ANDROID MOBILE CLIENT USER MANUAL

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1. OVERVIEW

PoiMapper mobile client application software is used to gather data from the field using mobile phones. The application is developed and maintained by Pajat Management Oy (http://www.pajat-solutions.com). The application includes a pre-defined form or set of forms that are exported from the database to the phone either via the Internet on the phone (OTA) or desktop client application. The form(s) can be filled and the data saved for further analysis and visualization. The solution caters for more advanced needs in data collection such as filling check-box type questionnaires, taking images of objects of interest, associating both time and location stamps to the objects, complex data types like part-of where forms are associated and skips in a form (conditional sub-questions).

1.1 Basic Hardware Requirements

Below is a list of basic hardware requirements for the mobile phone and the application to work effectively:

(i) Android platform version 2.2 (Froyo) or higher

The PoiMapper Android version works with Android 2.2 or higher. Currently tested on Android 2.2 (Froyo) and 2.3 (Gingerbread)

(ii) Micro-SD Memory Card

A Micro-SD Memory Card allows storing of data to save transaction costs or to store the data in situations where network connection is not available. This therefore eases data collection in remote areas where Internet connection is unavailable or unreliable.

1.2 Installation Procedure

The application is installed by searching for 'PoiMapper' in the Android Market. The installation procedure requires the user to follow the screen prompts until the installation is completed successfully. To configure the application, please check section 3 of this document.

2. OPENING AND USING THE APPLICATION

After successful installation, the application can be found in the application menu. The application is named 'PoiMapper' with the logo shown below. The application asks for log in with the user name and password or a security code (see Figure 1). One can opt to define a security code to be entered during subsequent accesses to the application instead of a username and password.

NB: The application must be configured before the user attempts to log in and fill a questionnaire. Please see section 3.1 of this document for instructions in how to carry out the application configuration.

Enter the relevant log in credentials and press ***Login***. After successful authentication, the ***Main Menu*** screen appears (see Figure 2). **NB:** Please ensure that the application is always on the foreground when

in use. Using the application in the background may cause the application to have undesired behaviour.

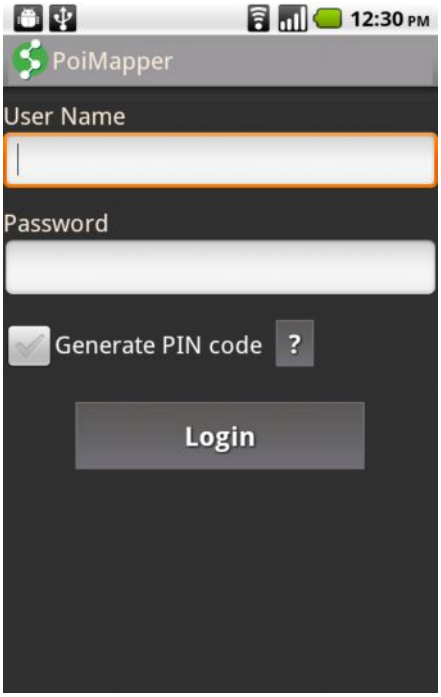

Figure 1: The log in screen

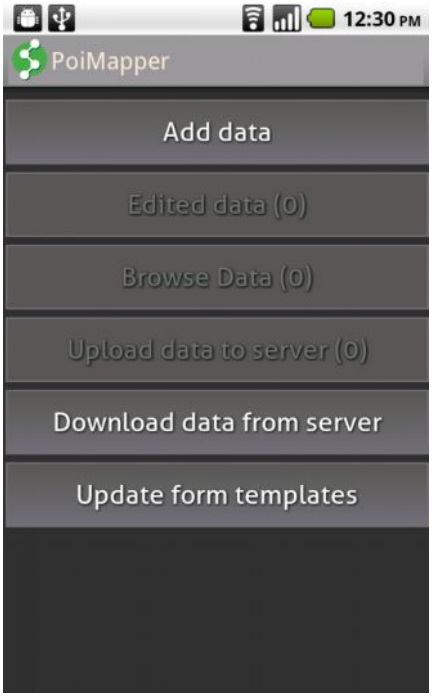

Figure 2: The application's main menu

A list of menus (**Add data**, **Edited data**, **Browse data, Upload to server, Download from server** and **Update form templates**) are available on the **Main Menu** screen. **Edited data** lists POI's created/modified by the user and are sorted alphabetically and grouped by POI type (form or

questionnaire). The POI's that are downloaded from the server are listed under **Browse data.** A copy of the POIs uploaded to the server is also saved under browse data in monitoring mode and in case the of survey mode, a read-only upload log is shown.

If there was a user already logged in and now a different user wants to log in, there is the option of changing user in the menu, just before logging in as shown below.

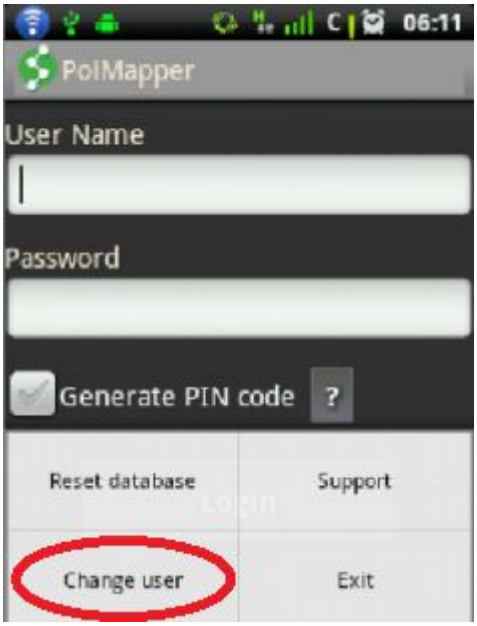

Figure 3: Change user in popup menu before logging in.

When this option is selected, another log in screen is presented. This one allows for logging in to the same database as the previous user. Note: The current user must be in the same group for this option to work. Else, they will be asked to log in afresh or cancel the changing user option. In which case, they will have to log in with the credentials used with the initial user.

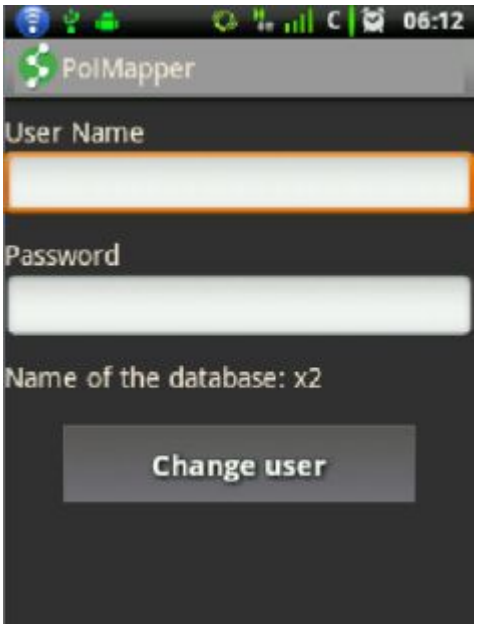

Figure 4: change user login screen

Figure 5: Warning displayed if user entered is not in the same group as the initial user.

2.0.1 Corrupted data files

Data corruption may occur because of several reasons. This corruption may affect the following types of database files: deleted POIs files, User edited files, Temporary data files and Server data files. The messages shown are as shown below.

i. Deleted POI files corrupted.

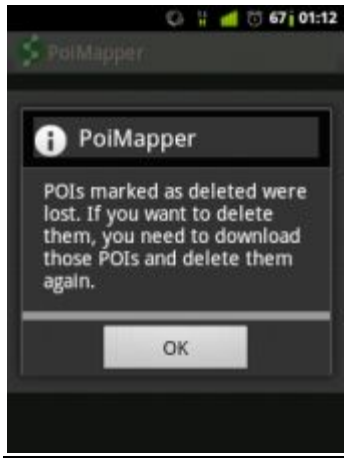

Figure 6: Corrupted Deleted POI's message alert

ii. User edited files corrupted.

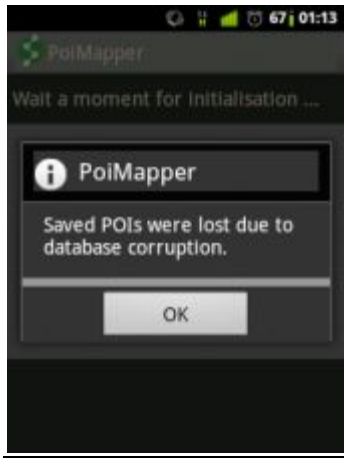

Figure 7: Corrupted Edited and saved POI's message alert

iii. Temporary data files corrupted.

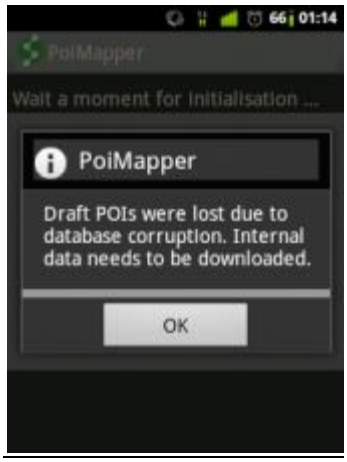

Figure 8: Corrupted draft/temporary POI's message alert

iv. Server data files corrupted.

Figure 9: Server data files corrupted Message

2.1 Add data

Add data shows a list of different forms (POI types) in a given survey. Selection of the form by tapping it on the screen opens it for data entry.

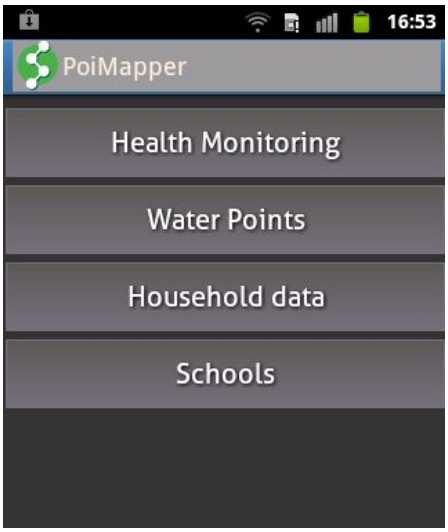

Figure 10: List of forms or POI types after selecting 'Add Data' menu

When a POI type or form is selected, the first page of the form is loaded on the screen. Figure 11 below shows the first page of the 'Health Monitoring' form. Mandatory fields must be filled in by the user in order to save the POI. Mandatory fields are marked with an asterisk '*'. If a mandatory field is not filled, pressing the save command will display a message ' ***Check mandatory fields: Mandatory field X on Page Y***', where X is the name of the field and Y is the page number of the form (see Figure 14). The ***Next*** command at the bottom of the page is used to navigate to the page that follows the current page of the form. Also, one can jump to a given page by selecting the "**Next"** page command at the bottom of the page. Pressing **Previous** in the Options menu list navigates to the previous page. Pressing **Back** in the popup menu saves the entered data as a draft.

To go to a specific page in the form, select the page from the popup menu. The 'Goto' commands on the popup menu are the links to the specific page numbers or names. (see Figure 13).

There is also an easier way of navigating from one page to the next through 'swiping' across the screen. In order to navigate to the next page, swipe from right to left across the screen or scroll down to the bottom and click 'Next'. Alternatively, tap on the area with the form name at the top and a pop up with the list of pages in the form appears. As well, in order to move back to the previous page, swipe from left to right across the screen. One can also add a comment to a POI by selecting the 'Add Comment' option in the menu if the comments field.

Figure 11: First page of the health monitoring form

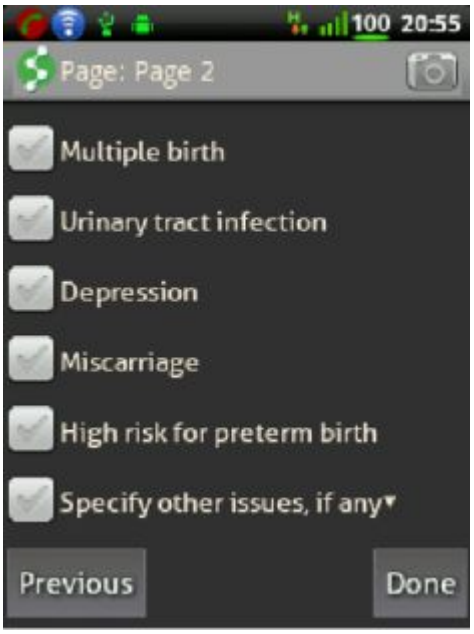

Figure 12: The second page of the health monitoring form

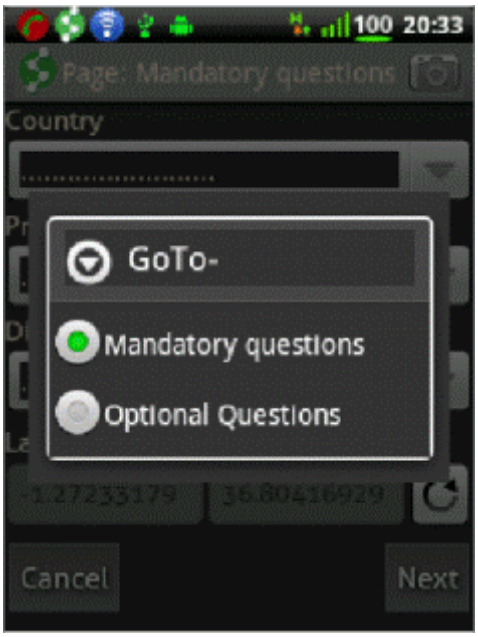

Figure 13: The option of going directly to a specific page

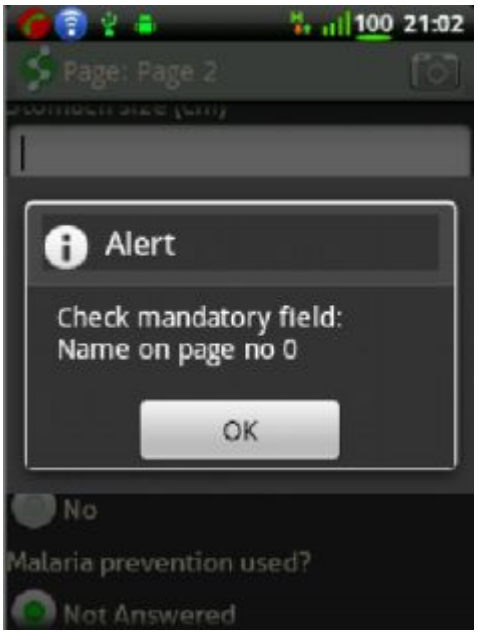

Figure 14: The alert displayed when the user attempts to save without a mandatory field saved.

2.1.1 GPS coordinates

When user selects Add data and the form has the GPS coordinates field, the application tries to get the GPS coordinates in the background. When the GPS coordinates are fetched, the field is updated.

Figure 15: GPS coordinates being fetched- displayed as the second header.

Before the user saves the POI, the application checks whether the GPS coordinates are found or not. If not found, the POI information is saved with the default coordinates (0.0 0.0).

The user can also opt to input the GPS coordinates manually when using a separate GPS device, for example. The manual GPS entry is set in the 'System Settings' as explained in section 2.6.8.

Figure 16: The application attempting to fetch GPS coordinates showing the GPS accuracy header.

2.1.2 Capturing image(s)

To capture an image, the camera icon is usually shown next to the image question or on the top right corner of the form. This is shown in the figure 17 below.

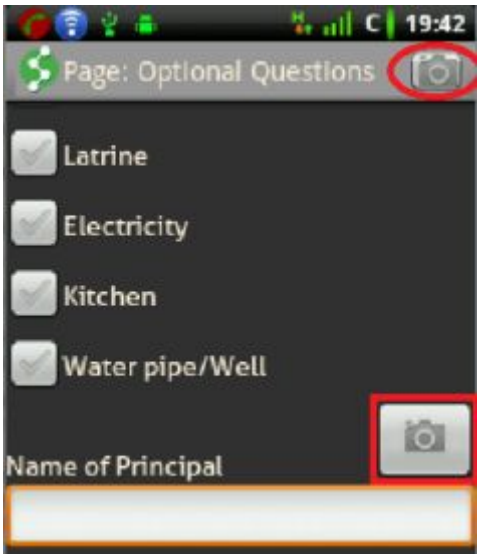

Figure 17: The camera icon for capturing an image

To take a picture, tap the camera icon on the screen. If the Poi type supports images, then there will be a camera icon on the top right corner of each page of the form. This is used when adding images to a form. However, on each image question, there will be a camera icon that can be used to capture images related to that question alone and not the entire form. This depends with the kind of phone you have. The captured image is added to the new POI and control goes back to the already captured images to view or capture more images. There is a limit of up to 5 images that can be associated with a POI instance.

2.1.3 View images

Images can be viewed only if the POI has got a picture question and there is at least one image captured. To view the images, tap the camera icon on the top right corner of the screen. This icon will be shown at that position only if there are images attached to the form. The camera icon may be next to the image question if there are images captured under that question. If there are images, they can be viewed by tapping the camera icon next to the question.

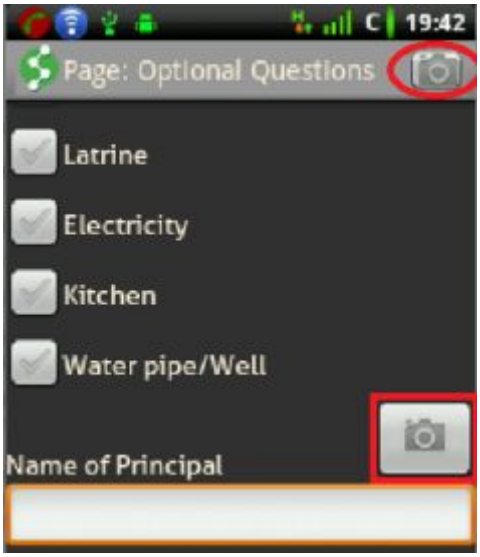

Figure 18: Camera icon for capturing/viewing images

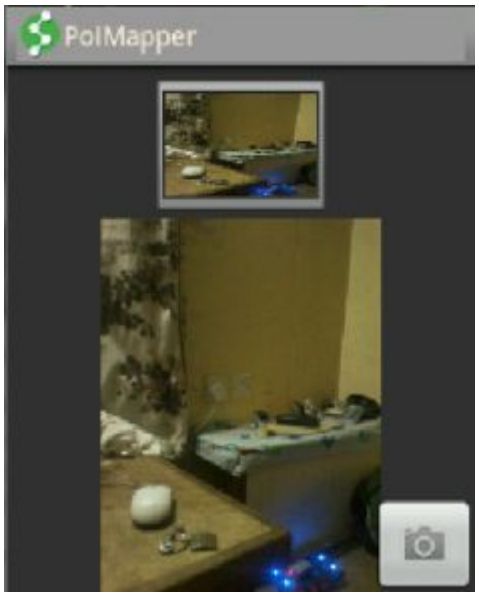

Figure 19: viewing and capturing more images

To delete an image, select the delete command on the popup menu when the image is displayed on the mobile phone's screen. Figure 20 below shows the Delete Image command on the popup menu under images.

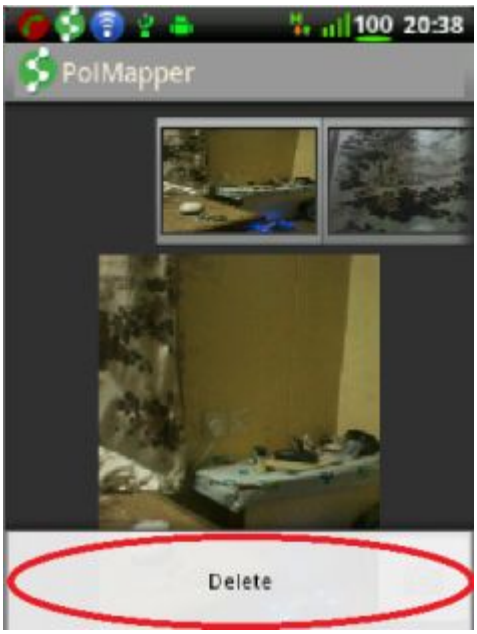

Figure 20: Delete image command when a POI has some captured images

2.1.4 Cancel adding POI

User can cancel the Add new POI operation by selecting the ***Cancel*** command at the bottom of the page of an open form. A confirmation screen is shown before loading the ***Main Menu*** page. Figure 18 below shows a screen with the alert message for the user to confirm the cancel action.

Figure 21: The cancel command.

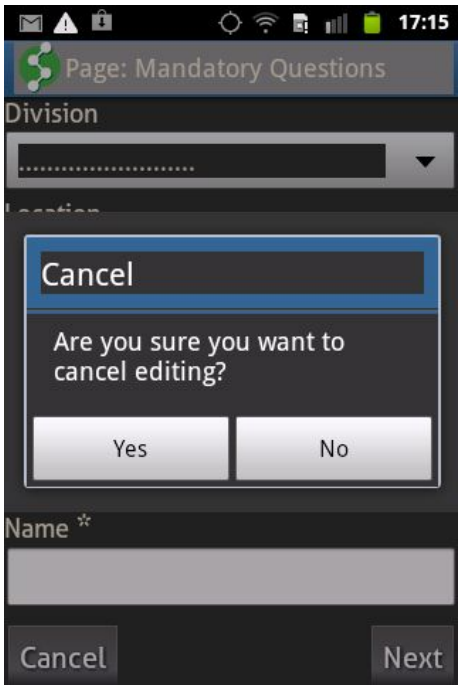

Figure 22: An alert message displayed after clicking 'cancel'

2.1.5 Save POI

Once the fields are populated, the user can select the ***Done*** command from the Options menu list as shown in Figure 23 below. The new POI information is saved locally to the phone (***UserEdits.dbs***) or automatically uploaded to the server if the automatic upload option is set (please refer to section 2.6.8). The newly created POI's are listed under ***Edited data*** in the main menu page***.*** The ***Done*** command is available in all pages and allows the user to save the POI data that has been entered. Before saving, the application verifies that all the mandatory fields are filled and prompts the user if they are not.

Figure 23: The 'Done' command in the popup menu for saving the data.

2.2 Edited data

The POI's that are added, modified or deleted by the current user and have **not** been uploaded to the server are listed under the ***Edited data*** menu. The menu is disabled by default unless there are some draft POIs or POIs not yet uploaded to the server. To View Edited data, go to **Main Menu** and tap the **Edited data** option**.** The number in the brackets shows the total number of POIs under the Edited data menu. Figure 24 below shows the Edited data menu which lists all the POI's added under the 'All POI' menu. POI's are also listed under each specific form/POI type. The deleted POI's are listed in the '**DELETED POIs**' menu where the number in the brackets indicates the number of deleted POI's. Figure 25 below shows a list of user-created/modified POI's as displayed under the ***Edited data*** menu. The (#1,#2) that appears after the POI instance means that page number one and two have both been filled. The 'Health Monitoring' form is listed here meaning that there are new or modified POI's for that form. Pressing the ***Previous*** command displays the previous page in ***edited data***.

The unsaved POIs or drafts are saved in **'Drafts'** menu where the number in the brackets indicates the number of draft POIs that are in the list.

Figure 24: Edited data menu as shown in the main menu.

Figure 25: A list of the created/modified POI grouped by POI types or forms.

Figure 26: A list of POIs under the Health Monitoring form.

2.2.1 Edit POI data

To edit the data of an already saved POI, open the '**Edited data'** menu and select the POI either under the 'All POI' menu or the specific POI type/form under which the POI lies. Select the POI by tapping it and this opens the form with the last saved values in each field. By default, the POI is in read-only mode. To activate the edit mode, select 'Edit' from the options popup menu.

2.2.1.1 Updating GPS Coordinates

To update the GPS coordinates of an already saved POI, click on the update button beside the GPS coordinates as shown below image 27. The application will attempt to get the GPS coordinates of the current location only after the GPS command is selected.

Figure 27: update GPS Coordinates button

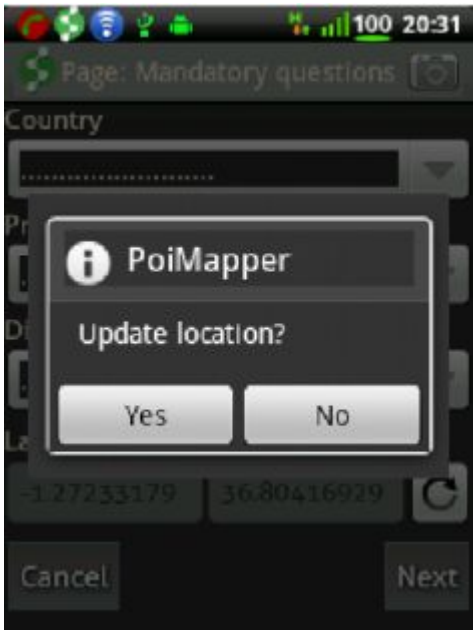

Figure 28: The prompt shown to the user when the GPS button is clicked

2.2.1.2 Capture Images

To capture images when editing a POI, please refer to the instructions in section 2.1.2 of this document.

2.2.1.3 View Images

To view images captured for a given POI, select 'View Images' in the popup menu. For more details please refer to section 2.1.3

2.2.2 Delete POI

To delete a POI under the Edited data'' menu, select the 'Delete' command as shown in Figure 29 below. A warning message '***Are you sure you want to delete this POI?***' is displayed as shown in Figure 30.

On selecting the 'Yes' option, the POI is deleted and on selecting the 'No' option, the previous page of the form that was open before selecting the delete option is displayed.

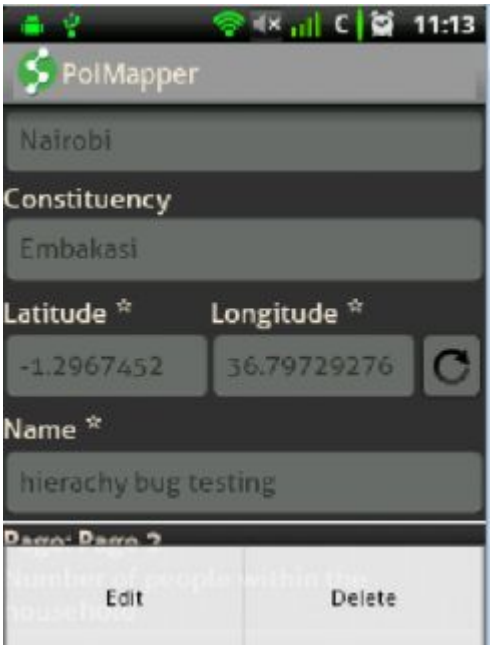

Figure 29: The 'Delete' command in the Options menu.

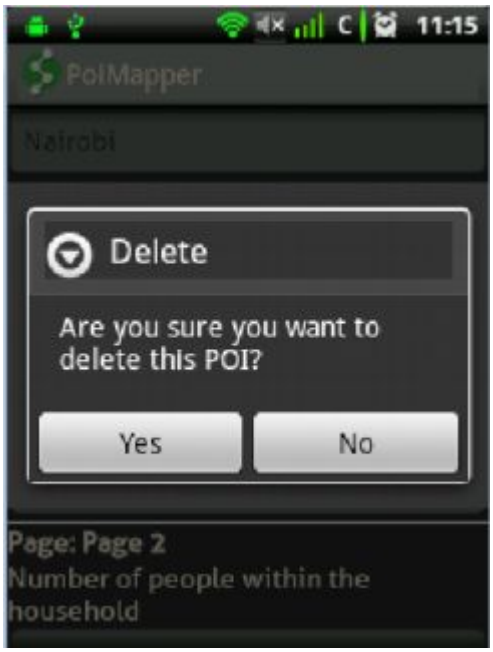

Figure 30: The prompt shown when the delete command is selected

2.2.3 Cancel Editing a POI

A user can opt to cancel the editing of a POI by selecting cancel on the bottom of the page or on the popup menu. A message asking the user to confirm cancelling of POI editing is displayed as shown in Figure 22 above. On selecting the Yes option, the screen with the list of POI's is displayed. On selecting the No option, the page of the form that was last opened is displayed.

Figure 31: The 'Cancel' command.

2.3 Browse data

The POI's that are imported from the server (***ServerData.dbs***) are listed under the '**Browse data'**. By default, all the listed POI' are non-editable (read-only).

To View POI's saved in the server, go to the **Main Menu** and select **Browse data.** A list of available POI types is listed on the screen as shown in Figure 32. Choose the desired POI type and press '**Select'** to view the all the POI's under that POI type as shown in Figure 33. The figure in brackets indicates the number of POI's under that POI type/form.

The '**Back'** command returns control to the previous screen.

If a POI has images, the '**Edit' , 'Cancel** 'and **'Delete'** options are found in the popup menu. If the POI has images, the camera icon will also be at the top right corner of the screen in the form that has been opened.

The delete command removes the selected POI from the list and lists the POI in Edited data's deleted POI's list. The POI's are deleted from the database once the data is uploaded to the server. A warning message, '***Are you sure you want to delete this POI?***', is displayed as shown in Figure 30 above for the user to confirm the action.

Figure 32: Browse data menu showing a list of POI types or forms.

Figure 33: Maternal Monitoring POI's list under the Maternal Monitoring form or POI type.

Notice too that the name of the form is displayed on the header of the forms list view. In the figure 33 above, the name is "Maternal Monitoring";

In order to edit the POI's under the Browse POI's menu; the user must choose a POI from the list and then select the ***Edit*** command in the popup menu as shown in Figure 29. Viewing the POI after selecting the ***Edit*** command is the same as opening a POI in the ***Edited data*** menu.

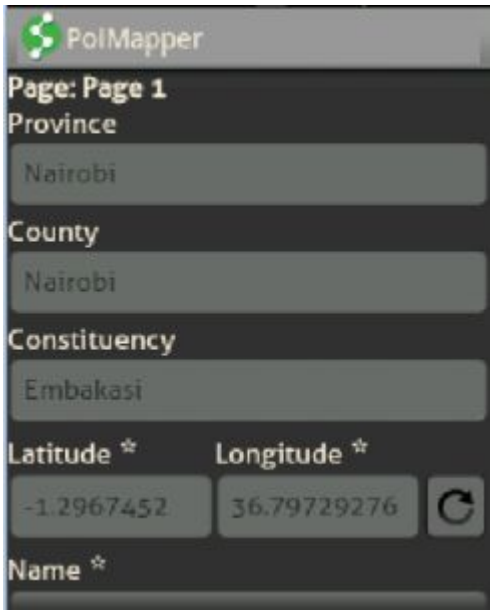

Figure 34: A selected School 'Patient c' selected for viewing or editing.

2.4 Upload to server

The '**Upload to server'** menu option allows the POI's that have been added or modified to be uploaded to the server via the Internet (OTA). This requires the mobile phone to have Internet access (GPRS/EDGE/3G/Wi-Fi). The status of the upload process is always displayed on the screen. Figure 35 below shows the menu screen immediately after the upload of data is started. Figure 37 and Figure 38 below show the upload success message once the upload of data is complete. The uploaded POI's are listed and can be viewed in the **'Browse data'** menu under the respective POI type if under monitoring mode (monitoring mode allows the user to download data already saved in the server) and a read-only upload log is shown in case a survey mode (survey mode means no download of data other than needs editing data from the server) plan is in use.

Figure 35: Poimapper screen when upload starts

Figure 36: Poimapper notification screen when upload is in progress

Figure 37: Poimapper notification screen when upload is complete

Figure 38: Poimapper screen when upload is complete

NB: **Data rates for the mobile operator apply.** If the data is bulky, especially when there are multiple images, or the Internet connection on the mobile device is unreliable, it is advisable to use the desktop client application (DTC) to do the data upload as opposed to doing it from the mobile phone since it is faster and convenient for bulky data.

If the current user's password has been changed in the server by the admin, upload or download of data will not be possible without the new password. During upload or download, a password update screen is shown and the logged in user is asked for the new password as shown below. If, the user enters the password that matches the one in the server, the process continues. Otherwise, the previous screen is shown.

Figure 39: Password has changed in server confirmation dialog

2.5 Download from server

The '**Download from server**' menu option allows POI's saved in the server to be downloaded on the phone for viewing and/ or editing purposes. This requires the mobile phone to have internet access (GPRS/EDGE/3G/Wi-Fi). The menu has various filtering options as shown in Figure 40 below. To download only the POI's that the logged in user has added, select '**Yes'** for the **'Download only my Poi'** option otherwise all POI's in the server will be downloaded. To download only POI's for a given form/POI type, mark the check box against the POI type/form. If no POI type is selected, data for all the POI types is downloaded with the criteria defined (for the current user only or all data).To start downloading the data from the server, press the '**Download**' button at the bottom of the screen. The screen displays the status of the download process and confirms when the download of data is over as shown in Figure 41 below. To download data that has been marked as needs editing (this means the data may have errors and needs to be reviewed), tick the '**Download Needs Editing Data**'. Needs editing is a feature that the administrators use to mark data that needs to be reviewed and send data back to enumerator in case it has errors.

NB: Downloading data from the server using the mobile application may be time consuming depending on the nature of the data downloaded and the quality of the Internet connection. It is advisable to download only the data required on the mobile phone. In addition, a lot of data downloaded on the phone may slow down the application. Data rates for the mobile operator apply.

For customers evaluating PoiMapper in survey mode, the '**Download from server**' menu is disabled.

There is also the option of selecting the **image size** to download. There are four options provided for this download: Original, Medium, Small, or no images. The Original Image download is not recommended because if there are many images to be downloaded, then the download process will be slower especially for weaker internet connections. The Default is the medium size that is optimised for fast download. Smaller images can as well be downloaded or no images download at all. This is shown in figure 42 below.

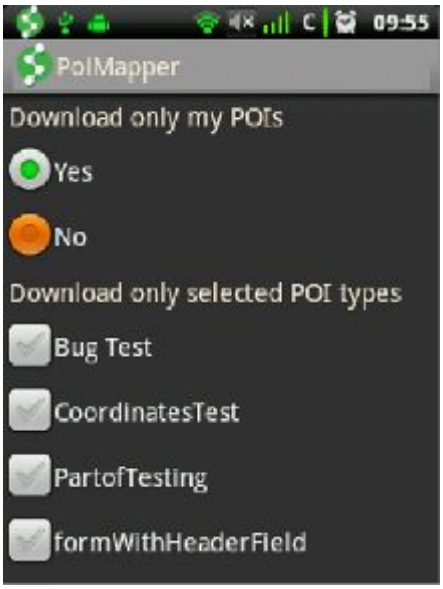

Figure 40: The screen displayed for select download criteria of data from the server.

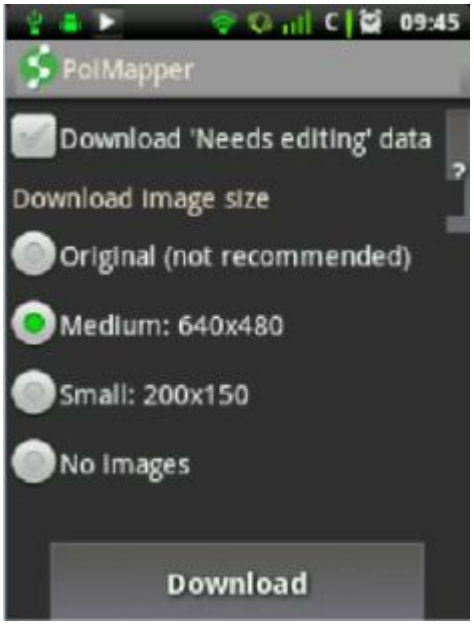

Figure 41: The screen displayed for select download image size from the server.

Figure 42: The screen displayed after successful download of data from the server. The number of POI's downloaded is also shown.

2.6 Settings

The settings menu of the PoiMapper application is found in the options popup menu when either in the main menu view or in the list of form(s) after selecting 'Add data' menu.

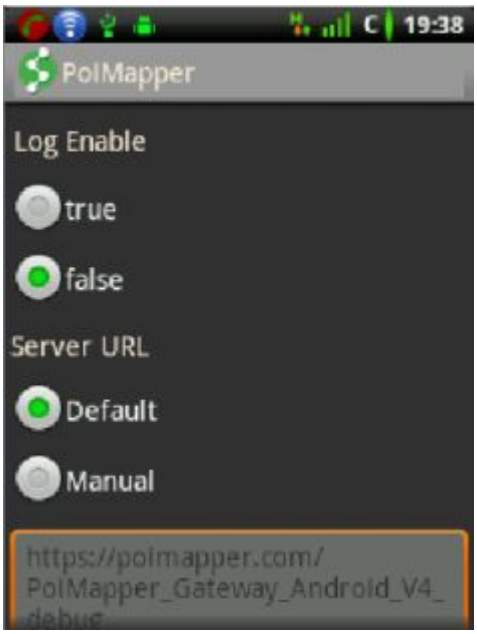

Figure 43: The screen displayed after opening the Settings menu.

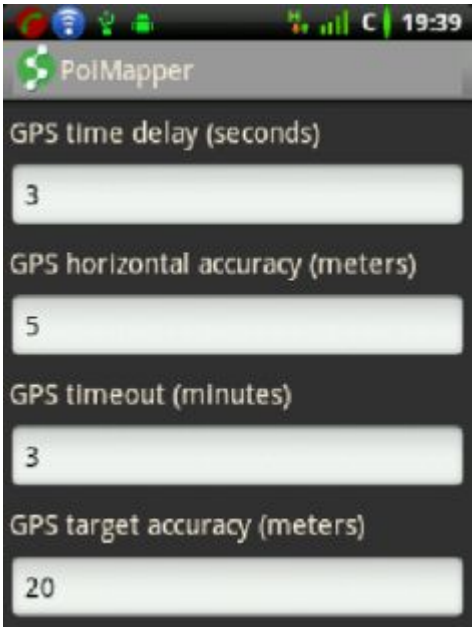

Figure 44: The screen displayed after scrolling down the settings menu.

2.6.1 Log enable

When this setting is set to true, it allows the application to log error and other information related to the application when it is being used. It is necessary for users with technical skills to be able to troubleshoot. It may also be necessary when a user would like to report a bug and provide the log file for analysis by the PoiMapper team.

2.6.2 Server UR (Gateway URL).

This option specifies the URL for the gateway that facilitates the upload and download of data between the server and the mobile phone. There are various options that are compatible with different versions of the application. The default option is usually the one compatible with the version of the application installed. The full URL is usually shown in a text area. The default option is the one that currently works with the version of the application and should not be altered unless advised to do so.

2.6.3 GPS time delay for routing

This setting is used to specify the interval of time after which the application fetches GPS coordinates when doing a routing exercise. The units are in seconds and the default value is 3 seconds .A lower value indicates that the application fetches the GPS coordinates more frequently. For high GPS accuracy, set the value for this setting to zero (0) and select 'Done' in the popup menu to save the changes.

2.6.4 GPS horizontal accuracy

This setting indicates the accuracy in terms of meters after which the application tries to fetch GPS coordinates afresh. The default value is 0 meters which gives the highest possible accuracy. A lower value indicates higher accuracy. Please note that the GPS accuracy also depends on the quality of GPS receiver on the device, visibility of the satellite (affected by weather changes and an open area is recommended).

2.6.5 GPS timeout (minutes).

This setting allows the user to set the maximum time that the application should use when getting the GPS coordinates. If the target accuracy will not have been achieved by then, then the values that will have been obtained so far will be used.

2.6.6 GPS target accuracy (meters).

This setting allows the user to enter the desired GPS accuracy in meters when adding a POI that has GPS as a field. The default is 20 meters. This is shown in the figure 36 above

2.6.7 Manual or Automatic GPS entry

This setting allows for the user to specify the manner in which the GPS coordinates are presented. The default option is 'Set Automatically' which means if a form has a GPS question, the application will automatically attempt to fetch the coordinates of the current location. The manual entry option allows the GPS coordinates to be specified as the latitude (X) and the longitude (Y). Manual entry is desirable when the GPS coordinates of the point to be mapped are already known or another device is used to get the coordinates (perhaps with higher accuracy).

2.6.8 Automatic/Manual data upload

This setting defines how the data will be uploaded to the server. The default option is 'Manual Upload'. For manual upload, the data is uploaded only after selecting the '**Upload to server**' option as explained

in section 2.4 of this document. In the case of automatic upload, the POI is uploaded to the server once a new POI is saved or changes are made to an existing POI and saved.

2.6.9 Image Quality

This setting allows the quality of images that the application will capture to be set. The default option is medium quality. High quality gives fine detail of images but however incurs more data traffic during upload as the images are bigger. On the other hand, low quality images have less fine detail and incur less data traffic when uploading data. The settings are as shown below:

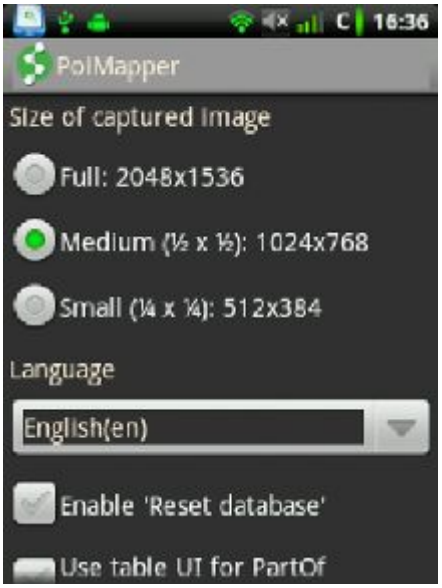

Figure 45: Image quality setting

2.6.10 Set language

This setting allows the user to switch between different languages. The default language is English. Changing the language setting changes the language of the menu items, all the status and alert messages.

2.6.11 Enable "Reset database"

This setting allows the user to provide the option of resetting the database so that another user can log in with different credentials. If this option is selected, then next time the application is started, the menu will include an option to reset the database as shown below.

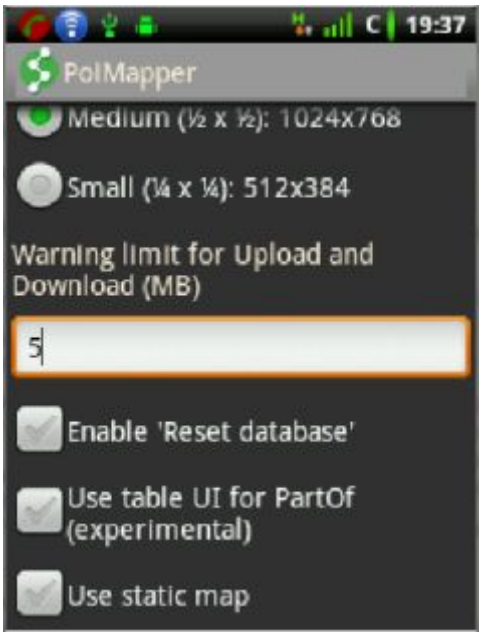

Figure 46: The option of resetting the database in settings

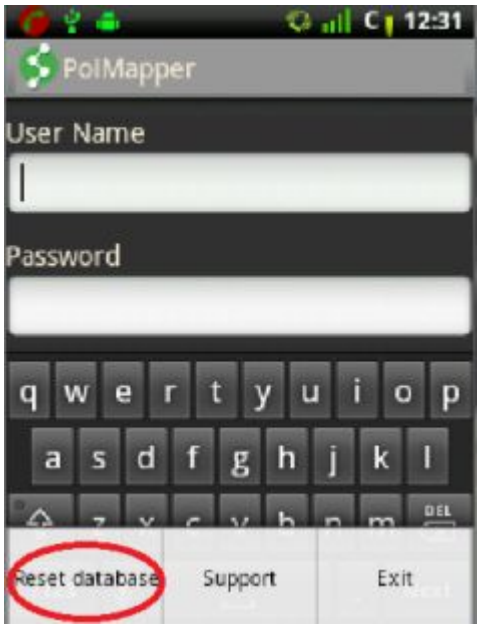

Figure 47: Resetting the database

2.6.12 Use table UI for Part-Of

This setting is used when a complex form, part-of form, is used. Part-of is a way of associating forms in PoiMapper such that there is a parent-child relationship between the forms. Checking this option shows the fields/questions of the child form as a table to be filled. This should only be used if the child form is to be filled as a table.

2.6.13 Use static map

This option when ticked allows the user to see the data collected or downloaded from the server on a map. The option is shown after selecting the POI type or form in Edited data or the Browse data menu and then selecting Map tab. The default view is the list view where the POIs are listed alphabetically.

2.6.14 Reset Security code

This option allows the user to reset the defined security code. A security code allows the user to define a secret code they can be using to access the PoiMapper application instead of entering the username and password always. If the user forgets their security, it can be removed on the log in screen. The set security code can also be reset under the settings menu as shown on figure 48 below.

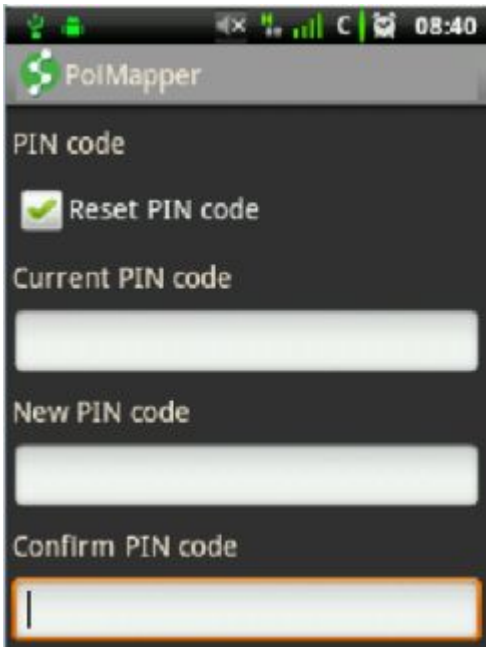

Figure 48: The option of resetting the security code on the settings menu

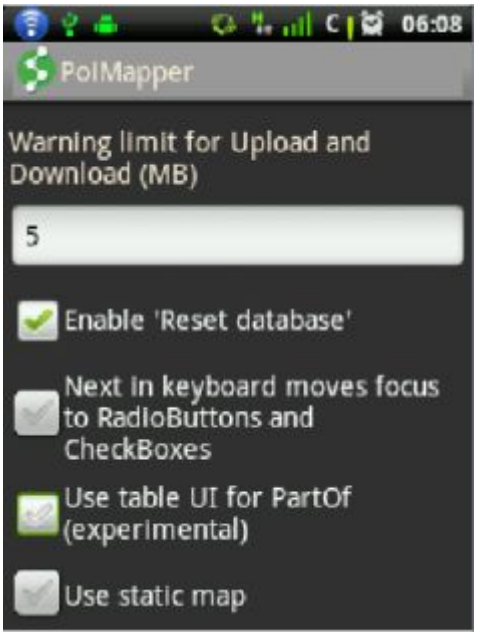

Figure 49: Next moves focus to radio buttons and checkboxes.

2.6.15 Next moves focus to radio buttons and checkboxes

This setting in the settings menu allows the user to enable the "next" option on the keyboard after entering text in a text box, to move to the subsequent radio or checkbox. If this option is disabled, then the user will have to manually take focus to the checkboxes and radio buttons in order to make input data using the textboxes and checkbox. By default, this option is disabled.

NB: To save any changes to the settings, select '**Done**' in the options popup menu. To discard any changes, press the back key on the mobile device.

2.7 Update form templates

This menu allows the changes that are done to a form or forms in a given survey to be downloaded on the phone over the air. It is recommended that any POIs that are still in the edited data menu be uploaded prior to doing a survey update since there might be incompatibilities brought by new changes to a form. The application prompts the user to restart it once a survey update is completed successfully.

Figure 50: Alert after selecting the "Update form templates" command

3. Configuring and upgrading the application

3.1 Configuring the Application

The PoiMapper application must be configured with the relevant application files for the survey, user login credentials and location hierarchy, if any.

Configuring the application on the phone is imperative so that you can log in and start collecting data. To have an over-the-air configuration, start the application from the application menu. The application shows the login options in the form displayed below.

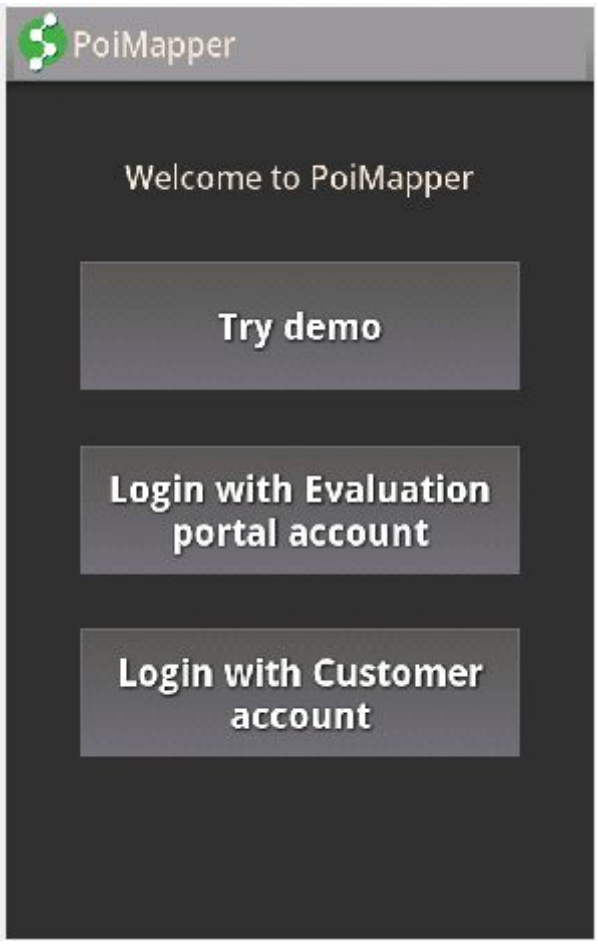

Figure 51: The login options screen shown when the application is run for the first time and after resetting the database

In order to use any of the above options, one has to specify a valid username, password and account name (organization database). Every organization has its own unique account name/database whose details are given to the contact person.

However, the "Try Demo" option does not require username or password. It is to be used for demonstration purposes only. The demonstration here is limited to the features that the application has.

The "Login with Evaluation portal account" is to be used for trial and evaluation of how the application works. This can be set up with a database to be used for evaluation purposes.

For dedicated customers, there is the "Login with Customer account" option. This is where a database, username and password are required.

After specifying the log in credentials, select '**Download'** button and wait for the application to download all the necessary configuration files from the server.

NB: The user must be having a valid username and password and there should be a survey linked to the user for the application to be configured effectively.

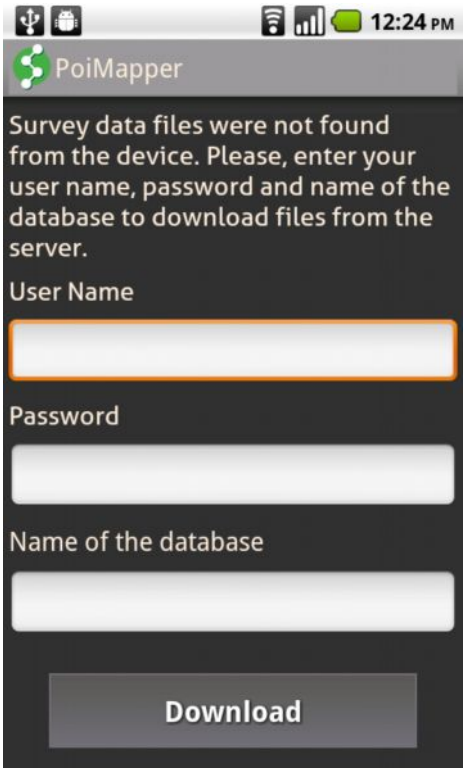

Figure 52: The configuration form shown when the application is run for the first time

3.2 Upgrading the mobile application

The mobile application can be upgraded to the latest stable version by accessing the most recent version in the Google Play Store (former Android market) by searching for 'Poimapper'. Upgrading allows one to have access to the latest features and bug fixes, if any.

4. ANSWERING SOME SPECIAL TYPES OF QUESTIONS

4.1 Answering Conditional questions

A conditional question is a question that shows another question that is relevant to the response of the user and hides the irrelevant question. In PoiMapper, conditional questions are supported for Boolean, single selection (radio button) and multiple selection (check box) questions. On selecting a given response, another question appears below the current question for the user to type a response. For example, if the question is "Do you have water in your home?", the response options are yes or no. If yes, one may want to ask, "What is the source of water?"If no, the respondent may be asked "Where do you get water from?" The conditional questions may go to many other levels depending on the questionnaire.

NB: The sub-questions can only be seen when a given response has been selected in the form.

4.2 Route Tracking and Area Tracing

Route tracking is used to map something linear like a road, power line, migration route etc. On opening a route tracking form, one may fill in the relevant data like the name, location hierarchy information, take pictures if any are required, etc. To start route tracking, press the 'Start Tracking' button at the

bottom of the form. The application fetches the coordinates after a period of time specified by the GPS time delay for routing defined in section 2.6.6. The default timeout delay is after every 3 seconds. The application has to be left open while route tracking is being done. Route tracking can be paused and stopped by pressing the 'Stop' button. Once routing is stopped, it can be restarted, resumed or the route POI saved by selecting the appropriate menu option.

Area tracing is used to map an enclosed area like a community, administrative area, perimeter of a premise etc and the output is a polygon as opposed to routing which is linear. The procedure of area tracing is exactly the same as the route tracking procedure explained above.

5 CLOSING THE APPLICATION

To close the application, select the '**Exit**' command in the popup menu or select the back key on the phone. This prompts for a confirmation as shown in Figure 57 below. On selecting the 'yes' option, the application closes and on selecting 'no' the application returns to the previous screen that was displayed.

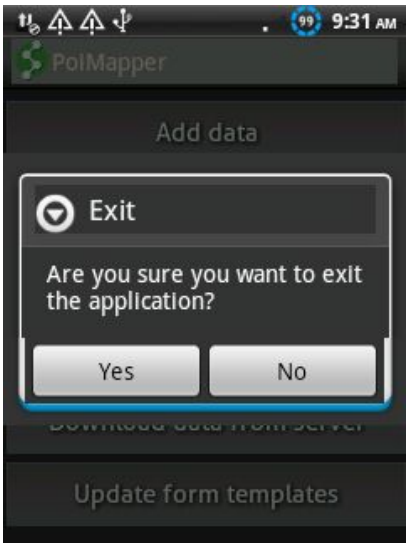

Figure 53: Warning message when closing the application.

6 GLOSSARY

The glossary section lists and explains some unfamiliar abbreviations and terms that have been used in this document.

GPS- Global Positioning System

OTA – Over The Air. This requires an Internet connection on the mobile device.

POI - Point of Interest

POI type/form – The term 'form' or POI type in the context of the PoiMapper application refers to a questionnaire. A questionnaire contains one or more questions.