A New Generation of Open Source Data Collection Tools

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Abstract—Organizations in low income regions need tools for collecting and reporting on data. Existing paper-based approaches are often slow and incomplete when compared to data collection tools on mobile devices. In this demonstration, we present the authors' Android-based system in addition to broader work by the OpenRosa Consortium – a community dedicated to building open source, standards-based tools for mobile data collection, aggregation, analysis, and reporting.

Index Terms—data collection, mobile phones, ICT

I. INTRODUCTION

A variety of tools are urgently needed to address the lack of data in low-income countries. This data is required for decision making and research in many sectors. Due to recent technological advancements, there is great excitement for using mobile devices to address current gaps in information. Phones and PDAs have proven to be dramatically faster and more complete than traditional methods of pen and paper, and can be more accurate and less expensive as well[5], [6].

The OpenRosa Consortium[1] is a group working together to foster open source, standards-based tools for mobile data collection, aggregation, analysis, and reporting. Participants include AED-Satellife, Cell-Life, CIDRZ, D-Tree International, DataDyne, Dimagi, Google, MRC-SA, University of Bergen, Makerere University, and the University of Washington. The group has active developers in Bangladesh, Kenya, India, Norway, Pakistan, South Africa, Tanzania, Uganda, and the United States primarily working on JavaRosa – an open source framework for data collection on Java-enabled phones.

By developing open source solutions and conforming to standards based on the W3C XForms specification, OpenRosa projects can interoperate their components. So while many of the member organizations are currently using JavaRosa for form collection and management systems, others are building complex solutions like clinical trial software[4], data reporting on servers[3], and even community health worker management[2].

II. DEMONSTRATION

In this demonstration, we will present some of the data collection and management tools under development by the authors for the OpenRosa Consortium. We will show form filling, submission and monitoring on mobile phones using JavaRosa and AndroidRosa. We will also demonstrate Server-Rosa, software which processes and hosts data submitted by mobile phones.

To demonstrate JavaRosa, we will use a few examples of phones which support Java 2 Platform Micro Edition (J2ME). The Nokia 3110c and 6085 both sell for around $100 and are widely available in low income regions. The Nokia N95 is available for around $400 and is one of the most advanced smartphones available. We will demonstrate form filling and submission functionality designed for community health care workers on these phones.

AndroidRosa will be demonstrated on the T-Mobile G1 phone running Android. Android is an open source operating system developed by Google that is more feature-rich and easier to develop for than J2ME. AndroidRosa uses the JavaRosa core code and leverages Android's unique abilities. We will demonstrate form filling which builds on the G1's input devices (touchscreen and keyboard) and sensors (SMS, location and images).

To collect the completed form data sent from the phones, we will demonstrate ServerRosa. This server component is written in Java and can run on local servers as well as in the cloud. Phones can submit completed form data to the server, which can export submitted data and generate reports if necessary. The server can also summarize and aggregate submission data and send it to a separate Android application, which supervisors can use to monitor data collection.

III. CONCLUSION

The OpenRosa Consortium is close to consolidating the necessary functionality for the first public release of JavaRosa, AndroidRosa and ServerRosa. Together, we are working towards solutions to allow organizations with minimal technical capacity to collect data using a variety of mobile phones.

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