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Cross-Platform OpenHDS Web Application

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Abstract

A proof of concept cross platform data collection application for Demographic and Health studies has been developed. This application allows for the collection of information about locations, individuals, births, and deaths within a region. This application can be run on both mobile devices, laptops, and desktops.

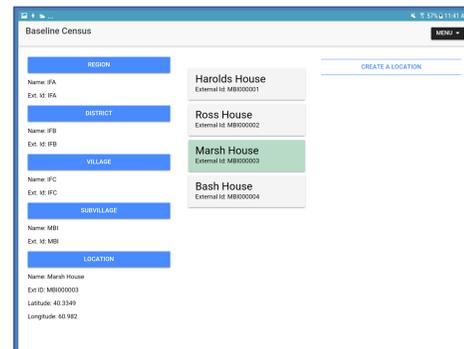
Background

An international network of research centers conduct demographic and health research (INDEPTH). The current software used is OpenHDS and has been around for six years. This version does not take advantage of modern technologies and is difficult to configure and manage.

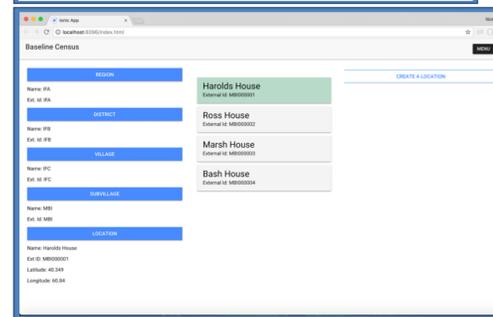
Objective

The goal of this project, was to create a cross platform application that uses modern technologies. The application leverages web based application frameworks (Angular, Ionic) to produce an interactive user interface for a client. The application is also progressive, allowing it to be used both online and offline.

A reduction in the server side code to a REST API was done to allow for the communication of information from the client to the server.



(a) Android Tablet



(b) Google Chrome Browser

Figure 1. Ionic OpenHDS on Different Devices

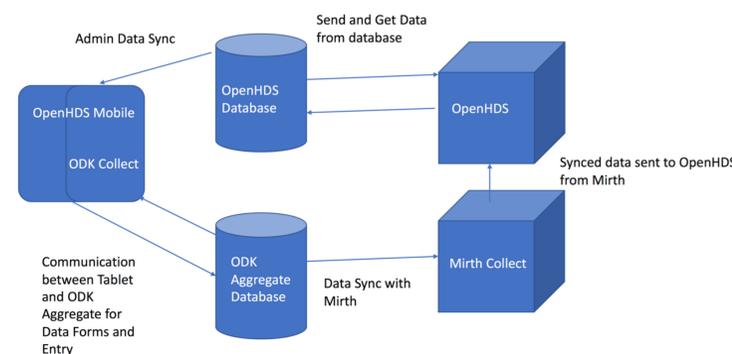


Figure 2. Original OpenHDS System Architecture

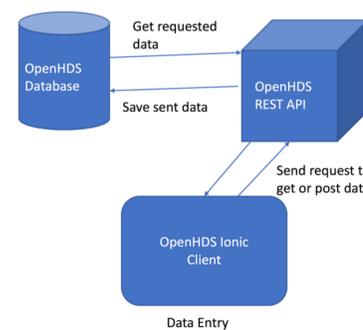


Figure 3. Ionic OpenHDS Architecture

Results

A functional proof of concept was successfully created. Navigation through a location hierarchy, adding locations, and data synchronization allow for a step into the application to see how it works. Figure 1, shows this navigation through the hierarchy.

In the old OpenHDS, there are multiple layers that need to be configured in order to use it. These configurations are ODK Aggregate for data collection and Mirth Connect for data synchronization. Along with this there is interop configurations that must be done to load data on a mobile device. This, along with the use multiple languages to implement OpenHDS, is a point of failure. The new version eliminates a lot of the configuration and uses one web-based language throughout for the user interface. Figures 2 and 3 show these changes.

As a result of the above, the application is less complex and more robust. As an example, suppose we added a data field. Adding the field to the old OpenHDS would require changing things in multiple places: Mirth, ODK Client, ODK Aggregate, OpenHDS server, the database, and the REST API. In the new version, the number of locations to change is substantially reduced. Adding a field in the new system would only require changes in data forms, the database, and the REST API.

Discussion/Next Steps

A well established web based application was developed. We expect the new application should be easier to maintain with a single code base for multiple devices/platforms and it should be more robust by reducing the number of interconnected components.

The next step in the project is to develop a complete way to record demographic information. Once this is done, events within a region (births, deaths, migrations) can also be recorded.

References

INDEPTH Network: <http://www.indepth-network.org/>
 OpenHDS: <https://github.com/OpenHDS>