



connecting the world for better health



**digital
square**



Global Goods October Webinar: Technical Highlights Across Our Community

October 30, 2019



Agenda

- Opening Remarks, Announcements, Introductions – Carl Fourie (5 minutes)
- Highlights of the OpenMRS Quality Assurance activities supported through Digital Square – Jan Flowers (12-15 minutes)
- Reveal and Akros' shift from mSpray – Annie Martin (12-15 minutes)
- OpenCRVS and the proof of concept in Bangladesh (12-15 minutes) – Annina Wersun and Ryan Crichton
- Q&A – remaining time



Digital Square Announcements

- Next webinar “Capacity Building and Network Analysis” in January 2020
- Please complete RSVP form for Global Good Innovators Meeting by November 1
- Notice D allocation status notifications coming soon
- Digital Financial Services RFA in preliminary technical application co-creation phase
- OpenHIE Community Meeting: November 4-8, 2019 in Addis
- Communications reminders:
 - Strategic communications workshop opportunity
 - Extended deadline for providing updates to Global Goods Guidebook entries in Smartsheet form
 - Please contact Bianca Poll with questions at bpoll@path.org



Introductions

- Carl Fourie, Senior Technical Advisor at Digital Square
- Jan Flowers, Director of Global Health Informatics at UW I-TECH
- Annie Martin, Research Lead at Akros
- Annina Wersun, Product Manager at Plan International
- Ryan Crichton, Software Developer at Jembi



Technical Highlights Across Our Community

OpenMRS QA Program *Ensuring the Quality of a Global Good*



30 October 2019



OpenMRS
MEDICAL RECORD SYSTEM

W UNIVERSITY of
WASHINGTON



What Is High Quality?

Just Works

Bug Free

Supports My Work

Available



Meets Requirements

Meets Users Needs

Fitness for Use

Reliable

Stable

On Time

On Budget

Supported



Trust + Satisfaction

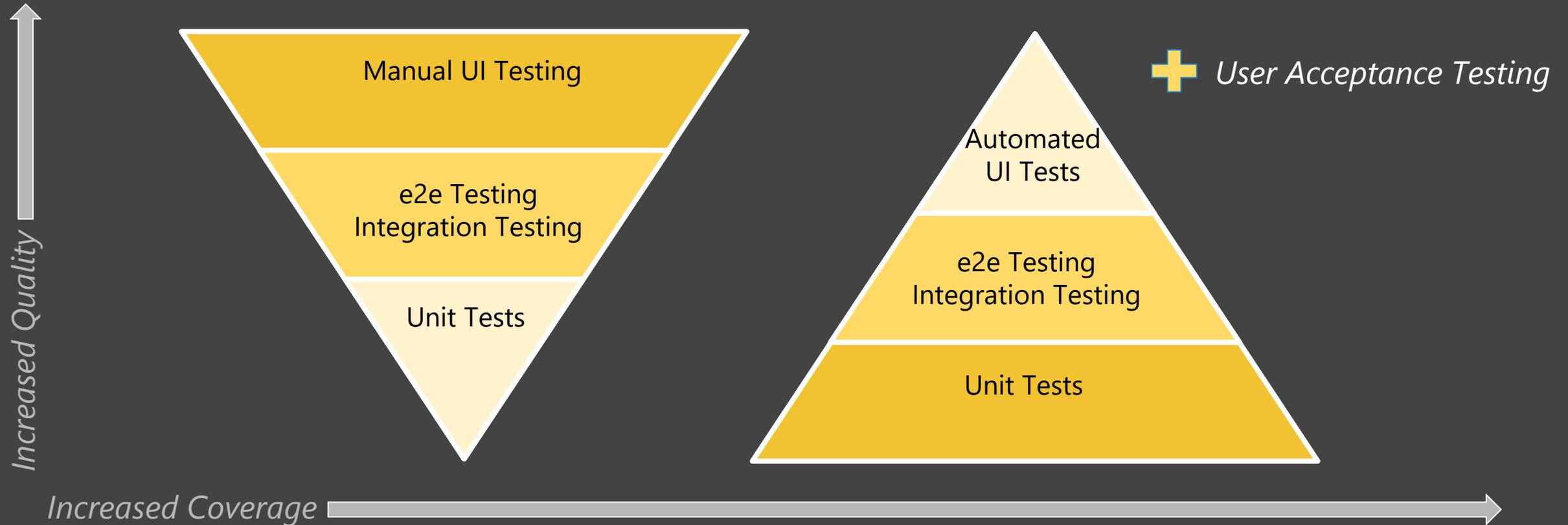
Quality is a Customer Determination

Quality Assurance? Yes, please!

From Reactive Quality Control to ProActive Quality Assurance

Reactive: Find Issues

Proactive: Prevent Issues





Community-Led and Supported

Why this approach?

- Ecosystem
- Continuity

What is the Implementation approach?

- Community engagement and decision-making
- Reuse and improve
- Standardised and community approved processes

What is the transition thought process?

- Sustainability
- Adaptable Tools
- Low Barrier Testing Framework
- Documentation



Quality Assurance + Global Goods

Why is quality assurance important for Global Goods?

How would you adapt this approach for your Global Good?

Thanks!

Any questions?



Spatial intelligence to optimize service delivery

Annie Martin
Akros

Spatial intelligence optimizes intervention delivery

Where are interventions needed??



Were they delivered??

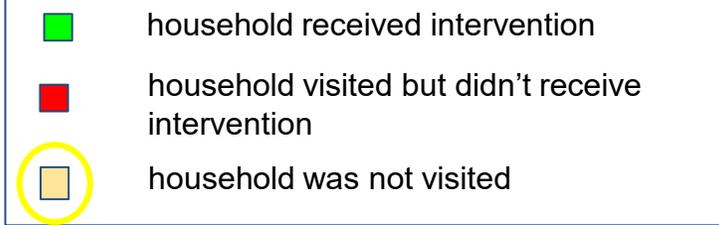


Improve impact of those interventions



Often coverage is overestimated

IRS, Malaria

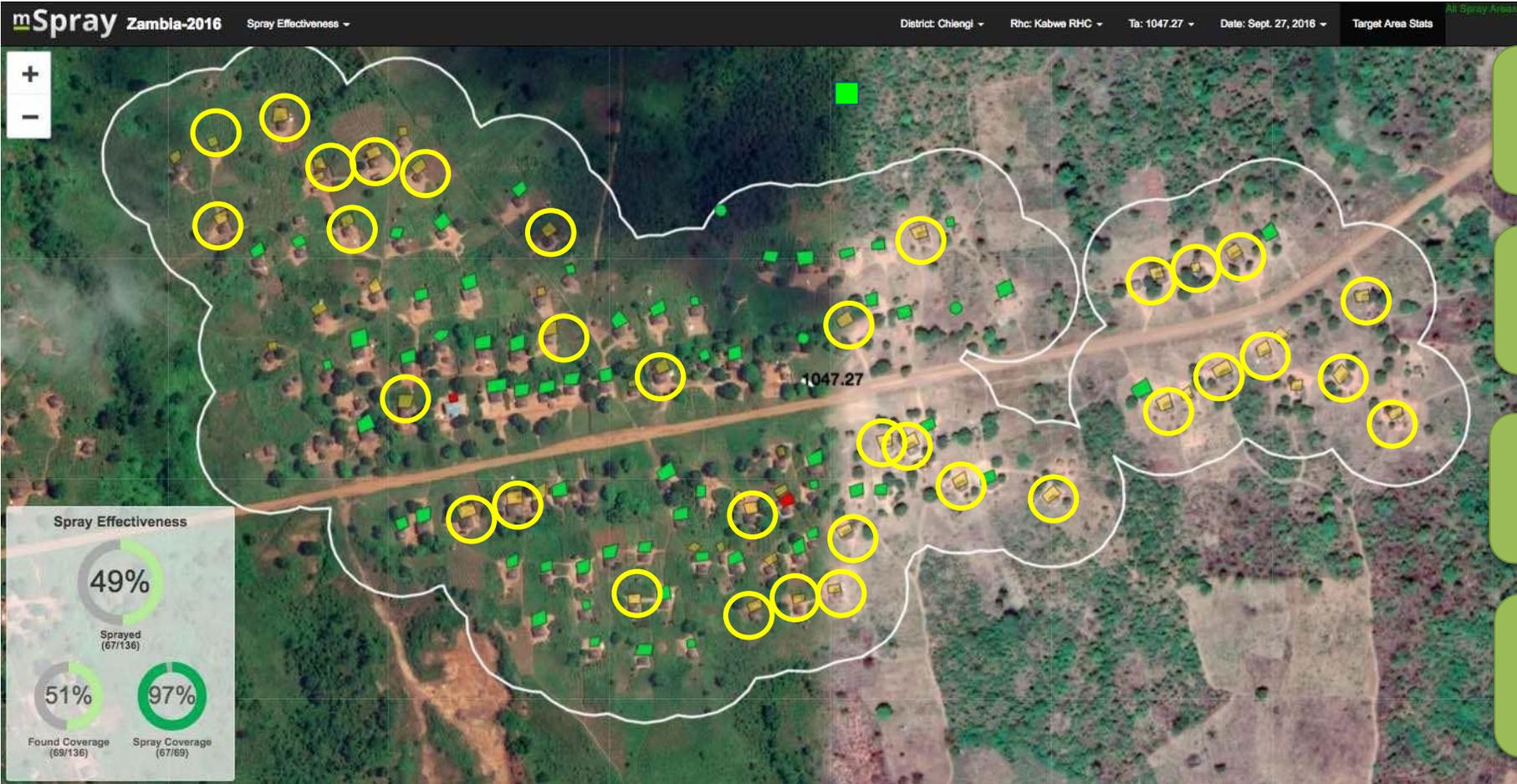


Often coverage measures look at the number of structures sprayed related to the number of structures found by spray teams.

There is potential that this vastly overestimates coverage when structures are not found.

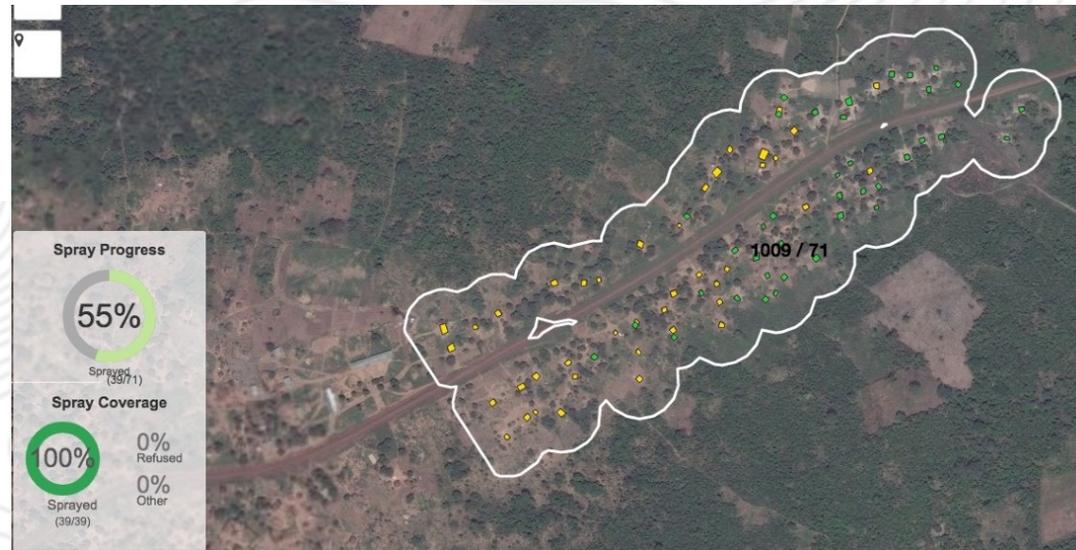
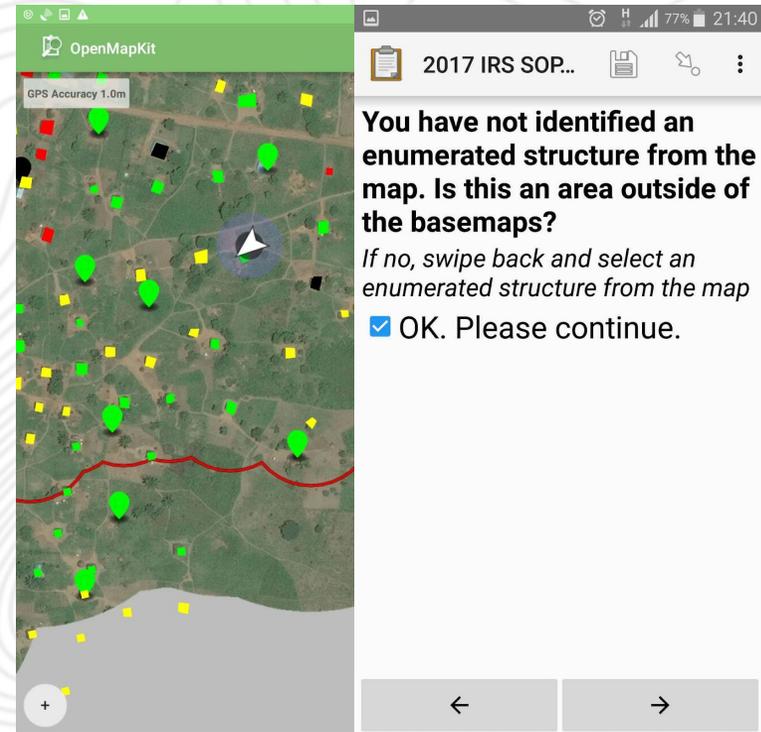
Spatial data from Zambia suggest as few as 54.5% of structures are found when no spatial aids are used in IRS.¹

Research from Iran, South Africa, and Namibia suggests the challenge of finding and visiting structures.^{2,3,4}



1. Bridges et al. Accuracy and impact of spatial aids based on satellite enumeration to improve IRS spatial coverage, Malaria Journal, 2018.
2. Mumbengegwi et al. Is there a correlation between malaria incidence and IRS coverage in western Zambezi region, Namibia? Public Health Action, 2018
3. Sakeni et al. Indoor Residual Spraying Coverage and Acceptability Rates to Control Malaria and the Householders' Reasons of Acceptance or Rejection of Spraying, in South-East of Iran, Int J Infect. 2015 ;2(4):e60147.
4. Hlongwana et al. Knowledge and practices towards malaria amongst residents of Bushbuckridge, Mpumalanga, South Africa. Afr Prim Health Care Fam Med, 2011

mSpray

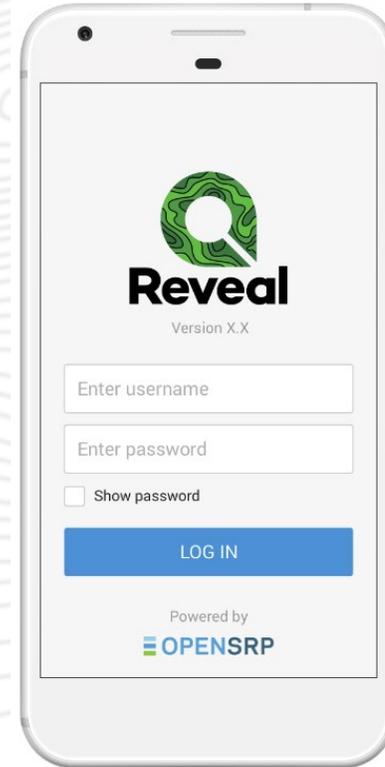
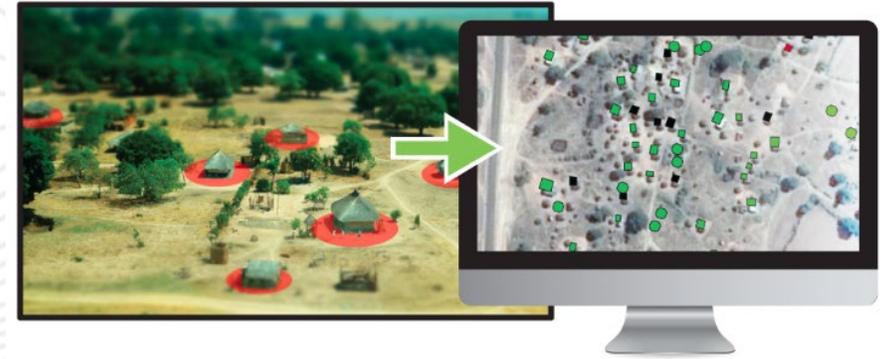




Reveal

REDEFINING PRECISION

- Development grant awarded to build on mSpray
- Support spatially precise interventions on more robust platforms, with more flexible data model
- Expands beyond IRS into MDA, Foci Investigation, net distribution, SMC, entomological surveys
- Expand the toolkit to support implementation planning



Reveal Workflow

Enumerate

Plan

Deliver

Monitor

Reveal Web UI

Reveal Mobile Client

Reveal Web UI

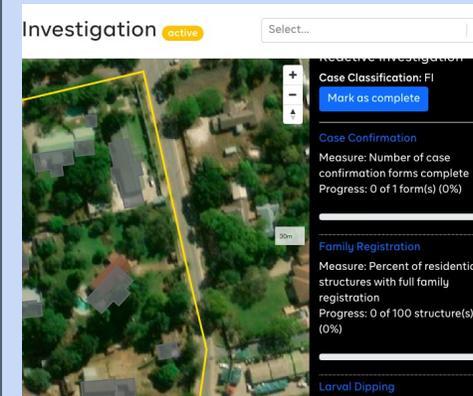
Users plan the reactive or routine interventions (RACD, MDA, IRS, Ento, etc.) using the spatial intelligence and algorithms run on the enumerated structures to target/plan.



Users carry out interventions and collect data in the field. Intervention data are geo-linked at the household level, and may be linked at person level.



Data syncs back to the Reveal Dashboards and are reviewed by program managers.



Implementation Transition

Platform

Data Model

User Strategy

Testing

Training

**Protocol
development**





Reveal

REDEFINING PRECISION

- 2019 implementations in Namibia, Thailand Zambia
- 2020 expansions planned in 5+ countries

Current Community of Practice Members

Vital Wave serves as the current steward of DSME community. Interested in joining? Read our member commitments and Get Involved!



<https://dsme.community/>



Anne Martin

acmartin@akros.com



OpenCRVS Design Research

Insights from human-centred field
research in Bangladesh

The logo consists of a light blue square frame with a white background. Inside the frame, the words "OPEN" and "CRVS" are stacked vertically in a bold, white, sans-serif font.

**OPEN
CRVS**

An estimated 1 billion people around the world cannot officially prove their identity, and 47% are children.
(World Bank, 2018)

Why is civil registration important for health?

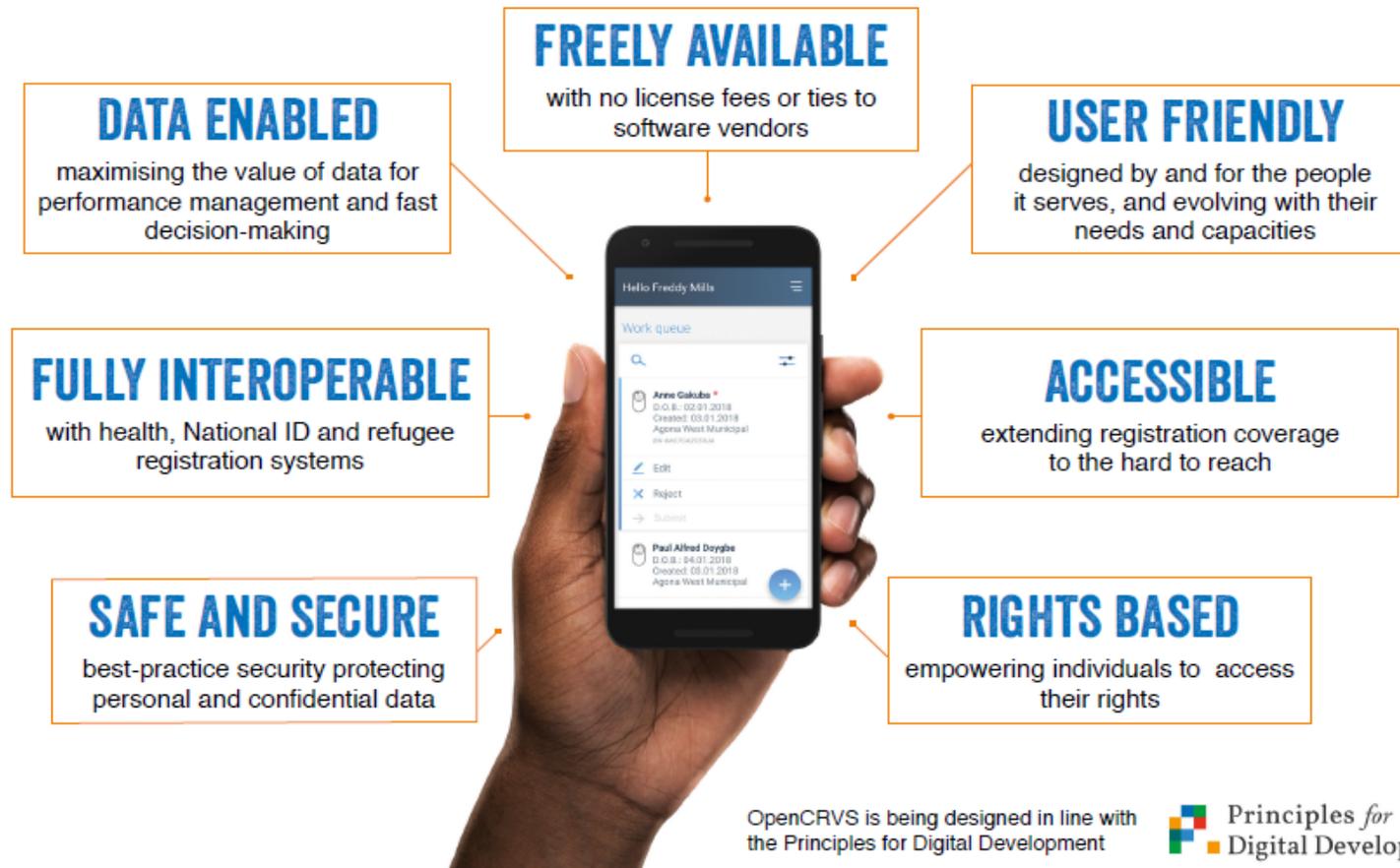
- Universality
- Denominator for many health related indicators
- WHO digital recommendations: 1 and 2 refer to the use of digital birth and death notification respectively, contributing to accountability coverage

Civil registration is broken

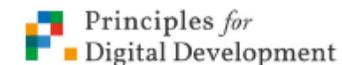
- Legal and regulatory constraints make universal civil registration practically impossible
- Manual, paper-based systems do not work in low resource settings
- Digital civil registration solutions have great potential but are poorly designed
- Business case for civil registration not established → under investment



OpenCRVS - a new standard for digital civil registration in low resource settings



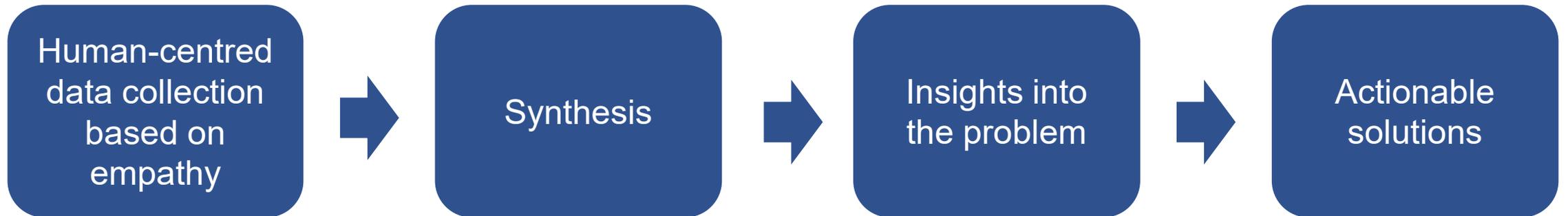
OpenCRVS is being designed in line with the Principles for Digital Development



Principles for Digital Development

Design Research

“Design research” is the study of human needs specifically undertaken to support the strategic design and development of products, services and programmes



Usability of forms

Insight: Field agents (community health workers) have difficulty completing long forms in digital format, particularly when scrolling is required and error messages appear in multiple places.

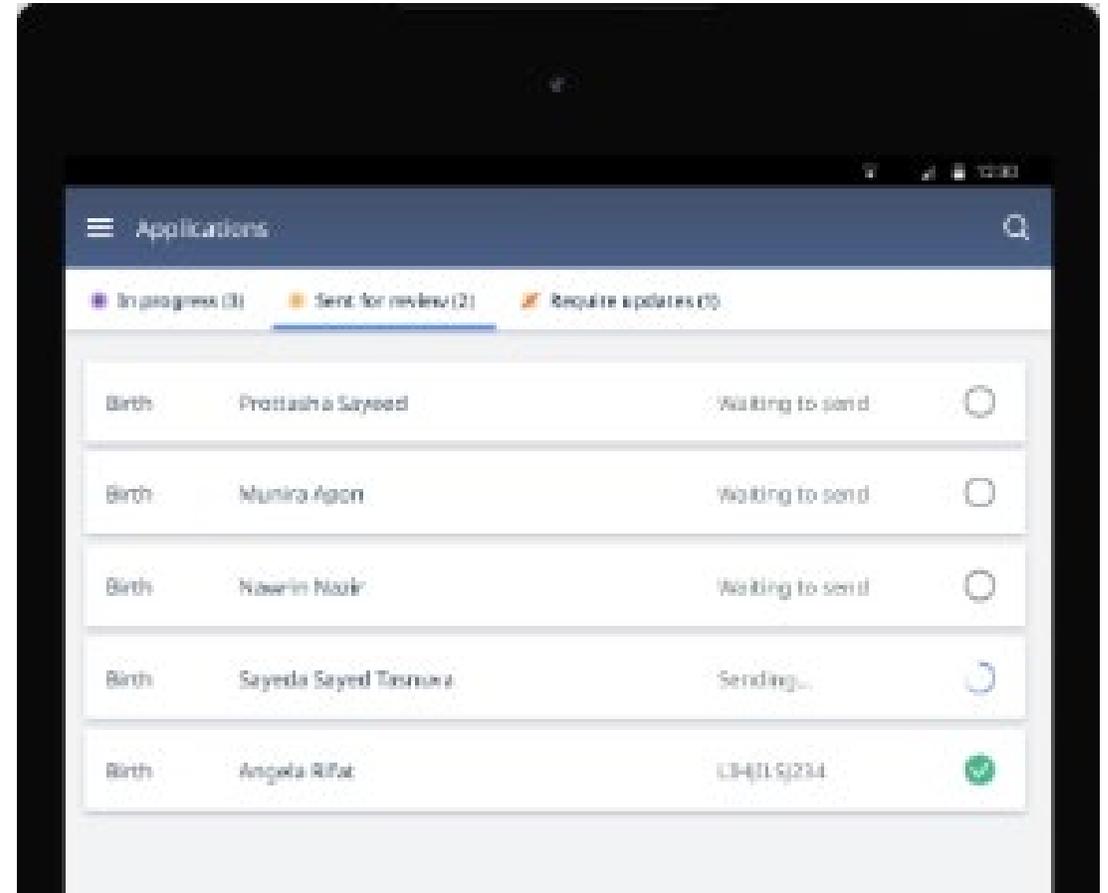
Solution: The use of simplified design patterns that have been proven to be user friendly and assist high-quality data entry.

The image displays two screenshots of the OpenCRVS application interface. The left screenshot is a desktop browser view of a 'Death application' form. It features a 'Back' button, a question 'Where did the death occur?' with five radio button options: 'Permanent address of the deceased', 'Current address of the deceased', 'Private home', 'Health institution', and 'Other'. A 'CONTINUE' button is positioned below the options. The right screenshot is a mobile phone view of a 'Birth application' form. It also has a 'Back' button and asks 'Who is the main point of contact for this application?' with radio button options for 'Mother', 'Father', and 'Someone else'. The 'Father' option is selected. Below this, there is a 'Phone number' label and a text input field containing '01729292334'. A 'CONTINUE' button is at the bottom.

Offline working

Insight: Field agents working in remote locations are unable to complete birth / death notifications as they have no/low connectivity.

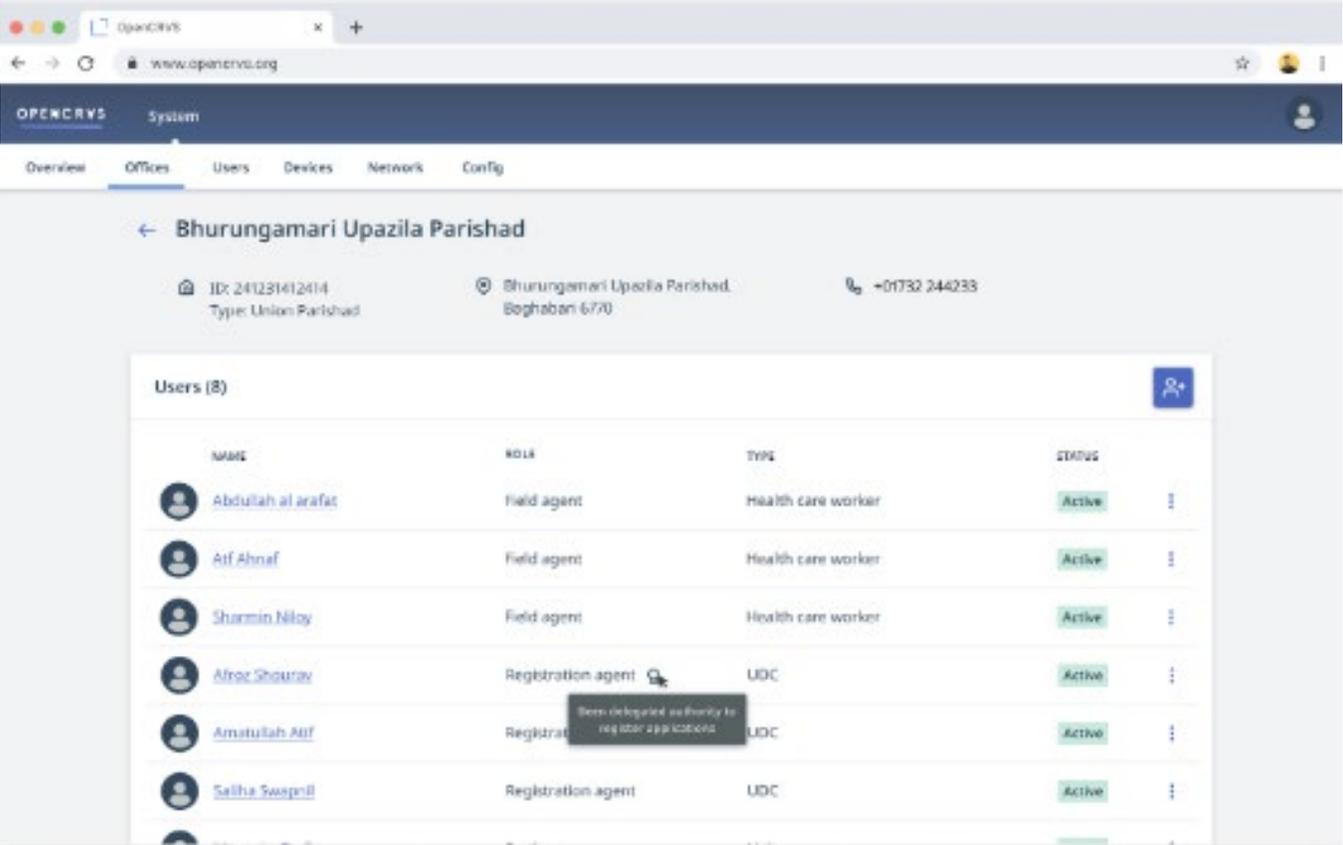
Solution: The field application is built using progressive web app (PWA) technology with a local data cache, which allows the user to continue working when there is no or low data connectivity. Once a connection is established, all completed work is synced with the office.



Delegated Authority

Insight: Registrars rarely conduct validation and registration activities and often have data clerks to do this work for them.

Solution: Registrars can delegate authority to other actors and enable them to monitor and track the actions of these individuals to increase accountability.



The screenshot displays the OPENCrvS System interface for the Bhurungamari Upazila Parishad. The page shows the following details:

- Office: Bhurungamari Upazila Parishad, Type: Union Parishad
- ID: 241231412414
- Phone: +01732 244233

The 'Users (8)' section contains a table with the following data:

NAME	ROLE	TYPE	STATUS
Abdullah al arafat	Field agent	Health care worker	Active
Atf Ahnaf	Field agent	Health care worker	Active
Shurmin Niloy	Field agent	Health care worker	Active
Afroc Shourav	Registration agent	UDC	Active
Amatullah Mif	Registration agent	UDC	Active
Selha Swaspril	Registration agent	UDC	Active

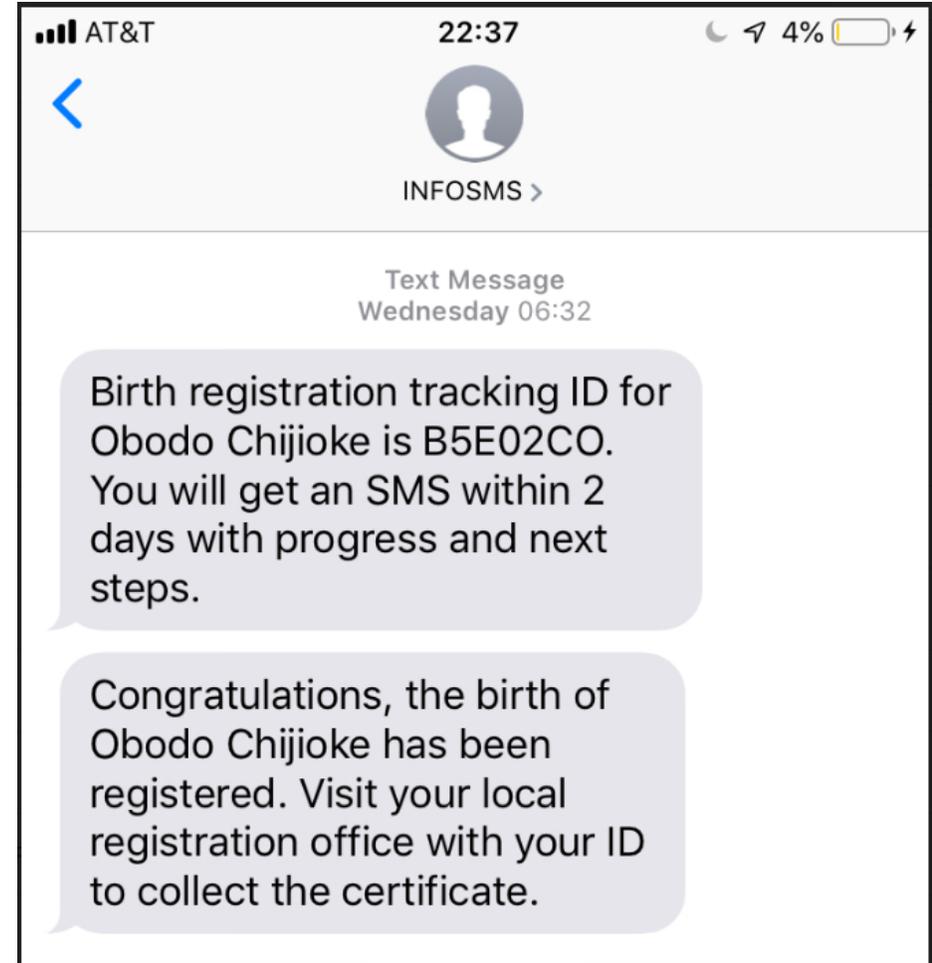
A tooltip for the user 'Amatullah Mif' indicates: 'Been delegated authority to register applications'.

Feedback on application status

Insight: Informants declaring the birth or death are not informed of the progress of their application and therefore feel let down by the registration service

Solution: Once the registration has been completed, informants receive an SMS telling them that the birth / death certificate can be collected from the Union Parishad

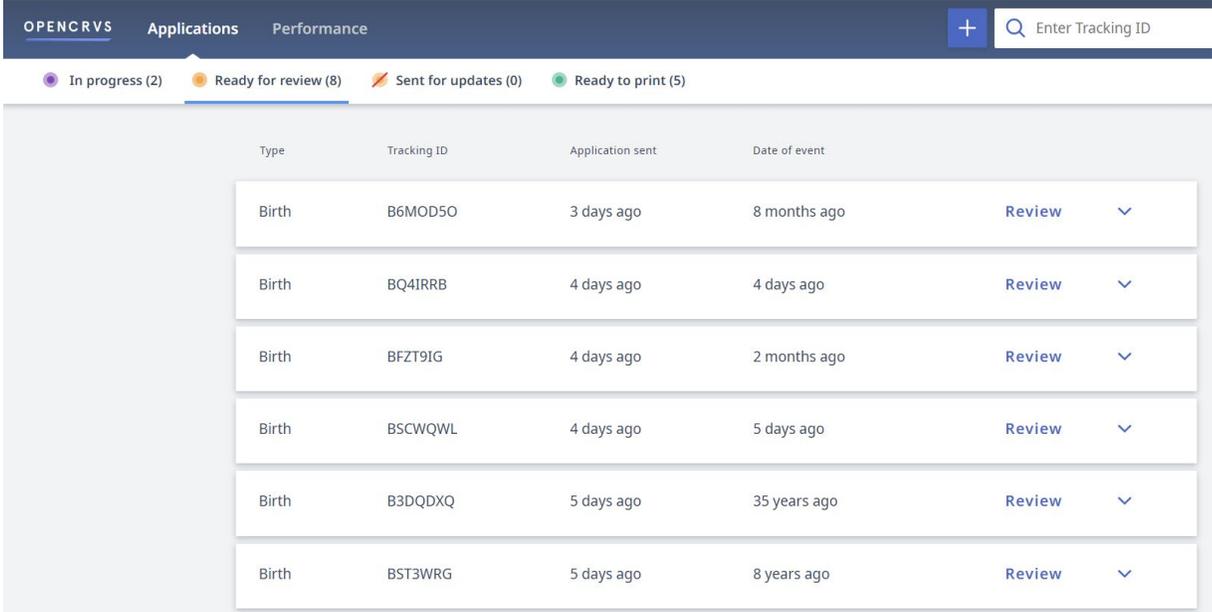
Explore potential for low literacy solutions incl. IVR.



Work queue

Insight: Registration office staff are faced with piles of birth / death notices for processing and have no way of managing their workload or knowing which applications are higher priority

Solution: The work queue is the default view for the registration officer, showing birth / death notices at various statuses, including those ready for review. Higher priority applications are shown first. By expanding an application, full details can be seen.



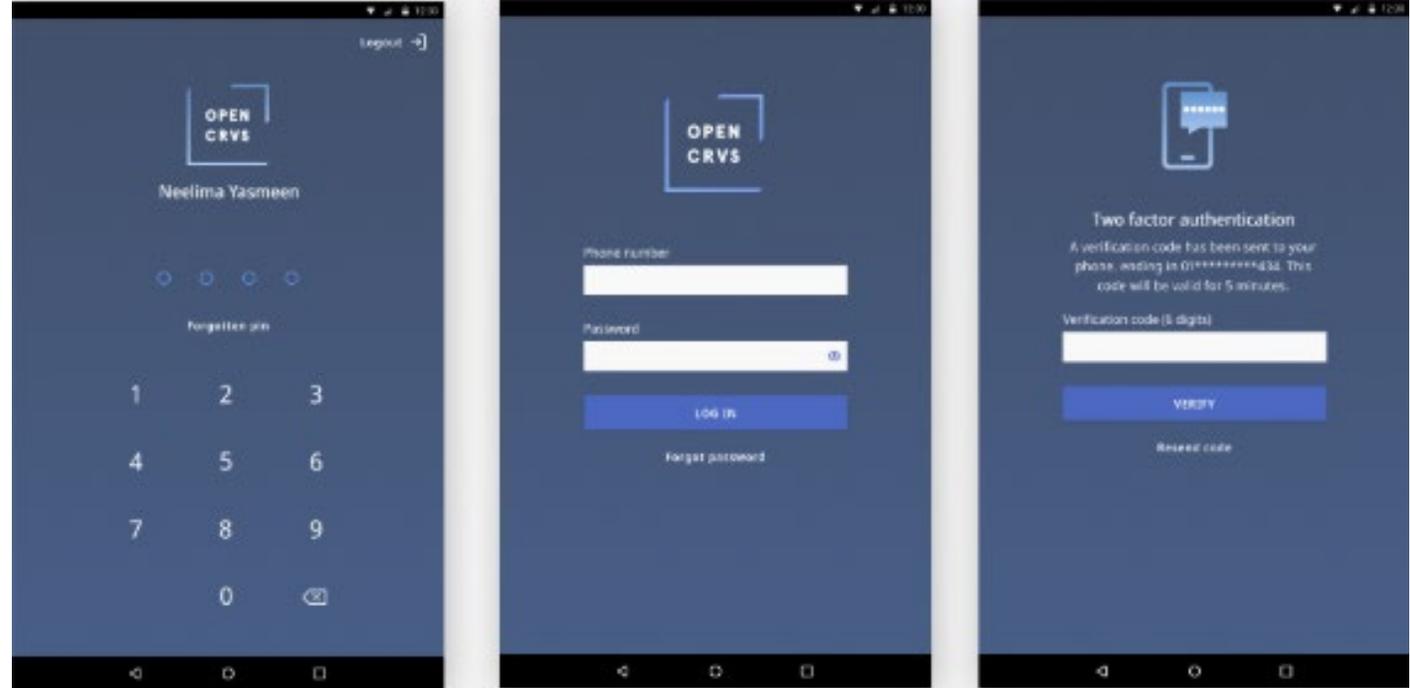
The screenshot shows the OPENC RVS Applications Performance dashboard. At the top, there are navigation tabs for 'OPENC RVS', 'Applications', and 'Performance'. A search bar on the right contains the text 'Enter Tracking ID'. Below the navigation, there are four status filters: 'In progress (2)', 'Ready for review (8)', 'Sent for updates (0)', and 'Ready to print (5)'. The 'Ready for review (8)' filter is selected. The main content area displays a table with the following columns: Type, Tracking ID, Application sent, Date of event, and a 'Review' button with a dropdown arrow. The table contains six rows of birth notices.

Type	Tracking ID	Application sent	Date of event	Review
Birth	B6MOD50	3 days ago	8 months ago	Review
Birth	BQ4IRRB	4 days ago	4 days ago	Review
Birth	BFZT9IG	4 days ago	2 months ago	Review
Birth	BSCWQWL	4 days ago	5 days ago	Review
Birth	B3DQDXQ	5 days ago	35 years ago	Review
Birth	BST3WRG	5 days ago	8 years ago	Review

Secure device access

Insight: It is common for registration office staff to share login details, reducing the traceability of data capture.

Solution: A PIN must be entered each time accessing the application. Once a week an additional 2-factor authentication is required, including a code being sent via SMS to the field agent.



Health as an access point

Insight: health workers have un-paralled access to families of newborns and those related to those who die. These actors already capture data required for birth and death registration

Solution: Integrate with health systems (DHIS2, OpenSRP) to leverage existing data capture and minimise additional workload for health professionals



OpenCRVS Architecture

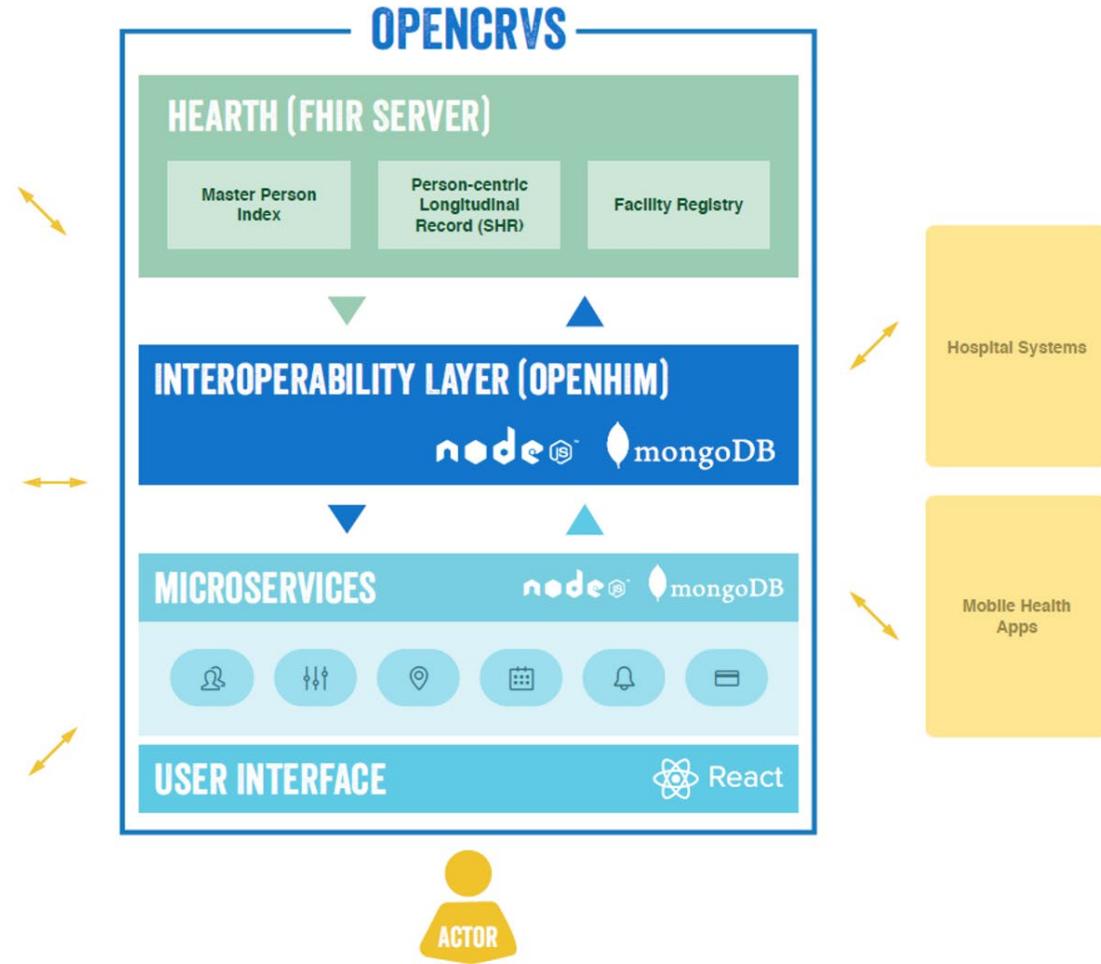
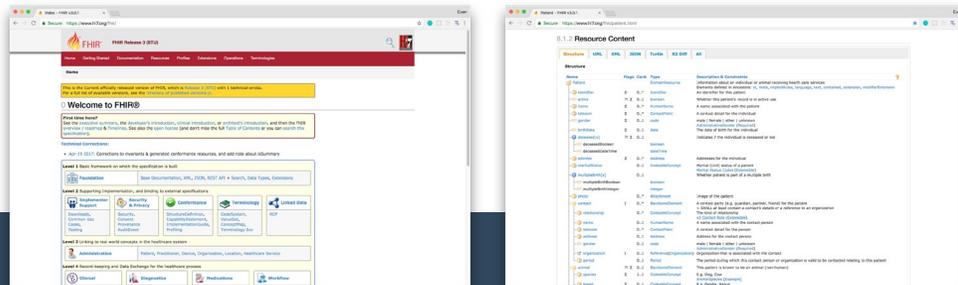
The architecture utilizes the OpenHIE architectural specification.

It consists of an Interoperability layer, enterprise service bus, OpenHIM, and the HEARTH tool, a FHIR data store server to capture, store and query FHIR resources.

Where necessary additional databases are setup for microservices that require additional internal information to be stored, such as user details for role based authentication and payment details.

Four additional user interface systems included are an offline, mobile registration client, a registration desktop application, an administration client and a data viz dashboard, into which registration data can be aggregated with imported data from interoperable systems such as DHIS2, so that OpenCRVS statistics may be visualised.

FHIR (Fast Healthcare Interoperability Resources) Specification, - an HL7 standard for exchanging healthcare information. <https://www.hl7.org/fhir/>



Next Steps

- 1. Pilot in Bangladesh: Jan – Dec 2020**
- 2. Product to be made available on open source licence: Early 2020**
- 3. OpenCRVS Foundation establishment: 2020**
- 4. African Implementation: starting in 2020**

A black and white photograph of a busy street scene in a developing country. A large, leafy tree dominates the right side of the frame, casting shadows on the ground. In the foreground, several people are sitting on wooden benches. A man in a white shirt and shorts is sitting on a bench, looking towards the camera. A woman in a dark dress is sitting next to him. In the background, many people are walking along the street. There are buildings on both sides of the street, some with arched windows. A sign is visible on a building in the background, but the text is not legible. The overall atmosphere is one of a bustling, everyday life scene.

Discussion & Questions



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