INTEROPERABILITY: Weaving investments together

Approaches to reducing fragmentation in digital health investments
THE PROBLEM
Digital Health Programs mostly have been implemented as vertical siloed applications financed by different donors and government programs.

**FRAGMENTATION OF DIGITAL HEALTH**

- Data is not comparable
- Funding is all independent
- Lifespan of solutions are based on lifespan of project
## HARMS FROM FRAGMENTATION

<table>
<thead>
<tr>
<th>Planning</th>
<th>Service Delivery</th>
<th>Financing</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Insufficiently and inconsistently driven by data</td>
<td>• Ineffective and inefficient services</td>
<td>• Short term waste due to development and maintenance costs of parallel systems</td>
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<tr>
<td>• Mis-allocation of health resources</td>
<td>• Inability to address performance challenges</td>
<td>• Long term waste due to the difficulty of legacy integration of existing unplanned systems</td>
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<td>• Poor targeting and under-performance of health programs</td>
<td>• Overlapping and inconsistent training</td>
<td>• Shortages in support for the platforms that do exist</td>
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THE SOLUTION
GLOBAL CONSENSUS

Ecosystem collaboration is needed to address current fragmentation and create a holistic digital health model.

GSMA — Scaling Digital Health in Developing Markets, June 2017

At the country level, cross-cutting digital health platforms should be interoperable and yet adaptable to local requirements and sovereignty.

National Academies of Science, Engineering, and Medicine, May 2017

As a first step toward national digital health implementation, leaders can develop a national digital health vision and strategy. Strong leadership and governance can prevent duplication of effort and harmonize standards for digital technology.

Broadband Commission Report on Digital Health, February 2017
The Rwandan MoH issues its first eHealth Strategy in 2006.

The Ugandan MoH issues a moratorium on new ICT systems in 2010.

The Tanzanian MOH institutes a costed investment plan for digital health in 2016.

The EAC develops a regional shared vision, roadmap and architecture.
VISION

Established country and regional collaborative processes led by government which yields national and regional plans, enterprise architecture, enabling interoperability and use of global goods.
ENTERPRISE ARCHITECTURE

• Blueprints or frameworks of information systems, commonly used to help ICT implementers design increasingly complex systems. Describe how components will interact with each other and external applications.
GLOBAL GOODS

- Software that is free and Open Source, supported by a strong community, has a clear governance structure, funded by multiple sources, deployed at significant scale, used in multiple countries, has demonstrated effectiveness, is designed to be interoperable and is an emergent standard application.

Select Examples

- dhis2
- OpenLMIS
- OpenMRS
- RapidPro
- Resource Map
- CommCare
- iHRIS
INTEROPERABILITY

• The ability of different information technology systems and software applications to communicate, exchange data and use the information that has been exchanged. Integration allows two applications to exchange information. Interoperability allows many.
STANDARDS

Syntactic Standards
(grammar: how you say it)

Semantic Standards
(vocabulary: what you say)
While adhering to the **Principles for Digital Development** and working through existing global and regional efforts, donors will:

1. **Collaborate**
   
   Collaborate to align investments with national digital health strategies.

2. **Invest in national plans**
   
   Prioritise investments in **national plans that incorporate “digital global goods”** and avoid bespoke systems.

3. **Enable sustainable investment**
   
   Engage early to **determine and quantify long-term costs** of operating, maintaining, and supporting digital health systems for sustainable country ownership.

4. **Track & measure**
   
   **Track** investments, progress, learnings and successes in digital health systems in a transparent manner.

5. **Strengthen skills**
   
   **Strengthen donor technical skills** and core capacities, including awareness of the Principles for Digital Development.
At the same time, donors will invest in:

6. Creation and evolution
   The creation and evolution of a country's national digital health strategy, policies and regulatory framework. Strategies include components such as architecture, standards, investment frameworks, privacy protection, and detailed operational and monitoring plans.

7. Maturity continuum
   Systems at a level appropriate to the country's progress along the digital health maturity continuum.

8. Country capacity
   Sustainable country capacity for digital health leadership, governance, implementation, oversight, global good adoption, and donor coordination.

9. Global goods
   Scalable, sustainable, accessible, interoperable, and evidence-based digital health global goods that meet country priorities.

10. Information and peer-learning
    Diverse stakeholder information-sharing and peer-learning networks at country and regional levels to foster coordination and alignment of implementation activities.
Interoperability and Global Development

@datarichness
It’s not 2007, the low-hanging fruit is gone.

Need health IT investments to reach Universal Health Coverage, the SDGs, & to reduce the disease burden.

- Universal IDs.
- Electronic health records to track & empower patients.
- Health financing beyond external sources.
- ....
An API exposes something (data, service) for communication.

Interoperable APIs *speak the same language*.

Interoperability is a Standardized API
Metcalfes law: The number of connections between nodes is nodes².

Consider 10 systems speaking their own language = 100 different combinations of languages.

Health IT requires interoperability to scale efficiently.

Global development is not alone in needing open standards.
“An open approach to digital development can help to increase collaboration in the digital development community and avoid duplicating work that has already been done.”

The Principles: ‘Use Open Standards…’

https://digitalprinciples.org/principles/
Standards bodies promote, grow and expand open standards.

IntraHealth, Regenstrief, Jembi Health Systems and others participate alongside actors in healthcare industries in standards bodies.

In the OpenHIE Community of Practice any institution can discuss standards, implement them, and build upon others’ works.
FHIR -- Fast Healthcare Interoperability Resources (pronounced "fire") is an API and resources for health IT exchange.

FHIR is supported by awesome products already within and outside global development.
Google uses FHIR for deep learning.
Apple announces effortless solution bringing health records to iPhone

Health Records Brings Together Hospitals, Clinics and the Existing Health App to Give a Fuller Snapshot of Health
Industry FHIR Tools for Developers

Synthea: Generate millions of realistic but fake patients and clinical visits
https://github.com/synthetichealth/synthea

ClinFHIR: Customize resources, graph them, query servers http://clinfhir.com

30 Running FHIR servers to query

SDKs in 7+ programming languages

Analytics in R https://github.com/FirelyTeam/RonFHIR
FHIR in Global Development

Jembi’s FHIR Server ‘Hearth’ [https://github.com/jembi/hearth](https://github.com/jembi/hearth)

OpenMRS [https://openmrs.org/](https://openmrs.org/)

IntraHealth’s OpenInfoMan [https://github.com/openhie/openinfoman](https://github.com/openhie/openinfoman)

And iHRIS [https://www.ihris.org/](https://www.ihris.org/)

OpenLMIS, DHIS2, and others are under development.
How do we Work Together on Interoperability?

Include interoperability in proposal & contract language:

Vendors have no reason not to use open standards.

Invest in products using open standards OpenMRS, OpenLMIS, OpenHIM, DHIS2, (...).

And OpenHIE participation.

More here: https://www.intrahealth.org/vital/3-ways-invest-interoperable-health-information-systems
A Collective Journey Toward Interoperability: OpenHIE

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“Our mission is to improve the health of the underserved through the open, collaborative development and support of country driven, large scale health information sharing architectures.”
Challenge: Communication (Exchange of information)
How?

“Our mission is to improve the health of the underserved through the open, **collaborative development** …” through:

**A Community of Communities**

- Facility Registry
- Client Registry
- Health Worker Registry
- Terminology Service
- Shared Health Record
- Interoperability Layer
- Architecture Community
- HMIS
- **Implementer Community**
- **Insurance Community**
- **Supply Chain Community**
1. Promote Interoperability Architecture Framework
2. Strengthen component functionality
3. Advocate for terminology standard use
4. Design standards-based workflows (interactions)
5. Influence / design standards (HL7 / FHIR)
6. Share learning
Where is the impact being made?

- Tanzania: BID (better immunization delivery)
- PEPFAR: Aggregate Data Exchange
- South Africa: momConnect
- Liberia: mHero
- Bangladesh: BHIE
- Philippines: PHIE
- Nigeria: ICT Framework

…and growing
Journey to better healthcare

- Collectively designed
- Standards-based
- Data exchange architecture and patterns
- To meet real-world needs
Join us in the Journey
http://ohie.org
July 31 - August 4, 2018 in Arusha, Tanzania

Mount Meru Hotel and Conference Centre

Event details can be found at ohie.org/OHIE18