Team 16

NGO Information Management Suite 1.0

Software Requirements Specifications

Overview

This document describes the requirements of the client for the application- those directly known to them and also those, which are implicit for any user. These requirements where found out by taking interviews and personal meetings with the client and also internal discussions among the development team.

Target Audience

This document is intended for the client to understand all his demands as specified in the document and the technical team to follow the same for project development.

Revision History

Version	Primary Author(s)	Description of Version	Reviewed By	Date Completed
2.0	Megha	Changes in mapping tools, use cases, toolset requirements	Aakash	13 March, 2012
1.0	Palashi, Surbhi, Jesal	First Draft	Aakash, Parth, Lalit	14th Feb 2012

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1. Introduction

1.1 Purpose

SRS (System Requirement Specification) is an organized way to collect direct and indirect software requirements for the software to be developed. It will serve as a guide for the developers on one hand and a software validation document for the prospective client on the other. It discusses the functional, non-functional, performance and development requirements and deliverables.

It is an organized document with an aim to assist in designing, coding and testing of the software and reduce the development effort by clearly enlisting all the system requirements specification. It'll help the development team visualize the scope of the project and extend it to its best possible use.

1.2 Scope

The product NIMS is an android-application and server based application software that will help in evaluating and cataloguing different tasks of the NGO in an efficient manner.

For the above purposes there are different modules concerned with data storage and update at server side, data updating and retrieval at the volunteer side, analyzing data statistically, social mapping area and data specifics to maps of the settlement under observation to help better visualization for NGO.

1.3 Clients and Stakeholders

Clients: The client of our project will be the NGO - **Vicharata Samuday Samarthan Manch,** based in Ahmadabad who works for the rights and welfare of Nomadic (Vicharata) & De-notified (Vimukta) communities and aims to help mainstream these communities by enabling them to fight for their rights.

Stakeholders: The main stakeholders of this project are as follows:

- Users: The volunteers of the NGO,
- NGO Admin Staff, who derive conclusions of the incoming data.
- Donors to the NGO.
- Developers: the developing team of this project, i.e.: SEN Team 16 of B.Tech batch 2009, DA-IICT.

1.4 References:

- Software Requirements Specification format - Copyright © 2002 by Karl E. Wieger.SRS version 1.0 - IT-314 –SOFTWARE ENGINEERING PROJECT TEAM 8, 2010
- IEEE SRS Document format http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=720574&userType=inst
- SRS version 1.1 - IT-314 - SOFTWARE ENGINEERING PROJECT TEAM 5, 2010
- SRS version 1.1 - IT-314 - SOFTWARE ENGINEERING PROJECT TEAM 9, 2011

1.5 Deliverables:

- The entire project with a basic integrated working android form collection application and web interface, with connectivity among both : Deadline – 10 April 2012
- User Manual and System Maintenance Facility : Deadline – 10 April and further
- Proposal, Feasibility study , Project Plan, SRS, Design document, Test plans, Gantt chart, Traceability matrix, COCOMO model analysis – with revision at least twice : Deadline – As per in project plan

2. Overall Description

2.1 Product Perspective

NIMS aims to provide a web-based information management system that will help the NGO in cataloguing their work in various fields in an efficient computerized manner rather than the manual, paper-based work style that they are using now.

This will help the NGO in proper management of the data collected with the help of server based system and analyzing the data for future use.

The product will provide the NGO with social mapping capabilities which helps in visualizing the work done in different fields and area by the NGO and other basic information needed by NGO.

2.2 Product Requirements

This product provides following main functions to the client and user of the product:

- An interactive android application for the volunteer of the NGO who visits various families and schools and organizations for collection of basic data and transferring it to the server interface.
- Replacing the pen-paper form to android app. which transfers data of family information, ration cards, voter id's, government schemes to server using GPRS.
- Preferred language for Android application is Hindi.
- Server based information management system which analyses the data collected by the volunteers in computerized manner.
- This management system will also allow the coordinators of the NGO to better understand the work in progress (done at what rate by volunteers) and tasks at hand in an organized and statistical manner.
- Generating volunteer performance reports and generating graphs (pie charts) for statistics like gender information, number of people in particular village, settlement, etc on server end.
- Social maps which will give an explicit idea to the NGO about various tasks carried on and to be done in various areas on a visualized map.

2.3 User Classes and characteristics

Main user classes of this product are:

Volunteers: They will use the Android app on their respective phones for collection and assessment of the families and schools of the areas they are assigned to work in.

NGO Admin: They will have full access to the server side system and the website and will be in control of all the information collected at their side. They will be able to organize the work to the coordinators on the basis of the analyzed data and social maps at server side.

2.4 Operating Environment

We need GPRS facility at least with the android response time of less than 1 sec at least; as this is the time a person takes to make an entry.

We need to use HTML, JavaScript, and CSS, jquery plugin for coding web interface for admin profile to supervise the data from android application. We need to use android software development libraries in the IDE named Eclipse based on Java for android application development. This application will be later tested on an android emulator and a real android tab a well. The back end coding of the server side information management system will done in PHP. The social mapping would be done using Openlayers javascript library, mapnik toolkit, java open street editor, tilemill tool by mapbox, satellite imagery from nasa and/or landsat images. The main database creation is to be done on MySQL on server side and SQLite on Android and querying will be executed through PHP.

2.5 Assumption and Dependencies

- It is anticipated that each volunteer will be having or given the basic equipment on which the android apps can run, by the NGO.
- The person working at the NGO's main office will be having the basic knowledge of the computer working and extraction of data.
- On field test runs will be conducted by the development team and later once local language support/ adequate training to volunteer to use NIMS in English is available, the volunteers will be handed over to test.
- There is GPRS facility on android phone.

2.6 Design and Implementation constraints

Database Design: The database structure should be as complete as possible during the design stage but there should be a room for modification without a large overhaul during later phases.

The android application shall use the SQLite database.

The system to be used at admin's side shall be in compliance with all Accessibility, Web Design, and Security policies applicable.

As part of standard operating procedures, a testing plan will be documented during the design phase. The testing plan will be based on user roles, modules or use cases, required tasks and expected outcomes.

Data collection will be done on a real time basis depending on availability of GPRS/3G network. In case the network is not available then the outgoing data will be stored offline on the device temporarily and transferred once network is made available.

The android application developed should be able to function properly on the equipments (android based phone) to be used by the NGO at volunteers' side.

3. Specific Requirements

3.1 External Interface Requirements

3.1.1 User (volunteer and admin) Interface:

The Android based client-server application will be used by the NGO volunteers to transmit information related to the NGO's work as well as the volunteer's location (via GPS while he/she is performing social mapping). The volunteer will provide data regarding the families living in the area of interest as input to the Android application running on a mobile Android device. The interface of this application will be clean and efficient. It will enable the volunteer to easily collect data and update the NGO's database server.

The server side of this application will have an interface to provide access to the data collected in the NGO's database so that the NGO can analyze and highlight the main issues based on their locations. The client side application interface will have tools to enable the volunteer to effortlessly collect data related to the NGO's activities in that location. The server side application interface will provide tools and options to easily access and search the data stored in the NGO's database server based on user-defined (here, admin)search criteria.

3.1.2 Software Interface:

Software	For
RUP , Microsoft Office Project 2010	Project Planning and Management
Eclipse IDE	Developing android application
Android Emulator plug-in	Android Application Testing
Git, Bitbucket	Version Control, source code hosting
MySQL, SQLite	Database Management
Google Docs and Google Groups	Team coordination and document sharing
Dia	Dataflow, E-R and Design diagrams
WAMP, LAMP	Testing and implementing PHP scripts

Openlayers JS library and/or JQuery plug-in, mapnik, tilemill, Java open street map editor	Implementing Social Mapping
Flash charts	Generating Charts on the server side interface
Twitter Bootstrap framework	Server Side interface

3.1.3 Hardware Interface:

The product has a server web interface and the client side (volunteer in the field) will have to be connected to the server side (NGO's server) using GPRS (or 3G if available).

The client side of the application will run on an Android based mobile device which will be used by the volunteers to collect and update data at the server side.

On the server side, there will be a server for database management and data analysis (for social mapping) for administrators of the NGO which will have to function properly at all times to ensure the safety and security of the data collected.

3.1.4 Communication Interface:

The input device at the client side would be a mobile Android based device. The output device will be the computer display screen running an Internet browser. Browser Compatibility testing will be carried out to know specific browser requirements in terms versions etc.(Currently working on Mozilla and Chrome)

3.2 System Features:-

The interfaces for the server side (controlled by the NGO admin), the client side (used by the coordinators on their Android based mobile devices) are all different according to their varied needs of the users.

3.2.1 for NGO Volunteers:

Login: (in V2)

On their Android devices, the coordinators can login and access and update the database.

View/Update Family Profile:

Coordinators can view and update family profiles that are stored in the database. The family profiles give information regarding the identity cards held by each of the family members and other general information about the families.

View/Update School Information:

Coordinators can update and review information and location of schools which serves as input to the social mapping of schools.

View/Update Social Maps: (in V2)

Coordinators can access and update the database with information about the location and general information for social mapping.

3.2.2 for NGO Admin:

Login:

NGO administration personnel can login to access the database server for information pertaining to the functioning of the NGO on the field as well as off it.

View/Update Coordinator Profile:

NGO admin officials can view and update information about the coordinators employed by the NGO. A coordinator profile contains information like the coordinator's assigned locations and their work record. They can also register a new coordinator on the database.

View Coordinator Location:

The NGO admin personnel can view each coordinator's location on the field via the GPS system on the coordinator's Android based mobile device.

View/Update Campaigns:

The NGO admin can view and modify information about the various campaigns run by the NGO.

View Family/schools Information:

The NGO admin personnel can view information regarding schools, families and hospitals fed to the database by the coordinators.

View/Update Social Maps: (in V2)

The organization can view and update information related to social maps.

3.3 Functional Requirements:

The functional requirements describe the intended behavior for desired functioning of the product. They are organized into use cases as follows:

Use Case 1:

Use Case	Client Login on Android Device
Description	Logging into a android device
Actors	a. NGO Volunteers b. Software Maintenance personnel
Assumptions	a. Login screen is always available first on opening the client application. b. Login password and username are known
Steps	a. Enter Username b. Password
Variations	a. If username and password have been set to "remember me" then click login straightaway. b. Wrong Password and Wrong Username c. Wrong password or Wrong Username

Non-Functional	Registration not to be provided at client 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 Volunteer Software Maintenance personnel
Assumptions	Logout 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	a. GPRS/3G connection of the phone is lost. b. Sudden Battery down c. Request Timeout

Use Case 3

Use Case	Server Login
Description	Logging in at the Server Side.
Actors	a. NGO Admin. b. Software Maintenance personnel
Assumptions	a. Web Interface is reachable. b. Login screen is loaded on reaching the server side web interface. c. Login username and password are known
Steps	a. Enter Username b. Password
Variations	a. If username and password have been set to “remember me” then click login straightaway. b. Wrong Password and Wrong Username c. Wrong password or Wrong Username

Non-Functional	None
Issues	What if Password or username is/are forgotten?

Use Case 4:

Use Case	Server Logout
Description	Logging out at the Server Side.
Actors	a. NGO Admin. b. Software Maintenance personnel
Assumptions	Logout option is always available across all screens in a session
Steps	Click Logout
Variations	None
Non- Functional	None
Issues	None

Use Case 5:

Use Case	Submit Social Map datum
Description	Sending geographic information of a place type and name to server.
Actors	a. NGO Volunteer b. Software Maintenance personnel
Assumptions	a. GPRS/3G connection already established b. GPS facility is there on the phone c. Coordinator has logged into a session.
Steps	a. Fill in name of the place. b. Fill in type of the place from the drop down list. c. Submit information. (GPS information fetched by the device and embedded into the outgoing packet appropriately.)
Variations	a. If information is already present in the database then return a message informing about it. b. Type and Name are both required fields so submission not possible without their entries.
Non-Functional	Inform actor about logout success by showing a login screen and a message-”You have logged out successfully”

Issues	a. What is GPS data is not reachable? b. What if GPRS connection is lost in between activity? c. Privacy issues of the person using the application for surveying.

Use Case 6:

Use Case	Submit family information
Description	Posting a Form filled for family information to the server
Actors	a. NGO Volunteer b. Software Maintenance personnel
Assumptions	a. GPRS/3G connection already established b. Coordinator has logged into a session. c. Village and Program information already filled (via GPS).
Steps	a. Fill in the details of a family. b. Submit.
Variations	If information is already present in the database then return a message informing about it.
Non-Functional	Inform actor about logout success by showing a login screen and a message-”You have logged out successfully”
Issues	a. What if GPS data is not reachable? b. What if GPRS/3G connection is lost in between activity? c. Validation of fields – string/number only in some fields

Use Case 7:

Use Case	Submit member information
Description	Posting a Form for members of the family
Actors	a. NGO Volunteer
Assumptions	a. GPRS/3G connection already established b. Coordinator has logged into a session. c. Village and Program information already filled (via GPS).
Steps	a. Fill in the details of a family. b. Fill the details of the members (as many as the user entered initially in the family info.)

	c. Submit.
Variations	If information is already present in the database then return a message informing about it by showing family information and member information of that person both.
Non-Functional	Inform actor about logout success by showing a login screen and a message-"You have logged out successfully".
Issues	a. What if GPRS/3G connection is lost in between activity? b. Validation of fields – string/number only in some fields.

Use Case 8.1:

Use Case	Change Settings on the Server Side
Description	Change password
Actors	a.NGO admin
Assumptions	a. logged in as admin b. internet connectivity
Steps	a. Enter old password b. Enter new password c. Re-enter new password
Variations	Password successfully changed message only when old password matches and new password is consistent in both entries.
Non-Functional	Inform actor about password change by "Password changed successfully"
Issues	a. absence of internet connectivity. b. Trying to change password when the session has already expired

Use Case 8.2:

Use Case	Change Settings on Server Side
Description	Edit Coordinator Info

Actors	a. NGO admin
Assumptions	a. logged in as admin b. internet connectivity
Steps	a. select the volunteer name b. add info/edit info/delete info c. Submit changes
Variations	Check with the user once before confirming changes and after change have an undo once option.
Non-Functional	a. Check with the actor about whether the actor is sure of the change or not before executing the change operation. b. Inform actor about success of the operation once the requested change has been made in the database.
Issues	a. absence of internet connectivity. b. Trying to change password when the session has already expired

Use Case 8.3:

Use Case	Change Settings on Server Side
Description	Database Changes
Actors	a. NGO admin
Assumptions	a. logged in as admin b. internet connectivity
Steps	a. select community/village/district to add/edit/delete b. add info/edit info/delete info c. Submit changes
Variations	Check with the user once before confirming changes and after change have an undo once option.
Non-Functional	a. Check with the actor about whether the actor is sure of the change or not before executing the change operation.

	b. Inform actor about success of the operation once the requested change has been made in the database.
Issues	a. absence of internet connectivity. b. Trying to operate when the session has already expired

Use Case 9:

Use Case	Change Settings (Project)
Description	Edit Project Info
Actors	a. NGO admin
Assumptions	a. logged in as admin b. internet connectivity
Steps	a. select the Project b. add info/edit info/delete info c. Submit changes
Variations	Check with the user once before confirming changes and after change have an undo once option.
Non-Functional	a. Check with the actor about whether the actor is sure of the change or not before executing the change operation. b. Inform actor about success of the operation once the requested change has been made in the database.
Issues	a. absence of internet connectivity. b. Trying to change settings when the session has already expired

Use Case 10:

Use Case	Edit government scheme information on the android device
Description	Edit Coordinator Info
Actors	a. NGO coordinator
Assumptions	a. logged in as expected coordinator

	b. internet connectivity
Steps	a. select the required government b. add info/edit info/delete info c. Submit changes
Variations	Check with the user once before confirming changes and after change have an undo once option.
Non-Functional	a. Check with the actor about whether the actor is sure of the submission or not before executing the submit operation. b. Inform actor about success of the operation once the requested change has been made in the database.
Issues	a. absence of internet connectivity. b. Trying to submit when the session has already expired

Use Case 11:

Use Case	Edit card information on the android device
Description	Edit Coordinator Info
Actors	a. NGO coordinator
Assumptions	a. logged in as expected coordinator b. internet connectivity
Steps	a. select the required card b. add info/edit info/delete info c. Submit changes
Variations	Check with the user once before confirming changes and after change have an undo once option.
Non-Functional	a. Check with the actor about whether the actor is sure of the submission or not before executing the submit operation. b. Inform actor about success of the operation once the requested change has been made in the database.
Issues	a. absence of internet connectivity.

	b. Trying to submit when the session has already expired

3.4 Non-functional requirements:

3.4.1 Performance requirements:

- The NIMS is a web interface and volunteer use app. and hence many variables like server, operating systems (Android and Windows), coordinator android application, browsing, network coverage and speed affect the performance of the system.
- The size of the database is dynamic and it subsequently grows on filling up new forms provided for various projects by the coordinator for different families and individuals. To keep the Android application lite, we need to delete the information as and when it is transferred to the server, and for viewing have to fetch it back from there (to be done later in the project)
- The software is designed to be a multi-user system, but as the NGO currently has only 5 volunteers, hence same time access of many people is not an issue for the application currently.
- All the constituting project portions of the software should run and update independently without interfering with other portions, whereas common database will be shared and updated by users depending on their permission/restriction level.
- The searching of the central database being queried must be equipped to handle certain number of queries at a time (around 3-5) as only these many admin people will be accessing it simultaneously if at all.
- Data updates should be made in time to the database on server (like within a day – as GPRS facility may not be available everywhere every time, but it will still be very fast as compared to months of delay in reports by volunteers)and should immediately be available to others with the authorization.
- The network provider should provide enough bandwidth and speed for efficient data transfer between two devices.

3.4.2 Domain requirements:

- No such domain requirements as the server will be a PC on the admin site, with the web interface as the frontend and database as bacend receiving information from volunteer side.

3.4.3 Safety requirements:

- The information that is being removed can be accessed indirectly, user can either maintain his/her own log book or can refer to the log file associated with the system.
- The transfer of data via GPRS should be secure, in software terms to maintain privacy for the NGO (though they do not require it much).
- The volunteers and administrators will be given unique user-name and passwords to view or edit pages depending on their permissions to access the data, so that there is no false or ambiguous data entry from any random person who is not a part of the organization.

- The computer must be well protected from viruses and other Internet-based threats in order to avoid crashing of server system, as it is the most crucial of all the components. Database should be secured with appropriate passwords and data backup options.

3.4.4 Security Requirements:

- Security will be inbuilt in the system, which will not allow unauthorized access to the system database. Moreover, it'll be insured that a user is tightly bounded to the permissions/restrictions of his domain.
- If any user logs out, then the session is said to be closed and he has to login again to use the software i.e. he cannot get back with simply using 'Back' button of the web-based interface or application.
- The system logs off the user automatically when the application is shut down by any means. In order to regain entry to the system, the user must log back in.

3.4.5 Software Quality Requirements:

1.) Maintainability:

- The user must be able to browse through the application without any difficulty.
- All the requirements and system features are well documented in both, soft (in-built help) and hard versions user manuals which we intend to ship along with the product itself. Along with it, the user interface developed will be simple. Both these factors will attribute to efficient utilization of resources by user.

2.) Portability:

- The software will run on all commonly used platforms; i.e. it allows its source code to be compiled for different computing platforms.
  1. .exe- for windows
  2. .rpm/.deb package – for LINUX
- Prerequisites for portability although will be presence of a few applications and features that will assist the functioning of our application, like XAMPP.

3.) Usability:

- Any report or document can be viewed and edited by many at a time because that parallel modifications can be possible as the data handling amongst the coordinators hardly overlaps.
- The web interface on admin side should be able to run on a computer system if a set of supporting applications are installed.
- The web interface shall provide a self-explainable user friendly interface such that it is usable with minimum amount of effort.
- All steps of the website development should be well documented to ensure maintenance of the product through lifetime.

4.) Efficiency:

- There are no performance constraints on the interface but it is desirable that the website occupies minimum space on the hard disk. (the main space requirement is for data as it grows rapidly)
- The android application has a constraint of response time being less than 1 sec and not much data should be there on android, as it makes the application heavy.

5.) Reliability:

- We need to provide facility of backup of entire system along with information for the admin and user to deal with problems like power failure, disk failure, etc.

3.4.6 Other Requirements:

- The source code should be kept confidential and should not be leaked out of the development team members. The documents provided by the client to be used during the development of the website are to be kept in secrecy and should be returned at the time of deployment.

4. Process Mode

Appendix A - Requirement Gathering

This section includes all the interaction sessions of the team members with the client organization's members. Modes of accession of expectations of the client from the software were mainly interviews and the on ground experience of one of the team members who has worked for a similar cause earlier.

Meeting no. 3:

Date: ????, 2012

Venue: Main Office, Ahmadabad.

Interviewee: Raju Param

Appendix B - Glossary

- **NGO:** Non-government organization
- **NIMS**: A project to enable a NGO carry out efficient information collection, visualization and interactive mapping in order to make well informed decisions and give out efficient work results.
- **FUNCTIONAL**: Relating to or based on function especially as opposed to structure.
- **ADMINISTRATION**: A method of tending to or managing the affairs of some group of people (especially the group's business affairs).
- **AUTHENTICATE**: Testing for genuineness.
- **INTERFACE**: A program that controls a display for the user (usually on a computer monitor) and that allows the user to interact with the system.

- **SYSTEM**: A set of things working together as a mechanism or interconnecting network.
- **CLIENT**: A person using services of a professional person or organization.
- **END-USER**: Users at the end-points or one using the ultimate product.
- **STAKEHOLDER**: Someone entrusted to hold the stakes for two or more persons betting against one another.
- **SERVER**: A computer that provides client stations with access to files and printers as shared resources to a computer network.
- **ATTRIBUTE**: A quality or feature regarded as characteristic or inherent.
- **LOGIN / LOGOUT**: Entering into and going out of the system.
- **DATABASE**: An organized body of related information.
- **QUERY**: An instance of questioning.
- **PROFILE**: An analysis (often in graphical form) representing the extent to which something exhibits various characteristics.
- **WEB PORTAL**: A point that functions as a point of access of information