SIDADIYA

System Requirement Specification

Group 07

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CS3016

Group 07

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Software Requirements Specification (SRS)

Report

Version: (1)   **Date: (06/05/2014)**

Table of Contents

1. INTRODUCTION

1.1. Purpose

The purpose of this Software Requirements Specification (SRS) document is to provide a detailed description of the requirements, specifications and functionalities of the 'Sidadiya' app and the web sites.

This document will cover each of the intended features of the mobile app and the websites, as well as offer a preliminary glimpse of the software application's User Interface (UI). The document will also cover hardware, software, and various other technical dependencies.

1.2. Scope

1.2.1. Final products

The project is mainly directed towards developing 'Sidadiya', the android mobile application for the user (customer) and 'Mudalali', a web based system for the vendors and product owners and another separate site for the customers to view all current offers.

1.2.2. Brief summary

The user of the mobile application is given the chance to include their preferred categories of interests to the system so that they would be able to either search for offers for those types of items, or would get notified about places which have the preferred offers if they are within a specified radius of distance from the customer's current location. The customer also has the privilege of viewing all offers through the site which will clearly categorize them show for the convenience of the user. The vendors will get the opportunity to update their offers on certain product categories in the web based system and advertise their new arrivals on the site.

The application is mainly targeting the local market but in contrast this can also be used globally with minimal adjustments. The vendors will need to get registered and maintain their individual profiles, where as anyone who would download the app will get the benefit of easy access to offers on their favorite products merely through a sign up with Google +.

1.2.3. Goal and Objectives

Goal: To be the pioneer brand in mobile marketing.

The following objectives are expected to be met with the successful implementation of the project.

- **Win a wider range of customer base for the app**

  In the ride to achieve our desired goal, it's our belief that winning the customer base is a predominant requirement for the establishment of the business. Since similar apps are already in the market, it is intended to gain a competitive advantage over the peer apps by attracting the customer with the introduction of unique and interesting features in the meantime.

- **Open up the local customer to a new dimension in the shopping experience**

  In an environment where most customers are used to shop in the same old traditional manner, it is intended to draw their attention towards the much feasible and less time consuming new trend. Giving them an option which adopts to their variant needs with the click of a button would get the customer to a revolutionary experience in shopping.

- **Increase the customer audience of the vendors**

  In order to achieve our prime goal it is very much vital that the vendors of all categories remain keen with the app and attract more vendors to advertise their offers in the site. To gain this target, increasing the customer audience for each vendor appears as a significant task. Introducing all offers to the interested parties and stimulating them to purchase them is quite the objective in this case.

1.3. Acronyms, and Abbreviations

PHP Hypertext Preprocessor

GUI Graphical User Interface

OS Operating system

SRS Software Requirements Specification

HTTP Hypertext Transfer Protocol

SQL Structure Query Language

HTML Hyper Text Markup Language

CSS Cascading Style Sheets

RAM Random Access Memory

1.4. References

1) "Android Push Notifications using Google Cloud Messaging", Android
   Example.[online].Available:
   http://androidexample.com/Android_Push_Notifications_using_Google_Cloud_Mes
   saging_GCM/index.php?view=article_discription&aid=119&aaid=139 [Accessed: May
   04, 2014]

2) " Android Notifications ", Tutorials Point.[online].Available:
   http://www.tutorialspoint.com/android/android_notifications.htm[Accessed: April
   30,2014]

3) " Creating Swipe Views with Tabs ", Android Developers.[online].Available:
   http://developer.android.com/training/implementing-navigation/lateral.html
   [Accessed: March 12, 2014]

4) " Driving route from my location to destination in Google Maps Android API V2",
   Android Map V2.[online].Available: http://androidmapv2.blogspot.com/ [Accessed:
   May 02, 2014]

5) " Android Working with Google Places and Maps Tutorial", Android
   Hive.[online].Available: http://www.androidhive.info/2012/08/android-working-
   with-google-places-and-maps-tutorial/ [Accessed: May 01, 2014]

1.5. Overview

This document is intended for all individuals participating in and/or supervising the 'Sidadiya' project.

Readers interested in a brief overview of the product should focus on the **Introduction** (Part 1), as well as the **Overall Description** (Part 2), which provide a brief overview of each aspect of the project as a whole. These will provide only the non-technical aspects of the project.

Readers who wish to explore the features of 'Sidadiya' in more detail should read on to the **Specific Requirements** (Part 3), which expands upon the information laid out in the main overview. It will also cover the performance, safety, security and various other aspects which are important to users who are not interested in technical details as well.

The **Change Management Process** (Part 4) offers details about the measures which would be taken when controlling the changes and alterations of the requirements and how a situation as such would be handled.

The readers who have trouble finding related information about certain terms and other relevant details should check **Supporting Information** (Part 6), which includes any additional information which does not fit logically into the other sections.

Any reader who wish to seek the approval and the supervisor should look into the **Document Approvals** (Part 5).

2. THE OVERALL DESCRIPTION

2.1. Product Perspective

Sidadhiya will allow users to receive their preferred deals to their Android based phones. This application is a small part of a larger set which will be added on to one at a time. The overall application will allow users to use all of the basic shopping needs from this application.

- App sends application request to GCM and immediately gives response to phone with registration ID.

- Phone sends registration ID to server

- Registration ID sends data to the phone

- Server has updates and sends to GCM
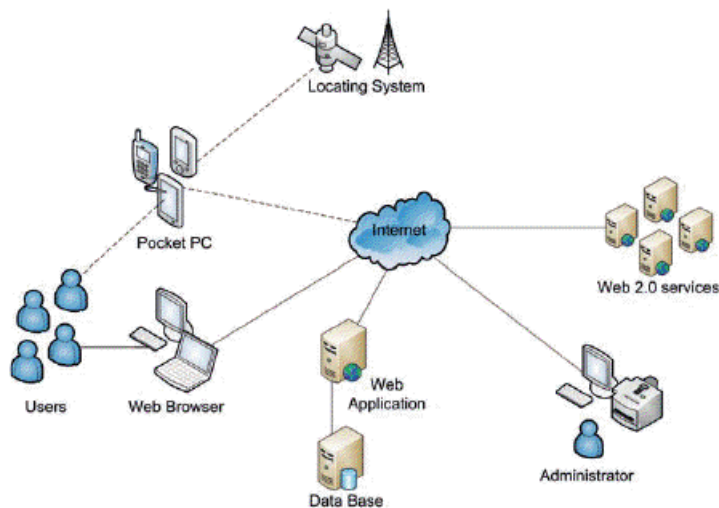
- App pushes data from GCM to device.

Figure 1: Overall System Architecture

2.1.1. System Interfaces

- **Google Map API V2**: To obtain routes between user's current location and the intended destination.

- **Google Places API**: Identify the location of the Vendor. Google location API provides abstract level description of what category a particular building/location belongs to. Location API helps to pin the location on Google Map.

- **GCM**: Push notification service.

- **Google play service**: To get the support of Google Map service to Android device.

- **Hostgator web server**: Need a web server that supports PHP5, APACHE, MySQL/MySQLi

- **Twitter Bootstrap**: As the front end CSS framework. With a lesser number of coding, rich appealing web interfaces can be built. Lightweight and easy to customize.

- **JQuery**: For user interactivity enhancements.

- **GreedDroid**: Android user interface enhancements

2.1.2. Interfaces

- **The logical characteristics of each interface between the deliverables and its users.**

o App and user

  ➢ It is assumed that the user has the basic knowledge on how to install the app after downloading. Instruction set will be given for first time users of the app. People who are willing to download the app can obtain the knowledge from our official website (www.sidadhiya.lk). Complete guide will be provided with images.

o Website and user

  ➢ Website interface is deigned in an easy to navigate manner while giving the user a unique browsing experience. Vendors can sign up filling lesser number

of input fields. Visitors/Customers can browse product based on categories, sub categories, price etc… which is similar to existing websites like wow.lk and mydeals.lk. Hence visitors' logical knowledge is fairly enough when dealing with sidadhiya.lk

➢ Rationale: This will allow concentrated deployment and easy editing of the application on a smaller scale. When we complete all the users should be able to use the service, as reaching more users will increase popularity and utilization.

a) **Aspect of optimizing the interface with the person using the app and websites.**

o App

➢ **Splash screen**: At a quick glance, user can sense the purpose of this app.

➢ **Signup with Google+:** Simple signup screen with Google+ button. User details are obtained using Google+ information. No extra effort needed in signing up.

➢ **List view with image**: User tends to click on the image rather scrolling up and down. This gives more likelihood to go through the deal.

➢ **Easy navigation**: Swipe screens.

o Websites

➢ Basically focusing on using blue and white as the theme colours where it is also given an attention on colour blind people.

➢ **Fixed navigation menu at top**: This will benefit the users who view the website using smartphones and tablets since it is easy to navigate.

➢ **Uniformity throughout the website**: Buttons and icons will have uniformity.

    ✓ Buttons where it needs to get the user's attention are developed in red colour (Cancel etc…)

    ✓ Signup button in green.

    ✓ FontAwesome icon set is being used.

    ✓ Error messages are displayed in red.

    ✓ Mandatory fields are marked in all forms.

    ✓ Validation is done in real-time (Username/Email etc…)

✓ Reset password: Single button where it does not need to submit current and previous password. The intention here is to direct vendor to the website as soon as possible without spending much time on form filling.

2.1.3. Hardware Interfaces

- **App:**
  o **OS Minimum Android Version**: KitKat (Android Version 4.0 or above)
  o **Rationale**: Previous versions of Android do not offer many features that are integral to the application interface such as menu swiping from left to right.
  o **Memory** : 512MB+Secondary Memory
  o **CPU:** Minimum processing power: Single Core 1 GHz

Additional information:

This will be an Android phone application, and as such will be designed to interface with the hardware present on the Android phone. In theory the application will be able to run by other devices that can emulate the Android, but this will not be a consideration during design. There are 4 physical buttons on the phone. The options button will be used specifically in multiple instances to bring up menus, such as in bringing up the ability to add an idea during the idea generation phase.

As this is a mobile device, it will be using the Android network to connect to the internet, which will allow it to communicate with the database servers. This means that it will be using the infrastructure, be it wireless communication points or physical lines, of the network in order to perform properly. There will have to be some sort of error checking for if the network is down or inaccessible.

- **Website:**
  o PHP5, APACHE, MySQL/MySQLi supported webserver.
  o We had to go for MySQL database system hence the PostgreSQL is commercial.

2.1.4. Software Interfaces

Sidadiya app will be connecting remotely to a MySQL database that is already set up and is the same one that the website connects to. This allows for use in exercises by users of both computers and the phone. The operating system the software runs on will be the operating system the Android phone runs on, which comes with a software framework that will be utilized, including many prepackaged components to do things like create menus, hookup buttons, and other common functions expected from a mobile device. The only communication will be between the phone and the server housing the database, which will be sending queries or updates and receiving the information back. The logic associated with the website will be duplicated on the phone, so there will be little in the way of a server side component performing logic.

2.1.5. Communication Interfaces

Sidadhiya is an Android application, but may still link to web pages that are not necessary to duplicate. As described above, this will be communicating with a database server, and so will be making use of the Android network and HTTPS in order to communicate. The primary forms of communication will be database requests. The system will need to be able to integrate with Google+ system in order for users to log in, and these sessions will need to be kept secure throughout use. The application will need to be synchronized to a certain extent with the other users of both the phones and the web browser, so that the information displayed to the user is always up to date.

2.1.6. Memory Constraints

- Device CPU should possesses 1 GHz processing power to match the requirement.
- Currently Android allows only 4KB push notification.

2.1.7. Operations

Described under interfaces (refer 2.1.2)

2.1.8. Site Adaptation Requirements

- Vendor/Visitors browsers should support JavaScript and as a prior requirement, users are encouraged to use JavaScript enabled web browsers.

2.2. Product Functions

'Sidadiya' Android Application

- **Select categories:** The user is given a pre specified set of categories of items so that he would be able to check for only the products he is currently interested in. He can change his list of preferences at any given time.

- **Notify about offers:** If the user has already selected his preferred item list, he would be notified if an offer related to a product in his preferred list is available in a venue within a given perimeter from the current user location. It is expected to give the user the option to change the perimeter he wishes to get notifications within, as he desires.

- **Search the precise location of the offer:** If a specific user is interested in purchasing the offer he is notified, he should be given the opportunity to search for the location of the vendor through a map.

- **Search for offers:** Apart from the notifications, user is also able to search for places (vendors) having offers related to his choice list. The offers could either be within a specified perimeter within his location or else he could search for all available offers.

- **Rate/comment on offers:** The user will be given the option to rate or comment on a certain deal. The ratings would be displayed when any user views an offer and he can decide on purchasing it based on the reviews.

- **Recommend offers to friends:** The users can recommend interesting offers to other users of the app through mail.

- **Foursquare:** If the user chooses, he can connect to his Foursquare account to be notified of daily offers at places he or his friends check in often.
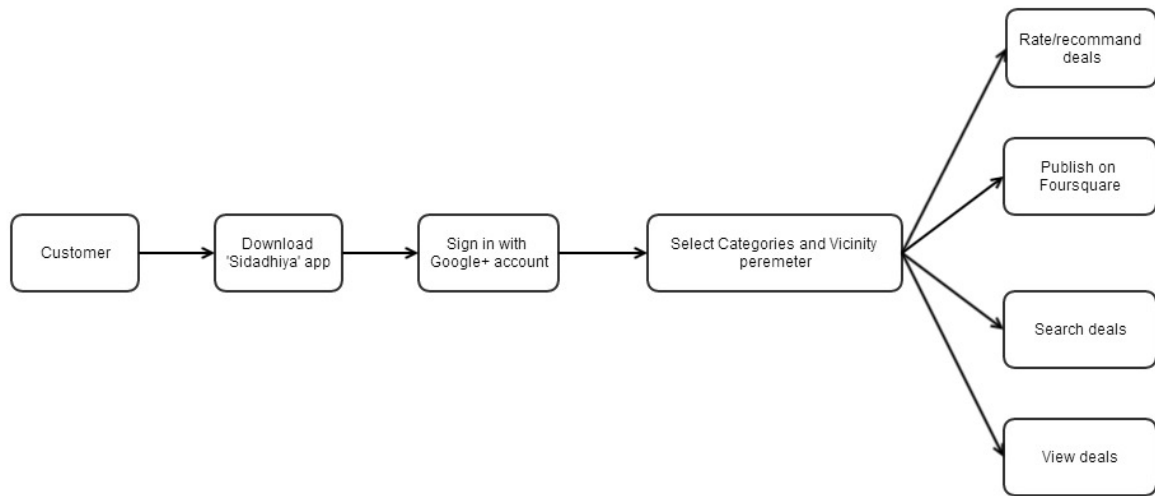

Figure 2: Mobile Application

Web based system for Vendors

- **Registration and Login:** All vendors should register into the system with a unique identity which would allow them to login to their individual profile when updating offers.

- **Update offers:** The vendor can update details about their offers on a daily basis through their profile.

- **Advertise on products (new arrivals):** The vendors are also given an option to advertise their new arrivals on the site if required.
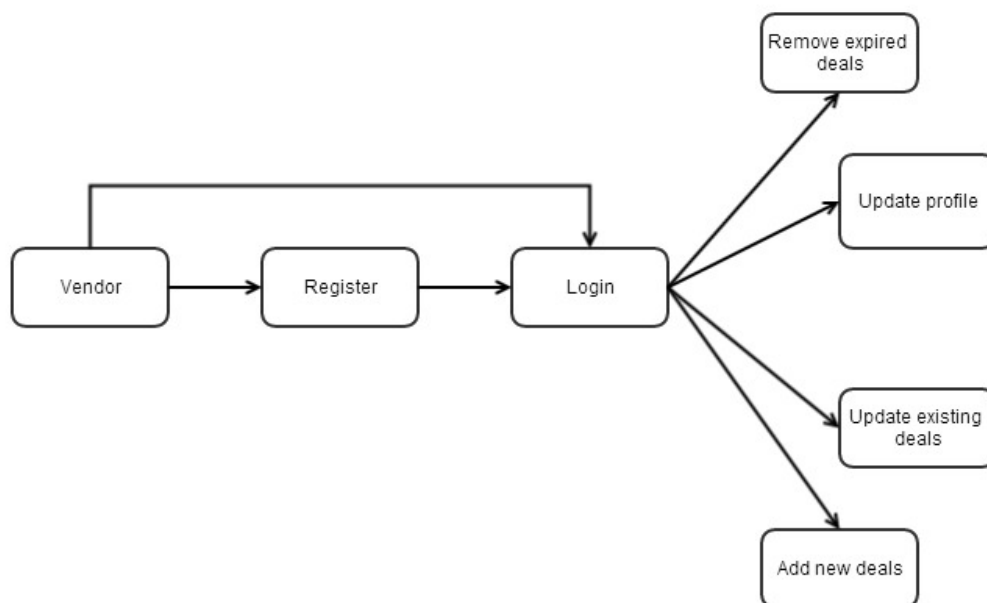
Figure 3: Vendor Site

Web based system for Customers

- **View Deals:** Customers can check any deal. Deals are assigned to several categories. Once a customer click a deal he'll redirect to a page dedicated for that specific deal. There the customer can see a deal description, availability, location etc.
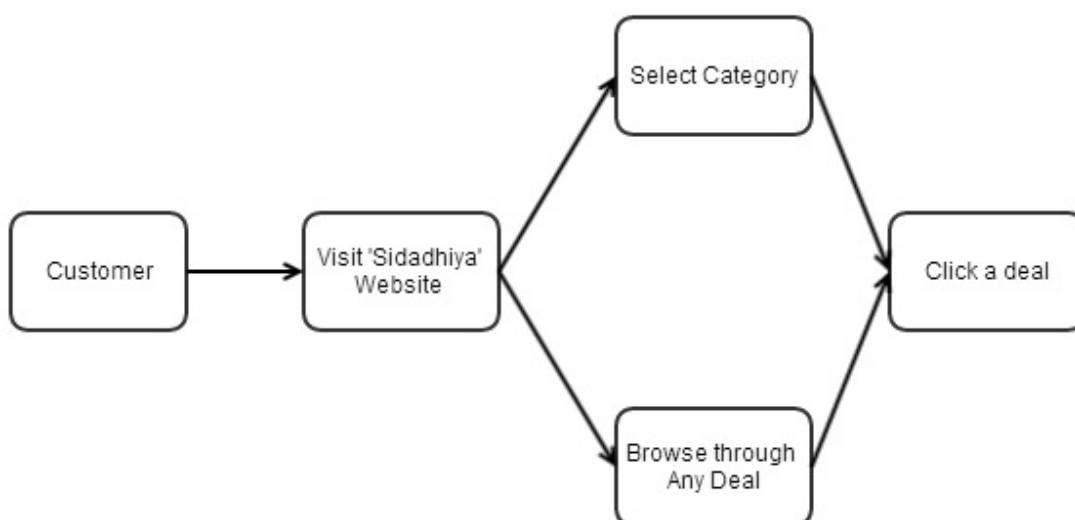

Figure 4: Customer Site

2.3. User characteristics

- **Users of the mobile application 'Sidadiya' (customer)**

  The customer need not have any knowledge on the technological aspects used. Since the app is developed in a much user friendly and an easily navigable manner, a basic knowledge and experience in using smart phones would be sufficient to use the application conveniently. It is assumed that the user knows his Basic English in order to interact with the app more successfully.

- **Users of the web site 'Mudalali' (vendor) and the 'Sidadiya' customer site (general customer)**

  As he has no interaction other than viewing the offers, having a basic knowledge and experience on surfing the internet is more than enough for the users who would be using the 'Sidadiya' customer site. The vendors who would be registering into the 'Mudalali' site needs to have an understanding on reading instructions and following a given procedure in order to maintain and update his profile details as well as when adding, updating and deleting offers. No advanced technological knowledge would be required in this case.

2.4. Constraints

- **Internet availability**

  Since the major part of the mobile application which is the notification system, depends on the availability of internet, it is a huge constraint. Unless the internet connectivity is confirmed the app user can only surf through the latest offers that were updated in the database while connection was available, but will not be able to get notifications about nearby offers.

- **Interface to other applications**

  When using GCM, messages of maximum size 4KB can be sent. And secondly since Google map API is used to show locations, it cannot be guaranteed that all locations are named as specified in the addresses of the vendor locations.

- **Parallel operations**

  There could be thousands of users using the app at the same time. Hence it is essential that parallel operations are maintained with reliability of the system.

- **Signal handshake protocols**

  Hypertext transfer protocol (http) is used for the websites, hence the limitations of that protocol would affect the design of the sites.

- **Reliability requirements**

  In case a malicious activity occurs, it has to ensure that the server would be back to normal within the minimum possible time as the notification system would solely rely on the availability of access to the server.

- **Safety and security considerations**

  Since the vendors should provide all their personal information when registering, and the customers are allowed to sign in using Google +, their personal information would need to be guaranteed to be protected.

2.5. Assumptions and Dependencies

- The app can only be accessed using android phones

  Since the app is targeted only for the android operating system, phones with other operating systems cannot use the app.

- Both the customer and the vendor needs to have email addresses in order to sign in to the app as well as to the 'Mudalali' site

- Every user needs to have a Basic English knowledge and the basic knowledge of using smart phones.

  The app and the website are based on English and the app is developed using android operating system, so both the customer and the vendor should have Basic English knowledge, and the customer should have a general knowledge to use the android app.

2.6. Apportioning of Requirements

- **Featured offers:**

  In the initial phase of the implementation, it will only display the offers of interested categories selected by each customer, and there will be no option for the vendors to promote and highlight their offer among the similar ones. But it is expected to upgrade it where they can pay for 'featured offers' giving it more attention prompting the customers to try it out.

- **Purchase offers through the app:**

  Although the current scope of the project doesn't involve a feature for the customer to purchase offers, it will be extended giving the customer the opportunity to purchase them through the app itself making more profit through that.

- **Integrate the app with a Mobile Marketing service provider**
  The app is intended to be integrated with a mobile service provider such as zMessenger in order to bring more customer interaction to the product and to define strategies to increase the revenue generated.

3. SPECIFIC REQUIREMENTS

3.1. External Interfaces
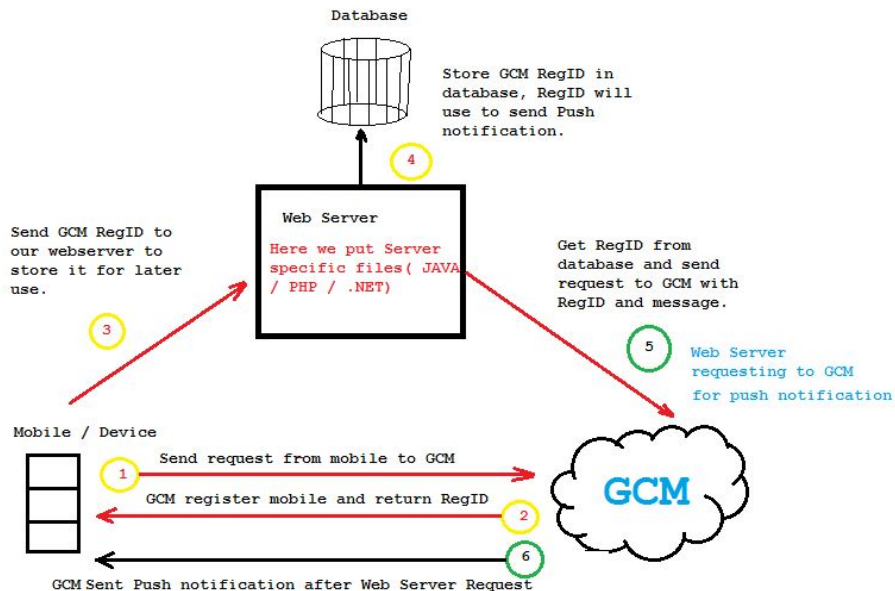
- Web Server - Google Cloud Messaging – Android App

Figure 5: System Architecture

> Purpose: Push Notifications using Google Cloud Messaging. Google Cloud Messaging for Android (GCM) is a service that allows us to send data from our web server to our customers' Android-powered device, and also to receive messages from devices on the same connection. The GCM service handles all aspects of queuing of messages and delivery to the target Android application running on the target device.

> Sources: Web server and 'Sidadhiya' android app

> Units of measure: kilobytes

> Relationships to other inputs/outputs: Here is the mechanism. It will show the relationships to other inputs/outputs
Android device sends SENDER_ID to GCM server for registration. After

successful registration GCM server returns registration ID to android device. After getting registration ID, Android device send registration ID to web server. Whenever push notification needed the RegID from our database and send request to GCM with RegID and message. After receiving push notification request GCM send push notification to android device.
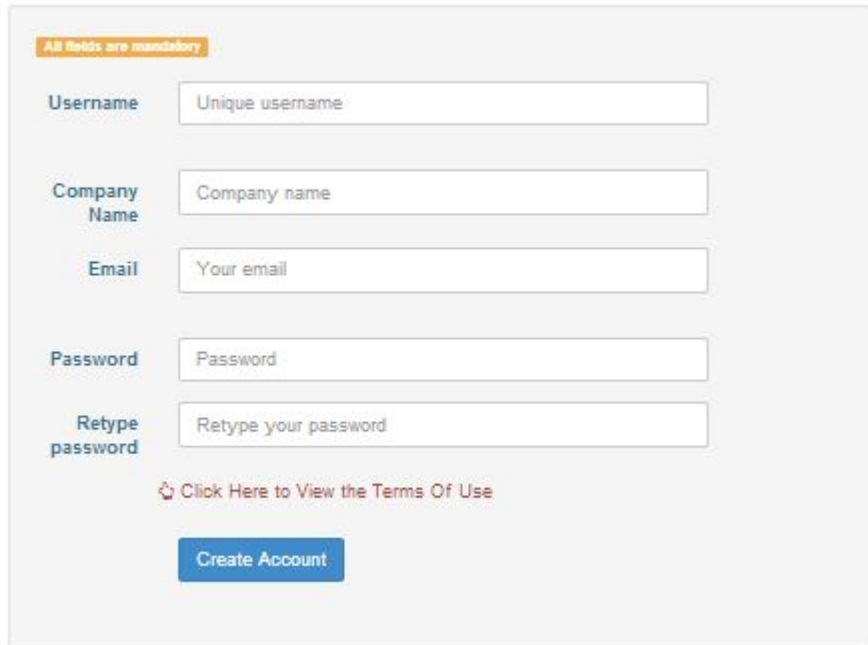
- Google Map Api – Android App

Figure 6: Google Map API

- ➢ Purpose: to locate the deal of a particular vendor.
- ➢ Source of input: Longitude and latitude of the vendor location
- ➢ Units of measure: GeoJson
- ➢ Data formats: Lat-Long pairs, String address
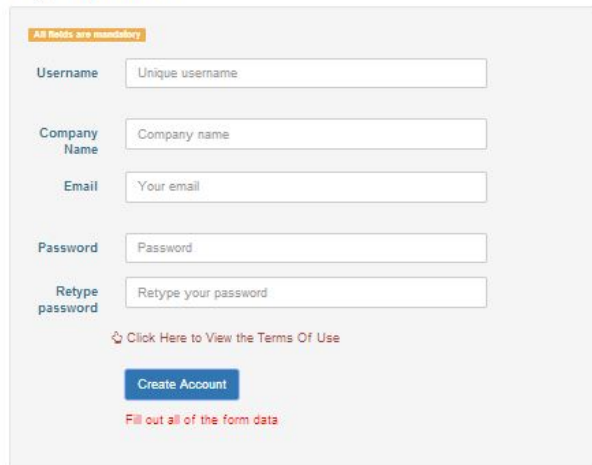- ➢ End message: Shows the location of the vendor.

- Vendor Sign Up

Figure 7: Sign Up 1

➢ Purpose: Vendor registration

➢ Source of input: User

Destination of output: Database(Web Server)

➢ Valid range, accuracy and/or tolerance:
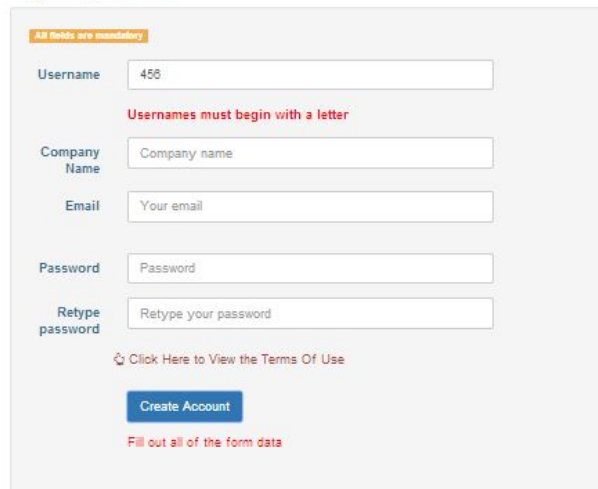
➢ Data Format: Json encoded data

Figure 8: Sign Up 2

Sign Up Form

All fields are mandatory

Username	456

Usernames must begin with a letter

Company Name	Company name
Email	Your email
Password	Password
Retype password	Retype your password

↻ Click Here to View the Terms Of Use

Create Account

Fill out all of the form data

Figure 9: Sign Up 3
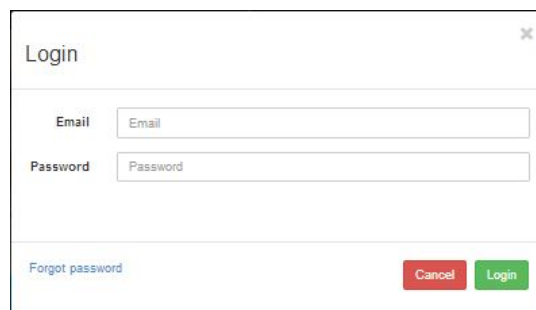
Sign Up Form

All fields are mandatory

Username	ch

3 - 16 characters please

Company Name	Company name
Email	Your email
Password	Password
Retype password	Retype your password

↻ Click Here to View the Terms Of Use

Create Account

Fill out all of the form data

Figure 10: Sign Up 4

- Vendor Login

Login ✕

Email	Email
Password	Password

Forgot password   Cancel   Login

Figure 11: Login

➢ Purpose: Login to vendor's profile

➢ Source of input: User

Destination of output: Database (Web Server)

➢ Valid range, accuracy and/or tolerance:

➢ Data Format: Json encoded data
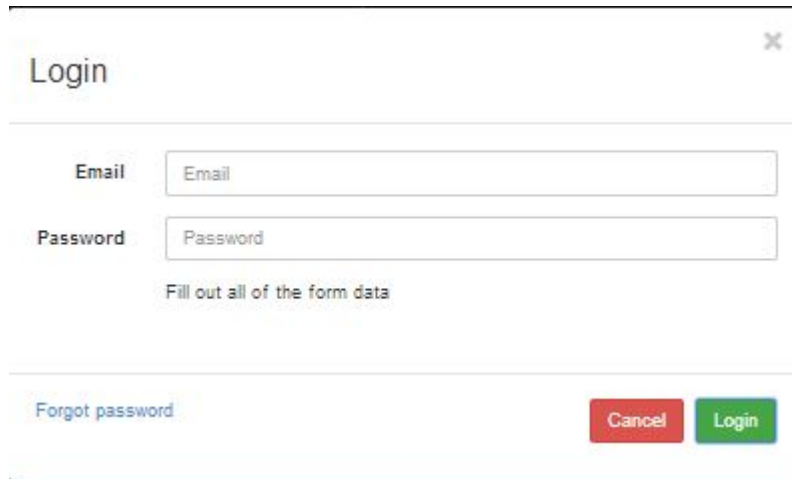
Figure 12: Forgot Password

- Android App Login

Figure 13: App Sign Up

➢ Purpose: Login to 'Sidadiya' app

➢ Source of input: Customer

➢ Relationships to other inputs/outputs: Once the customer signed in he/she can select the deal categories

➢ Data formats: Json encoded data

• Android App – Selecting Deal Categories
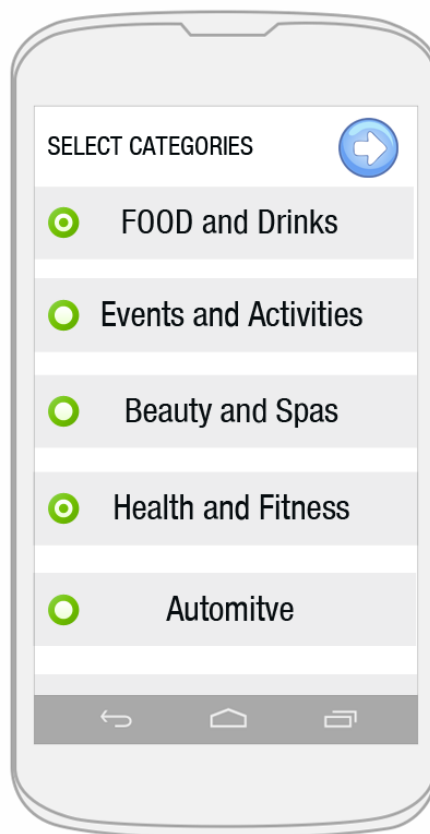
Figure 14: Select Categories 1

➢ Purpose: Customer selects the categories which they like to receive offer

➢ Source of input: Customer

➢ Valid range, accuracy and/or tolerance:
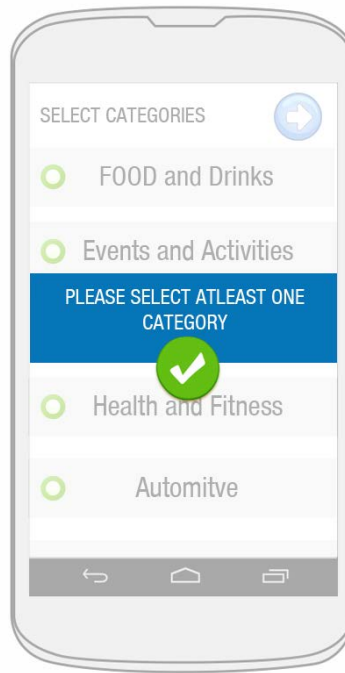
Figure 15: Select Categories 2

➢ Relationships to other inputs/outputs: After selecting categories customer should select the vicinity perimeter.

➢ Data formats: Json encoded data

• Android App – Selecting Vicinity Perimeter
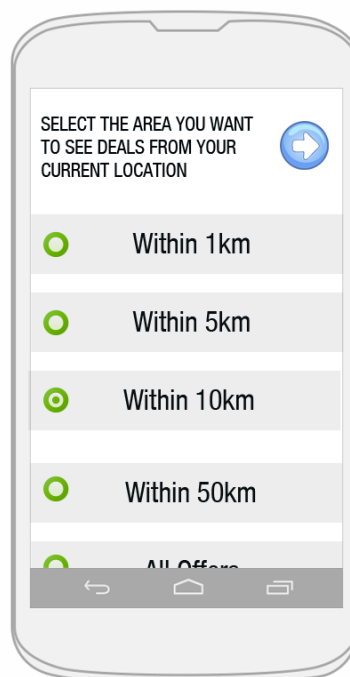
Figure 16: Select Vicinity Perimeter

➢ Purpose: App will be designed in a way that offers will be notified according to this vicinity perimeter.

➢ Source of input: Customer

➢ Valid range, accuracy and/or tolerance:
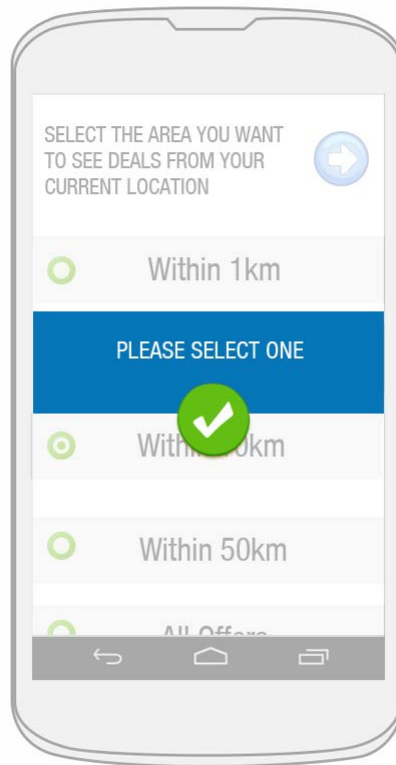
Figure 17: Select Vicinity Perimeter 2

➢ Relationships to other inputs/outputs: Deals will be notified according to the vicinity perimeter.

➢ Data formats: Json encoded data

- Android App – Main Interface
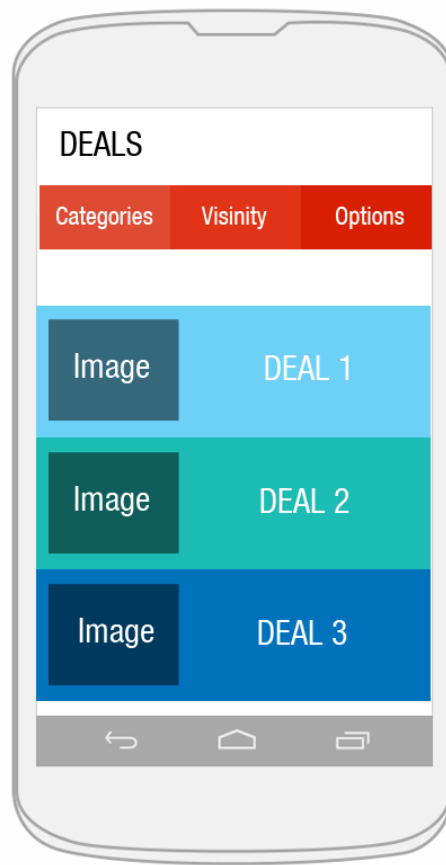
Figure 18: Home Page

➢ Purpose: App will display offers according to customer's selections.

➢ Source of input: App database

Destination of output: 'Sidadhiya' app

➢ Relationships to other inputs/outputs: Can view deal info by clicking

an offer from here.

➢ Data formats: Json encoded data

- Android App – Individual Deal
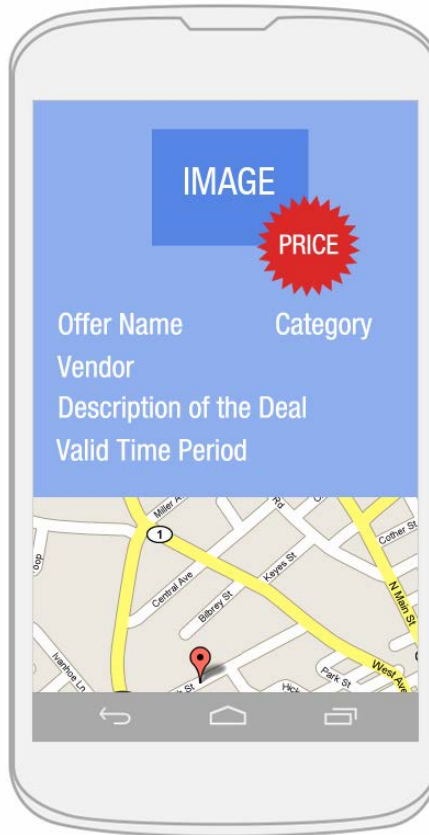
Figure 19: Detailed Page

➢ Purpose: Displays the details of offer.

➢ Source of input: App database

Destination of output: 'Sidadhiya' app

➢ Relationships to other inputs/outputs: After watching the offer

customer will be given a chance to rate the offer.

➢ Data formats: Json encoded data

- Android App – Rate/Comment the offer
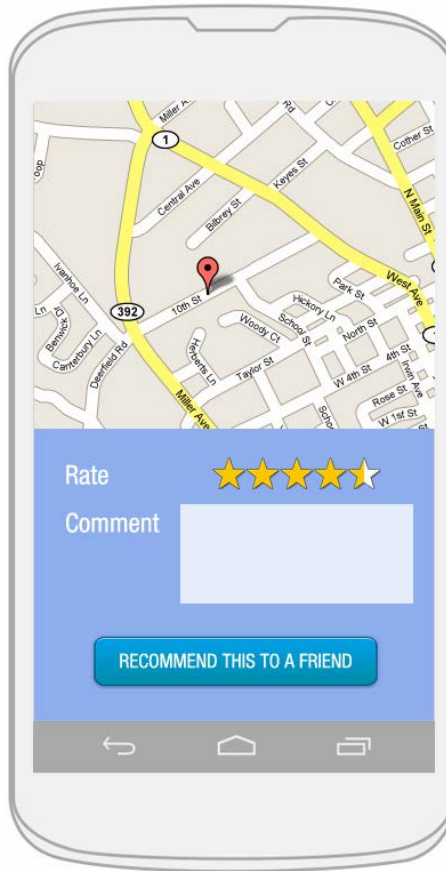
Figure 20: Rate and Comment

> ➢ Purpose: Other customers will be able get an idea about the offer

> ➢ Source of input: Customer

> ➢ Data formats: Json encoded data

3.2. Functions (Functional Requirements)

3.2.1. Mobile Application

a) Function : Signup

o **Sequence of operations:**

When the customer downloads the app and use it for the first time he shall sign up to the system with a Google + account. The user is given the option to select whether to sign in with an existing Google+ account or to create a new account. If he

chooses to sign in with an existing account, he is given the option to select the account he wants and to enter the password. If the account information match with the information he has given, then the user is redirected to the home page of the app. If he decides to create a new account he is directed to the Google page to create a new Google account and once the account is created there, he shall sign in giving the user name and password. Once the user has signed in it is not required to log in each time he uses the app. The app would show that the relevant user has signed in when he starts the app and in case he wishes to revoke access from the specified Google+ account, an option is given to do so at that time.

- o **Validity checks on inputs:**

If the user name and/or password provided when signing in doesn't match with the actual account information the user shall see an error message asking him to reenter the information. The validity of inputs when creating an account or number of attempts to login are not implemented within the system, as Google+ accounts are used to sign in.

b) **Function :** Select categories and vicinity perimeter
- o **Sequence of operations:**

Once the user has signed in for the first time, he shall select the categories he wishes to get offers from. The categories are pre specified and the user has to select either one or more categories he would like to get notifications about. The categories include the following options:

- ➢ Food and drinks
  - o Restaurants
  - o Coffee and treats
  - o Groceries and markets
- ➢ Events and activities
  - o Things to do
  - o Classes
  - o Site seeing
  - o Night life

- o Tickets
- ➢ Beauty and Spas
  - o Salons
  - o Cosmetic procedures
  - o Hair and Styling
  - o Hair removal
  - o Nails
  - o Spas
- ➢ Health and fitness
  - o Gym
  - o Natural medicine
  - o Sports
  - o Weight loss
- ➢ Automotive
  - o Auto repair
  - o Auto detailing
- ➢ Shopping
  - o Arts and entertainment
  - o Health and beauty
  - o Home and garden
- ➢ Fashion
  - o Men's
  - o Women's
  - o Kids and baby
  - o Accessories

The user shall also select the vicinity perimeter he would like to get notifications within, out of the following options:

- ▪ Within 1 km from the current location
- ▪ Within 5 km from the current location
- ▪ Within 10 km from the current location
- ▪ Within 50 km from the current location

- All offers

Once a user has selected his preferred categories and the vicinity perimeter for the first time, he can always change the perimeter, select more and/or remove selected categories, from the menu which is at the top whenever he uses the app.

o **Responses to abnormal situations:**

In case a user decides to navigate forward from the page without selecting at least one category and/or the vicinity perimeter, a message shall be displayed asking him to select one or more categories and/or the vicinity perimeter and shall prevent him from navigating until he do so.

o **Effect of parameters:**

The categories and the vicinity perimeter selected by the user would serve as parameters in this case. The resulting offers shown would depend on those two parameters.

c) **Function :** Get notifications about offers

o **Sequence of operations:**

Once a user has specified the categories he is interested in, the system shall store the data on a database and according to the relevant data notifications would be pushed to the application about the offers. If the user is connected to internet, even if he has not logged into the app, the notifications would be shown with the offers from the categories and in the vicinity perimeter that he has specified. The top 100 offers out of all the offers according to his specifications would be received as notifications and the user can scroll through each and can click on them to view more details about each offer (refer part e))

o **Responses to abnormal situations:**

In a case where the user has no internet access the notification system will not function as the connection with the cloud in interrupted. Hence only the search

facility would be available for the user where he can search for offers as per the latest update of the database done before losing internet connection.

- o **Effect of parameters:**

The categories and the vicinity perimeter selected by the user would serve as parameters in this case. The resulting notifications on offers shown would depend on those two parameters.

d) Function : Search for offers

- o **Sequence of operations:**

Once a user has signed up and selected the categories and vicinity perimeter for the first time, and whenever he starts the app there after, he shall be directed to the home page with all the up to date offers. The user can select one or more categories of offers and a vicinity of perimeter out of the categories and perimeters specified in part b) in order to search for offers. This function and its selection options are independent from the notifications he shall receive according to the options he has selected as mentioned in part b). Once the relevant list of offers is displayed, the user can select each offer to view more details about each of them separately (refer part e))

- o **Responses to abnormal situations:**

A user can refrain from giving a vicinity perimeter. In such a case offers from everywhere of categories he has selected shall be displayed. But if a user selects the search option without specifying at least one category he is asked to enter one or more categories in order to proceed with searching.

e) Function : Search for more details of a selected offer

   o   **Sequence of operations:**

The user will be directed to this kind of a page either by clicking an offer in a
notification he got (part c)) or by clicking an offer in a search result list (part d)). Here
the following details of an offer would be displayed for the user.

- Offer name
- Offer category
- Vendor
- Detailed description
- Valid time period
- Price
- Route from the current location to the location of the offer vendor on a map
- Rate and comment on the offer option (refer part f))
- Recommend offer option (refer part g))

f) Function : Rate and comment on the offer

   o   **Sequence of operations:**

From the page where the user can view the details of an offer, he is given the option
to rate the offer. Five stars will be provided and the user can rate as he prefers the
offer and also he is able to add a comment under the offer detail and also view the
previous comments by others.

g) Function : Recommend offers to friends

   o   **Sequence of operations:**

In the same page where user can view offer details, he can also recommend offers to
friends via email. Once the user click the recommend button he can enter the email
address of a friend and send the recommendation. The receiver will get an email,

specifying that the stated offer was recommended by the relevant user with the details of the offer as mentioned in part e)

o **Validity checks on inputs:**

In case a user enters an input which is not of the email format, he will be shown an error message and asked to reenter a valid string.

o **Responses to abnormal situations:**

If the specified email address does not belong to any account, the user will receive a message stating so.

h) **Function :** Publish on Foursquare

o **Sequence of operations:**

In the same page where the user can view the details of an offer, an option is given for him to check in to those places. Once the check in option is selected a message will be displayed on his Google+ account saying this user has checked in at the relevant vendor's location.

3.2.2. 'Sidadiya' web site for customers

a) **Function :** Select category to view offers

o **Sequence of operations:**

The only functionality available for this site is to walk through the categories and view offers. The user is not given any option to interact with the site other than selecting the categories and viewing the relevant offers.

3.2.3. 'Mudalali' web site for vendors

a) Function : Registration

- o **Sequence of operations:**

  At the time of signing in the vendor has to provide the following basic information.

  - Username - Has to be unique. An error message will be displayed asking him to enter another username if the given username is not available.

  - Company name - Has to be unique. An error message will be displayed asking him to enter another company name if the given company name is already in the database.

  - Email - Has to be unique. An error message will be displayed asking him to enter another email if the given email is not available.

  - Password – Should have at least 8 characters including at least one capital letter, a number and a special character.

  - Retype password – If the passwords do not match an error message will be displayed asking him to reenter password

Once the registration is complete, the vendor will have to wait for the site admin to go through the details and approve him as a vendor to gain access to the profile. He will not be directly linked to the site, until he is authorized by the site admin as a true vendor.

b) Function : Login

- o **Sequence of operations:**

  Each time the vendor logs in to the site he will have to enter the email and password provided by him at the time of registering. The vendor will be allowed to access his profile once the details are authorized.

o **Validity checks on inputs:**

If the email is not of the correct format a message will be displayed asking him to enter a valid email address. If the email and password do not match with details in the database an error will be displayed asking the vendor to reenter the data.

o **Responses to abnormal situations:**

In case a vendor forgets the password, an option is provided for him to create a new password. The vendor will have to enter the email address and a link to reset the password will be emailed to the given address. Once the vendor has created the new password he can login to the site as usual.

c) **Function :** Update profile

o **Sequence of operations:**

Once the vendor gets access to his profile he has to update the following details regarding his company.

- Website – if available
- Branch names
- Branch addresses, contact numbers

The vendor can change the details whenever he wishes to including these and the email and password but not the username.

d) **Function :** Update offer details

o **Sequence of operations:**

The vendor has to enter details about each of his offers which are mentioned in 3.2.1.part e). He is given the option to change any of the details and/or remove any offer from his offer list. Once the valid time period is over the offer would be deleted from the database even if the vendor does not remove it.

3.3. Performance Requirements

3.3.1. Capacity

- The number of simultaneous users supported by the mobile application would be 5000. Stress testing would be used to test the capability of the application to serve that much of users at the same time.
- The push notifications that are sent from the cloud to the application can have a maximum of 4KB data. Hence the information sent through the cloud will need to be adjusted to suit that size.

3.3.2. Dynamic numerical requirements

- The maximum number of notifications shown to a user would be 100 at a given time. Since there could be a large number of notifications received, the performance might get affected due to that reason. Hence only the top 100 notifications would be shown to the user.

3.4. Logical Database Requirements

Relational database approach is considered, in developing the system. The improved version of MySQL (i.e. MySQLi) is used as the database querying language. All data that are stored in the database are transferred into corresponding data formats in MySQLi (or data types) in order to achieve a higher performance and reliability.

Eg:
- id INT(11)
- name/category/subcategory … VARCHAR(255)
- signup/lastlogin/notescheck … DATETIME
- activated/reported/approved … ENUM
- description TEXT
- long/latt…. FLOAT

Furthermore, to ensure the security and integrity of the data that is stored in the database data encryption functions were used.

Eg: to encrypt password MD5 hashing function was used.

Eight data entities were recognized at the moment and this would subject to change with further development that is planning to carry out in next phase (eg: with the integration of payment gateway, there would be need for more entities to hold the session of each user). Well illustrative diagram is given down the line, which indicates relationships among entities.

Foreign keys play a major role when communicating among different tables; hence the foreign key constraints are visible in many MySQLi queries.

```
            real_price INT(11) NOT NULL,
            new_price INT(11) NOT NULL,

            reported  ENUM('0','1') NOT NULL DEFAULT '0',
            PRIMARY KEY (id),
            FOREIGN KEY (vendor) REFERENCES users(username)
            )";
$query = mysqli_query($db_conx, $tbl_users);
if ($query === TRUE) {
    echo "<h3>deals table created OK :) </h3>";
} else {
    echo "<h3>user table NOT created :( </h3>";
}
```
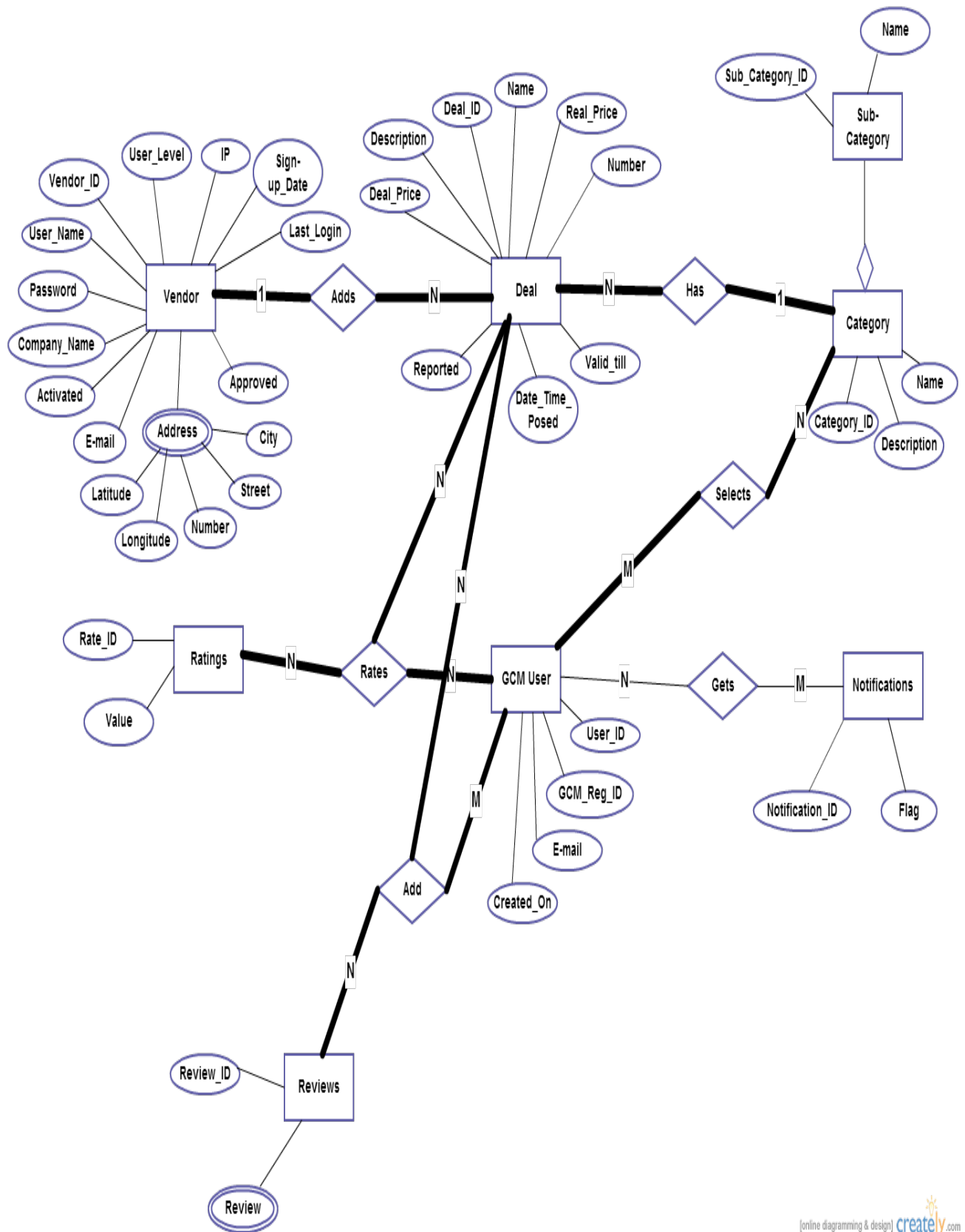
Figure 21: Entity Relationship Diagram

3.5. Design Constraints

3.5.1. Limited screen size and resolution for the mobile application

Since the major part of the project is the mobile app, the primary design constraint would be the mobile platform. As this application is targeting only the mobiles, limited screen size and resolution is shall be a major consideration in designing. Hence creating an easily navigable, user-friendly interface which would also be effective and quick is a difficult challenge.

3.5.2. Limited processing power for the mobile application

The memory and the processing power is limited in a mobile application. Since our app is dealing with a considerable amount of data from the web server this constraint is worth considering. 'Sidadiya' is meant to be quick and responsive, even when dealing with a large amount of data, push notifications, maps etc. ,so each feature shall be designed and implemented with efficiency in mind.

3.5.3. Android mobile platform

The mobile application would only be targeting the Android platform. Hence it needs to be designed targeting the android users and not the other platforms.

3.5.4. Energy consumption

The algorithms and functions used within the application needs to be designed with caution considering the energy consumption as the mobile's battery consumption is a critical issue that needs attention.

3.5.5. Internet usage

The major part of the application depends on the internet connectivity of the mobile phone. The design has to be optimized to support when the user has no internet connectivity for the situation where he will not be able to receive notifications and how the search function should be handled with previously saved data.

3.5.6. Standards Compliance

The following standards would affect the design of the mobile application and the web sites.

a) CSS 3 standards

b) HTML5 standards

c) JavaScript standards

d) Jason standards

e) Google map API V2 standards

f) Google cloud message API standards and limitations

3.6. Software System Attributes

3.6.1. Reliability

Reliability of the app shall be ensured through stability testing and stress testing in order to ensure that it will not crash due to an overloaded number of users.

Also measure will be taken to avoid malicious activity on the 'Mudalali' site the vendors would not be grant permission to create profiles until a manual inspection is done by the site admin.

3.6.2. Security

a) Mobile app

The mobile application assumes that only the user or whoever he/she allows will have access to his/her mobile. With that being said, only a Google email address is required to verify the identity of the user upon opening the app for the first time. Afterwards, since it is not password protected and the user will directly be shown to the home screen there is no method to authenticate the user's identity. Even if so, there's no potential threat to the user, as this app doesn't store any confidential information or data relevant to the user other than his/her preferences for shopping categories which cause no harm even if revealed.

b) Web sites for customers and vendors

The registrations to the vendor site are only accepted after a manual examination of the registration details by the admins. Profile access is hence granted only after examining the details. Therefore malicious activity in the site is prevented. The confidential information regarding vendor profiles are stored encrypted preventing disclosure. The site for the customers would only share the database of the vendors to display the offer details. No confidential information will be stored or processed under this site and hence no security issues will arise.

3.6.3. Safety

'Sidadiya' is primarily a safe application. It will not affect data stored outside of its servers nor will it affect any other applications installed on the user's phone. It cannot cause any damage to the phone or its internal components. The websites would also cause no harm or damage to any user or other site in whatsoever the manner.
The only potential safety concern associated with this application applies to virtually all mobile apps: this mobile app should not be used while operating a vehicle or in any other situation where the user's attention must be focused elsewhere.

3.6.4. Maintainability

The app needs to be maintainable mainly because future extensions are expected. And at the same time it has to ensure that future defect isolation and correction would not cause extra inconveniences due to improperly maintained coding. As an assistance for this the source code of the will be uploaded to GitHub.

3.6.5. User-friendliness

Both the app and the web based system need to give the users a good browsing experience even with a less knowledge on technical aspects. It should be simple, elegant and at the same time should clarify every option the user has in a comfortable manner.

4. CHANGE MANAGEMENT PROCESS

Change Management Program (CMP), more commonly known as Change Control Process or Change Control Management Process, is a formal process used to ensure that changes to a product or system are introduced in a controlled and coordinated manner (as defined by ISO 20000).

This app 'Sidadhiya' is not designated as a product, but rather a service provided to the customer in order to facilitate a smooth transition into the vogue of e-business. It will be available at the Google App Store and linked to several social media networks like Google+, Twitter which will expedite the feedback process which involves rating, criticizing, suggesting changes etc.

Since this is designed for public use, formal documenting procedures and closed-door meetings with clients will not take place, rather the stakeholders will gather and discuss changes and evaluations proposed by the customers on a regular basis.

Gauging of the feasibility, business impact, audience and implementing fundamental changes as required will be some of the prime tasks in the Change Management Process. Constant updates on the developments and modifications would be informed via Github, Google App Store.

5. DOCUMENT APPROVAL

Approval of the supervisor:

Name   : Dr. D.D.Karunaratne

Signature   : ………………………………….

Date   : ………………………………….

Further Comments:

6. SUPPORTING INFORMATION

- Index

  - **SRS**: A Software requirements specification (SRS), a requirements specification for a   software system, is a description of the behavior of a system to be developed and may include a set of use cases that describe interactions the users will have with the software. In addition it also contains non-functional requirements. Non-functional requirements impose constraints on the design or implementation (such as performance engineering requirements, quality standards, or design constraints).

  - **UI**: Abbreviated UI, the junction between a user and a computer program. An interface is a set of commands or menus through which a user communicates with a program. A command-driven interface is one in which you enter commands. A menu-driven interface is one in which you select command choices from various menus displayed on the screen.

  - **Google +**: Google+ is a social networking and identity service that is owned and operated by Google Inc.

  - **GCM**: Google Cloud messaging is a service that helps developers send data from servers to their Android applications on Android devices, or from servers to their Chrome apps and extensions.

  - **Google Map API V2**: Allow your users explore the world with rich maps provided by Google. Identify locations with custom markers, augment the map data with image overlays, embed one or more maps as fragments etc.

  - **Google Places API**: The Google Places API is a service that returns information about Places — defined within this API as establishments, geographic

locations, or prominent points of interest — using HTTP requests. Place requests specify locations as latitude/longitude coordinates.

➢ **HTTP requests**: That request which your computer sends to the web server contains all sorts of (potentially) interesting information.

➢ **Latitude**: In geography, latitude (ф) is a geographic coordinate that specifies the north-south position of a point on the Earth's surface.

➢ **Longitude**: Longitude, is a geographic coordinate that specifies the east-west position of a point on the Earth's surface.

➢ **Google play service**: Google Play services is used to update Google apps and apps from Google Play.

➢ **Hostgator:** Hostgator is a leading provider of website hosting, VPS hosting and dedicated servers.

➢ **PHP**: PHP Hypertext Preprocessor. A system scripting language used in web development, the main coding language proposed to be used for the system development.

➢ **APACHE**: The Apache HTTP Server, commonly referred to as Apache, is a web server application notable for playing a key role in the initial growth of the World Wide Web.

➢ **MySQL**: MySQL is the world's second most widely used open-source relational database management system (RDBMS).

➢ **Twitter Bootstrap**: Bootstrap is a free collection of tools for creating websites and web applications. It contains HTML and CSS-based design templates for

typography, forms, buttons, navigation and other interface components, as well as optional JavaScript extensions.

➢ **HTML**: Hyper Text Markup Language. The main markup language creating web pages. Markup language is an artificial language using a set of annotations to text that give instructions regarding the structure of text or how it is to be displayed.

➢ **CSS**: Cascading Style Sheets. Use to exercise precise control over the appearance of your HTML documents. Easy to understand and use. Help to maintain a consistent look for a web site.

➢ **JavaScript** – Client side scripting language. Because of the static environment in HTML, JavaScript is use to provide dynamic facilities similar to Java applets or CGI programming. Runs on the client web browser.

➢ **JQuery**: jQuery is a cross-platform JavaScript library designed to simplify the client-side scripting of HTML.

➢ **GreedDroid**: GreenDroid is a development library for the Android platform. It makes UI developments easier and consistent through your applications.

➢ **Splash screen**: A splash screen is an image that appears while a game or program is loading. The term may also be used to describe an introduction page on a website.

➢ **KitKat**: Android is an operating system based on the Linux kernel, and designed primarily for touchscreen mobile. The latest major release is Android 4.4 "KitKat".

➢ **Memory**: Computer data storage, often called storage or memory, is a technology consisting of computer components and recording media used to

retain digital data. It is a core function and fundamental component of computers.

➢ **CPU**: The central processing unit (CPU) of a computer is what manipulates data by performing computations.

➢ **PostgreSQL**: PostgreSQL, often simply "Postgres", is an object-relational database management system (ORDBMS) with an emphasis on extensibility and standards-compliance. As a database server, its primary function is to store data, securely and supporting best practices, and retrieve it later, as requested by other software applications, be it those on the same computer or those running on another computer across a network (including the Internet).

➢ **Communication interface**: an electronic circuit, usually designed to a specific standard that enables one machine to telecommunicate with another machine.

➢ **Foursquare**: Foursquare is a location-based social networking website for mobile devices, such as smartphones.

➢ **Parameters**: A parameter, in its common meaning, is a characteristic, feature, or measurable factor that can help in defining a particular system. A parameter is an important element to consider in evaluation or comprehension of an event, project, or situation.

➢ **Design Constraints**: Design constraint is a number of limitations on the conditions under which the development of a system takes place. It is used in systems design, and it focuses.

➢ **Json**: JSON (JavaScript Object Notation) is a lightweight data-interchange format. It is easy for humans to read and write. It is easy for machines to parse and generate.

➢ **GeoJson:** GeoJSON is a format for encoding a variety of geographic data structures.

➢ **Github**: GitHub is a web-based hosting service for software development projects that use the Git revision control system.

- Use case diagrams
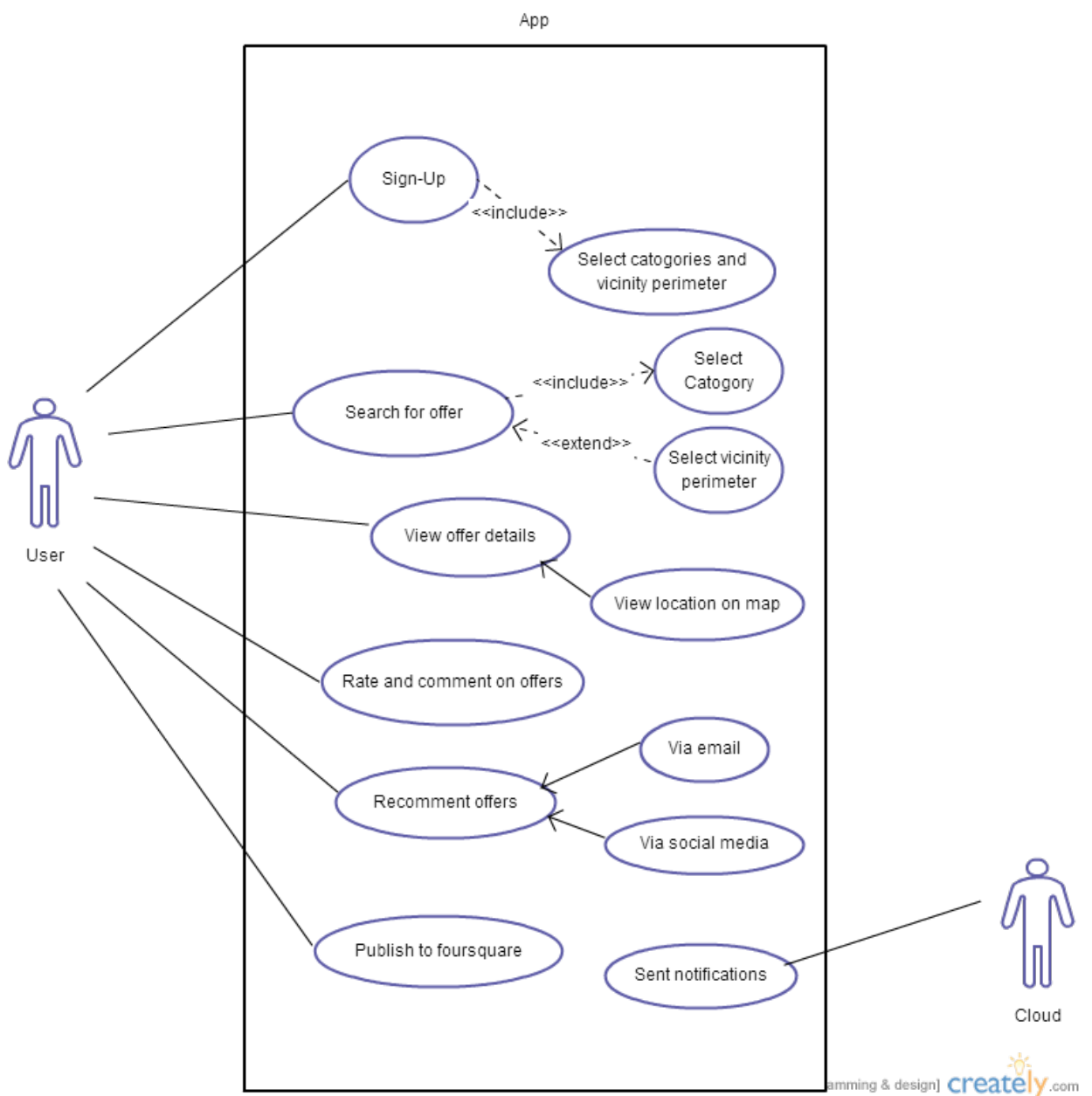   - ➢ Use case diagram for the 'Sidadiya' mobile app
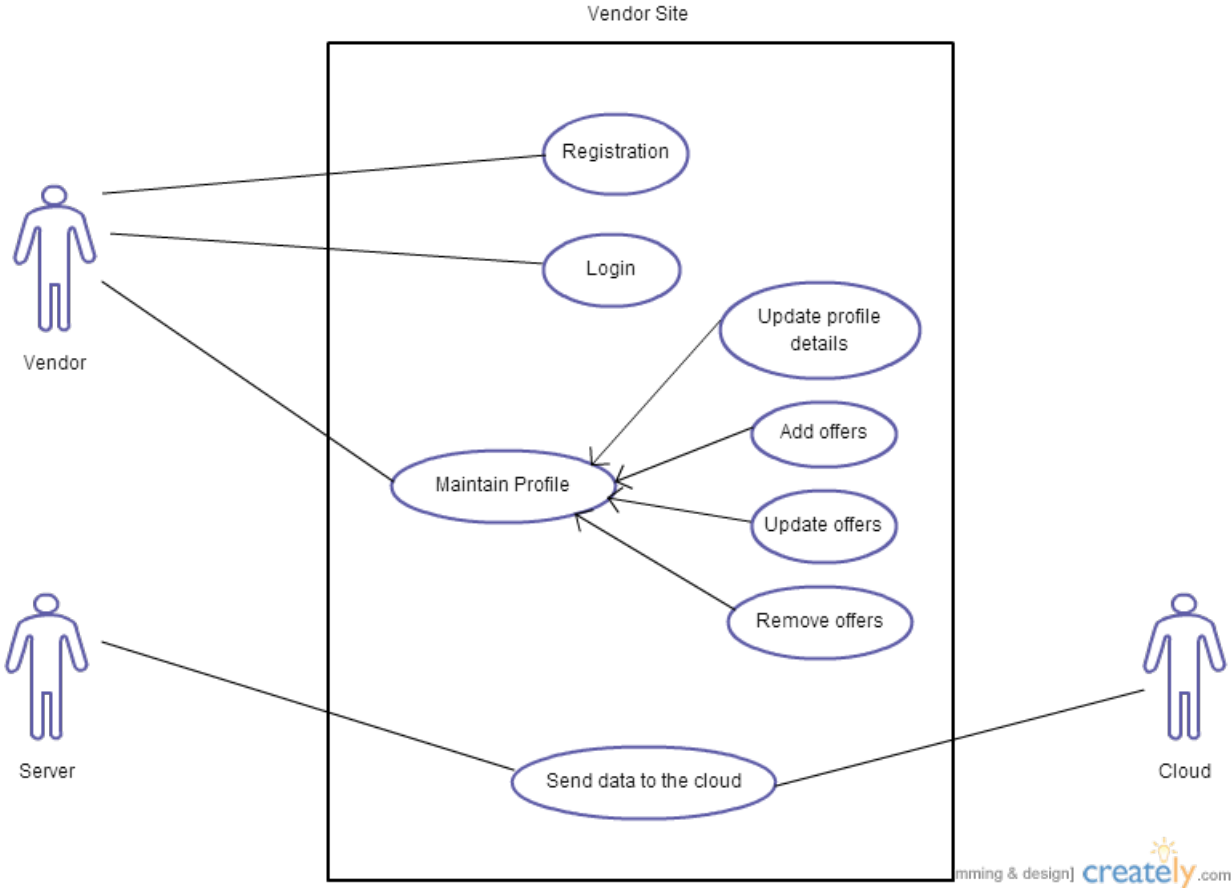

Figure 22: Use Case - Mobile Application

➢ Use case diagram for the 'Mudalali site'

Figure 23: Use Case – Web Site