



Leveraging Interoperability to Improve Health

Interoperability Deep Dive

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Jonathan Payne, MS Sr. Technical Advisor, mHealth Alliance Executive Director, Open Concept Lab Instructor, Boston University School of Public Health paynejd@gmail.com



Typical EMR Implementation Costs

In-House EMR Costing	Year 1	Year 2	Year 3	Year 4	Year 5	Subtotal
Labor	\$760,000	\$782,000	\$806,284	\$830,473	\$855,387	\$4,034,144
6x60 User Support, 3x80 IT						
Infrastructure Support, 1x80						
clinical II Support, 1x80 Bi						
Consulting						
Project Management	\$12,500					\$12,500
Training Support	\$17,000					\$17,000
Initial Confuguration	\$18,750					\$18,750
Data Center						
Hardware	\$110,000			\$110,000		\$220,000
Software License Fees	\$37,200	\$37,200	\$37,200	\$38,316	\$38,316	\$188,232
Storage and Backup Costs	\$12,000	\$9,000	\$9,000	\$12,000	\$9,000	\$51,000
Telecommunications	\$1,200	\$1,200	\$1,200	\$1,236	\$1,236	\$6,072
Application Software and						
Implementation	\$37,465					\$37,465
Annual Maintenance Fees	\$157,500	\$157,500	\$157,500	\$157,500	\$157,500	\$787,500
Data Warehouse Costs	\$11,500	\$1,500	\$1,500	\$11,845	\$1,545	\$27,890
Integration Points	\$37,500			\$37,500		\$75,000
Year Total	\$1,212,615	\$988 <i>,</i> 400	\$1,012,684	\$1,198,870	\$1,062,984	\$5,475,553
Cumulative Total	\$1,212,615	\$2,201,015	\$3,213,699	\$4,412,569	\$5,475,553	

"EMR Cost Study: Implementing and Operating Electronic Medical Records in the Long Term and Post-Acute Care Environment." CIO Consortium. February 2011. <u>http://www.ahcancal.org/facility_operations/hit/Documents/2011-02%20CIOC%20EMR%20Cost%20Study%20-%20Final%20Release(v3)%2006-2011.pdf</u>

Technology is only **10%** of the *Solution*.

Jon Payne Standards & Interoperability in mHealth



https://www.youtube.com/watch?v=p6UUDKx6FeY

2013 WHO Resolution:

eHealth Standardization & Interoperability

"...the secure, effective and timely transmission of personal data or population data across information systems requires adherence to standards on health data and related technology"

http://apps.who.int/gb/ebwha/pdf_files/WHA66/A66_R24-en.pdf

(1) Lack of rigorous *evidence* linking mHealth solutions to improved health and demonstrated cost-effectiveness

(2) Lack of sustainable sources of *financing* for mHealth

- (3) Lack of *capacity* throughout the health community to design and deploy mobile health
- (4) Lack of an enabling environment in which national or regional *policies* support the use of mobile for health
- (5) Lack of systematically applied technological *standards and interoperability* between systems

Source: mHealth Alliance Strategy. Created by the mHealth Alliance and Dalberg Global Development Advisors. January 2012.

- Few examples of interoperability working
- No definition for interoperability of mHealth in LMIC contexts
- Existing standards are not relevant
- Lack of a strong central force
- Standards are too expensive
- More challenging than expected

BUT...

- Interoperability on the agenda
- LMICs developing eHealth strategies
- New business models emerging for standards organizations

"We're not very sophisticated on [interoperability]. We have no in-house competency in interoperability and do not have a clear position on it... We expect those that we fund to be able to make decisions about interoperability."

– Donor

Institutional

Process

Semantic

Technical





Standards

"Standards are a bit like doing plumbing – technically challenging, critical to get right, no one wants to do it."

- **Data interchange** Harmonization and adaptation of clinical and administrative messages for system and device interoperability.
- **Semantic content** Develops standards for the representation of terminological resources, such as health concepts and data.
- Security, Safety and Privacy Confidentiality, integrity and availability, accountability, security management and information systems safety.
- Pharmacy and medicines business Develops standards for interoperability of e-pharmacy systems and other medicines applications.
- Architecture Definitions, templates, data sets. Standardized models of the functions and conformance criteria associated with a system that is platform agnostic (e.g. HL7 Electronic Health Record System Functional Model), including definition of business requirements and data structures.

eHealth Architecture

Informed health policy Improved access to care Evidence-based practice Informed health service planning Efficiency, productivity, cost-effectiveness Improved quality of care – to individuals & populations



* ISO 14639 Part 1 – Capacitybased eHealth Roadmap – Overview of National e-Health Incentives

Countries	National mHealth Strategy	National eHealth Strategy
India	-	Yes
Bangladesh	-	Yes
Vietnam	-	-
Guatemala	-	-
Peru	Yes	Yes
Panama	-	Yes
Tanzania	Yes	Yes
Nigeria	-	-
Rwanda	-	Yes
South Sudan	-	-
South Africa	-	Yes

- 1) Novel job aid for remote and individualized notification, decision support, data capture, etc. with **undefined linkages to standard domain models** (e.g. EHR, PHR).
- 2) Limited bandwidth and infrastructure leading to power fluctuations and intermittent cellular connectivity may require lighter-weight and more reliable transmission protocols, and may generate **dependence on** foreign infrastructure (e.g. cloud-based).
- 3) The use of insecure and technically limited messaging interfaces (e.g. voice, SMS, USSD), to communicate with patients, health workers, or information systems may require new methods for securing, verifying, and efficiently transmitting data and protecting patient privacy.
- 4) **Task shifting to non-clinical and community-based workers** has revealed gaps in standardized terminology to represent community-based care, especially in rural settings, and presents unique challenges in terms of connecting systems to enable continuity of care.
- 5) **Absence of guidelines** for use and adaptation of existing health informatics standards in LMIC contexts.
- 6) **Different stakeholders** involved which alters incentives for adoption of standards and participation in standards development activities



SDO Participation Gap

ECONOMIC GROUPING	ISO TC 215 P	ISO TC 215 0	HL7	IMIA
LIC	Kenya	Zimbabwe	-	Burundi, Malawi, Mali, Togo
LMIC	Armenia, Honduras,	Mongolia, Ukraine	-	Cameroon, Côte d'Ivoire, Ghana,
	Philippines			Honduras, Nigeria, Pakistan,
				Philippines, Sri Lanka, Ukraine
UMIC	Brazil, China, Iran,	Argentina, Bulgaria,	Argentina, Bosnia	Argentina, Bosnia and
	Malaysia, Mexico,	Colombia, Ecuador,	and Herzegovina,	Herzegovina, Brazil,
	Russian Federation ,	Kazakhstan,	Brazil, China,	Chile, China, Cuba,
	South Africa,	Romania, Serbia,	Colombia, Mexico,	Iran, Mexico, Peru,
	Tunisia, Turkey	Thailand	Romania, Russian	Romania, South Africa,
			Federation, Turkey,	Thailand, Turkey,
			Uruguay	Uruguay, Venezuala

Figure 3. LIC, LMIC, UMIC standards organization membership.

GEOGRAPHIC REGION	COUNTRIES	ISO TC 215 P	ISO TC 215 0	HL7	IMIA
Sub-Saharan Africa	43	1	1	0	7
South Asia	8	1	0	0	3
Europe & Central Asia	23	3	5	4	4
East Asia & Pacific	24	4	2	1	3
Latin America & Caribbean	29	2	3	5	8
Middle East & North Africa	13	2	0	0	1
Other	75	21	11	24	31
TOTAL	215	33	6	33	57

Figure 4. ISO, HL7 and IMIA membership categorized by geographic region.

GOALS

Shift market dynamics to incentive interoperability of m/eHealth systems

Establish local participation and leadership in health informatics standards and interoperability activities

		ACTIVITIES		
Build Capacity, Increase Access	Fill LMIC Standards Gaps	Facilitate LMIC Engagement and Mediation	Coordination and Alignment among Stakeholders	Strengthen eHealth Governance

Goal 1: Shift market dynamics to incentivize interoperability of m/eHealth systems	Build capacity, increase access lncrease government and donor HR capacity to strategically invest in interoperable health systems Global compendium of standards & implementation guides for LMICs and materials to improve selection, adoption, deployment, maintenance, and governance of standards/interop Advocate for lower cost of access to key standards materials for LMICs	Fill standards gaps Adapt standards and guidelines to LMIC use cases and identify/fill standards gaps where present Incorporate mHealth and LMIC use-cases into standards-based health domain models and profiles Co-sponsor award or competition for open source, reusable implementations of a key health informatics standards	LMIC Engagement and Mediation International community collect and represent LMIC use cases in the standards development process	Coordination and alignment among all stakeholders Establish mechanism to align donor eHealth activities with each other and with governments' national eHealth strategies Align external stakeholder activities with national eHealth strategies Develop tiered interoperability certification to set minimum standards compliancy requirements for implementations and RFPs	Strengthen m/eHealth governance
Goal 2: Establish local participation and leadership in health informatics standards and interoperability activities	Establish technical training & education programs Empower private sector, professional organizations, and academia through membership in national standardization efforts	LMIC stakeholders engage as appropriate in standards development processes, esp. systematic contribution of requirements and use cases to standards community	Establish mechanisms and strengthen capacity for local engagement in standards activities, such as regional eHealth standardization collaboratives	Support governments in development of standards and interoperability guidelines as part of or to supplement eHealth strategies	Promote LMIC participation and operationalization of WHO eHealth Data Standards Resolution

- Global and regional resolutions on eHealth Data/Interoperability Standardization
- "Interoperification" Global interoperability certification mechanism
- Regional eHealth Collaboratives
- Formalizing partnerships between SDOs and LMIC governments
- mHealth Expert Learning Program (mHELP)
- Open Health Information Exchange (OpenHIE) initiative
- Open health terminology and indicator services (WHO Indicator Registry, Open Concept Lab)
- National enabling environment initiatives

Strategic Decision Making Tool

CASE STUDY: MHEALTH INTEROP CERTIFICATION – "INTEROPER-IFICATION"

How does this contribute to the overall strategy?

An independent multi-tiered certification program could be built into RFPs and leveraged by governments to shift market incentives towards standards adoption and interoperability

What are the aims/objectives

- **1**. Tiered certification program adopted into RFPs of major donors to guide grantees in standards adoption and interoperability best practices
- 2. Certification program used by LMIC governments to set minimum standards/interop requirements for m/eHealth implementations

What is the plan for achieving the aims and objectives?

Research comparable efforts to develop well-informed proposal; put together coalition of partners (esp. donors, govts) to endorse the program and to jointly seek funding; identify independent certification body; develop the program

What is needed from the team and from which team members?

Research on certification programs (esp. assessing market willingness to adopt), proposal development, establishing coalition of partners, identifying/establishing certification body





Leverage mobiles to reduce duration and frequency of stock outs of essential lifesaving commodities.



Improve quality, comprehensiveness, and timeliness of routine reporting from primary health facilities and increase utilization of HMIS data to strengthen health system improvement efforts.



Advise ICT4SOML on implementation process and a plan for scale up of mobile payment for CCT projects across Nigeria.



Generate demand and awareness around use of mobiles for health services.

