

Team 16

NGO Information Management Suite 1.0

High Level Design Document

## Overview

This is the high level design document for NIMS, an information management suite for an NGO.

The first part gives a brief description of the project topic. The second part is the overview of the design of this application. The third part is the system overview which covers information regarding the application environment and the hardware and software requirements. The fourth part is the system design which contains relationship design, and database design, use case diagrams and the design architecture.

## Target Audience

This document is intended for the technical team. This document contains detailed information regarding implementation procedures.

## Version Control History

Version	Primary Author(s)	Description of Version	Reviewed By	Date Completed
2.0	Anshul, Lalit, Megha, Parth, Jatan	High Level Design Document for Phase 1 and 2, new modules, data flow diagrams added, changes in the database	Lalit	1 <sup>st</sup> April, 2012
1.0	Anshul, Lalit, Aakash, Megha, Parth,	High Level Design Document for Phase 1	Aakash	13 <sup>th</sup> Feb, 2012

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## 1. Introduction

A software design document (SDD) is a written description of the software product, that a software designer writes in order to give a software development team an overall guidance of the architecture of the software project.

### 1.1 Purpose

The purpose of this document is to outline the technical design of the NGO Information Management Suite and provide an overview for its implementation. Its main purpose is to –

- Provide high level design of our system
- Provide the link between the Functional Specification and the detailed Technical Design document
- Document the functionality provided by each module or group of modules and show how the various components interact in the design
- This document is intended to help the coding team to build the system.

### 1.2 Document Overview

This document is organized into the following sections:

- Introduction: Provides information related to this document (e.g. purpose, term definitions etc.)
- Design Overview: Describes the approach and guiding principles
- System Overview: Describes User Characteristics, User Objectives, Hardware and software Requirements, interfaces and Design Constraints
- System Design: Contains use case diagram, E-R diagram, Data-flow Diagram.
- Architecture: Describes architecture design and briefly functionality of various modules and how group of modules interact to provide common functionality.
- Glossary

### 1.3 Scope

This document contains the high level design which shows the various modules and how they interact with each other thus enabling our system to work. The Application Design outlined in this document builds upon the scope defined in the Requirements phase. This document will serve as a link between design team and coding team and will be frequently referred by coding team to build our system.

## 1.4 Definitions, Acronyms and Abbreviations

- **PHP** - Hypertext Processor scripting language
- **MySQL** – relational database management system (RDBMS)
- **HTTP** – Hypertext Transfer Protocol
- **WWW** – World Wide Web
- **Apache** – Web Server
- **UML** – Unified Modelling Language
- **Administrator** - This is a webmaster whose primary role is to maintain the website and keep it up and running. He has sound knowledge of web development and database management. He has full authority to add or remove anything from the website which he deems necessary.

## 1.5 References

- Software Requirements Specification
- Project Plan

## 1.6 Methodology, Tools, Techniques

- Dia, Microsoft Visio
- Microsoft Word

## 1.7 Key Stakeholders

- VSSM (NGO)
- Application Developers

## 1.8 Intended Audience

This document is meant for the technical team for reference during the implementation phase.

## 2. Design Overview

We aim to develop a web based information management system that takes care of the basic needs of cataloguing their work, viewing and analysis the status of voter cards, ration cards, sex ratio of various communities covered by the NGO and aid in creating social maps of the population and the area in which the volunteer is working. The IMS will be equipped with several relevant statistical analysis capabilities. The IMS is going to consist of two parts (both software and hardware wise):

1. Client side application (which will be with the coordinators) for easy data collection and update.
2. Server side application (at main centre of the NGO) for database management and analysis of the collected data.

For the server end, data coming from Android phones used by coordinators will be stored in a local database initially and the main database at the server gets updated at regular intervals. The relational and ER diagram of the database used are depicted underneath. The architecture of the website and automatic error detection and information retrieval system on Android is also provided.

Business Angle: The NGO maintains all its data by far, on paper and it takes time for it to reach to NGO from volunteers working in remote locations. Also, the form in which the data is filled is very complicated and consumes a lot of time. In order to solve this problem, we develop an android application, which takes data in tabular form, stores the data in a local database on the android device and updates the database at the server side as and when required. This will facilitate the NGO to get and view the updated data frequently.

### 2.1 Background Information

At system level we need to understand the user requirements very clearly before designing the database and the information which the NGO generally requires from its coordinators. For the same we have analysed the various forms used by the coordinators to collect the data, like collecting family information, information of children studying in school, various charity items given to people, information about various cards and government schemes for tribal denotified tribes, etc.

### 2.2 Current Process

The current work done for designing includes:

- 1.) Logic Design: Understanding the requirements and dividing the project into two modules – server side web application and a client side android application.

- 2.) Technical Design: Further we have analysed and designed the flow of processes “Use case Diagrams”, the database by using “E-R Diagram” and “Relational Schema”. The final top level architecture is explained in the later section.

### 2.3 Constraints/ Risks

- 1.) Assuming that requirements are as per the client has informed us and only what they work on till now, we have not added new features, except that of social mapping.
- 2.) To add new information collection forms, the database has to be added with more fields at later stage, which may cause some problems.

### 2.4 Guiding Principles

- Scalability - It can be scaled for more than one NGO, but as different firms have different demands, this project is only for a particular NGO. The database can however be scaled within the framework of one NGO, by adding new fields in tables.
- Maintainability - The application is developed in modularized manner so any modifications to any particular entity in the data base or scripts will be easily maintainable and modifiable to add new tables or update algorithm etc. Also adding new features to the system can be easily achieved by adding further scripts.
- Portability – The scripting languages used by system are PHP, HTML, CSS, MySQL files and these runs easily on popular Apache servers, Windows, Unix servers etc. It is kept highly independent of the Operating system of the server or the browser at the client side. Firefox browser is the test browser on which the application is tested against and it produced positive results. The client side is an android application which runs only on devices installed with android OS.
- Reliability - Reliability from this application will mean that the analysis and other results produced by the system take properly into considerations all the inputs from the client side. Failing in achieving this may lead to rejection of the application usage by the NGO.



### **3. System Overview**

#### **3.1 User Characteristics**

1. Literate- Yes.
2. Education- Till 10th grade
3. Language Proficiency- Can speak/write/read Gujarati
4. Can read and understand basic English

Initially the NIMS build will be shipped in with an interface in English language only. We plan to provide local language support in later versions of our product. As we know typing in Gujarati/Hindi can be very cumbersome, even a local language support may create user interaction issues.

5. Computer literacy

The users have no prior issue in handling a computer, tablet or a mobile phone. They have used java based mobile phones, so adapting to an android OS based device won't take much time if a proper interface is provided which will help them to adapt to the new system quickly.

#### **3.2 User Problem Statement**

1. Currently, with the pen and paper based approach the user (field coordinator) is expected to keep track of his activities over the month and then submit a set of documents detailing his monthly activities. Since there is no constraint on keeping the information objective enough and to the point, the user ends up sending lots of data that may be of very less help to the NGO. Thus the entire effort put in by the coordinator goes wasted.
2. The NGO personnel on receiving the data from the field coordinators have to first go through the process of transferring the pen-paper work to their computers before doing any analysis task which is an unnecessary overhead.
3. The field coordinators have to come to the NGO's office from various places to submit the documents as of now. There is travel money that is spent in addition to one person day lost.
4. The social maps currently made are on chart paper and purely based on coordinator's estimation of a place which can be totally incorrect at time. Again, effort is wasted along with inefficient work.

### 3.3 User Objectives

This section outlines the users' objectives and requirements for the new system.

1. Seamless interface
2. Social Mapping on the go
3. Real time data feed from field to office headquarters
4. Data Visualization for the NGO personnel

### 3.4 Hardware Requirements

The project would require a basic android device (preferably one enabled with GPS) for each of the coordinators working for the NGO and a personal computer at the NGO's office.

### 3.5 Software Requirements

The project development would require an Eclipse IDE to build the Android app which will be later tested on the Android Emulator plugin within Eclipse. At the server side, we would require WAMP server to provide a local server for running and testing our PHP scripts for server side programming. The database at the client side will be maintained and managed using SQLite, while at the server side MySQL would be used for the same. Google Map API or JQuery plugins like craftman would be used to implement the social mapping feature on the web application at the server side. The project also requires a dedicated server which can host the web application. This machine would serve as a web server and a database server.

### 3.6 Interfaces

There will be two interfaces:

- **Coordinator Interface:** In this interface, first the coordinator needs to login into the application and then he/she can submit the family information, can check the status of a family and can update the information of the family. The coordinator can also submit the information of any place which can be later marked on the social map at the server side.
- **NGO Admin Interface:** In this interface, first the NGO admin would login and then he/ she can see the collected data and analyse the data. The data would include the village information (family information), the social map of the

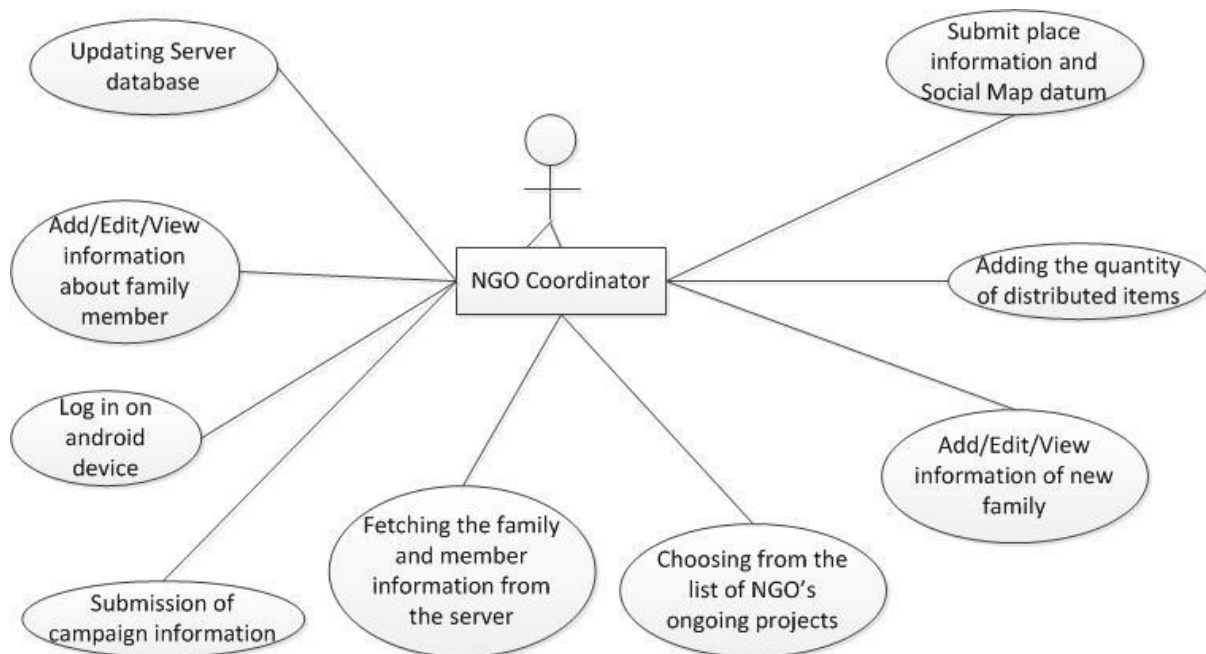
village, the status of voter cards, ration cards, sex ratio of various communities covered by the NGO and information regarding various projects undertaken by the NGO.

## 4. System Design

### 4.1 Use Cases

Users of the system will be the coordinator (Client Side) and the administrator (Server side) of the NGO. Each type of user has different needs and hence performs different functions as mentioned in the Software Requirements Specification.

#### 4.1.1 For Android application User (NGO Coordinator):



#### Use Case 1:

Use Case	Coordinator Login on Android Device
Description	Logging into an android device
Actors	a. NGO Coordinator
Assumptions	a. Login screen is always available first on opening the client application.

	<ul style="list-style-type: none"> <li>b. Login password and username are known</li> <li>c. Application is installed properly</li> </ul>
Steps	<ul style="list-style-type: none"> <li>a. Enter Username</li> <li>b. Password</li> </ul>
Triggers	Launching application
Variations	<ul style="list-style-type: none"> <li>a. Wrong Password and Wrong Username</li> <li>b. Wrong password or Wrong Username</li> </ul>
Non-Functional	Registration not to be provided at coordinator side.
Issues	What if coordinator forgets password/username?

**Use Case 2:**

Use Case	Client Logout on Android Device
Description	Logging out from an android device
Actors	NGO Coordinator
Assumptions	Going back to home page option is always available across all screens in a session.
Steps	Click "Logout"
Variations	None
Non-Functional	Inform actor about logout success by showing a login screen and a message-"You have logged out successfully"
Issues	<ul style="list-style-type: none"> <li>a. GPRS/3G connection of the phone is lost.</li> <li>b. Sudden Battery drainage.</li> <li>c. Request Timeout</li> </ul>

**Use Case 3:**

Use Case	Submit campaign information
Description	Sending geographic information of settlement and village name to server.
Actors	NGO Coordinator
Assumptions	<ul style="list-style-type: none"> <li>a. GPRS/3G connection already established</li> <li>b. GPS facility is there on the phone</li> </ul>

	c. Coordinator has successfully logged into a session.
Steps	a. Fill in name of the settlement. b. Fill in name of the village. c. Submit information.
Triggers	Logging into a session.
Variations	a. Settlement name not entered. b. Village name not entered.
Non-Functional	Inform actor about missing field entries by displaying "Please enter required information"
Issues	a. What if GPRS connection is lost in between activity? b. Privacy issues of the person using the application for surveying.

**Use Case 4:**

Use Case	Choose from the list of Ngo's on-going projects
Description	To choose for which project from those given is the survey being conducted.
Actors	NGO Coordinator
Assumptions	a. GPRS/3G connection already established b. Coordinator has logged into a session. c. Village and Settlement information already submitted to server database.
Steps	Choose from the given options for the settlement under survey : <ul style="list-style-type: none"> <li>• Family Information</li> <li>• Social Map</li> <li>• Item Distribution</li> <li>• Update Information</li> </ul>
Triggers	Submitting campaign information.
Variations	None
Non-Functional	None
Issues	What if GPRS/3G connection is lost in between activity?

**Use Case 5:**

Use Case	Choosing whether the family is new or already existing
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Description	To choose whether information needs to be entered for a new family or it is an already registered family whose information is to be viewed or edited.
Actors	NGO Coordinator
Assumptions	a. GPRS/3G connection already established b. Coordinator has logged into a session. c. Village and Settlement information already submitted to server database.
Steps	Choose from the given options for the family under survey.
Triggers	Choosing Family Info from the list of given projects
Variations	None
Non-Functional	None
Issues	What if GPRS/3G connection is lost in between activity?

**Use Case 5.1:**

Use Case	Submit family information
Description	Posting a Form filled for family information to the server
Actors	NGO Coordinator
Assumptions	a. GPRS/3G connection already established. b. Coordinator has successfully logged into a session. c. Village and Settlement information already filled. d. Family has not already been registered.
Steps	a. Fill in the details of a family. b. Submit.
Triggers	Selection of new family option in the previous view.
Variations	Leaving essential fields empty
Non-Functional	Inform actor about missing field entries by displaying "Please enter required information"
Issues	a. What if GPRS/3G connection is lost in between activity? b. Validation of fields – string/number only in some fields

**Use Case 5.1.1:**

Use Case	Choosing type of information to be displayed/entered for the family
Description	To choose from the given list of type of information to be entered/viewed/edited for a family
Actors	NGO Coordinator
Assumptions	<ul style="list-style-type: none"> <li>a. GPRS/3G connection already established</li> <li>b. GPS facility is there on the phone</li> <li>c. Coordinator has successfully logged into a session.</li> <li>d. Village and Settlement information already filled.</li> <li>e. Family has been newly registered or is an already registered family.</li> </ul>
Steps	Choose from <ul style="list-style-type: none"> <li>a. general family information</li> <li>b. member information</li> <li>c. identity cards</li> <li>d. government schemes</li> </ul>
Triggers	<ul style="list-style-type: none"> <li>a. Choosing a family from a given list.</li> <li>b. Submitting information of a new family.</li> </ul>
Variations	None
Non-Functional	None
Issues	What if GPRS connection is lost in between activity?

**Use case 5.1.1.1:**

Use Case	Viewing/Editing Family Information
Description	To view or edit information about the new/existing family under purview.
Actors	NGO Coordinator
Assumptions	<ul style="list-style-type: none"> <li>a. GPRS/3G connection already established</li> <li>b. GPS facility is there on the phone</li> <li>c. Coordinator has successfully logged into a session.</li> <li>d. Village and Settlement information already filled.</li> <li>e. Family has been newly registered or is an already registered family.</li> </ul>

Steps	View information or edit it (Using the given option)
Triggers	Choosing family information from the given list for the particular family
Variations	None
Non-Functional	None
Issues	What if GPRS connection is lost in between activity?

**Use Case 5.1.1.2:**

Use Case	Entering/Viewing/Editing Member Information
Description	To enter/view/edit (depending on whether the family exists already or is newly registered) information about the new/existing member of family under consideration.
Actors	NGO Coordinator
Assumptions	<ul style="list-style-type: none"> <li>a. GPRS/3G connection already established</li> <li>b. GPS facility is there on the phone</li> <li>c. Coordinator has successfully logged into a session.</li> <li>d. Village and Settlement information already filled.</li> <li>e. Family has been newly registered or is an already registered family.</li> </ul>
Steps	<ul style="list-style-type: none"> <li>a. For new family – Enter Information for each member of family</li> <li>b. For existing family – <ul style="list-style-type: none"> <li>• Select member from family to view his information.</li> <li>• Add a new member.</li> </ul> </li> </ul>
Triggers	Choosing member information from the given list for the particular family
Variations	<ul style="list-style-type: none"> <li>a. Empty fields in the member information (for a new member)</li> <li>b. Editing information of members by choosing from the list.</li> </ul>
Non-Functional	Inform actor about missing field entries by displaying “Please enter required information”
Issues	What if GPRS connection is lost in between activity?

**Use Case 5.1.1.3:**

Use Case	Entering/Viewing/Editing Identity Cards Information
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Description	To enter/view/edit (depending on whether the family exists already or is newly registered) card information about the new/existing family under consideration.
Actors	NGO Coordinator
Assumptions	<ul style="list-style-type: none"> <li>a. GPRS/3G connection already established</li> <li>b. GPS facility is there on the phone</li> <li>c. Coordinator has successfully logged into a session.</li> <li>d. Village and Settlement information already filled.</li> </ul>
Steps	Choose the card for which the information is to be edited/viewed/entered.
Triggers	Choosing identity cards from the given list for the particular family
Variations	None
Non-Functional	None
Issues	What if GPRS connection is lost in between activity?

**Use Case 5.1.1.3(a):**

Use Case	Entering/Viewing/Editing Voter Card Information
Description	To enter/view/edit (depending on whether the family exists already or is newly registered) card information about the new/existing family under consideration.
Actors	NGO Coordinator
Assumptions	<ul style="list-style-type: none"> <li>a. GPRS/3G connection already established</li> <li>b. GPS facility is there on the phone</li> <li>c. Coordinator has successfully logged into a session.</li> <li>d. Village and Settlement information already filled.</li> <li>e. Family has been newly registered or is an already registered family.</li> <li>f. Member Information has been fed in</li> </ul>
Steps	<ul style="list-style-type: none"> <li>a. For new family – Enter Information for each member of family stating whether the card has been issued or applied for</li> <li>b. For existing family – Enter information similar to that of a new family member if data is missing, or change status if required.</li> </ul>
Triggers	Choosing voter card from the given list of cards for the particular family

Variations	None
Non-Functional	None
Issues	a. What if GPRS connection is lost in between activity? b. What should be the default value of the status of the card?

**Use Case 5.1.1.3(b):**

Use Case	Entering/Viewing/Editing Ration Card Information
Description	To enter/view/edit (depending on whether the family exists already or is newly registered) card information about the new/existing family under consideration.
Actors	NGO Coordinator
Assumptions	a. GPRS/3G connection already established b. GPS facility is there on the phone c. Coordinator has successfully logged into a session. d. Village and Settlement information already filled. e. Family has been newly registered or is an already registered family. f. Member Information has been fed in
Steps	a. If the card has already been applied for – Enter Information category of card of family b. If the card has already been issued – Enter new information/Edit (or view) information if required.
Triggers	Choosing ration card from the given list of cards for the particular family and hence choosing whether the card is to be applied for or is already issued.
Variations	None
Non-Functional	None
Issues	a. What if GPRS connection is lost in between activity? b. What should be the default value of the status of the card?

**Use Case 5.1.1.3(c):**

Use Case	Entering/Viewing/Editing Plot Card Information
Description	To enter/view/edit (depending on whether the family exists already or

	is newly registered) card information about the new/existing family under consideration.
Actors	NGO Coordinator
Assumptions	<ul style="list-style-type: none"> <li>a. GPRS/3G connection already established</li> <li>b. GPS facility is there on the phone</li> <li>c. Coordinator has successfully logged into a session.</li> <li>d. Village and Settlement information already filled.</li> <li>e. Family has been newly registered or is an already registered family.</li> <li>f. Member Information has been fed in</li> </ul>
Steps	Choose from the given options the ownership rights for the plot occupied by the family
Triggers	Choosing plot card from the given list of cards for the particular family
Variations	None
Non-Functional	None
Issues	<ul style="list-style-type: none"> <li>a. What if GPRS connection is lost in between activity?</li> <li>b. What should be the default value of the status of the card?</li> </ul>

**Use Case 5.1.1.3(d):**

Use Case	Entering/Viewing/Editing Job Card Information
Description	To enter/view/edit (depending on whether the family exists already or is newly registered) card information about the new/existing family under consideration.
Actors	NGO Coordinator
Assumptions	<ul style="list-style-type: none"> <li>a. GPRS/3G connection already established</li> <li>b. GPS facility is there on the phone</li> <li>c. Coordinator has successfully logged into a session.</li> <li>d. Village and Settlement information already filled.</li> <li>e. Family has been newly registered or is an already registered family.</li> <li>f. Member Information has been fed in</li> </ul>
Steps	<ul style="list-style-type: none"> <li>a. For new family – Enter Information for each member of family stating whether the card has been issued or applied for</li> <li>b. For existing family – Enter information similar to that of a new</li> </ul>

	family member if data is missing, or change status if required.
Triggers	Choosing voter card from the given list of cards for the particular family
Variations	None
Non-Functional	None
Issues	a. What if GPRS connection is lost in between activity? b. What should be the default value of the status of the card?

**Use Case 5.1.1.3(e):**

Use Case	Entering/Viewing/Editing Aadhar Card Information
Description	To enter/view/edit (depending on whether the family exists already or is newly registered) card information about the new/existing family under consideration.
Actors	NGO Coordinator
Assumptions	a. GPRS/3G connection already established b. GPS facility is there on the phone c. Coordinator has successfully logged into a session. d. Village and Settlement information already filled. e. Family has been newly registered or is an already registered family. f. Member Information has been fed in
Steps	a. For new family – Enter Information for each member of family stating whether the card has been issued or applied for b. For existing family – Enter information similar to that of a new family member if data is missing, or change status if required.
Triggers	Choosing voter card from the given list of cards for the particular family
Variations	None
Non-Functional	None
Issues	a. What if GPRS connection is lost in between activity? b. What should be the default value of the status of the card?

**Use Case 5.1.1.4:**

Use Case	Entering/Viewing/Editing Government Scheme Information
Description	To enter/view/edit (depending on whether the family exists already or is newly registered) government scheme information about the new/existing family under consideration.
Actors	NGO Coordinator
Assumptions	<ul style="list-style-type: none"> <li>a. GPRS/3G connection already established</li> <li>b. GPS facility is there on the phone</li> <li>c. Coordinator has successfully logged into a session.</li> <li>d. Village and Settlement information already filled.</li> <li>e. Family has been newly registered or is an already registered family.</li> <li>f. Member Information has been fed in</li> </ul>
Steps	Choose the government scheme for which the information is to be edited/viewed/entered.
Triggers	Choosing Government schemes from the given list for the particular family
Variations	None
Non-Functional	None
Issues	What if GPRS connection is lost in between activity?

**Use Case 6:**

Use Case	Submit Social Map datum
Description	Sending geographic information of a place type and name to server.
Actors	NGO Coordinator
Assumptions	<ul style="list-style-type: none"> <li>a. GPRS/3G connection already established</li> <li>b. GPS facility is there on the phone</li> <li>c. Coordinator has successfully logged into a session.</li> <li>d. Village and Settlement information already filled.</li> </ul>
Steps	<ul style="list-style-type: none"> <li>a. Fill in type of the place.</li> <li>b. Fill in name of the place.</li> <li>c. Submit information. (GPS information fetched by the device and embedded into the outgoing packet appropriately.)</li> </ul>
Triggers	Choosing social map option from list of projects.

Variations	a. Type of place not entered. b. Name of the place not entered.
Non-Functional	Inform actor about missing field entries by displaying “Please enter required information”
Issues	a. What if GPRS connection is lost in between activity? b. What if GPS data is not reachable? c. Privacy issues of the person using the application for surveying.

**Use Case 7:**

Use Case	Submit item distribution datum
Description	Saving information of which item is being distributed in the particular settlement.
Actors	NGO Coordinator
Assumptions	a. GPRS/3G connection already established b. Coordinator has successfully logged into a session. c. Village and Settlement information already filled.
Steps	Fill in the item to be distributed
Triggers	Choosing item distribution option from list of projects.
Variations	Item not entered.
Non-Functional	Inform actor about missing field entries by displaying “Please enter required information”
Issues	a. What if GPRS connection is lost in between activity? b. Privacy issues of the person using the application for surveying.

**Use Case 7.1:**

Use Case	Submit quantity of the particular item distributed
Description	Saving the quantity of the item given to each family in the particular settlement.
Actors	NGO Coordinator
Assumptions	a. GPRS/3G connection already established

	<ul style="list-style-type: none"> <li>b. Coordinator has successfully logged into a session.</li> <li>c. Village and Settlement information already filled.</li> </ul>
Steps	<ul style="list-style-type: none"> <li>a. Given the list of families in the settlement, fill in the quantity against each.</li> <li>b. Submit information</li> </ul>
Triggers	Submitting the item being distributed in the given settlement.
Variations	Quantity not entered for any family. (One or more).
Non-Functional	None.
Issues	<ul style="list-style-type: none"> <li>a. What if GPRS connection is lost in between activity?</li> <li>b. What if quantity field is empty for one or more families?</li> </ul>

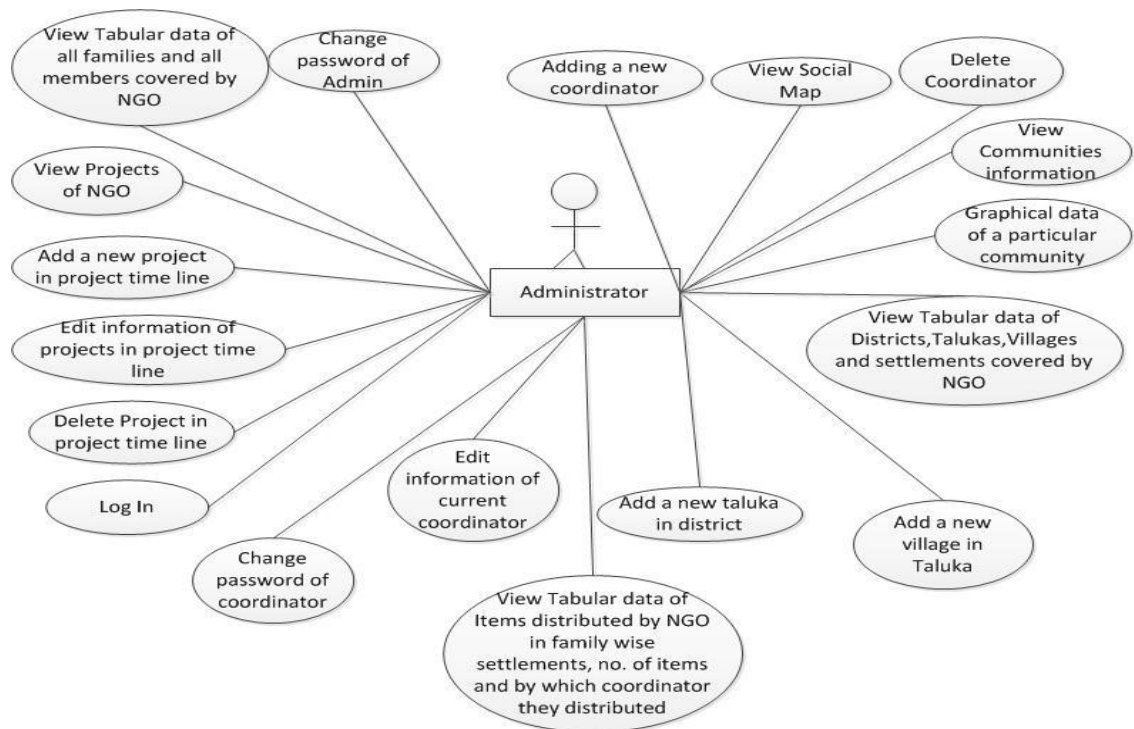
## Use Case 8:

Use Case	Update server database
Description	Sending the information stored on the local database obtained during the server to the server.
Actors	NGO Coordinator
Assumptions	<ul style="list-style-type: none"> <li>a. GPRS/3G connection already established</li> <li>b. Coordinator has successfully logged into a session.</li> <li>c. Village and Settlement information already filled.</li> <li>d. Coordinator has filled up all the necessary forms and is ready to update/enter the information obtained on the server database</li> </ul>
Steps	Choose the option of updating database from the ngo projects page.
Triggers	Choosing the update database button from ngo projects page.
Variations	None.
Non-Functional	None.
Issues	<ul style="list-style-type: none"> <li>a. What if GPRS connection is lost in between activity?</li> <li>b. What if certain forms are left empty for one or more families within the settlement?</li> </ul>

## Use Case 9:

Use Case	Go to home/ngo projects page.
Description	Every step of the application, user will get an option to go back to the home page at any point of time.
Actors	NGO Coordinator
Assumptions	a. GPRS/3G connection already established b. Coordinator has successfully logged into a session. c. Village and Settlement information already filled.
Steps	Click on home/ngo projects button
Triggers	Clicking on home/ngo projects button
Variations	None.
Non-Functional	None.
Issues	What if GPRS connection is lost in between activity?

## 4.1.2 For Server side web application user (NGO administrator):





**Use Case 1:**

Use Case	Social Map
Description	Showing social map of the selected district
Actors	NGO Administrator Public
Assumptions	Internet connection is available
Steps	Select the particular district
Triggers	View social map of a particular region
Variations	None
Non-Functional	None
Issues	There might be a delay in displaying the social map in case the internet speed is very low.

**Use Case 2:**

Use Case	Login on Website
Description	Logging into the website
Actors	NGO Administrator
Assumptions	a. Internet connection is available b. Actor has logged into a session
Steps	a. Enter Username b. Password
Triggers	Clicking on the 'Log In' button on the screen
Variations	a. Wrong Password and Wrong Username b. Wrong password or Wrong Username
Non-Functional	Inform actor about login success by showing a message-" Logged in as NGO Admin "
Issues	Administrator forgets password/username

**Use Case 3:**

Use Case	View Community information
Description	Graphical analysis of the data about different communities for which the NGO works
Actors	NGO Administrator
Assumptions	Internet connection is available Actor has logged into a session
Steps	Select the particular community from Community tab
Triggers	Clicking on 'Communities' field
Variations	None
Non-Functional	Bar charts of the data: sex ratio, traditional vs. current occupation, ration card status, ration card category, member job card status, voter card status and status of children going to school
Issues	The charts may not be compatible with all the browsers

**Use Case 4:**

Use Case	Showing graphical analysis of a particular community
Description	Showing social map of the selected district
Actors	NGO Administrator
Assumptions	a. Internet connection is available b. Actor has logged into a session
Steps	Select a particular community
Triggers	Selecting a particular community
Variations	None
Non-Functional	a. Pie charts of the data: sex ratio, traditional vs. current occupation, ration card status, ration card category, member job card status, voter card status and status of children going to school b. Information about population, district covered and average family daily income of corresponding community

Issues	The charts may not be compatible with all the browsers.
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**Use Case 5:**

Use Case	Projects of the NGO
Description	View all the projects and their detailed information about dates, milestones, donors, etc. that have been undertaken so far by the NGO
Actors	Administrator
Assumptions	<ul style="list-style-type: none"> <li>a. Internet connection is available</li> <li>b. User-name and password are known</li> <li>c. Database is maintained properly</li> </ul>
Steps	<ul style="list-style-type: none"> <li>a. Navigate through the timeline to view detailed progress of any project by month or by year.</li> <li>b. Get detailed information about a project by clicking on that project's timeline.</li> </ul>
Triggers	Clicking the Projects button on the title bar.
Variations	None
Non-Functional	None
Issues	<ul style="list-style-type: none"> <li>a. Administrator forgets to enter all the required project details in the database.</li> <li>b. Administrator enters wrong data about the project.</li> </ul>

**Use Case 6:**

Use Case	Displaying data in tabular form
Description	Displaying tabular data of the settlement, villages, families etc. covered by the NGO in tabular form
Actors	NGO Administrator
Assumptions	<ul style="list-style-type: none"> <li>a. Internet connection is available</li> <li>b. Actor has logged into a session</li> </ul>

Steps	Click on the “Tabular Data” field
Triggers	Clicking on the “Tabular Data” field
Variations	None
Non-Functional	None
Issues	None

**Use Case 7:**

Use Case	Showing data of the district in tabular form
Description	Showing data of the districts covered by NGO in tabular form
Actors	NGO Administrator
Assumptions	a. Internet connection is available b. Actor has logged into a session
Steps	Click on the ‘District Information’ field Or Click on the ‘Tabular Data’ field
Triggers	Clicking on the ‘District Information’ field or Clicking on the “Tabular Data” field
Variations	None
Non-Functional	None
Issues	None

**Use Case 7.1:**

Use Case	Showing data of particular district in tabular form
Description	Showing data of the selected district in tabular form
Actors	NGO Administrator
Assumptions	a. Internet connection is available b. Actor has logged into a session

Steps	a. Click on the 'District Information' field b. Click on the name of the district
Triggers	Clicking on the name of a particular district
Variations	Shows similar tabular data for any other district chosen from the given list.
Non-Functional	None
Issues	None

**Use Case 8:**

Use Case	Showing data of the taluka in tabular form
Description	Showing data of the districts covered by NGO in tabular form
Actors	NGO Administrator
Assumptions	a. Internet connection is available b. Actor has logged into a session
Steps	Click on the 'Taluka Information' field Or Click on 'taluka' field of the navigation when the page of tabular data of a particular district is open
Triggers	Clicking on the "Taluka Information" option on the side menu
Variations	Clicking on 'district' field of the district table to display the information of all the talukas present in that district.
Non-Functional	None
Issues	None

**Use Case 8.1:**

Use Case	Showing data of particular taluka in tabular form
Description	Showing data of the selected taluka in tabular form

Actors	NGO Administrator
Assumptions	a. Internet connection is available b. Actor has logged into a session
Steps	a. Click on the 'Taluka Information' field b. Click on the name of the taluka
Triggers	Clicking on the name of the taluka
Variations	Shows similar tabular data for any other taluka chosen from the given list.
Non-Functional	None
Issues	None

**Use Case 9:**

Use Case	Showing data of the village in tabular form
Description	Showing data of the villages covered by NGO in tabular form
Actors	NGO Administrator
Assumptions	a. Internet connection is available b. Actor has logged into a session
Steps	Click on the 'Village Information' field Or Click on 'village' field of the navigation when the page of tabular data of a particular taluka is open
Triggers	Clicking on the "Village Information" option
Variations	Clicking on 'taluka' field of the taluka table to display the information of all the villages present in that taluka.
Non-Functional	None
Issues	None

**Use Case 9.1:**

Use Case	Showing data of particular village in tabular form
Description	Showing data of the selected village in tabular form
Actors	NGO Administrator
Assumptions	a. Internet connection is available b. Actor has logged into a session
Steps	a. Click on the 'Village Information' field b. Click on the name of the village
Triggers	Clicking on the name of the village
Variations	Shows similar tabular data for any other village chosen from the given list.
Non-Functional	None
Issues	None

**Use Case 10:**

Use Case	Showing data of the settlement in tabular form
Description	Showing data of the settlements covered by NGO in tabular form
Actors	NGO Administrator
Assumptions	a. Internet connection is available b. Actor has logged into a session
Steps	Click on the 'Settlement Information' field Or Click on 'settlement' field of the navigation when the page of tabular data of a particular village is open
Triggers	Clicking on the "Settlement Information" field
Variations	Clicking on 'village' field of the village table to display the information of all the settlement present in that district.
Non-Functional	None

Issues	None
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**Use Case 10.1:**

Use Case	Showing data of particular settlement in tabular form
Description	Showing data of the selected settlement in tabular form
Actors	NGO Administrator
Assumptions	a. Internet connection is available b. Actor has logged into a session
Steps	a. Click on the 'Settlement Information' field b. Click on the name of settlement
Triggers	Clicking on the name of the settlement
Variations	Shows similar tabular data for any other settlement chosen from the given list.
Non-Functional	None
Issues	None

**Use Case 11:**

Use Case	Showing data of the family in tabular form
Description	Showing data of the all families covered by NGO in tabular form
Actors	NGO Administrator
Assumptions	a. Internet connection is available b. Actor has logged into a session
Steps	Click on the 'Family Information' field Or Click on 'family' field of the navigation when the page of tabular data of a particular settlement is open
Triggers	Clicking on the "Family Information" field Or Clicking on 'family' field of the navigation when the page of tabular data of a particular settlement is open



Variations	Clicking on 'settlement' field of the settlement table to display the information of all the family present in that district.
Non-Functional	None
Issues	None

**Use Case 11.1:**

Use Case	Showing data of all members in particular family in tabular form
Description	Showing data of the selected family with all members in tabular form
Actors	NGO Administrator
Assumptions	a. Internet connection is available b. Actor has logged into a session
Steps	a. Click on the 'Family Information' field b. Click on the name of the 'Family Head'
Triggers	Clicking on the name of the 'Family Head'
Variations	Shows similar tabular data for any other family chosen from the given list.
Non-Functional	None
Issues	None

**Use Case 12:**

Use Case	Showing data of the member in tabular form
Description	Showing data of the all members of all the families covered by NGO in tabular form
Actors	NGO Administrator
Assumptions	a. Internet connection is available b. Actor has logged into a session
Steps	Click on the 'Member Information' field

	Or Click on 'member' field of the navigation when the page of tabular data of a particular family is open
Triggers	Clicking on the "Member Information" field
Variations	Clicking on 'family' field of the family table to display the information of all the members present in that district.
Non-Functional	None
Issues	None

**Use Case 13:**

Use Case	Showing data of the items distributed by NGO in tabular form
Description	Showing data of all the items distributed by NGO in tabular form
Actors	NGO Administrator
Assumptions	a. Internet connection is available b. Actor has logged into a session
Steps	Click on the 'Item Information' field
Triggers	Clicking on the "Item Information" field
Variations	None
Non-Functional	None
Issues	None

**Use Case 14:**

Use Case	Showing data of the item distribution by NGO in tabular form
Description	Showing data of all the items distributed by coordinator who distributed, settlement name in which they are distributed, family head's name in whose family they are distributed and no. of items of that item distributed by NGO in tabular form
Actors	NGO Administrator

Assumptions	a. Internet connection is available b. Actor has logged into a session
Steps	Click on the 'Item Distribution' field
Triggers	Clicking on the "Item Distribution" field
Variations	Clicking on 'item_name' field of the item information table to display the distribution information of that particular item
Non-Functional	None
Issues	None

**Use Case 15:**

Use Case	Change password of administrator
Description	Change the password for the administrator
Actors	Administrator
Assumptions	Administrators have the user-name and correct old password of the coordinator whose password is to be changed
Steps	a. Click on the Settings tab on the title bar. b. Click on the Change Password option in the Settings list c. Enter the user-name and old password of the coordinator d. Enter new password and confirm it again e. Save the changes
Triggers	Clicking the Change Password option in Settings list
Variations	None
Non-Functional	None
Issues	a. Administrator enters wrong user-name and/or wrong old password b. After changing the password administrator forgets the new password c. After entering the data administrator forgets to save the data but gives the new information to the coordinator

**Use Case 16:**

Use Case	Adding a new coordinator
Description	To add the details of a new coordinator in the database, this function will be used
Actors	Administrator
Assumptions	Administrator knows all the required details about the coordinator
Steps	In the Settings list, select Add New Coordinator option and fill in the new coordinator's detail accordingly and save the changes
Triggers	Selecting the Add New Coordinator option from Settings list
Variations	None
Non-Functional	None
Issues	<ul style="list-style-type: none"> <li>a. Administrator forgets the user-name and password entered in the database for that coordinator</li> <li>b. Administrator enters incorrect data of the coordinator</li> </ul>

**Use Case 17:**

Use Case	Edit coordinator's information
Description	Edit the information of an existing coordinator or delete the records of a coordinator completely
Actors	Administrator
Assumptions	<ul style="list-style-type: none"> <li>a. The coordinator's information to be edited is already present in the database</li> <li>b. Administrator knows about the exact new details about that coordinator</li> <li>c. Administrator knows whether to delete the coordinator or edit it</li> </ul>
Steps	<ul style="list-style-type: none"> <li>a. Select Edit existing Coordinator's Information option from the Settings list</li> <li>b. Select the particular coordinator whose details are to be edited</li> <li>c. Change the details of the coordinator and save the changes</li> </ul>
Triggers	Selecting Edit existing Coordinator's Information option
Variations	None
Non-	None

Functional	
Issues	<ul style="list-style-type: none"> <li>a. Administrator confuses the coordinator's details to be changed with some other coordinator and selects the wrong coordinator</li> <li>b. Administrator enters wrong data</li> <li>c. Administrator deletes the coordinator from database instead of just editing their information</li> <li>d. Administrator forgets to save the data edited</li> </ul>

**Use Case 18:**

Use Case	Add a new project
Description	Add a new project in the database
Actors	Administrator
Assumptions	<ul style="list-style-type: none"> <li>a. The project's information to be edited is already present in the database</li> <li>b. Administrator knows about the exact new details about that project</li> </ul>
Steps	Select Add New Project option from the Settings tab Enter the details of the new project to entered into the database
Triggers	Selecting Add new project option
Variations	None
Non-Functional	None
Issues	<ul style="list-style-type: none"> <li>a. Administrator confuses the project's detail to be added with some other project.</li> <li>b. Administrator enters wrong data</li> <li>c. Administrator forgets to save the data</li> </ul>

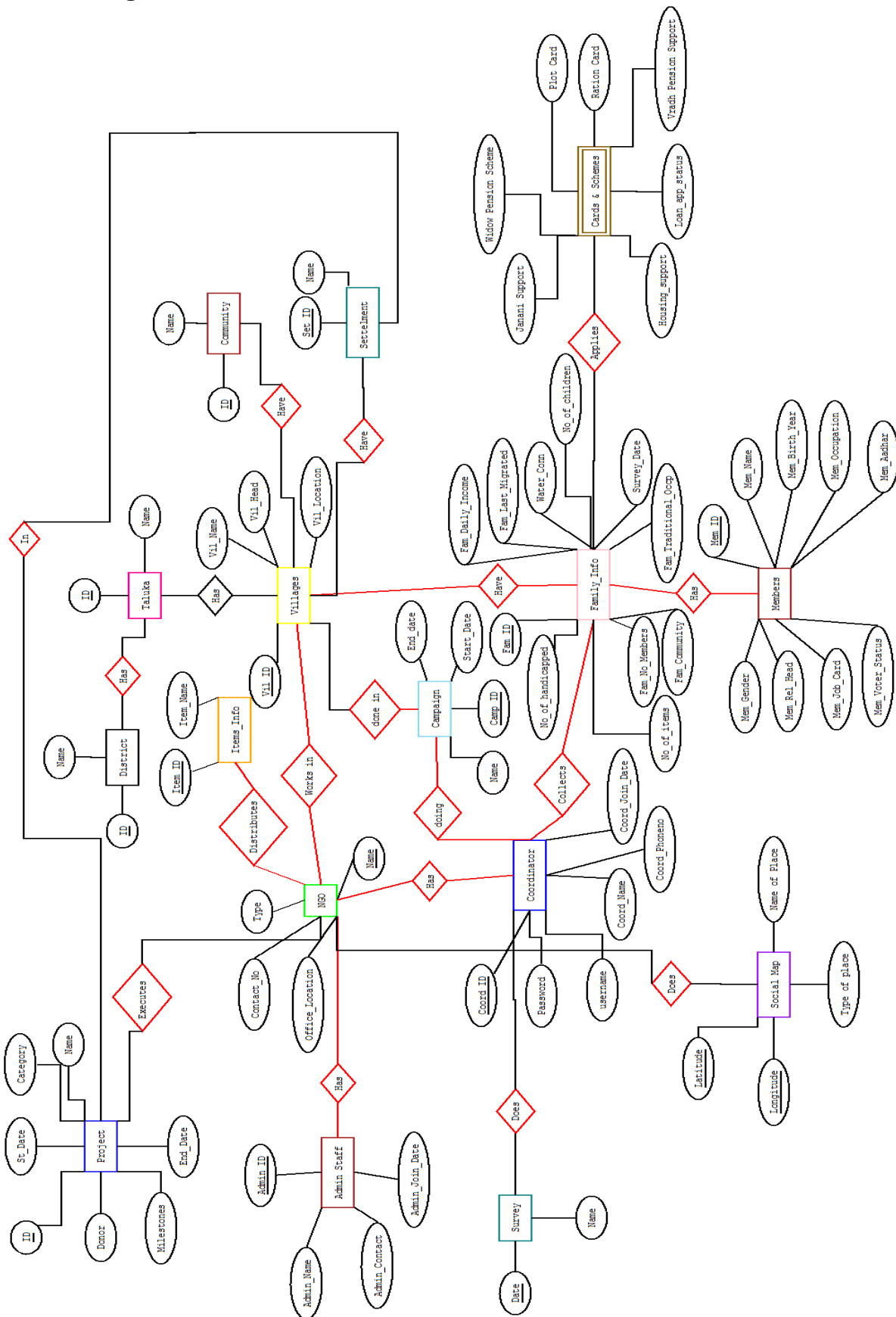
**Use Case 19:**

Use Case	Edit project's information
Description	Edit the information of an existing project or delete the records of a project completely
Actors	Administrator

Assumptions	<ul style="list-style-type: none"> <li>a. The coordinator's information to be edited is already present in the database</li> <li>b. Administrator knows about the exact new details about that coordinator</li> <li>c. Administrator knows whether to delete the coordinator or edit it</li> </ul>
Steps	<ul style="list-style-type: none"> <li>a. Select Edit existing Project's Information option from the Settings tab</li> <li>b. Select the particular project whose details are to be edited</li> <li>c. Change the details of the project and save the changes</li> </ul>
Triggers	Selecting Edit existing Project's Information option
Variations	None
Non-Functional	None
Issues	<ul style="list-style-type: none"> <li>a. Administrator confuses the project's detail to be changed with some other project and selects the wrong project</li> <li>b. Administrator enters wrong data</li> <li>c. Administrator deletes the project from database instead of just editing its information</li> <li>d. Administrator forgets to save the data</li> </ul>

**Use Case 20:**

Use Case	Add new village / taluka in database
Description	Add a new village or taluka in the main database
Actors	Administrator
Assumptions	Administrator knows the new village or taluka's name
Steps	<ul style="list-style-type: none"> <li>a. Select Add a new Village/Taluka option from the Settings Tab</li> <li>b. Enter the information about the new village or taluka and save the changes.</li> </ul>
Triggers	Addition of new village or tauka in NGO's work area
Variations	None
Non-Functional	None
Issues	Administrator doesn't know the exact information about the new village, its taluka or its district.



**Figure 1:- ER Diagram**

### 4.3 Relational Schema

Family\_info:

<u>Fam_id</u>	<u>Fam_Head</u>	<u>Fam_no_of_members</u>	<u>Fam_no_of_children</u>
<u>Fam_last_migrated_from</u>	<u>Fam_traditional_occupation</u>	<u>Fam_no_of_children_school</u>	<u>Fam_daily_income</u>
<u>Fam_settlement_id</u>	<u>settlement_ID</u>	<u>Fam_water_connection</u>	<u>Com_ID</u>
<u>Fam_janani_support_status</u>	<u>Fam_widow_pension_scheme</u>	<u>Fam_vraddh_pension_scheme</u>	<u>Fam_housing_support</u>
<u>Fam_plot_card_Status</u>	<u>Fam_ration_card_category</u>	<u>Fam_ration_card_status</u>	<u>Fam_loan_application_status</u>
<u>Fam_electricity_status</u>	<u>Fam_no_of_handicapped</u>	<u>No_of_items</u>	

Member Table:

<u>Mem_ID</u>	<u>Fam_id</u>	<u>Mem_Name</u>	<u>Mem_birth_year</u>	<u>Mem_Occupation</u>
<u>Mem_Relation_with_Head</u>	<u>Mem_Gender</u>	<u>Mem_Job_Card</u>	<u>Mem_Voter_Status</u>	<u>Mem_Adhar_card</u>

Mem\_job\_card-

NOT\_APPLIED(default), ISSUED, APPLIED\_NOT\_ISSUED , NOT\_APPLICABLE

Mem\_voter\_status-

NOT\_APPLIED (default), ISSUED, APPLIED\_NOT\_ISSUED , NOT\_APPLICABLE

Mem\_adhar-

NOT\_APPLIED (default), ISSUED, APPLIED\_NOT\_ISSUED , NOT\_APPLICABLE

NGO Table:

<u>NGO_Name</u>	<u>NGO_Type</u>	<u>NGO_Contact_No</u>	<u>NGO_Office_location</u>
<u>NGO_username</u>	<u>NGO_password</u>	<u>NGO_ID</u>	

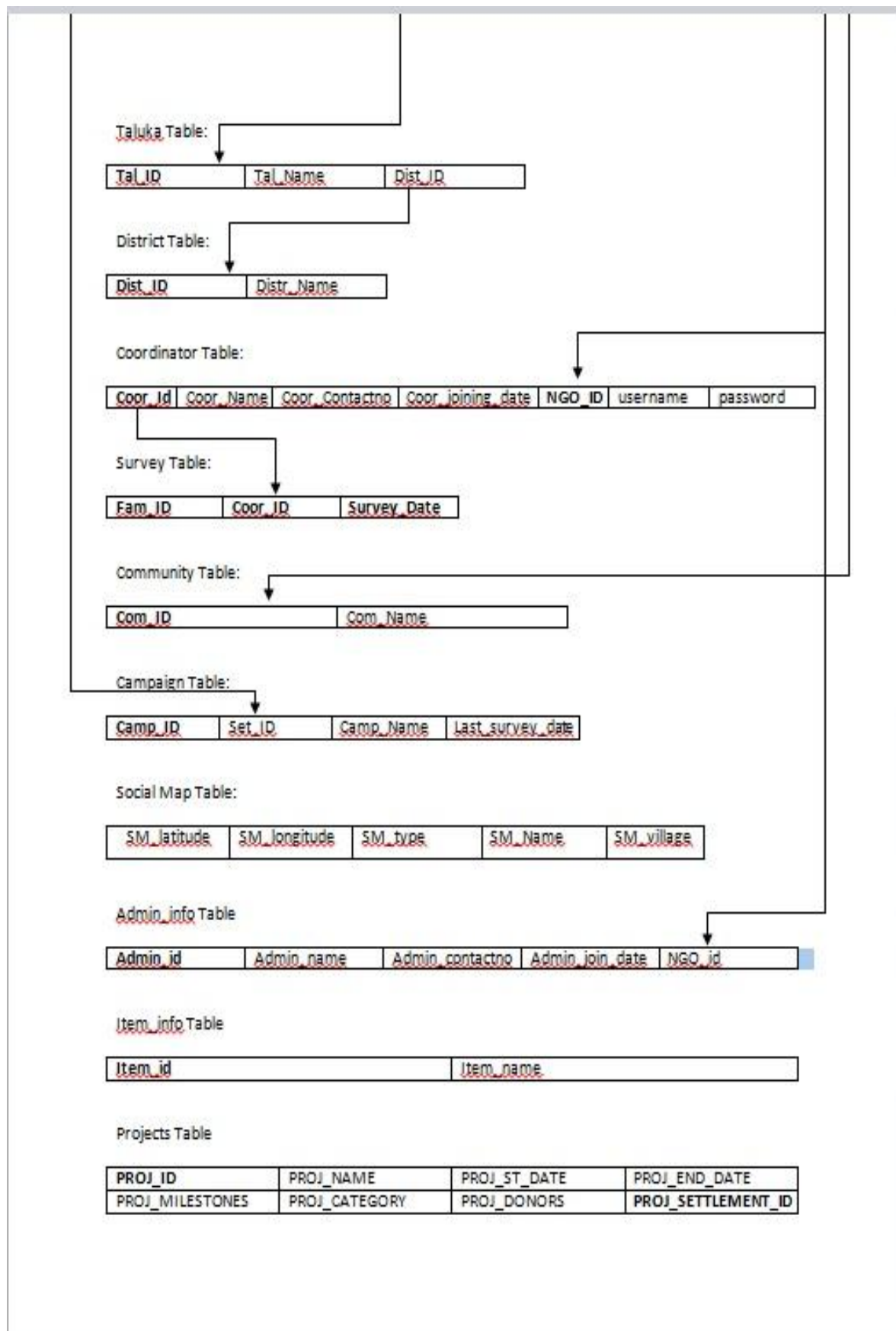
Settlement Table:

<u>Set_id</u>	<u>Set_Name</u>	<u>Vil_ID</u>
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Village Table:

<u>Vil_id</u>	<u>Vil_Name</u>	<u>Taluka_ID</u>
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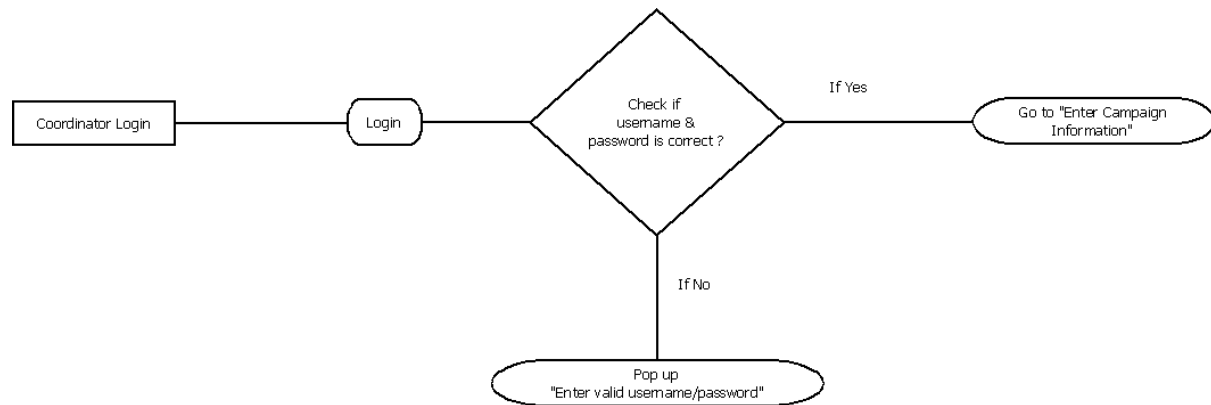




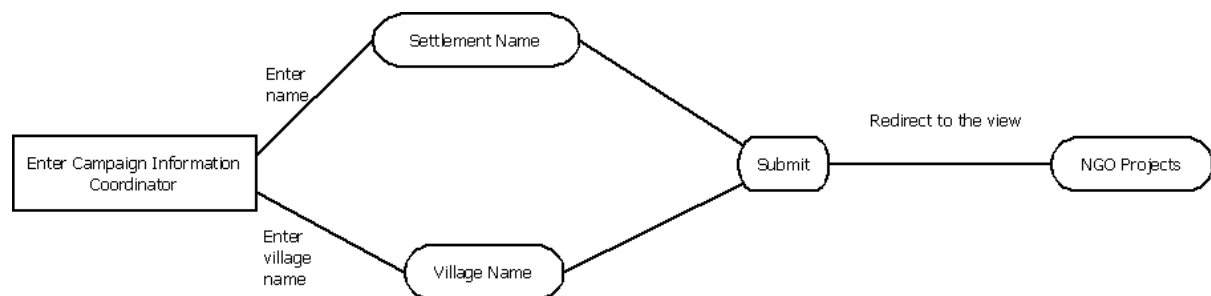
## 4.4 Dataflow Diagrams

### 4.4.1 Client Side

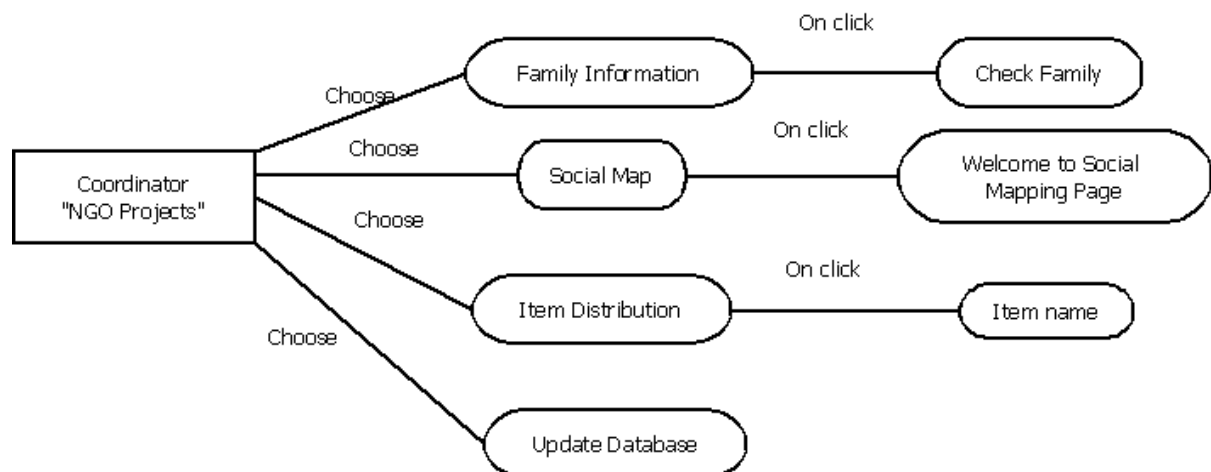
#### Coordinator Login



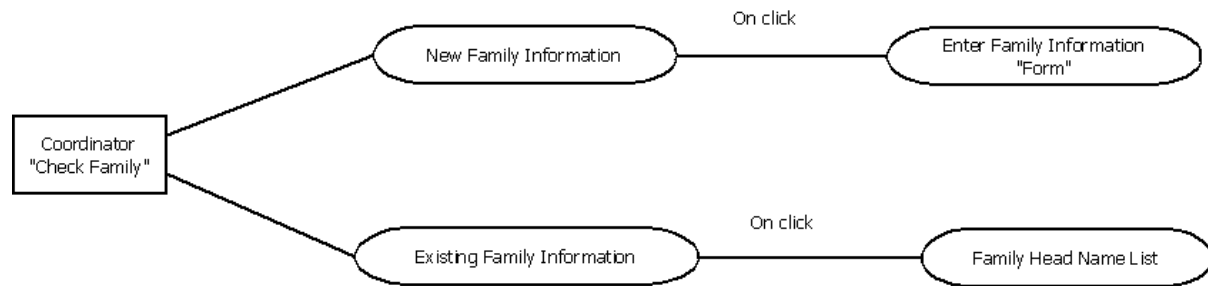
#### Campaign Form



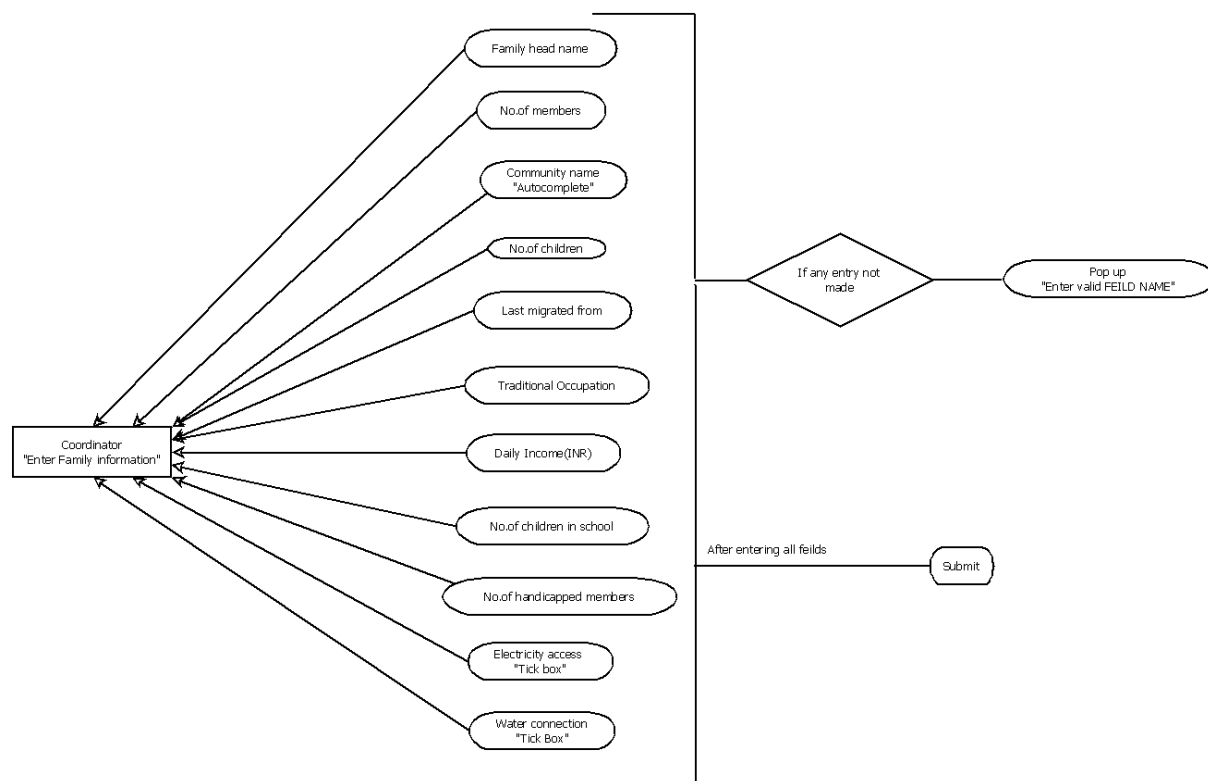
#### NGO Projects Selection



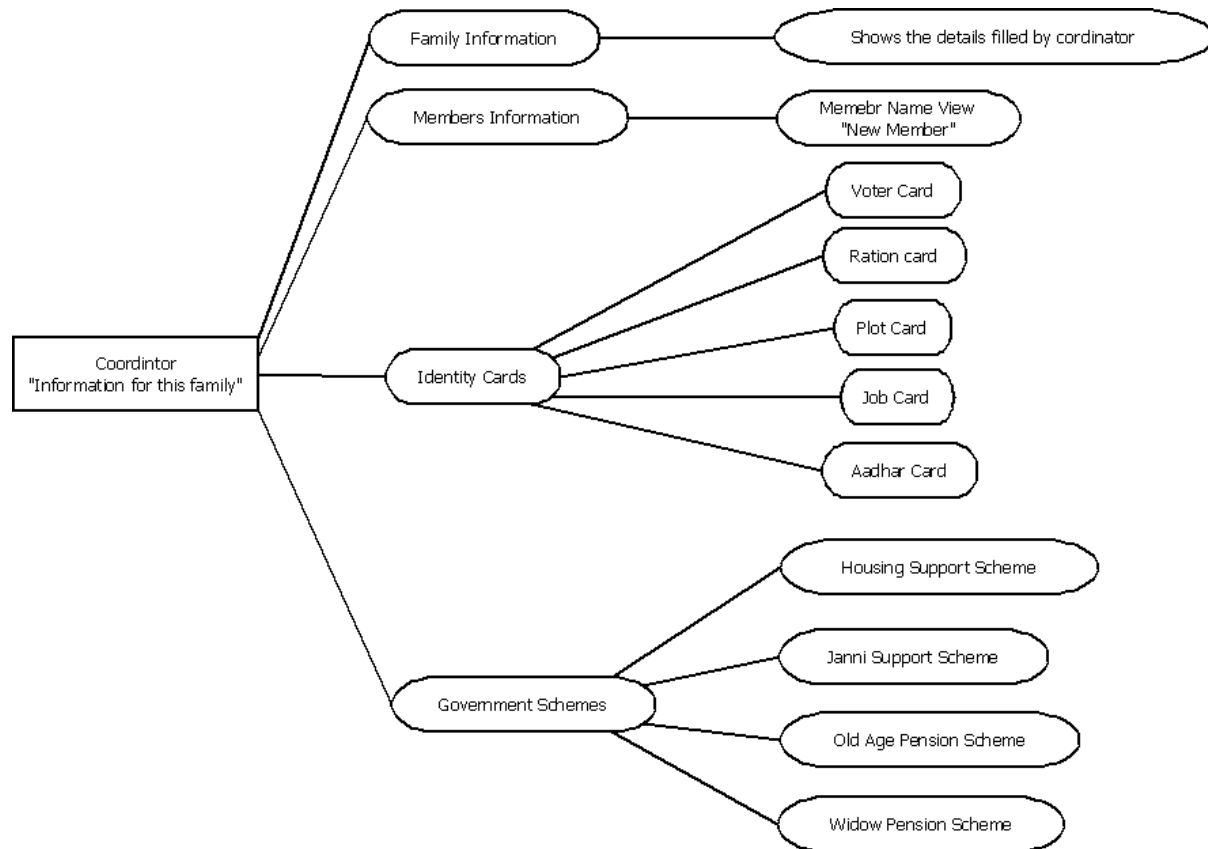
## Check Family



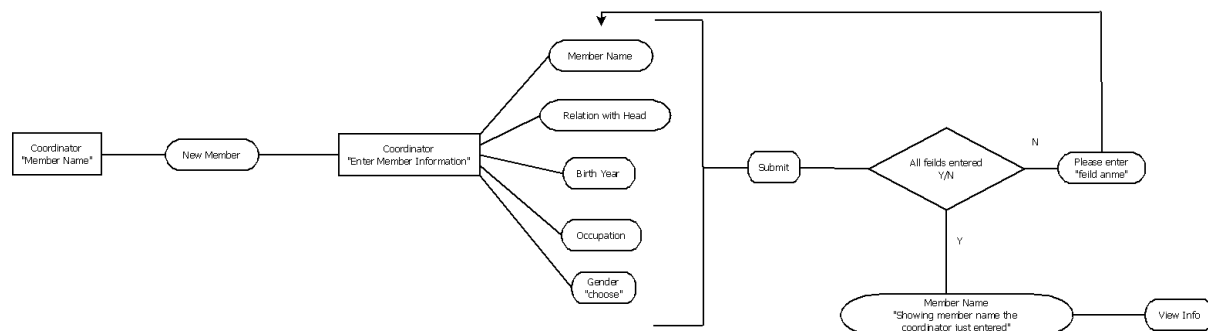
## New Family Form



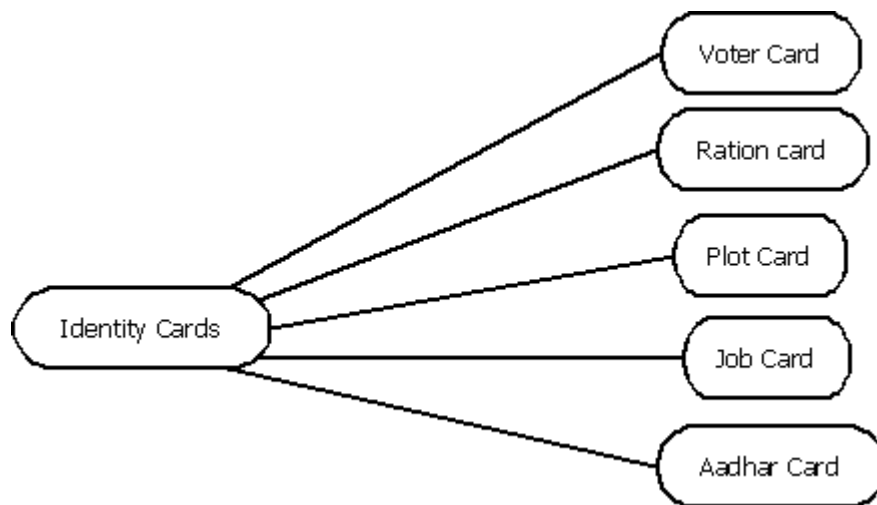
## Family Menu



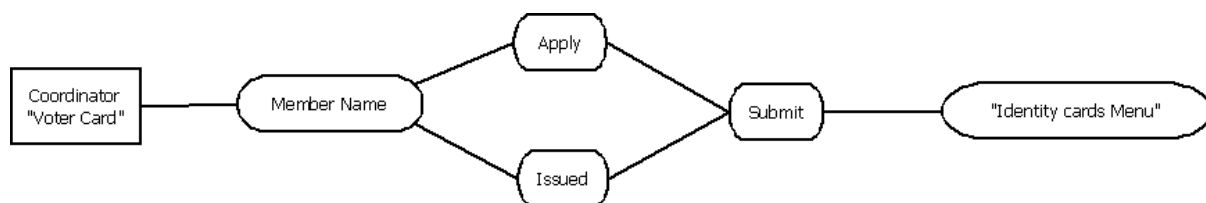
## New Member Form



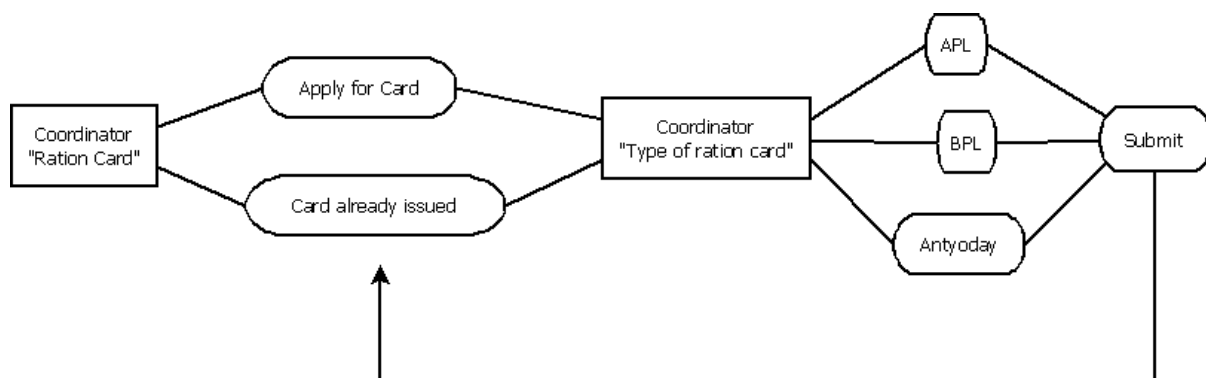
## Identity Cards Menu



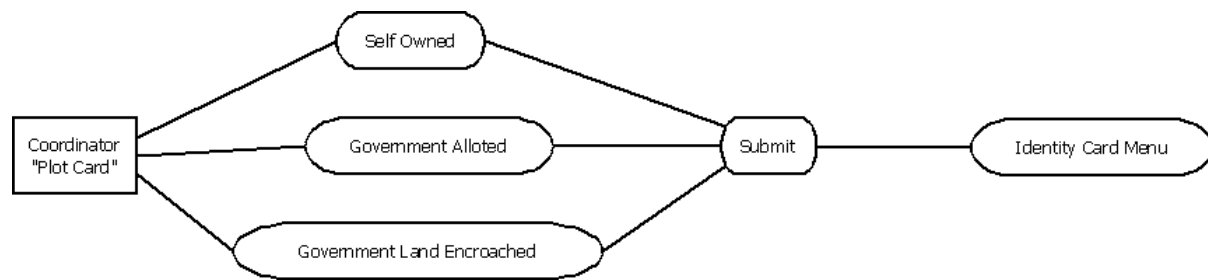
## Voter Card



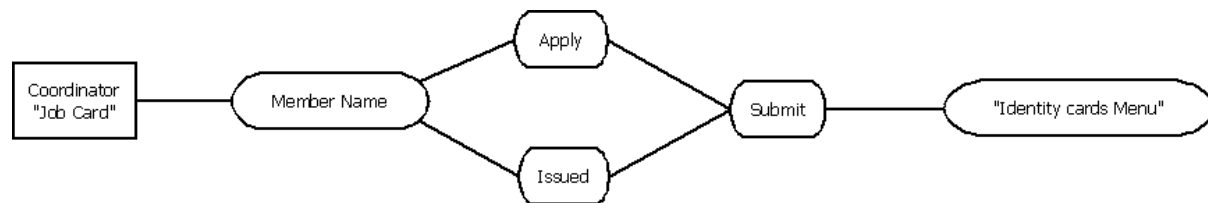
## Ration Card



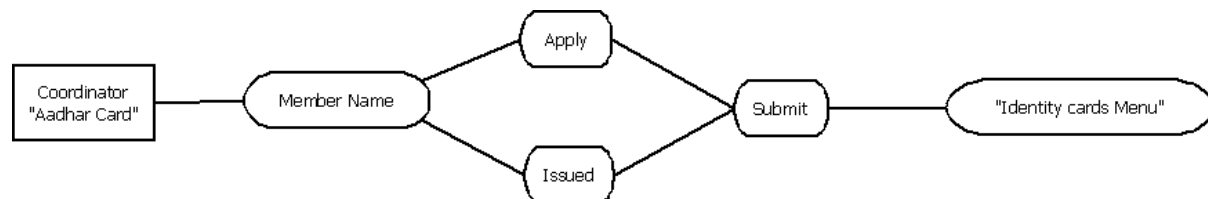
### Plot Card



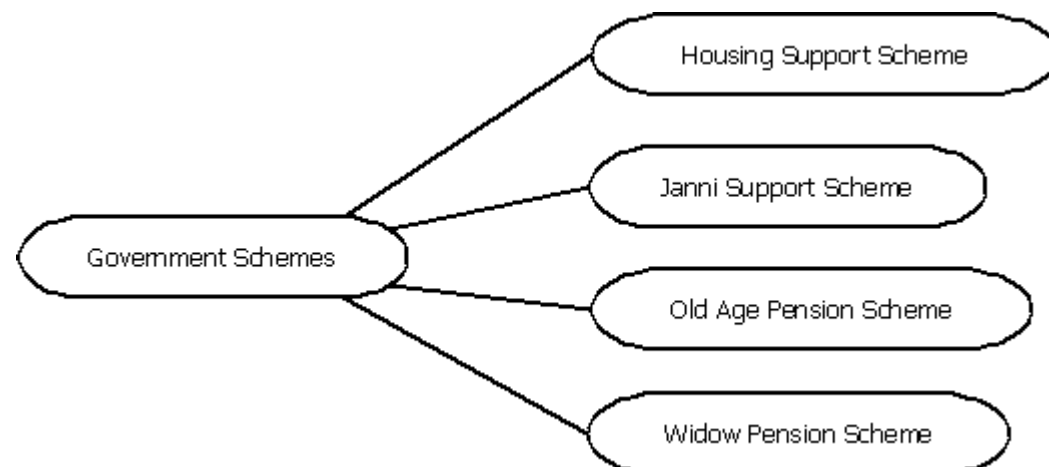
### Job Card



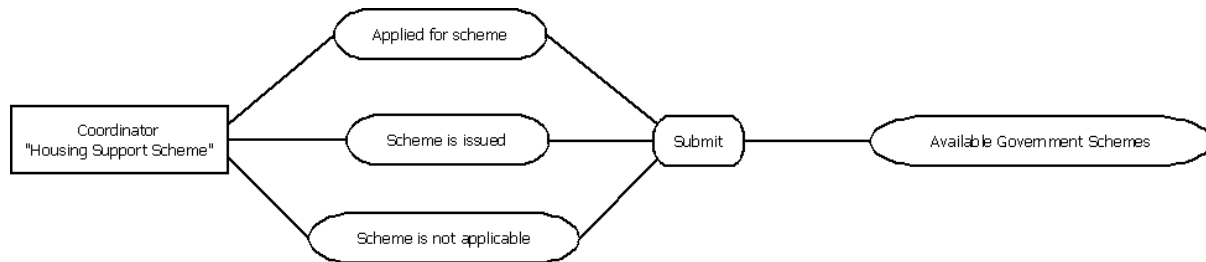
### Aadhar Card



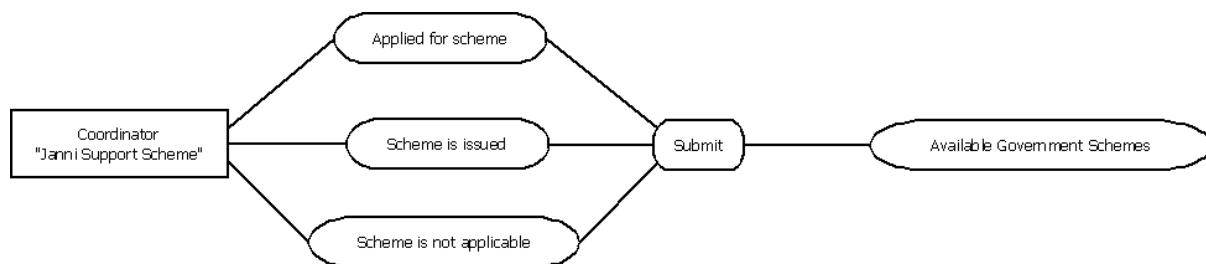
### Government Schemes



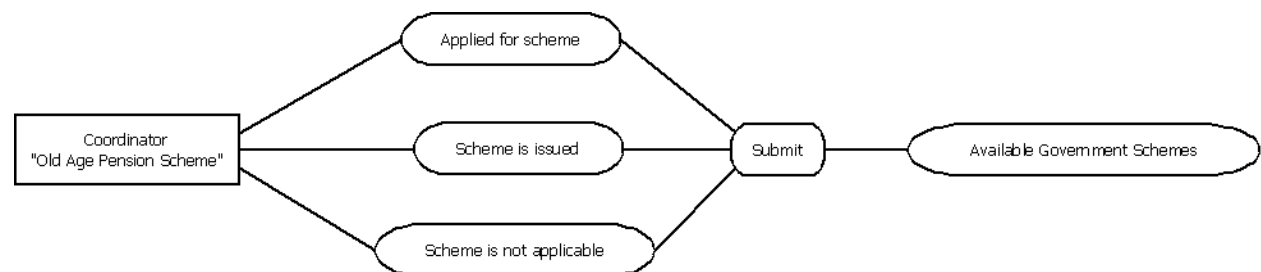
## Housing Scheme Support



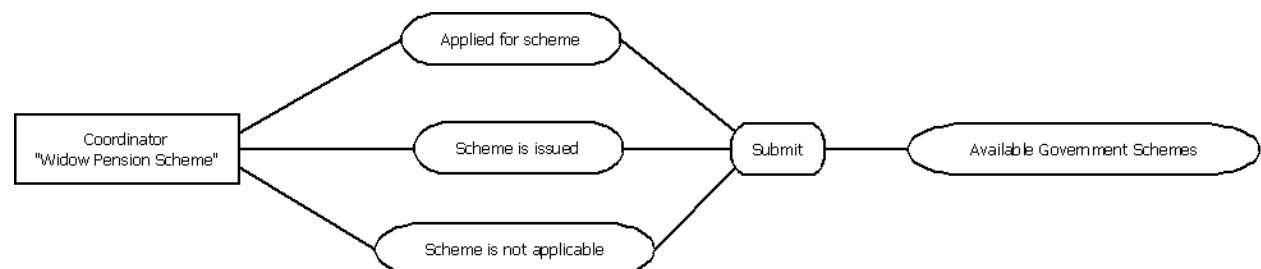
## Janani Support Scheme



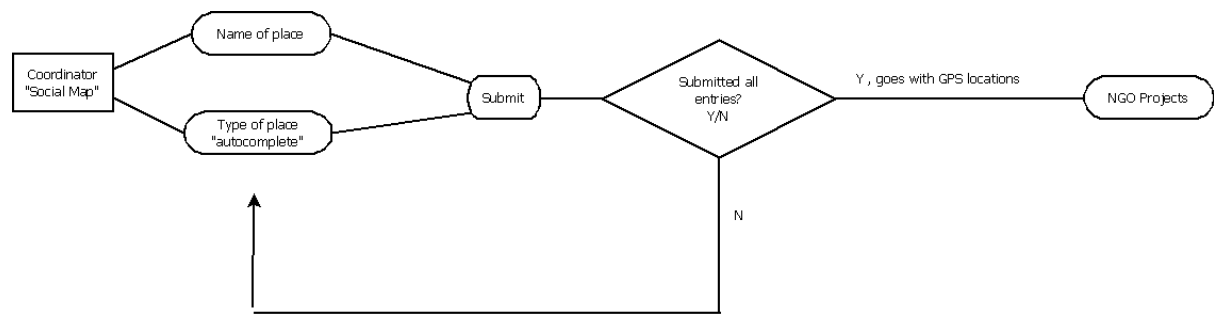
## Old Age Pension Scheme



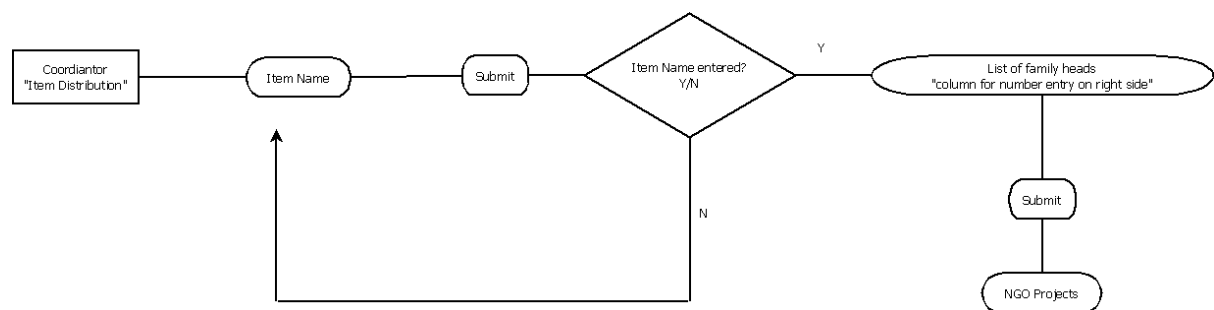
## Widow Pension Scheme



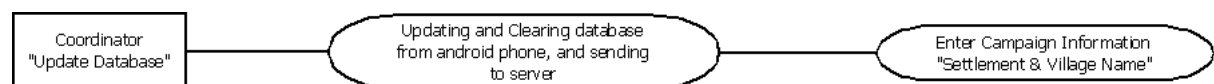
## Social Map



## Item Distribution



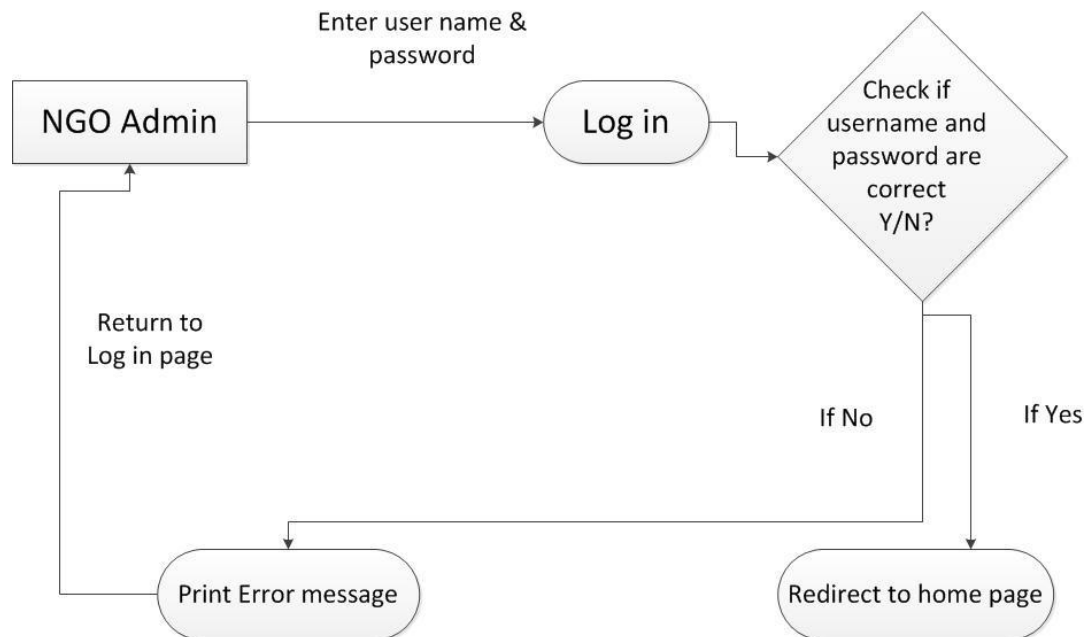
## Update Database



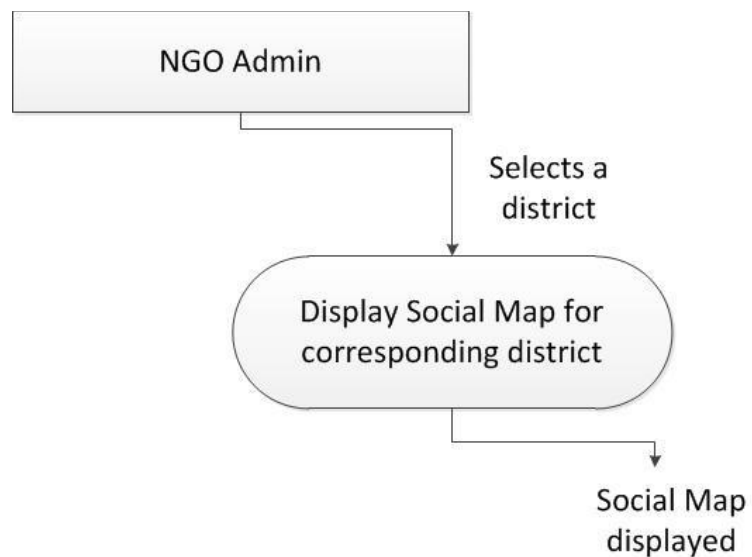


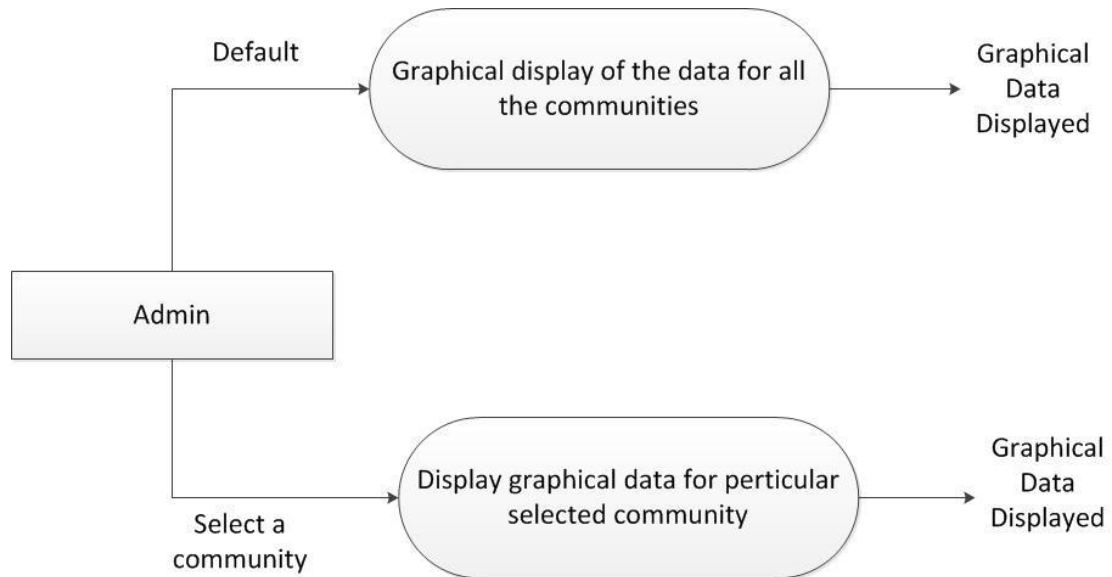
#### 4.4.2 Server Side

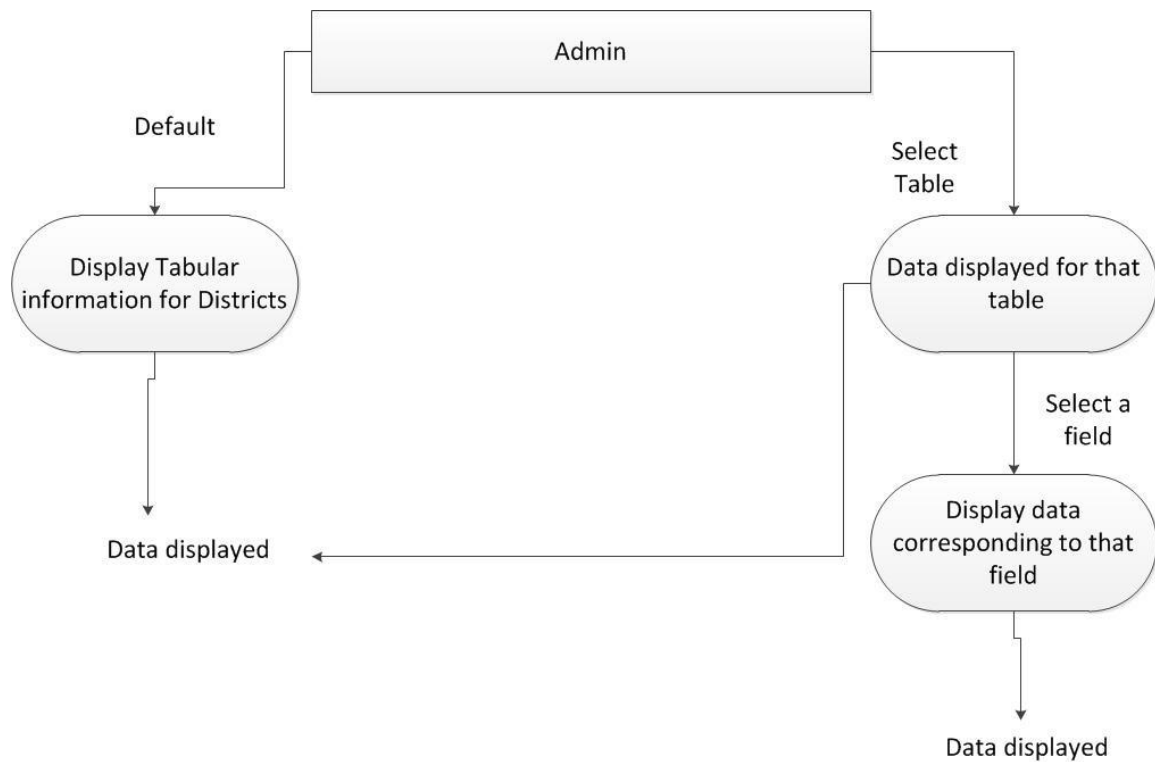
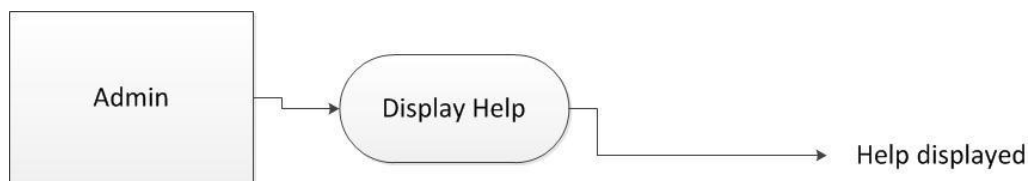
##### Login Activity



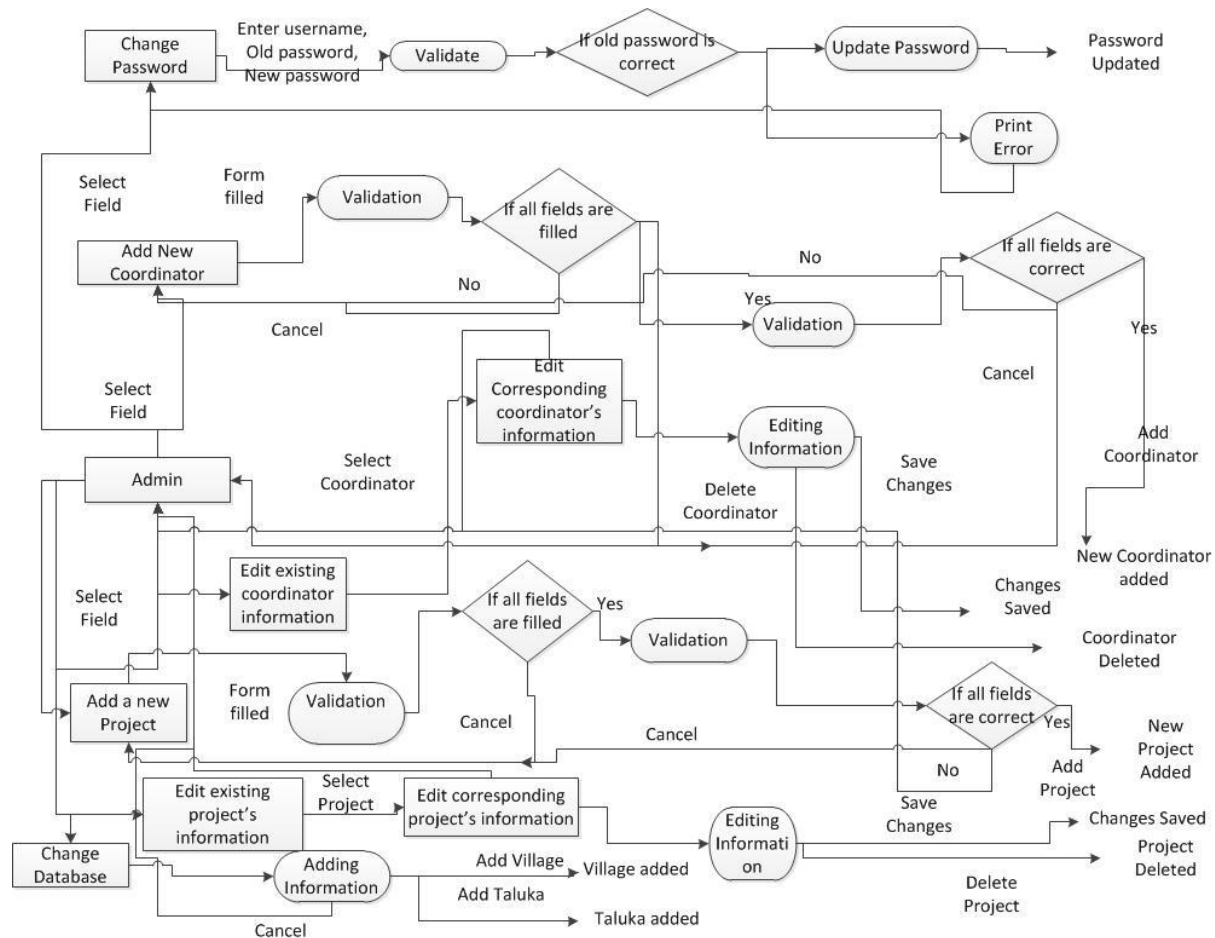
##### Social Map Activity



**Communities Information Activity****Project Timeline Activity**

**Tabular Data information Activity****Help Activity****Logout Activity**

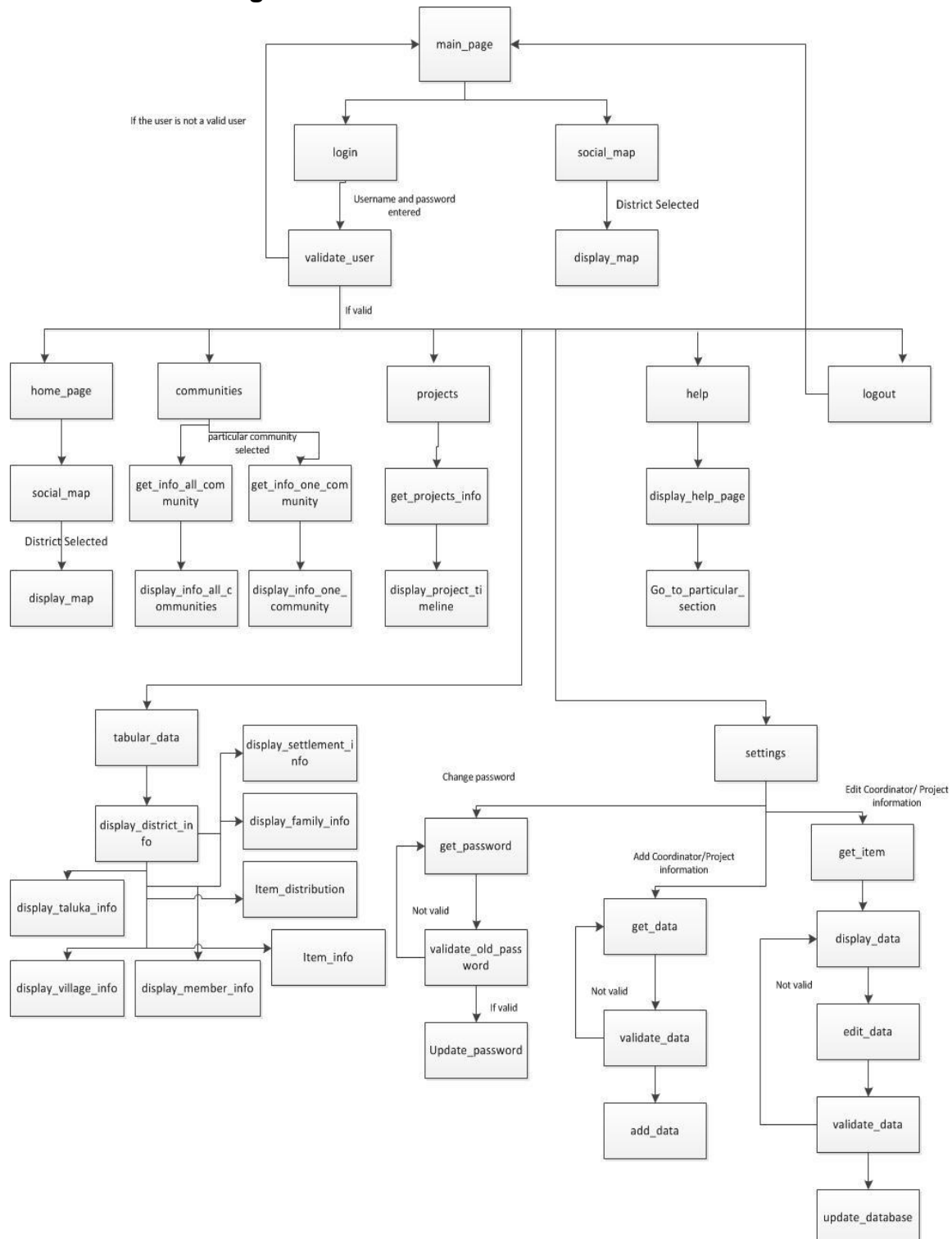
## Settings Activity



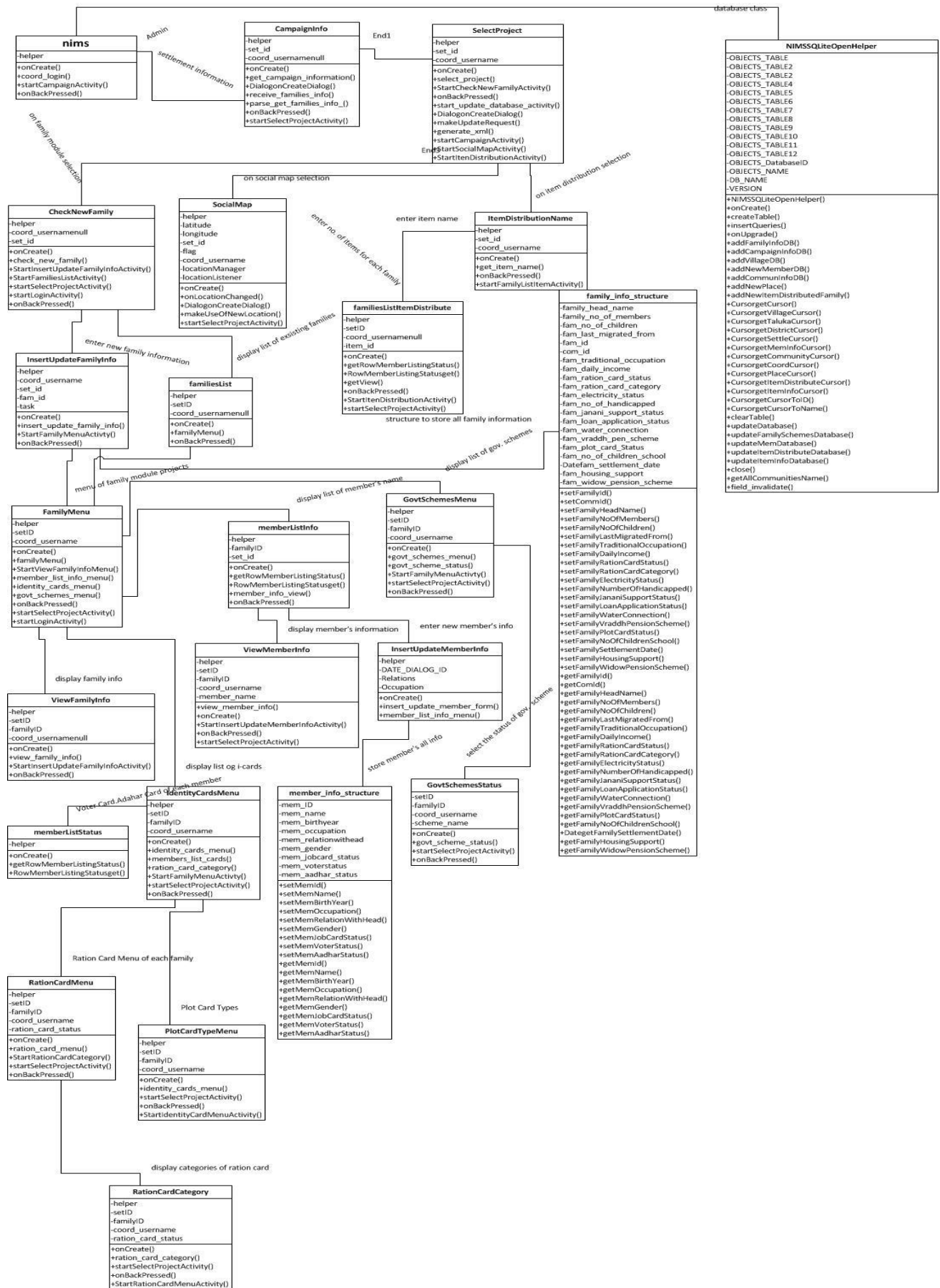
## 5. Architecture

Architecture is the hierarchical structure of program components or modules, the manner in which these modules interact to build our system which caters to the requirements as specified in SRS document.

### 5.1 Architecture Design for the Server Side



## 5.2 Class Design for the Client side



## 6 High level Description of Modules

### 6.1 Client Side Modules

**Login Module:** This module validates if it is an authenticated coordinator.

**Campaign Module:** This module is used to take the information of the campaign by the coordinator.

**Family Information Module:** This module is used by the coordinator to maintain and manage the family information and its member information.

**Social Map Module:** This module is used to take the name of a place, type of place as an input by the coordinator. The latitude and longitude of the place is saved using Internet/GPS of the android device.

**Item Distribution Module:** This module is used to manage and maintain the information of item distribution by the coordinator to the families.

### 6.2 Server Side Modules

**Login Module:** This module validates if the user is an authenticated administrator.

**Social map Module:** This module displays the social map of the corresponding district selected by the user.

**Communities Module:** This module displays analytical data in the form of bar graphs and pie charts of communities selected by the user.

**Project Module:** This module is used to display the information of all the projects undertaken by the NGO on a timeline which can be viewed by the user.

**Tabular data Module:** This module displays the information of various districts, taluka, village etc. in a tabular form.

**Settings Module:** This module allows the user to view, edit, add and update information of the coordinators, projects, village etc.

**Help Module:** This module provides a brief description of each of the above functionalities to the user.

**Logout Module:** This module facilitates the user to logout of the system.

## 7 Glossary

- **E-R Diagram (Entity Relationship diagram):-** An entity-relationship (ER) diagram is a specialized graphic that illustrates the interrelationships between entities in a database.
- **Use Case Model:** - Use Case Model describes the proposed functionality of a new system. A Use Case represents a discrete unit of interaction between a user (human or machine) and the system.
- **Coordinator:** - User type who voluntarily work with an NGO and help in collecting various types of information of a remote village.
- **Administrator:** - User type who manages the working of the NGO, keeps a track on the working of the coordinators, maintain the information of the donors as well as view and analyse the information collected by the coordinators.
- **Social Mapping:** - It is designed to enhance the impact of such social investment by showing the extent of investment in relation to socio economic needs by geographic region and development sector. The map depicts this information in an easily accessible form on a Google Earth platform.
- **Model:** - The model manages the behaviour and data of the application domain, responds to requests for information about its state (usually from the view), and responds to instructions to change state (usually from the controller).
- **Views:** - The view renders the model into a form suitable for interaction, typically a user interface element. Multiple views can exist for a single model for different purposes.
- **Controller:** - The controller receives user input and initiates a response by making calls on model objects. A controller accepts input from the user and instructs the model and views to perform actions based on that input.