ABSTRACT

In today's fast moving lifestyle, we often come across a lot of difficulty in maintaining and clearing of recyclable wastes. A person has very minimal time to think and go about it. So to overcome such problems, a company called MyScrapKart came up with an idea of creating an interface where users can sell scrap for the right value by ensuring the accurate weight with EMW i.e. Equivalent Mud Weight or accurate weight. The company needed an android application for android users to ease the procedure of selling the scrap materials. So to overcome this need, the responsibility to create an android application for MyScrapKart company was taken up. The project was developed to help the city to be cleaner and healthier, the application also helps people to save lot of time in disposal of waste and also provides an opportunity to gain easy money from the scrap sold which directly contributes to Swachh Bharat. Thus the tag line Trash to Cash.!

As per the company's requirements, the objectives of the application were taking time, location and date from the user and sending the request to the company about the collection of the scrap. Also, providing facility to the user to click photo of the scrap materials collected and sending it to the company. With these requirements as a base, the application was developed including Google map, date and time fetcher and an additional application where the employee can send bill details to the user after collection of scrap.

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Chapter 1

INTRODUCTION

The MyScrapKart application is an application intended to use on the Android platform. While the MyScrapKart mobile application is the main focus of the project, there is also a server-side application to help the client company. The scope of the project encompasses both server and client side application functionalities, so both aspects are covered in detail within this document. The server side application refers to another android application which is used by the employees of MyScrapKart company collecting scrap to ensure that the transaction has been completed. There are mainly two objectives which describes the complete working of this project. One is to provide a transparent and easy to use platform for selling the scrap. Second is to provide functionalities to both company and customer to buy and sell the scrap materials that are produced at customer's locality respectively. In this section, the project overview, what made the team make up this project i.e. the motivation and problem statement is discussed. Followed by chapter 2 with requirement analysis which has subsections talking about system model, giving details about what requirements the company asked i.e functional requirements and non-functional requirements specifying criterias that can be used to judge the operation of a system and database requirements. Followed by chapter 3 with system design and architectures. Finally the document looks into the results of the project in chapter 4 and the conclusion in chapter 5.

1.1 Project Overview

The MyscrapKart android application is composed of two main components: a client-side application which will run on android handsets, and a server-side application which will support and interact with various clients. The application shall be used mainly in metropolitan cities to have clean environment and the world a better place to live in.

1.2 Motivation

In this age of environmental concern individuals are outwardly interested in the healthy state of their surroundings. As populations increase and we become more connected with our environment and each other through global communication, commerce and transportation, that interest also increases. Our desire for a clean environment represents a powerful sense

of destiny and hope for the future. The company for which we created the android worked in this context. The company's main intention is to collect the scrap materials from the customer's place and recycle them. This would provide cash to the customer selling the scrap material and also lead to a cleaner environment. There are many articles related to making our environment clean by collecting scrap such as YM Reddy's article [3] in 2015 about how collection of scrap for bangaloreans has become easier now. Also, Devika Kher's article [4] in the same year regarding what connects households with raddiwalas.

1.3 Problem Statement

To develop an android application for MyScrapKart company that helps in buying and selling scraps for standard price.

Chapter 2

REQUIREMENT ANALYSIS

This chapter specifies the needs and conditions to be met for the project to be framed as complete software product. We take into account all the requirements of the various stakeholders and users. The chapter also discusses the ideas and design issues from a software perspective. In section 2.1, the chapter talks about the system model. Followed by section 2.2 with functional and section 2.3 with non-functional requirements. Last section 2.4 giving details about database requirements.

2.1 System Model

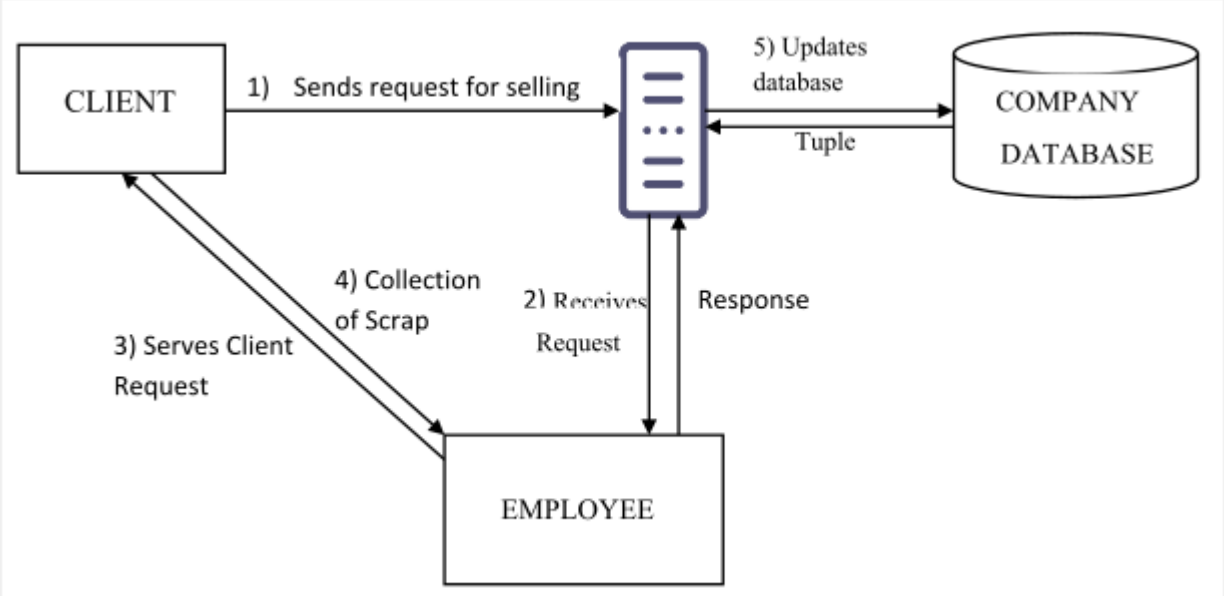

Figure 2.1: System Model

A system architecture or systems architecture is the conceptual model that defines the structure, behavior, and more views of a system.

In the above design we have the following flow as follows:

1. Client's request of selling scrap materials is fetched and it is stored in the company's database.

2. Employees are informed to fulfill the request of the customer. Work is distributed among employees to collect the scrap materials. where they meet the customer at the specified location, time and date given by customer.

3. employees serve customer's request at the specified location, time and date given by customer.

4. After collection of scrap materials from the customer, the employee sends bill details to the customer's email address.

5. The response is given to the server by the employee about collection of scrap from the customer. The database is updated stating that the collection is done and also the bill details of the customer is saved.

2.2 Functional Requirements

Functional Requirements are requirements that define specific behavior or functions. For our project, functional requirements are as follows:

- The application should have maps to select address of user.
- The application should have a feature for clicking image of the scrap collected by the user and sending it to the company for reference.
- The application should have feature for selecting date on which the user wishes to sell scrap.
- The application should allow the employee of the company to update database information such as addition of new customers into the database, marking the customer requests that are done, updation of billing information.
- The application should allow the employee of the company to send bill details to the user's email address and notify in the application.

2.3 Non-Functional Requirements

A non-functional requirement specifies criteria that can be used to judge the operation of a system, rather than specific behaviors of the system. For our project, non-functional requirements are:

- Performance Requirements - Performance shall not be an issue because all of our server queries involve small pieces of data. Changing screens shall require very little computation and thus will occur very quickly. Updates to the database shall be reflected quickly. The user app has very less interfaces so computation of changing screens will be very less too.

- Safety Requirements - MyScrapKart shall not affect data stored outside the company database nor will it affect any other applications installed on the user's phone. It shall not cause any damage to the phone or its internal components. The only potential safety concern associated with this application applies to virtually all handset apps: MyScrapKart should not be used while operating a vehicle or in any other situation where the user's attention must be focused elsewhere.

- Security Requirements - The user shall get access to app through signing up by providing necessary information or by logging in through Gmail or facebook. Hence the application is secure. In users App the employee uses their Id for logging into the app.

- Software Quality Attributes - The graphical user interface of MyScrapKart is to be designed with usability as the first priority. The app will be presented and organized in a manner that is both visually appealing and easy for the user to navigate. There will be feedbacks and visual cues such as notifications to inform users of updates and pop-ups to provide users with instructions.

- Business Rules - 1. Costumer's identification proof is requirement when selling the scrap materials to the company. 2. No hazardous materials to be sold (Except for industries). 3. Services to individual houses only during Saturdays and Sundays.

2.4 Database Requirements

An entity relationship model, also called an entity-relationship (ER) diagram, is a graphical representation of entities and their relationships to each other, typically used in computing in regard to the organization of data within databases or information systems. Therefore database requirements of the company is depicted through ER diagram as shown below:

The customer first login to the app from different cities and areas of bangalore. The 'loginInfo' entity has customer details such as customer name, Email id, Phone number, address etc. The 'loginInfo' entity is connected to city entity with 'cityId' and 'loginInfo' is connected to area using 'areaId'. The 'priceList' entity is connected to city using 'cityId' and the 'priceList' entity has attributes as 'idPriceList' , 'item name' , 'itemPrice'.

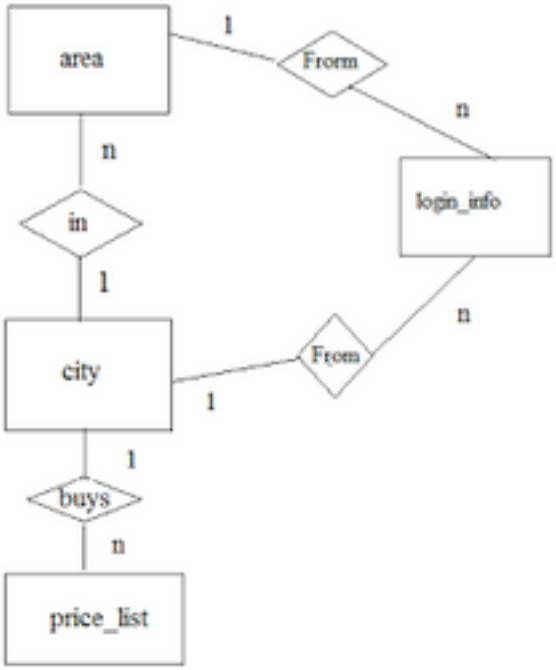

Figure 2.2: ER Diagram

Chapter 3

SYSTEM DESIGN

The goal of this chapter is to inform provide the reader a specification of the design. A brief description of the project's algorithm is made and discussed, along with the API's used in implementing the project. Section 3.1 talks about architectural design which consists of 3-tier architecture. It is followed by section 3.2 showing relational schema of the company and how data is organised in the database. Section 3.3 talks about user interface design swhicyis narrated with the help of wire frame design. Section 3.4 consists of sth em specifications which includes software and hardware requirements of the project. This chapter is concluded with system functionalities in section 3.5 giving description about each module of the android application.

3.1 Architecture Design

Architecture design is a designing concept that focuses on the components or elements of a structure or system and unifies them into a coherent and functional whole, according to a particular approach in achieving the objective(s) under the given constraints or limitations. Architecture design is shown in figure 3.1.

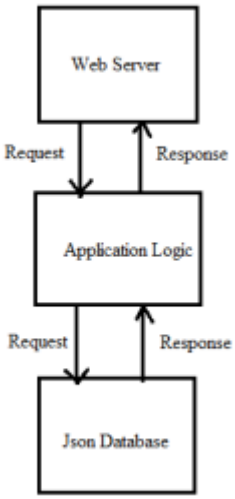

Figure 3.1: 3-tier Architecture

3.2 Data Design

Data Design is an overall process of designing, not just the base data structures, but also the forms and queries used as part of the overall database application within the database management system (DBMS). The process of doing database design generally consists of a number of steps which will be carried out by the database designer. Usually, the designer must:

- Determine the data to be stored in the database.
- Determine the relationships between the different data elements.
- Superimpose a logical structure upon the data on the basis of these relationships.

Within the relational model the final step above can generally be broken down into two further steps, that of determining the grouping of information within the system, generally determining what are the basic objects about which information is being stored, and then determining the relationships between these groups of information, or objects. Relational schema of project is shown below:

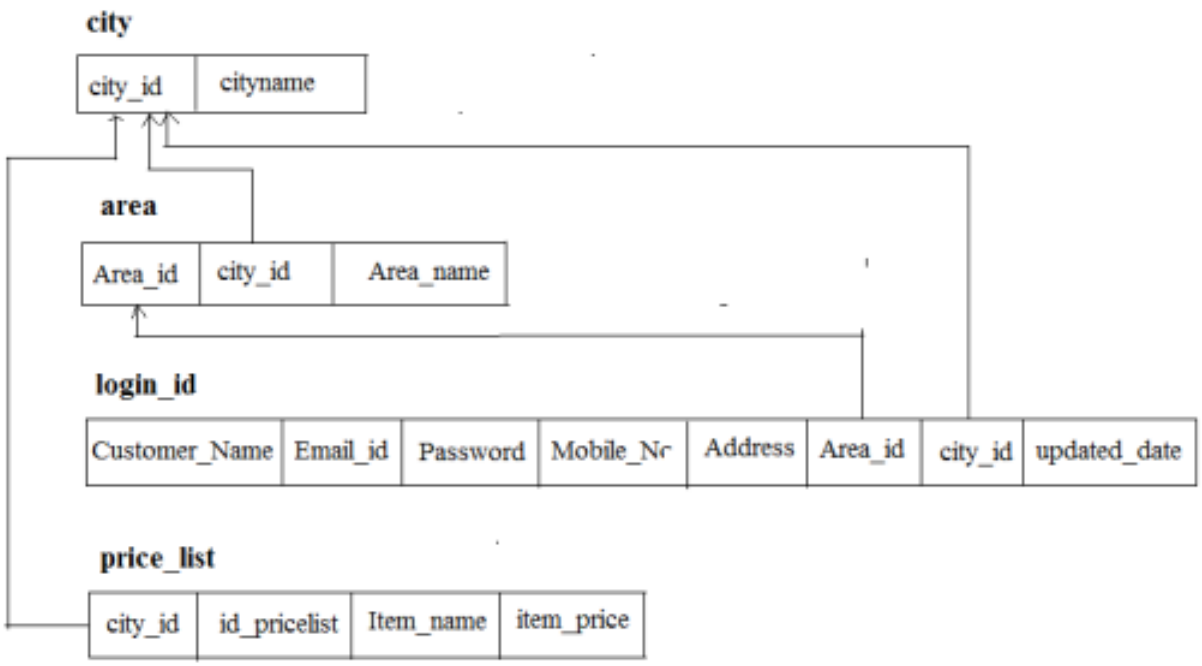

Figure 3.2: Relational Schema

3.3 User Interface Design

User interface design (UI) is the design of user interfaces for machines and software, such as computers, home appliances, mobile devices, and other electronic devices, with the focus on maximizing usability and the user experience. The following shows the UI design of the application:

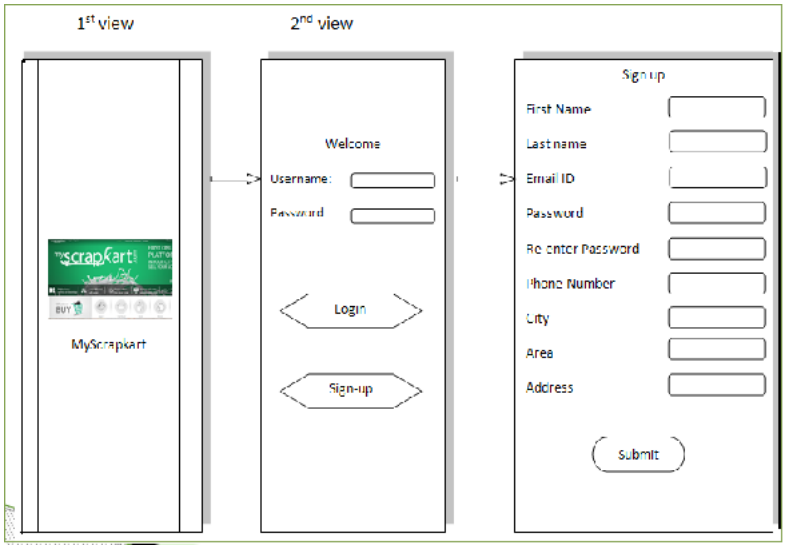

Figure 3.3: Wire frame: Phase 1

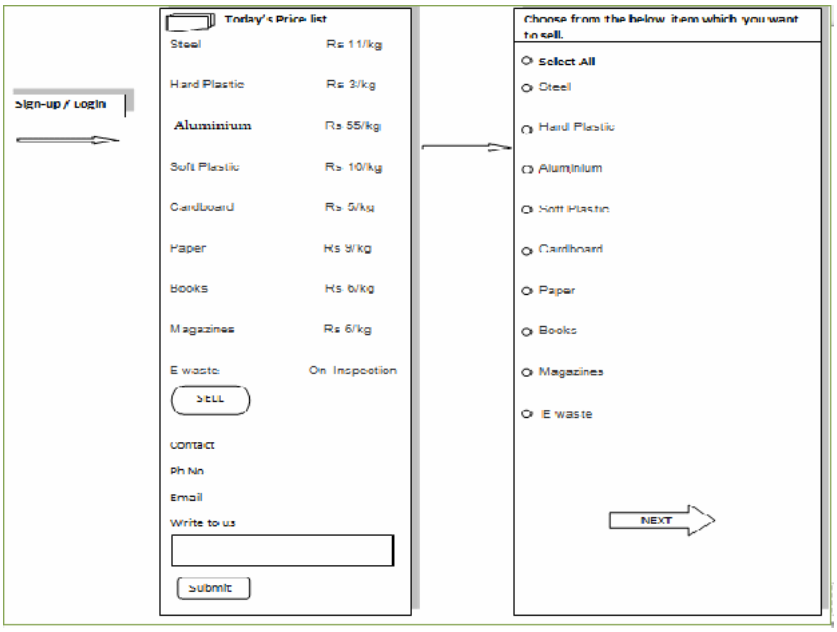

Figure 3.4: Wire frame: Phase 2

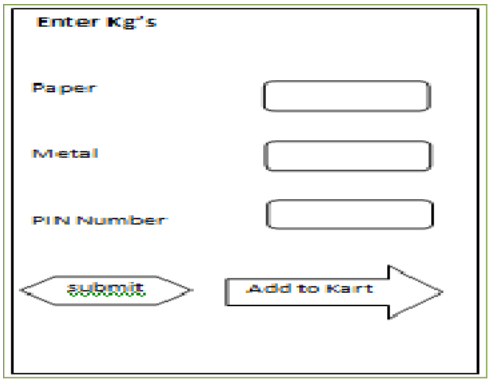

Figure 3.5: Wire frame: Phase 3

3.4 System Specifications

A System Requirements Specification (abbreviated SyRS when need to be distinct from a Software Requirements Specification SRS) is a structured collection of information that embodies the requirements of a system. Subsections 3.4.1 and 3.4.2 talk about software and hardware requirements respectively for the application.

3.4.1 Software Requirements

- Software's used - Android SDK, android studio, Emulator for development.
- Operating System - Any android studio compatible OS (Windows/ Linux/ MacOSX)
- Database - To save the Log-in details, Selling Price, User History in company's database which uses MySQL (Company's database is hosted online).

3.4.2 Hardware Requirements

Device to test: Android Smart phones version 4.3 and above.

3.5 System Functionalities

The system is divided in set of different modules provide individual different functionality as shown below.

3.5.1 Module 1:

- Input: Customer enter his/her login details.

- Processing: Authentication of login details is done by comparing values with database and if no login details then the customer is asked to register.
- Output: Customer is logged in and ready to use the application

3.5.2 Module 2:

- Input: Customer checks the list of materials and sets the date and time for collection of scrap materials
- Processing: Checking the validity of date and time is done.
- Output: The date and time is set for receiving scrap materials from the customer.

3.5.3 Module 3:

- Input: After the setting of date and time, the customer is asked to set the location.
- Processing: The address is validated.
- Output: Address is set.

3.5.4 Module 4:

- Input: Customer details sent to the company's database.
- Output: Based on the details of the customer, the company sends it's employee to serve the customer's request.

Chapter 4

RESULTS AND DISCUSSION

The following images show the results after implementing the android application on the device.

- Page 1: Splash screen. Logo appears in at center. Duration - 3 seconds. As shown in Fig.4.1

Figure 4.1: Company's Logo

- Page 2: Login/ Signup Front-end software. Username and password is entered as input in the form wherein the username can be any name that the user wishes to give comprising of block or small or mixture of both letters and digits and password should be minimum of 5 characters where it can contain any character but not special characters. Display of error message occurs if the username and password doesn't match with the database or else the control goes to the home screen page. As shown in Fig.4.2.

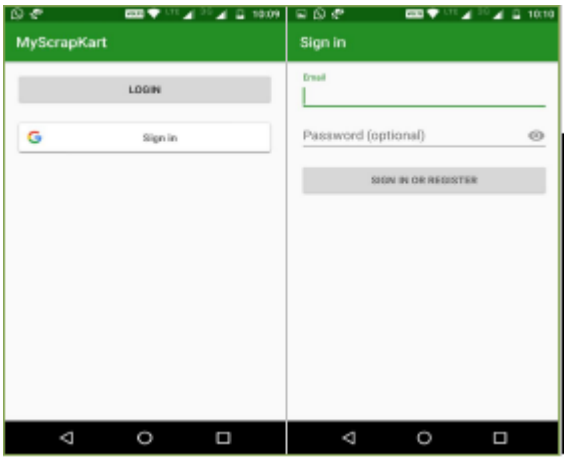

Figure 4.2: Login interface

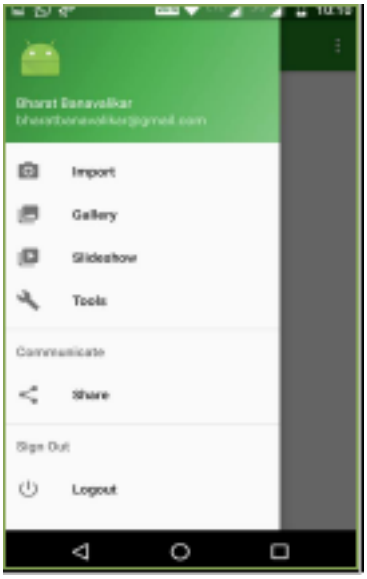

Figure 4.3: Menu bar interface

- Page 3: Menu bar. As shown in Fig.4.3 containing a drawer which contains login information, logout button along with other essential details.

- Page 4: Schedule pickup: Date and time of pickup and address. As shown in Fig.4.4.

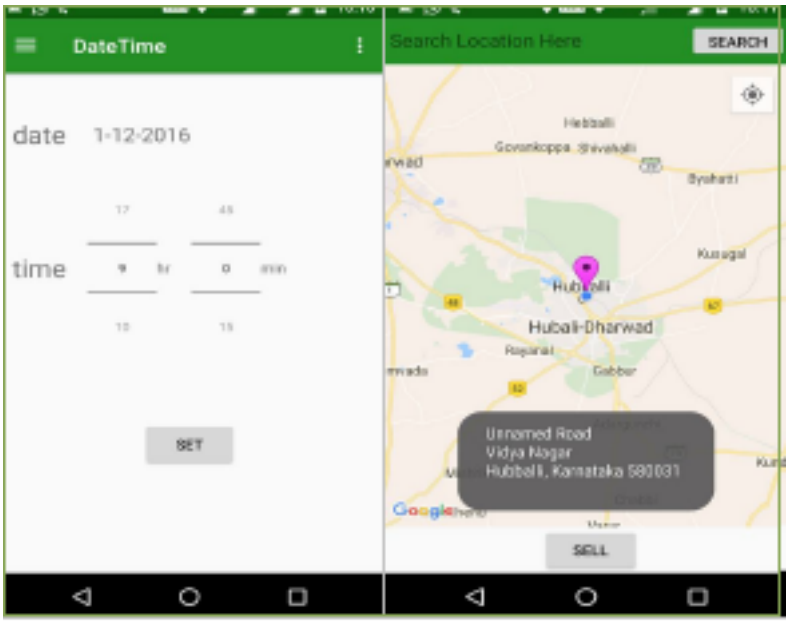

Figure 4.4: Date, time and location fetching interface

- Page 5: Submit button details. As shown in Fig.4.5. The details given above should be stored in a hosting database of company's website.

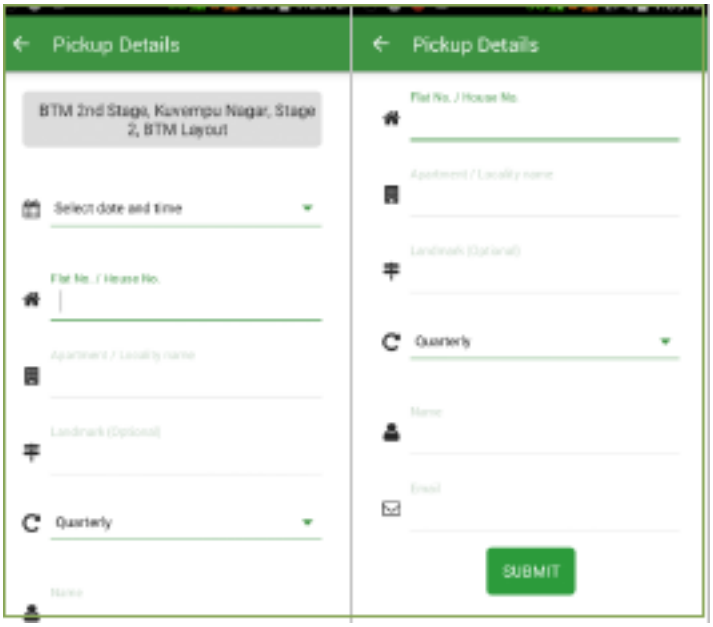

Figure 4.5: Pickup details interface

- Page 6: Quotation page. As shown in Fig.4.6.

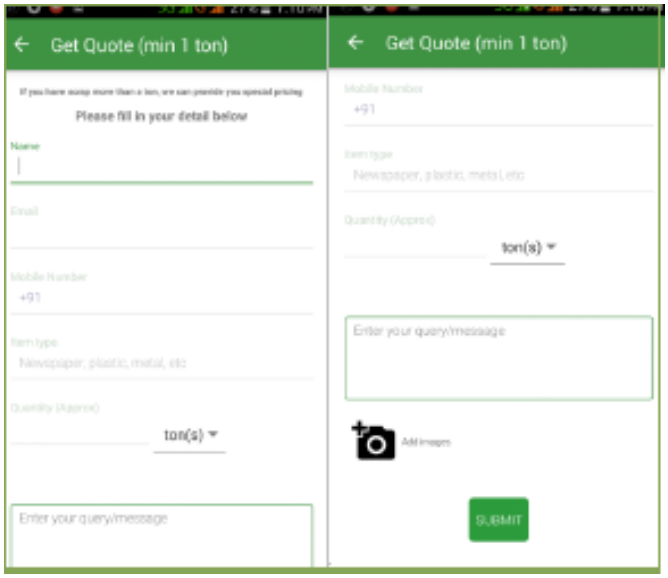

Figure 4.6: Item details interface

Chapter 5

CONCLUSION

Scrap being a waste material is usually thrown away from the households which results it being on roads and locality areas. It is a major problem these days as more and more areas are getting congested with waste and scrap materials. MyScrapKart company took an initiative to solve this problem by buying scrap materials from people and recycling them. Extending this idea an android application was developed to supplement them for this good cause. The company has benefited many customers around Bangalore and now they will be extending their work with the android application.

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[4] Kher Devika. What connects the raddiwalas to the newspaper publishing houses?. 21^{st} July 2015. Available at `logos.nationalinterest.in/whatconnectstheraddiwalastothenewspaperpublishinhouses`.