COMSATS University Islamabad (CUI)

Project Proposal

(Scope Document)

For

Smart Construction Manager

Version 1.0

By

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Bachelor of Science in Computer Science (2018-2022)

SCOPE DOCUMENT REVSION HISTORY

No.	Comment	Action

Supervisor Signature:

Date:

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Project Category:

- **B-**Web Application/Web Application based Information System.
- **E-** Smartphone Application

Abstract

To develop a One Window Solution for the construction process of housing in the state and keeping in view the incumbent government's housing and construction policies & packages to minimize the time & effort for the construction process and ensure transparency. This solution also addresses unexpected turn of events in the fiscal policies caused by the global pandemic (COVID-19). It also ensures the safety of people regarding the SOPs. Smart Construction Manager is an all-rounder application addressing basic house construction needs.

1 Introduction

The different government as well as private bodies of the state are moving towards automation. The technological reforms provide an easier access to public to avail their services. The records of an individual can be accessed in a few seconds as the NADRA databases have been regularized, the physical existence of records is minimal.

Similarly, the process of communication has been eased with the advancement of telecommunications, currently there are 5 major telecom companies authorized by PTA.

The records of Active Taxpayers in Pakistan can be viewed on the FBR website which once used to be a tedious task.

Reforms in the private sectors have also took a turn for more better, efficient, and easier access. The private & the private – limited companies function on the national as well as international scope due to the technological advancements.

The banking sector comprising both public and private banks have the whole dependency on a 24-hour active functioning system.

The government organizations such as the development authorities of different cities have introduced the concepts of One-window operations to streamline the working process, our project is providing faster and easier access to this operation.

2 Problem Statement

The process of construction starts with owning the piece of land. The ownership of plot can be achieved by buying the land directly from development authority. Or the land ownership can be transferred from one person to the other. People look for property dealers who then search for the land as per user requirements. When they find the required land, they buy it and move towards construction. [1]

After you have the land, you must apply to the respective development authority for the approval of map for the construction site. The procedure of approval involves applying to the development authority then wait for response. You may have to wait for weeks because the process in most development authorities is manual. You must physically submit handwritten application. When your application is accepted you then submit the required documents. Then you have the approval for the construction.

The construction procedure starts with hiring people for different tasks. People may hire a single construction company which will do all the work of construction until the construction is complete. Some may prefer hiring labors themselves. Either way, searching for workers is time consuming. And sometimes the people hired for work may not perform well or the hirer may not pay them well.

During the construction, development authorities keep sending their employees to keep in check the construction procedure. They verify the items used for constructions are of good quality. And they also keep in check that if the approved map provided in the start is followed.

They also charge money for each visit. And provide confirmation if the procedure is smooth. These confirmations are later required to register the constructed site by your name.

After the construction is done, people will need the daily utility services. These services are generally acquired from government bodies. These can be electricity connections, Sui Gas connections and Water Connections etc. When people apply for these connections, they again must physically visit the respective offices to submit their applications. Also, it is not compulsory for people to apply here after construction. People can apply during construction just after land approval.

3 Problem Solution for the Proposed System

Smart Construction Manager will provide user the interface to search for the land in their respected areas. People who want to sell the land can post their adds and then the buyer can contact them. User can also hire a property dealer through our app and ask him to search for the land.

After users have the ownership of the land, they can apply to their respective development authorities for map approval. For this, we must apply to the respective development authority. User will have option to submit this application through app. After that they can continue with the submission of physical documents.

When the construction process starts, users will now have the option to hire people for different tasks. User can hire construction companies through our application. Or the user can hire labor directly. User will also have the option to buy equipment for construction through our application. These items can be Cement, Bricks and Other construction materials.

During the construction, we are supposed to inform development authorities to come at the construction site and verify the process. This must be two- or three-times during construction at different stages. We can request the development authorities through our application. Also, we will see the confirmation and progress on our app.

After the construction is done or after the land is approved, people can send request to government institutions for utility services.

Related System Analysis/Literature Review

Table 1: Related System Analysis with Targeted Project Solution

Application Name	Weakness	Proposed Project Solution
• Zameen.com	• Does not deal with government bodies. • Outsourced labor is required. [2]	• Deals effectively with government bodies through separate portals. • Labor can be hired through the application
• Graana.com	• Dedicated Solely for real estate. • Utility services not provided [3]	• Multi-purpose provides real estate, contractors, labors, builders. • Utility Services included.
• LDA (Lahore Development Authority) Insaaf Portal	• Limited for Lahore City [4]	• Scalable to multiple development authorities

4 Advantages/Benefits of Proposed System

- Ease in Applying for Land Approval
- Finding Construction Companies
- Contractors and Labors
- Ease in construction process
- Easily Apply for Daily Life Services (Electricity, Sui Gas etc.)
- Easier inter-process communication.
- Updates on Fingertips regarding Application Process.
- Hire Professionals for home décor.
- Ensure transparency.
- Time Efficient

5 Project Scope

System will provide a one window application and act as agent of communication between construction companies, user, and government bodies. The user will provide the required information to the system the system will authenticate the user. User will submit request to respective organization (depending upon the location of project) & The construction company. The authorities and the industries will accept the request. Design and Layout will be sent by user. After review authorities and industries will generate the response.

5.1 Government Organizations & Construction companies:
- User will be provided an interface for Government organizations & companies.
- User will submit request to respective organization (depending upon the location of project) & The construction company.
- The authorities and the industries will accept the request.
- Design and Layout will be sent by user.
- After review authorities and industries will generate the response.

5.2 Foreign Pakistani & Construction companies:
- The overseas Pakistani can have access to the same utilities as a local Pakistani.
- His registration will be done through his ONIC (Overseas National Identity Card)
- He can strike a deal with any construction company of his choosing, however, to ensure transparency a local relative might also be registered to handle the project physically.
- The process will be same as mentioned above.

5.3 Foreign Pakistani & Development authority:
- Registration
- Application for design approval
- Blueprint
- Get Updates
- Design Approval

5.4 Foreign Pakistani & Utility Services:
- Registration for the service
- Send Location
- Service availability
- Approval

5.5 Local Pakistani & Utility Services:
- Registration for the service
- Send Location
- Service availability
- Approval

5.6 Local Pakistani & Construction companies:
- Registration process will be same as heading 5.1.
- NIC will be used for registration here.
- Further process same as 5.2

5.7 Local Pakistani & Development authority:
- Registration
- Application for design approval
- Blueprint
- Get Updates
- Design Approval

5.8 Owner and Builders:
- Owners can hire builders through the portal.
- Contract will be formed.
- Payment

5.9 Builders and Labor:
- Builders can hire their own labor or outsource the project.
- The different kinds of labor in the construction process h will be hired.
- The construction process will be followed by the builders.

Incase owner wants to fire the builder he has to submit the subsidy to the company depending upon the duration builders were hired.

6 Modules

6.1 Module 1: Land Transfers and Ownerships
- The first thing user needs is to own a land.
- User can buy land from development authorities or other people.
- User will need to transfer the ownership which will require interaction with development authorities.

6.2 Module 2: Land Approval
- User will need to get the approval for construction after owning the land.
- This module will deal with user sending approval requests to respective development authorities.

6.3 Module 3: Buy and Sell
- After land is approved for construction, user now requires equipment and manpower for construction.
- Login/signup: Users will set up their accounts, providing necessary information. Once the sign up is complete the user can login.
- Post an Add: User can post add of items or services they want to sell.
- Search Adds: User can search items or services they require.
- Chat box: A chat box feature will be implemented in the Smart Construction Manager to ensure smooth communication between the patron and the client.
- Review (Ratings): After service delivery the user (buyer) will be able to review the service based upon the work delivered. User will rate the patron based upon a convention, from 5 star to being the highest and 1 to lowest. The ratings will add to the Patron's account and level him up in the search results.

6.4 Module 4: Construction Supervision
- Receive intimation from Development Authorities: The supervisory officer belonging to any cadre will be delivered the intimations Letter issued to him.
- Site inspection at different stages: The user will get an update on an upcoming site inspection of the property.
- Keep record of inspection: The app will keep the record of all the site visits by the officer, including date and time of inspection (TOI).
- Discrepancy Report: Incase the officer sees at the site; a discrepancy report update will be delivered to the user.

6.5 Module 5: Utility Services
- Send Request for Services Connection: The user will be given the option to generate a request for the utility service. He will be issued a ticket against application.
- Send Requirements: The basic requirements needed for the application of services include:
  - Location: The address of the site.
  - Land Approval Certificate: The Land approval certificate by the concerned housing society/ Sector.
  - Bill of Nearest Home: The copy of a bill from the neighboring houses, to ensure the availability of service in area.
  - Urgent/Normal: To generate an application on priority basis or normal.
  - Demand Notice (Sui Gas Only): Demand Notice for the supply of Gas for the property.
- Get Updates: The user will be constantly updated about the status of their application via email and text about the status of the pending service.
- Approval: The approval status of the request will be delivered to user via text and email.

6.6   Module 6: Requests Management

- •   Receive Requests from User: This Feature will receive the requests generated from the user.
- •   Send Requestee Update: This Feature will send the requests generated by the user to the concerned recipient.
- •   Approve/Disapprove and Terminate Request: This Feature will allow user (Authorities & Services) to approve/ disapprove a request. In addition, a termination of request feature during the approval process will be included in this feature.
- •   Search requests: Users (Patron & Client) will be able to search the generated requests.
- •   Delete Requests: Users (Patron & Client) will be able to delete the generated requests.
- •   Update Request: Users (Patron & Client) will be able to update the generated requests.

7   Limitations

- •   Attested documents cannot be submitted which are essential for the process.
- •   Requires internet connection for buy and sell.
- •   Locally available only.

8   Software Process Methodology

We will be following Modified Waterfall process methodology. Modified Waterfall enables the phases to overlap when needed.

8.1   Planning
Basic goals and objectives to be achieved through the project are defined in this phase.

8.2   Requirement Analysis
We gather the requirement through questionaries and forms. Then we consult our supervisor regarding the requirement. If he approves it, we then move to designing.

8.3   Design
We design the frontend using graphical tools like Adobe Photoshop. Then according to our frontend, we will design flow of backend using Microsoft Visio.

8.4   Coding
We will implement our design using various Programming languages like JavaScript and Java. And multiple techniques like Object Oriented Programming.

8.5   Testing
Testing will be taken out in different stages. We will test the major functionalities of each module. Then we will improve our minor functional requirements as we go. We will provide test cases against each use case to ensure smooth working of Smart Construction Manager.

8.6   Documentation

We will pen down everything related to our project using Microsoft Word. And create a beautiful presentation along with it.

9   Tools and Technologies

Table 2: Tools and Technologies for Targeted Project

	Tools	Version	Rationale
Tools And Technologies	MS Visual Studio	2019	IDE
	Adobe Photoshop	CSC 6	Design Work
	MS Word	2019	Documentation
	MS Power Point	2019	Presentation
	IntelliJ Idea	2020	IDE
	PyCharm	2020	IDE
	Android Studio	2020	IDE
	Eclipse	2020	IDE
	Pencil	2.0.5	Mockups Creation
	Technology	**Version**	**Rationale**
	Java	11.0	Programming language
	SQL	2013	Query Language
	Html	5	Web Development
	CSS	3	Styling (Cascade Stylesheet)
	JavaScript	2019	Programming Language
	Bootstrap	4	Framework
	jQuery	3.1.5	JS Library
	Node.js	12.0	JS Library
	React	17	JS Library
	React Native	0.62	Hybrid Development
	Firebase	Updated	DBMS

10   Project Stakeholders and Roles

Talha Ejaz will be dealing with the management systems at the development authorities and government sectors. While Waleed Butt will be dealing with modules 1 to 3 which involve app development. Dr. Ashfaq Farooqi will be our guide in the process.

Table 3: Project Stakeholders for Targeted Project

Project Sponsor	*COMSATS University Islamabad*
Stakeholder	- Talha Ejaz - Waleed But - Project Supervisor Name: Dr. Ashfaq Hussain Farooqi - Final Year Project Committee: Evaluation of project

11   Team Members Individual Tasks/Work Division

Table 4: Team Member Work Division for Targeted Project

Student Name	Student Registration Number	Responsibility/ Modules
• *Talha Ejaz*	• *SP18-BCS-161*	• *(Module4-Module6)*
• *Waleed Butt*	• *SP18-BCS-170*	• *(Module1-Module3)*

12   Data Gathering Approach

We will use techniques like interviews and questionaries through Google forms to grasp the general requirements for the construction process. First approach the domain expert to thoroughly understand the functionality of this proposed system. Preparing basic prototypes and using documentation techniques like use cases and class diagrams for the further discussions in the interviews. Then we will do group discussions for brainstorming.

13   Concepts

In this project we will be learning

- •   One Window Application
- •   Mobile Application Development (React Native)
- •   Web Development (HTML, CSS, and JavaScript)
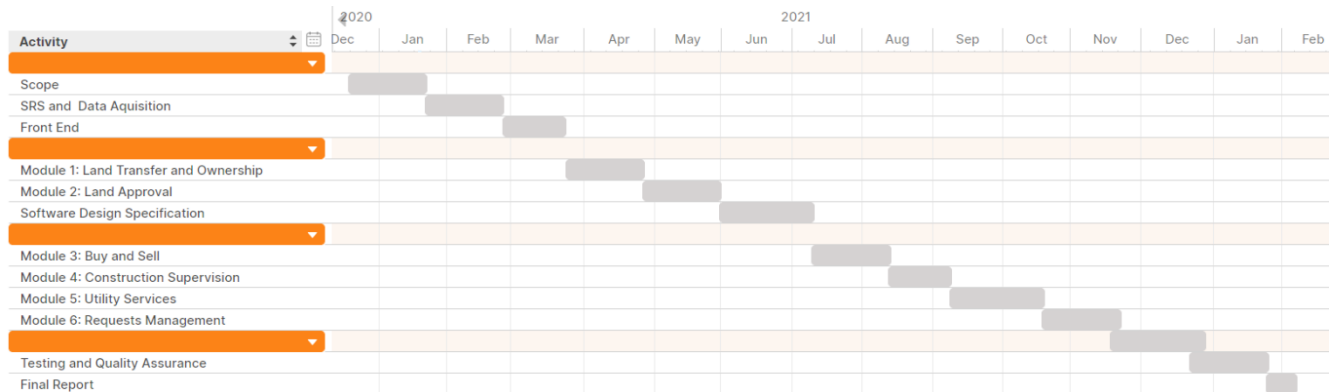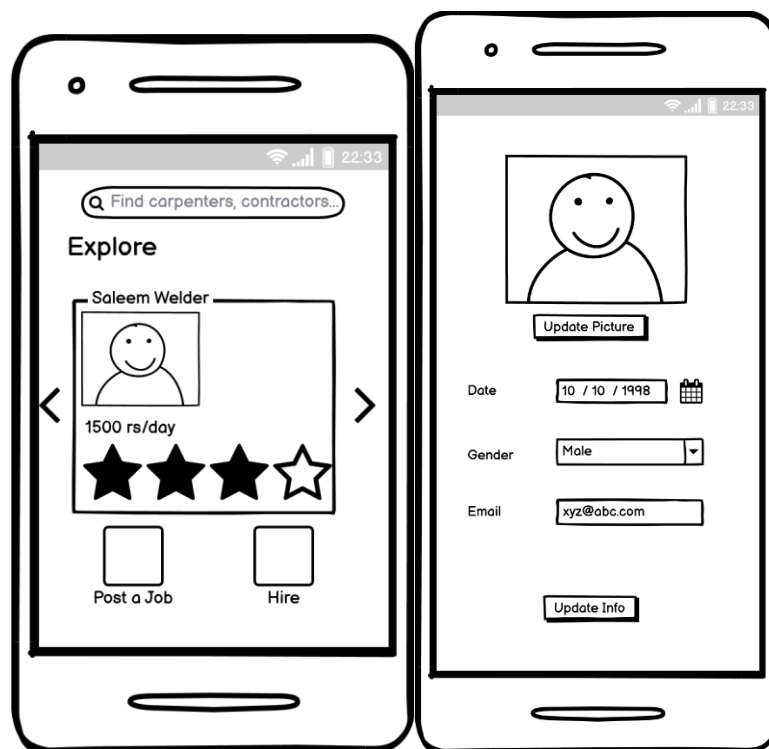- •   Google Firebase

14   Gantt Chart

Figure 1: Gantt Chart of Targeted Project

15   Mockups

ID^	Name	Adress	Respond
12321	Giacomo Guilizzoni Founder & CEO	Plot # 1231 Street 41 G-11/2	Accepted
12312	Marco Botton Tuttofare	Plot # 1231 Street 41 G-11/2	Accepted
42312	Mariah Maclachlan Better Half	Plot # 1231 Near Chandni chowk Rawalpindi	Rejected
12322	Valerie Liberty Head Chef	Plot # 1231 Near Chandni chowk Rawalpindi	Accepted
12321	Kashif Jababr	Plot # 1231 Near Chandni chowk Rawalpindi	Accepted
34542	Mustafa Arabi	Plot # 1231 Near Chandni chowk Rawalpindi	Waiting..

16   Conclusion

Smart Construction Manager will aid the public with ease in process of construction. Endogenous and exogenous factors affecting the efficiency and transparency between government institutions and service providers will be ensured. The extensive research and practical implementation of Smart Construction Manager will provide us with the experience of Mobile and Web Application development, a general idea about one window application and its implications.

17 References

[1] CDA, "FAQs - CDA," CDA, [Online]. Available: http://www.cda.gov.pk/resource_center/faqs.asp#faq1.

[2] Zameen, "Zameen Blog," 2021. [Online]. Available: https://www.zameen.com/blog/.

[3] Graana, "Pakistan's Smartest Property Portal," Graana, [Online]. Available: https://www.graana.com/.

[4] LDA, "Lahore Developement Authority," LDA, [Online]. Available: https://www.lda.gop.pk/page.php?p=TmpReg==.

18   Plagiarism Report