

HMIS/LMIS Integration Demonstration

DHIS 2, OpenLMIS & OpenSRP
GDHF 2017

Agenda



1. Why Integrate?

2. Our systems

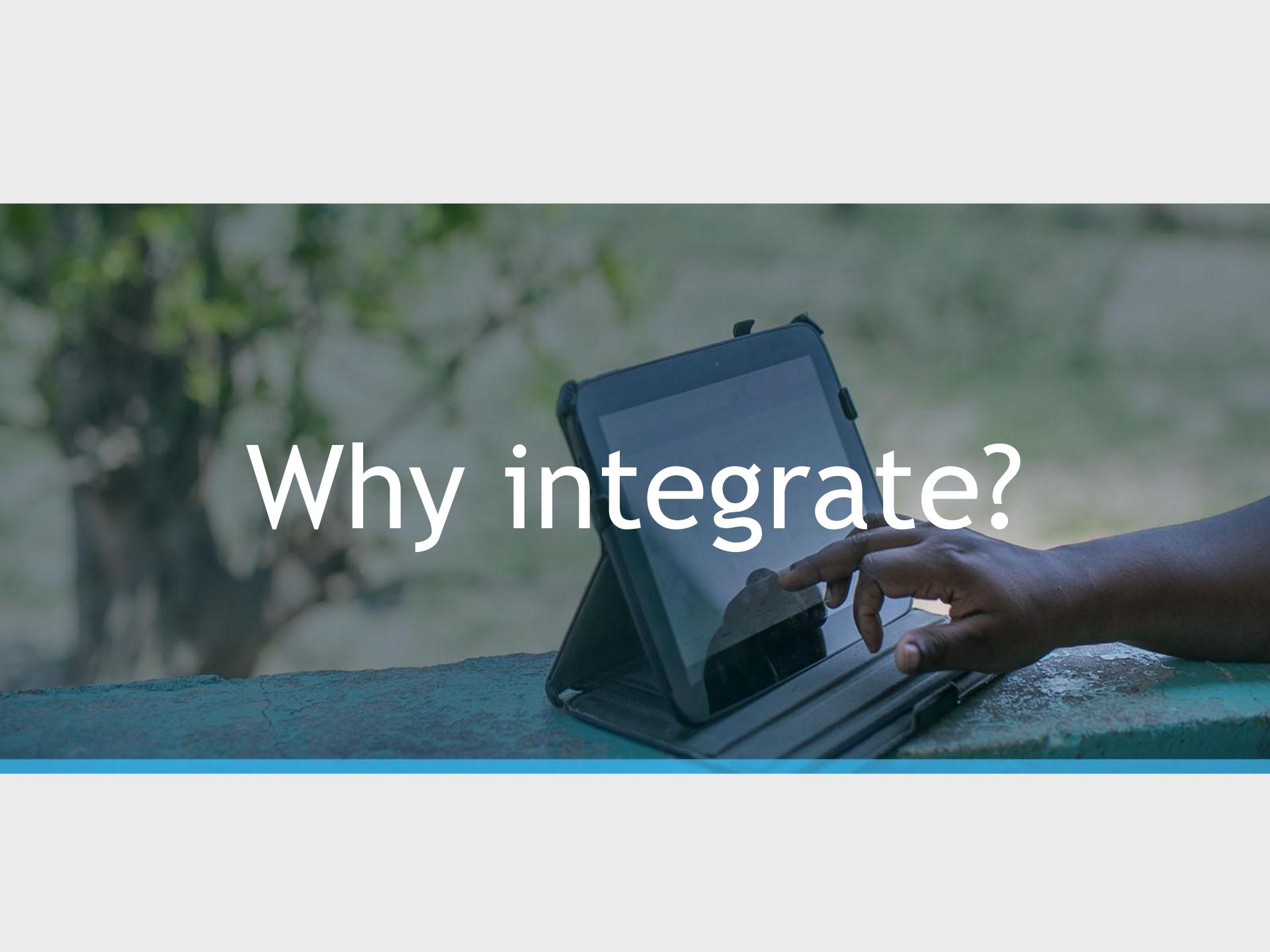
- HMIS (DHIS 2), LMIS (OpenLMIS), EMR (OpenSRP)

3. *Live Demo*

4. Best Practices / How to Integrate / Risks & Challenges

5. Discussion / Q & A

Exploratory discussion on integration opportunities

A photograph showing a close-up of a person's hand interacting with a tablet computer. The tablet is resting on a dark, textured surface, possibly a bench or a table. The screen of the tablet is visible, showing some content that is mostly obscured by the large, semi-transparent white text overlaid on the image. The background is blurred, showing greenery and what might be a path or road.

Why integrate?

What is Integration?



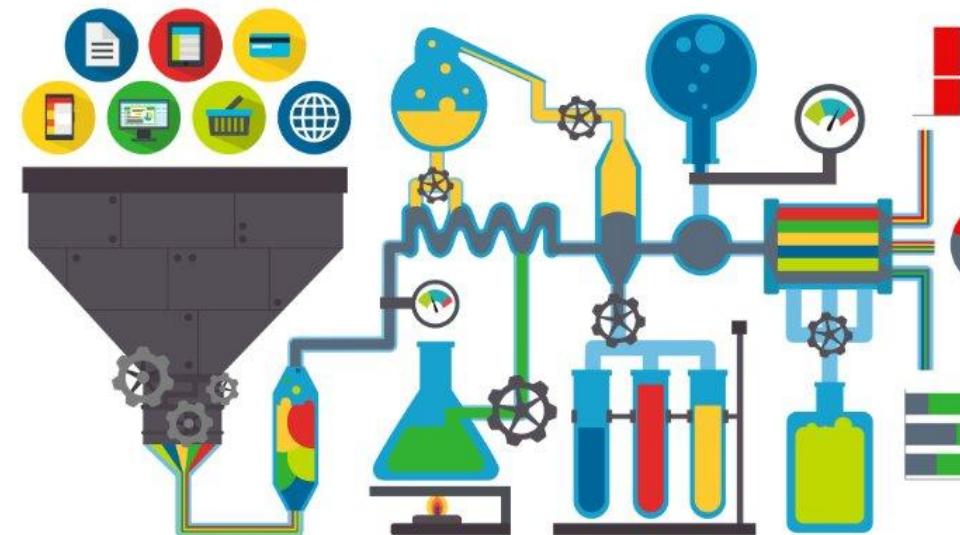
Interoperability Integration

Why?

The image features a central, large blue word 'data' surrounded by numerous other words in various colors. These surrounding words include: Best-of-breed (orange), Specialization (green), going (orange), Complexity (purple), Reporting (green), digital (green), services (pink), adoption (orange), Custom (cyan), Smartphones (teal), Real-time (cyan), Mobile (red), Interoperability (orange), Analytics (orange), Streaming (purple), Tablets (green), Cloud (red), and Everything (purple). The words are arranged in a circular or radial pattern around the central 'data' word.

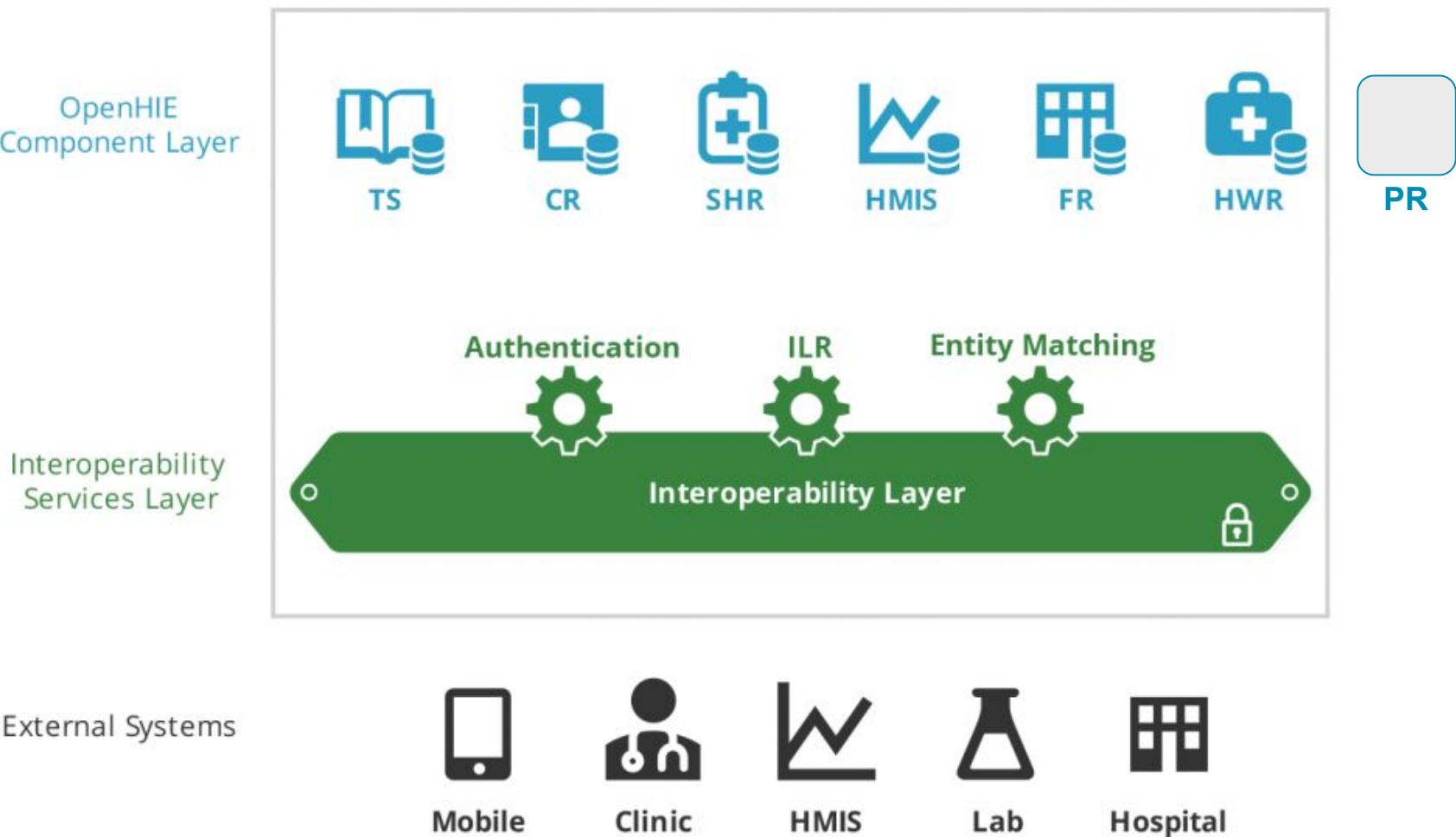
Integration unlocks value

- Reduces data entry
- Improves data quality
- Speeds up reporting/insights



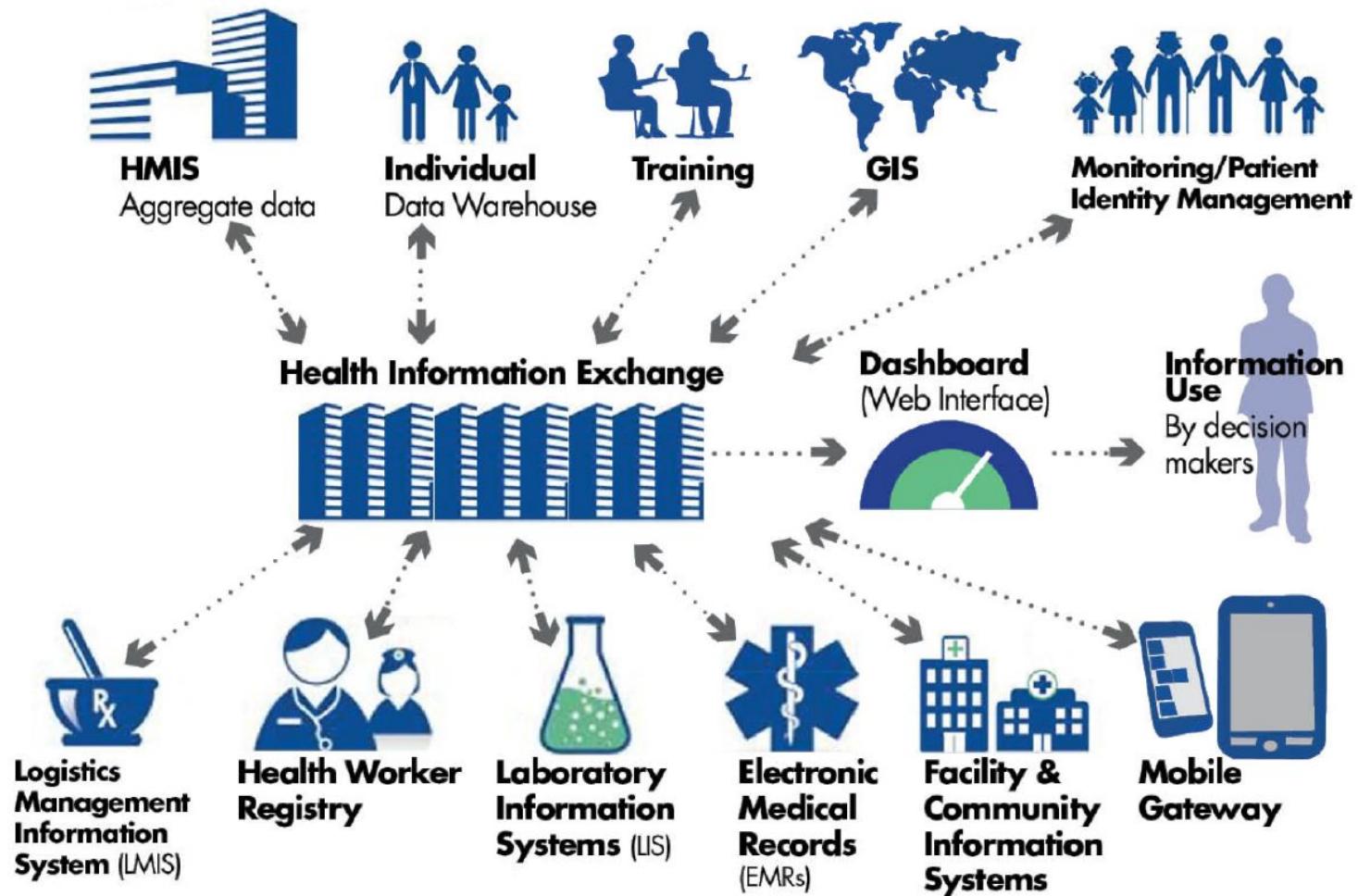
Interoperability in Global Health

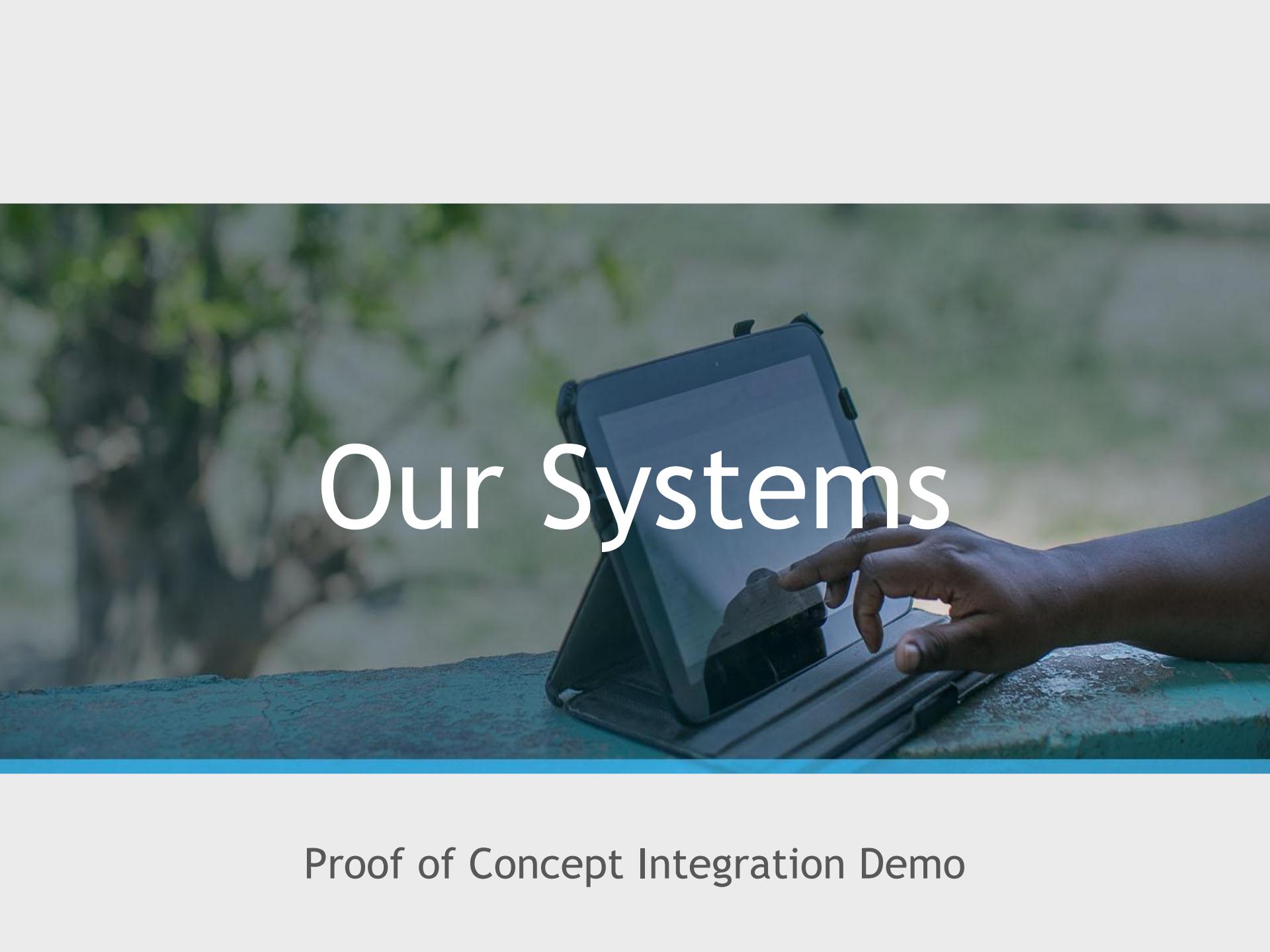
OpenHIE Architecture <https://ohie.org/#arch>



Interoperability in Global Health

Model from CHAI, JSI, and VillageReach includes supply chain, laboratory, and more:



A photograph showing a close-up of a person's hand interacting with a tablet device. The tablet is resting on a dark, textured surface, possibly a car roof or a bench. The screen of the tablet is visible, showing some graphical interface elements. The background is blurred, suggesting an outdoor setting with greenery.

Our Systems

Proof of Concept Integration Demo

A photograph showing a close-up of a person's hand interacting with a tablet device. The tablet is resting on a dark, textured surface, possibly a bench or a table. The screen of the tablet is visible, showing some content that is not clearly legible. The background is blurred, showing what appears to be a natural setting with greenery. The overall lighting is soft, suggesting an outdoor environment during the day.

What is HMIS?

Health Management Information System

- A **health management information system (HMIS)** collects and reports program information, such as incidence of disease, client/patient information, and health services rendered. HMIS data can be used to determine disease patterns or to track health services use, as well as to monitor and evaluate health service delivery.
- DHIS2 is the most widely used application in LMICs, and is optimized for *data reporting*.

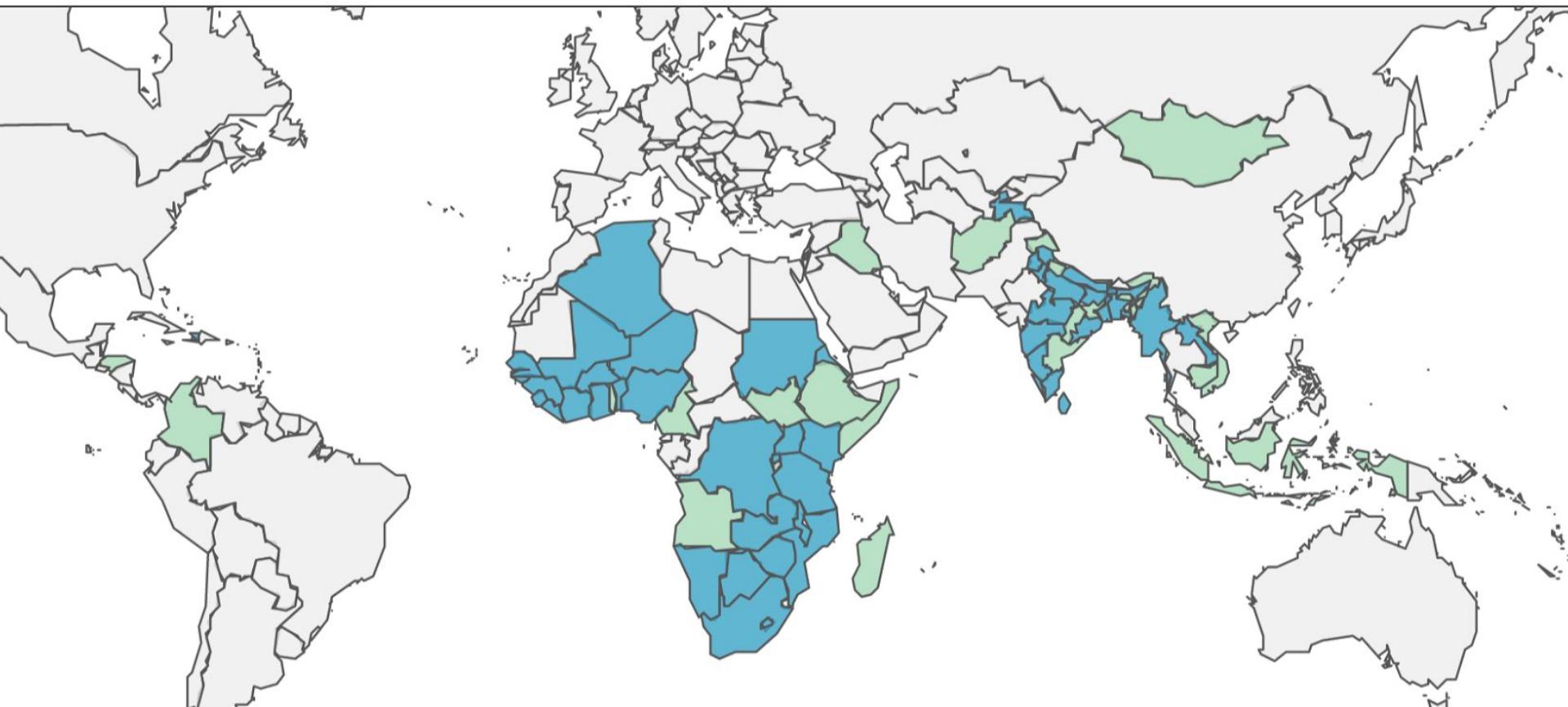
DHIS 2



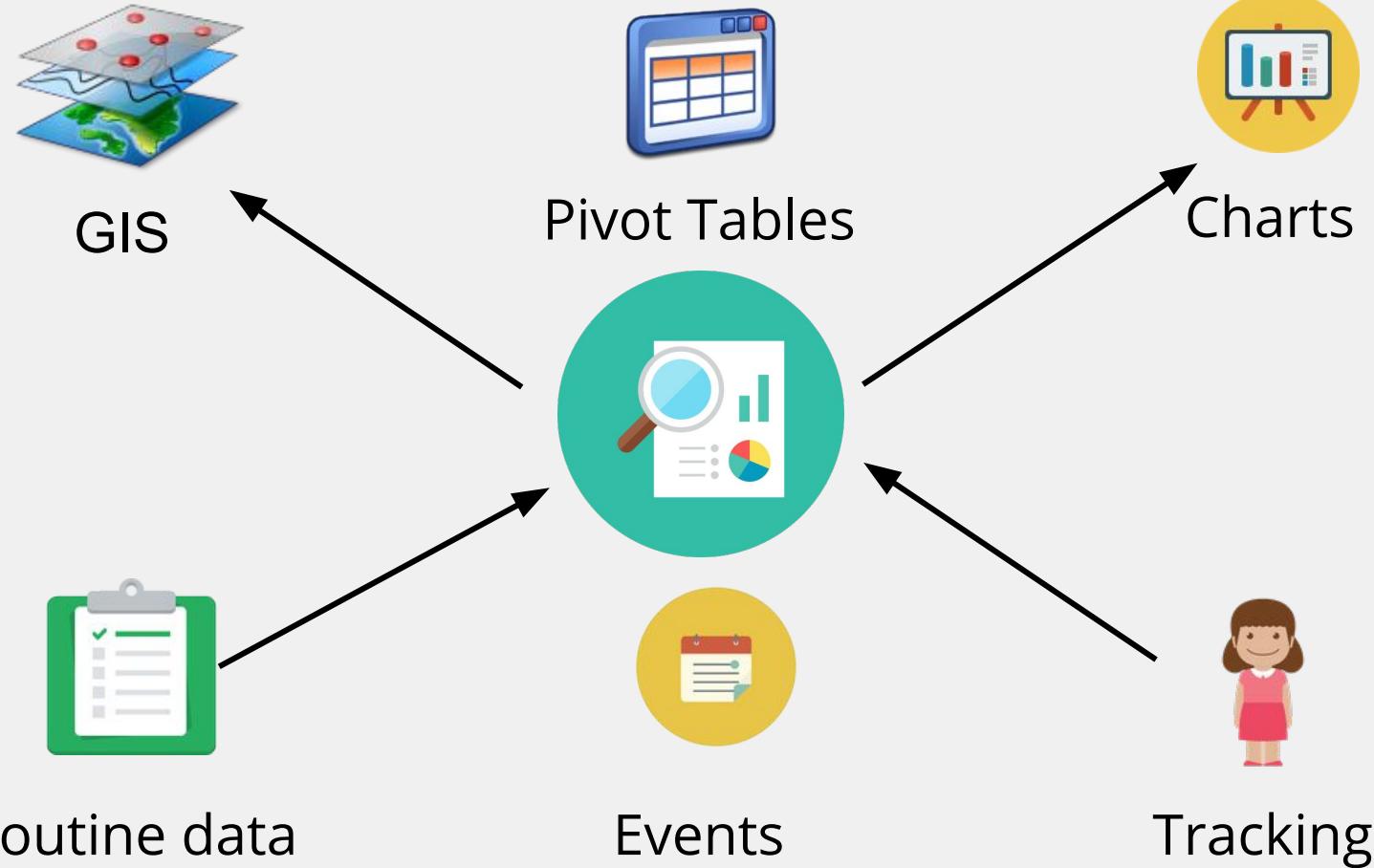
- Capture, management, and analysis of data
- Highly flexible and configurable platform with a wide variety of use cases
- Free and open source software
- Extensible through Web APIs and other applications
- New major versions released each quarter

dhis2

DHIS 2 Global Footprint



DHIS 2 Features



A photograph showing a close-up of a person's hand interacting with a tablet computer. The tablet is resting on a dark, textured surface, possibly a bench or a table. The screen of the tablet is visible, showing some content that is mostly obscured by the large, semi-transparent white text overlay. The background is blurred, showing what appears to be a natural setting with greenery and a path.

What is LMIS?

Logistics Management Information System

- A ***logistics management information system (LMIS)*** is an information system that is used to collect, organize, and present logistics data gathered from all levels of the health system. An LMIS enables logisticians to collect the data needed to make informed decisions that will ultimately improve product availability and customer service. One immediate decision that is made based on logistics data is the quantities of products that should be resupplied to health facilities
- OpenLMIS, Logistimo, and Real Time Value Network™ are examples of LMIS applications in use in Africa and Asia; they are optimized for *supply chain management*



OpenLMIS

OpenLMIS is an open source, cloud-based, enterprise class electronic logistics management information system (LMIS) purpose-built to manage health commodity supply chains

The OpenLMIS initiative incorporates a community-focused approach to develop open source and customizable LMIS systems



From knowledge to action
for reproductive, maternal,
newborn, child and
adolescent health.



Current Features and Functionality



Requisitions and Ordering

- Create, authorize, approve report and requisitions, both regular, based on configured processing periods, and emergency.
- Supports offline data capture on key screens.
- Executes complex and configurable approval hierarchies.
- Calculates order amounts based on average consumption and max policies.
- Complex data validations to support quality data capture.
- Generate orders for external fulfillment based on approved requisitions.



Setup and Customization

- Manage system users, role assignments, programs, facilities, orderables and associations with bulk uploads and administrative screens.
- Configure the system to match your processing and reorder periods, policies and facility hierarchy.



Stock Management

- Record transactions and view electronic stock cards (supports lot info)
- Perform physical inventory & adjustments
- Track ins/outs of stock – send and receive stock

Vaccine Module MVP Scope (3.3)

OpenLMIS version 3 and vaccine module

A long-term, solution supported by a community of financing and implementation partners

- Track stock amounts at multiple levels of the supply chain
- Manage the resupply of stock by fulfilling orders to supervised facilities
- Calculate reorder amounts calculated using ideal stock amounts
- Manage a centralized CCE catalog; Add and monitor CCE at specific facilities
- Reporting on DISC indicators



Requisitions & Allocations.

Supports push, pull, and mixed supply chains and the processes required for each.



Forecasting.

Update and input annual forecasted needs, at sub-national levels, to inform reorder and resupply quantities.



Stock Management.

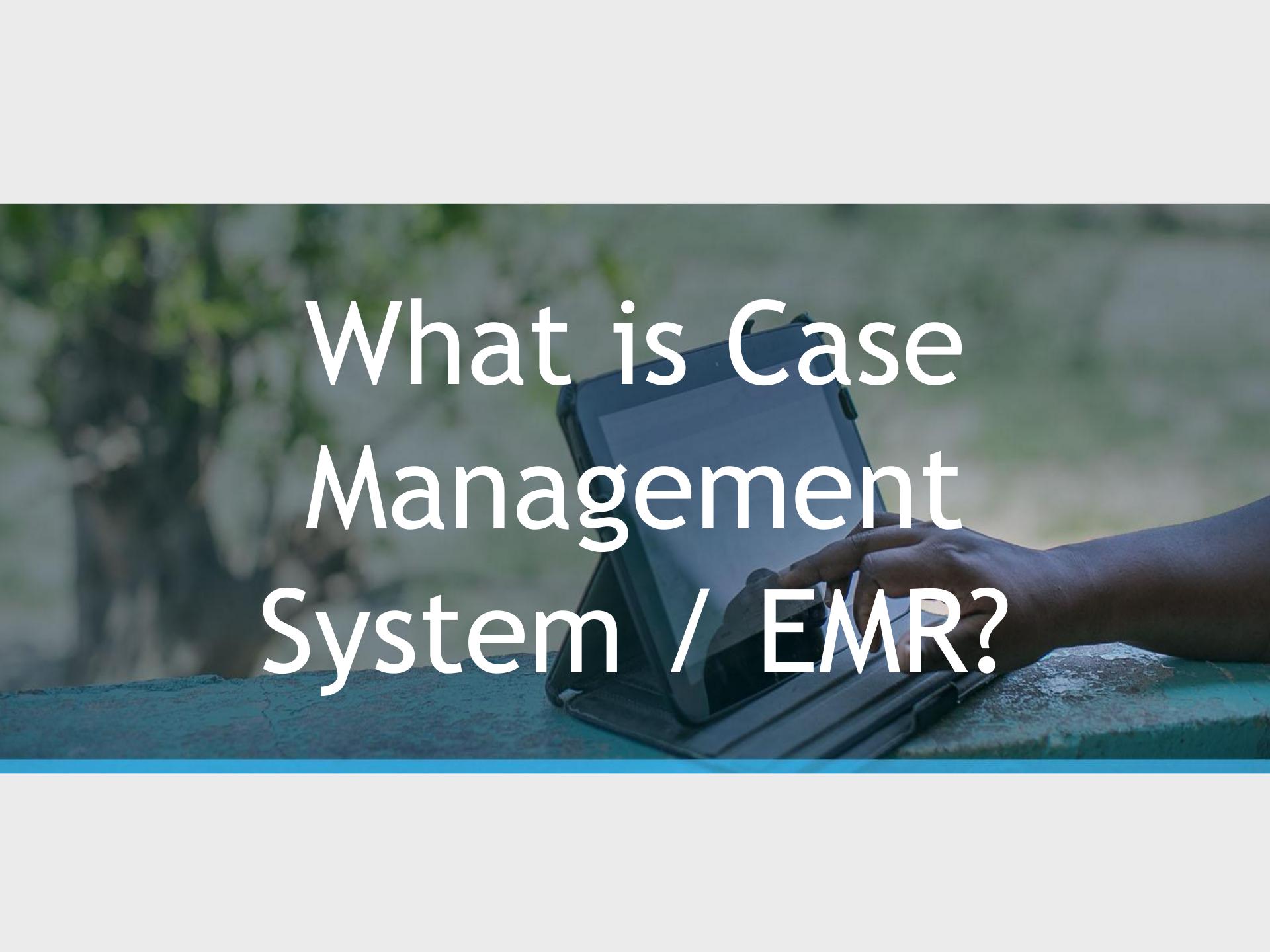
Captures inventory data and stock movements to provide an overview of full stock availability. Record vial wastage and VVM status.



Cold Chain Equipment. OpenLMIS captures cold chain equipment inventory, functional status, and temperature status.

Estimated Release Date: March 30

Follow the [living product roadmap](#) for updates.

A photograph showing a close-up of a person's hand interacting with a tablet device. The tablet is resting on a dark, textured surface, possibly a bench or a table. The background is blurred, showing what appears to be a park or outdoor setting with greenery. The overall lighting is soft and natural.

What is Case Management System / EMR?

Case Management System / Electronic Medical Record

Case management features promote continuity of care across life stages by ensuring clients receive the complete package of health services with automated scheduling and showing reminders for follow-up visits and required services. These features enable health workers to see a holistic view of their clients and easily manage client records.

OpenSRP

NR ZEIR

Zone 1 + 199 🔍

Search name or ID Scan QR code

CHILD	AGE	ID	WEIGHT	DUE VACCINE
	Robert Roberts Biana Tylor	5047162 9w 1d	✓ 6.0 kg	Upcoming 6 weeks
	Precious Chelo Sharon Kekkoma	5178611 1y 9m	Record weight	✓ 18 months
	Lastone Tembo Lee Hu	4291431 Bw 1d	Record weight	Record at birth
	Harry Moonga Glace Mbewe	4291423 Bw 5d	Record weight	Upcoming 6 weeks
	Issue... Issue Parentname: 10w 4d	5138623	Record weight	Record at birth
	Issue Twentytwo Issue Parentname: 10w 4d	5138615	Record weight	Record at birth
	Choolwe Siakantu Zwing Syangandu	4996971 1y 188/17	Record weight	Record 9 months
	Mosley Chizela... Estely Sakuba	4996963 8m 3w	Record weight	Record 10 weeks
	John Rambo M/G: 5y 2m	5143144	Record weight	Record at birth
	Patrick Malyamba Glacys Imasku	5136148 5m 34		Lost to Follow-Up
	Rose Moonga Luvvie Bwende	60098014...	Record weight	Record 10 weeks

← ZEIR > Robert Roberts Zone 1

Robert Roberts
ZEIR: 5047162 Age: 9w 1d

WEIGHING RECORD

IMMUNISATION RECORD

BIRTH RECORD

6 WEEK RECORD

10 Weeks

OPV 0 BCG

24 Aug 25 Sep 2017

Cancel Set

PCV 1 Rota 1

← ZEIR > Robert Roberts Zone 1

Robert Roberts
ZEIR: 5047162 Age: 9w 1d
CE

Weight-for-age BOYS

PREVIOUS WEIGHTS

Age	Weight	Z-score
9w 1d	6.0 Kg	0.6
7d	3.2 Kg	-0.3
0d	2.3 Kg	-2.4

Done

10 Weeks

OpenSRP Features

- Two-way integration with OpenMRS
- Common data model (maps to CIEL concept dictionary)
- Offline functionality, including schedules, patient registrations, lookups
- Unique identifier module / QR code support / biometric support
- Global patient lookup
- Team-based data sharing
- DHIS2 integration and reporting
- In-app reporting

The screenshot shows a mobile application interface for a child named Joyce Mwansa. At the top, there is a navigation bar with a back arrow, the text "ZamJab > Joyce Mwansa", and the clinic name "Linda Clinic". Below the navigation bar is a profile section featuring a small photo of Joyce Mwansa, her name, EIR number (5425428), and age (6w 4d). To the right of this profile section are two buttons: "WEIGHT-FOR-AGE" and "HER SIBLINGS", each accompanied by a small icon. Below these buttons is a section titled "IMMUNISATION RECORD" with the date of birth "DOB: 17/12/2016". This section contains a table with three rows: "Previous: 6 Weeks" (OPV 1, Penta 1, PCV 1), "10 Weeks" (Record OPV 2, Record Penta 2, Record PCV 2), and a final row that is mostly empty.



In-app Reporting

- Daily tallies of service data
- Monthly reporting indicator aggregations
- Submission to DHIS2

HIA2 Reports

Daily Tallies Draft Reports (0) Sent Reports

March 2017

- 4 March 2017
- 12 March 2017
- 26 March 2017

February 2017

- 2 February 2017
- 11 February 2017
- 23 February 2017

January 2017

- 2 January 2017
- 17 January 2017
- 28 January 2017

December 2016

- 6 December 2016
- 11 December 2016

← Daily Tally > 4 March 2017

Under 5 Clinic Attendance

ID	Indicator	Value
CHN1-005	Attendance child health <12months (male)	2
CHN1-001	Attendance child health <12months (female)	2
CHN1-005	Attendance child health <12months (total)	2
CHN1-001	Attendance child health 12-59 months male	2
CHN1-005	Attendance child health 12-59 months female	2
CHN1-001	Attendance child health 12-59 months (total)	2
CHN1-005	Attendance child health total	2
CHN1-005	Attendance from outside catchment's area	2

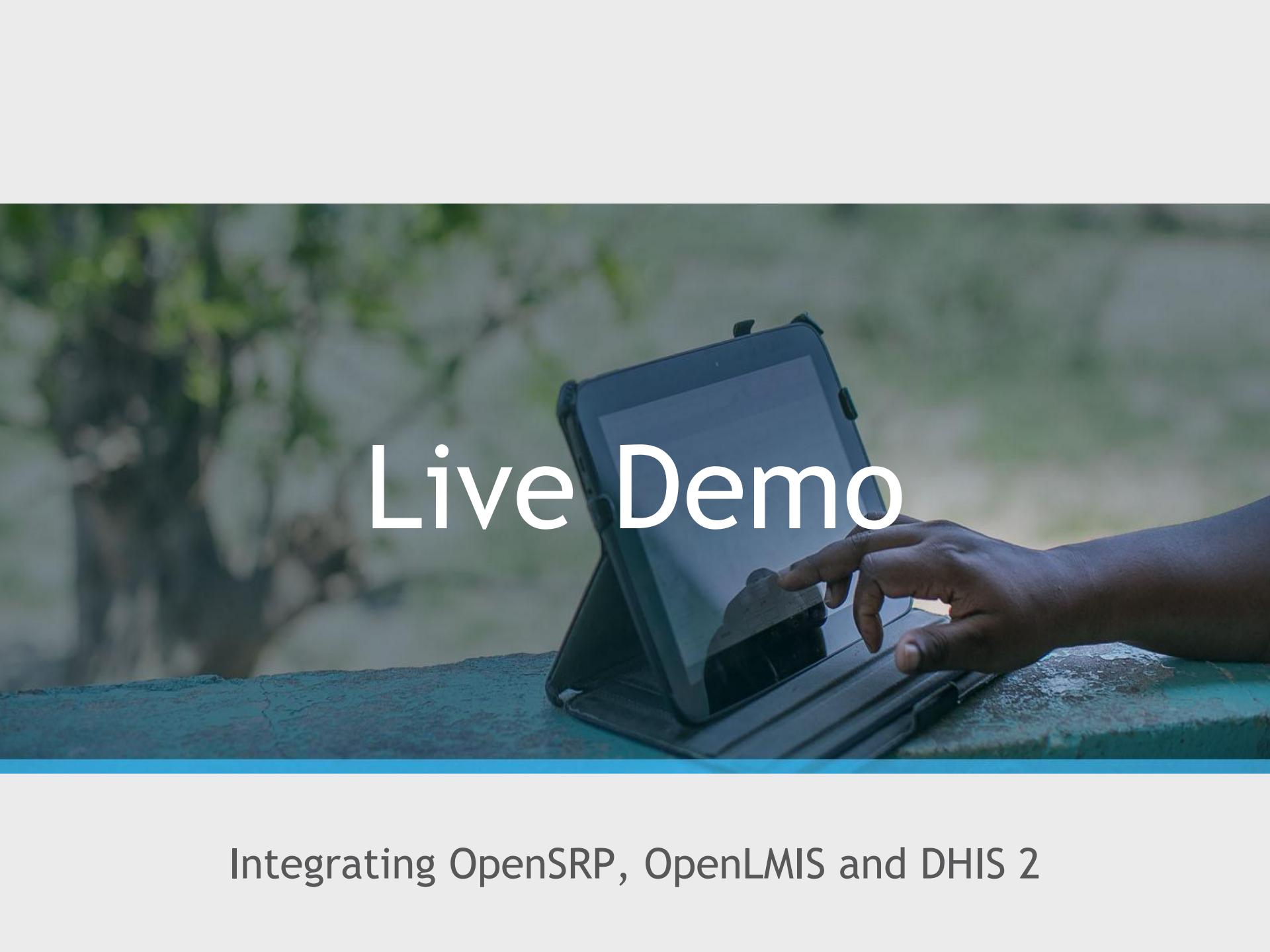
Growth Monitoring and Nutrition

Immunisation

Vitamin A, Deworming, and ITNs



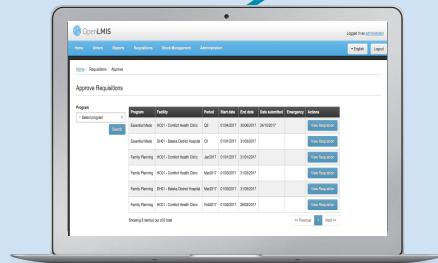
Live Demo

A close-up photograph of a person's hand interacting with a tablet computer. The tablet is positioned at an angle, showing a map or geographical data on its screen. The hand is pointing at the screen. The tablet is resting on a dark, textured surface, possibly a table or bench. The background is blurred, showing what appears to be a natural setting with greenery and a path.

Integrating OpenSRP, OpenLMIS and DHIS 2

POC: Integrating Stock data and Coverage data

Supply Chain Management



Send stock information

Health Service Delivery Management

dhis2



Send coverage information



Users



Immunization Nurse

- Administers vaccinations
- Records services rendered in the OpenSRP application



Users

Store Manager

- Tracks stock levels
- Requests stock using OpenLMIS application

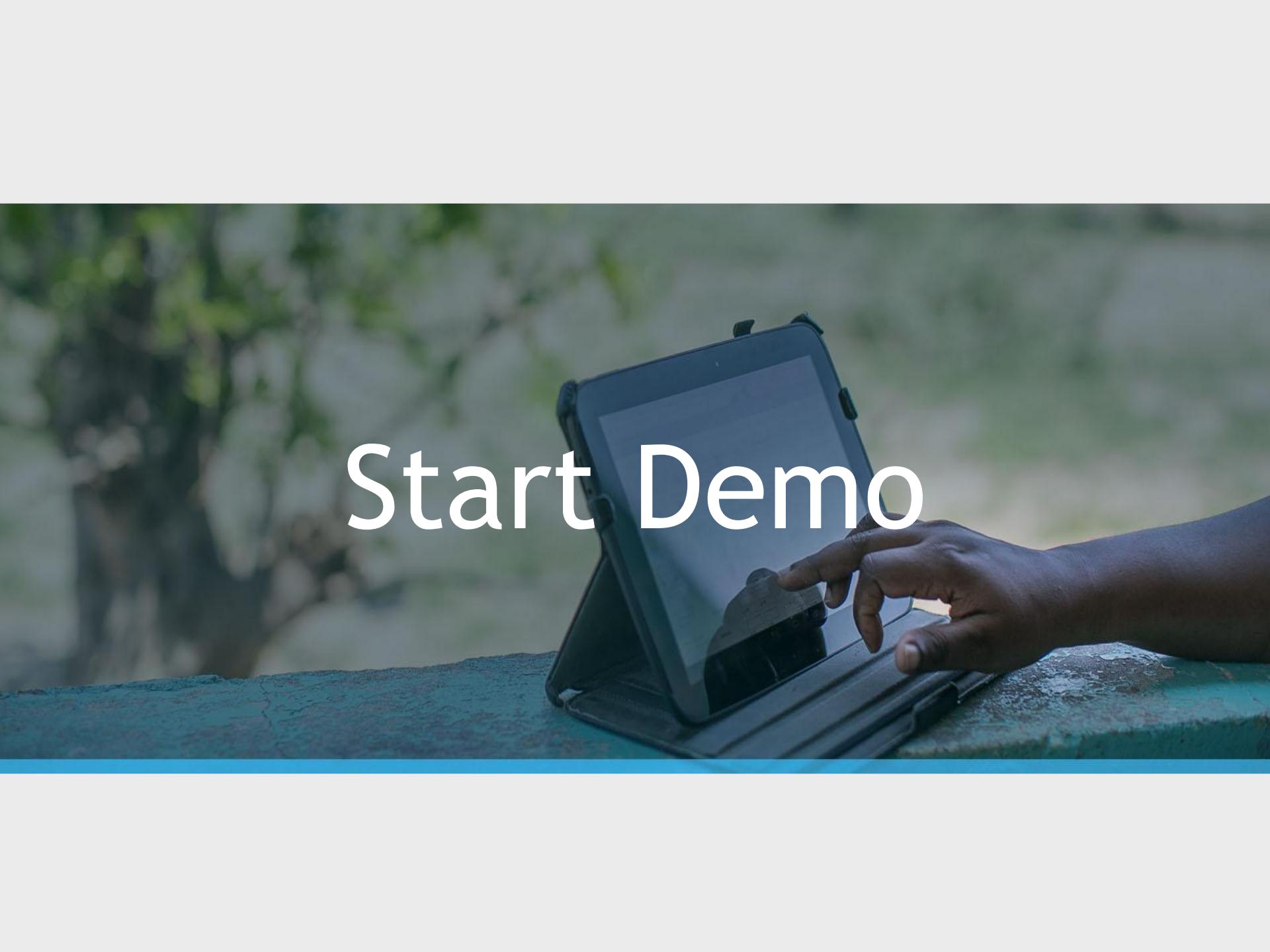


Users

EPI Manager

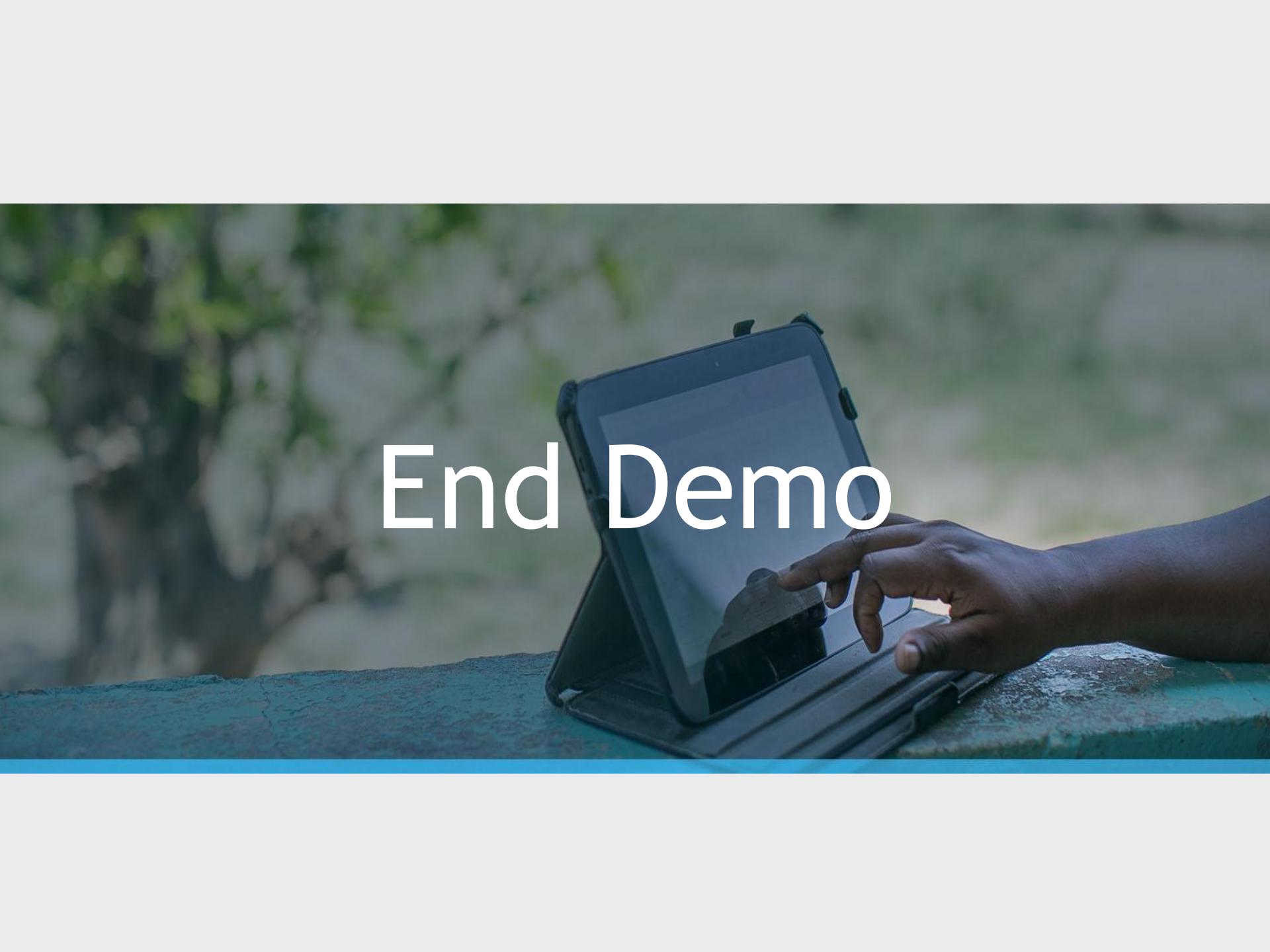
- Monitors program
- Conducts root cause analysis
- Takes action on issues
- Uses DHIS 2 to visualize data



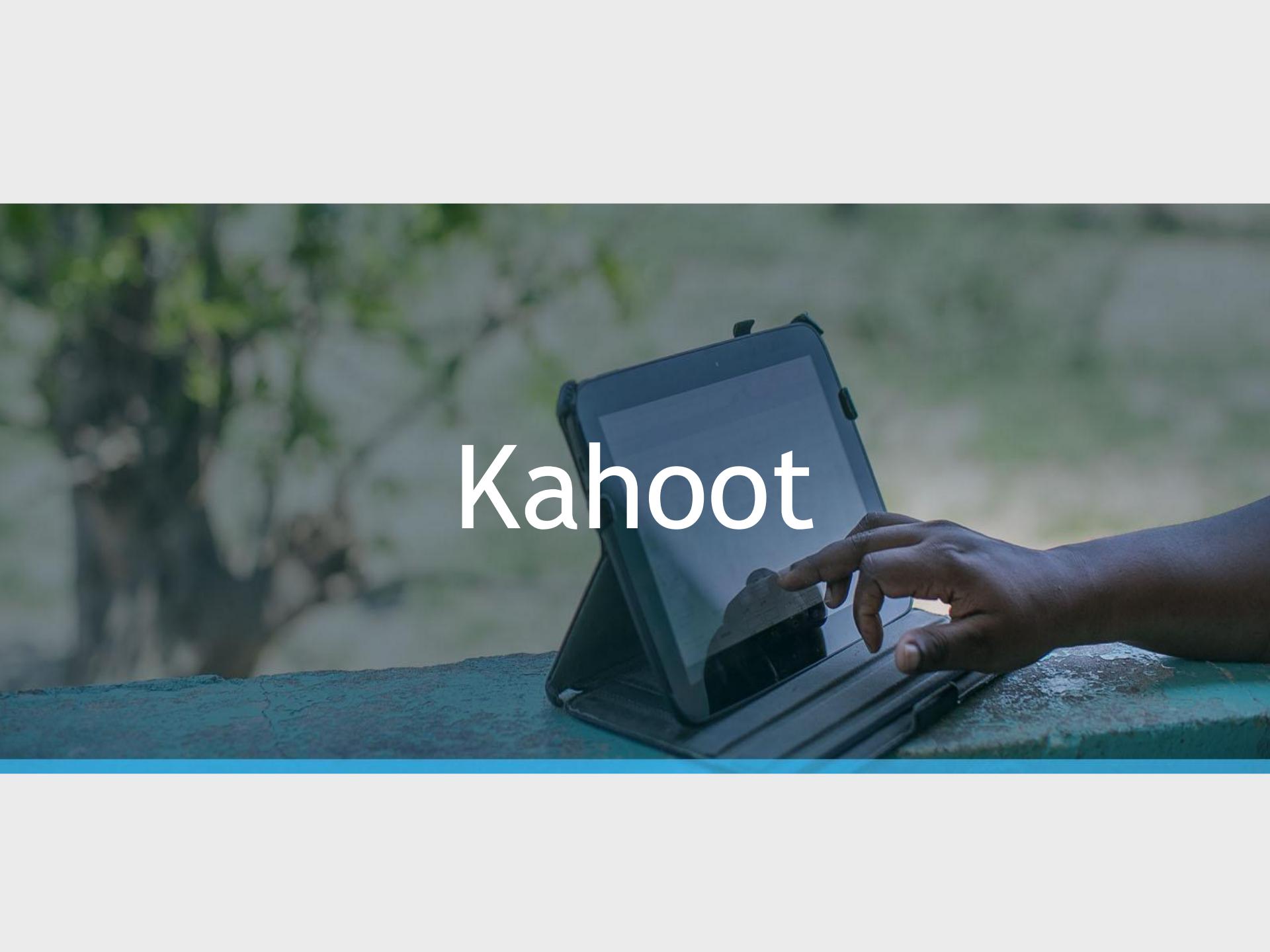
A close-up photograph of a person's hand interacting with a tablet computer. The tablet is positioned at an angle, showing its screen and a black protective case. The hand is pointing at the screen, which reflects some light. The background is blurred, showing what appears to be a natural outdoor setting with greenery.

Start Demo

https://docs.google.com/document/d/12_qE_rxtPRwrabSCXZ7C_QlSxvFnqR6dcwBDQHaChZE/edit

A close-up photograph of a person's hand interacting with a tablet computer. The tablet is positioned at an angle, showing its screen and a black protective case. The hand is visible on the right side, with fingers touching the screen. The background is blurred, showing what appears to be a natural outdoor setting with greenery.

End Demo

A close-up photograph of a person's hand interacting with a tablet computer. The tablet is propped up at an angle, showing a dark screen with the word "Kahoot" in large, white, sans-serif letters. The hand is visible on the right side, with fingers resting on the touchscreen. The tablet is placed on a textured, teal-colored surface, possibly a bench or a table. In the background, there is a blurred view of greenery and a path.

Kahoot

URL: integration.baosystems.com
Username: guest
Password: GDHF2017

Login!

Discussion



Where else would integration be valuable?

OpenSRP -> DHIS2

- case level to aggregate

OpenSRP -> OpenLMIS

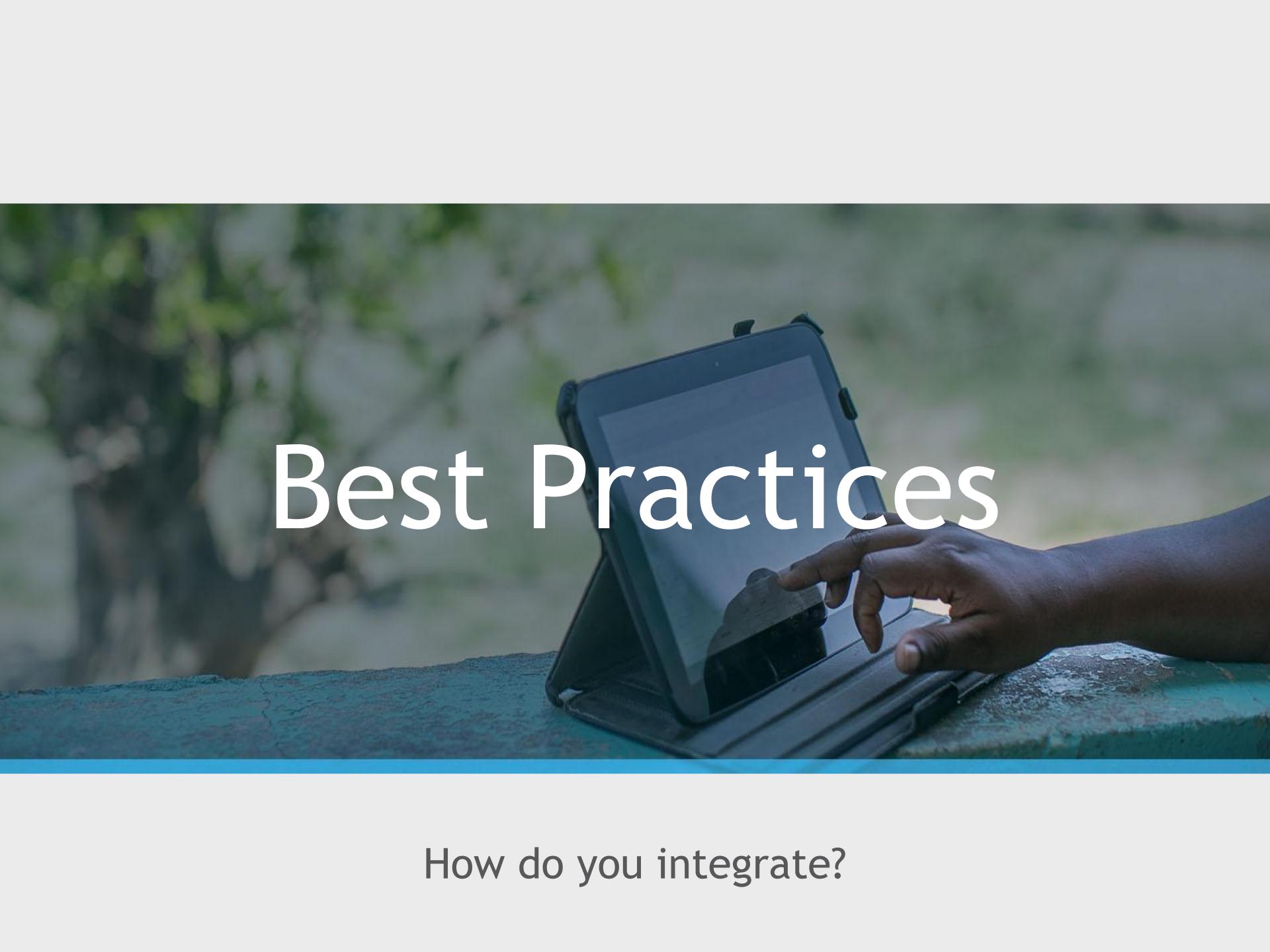
- Submit a requisition to order more stock

OpenLMIS -> OpenSRP

- Receive advance shipment notifications
- Confirm proof of delivery
- Update equipment functionality

DHIS2 -> OpenLMIS

- see aggregate usage information for resupply decisions

A close-up photograph of a person's hand interacting with a tablet device. The tablet is resting on a dark, textured surface, possibly a car roof or a bench. The screen of the tablet is visible, showing some content that is mostly obscured by the large white text overlaid on the image. The background is blurred, showing what appears to be a natural setting with greenery.

Best Practices

How do you integrate?

Why Integrate?

Project A



Project B



Project C



Project D

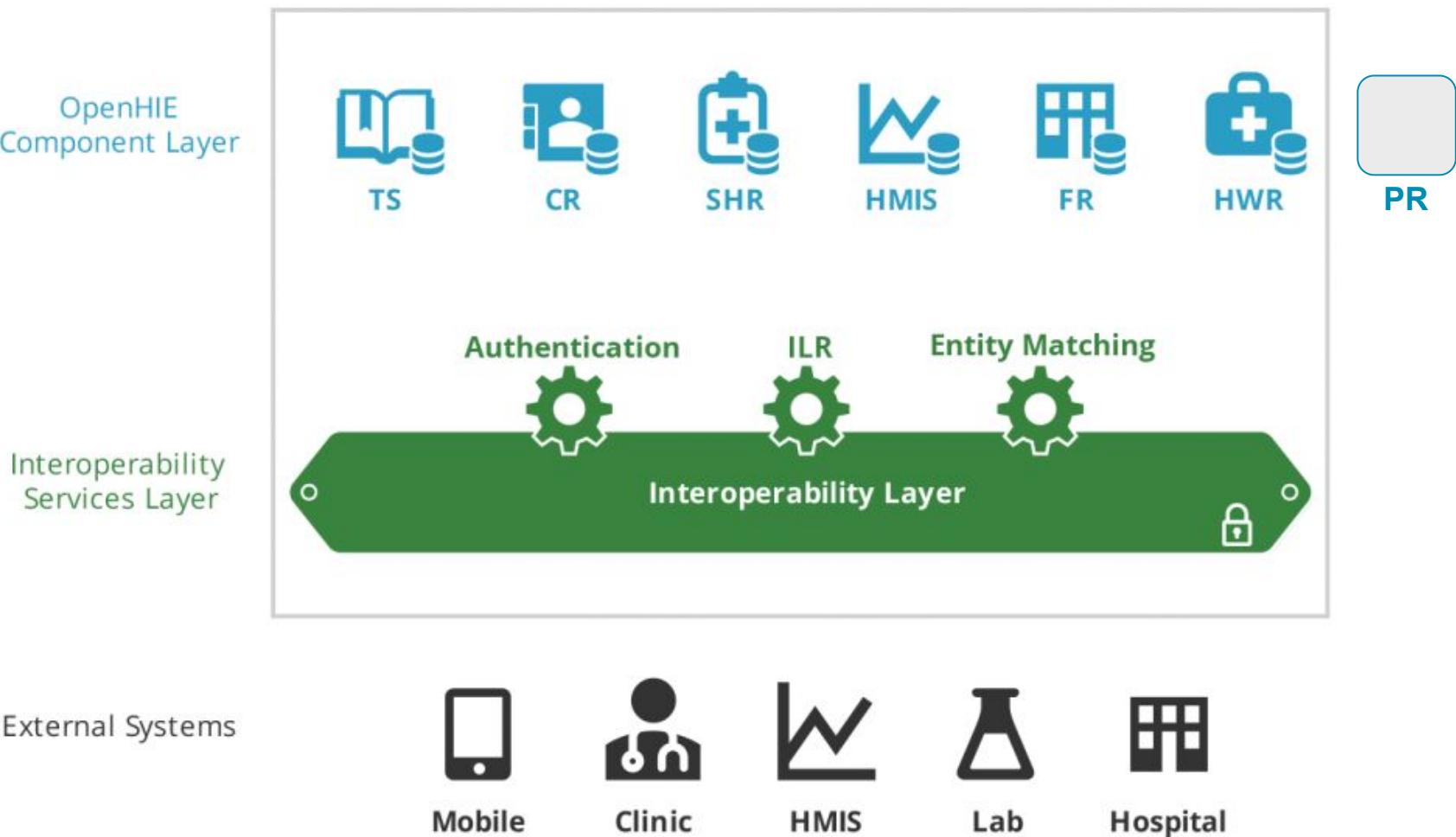
Project E

.....

- Naming conventions issues
- Data validation issues
- Data quality issues
- Mismatched metadata
- Mismatched disaggs
- Missing meta data
- Missing disaggs
- Inconsistent frequencies

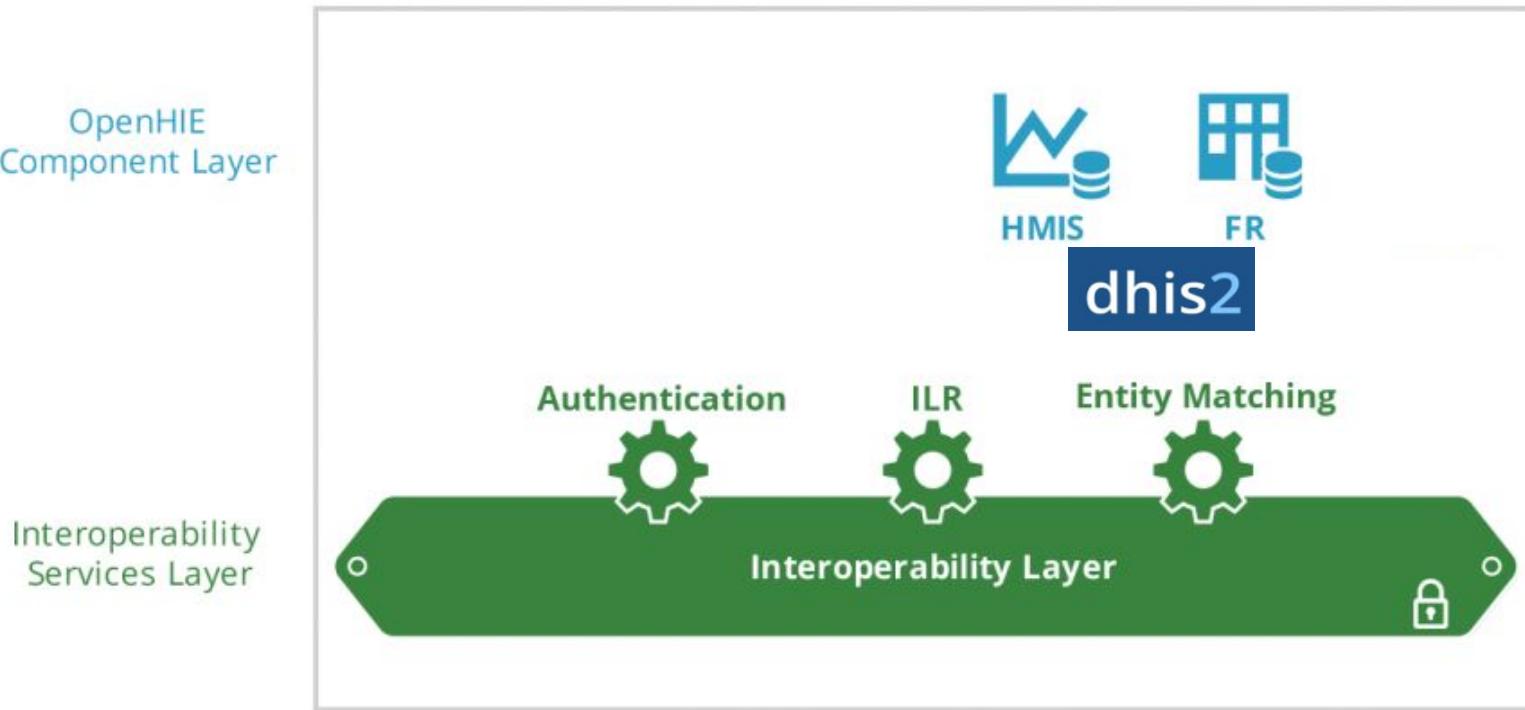
Interoperability in Global Health

OpenHIE Architecture <https://ohie.org/#arch>



DATIM4U Example

OpenHIE Architecture <https://ohie.org/#arch>



External Systems



Considerations for Integration

Technology

Human Resources



- Repeatable
- Sustainable
- Scalable
- Recoverable

Keys to Integration Success



- **Data Governance**
- **Standards Adoptions**
- **Supported and Active Software Development**
- **Security and Compliance**
- **Proper Staffing**
- **Be Flexible**

Risks to Integration



- Complexity of systems to be integrated
- Changes in software, particularly APIs
- Security being optional
- Compliance & local laws
- Capacity / Staffing

A photograph showing a close-up of a person's hand interacting with a tablet computer. The tablet is positioned at an angle, resting on a dark, textured surface that appears to be a wooden bench or table. The background is blurred, showing green foliage and a path, suggesting an outdoor setting like a park. The lighting is natural, and the overall color palette is earthy tones.

Discussion / Q & A

END

Presentation Outline



What is LMIS, HMIS and EMR? **NICOLA does HMIS, MARY JO does LMIS, Matt does EMR**

Introduction to all three systems (1 slide each)

- Nicola to introduce DHIS 2
- Mary Jo to introduce OpenLMIS
- Matt to introduce OpenSRP

What does integration mean? What does interoperability mean? Why? **BRANDON (VR)**

-

Begin the demo integration walkthrough (*use the slides to get shared understanding of the flow of the demo*)

- Explain the various roles and why you are using that system and why the integration helps you do your job
- Could talk about the use cases we are demonstrating
- Also, highlight other opportunities of integration

Key success and failure points to integration. How do you maintain integration?

- Steffen to add in a slide or two
- Good time to ask questions about failures/challenges

Discussion questions (**EVERYONE** please think about questions which can happen throughout presentation)

- Add more to the next slide

Sessions Description

Many countries considering their health information system (HIS) strategy have expressed a growing interest in integrating systems and incorporating systematic analysis of Logistic Management Information System (LMIS) and Health Management Information System (HMIS) data to improve supply chain performance and service delivery. Specifically for immunization supply chains, interest is rapidly growing in data for management and the provision of high-quality data for accurate and informed decision-making. For this lab session, participants will see a demonstration environment on three systems: DHIS 2, OpenLMIS and OpenSRP, all of which manage both LMIS and HMIS data within immunization supply chains across countries.

The OpenLMIS, DHIS 2, and OpenSRP Integration Lab aims to present a proof-of-concept for systems integration, demonstrating how supply chain and health information systems can bring data together for decision-making and reporting while maximizing data capture and reducing redundancies. The lab will hold a discussion on the key steps, data governance decisions, and technical requirements behind a DHIS 2 (HMIS), OpenLMIS (LMIS), and OpenSRP (point of care vaccine registry) integration. The lab will demonstrate how data captured in varying systems can be visualized together in another system to drive better decision making. During the lab, participants will see how an electronic LMIS (OpenLMIS) feeds stock level and inventory data into the HMIS (DHIS 2) where it can be compared against vaccine coverage information reported by a digital registry (OpenSRP). Additionally, participants will see how stock levels of vaccines can be viewed side-by-side for a particular facility or geographic area. Throughout the lab, participants will be asked to share experiences and join the discussion to identify lessons learned and additional opportunities.