

Collecting and utilizing point-of-interest (POI) data cost-effectively with mobile technologies

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Abstract— Pajat Management offers the PoiMapper mobile GIS cloud service. The company was created in September 2009 and has been developing the solution in close collaboration with Plan International. Our application is a combination of data collection features and mapping features in one package enhanced with a features that helps specifically with program monitoring and related field work.

PoiMapper supports an organization's work processes because it supports integration with other information systems and flow of data between systems. The way the data flow works is that one can start by populating the PoiMapper server with existing data from other sources. The way the PoiMapper database is structured is that it consists of users, user groups, definitions of questionnaire forms, POI forms, and also route and area forms. An important feature of PoiMapper is that one can define area hierarchies that are then used to organize and access the filled forms.

Completed data is then uploaded to the server. In our portal one can use filtering and search to identify data sets of interest, visualize data on maps, do history traces of edit histories for instance of any point of interest and export data for further visualization and analysis, in Excel, SPSS, ArcGIS or Highcharts. To ensure privacy and security of data and enable having data only on the customer premises, each organization gets their own database. The organizational benefits are three fold: increase efficiency in actual field work, less error in data and faster availability of data to the stakeholders and ultimately improved decision making and planning ability.

Keywords—Data Collection, PoiMapper, Point of Interest.

I. INTRODUCTION

POIMAPPER is a mobile POI data collection and sharing solution developed for affordable GPS-enabled feature phones[1]. PoiMapper makes fieldwork more efficient and reliable and improves the capability to plan and monitor field activities. It is suitable for development programs focusing on topics such as health, education and agriculture as well as for commercial use such as installation and maintenance of telecommunications equipment.

Using PoiMapper you can:

- define points-of-interest (POIs), routes and areas with associated data to be collected
- define data of multiple types: text, numbers, single and multiple choice alternatives, or conditional sub-questions

- capture pictures or tag audio notes to POIs
- collect data with affordable lower-end mobile phones with GPS and camera
- upload data directly to a central database over the cellular network or via an internet-connected computer
- edit existing data downloaded directly onto the mobile phone during follow-up visits
- view collected data using back-office reporting and analysis tools

II. POIMAPPER SERVICE PLATFORM

The PoiMapper solution consists of 4 tools:

- 1. Authoring Tool:** Create questionnaires of different complexities using an intuitive web based tool. The authoring tool supports the creation of questionnaires for collecting location, route and area based data. Questions of different data types like Multimedia (pictures & audio), text, integers and more can be created using this tool. Furthermore, the authoring tool can be used to define locations where questionnaires will be conducted.
- 2. Administration Tool:** A web based tool For creation of users with various levels of rights, user groups and surveys related to specific locations. Users who will collect data have to be defined in the administration tool and associated to a user group. The user group consists of a set of users who are responsible for conducting surveys (A survey is a group of questionnaires) in a predefined location. The administration tool associates user groups to surveys and surveys to specific locations where the surveys will be carried out.
- 3. Web Portal:** For visualizing and analyzing data on a map and exporting data to spreadsheets for further analysis. Collected data can be exported to different maps platforms (Open Street Map, Google maps, ArcGIS).



Fig. 1 Service Platform

4. Mobile Client: an application that runs on a supported mobile phone displaying the downloaded surveys and allowing questionnaire data to be entered and saved. The mobile client is currently supported on the S60, S40 and Android platforms

development program work in any area. As the solution is co-designed with NGO Plan, PoiMapper is optimized for NGO requirements, taking into account various rough field conditions such as limited connectivity. For example, PoiMapper can be used to track information about schools in a region. A user could harness the multimedia features of the mobile phone, i.e. also take pictures of the school and facilities with the mobile phone's camera as part of data collection for the questionnaire. The images, location and timestamp are tied to the specific school entry in the database. If the school is located in an area with no data connectivity, information is stored on an external memory card to be uploaded later. The database can be exported to Excel for formatting and analysis, and points of interest can also be visualized on a map.

2. Mobile Health: PoiMapper enables patient data transfer to central health records (and can be integrated into back-end systems such as Open MRS), as well as transfer of patient status from rural areas to treatment centers where further advice can be given. Having a PoiMapper health mapping solution in each community used by health workers is currently possible, since the solution is especially designed to run on affordable phones. Plan Thailand uses PoiMapper for the monitoring and evaluation of two programs, both located in Chiang Rai. One of the cases is a public health program to track the spread of tuberculosis in

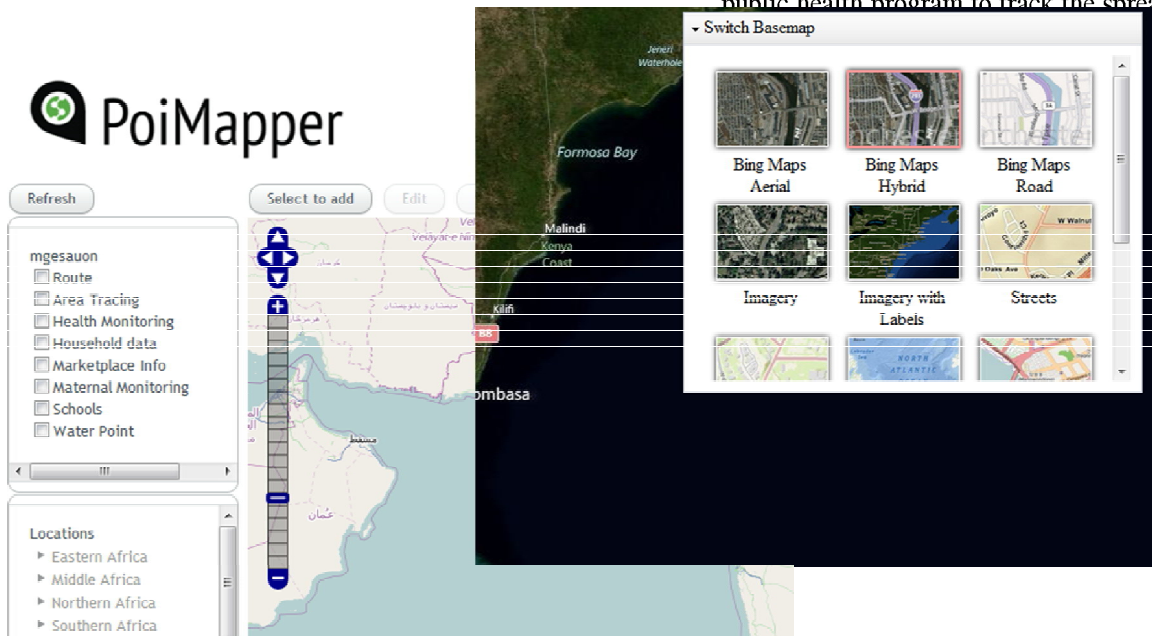


Fig. 2. Poimapper Tools

III. CASES OF USE

1. Humanitarian & International Development: PoiMapper is designed for monitoring of status and progress of

By harnessing PoiMapper, Plan will be able to provide real-time visibility to field work and share the collected data with stakeholders. Additionally, GPS location, timestamp and images associated with the collected program survey data can be viewed using Plan Thailand's own customized program portal. All this allows exact pinpointing of affected households and, since PoiMapper stores the history of collected data; accurate baseline studies can be performed. PoiMapper is beneficial for any type of community health worker activity related to health data.

3. Environmental & Climate change: PoiMapper can be used to monitor rare species in national parks and game reserves. For example, population estimates of rare/endangered species can be collected over time by updating existing information with each survey. This information can easily be exported to excel, allowing trends in data, such as population change, to be readily visualized.

IV. HOW TO GET STARTED

PoiMapper is offered with a complete cost-effective SaaS (software-as-service) model and is provided by Pajat and global partners, who also provide related services such as training, on-site support and organization/sector-specific customization. The following are the different types of usages which apply to PoiMapper:

1. **Evaluation user (free):** The first level is an evaluation user which allows you to see PoiMapper in action. As an evaluation user you can create POIs with your mobile phone and view the POIs on our shared internet portal. You can also use our web-based authoring tool in stand-alone mode to create new questionnaire forms that can be downloaded onto your mobile phone. All you need to do is sign up on '<http://www.poimapper.com/use-poimapper>' and follow the following instructions:
 - a. Go to <http://portal.poimapper.com/portal/poimapper-eval>.
 - b. Install PoiMapper software on your PC and phone
 - c. Collect data on a mobile phone and then upload the data to the portal
 - d. View the collected data in the web portal
2. **Organization test user (free):** The second level is an organization test user. At this level we will create a database for you. You'll also get one user account for this database. You'll be able to create new POI forms with our web-based Authoring tool and use those with your mobile client. Access to the user admin tool is restricted. To sign up visit '<http://www.poimapper.com/use-poimapper>'. To get started, follow the following steps:
 - a. Request your own db for your organization by contacting the PoiMapper team

- b. Define your own forms and location hierarchy
- c. Define your users and groups and link them to locations and forms
- d. Install software in your field workers' PCs and phones
- e. Collect, upload and review data in the web portal

REFERENCES

- [1] www.pajat-solutions.com