# Updates

Assignment 1 is submitted..... right?!?

Assignment 2 is posted. It is due Sept 29th.

Other things? Questions? Concerns?

# Questions

Why collect data?

What are the challenges in collecting data?

What data is collected from you in your lives?

# Open Data Kit (ODK)
## Mobile Data Collection, Aggregation, and Dissemination

# Collecting data in low-income regions is difficult.

# Paper provides both the information capture and retrieval.

# Lag between data collection and actionable information.

# Paper is common, but can be very limiting.

# Paul Persil Patient

Back Print

Gender **Male**
Age **44 years** (~ Jun 01, 1934)
Last Visit **1 week ago** (Aug 14, 2008)
Doug Doctor, Rwinkwavu Hospital

TRACnet ID: 12345
Carte d'Identité: 1234567

IMB ID **12345678-A**

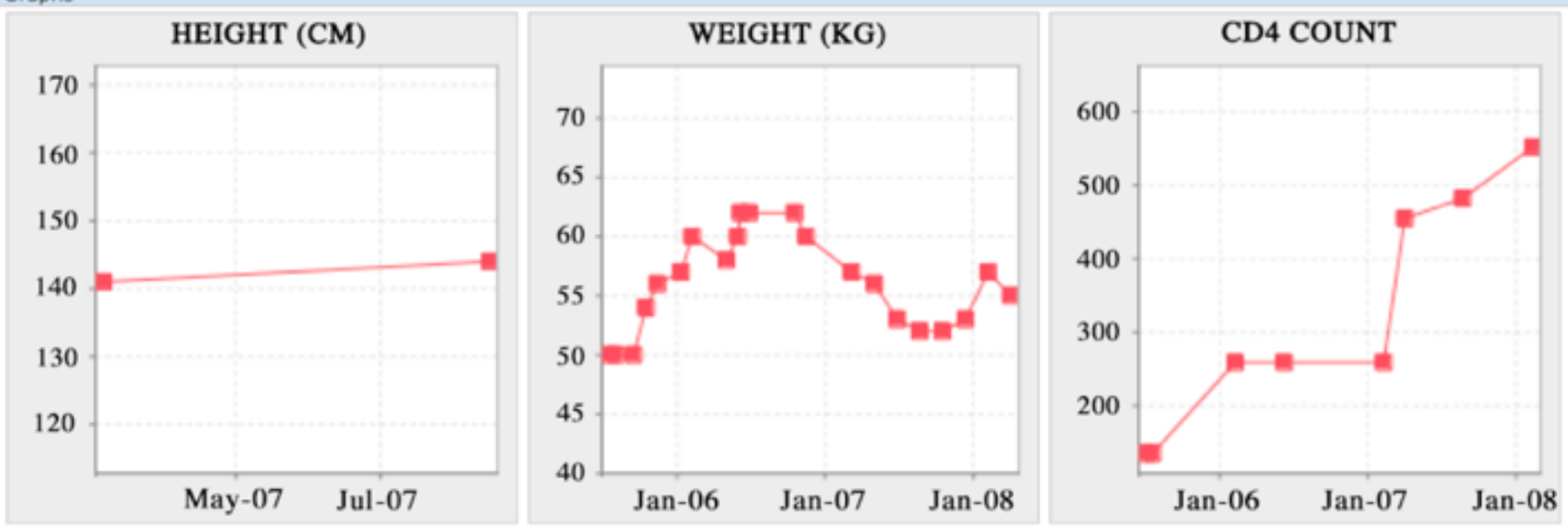
| Alerts |
|---|
| **NO XRAY RESULT IN THE LAST 6 MONTHS** |
| **NO CXR RESULT** |

| Notes |
|---|
| No known allergies |

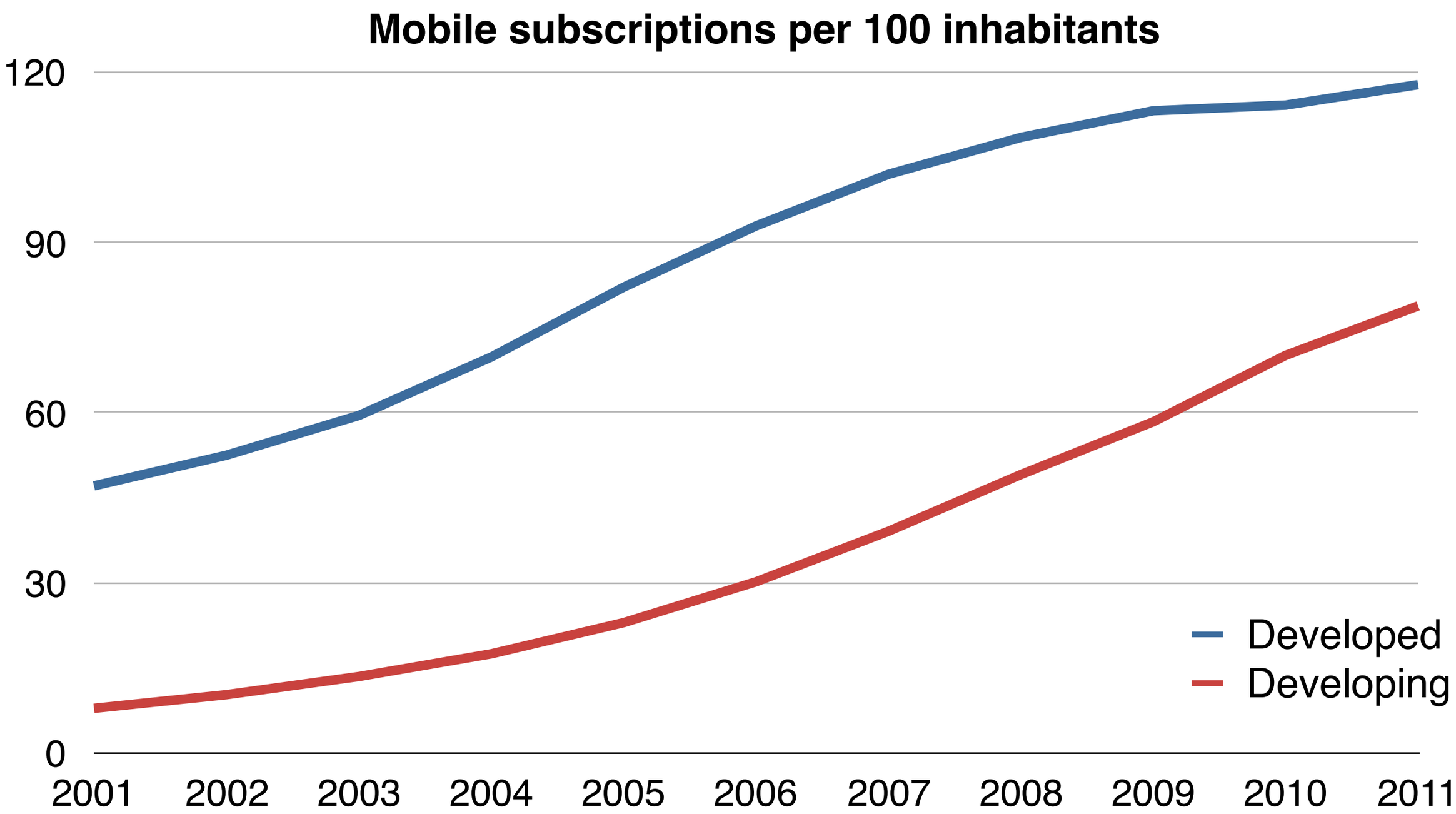
| Drug Order | Dose | Frequency | Start Date | Stop Date | Notes |
|---|---|---|---|---|---|
| **AZT+3TC** | 1.0 tab(s) | 2/d x 7 d/w | Sep 13, 2007 | | |
| **D4T** | 150 mg | 1/d x 7 d/w | Aug 02, 2007 | | |
| Triomune-40 (stopped) | 1.0 tab(s) | 2/d x 7 d/w | Sep 01, 2007 | Sep 13, 2007 | Unexplained facial rash |
| EFV 600 (stopped) | 1.0 mg | 1/d x 7 d/w | Aug 02, 2007 | Sep 13, 2007 | |

| Lab Test | Result | Date | Notes |
|---|---|---|---|
| **CD4** | **512** | Aug 15, 2008 | Ordered by Dr. Doctor |
| **CD4** | **259** | Aug 01, 2008 | |
| **Viral load** | **515** | Jul 28, 2008 | Second test for verification of status |
| Viral load | 200 | Jul 27, 2008 | Ordered by Dr. Green |

Graphs



# Growth of cellular technology enables innovation



# Aren’t devices expensive?

**Extra costs:**
Devices: $80-400
Data Plans (sometimes)
Server cost: ~$2/month (or self hosting, large upfront cost).

**Savings:**
Data transcription
Data validation
Transportation
TIME

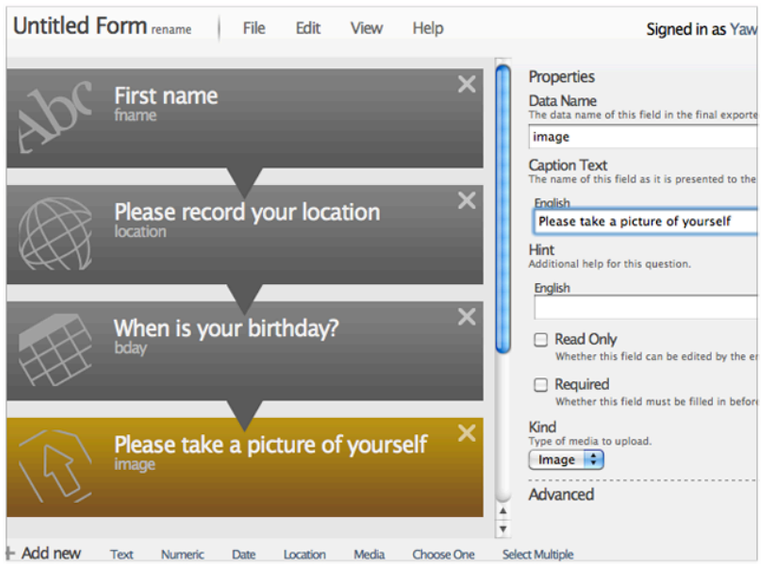
**Result:**
Devices pay for themselves within 2 campaigns

# Open Data Kit (ODK)

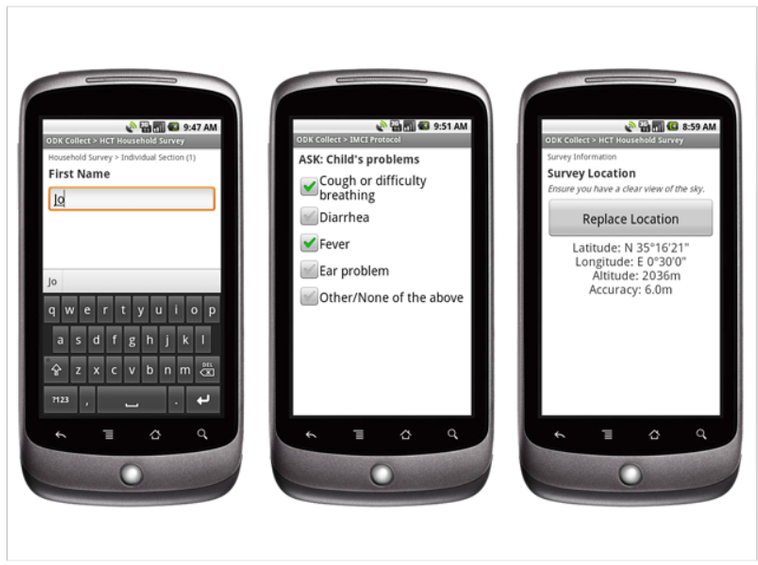
- Project started in 2008
- Mobile data collection tools for Android devices
  - There was too much focus on clumsy J2ME devices
  - Not enough focus on the trajectory of technology
- Modular, open architecture
  - Too many stove-piped solutions
  - Large commercial enterprise systems
- Open source (Apache2)
  - To use for any purpose

# ODK uses phones and tablets to digitize data collection.

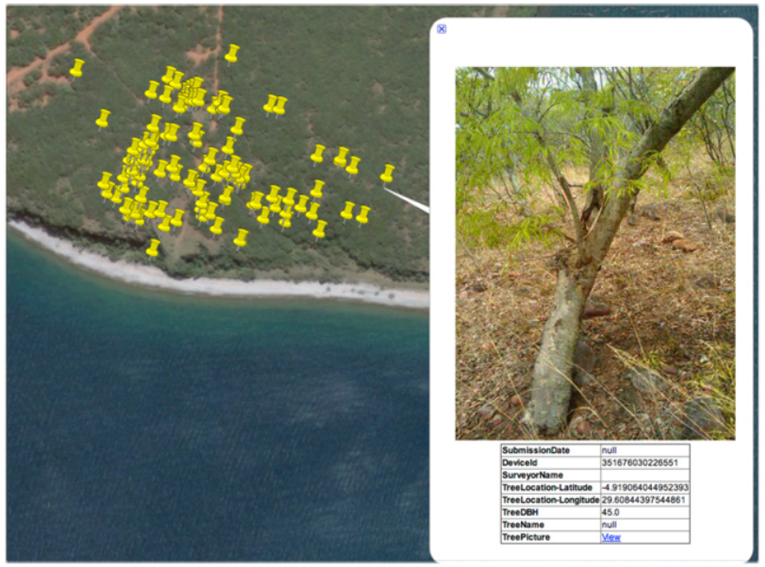
## 1. Build form



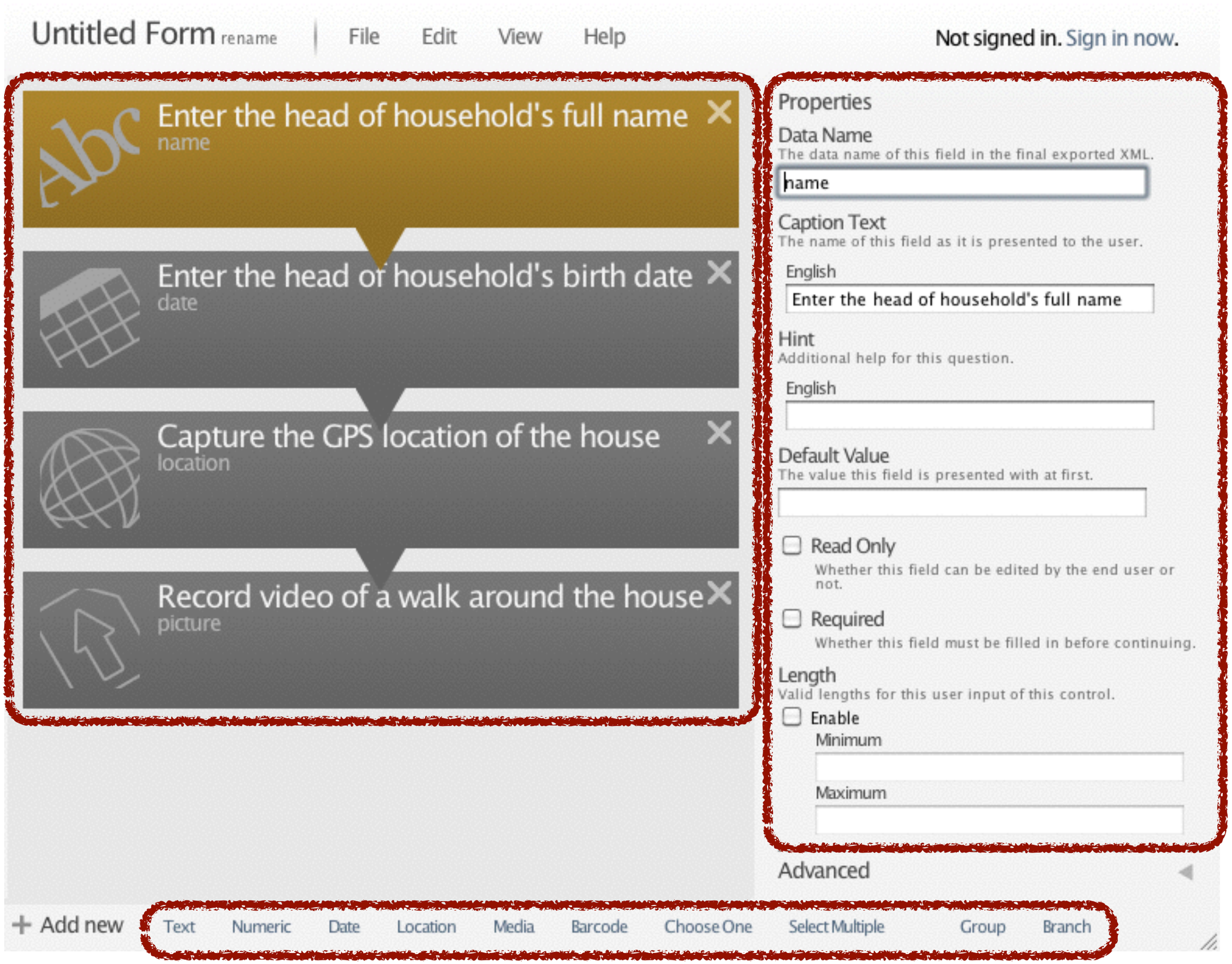

## 2. Collect data




## 3. Aggregate results



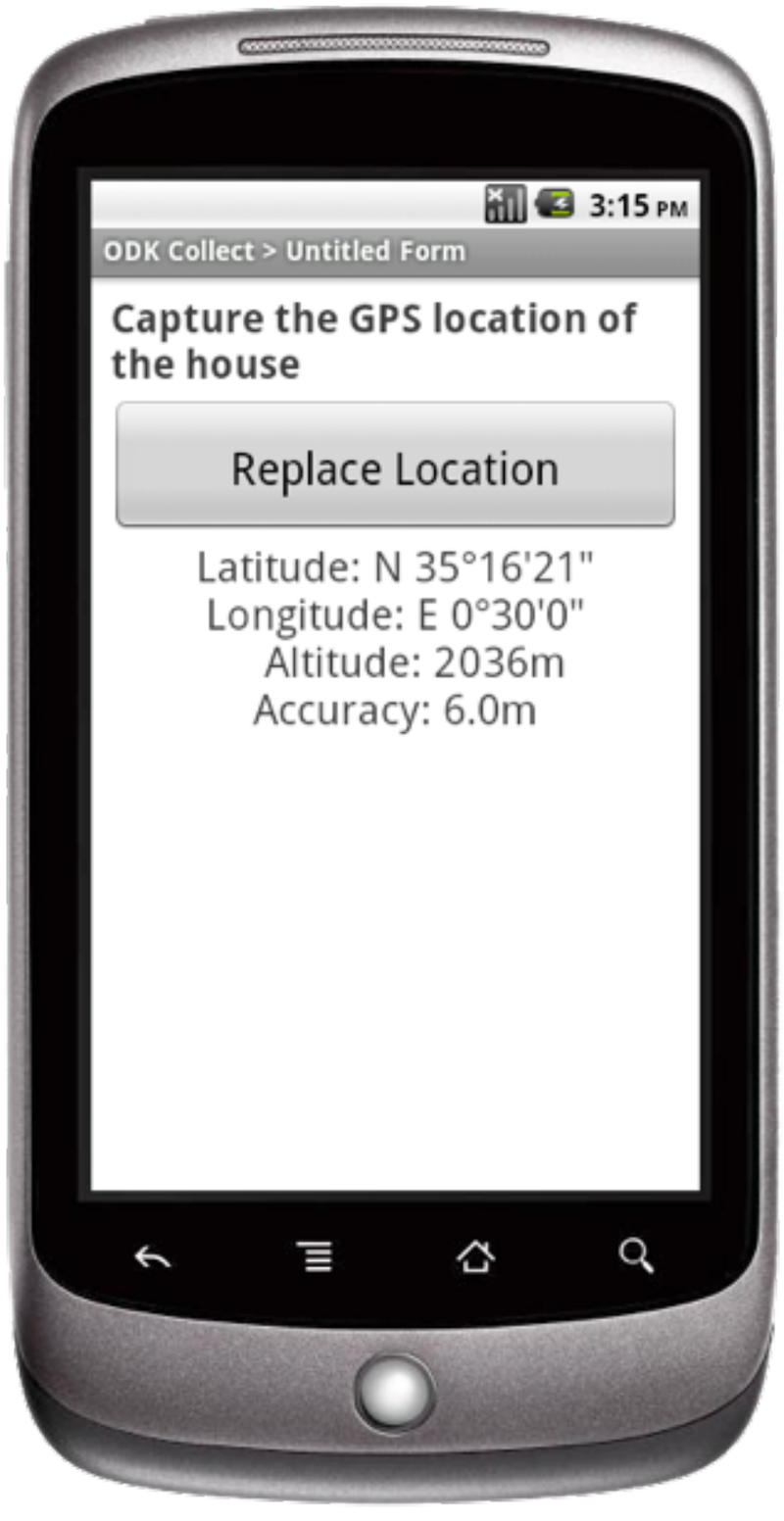
# Build: Drag and drop prompts for form creation.



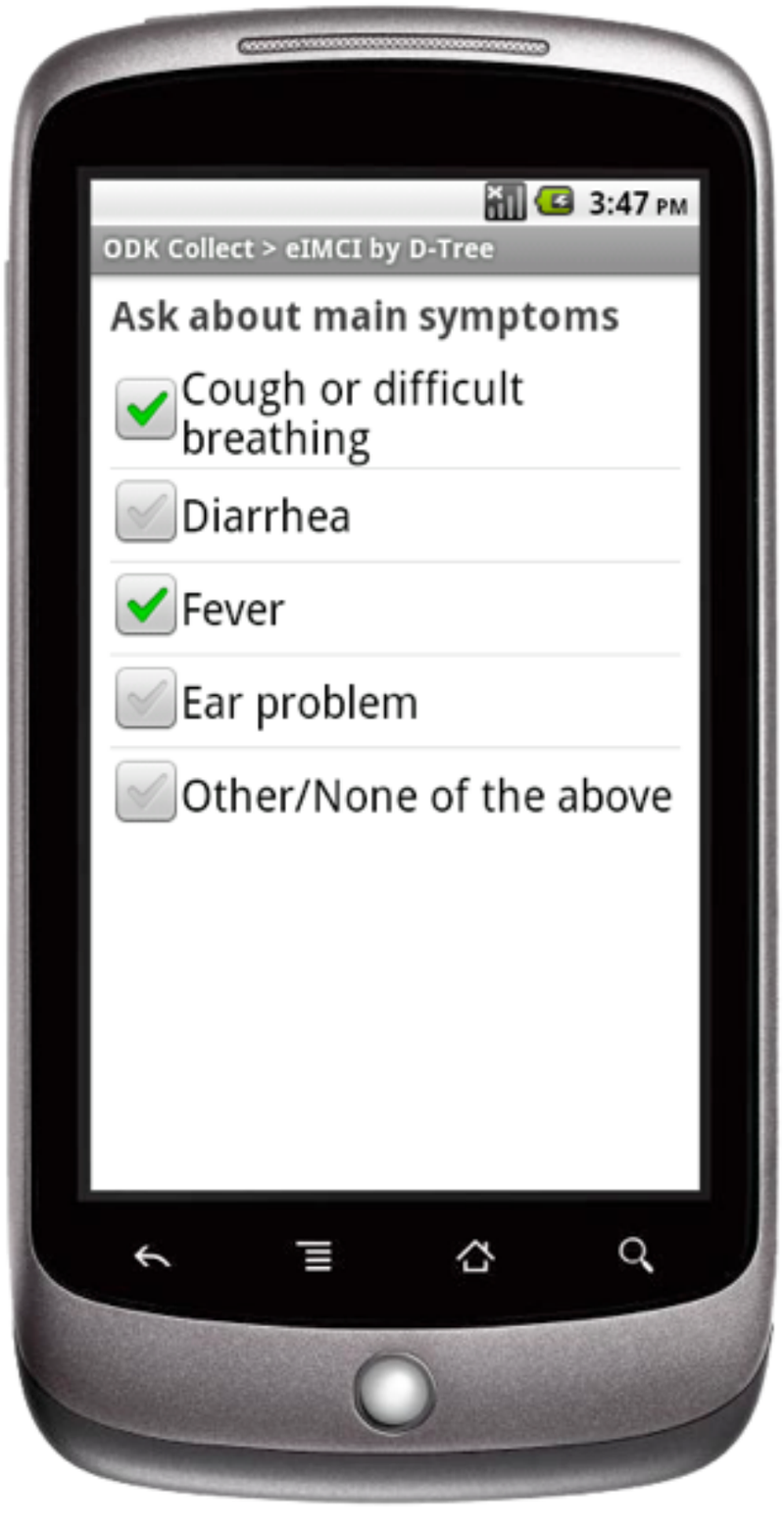
**XForms describes the form logic and data schema.**

```
            <instance>
                <data>
                    <name/>
                    <date/>
                    <location/>
                    <picture/>
                </data>
            </instance>
            <itext>
                <translation lang="eng">
                    <text id="/data/name:label">
                        <value>Enter the head of household's full name</value>
                    </text>
                    <text id="/data/date:label">
                        <value>Enter the head of household's birth date</value>
                    </text>
                    <text id="/data/location:label">
                        <value>Capture the GPS location of the house</value>
                    </text>
                    <text id="/data/picture:label">
                        <value>Record video of a walk around the house</value>
                    </text>
                </translation>
            </itext>
            <bind nodeset="/data/name" type="string"/>
            <bind nodeset="/data/date" type="date"/>
            <bind nodeset="/data/location" type="geopoint"/>
            <bind nodeset="/data/picture" type="binary"/>
        </model>
    </h:head>
    <h:body>
        <input ref="name">
            <label ref="jr:itext('/data/name:label')"/>
```

# Collect: Display prompts for data collection.



# Collect: Multiple languages and multimedia ability.



# Aggregate: Host data and provide extraction interfaces.

Submissions | Form Management | Site Admin

Log Out
wbrunette@gmail.com

Filter Submissions | Exported Submissions

Form: Geo Tagger v2 | Filter: none | Visualize | Export

Save | Save As | Delete

Display Metadata

Submissions per page: 100

Filters Applied

Add Filter

Hide DeviceId

Previous | **Geo Tagger v2** | Next

| Image | Location Latitude | Location Longitude | Location Altitude | Location Accuracy | Description |
|---|---|---|---|---|---|
| | 47.65434975 | -122.30498975 | 21.29999924 | 6.708204 | HUB construction |
| | 47.64834739 | -122.29989853 | -20.29999924 | 5.656854 | Docks at WAC |
| | 47.65335942 | -122.3255423 | -14.89999962 | 6.708204 | Foot of Latona |
| | 47.64634424 | -122.33644953 | -7.0999999 | 6.3245554 | Home |
| | 47.64540379 | -122.33636588 | -7.19999981 | 4.472136 | Kite hill... Gasworks |
| | 47.62708792 | -122.33274967 | -8.0 | 6.708204 | Chandler's Cove |
| | 47.65824883 | -122.31314593 | 31.0 | 5.0 | The Ave |
| | 47.66945725 | -122.30360415 | 25.39999962 | 5.0 | Ravenna Park |
| | 47.68088862 | -122.3291259 | 48.59999847 | 5.0 | Greenlake |
| | 47.68999464 | -122.3554331 | 68.59999847 | 7.2111025 | Greenwood |

# Aggregate: Codebase runs locally and in the cloud.

flickr: theplanetdotcom

# Aggregate: Stores or forwards data to external systems.

| | |
|---|---|
| **DeviceId** | 351676030226627 |
| **SurveyorName** | Shadrack |
| **TreeLocation-Latitude** | -4.9192410707473755 |
| **TreeLocation-Longitude** | 29.60762321949005 |
| **TreeDBH** | 57.0 |
| **TreeName** | Myombo |
| **TreePicture** | View |

# XLSForm: Build and share forms with Excel

| A | B | C | D | |
|---|---|---|---|---|
| **type** | **name** | **label** | **hint** | **constraint** |
| select_one occupation | a7 | 7. What is your occupation? | [Classify respondent on occupation. If other, list occupation stated]<br><br>Researchers: please make sure not all selected respondents belong to the same occupational category (if at all possible). | |
| text | a7_working_class | Working class? Please specify. | | selected(${a7},'8') |
| text | a7_other | Other? Please specify. | | selected(${a7},'66') |
| end group | a7_group | | | |
| begin group | a8_group | | | |
| select_one educational_level | a8 | 8. Please could you tell me your own education level? | Researchers: please make sure not all selected respondents belong to the same educational level (if at all possible). | |
| integer | a8_primary | Last year of primary school? | | selected(${a8},'2') and . >= 1899 and |
| integer | a8_secondary | Last year of secondary school? | | selected(${a8},'4' )and . >= 1899 and |
| text | a8_details | Further studies? Please specify. | | selected(${a8},'6') |
| end group | a8_group | | | |
| select_one yes_no | a9 | 9. Do you have access to a radio within your home? | | |
| begin group | a10_group | | | |
| select_one listen_radio | a10 | 10. How often do you listen to the radio? | | |
| text | a10_other | Other? Please specify. | | selected(${a10},'66') |
| end group | a10_group | | | |

survey | choices | settings | +

# enketo: Collect data offline in the browser.

Makubaliano iliyo toka kwenyi utafiti inayo husu Idadi Ofisini S.E.L.F. *

- ◯ Ok. Tafadhali kuendelea.

---

## A. Utafiti

1. Namba ya Mulengwa *

2. Siku ya kujibu ku maswali ama maulizo

---

## Utafiti kuhusu wakaaji

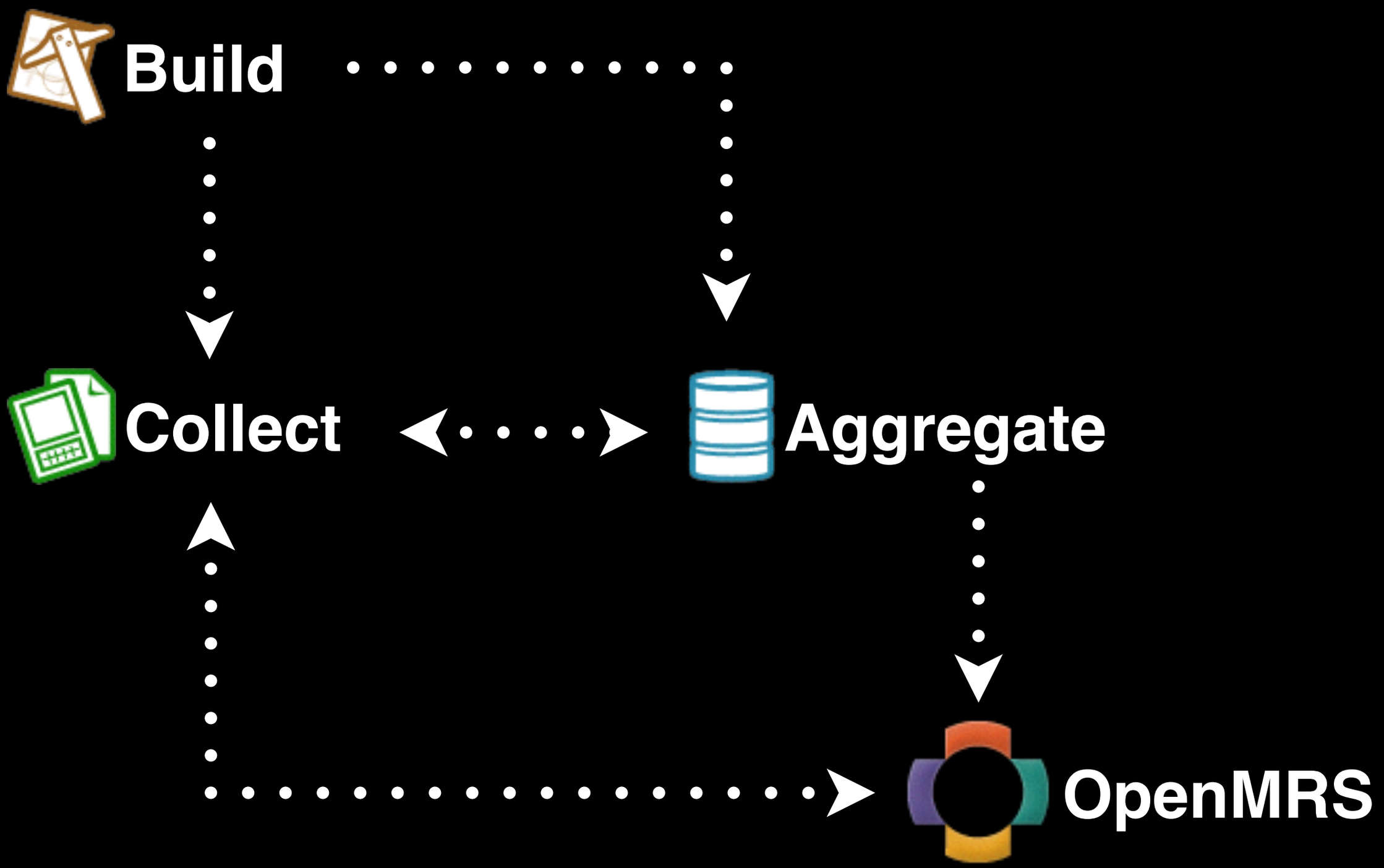
5. Una umri gani? *

---

## Mwisho wa utafiti

Namba ya mutafiti *

# ODK: How the tools fit together



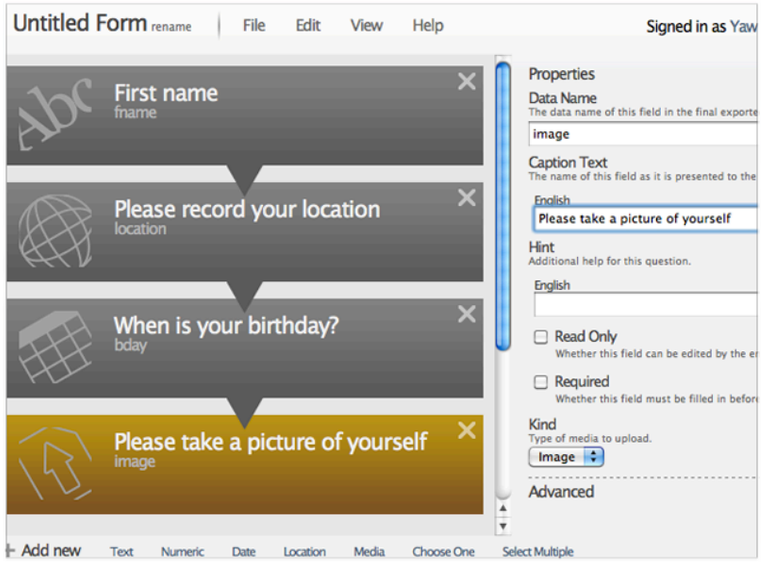
# ODK: Open APIs let you customize your solution

XLSForm

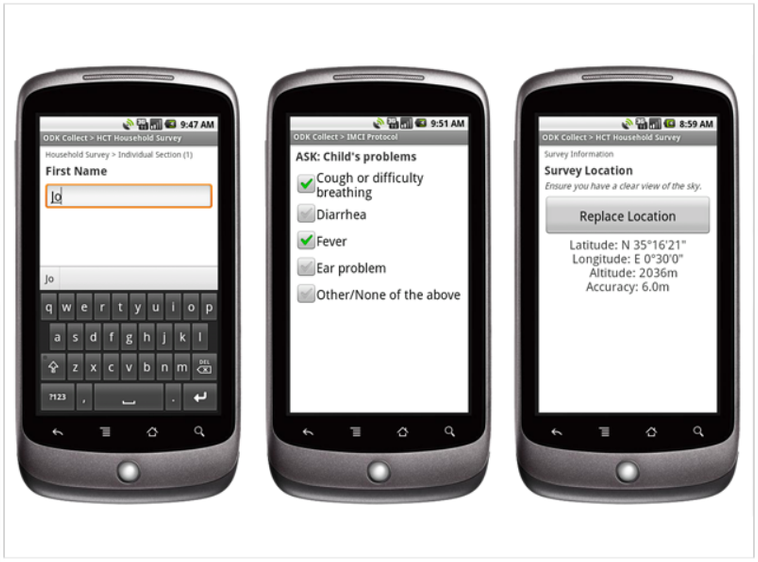
JavaRosa

Google
MapsEngine

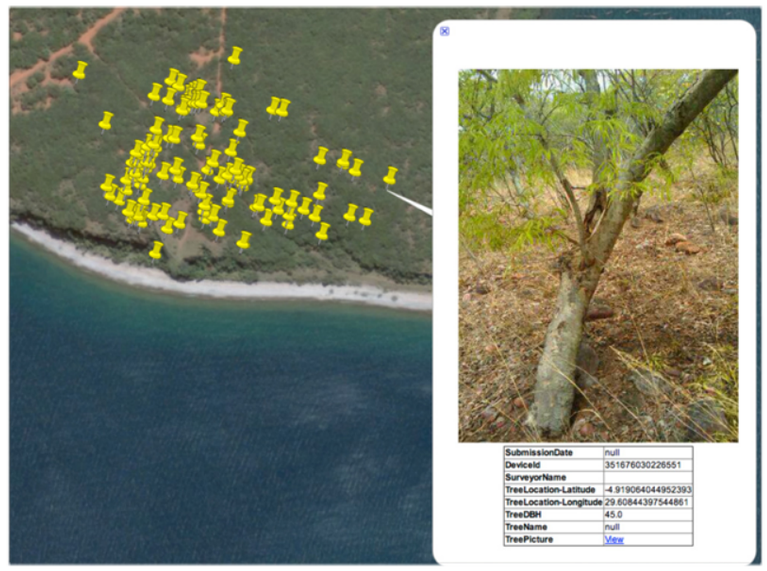
# 1. Build form




# 2. Collect data




# 3. Aggregate results



# Jane Goodall Institute uses ODK for forest monitoring.

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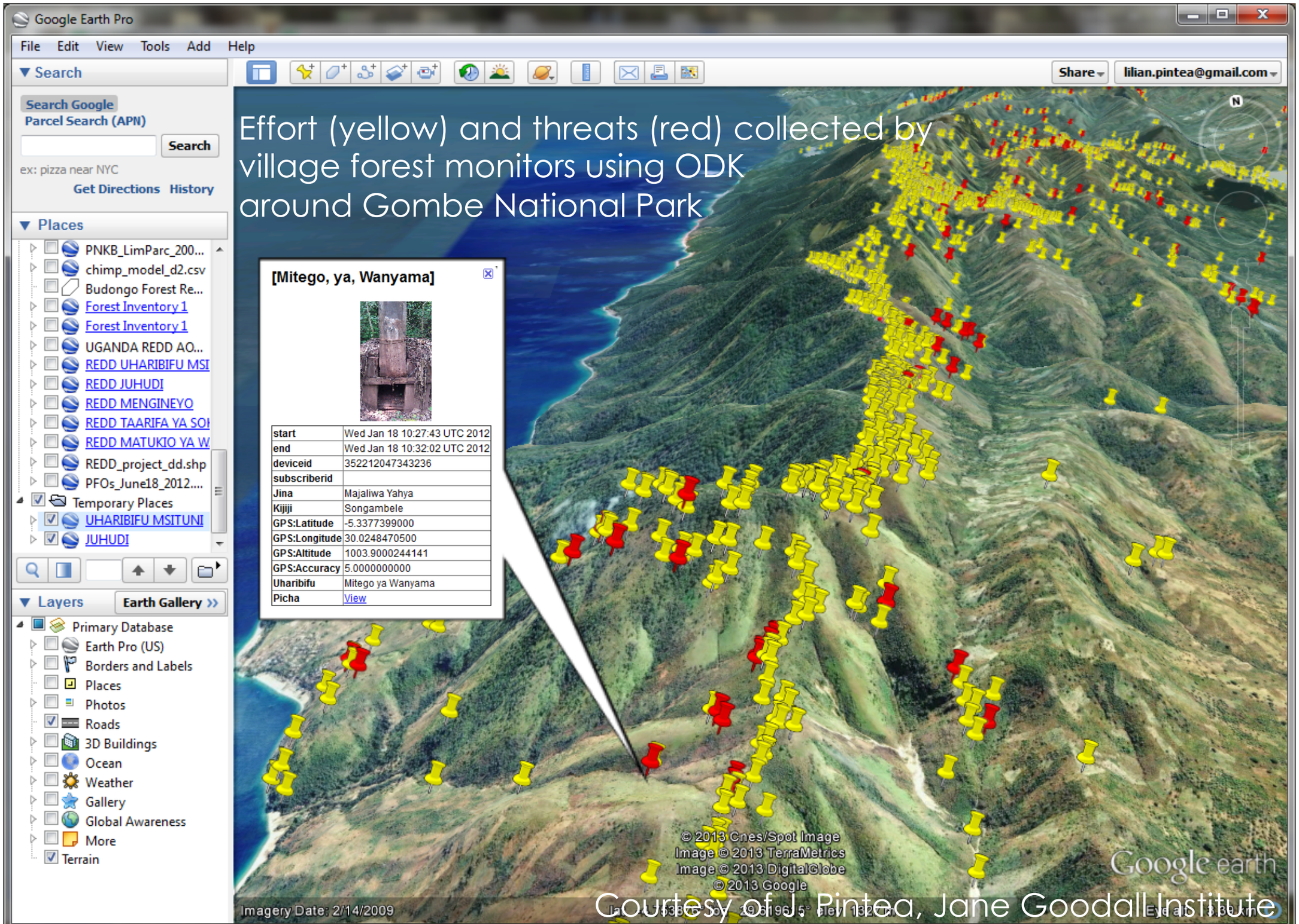



Courtesy of J. Pintea, Jane Goodall Institute

# Kiva uses ODK to get borrower information.

Ruth

Eldoret, Kenya  Agriculture | Farming

LOAN OVERVIEW | REPAYMENT SCHEDULE | LENDER COMMENTS

PAYING BACK

## This loan has be fully funded!

A loan of $375 helped Ruth buy irrigation pipes.

16% repaid

Find a Loan

| | |
|---|---|
| Repayment Term: | 18 months (more |
| Repayment Schedule: | Irregularly |
| Pre-Disbursed: | Aug 30, 2012 |
| Listed | Sep 7, 2012 |
| Currency Exchange Loss: | Possible |
| Default Protection | Not Covered |

# Carter Center uses ODK for monitoring elections.

**Carbon For Water collected over 1,000,000 forms with 4,000 ODK-powered phones in 6 weeks.**

**AMPATH's health workers have used ODK to counsel and test over 1,000,000 people for HIV.**

http://vimeo.com/38123850

# Growing community around the platform.

- Nafundi - A company started by the guys who invented ODK. If you need professional support or require changes to ODK tools, why not try the only company the ODK team recommends?
- Dimagi - Provides support for core and custom development on the Open Data Kit platform. They work closely with team that founded ODK.
- Mindflow Associates - Have experience customizing OpenMRS, ODK data collection solutions, building Android phone based applications, utilizing JavaRosa-based technologies amongst many others.
- Afrisis - Has developed and deployed end to end (mobile, touch-screen kiosks, SMS, desktop, web) software solutions across all provinces of Mozambique. They are quite familiar with JavaRosa-based technology.
- Mega Six Solutions - Based in Kenya, and specializing in Research and IT domains, we have expertise in data management processes. Using our Android development team, Mega Six will help you customize ODK for desired data collection and aggregation.
- Group Complete - Will design and implement survey collection forms for users of Group Complete (and ODK-based tool) for free.
- ULevel - A company based in Brazil doing customizations on Collect for Android.
- WebFirst - Well versed in the development of data collection systems like JavaRosa and ODK in low-resource and standard environments.
- EarlySail - Have customized ODK Collect for a few pilot projects as well as assisted in form development. They will soon be porting ODK to BlackBerry.
- Seeing Swans - A company focusing on data collection and complex analytics. They have customized

# Diverse Implementer Community

OpenDataKit
magnifying human resources through technology

ABOUT USE DOWNLOAD HELP PARTICIPATE

## Home

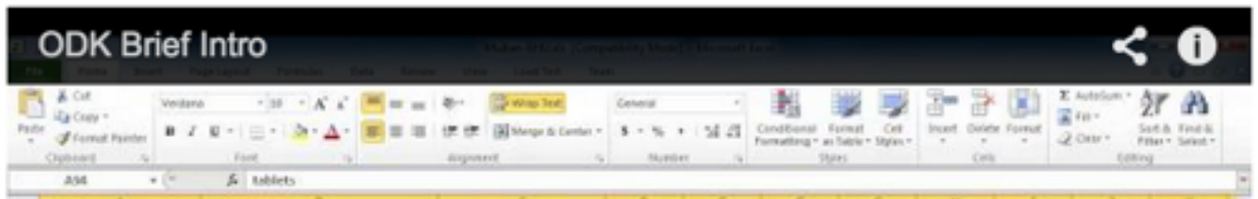
Open Data Kit (ODK) is a free and open-source set of tools which help organizations author, field, and manage mobile data collection solutions. ODK provides an out-of-the-box solution for users to:

1. Build a data collection form or survey (XLSForm is recommended for larger forms);
2. Collect the data on a mobile device and send it to a server; and
3. Aggregate the collected data on a server and extract it in useful formats.

In addition to socio-economic and health surveys with GPS locations and images, ODK is being used to create decision support for clinicians and for building multimedia-rich nature mapping tools. See the list available tools, featured deployments, and implementation companies for more examples of what the ODK community is doing.

We welcome and encourage participation from the user community. ODK is supported by a growing community of developers, implementers and users as well as various companies. Core ODK development is supported by ongoing research at the University of Washington's Department of Computer Science & Engineering and through donations from users.

Below are two short videos explaining a bit about the project.




TRANSLATE

Select Language

BLOG

ODK 2.0 Alpha "rev 122" now available
September 2, 2014

A Getting Started Guide walks through using and modifying a form, and highlights many of the capabilities of the 2.0 tools, including bi-directional sync with the server. The 2.0 tools are in Alpha or Beta status. We are referring to the combined set of tools as the "rev 122" software. To understand what we mean [...]

ODK v1.4.4 tools now available
August 29, 2014

There are new v1.4.4 versions of: ODK Aggregate Installer now asks for an ODK Aggregate username and uses that as the super-user (rather than a gmail account). Eliminates problems with Google OpenID logins by avoiding/obsoleting them. IE 6 and IE 7 are no longer supported. Fix for column naming bug that sometimes impacted tables with [...]

# Technical Website for Development

# opendatakit

Open Data Kit (ODK) is a free and open-source set of tools to help create mobile data collection services.

**Project Home** | Downloads | Wiki | Issues | Source

**Summary** People

**Project Information**

Starred by 229 users
Project feeds

**Code license**
Apache License 2.0

**Members**
wbrunette, borriellog, mitchellsundt, clarlars, rohit.chaudhri, yanokwa@nafundi.com, chartung@nafundi.com, sudar.sam
49 committers

**Your role**
Committer

**Links**

**Blogs**
ODK Website

**Groups**
ODK Community
ODK Developers

**This site is primarily for developers. If you are not a developer, please visit http://opendatakit.org.**

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ODK provides an out-of-the-box solution for users to:

- Build a data collection form or survey;
- Collect the data on a mobile device and send it to a server; and
- Aggregate the collected data on a server and extract it in useful formats.

In addition to socio-economic and health surveys with GPS locations and images, ODK is being used to create decision support and for building multimedia-rich nature mapping tools. See featured deployments and list of tools for more examples of what the is doing. We welcome and encourage participation from the user community.

**Downloads of the tools are available at Downloads.**

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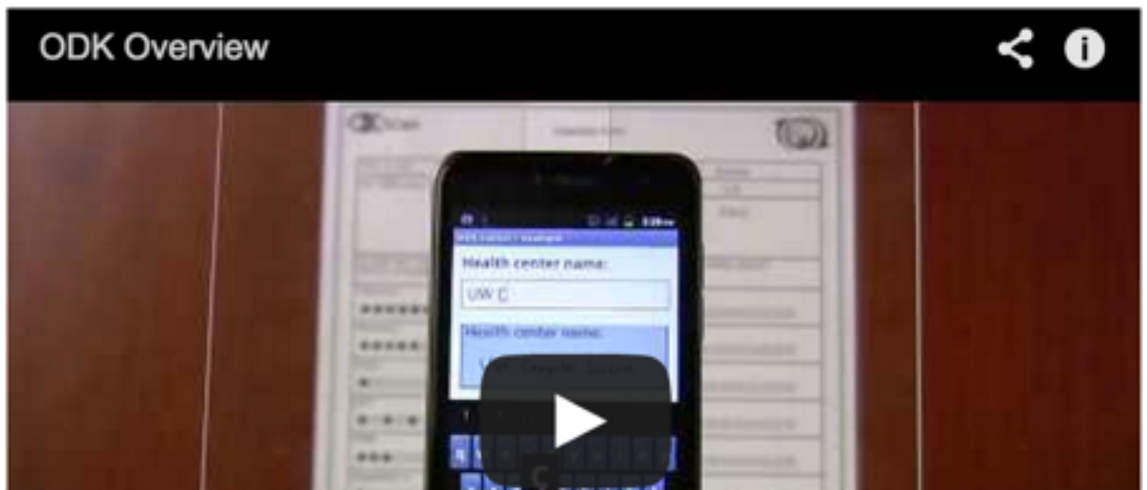


# Tired of clipboards and paper forms?

Nafundi can replace your paper forms and surveys with smartphones and tablets.
Our apps will help your mobile staff (e.g., census takers, health workers)
collect data accurately and report results instantly.

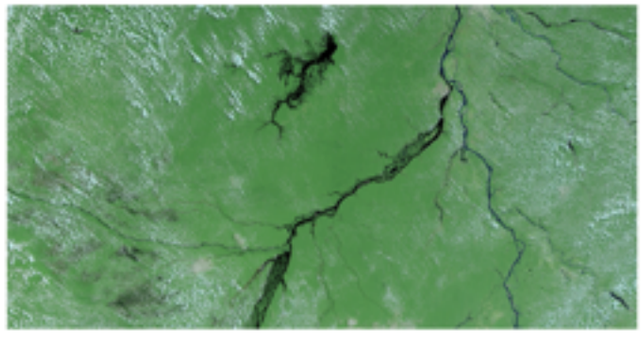
Learn More

Nafundi designs, builds, deploys, and supports mobile data collection software.
We started Open Data Kit, the best way to build forms, collect data, and aggregate results.

## Nafundi ensures Johns Hopkins can monitor and evaluate research globally

*"We've used Open Data Kit for years and we love it. Our latest project needed new features that were not in ODK Collect and so we came to Nafundi for help. We knew it would be a lot of work in a short amount of time but they delivered big time. If you need changes to ODK done well and on time, I can't recommend Nafundi enough."*

Luke MacDonald
Assistant Director
Johns Hopkins University Global Water Program



## Nafundi works with Google to monitor changes to the Earth's ecosystems

*"I've been working with Nafundi's founders since 2009, from the Amazon rain forest to the heart of Africa. They have a rare ability to discern the essence of a problem and deliver solutions that are easy to use, work at scale, and make a difference."*

Rebecca Moore
Engineering Manager
Google Earth Outreach, Google Earth Engine

## Nafundi helps Task Force for Global Health eliminate tropical diseases

*"Being able to quickly collect and process data is vital to public health programs. We've been working with Nafundi for years, and they are great at solving the pain points (on mobile and desktop) we come across. They work quickly, solve problems the first time, and give us the confidence we need to scale. We could not do our work without Nafundi."*

Alex Pavluck
Neglected Tropical Diseases Support Center
International Trachoma Initiative

# ODK Usage

- ODK has been a successful open source project
  - Website usage stats (still doubling every year)
    - Over 150K unique visitors from 202 countries
    - Average of 10K unique visitors/month
    - Code site gets over 3K unique visitors/month
  - Online survey (73 respondents) last year (small portion of users)
    - 55 deployments involving >5500 devices in 30+ countries
  - Installs and code downloads
    - 3.5K code downloads
    - 25K distinct clients have installed ODK Collect using Play
    - NOTE: many orgs setup their devices directly w/o Play

# Open Data Kit (ODK)
## Mobile Data Collection, Aggregation, and Dissemination