

Swiss TPH



Swiss Tropical and Public Health Institute
Schweizerisches Tropen- und Public Health-Institut
Institut Tropical et de Santé Publique Suisse

Assoziiertes Institut der Universität Basel

Public Health Computing Group
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OpenHDS overview

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OpenHDS

HDSS data platform developed by a distributed team

Based on many of the concepts in HRS2

First introduced in Cross River HDSS, Nigeria

Since then rolled out in several additional sites

Objectives:

Improve data quality

Improve timeliness of data availability

Harmonization between INDEPTH member centres

Efficiency (at centre level)

Implementation status

Implemented

INDEPTH

Cross River (Uni Calabar, Nigeria), Ifakara and Rufiji (both Ifakara Health Institute, Tanzania), Nanoro HDSS, Manhica HDSS

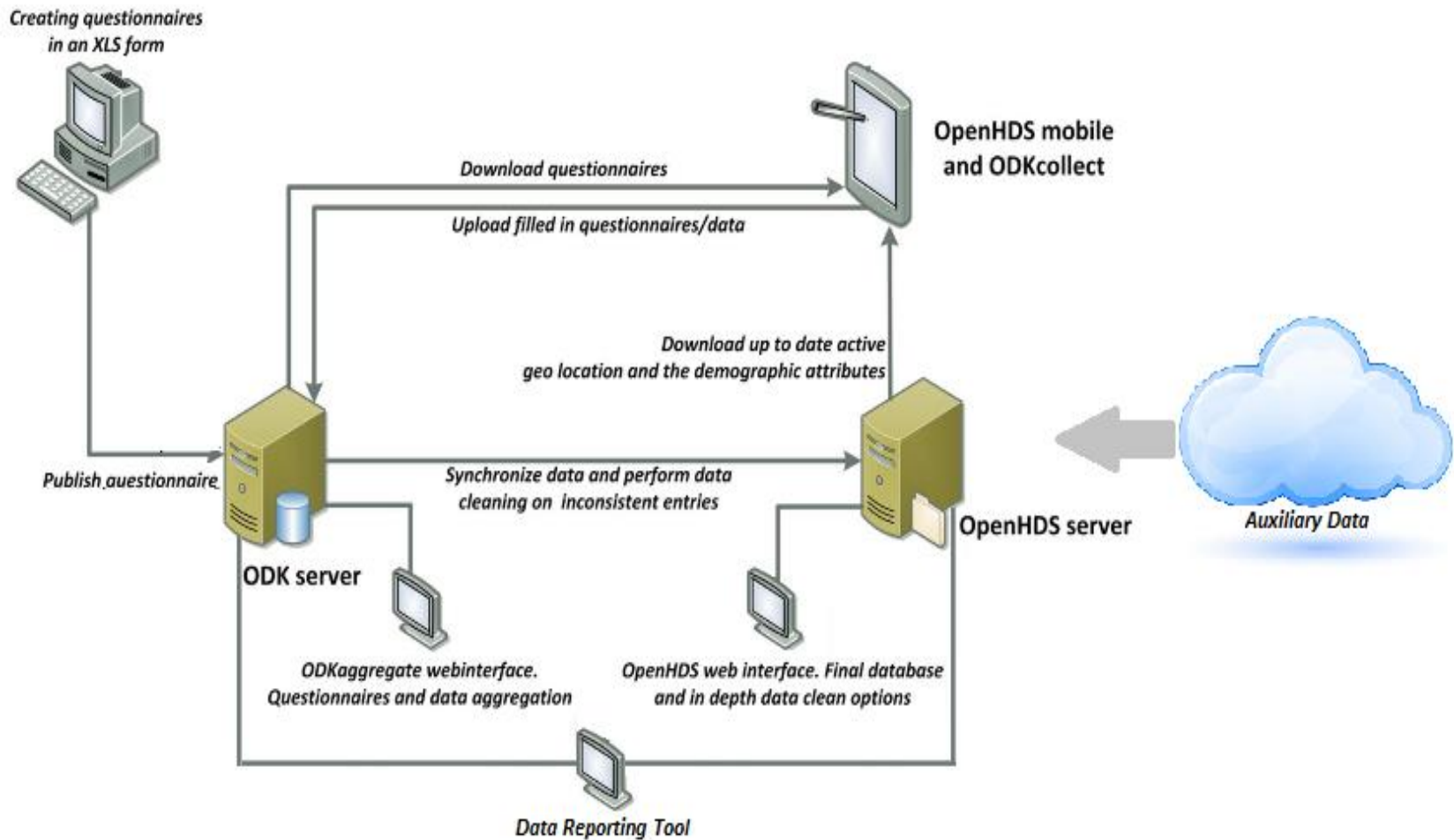
Other

Rusinga Island (ICIPE, Kenya); Majete (College of Medicine, Blantyre, Malawi); Bioko Island (through Uni Southern Maine)

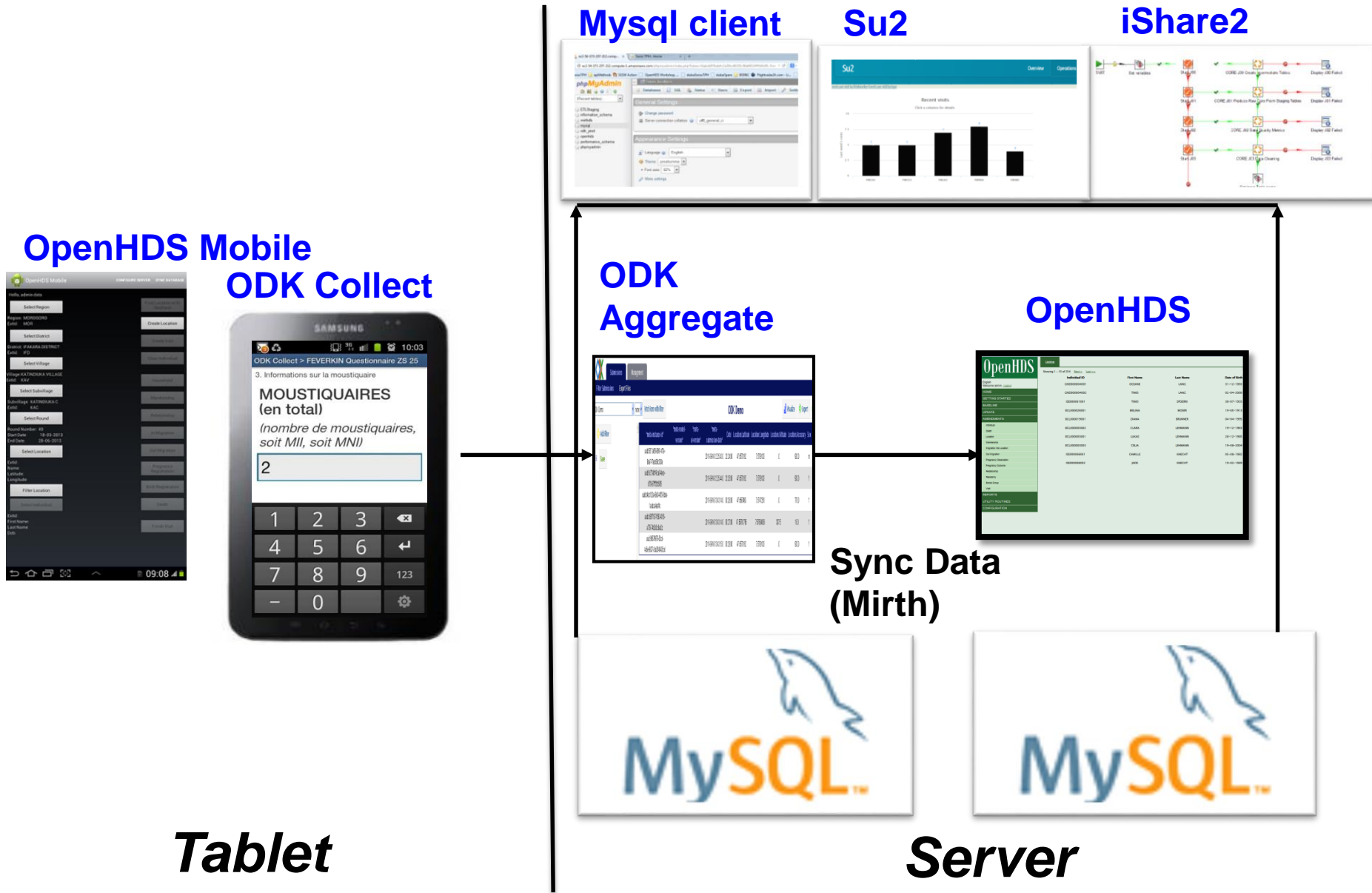
In preparation

Taabo HDSS, Ethiopian HDSSs (Arba Minch, Butajira, Dabat, Gilgel Gibe, Kersa, Kilite Awlaelo, Mecha)

OpenHDS overview



System architecture



Data integration

MirthConnect

processedByMirth	deviceId	meta	instanceId	start	visitId	fieldWorkid	locationId	roundNumber	visitDate	intervieweeId	correctInterviewee	intervieweeName
⊗	true	uuid:5b4d9193-2b1f-4c22-e50f-7daf79129624		2013-07-31 13:33:10	KAT00024018	FWHR2	KAT000240	18	2013-07-31 00:00:00	KAT000240002	1	
⊗	true	uuid:d92c159-698b-4080-9941-c280251199a		2013-07-31 13:30:39	KAT00024018	FWHR2	KAT000240	18	2013-07-31 00:00:00	KAT000240002	1	
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⊗	true	uuid:6ea6534e-a3e5-425d-8045-806409984e7		2013-07-31 11:51:07	LP000503018	FWMM1	LP000503	18	2013-07-31 00:00:00	LP000503002	1	
⊗	true	uuid:97671864-fc0e-4e0b-9609-95683054174		2013-07-31 11:27:01	LP000502018	FWMM1	LP000502	18	2013-07-31 00:00:00	LP000502003	1	
⊗	true	uuid:ba101e0b-7391-443b-9464-a11fa10a2691		2013-07-31 12:25:28	LP000506018	FWMM1	LP000506	18	2013-07-31 00:00:00	LP000506011	1	
⊗	true	uuid:bc567c0b-6d13-465b-92d8-66eaeff758011		2013-07-31 13:26:28	LP000510018	FWMM1	LP000510	18	2013-07-31 00:00:00	LP000510002	1	
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⊗	true	uuid:c70168e-392d-49d4-b06e-1e140063a05		2013-07-31 12:56:06	MLA000027018	FWLK2	MLA000027	18	2013-07-31 00:00:00	MLA000027001	0	SAD, PWEM
⊗	true	uuid:418a6502-aaf5-413c-9462-80786adcb664		2013-07-31 13:42:37	MLA000022018	FWLK2	MLA000022	18	2013-07-31 00:00:00	MLA000022002	1	
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OpenHDS

- English
- Welcome admin, [Logout](#)
- HOME
- GETTING STARTED
- BASELINE
- UPDATE
- AMENDMENTS
- REPORTS
- UTILITY ROUTINES
- CONFIGURATION

MirthConnect

- Is an open source standards-based healthcare integration engine
- First released in 2006, version 3.0 released in 2013
- Widely used
- Facilitates the routing, filtering, and transformation of messages between systems over a variety of protocols or connectors (HTTP, Databases, Web Services, Files FTP...)
- Easily transform, filter, and route your data
- Lets you configure email alerts so that you know if there is a problem with your interface

The screenshot displays the MirthConnect dashboard. On the left is a navigation menu with sections for 'Channels', 'Users', 'Settings', 'Alerts', 'Events', and 'Plugins'. Below this are 'Status Tasks' (Refresh, Start All Channels, Stop All Channels, Reset All Channels, Send Message, View Messages, Remove All Messages, Clear Statistics, Pause Channel, Stop Channel) and 'Other' (Help on this topic, About Mirth, Visit MirthProject.org, Report Issue, Logout).

The main area shows a 'Dashboard Status Panel' table with columns for 'Started', 'Count', and 'Status'. The table lists various connectors and their current states:

Started	Count	Status
Started LLP Listener	22851	Receiving
Started Mirth Results Lab Message Processor	473	Waiting
Started DICOM Receiver	16	Idle
Started CDA and CCD to HTML	2	Idle
Started Web Service SOAP Receiver	0	Waiting
Started CSV Reader	6	Idle
Started XML to HL7v2 over LLP	15	Waiting
Started E-Prescribing Incoming Data	277	Idle
Started Remove empty XML elements	29	Idle
Started Mirth Results Message Cleanup	0	Waiting
Started Mirth Results Generate PDF	0	Waiting

Below the status panel is a 'Server Log' table with columns for 'Timestamp', 'Connector Info', 'Event', and 'Info'. The log shows a series of events from 2009-03-25, including file readers and writers, with events like 'Done', 'Busy', and 'Connected'.

OpenHDS: recent developments

Improved management of data entry forms

Migration classification (internal, external)

Documentation and DM SOPs

Integration with iShare2

Version 1.5 production release

<https://github.com/SwissTPH/>

OpenHDS: recent developments

Flexible configuration

- Location Hierarchy (up to 8 levels)

- Visit at Location/Household

- Additional constraints (e.g. earliest date of an event)

Multi language (FR-EN-PT-ES-SW-Amharic)

Added support for death and change of Head of household

OpenHDS: recent developments

Guided tablet workflow (hiding-showing buttons)

Highlighted people visited

Added “successful” visit flag(to distinguish from empty houses/nobody inside at time of the visit)

Improved tablet sync (faster) and info for data manager for entities synced (sync successful-last time synced)

Experimental extra forms mirth channels

Outlook: utilize OpenHDS system architecture

Further near-time quality control

Additional reporting channels

Potential for surveillance-response

Data integration with health facilities & CRVS

Key enabling factors and best practices for adequate data collection and management

Centralized data storage and management

- Client-server database management system

- Web-based data management application

Near time data centralization

- Point of collection digitization

- Secure data transfer

Near time quality control

- Open interfaces

- Automatized, extensible reporting engine

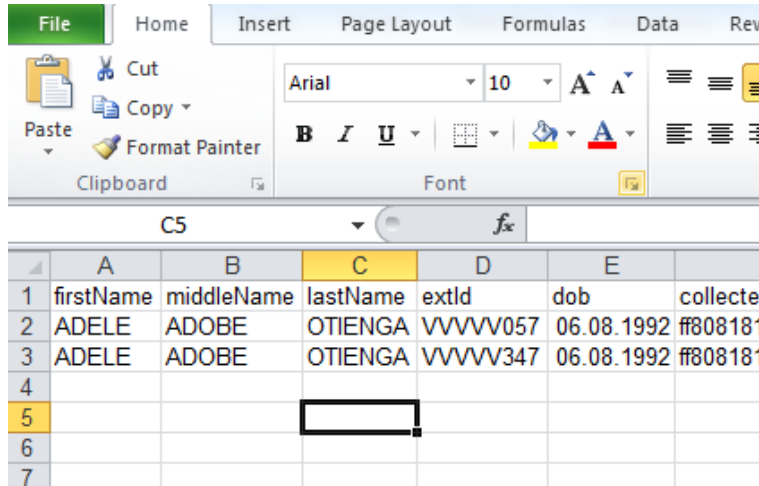
Additional possibilities

- Beyond questionnaires: bar codes
- Scanning the code gives access to add data to the specific location
- For navigation purposes, the database is converted with GIS to a geographical database
- Houses in designated clusters to be visited by the FW are displayed on Google Earth mobile app
- Biometry?



Near-time quality control

- Nightly synchronization and error reporting



The screenshot shows the Microsoft Excel interface with the following data table:

	A	B	C	D	E	
1	firstName	middleName	lastName	extId	dob	collecte
2	ADELE	ADOBE	OTIENGA	VVVVV057	06.08.1992	ff808181
3	ADELE	ADOBE	OTIENGA	VVVVV347	06.08.1992	ff808181
4						
5						
6						
7						

Duplicate individuals



Operational guidance



Revisit guides

Additional resources

Latest source code, releases, and manual

<https://github.com/SwissTPH/>

Stable repository

<https://github.com/openhds/>

Windows server setup

<https://digitalhealth.institute/courses/openhds-basic-installation/>