Strategies for building and governing national digital health architectures

ICT4D 2017 – Hyderabad, India

Derek Treatman
Director of Technology Solutions, Vital Wave
@dtreatman
Vital Wave Impact Areas

- HEALTH
- AGRICULTURE
- SMBS AND THE INFORMAL ECONOMY
- FINANCIAL SERVICES
- WOMEN AND DEVELOPMENT
- ENERGY AND ENVIRONMENT
- EDUCATION
- EMERGING CITIES
- DATA FOR DECISION MAKING
Africa Presence and Resources

Engagements & Experience

Field Team Available and Number of In-country Experts

Regional Hub and Number of In-country Experts

Senior team of international experts with extensive background in global business and development regularly deployed in-country
Creating Sustainable Digital Programs
Country examples and supporting tools to achieve SDGs

Malawi

Technical review of all systems supporting national HIV/AIDS programs to develop strategic plan for system integration, reducing fragmentation of data

Ethiopia

Technical assistance to develop and implement a national strategy, governance structures, and standardized systems

Supportive Tools
Data Use Partnership – Malawi
Reduce system fragmentation to increase data quality and access

Technical review of all systems supporting national HIV/AIDS programs to develop strategic plan for system integration
Electronic Health Information System (HIS) Landscape for HIV/AIDS in Malawi

A lot of good data, numerous disconnected systems

### MINISTRY OF HEALTH (MoH)

<table>
<thead>
<tr>
<th>System Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baobab Health Trust (BHT)</td>
<td>Health and Technical Support Services (HTSS)</td>
</tr>
<tr>
<td>DHA Management Information System (DHA-MIS)</td>
<td>Department of HIV/AIDS (DHA)</td>
</tr>
<tr>
<td>Health Management Information System (HMIS)</td>
<td>Central Monitoring and Evaluation Division (CMED)</td>
</tr>
<tr>
<td>Health Management Information System (iHRIS)</td>
<td>Human Resource Department (HR)</td>
</tr>
<tr>
<td>Laboratory Information Management System (LMIS)</td>
<td>Clinton Health Access Initiative (CHAI)</td>
</tr>
<tr>
<td>Laboratory Information Management System (LIMS)</td>
<td>Drug Resource Enhancement Against AIDS and Malnutrition (DREAM)</td>
</tr>
<tr>
<td>Logistics Management Information System (LMIS)</td>
<td>Laboratory Information Management System (LMIS)</td>
</tr>
<tr>
<td>Demographic Data Exchange (DDE)</td>
<td>Electronic Health Record (EHR)</td>
</tr>
<tr>
<td>Health Management Information System (HMIS)</td>
<td>Electronic Health Record (EHR)</td>
</tr>
</tbody>
</table>

### MINISTRY OF FINANCE (MoF)

<table>
<thead>
<tr>
<th>System Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Economic Planning &amp; Development (EP&amp;D)</td>
<td>Accountant General Office (AGO)</td>
</tr>
<tr>
<td>Local Authority HIV and AIDS Reporting System (LAHARS)</td>
<td>Integrated Financial Management Information System (IFMIS)</td>
</tr>
<tr>
<td>Part of District Data Bank (DDB)</td>
<td>Integrated Financial Management Information System (IFMIS)</td>
</tr>
<tr>
<td>Health Management Information System (HMIS)</td>
<td>Serenic Navigator</td>
</tr>
</tbody>
</table>

### OFFICE OF THE PRESIDENT AND CABINET (OPC)

<table>
<thead>
<tr>
<th>System Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Human Resource Management and Development (HRMD)</td>
<td>Human Resources Management Information System (HRMIS)</td>
</tr>
</tbody>
</table>

**Note:** Systems represented include only those that are nationally implemented or operated as of June 2016, does not include localized pilot systems

1 Only system used at community level; not currently used for HIV/AIDS commodities
Open Health Information Exchange (OpenHIE)

A standards-based, interoperable architecture model to connect the disconnected

Central Registries and Services
Provides the ‘For whom,’ ‘By whom,’ ‘Where,’ and ‘What’ aspects, harmonizing each across the health system

- TS: Terminology Service
- CR: Client Registry
- SHR: Shared Health Record
- HMIS: Health Management Information System
- FR: Facility Registry
- HWR: Health Worker Registry

Interoperability Layer
Orchestrates message processing between POS apps and systems like EHR, LMIS, LIMS

Point of Service (POS) Applications
Digital data sources, such as EHR, LMIS, LIMS

TS: Terminology Service
CR: Client Registry
SHR: Shared Health Record
HMIS: Health Management Information System
FR: Facility Registry
HWR: Health Worker Registry
Planning a National Health Information Exchange (HIE)

With a little programming, and a lot of negotiation, integration is possible

Central Registries and Services

- **TS**
  - Basic functionality provided by DHIS2 Option Sets

- **CR**
  - Extend existing service to support OpenHIE workflows

- **SHR**
  - Long-term goal to support patient-centric data from EHRs, lab, and pharmacy systems

- **HMIS**
  - Enhance existing DHIS2 to serve as central repository and basic FR and TS

- **FR**
  - Basic functionality provided by DHIS2 Facility List

- **HWR**
  - Facility records linked with DHIS2 facility list

Point of Service Applications

- **EHR**
- **LIMS**
- **LMIS**
- **IFMIS**
- **LAHARS (DDB)**
- **EHR**
- **iHRIS**
Data Use Partnership – Ethiopia
Implementation of the Information Revolution

Ethiopia Information Revolution

Pillar 1:
Cultural transformation for health data use

Pillar 2:
Digitalization and scale-up of priority HIS

The connected Woreda Demonstration projects

Transformed Woredas

HIS Governance

Approach to Technical Assistance in Ethiopia

- Government in the lead from the beginning
- Build capacity through seconded staff
- Prioritize governance
- Apply OpenHIE model
- Make it LIVE!
Master Facility Registry (MFR)

Updated across decentralized health system, open public access

Compiled over 28,000 facility records from disparate disconnected systems to create open access for decentralized updating and planning.
# National Health Data Dictionary (NHDD)

Harmonization of health terminology, establishment of standards

---

**Concept Details**

<table>
<thead>
<tr>
<th>ID</th>
<th>C1.1.1.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default Display Name</td>
<td>Early postnatal care coverage</td>
</tr>
<tr>
<td>Display Name Locale</td>
<td>en</td>
</tr>
<tr>
<td>Concept Class</td>
<td>Indicator</td>
</tr>
<tr>
<td>Datatype</td>
<td>Numeric</td>
</tr>
<tr>
<td>Retired</td>
<td>False</td>
</tr>
<tr>
<td>Concept Version URL</td>
<td>/orgs/EthiopiaMOH/sources/HMIS-Indicators/concepts/C1.1.1.7/57d7a67e2f9cfe00078</td>
</tr>
</tbody>
</table>

**Names & Synonyms**

- Early postnatal care coverage

**Descriptions**

Proportion of women who attended postnatal care at least once during the early post-partum period (within 7 days after delivery).

**Custom Attributes**

- **HMIS-Category-2**: C1.1 Maternal and Child Health
- **HMIS-Category-3**: C.1.1 Maternal Health
- **HMIS-Category-1**: C1: Access to Health Service
- **Interpretation**: Early Postnatal care (PNC) coverage is the proportion of women and newborns who get care, at least...
- **Applicable Reporting Units**: HP, HC/Clinic, Hospital, WorHO, ZHD/SchHO, RHB, FMOH
- **Number of postnatal visits within 7 days of delivery**: 0-48 hours (0-2 days) 49-72 hours (2-3 days) 73 hours-7 days (4-7 days)
- **Total number of expected Deliveries**: Monthly
- **Service delivery tally (for HP), postnatal care register; RH register (for primary private clinics)**

---

Established as the **authoritative source** of health definitions in Ethiopia mapped to international standards.
Governance of the Information Revolution

Ministerial Committee
Min of Health (chair), Chief of Staff, State Ministers

Information Revolution Steering Committee
Chief of Staff (chair), PPD, HITD, PHID, HEPHC, MSGD, HRD

Master Facility Registry TWG
PPD, HITD, PHID, partner NGOs, other directorates

Information Revolution Steering Committee
Chief of Staff (chair), PPD, HITD, PHID, HEPHC, MSGD, HRD

National Health Data Dictionary TWG
PPD (chair), HITD (secretary), PHID, partner NGOs, other directorates

Develop, adopt, manage, and maintain the systems

Regional Health Bureaus

Woreda Health Offices

Alignment with FMOH priorities and vision

Overall leadership and strategic direction

Guide to abbreviations:
Federal Ministry of Health (FMOH); Non-Governmental Organization (NGO); Technical Working Group (TWG); Policy and Planning Directorate (PPD); Health Information Technology Directorate (HITD); Public Health Infrastructure Directorate (PHID); Human Resource for Health Directorate (HRD); Medical Services General Directorate (MSGD); Health Extension and Primary Health Care (HEPHC)
The Broadband Commission for Sustainable Development
High-level advocacy to promote broadband in underserved communities to accelerate achievement of Sustainable Development Goals (SDGs).

The Commission is chaired by President Kagame of Rwanda and Mexico’s Carlos Slim Helú, with ITU SG and UNESCO DG as Co-Vice Chairs.

The Broadband Commission Working Group on Digital Health

Released a report early 2017, co-chaired by Nokia and the Novartis Foundation with Commissioners and external health experts. The report advocates for governments to take action on national digital health strategies to enable scaling and solve the fragmentation dilemma. 8 country case studies: Philippines, Malaysia, Estonia, Norway, Canada, Rwanda, Nigeria and Mali.

Sustained senior government leadership and committed financing
Effective governance mechanisms
A national ICT framework that facilitates alignment between health and ICT sectors

In the Works: Guide for Scale

1. Explore business model scenarios

Revisit costs and revenue
A careful review of your top-line numbers may identify opportunities to decrease costs. Growth in revenue spots and problem areas can be accelerated, or ideally, monthly.

Explore digital service models
Mapping the stakeholder value will identify areas that can be created by expanding your revenue. Are end users or stakeholders willing to pay for that value?

Learn more: here

Evaluate alternatives
Quantifying potential revenues is an important first step in understanding the value of government, end users, and stakeholders.

Explore models: here

Identify and propose solutions
Identifying new sources for revenue is crucial. In the private sector, interested in providing seed solutions.

Learn more: here

2. Create your revenue forecast

Create a revenue model
Developing a spreadsheet model that lists your revenue and funding sources will let you play with different assumptions for growth and market shifts.

Translate your research into numbers
Using data from your financial landscaping and market research will help you estimate the revenue from each of your possible revenue sources.

Try it out: here

Estimate your revenue and test it out
Arriving at a total revenue number from the mix of options available will give you options to vet with internal and external stakeholders. Factoring in how customer and channel partner acquisition may impact revenues over time can be helpful when shifts happen.

Update forecasts as needed
Revenue forecasting is not a one-time exercise, especially in the digital services world. Using new data to constantly update your assumptions and numbers keeps your perspective fresh.

3. Common digital service business models

In any business or economic return to your models will

High Variability

THIRD-PARTY

Grant subs
Donor provides part of service's cost

Useful for funding innovative government resources grants are often short-term

Custom
Monetizes the service's access
Capitalize on how consumer's access
May present short-term

Social vs. commercial
Many ICT4D pilots start with little financial return. Expansion may be dependent on achieving measure program performance for expansion and ability to get existing investor right for you.

Revenue is important in the public sector too
Even if your service is toll-free and connectivity costs are borne by the government (i.e., someone is paying), being able to successfully engage with private-sector firms like MNOs is a big asset. To negotiate good rates with MNOs, a compelling business case must be presented that demonstrates how they can make profit.

Making it easy to pay
Esoko partnered with Vodafone in Ghana to create “The Vodafone Farmers’ Club” to allow farmers to pay for farming tips and market information with mobile phone credit. This made the farmers’ use of the program easy and comfortable. It greatly increased willingness to pay and made revenue forecasting easier.
Thank You

Join us and our partners in these sessions:

- Monday, May 15, 11:45, [http://sched.co/AIQm](http://sched.co/AIQm)
  Moving beyond scale in digital solutions: what works and what doesn’t?

- Monday, May 15, 14:15, [http://sched.co/AIU4](http://sched.co/AIU4)
  Strategies for building and governing national digital health architectures

- Monday, May 15, 17:00, [http://sched.co/AIst](http://sched.co/AIst)
  Partnerships & Collaborative Solutions Track Panel

- Tuesday, May 16, 12:30, [http://sched.co/AIRe](http://sched.co/AIRe)
  From cash to digital: bulk payments in Uganda

- Wednesday, May 17, 14:15, [http://sched.co/AQ0r](http://sched.co/AQ0r)
  Digital scale up guidance toolkit: User testing session