                                    String cus_address=
jsonChildNode1.optString("cus_address");

                                                    String id=
jsonChildNode1.optString("id");

                                                    String cus_add_date=
jsonChildNode1.optString("cus_add_date");

//////////////////////////////////////////////////////////////
```

```
System.out.println("Owner Informations : " +
cus_id+prj_id+cus_name+cus_pass+cus_phone+cus_email);

OCTSC.Owner_Informations(cus_id,prj_id,cus_name,cus_pass,cus_phone,cus_email,cus_addre
ss,id,cus_add_date);

                                                                    }

//////////////////////////////////////////////////////////////////////////

                                                                    JSONObject jsonResponse =
new JSONObject(response);

                                                                    JSONArray jsonMainNode =
jsonResponse.optJSONArray("User_Informations");

                                                                    for (int i = 0; i <
jsonMainNode.length(); i++)

                                                                    {

                                                                    JSONObject jsonChildNode =
jsonMainNode.getJSONObject(i);

                                                                    String user_id =
jsonChildNode.optString("user_id");

                                                                    String user_na_number =
jsonChildNode.optString("user_na_number");

                                                                    String user_phone=
jsonChildNode.optString("user_phone");

                                                                    String user_email=
jsonChildNode.optString("user_email");

                                                                    String user_address=
jsonChildNode.optString("user_address");

                                                                    User_Type=
jsonChildNode.optString("user_type_id");

                                                                    String user_pic=
jsonChildNode.optString("user_pic");
```

```
String id= jsonChildNode.optString("id");

String user_add_date= jsonChildNode.optString("user_add_date");


//System.out.println("Project Informations : " + prj_id+prj_code+prj_name+type_id+site_manager_id+prj_description);


if(user_pic !=null)

{

//imgurl ="http://10.0.2.2/OCTSC/Admin/Documents/Users_Pic/"+user_pic;

imgurl ="http://192.168.43.105/OCTSC/Admin/Documents/Users_Pic/"+user_pic;

try

{

URL url = new URL(imgurl);

InputStream input = url.openStream();

try {


File storagePath = Environment.getExternalStoragePublicDirectory(Environment.DIRECTORY_DOWNLOADS+"/MyDocuments");

OutputStream output = new FileOutputStream (new File(storagePath,user_pic));

try {
```

```
                byte[] buffer = new
byte[2048];

                int bytesRead = 0;

                while ((bytesRead =
input.read(buffer, 0, buffer.length)) >= 0)

                {

                   output.write(buffer,
0, bytesRead);

                }
              } finally {
                output.close();
              }
            } finally {
              input.close();
            }
            } catch(Exception e)
            {
              System.out.println("error
in sd card "+e.toString());

            }


System.out.println("IMG : " + imgurl);

        }
        else
        {

System.out.println("IMG : " + imgurl);

        }
```

```
OCTSC.User_Informations(user_id,name.getText().toString().trim(),password.getText().toString
().trim(),user_na_number,user_phone,user_email,user_address,User_Type,user_pic,id,user_add_
date);


OCTSC.close();


if(User_Type.equals("3"))
                                                    {
                                                      dialog.dismiss();
                                                      Intent intent = new
Intent(Login.this,Civil_Eng_Main.class);
                                                      startActivity(intent);
                                                      Login.this.finish();
                                                    }
else
                                                    {
                                                    dialog.dismiss();
                                                    Intent intent = new
Intent(Login.this,Main.class);
                                                    startActivity(intent);
                                                    Login.this.finish();
                                                    }
}



                                                    }
```

```
if(response.equalsIgnoreCase("
Not"))

{

System.out.println("Login  Not
Done :" + "Not Done");

dialog.dismiss();

showAlert();

}

                    }

  catch (Exception e)

                    {

          return null;

        }

  return null;

                    }

protected void onPostExecute()

{

  dialog.dismiss();

}

}

public  static  class
CheckNetwork

{

   private  static  final  String
TAG = CheckNetwork.class.getSimpleName();
```

```
public static boolean isInternetAvailable(Context context)
{
    NetworkInfo info = (NetworkInfo) ((ConnectivityManager)
context.getSystemService(Context.CONNECTIVITY_SERVICE)).getActiveNetworkInfo();
    if (info == null)
    {
        Log.d(TAG,"no internet connection");
        return false;
    }
    else
    {
      if(info.isConnected())
      {
          Log.d(TAG," internet connection available...");
          return true;
      }
      else
      {
          Log.d(TAG," internet connection");
          return true;
      }
```

```
        }
    }
}
public void NOInternet(){
Login.this.runOnUiThread(new
Runnable()
  {
     public void run() {
          AlertDialog.Builder
builder = new AlertDialog.Builder(Login.this);
          builder.setTitle("No
Connection!");
builder.setMessage("Mobile
Data not Active please check your connectivity !")
.setCancelable(false).setPositiv
eButton("OK", new DialogInterface.OnClickListener()
               {
                  public       void
onClick(DialogInterface dialog, int id)
                  {
                  }
               });
          AlertDialog    alert    =
builder.create();
          alert.show();
     }
```

```
                                                    });
                                                }
////////////////////////////////////////////////////////////////////////////////////////////////
                                                public void showAlert(){

                                                Login.this.runOnUiThread(new
Runnable()

                                                  {
                                                     public void run()
                                                     {
                                                AlertDialog.Builder builder =
new AlertDialog.Builder(Login.this);

                                                builder.setTitle("Error");
                                                builder.setMessage("Wrong
username/password !")

                                                .setCancelable(false)
                                                .setPositiveButton("OK", new
DialogInterface.OnClickListener()

                                                {
                                                public void
onClick(DialogInterface dialog, int id)

                                                                {


                                                                }
                                                            });
                                                AlertDialog alert =
builder.create();

                                                alert.show();
```

```
                }
            });
        }
    }
```

C.V

Mohammed Abuelgassim Hussein Ahmed

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OBJECTIVE:

Seeking a job opportunity with a well organized firm where I can cultivate my talents, develop my skills, and gain experience.

EDUCATION:

- 2005-2008 High School Certificate of Secondary Education from Mohammed Alsaid Albarbri High School, Port Sudan, Sudan.
- 2008-2012 B. Sc. (Honor) in Computer Science at Future University (Computer Man Previously), Khartoum, Sudan.

- 2015-Now Doing Master degree in Information System at Future University (Computer Man Previously), Khartoum, Sudan.

SKILLS:

- Ability to work under pressure.
- Good command of English written and spoken.

- Good communication skills.
- I am a self-motivated person and can make effort depending on my enthusiasm, tendency for success and quick learning.
- I am so social and can fit easily in a new environment.
- Advanced operator of computer applications (Microsoft Office (Word, Access, PowerPoint, and Front page), Internet).
- Know HTML, CSS, PHP, and MYSQL.
- Known basics in Programming Android Applications.
- Can work individually or as a part of a team.
- Potential for growth within an organization.
- Have Some Experience In Game Design and Game Programming.
- Using Unity3d Engine for Game Development.
- Work under Linux platform.
- Quick learner.
- Dreamer.

Hobbies and Interests:

- Cyclist and interest in riding a long distance and traveling by bicycle.
- Reading, but not always from time to another.
- Interest in knowing other people cultures.
- Running.
- Surfing the Internet.
- Football from time to time.

LANGUAGES:

English & Arabic .Fluent

PROJECTS:

Student Disk (SDFU Android App) – Future University

E-Library (Technical Support) – Future University

Project Unit (Technical Support) – Future University

Online Timetable (Technical Support) – Future University

MEMBERSHIPS:

At Future University Department of Computer Science

At Sanhory Technology Company

At Center of E-Learning and Software Development Unit.

MISC. INFORMATION:

- Date of Birth: 04 November 1991.
- Nationality: Sudanese

Duties:

Final Project: Multimedia Education System For Deaf And Hear Impairment Children (Using Dark Basic professional and some multimedia tools like Photoshop, Fps creator, Movie Maker, 3D MAX, ProShow Producer.

24 month's training in Center of E-Learning and Software Development (CESD) at Future University.

Android Developer at Center of E-Learning and Software Development (CESD) at Future University.

REFERENCE:

- Director of Center of E-Learning and Software Development (CESD)

  Eng: Omer Emad Bakhit Hamed

  Future University, Sudan

  Mobile: 0907455442

- Head of Computer Science Department

  Us: Zeinb Mohammed Sedahmed

  Future University, Sudan

  Mobile: 0912254606

- Head of Project Unit Department of Computer Science

  Us: Mohammed Abdalwahab

  Future University, Sudan

  Mobile: 0912420666