

Implementing Interoperability Layer to Support Information Exchange: Experience from Tanzania Health Sector

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Background

- Fragmented ICT pilots and numerous HIS silos
- Need of an interoperability layer inadequate sharing/exchange of health information across the sector
- Fragmented and uncoordinated business processes
- No common investment framework
- Emphasis on governance and partner coordination
- Need for a holistic approach



GoT HIE Commitment

Health Sector Strategic Plan 2015 – 2020

• The health sector will embrace rapid development of ICT for improving administrative processes, patient/client recording and communication, and stimulate the development and guide interoperability of systems.

Tanzania: eHealth Strategy 2013 – 2018

- Established eHealth standards, rules, and protocols for information exchange and protection.
- Established comprehensive health facility, provider, and client registries with complete and current information that meets stakeholders' needs.

Establishment of Governance Committee

• National eHealth Steering Committee

Tanzania Health Information System Integration Evolution

Organized





- Multiplicity of systems (128+)
- Business/ program specific system silos
- No standards, redundancy, gaps
- Limited scale and no governance

- ILS Gatew ay TIMR
- Integrated Other Institutions/ sectors Applications teroperabil laver component LGA Epicor Interoperability HEALTH INFORMATION MEDIATO service laver NHIF & External Syster with Domain specific
- Some nationally scaled systems (DHIS2, eLMIS, VIMS, HRHIS, HFR etc)
- Limited peer-to-peer interoperability
- Key architectural gaps
- Limited governance (system specific)

- Enterprise Architecture (13+ Systems)
- Common standards and guidelines
- Formal governance (eHealth SC)
- Linked with other eGov systems (Muungano Gateway)

Phase 01 Use Cases (11 systems are integrated)

Use Case #01: Client level data exchange for hospitals

- a. Tracking medical services received
- b. Tracking deaths by disease case
- c. Tracking bed occupancy rate
- d. Tracking hospital revenue

Use case #02:Aggregate data exchange to DHIS2 through HIM

- **a. eLMIS:** Count of stock received, consumed, stock on hand at facility level
- b. Immunization data (VIMS): Monthly Counts of children vaccinated
- **c. E9:** Count of stock received, consumed (distributed), SOH at MSD
- d. HRHIS: Number of HCW for each cadre (MDs, Nurses, etc) by gender and employer

Use Case #3: Health Facility Registry Data Extract

- a. HFR: Post facility information to DHIS2 through HIM
- b. HFR: Post facility information to VIMS through HIM



HIM Administrator's Landing Page

TZ HIM	Dashboard	Organizations	Messa	ge Types	Configurations	Connections	Processing Activity	System Admin		Log out
Administ	rator Dashboa	rd								
	12 Organizations View all			11 Message Typ View all	es	Con	25 figurations View all	Pe	nding Delivery	
Organizati	ons					Message Types				
Latest Org	ganizations:					Latest Message	Types:			
HRHIS		3/2	6/2018	Public	🕑 Edit	HMIS Revenue Tr Status: active	ansaction	5/02/2018	C	Edit
E9		2/0	6/2018	Public	🕑 Edit	VIMS Children Vaccinated Counts Status: active		4/06/2018	C	Edit
Mbeya Zo	nal Referral Hospital	1/2	5/2018	Public	🕑 Edit	HRHIS Healthcar Status: active	e Worker Updates	3/28/2018	C	Edit

Admin can track In/Outbound Messages Status

Inbound Messa	ges										Inbou	un		
10 Records v										Filter Results				
Туре	Type Date/Time 👻 Trans. ID		Source M		Message Type		Interface	Total Trans.	Total Errors	Threshold	• Wha	t is		
On Demand	7/09/18 4:17 PM	<u>5520180709161700130</u>	Muhimbili National Hospital	onal Hospital MNH Revenue			File Drop	314,430	36,871	100%	• Messa			
On Demand	7/09/18 2:02 AM	<u>9 2 102018070902020094</u>	Ministry of Health Vaccine Information Management System	Children Vaccinated Counts (REST API)			Rest API	1,857	0	100%	• Trans			
Watch List Ent	ry 7/08/18 11:50 PM	N/A	E9	Daily Stock Transaction			Secure FTP	N/A	N/A	N/A	• Numb			
On Demand	7/08/18 10:14 AM	<u>3112018070810140074</u>	0810140074 Mbeya Zonal Referral Hospital		MZRH Death By Disease SFTP		Secure FTP	0	0	100%	• Erroi	SI		
Watch List Ent	ry 7/07/18 11:50 PM	N/A	E9	Daily Stock Trans								_		
On Demand	7/06/18 11:56 PM	<u>9 1 1320180706235602697</u>	HRHIS	Healthcare Worke		Outbound Message	es							
Watch List Ent	ry 7/06/18 11:50 PM	N/A	E9	Daily Stock Trans		20 Records	*							
Watch List Ent	ry 7/06/18 11:50 PM	N/A	eLMIS	DHIS2 Logistics 1	S2 Logistics 1 Type		Date/Time 👻	Trans. II)	Та	rget			
On Demand	7/06/18 4:59 PM	<u>5520180706165900100</u>	Muhimbili National Hospital	MNH Bed Occupa	à	On Demand	11/26/18 1:30	<u>9 m 22520181126</u>	01304353 I	DHIS2		He		
On Demand	7/06/18 4:59 PM	<u>5520180706165900180</u>	Muhimbili National Hospital	MNH Death By D		On Demand	11/26/18 1:30	<u>9 m 10252018112</u>	10252018112601304335 Ministry of Health Management Sy		h Vaccine Information He /stem			
						On Demand	11/26/18 1:24	<u>9 m 22520181126</u>	m 22520181126012435250 DHIS2			He		
Showing 1 to 10 of 18 entries						On Demand 11/26/18 1:24 9 m 102			02520181126012435233 Ministry of H Manageme		Vaccine Information	He		
Outbound transactions						On Demand	11/26/18 1:18	<u>9 m 22520181126</u>	0 <u>11845571</u> I	DHIS2		Не		
• When the transaction was cont						On Demand	11/26/18 1:18	<u>9 m 10252018112</u>	6011845548 I	Ministry of Health Vaccine Informati Management System		He		
• What is the data target						On Demand	11/25/18 20:03	<u>8 m 41520181125</u>	20030714	HDR		HN		
• Mossage type						On Demand	11/25/18 19:58	<u>8 m 42420181125</u>	195812128	HDR		HN		
• Message type						On Demand	11/25/18 19:50	<u>8 m 41720181125</u>	195029229	HDR		HN		
• Iransport method						On Demand	11/24/18 20:00	<u>8 m 41520181124</u>	200003766	HDR		HN		
Number of transaction Sent						On Demand	11/24/18 19:55	<u>8 m 42420181124</u>	195508804	HDR		HN		
 Errors 	 Errors reported for admins attention 					On Demand	11/24/18 19:50	<u>8 m 41720181124</u>	195027813	HDR		HN		

Out

d transactions

- the transaction was received
- is the Data source
- ge type
- ort method
- er of transaction received
- identified for admins attention

Outbound Messages											
	20 Records	rds v							Filter Results		
	Туре	Date/Time 👻	Trans. ID	Target	Message Type	Interface	Total Trans.	Total Errors	Threshold		
•	On Demand	11/26/18 1:30	<u>9 m 2252018112601304353</u>	DHIS2	Health Facility Registry Transactions	Rest API	1	0	100%		
	On Demand	11/26/18 1:30	<u>9 m 10252018112601304335</u>	Ministry of Health Vaccine Information Management System	Health Facility Registry Transaction	Rest API	1	0	100%		
	On Demand	11/26/18 1:24	<u>9 m 22520181126012435250</u>	DHIS2	Health Facility Registry Transactions	Rest API	1	0	100%		
	On Demand	11/26/18 1:24	<u>9 m 102520181126012435233</u>	Ministry of Health Vaccine Information Management System	Health Facility Registry Transaction	Rest API	1	0	100%		
	On Demand	11/26/18 1:18	<u>9 m 22520181126011845571</u>	DHIS2	Health Facility Registry Transactions	Rest API	1	0	100%		
	On Demand	11/26/18 1:18	<u>9 m 102520181126011845548</u>	Ministry of Health Vaccine Information Management System	Health Facility Registry Transaction	Rest API	1	0	100%		
	On Demand	11/25/18 20:03	8 m 4152018112520030714	HDR	HMIS Service Received Transaction	File Drop	3,779 🙂	0	100%		
	On Demand	11/25/18 19:58	8 m 42420181125195812128	HDR	HMIS Revenue Transaction	File Drop	5,257	0	100%		
	On Demand	11/25/18 19:50	8 m 41720181125195029229	HDR	HMIS Bed Occupancy Transaction	File Drop	1,163	0	100%		
	On Demand	11/24/18 20:00	8 m 41520181124200003766	HDR	HMIS Service Received Transaction	File Drop	3,588 🙂	0	100%		
	On Demand	11/24/18 19:55	8 m 42420181124195508804	HDR	HMIS Revenue Transaction	File Drop	4,897	0	100%		
	On Demand	11/24/18 19:50	8 m 41720181124195027813	HDR	HMIS Bed Occupancy Transaction	File Drop	1,024	0	100%		

Support Multiple Transport Methods, Data Formats & Code Sets

- Multiple data transport methods
 - File uploads/downloads (Web Interface)
 - Web APIs
 - sFTP
 - FHIR
- Multiple data formats
 - Custom, HL7, XML, JSON, txt, xls, csv
- Multiple code sets
 - Custom, ICD 9 & 10, CPT4, SNOMED, LOINC

* Not an exhaustive list

Future Uses of the System

- Increase ability to triangulate and compare data across domains/tiers/functions
- Enhance the premise of collecting data once and use multiple times
- Better continuity of care across
 programs/facilities/health needs
- e-Referral from community to facility and lower to higher facility
- Improved decision-making at time of care



Sustainability Strategies

- Application of the principles for digital development including:
 - -Design with the user
 - -Design for scale
 - -Build for sustainability ... etc.
- Implementation of three tiers support structure
- Structured training methodology catered for different user groups
- Easy to use supporting tools & system operationalization and administration guides

THANK YOU!