

OpenHIE & Digital Square

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Image courtesy
IntraHealth International



HIS eco-system

- Data is a precious resource

the ability to share data and metadata increases the value a country's investment

- openMIS sits in a complex health information eco-system

openMIS needs to interoperate with multiple point of service applications

- Sharing requires resources

*we have an imperative to **reduce implementation burden** and provide **stable means for sharing data***

OpenHIE
Component Layer



TS



CR



SHR



HMIS



FR



HWR

Interoperability
Services Layer

Authentication



ILR



Entity Matching



Interoperability Layer



External Systems



Mobile



Clinic



HMIS



Lab



Hospital



Community of Communities

- Established:
 - Health Facility, Shared Health Record, Implementers Network, Client Registry, ...
- New:
 - Supply Chain, Health Insurance

Standards

- Integrating the Health Enterprise (IHE)
 - PIXm/PDQm – Client/patient demographic information (birth date, name, gender, identifiers)
 - ADX – Aggregate Data Exchange: indicator reporting
 - CSD, mCSD– Care Services Discovery: health facility and health worker metadata
- Moving towards HL7 FHIR based standards and workflows

Software

- Reference software for each of the main components
- IHE Certification



Health Finance Community

- First call January 29, 2018 <http://bit.ly/2EsBd0s>
- Next call March 2, 2018 <http://bit.ly/2EKfULp>

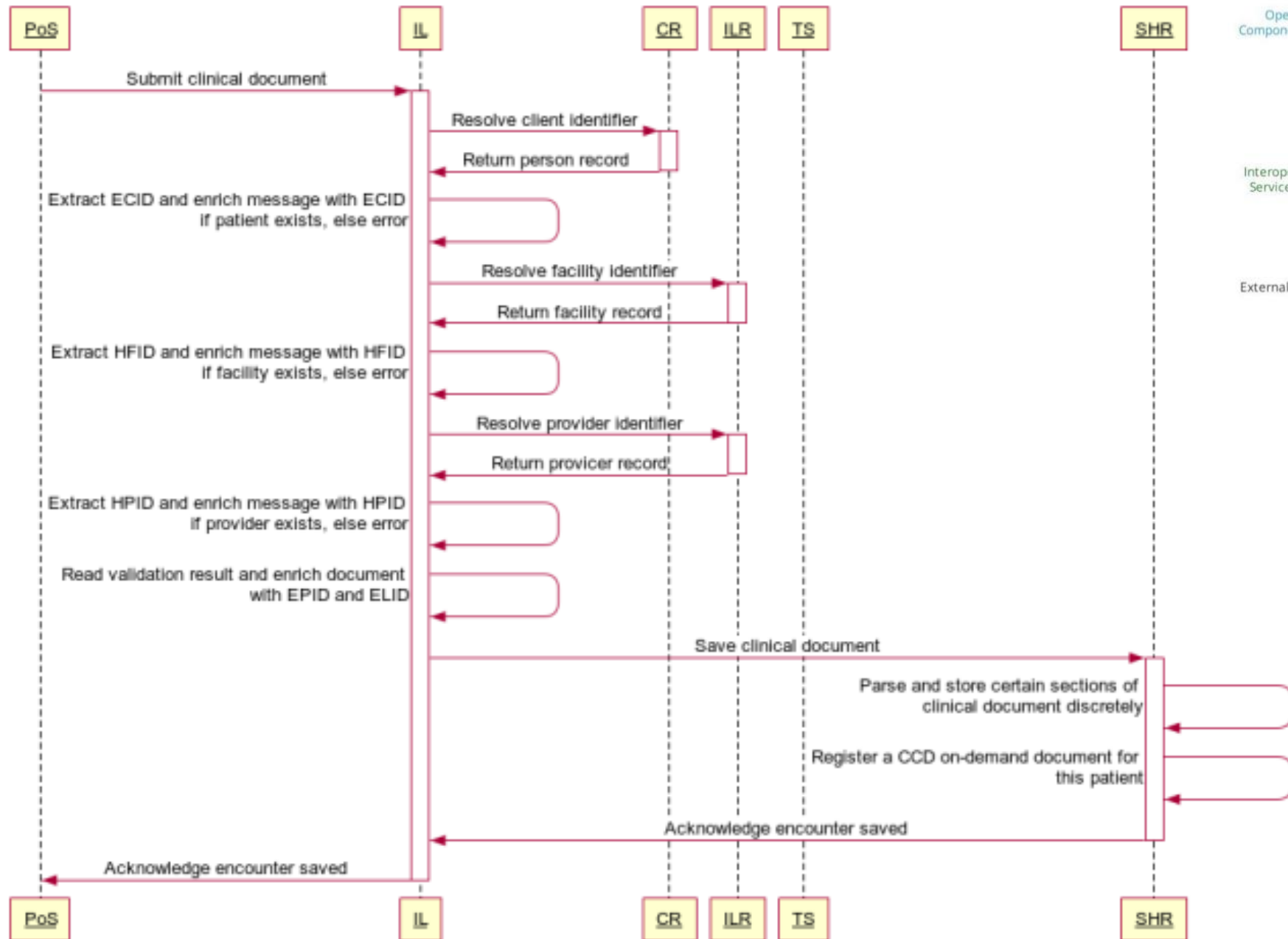
Define Data Exchange Standards for Prioritized Scenarios

- Metadata Synchronization
 - Linking client to Master Client Registry and Civil Registry systems
 - Linking facility list with Master Facility Registry
 - Mapping local claim/procedure codes to clinical terminologies
- Data Utilization
 - Medical Commodity consumption reporting to HMIS and Supply Chain systems
 - Resource planning for increasing utilization of health service
- Point of Service
 - Eligibility Verification
 - Claim Submission
- Health Insurance Business Domain
 - Linking with ePayment systems
 - Linking with accounting systems



How do we prioritize for openMIS roadmap?

Save Clinical Encounter



OpenHIE Component Layer

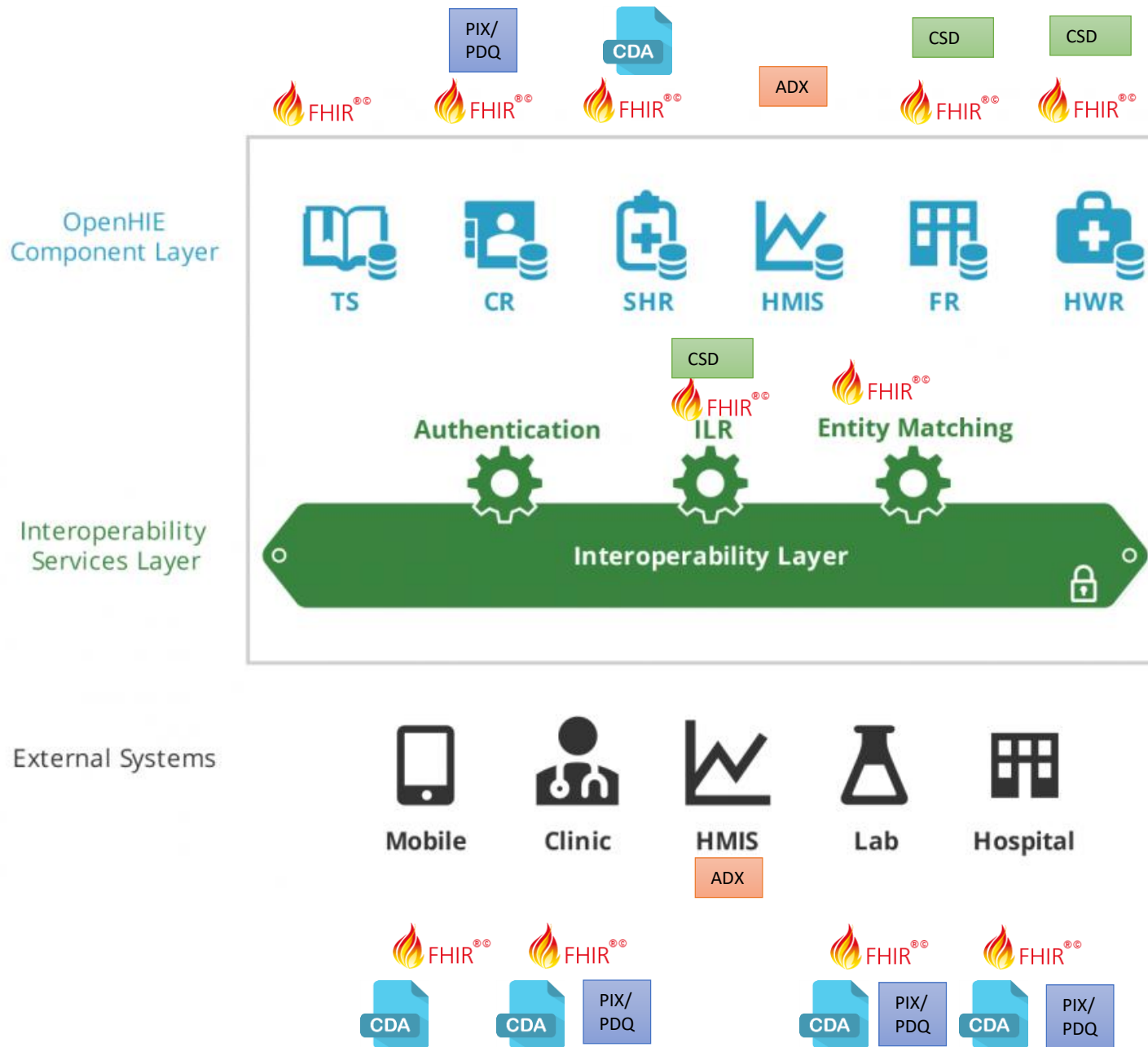


Interoperability Services Layer



External Systems





Available standards

HL7 FHIR

Data Model

Clinical

General:

- AllergyIntolerance 1
- Condition (Problem) 2
- Procedure 1
- ClinicalImpression 0
- FamilyMemberHistory 1
- RiskAssessment 0
- DetectedIssue 1

Care Provision:

- CarePlan 1
- Goal 1
- ReferralRequest 1
- ProcedureRequest 1
- NutritionOrder 1
- VisionPrescription 0

Medication & Immunization:

- Medication 1
- MedicationOrder 1
- MedicationAdministration 1
- MedicationDispense 1
- MedicationStatement 1
- Immunization 1
- ImmunizationRecommendation 1

Diagnostics:

- Observation 3
- DiagnosticReport 3
- DiagnosticOrder 1
- Specimen 1
- BodySite 0
- ImagingStudy 2
- ImagingObjectSelection 1

Identification

Individuals:

- Patient 3
- Practitioner 1
- RelatedPerson 1

Groups:

- Organization 1
- HealthcareService 1
- Group 1

Entities:

- Location 1
- Substance 1
- Person 1
- Contract 0

Devices:

- Device 1
- DeviceComponent 1
- DeviceMetric 1

Workflow

Patient Management:

- Encounter 1
- EpisodeOfCare 1
- Communication 1
- Flag 1

Scheduling:

- Appointment 1
- AppointmentResponse 1
- Schedule 1
- Slot 1

Workflow #1:

- Order 0
- OrderResponse 0
- CommunicationRequest 1
- DeviceUseRequest 0
- DeviceUseStatement 0

Workflow #2:

- ProcessRequest 0
- ProcessResponse 0
- SupplyRequest 0
- SupplyDelivery 0

Infrastructure

Information Tracking:

- Questionnaire 2
- QuestionnaireResponse 2
- Provenance 1
- AuditEvent 2

Documents & Lists:

- Composition 2
- DocumentManifest 1
- DocumentReference 2
- List 1

Structure:

- Media 1
- Binary 1
- Bundle 2
- Basic 1

Exchange:

- MessageHeader 2
- OperationOutcome 2
- Parameters 1
- Subscription 1

Conformance

Terminology:

- ValueSet 3
- ConceptMap 2
- NamingSystem 1

Content:

- StructureDefinition 2
- DataElement 1

Operations Control:

- Conformance 2
- OperationDefinition 1
- SearchParameter 1

Misc:

- ImplementationGuide 0
- TestScript 0

Financial

Support:

- Coverage 0

Billing:

- Claim 0

Payment:

- PaymentNotice 0























Other:

- ExplanationOfBenefit 0

5.1.2 Resource Content

Structure
UML
XML
JSON
All

Structure

Name	Flags	Card.	Type	Description & Constraints
 Patient			DomainResource	Information about an individual or animal receiving health care services
•  identifier		Σ 0..*	Identifier	An identifier for this patient
•  active	?! Σ	0..1	boolean	Whether this patient's record is in active use
•  name		Σ 0..*	HumanName	A name associated with the patient
•  telecom		Σ 0..*	ContactPoint	A contact detail for the individual
•  gender		Σ 0..1	code	male female other unknown AdministrativeGender (Required)
•  birthDate		Σ 0..1	date	The date of birth for the individual
•  deceased[x]	?! Σ	0..1		Indicates if the individual is deceased or not
•  deceasedBoolean			boolean	
•  deceasedDateTime			dateTime	
•  address		Σ 0..*	Address	Addresses for the individual
•  maritalStatus		0..1	CodeableConcept	Marital (civil) status of a patient Marital Status Codes (Required)
•  multipleBirth[x]		0..1		Whether patient is part of a multiple birth
•  multipleBirthBoolean			boolean	
•  multipleBirthInteger			integer	
•  photo		0..*	Attachment	Image of the patient
•  contact		I 0..*	BackboneElement	A contact party (e.g. guardian, partner, friend) for the patient <i>SHALL at least contain a contact's details or a reference to an organization</i>
•  relationship		0..*	CodeableConcept	The kind of relationship PatientContactRelationship (Extensible)
•  name		0..1	HumanName	A name associated with the contact person
•  telecom		0..*	ContactPoint	A contact detail for the person
•  address		0..1	Address	Address for the contact person
•  gender		0..1	code	male female other unknown

HL7 FHIR

RESTful API

2.1.0 RESTful API

FHIR Infrastructure  Work Group	Maturity Level: N/A	Ballot Status: DSTU 2
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Each "resource type" has the same set of interactions defined that can be used to manage the resources in a highly granular fashion. Applications claiming conformance to this framework claim to be conformant to "RESTful FHIR" (see [Conformance](#)).

Note that in this RESTful framework, transactions are performed directly on the server resource using an HTTP request/response. The API does not directly address authentication, authorization, and audit collection - for further information, see the [Security Page](#).

The API describes the FHIR resources as a set of operations (known as "interactions") on resources where individual resource instances are managed in collections by their type. Servers can choose which of these interactions are made available and which resource types they support. Servers SHALL provide a [conformance statement](#) that specifies which interactions and resources are supported.

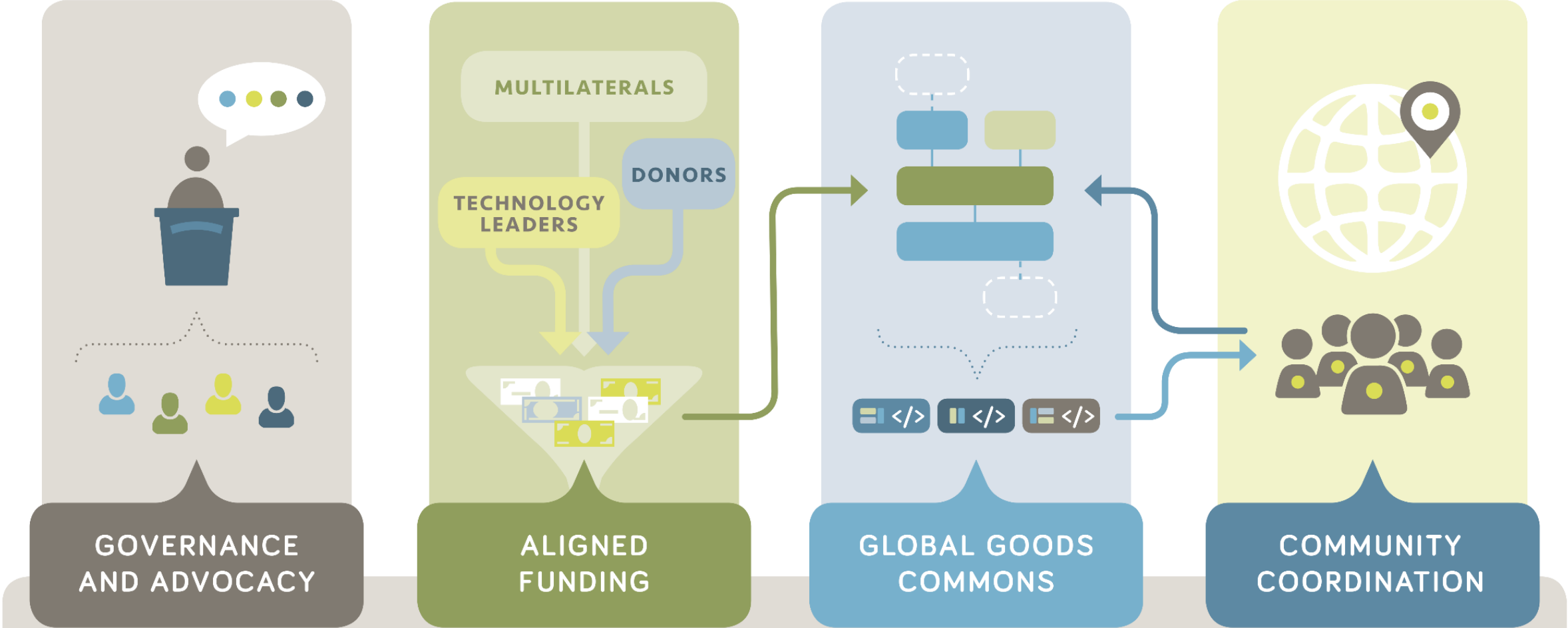
The following logical interactions are defined:

Instance Level Interactions	
read	Read the current state of the resource
vread	Read the state of a specific version of the resource
update	Update an existing resource by its id (or create it if it is new)
delete	Delete a resource
history	Retrieve the update history for a particular resource
Type Level Interactions	
create	Create a new resource with a server assigned id
search	Search the resource type based on some filter criteria
history	Retrieve the update history for a particular resource type
Whole System Interactions	
conformance	Get a conformance statement for the system
batch/transaction	Update, create or delete a set of resources in a single interaction
history	Retrieve the update history for all resources
search	Search across all resource types based on some filter criteria

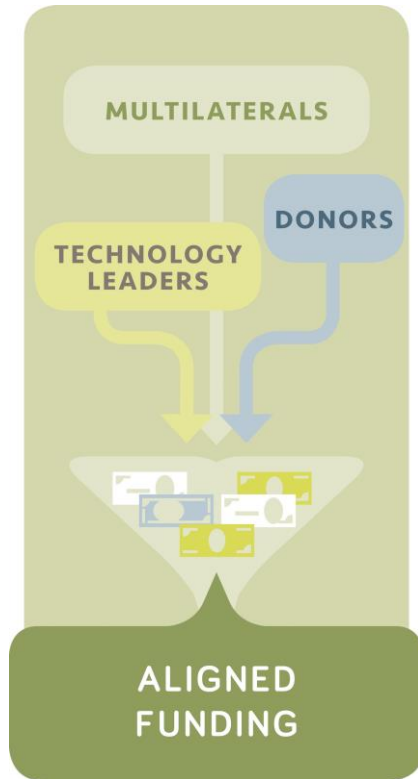
In addition to these interactions, there is an [operations framework](#), which includes endpoints for [validation](#), [messaging](#) and

```
{
  "fullUrl": "http://hl7.org/fhir/Patient/71",
  "resource": {
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    },
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      "div": "<div>Fletcher, Brenda. MRN:\n          577390</div>"
    },
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        "type": {
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            }
          ]
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    "managingOrganization": {
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    }
  }
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    "id": "72",
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      "lastUpdated": "2012-06-03T23:45:32Z"
    },
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      "status": "generated",
      "div": "<div>Powell, Kathryn. MRN:\n          577391</div>"
    }
  }
}
```

Four Strategic Pillars



Umbrella Investments in Digital Health



USAID

- Global Goods (technical oversight)
- Regional Road Maps & Networks
- Digital Health Atlas
- \$5.6m in direct investments



Bill & Melinda Gates Foundation

- Global Goods (open proposal process)
- Regional Road Maps
- \$5.3m in direct investments



Other Investments

- Regional Road Maps & Networks
- \$800k across eight direct and indirect investments

Investing in Global Goods



Digital Square Notice B

Promoting the collaborative development of proposals for investments in digital health global goods

Digital Square supports investments in digital health global goods, which are tools that are adaptable to different countries and contexts. Mature digital health global good software is software that is (usually) Free and Open Source (FOSS), is supported by a strong community, has a clear governance structure, is funded by multiple sources, has been deployed at significant scale, is used across multiple countries, has demonstrated effectiveness, is designed to be interoperable, and is an emergent standard application.

We are using an open proposal process. Your concept notes and proposals will be publicly posted, giving you and other submitters the opportunity to find collaborators and provide and receive feedback from your peers.

> [Read important information about this opportunity](#)

- + **December 20 - January 18: Concept Note Submission - CLOSED**
- + **January 20 - March 9 (by 3pm Pacific time): Proposal Co-creation Phase**
- + **March 10 - March 23 (by 3pm Pacific time): Proposal Finalization Phase**
- + **March 24 - April 12: PRC Review Phase**
- + **Late-April - Mid-May: Board Review Phase**
- + **Mid-May: Awards Announced**



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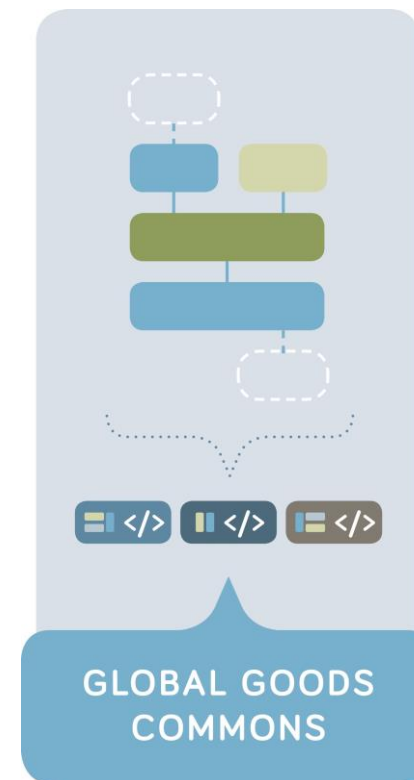
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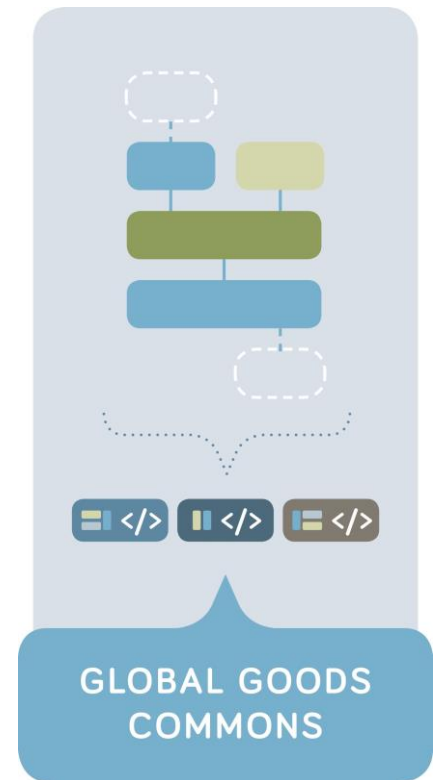
Maguette Thioro NDONG on: [Integrated Non-Communicable Disease Surveillance...](#)



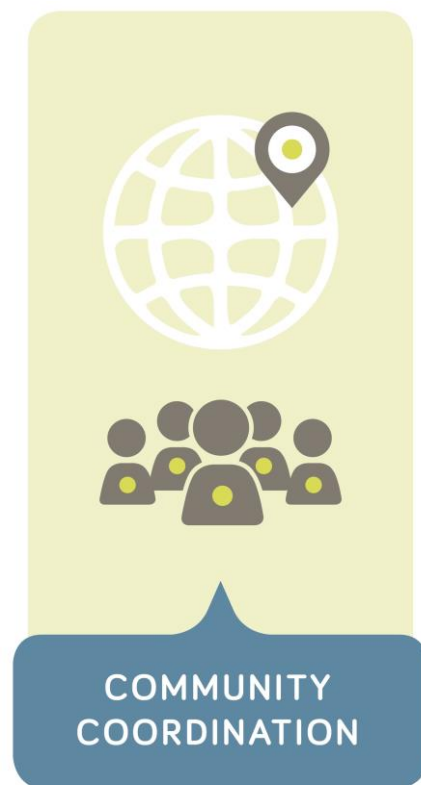
Current Investments



- **Bahmni**: transition from ThoughtWorks to Bahmni Coalition, Upgrade ERP
- **Digital Health Atlas**: Core Development and Implementation Support
- **eIDSR**: linking mHero and DHIS2 for eIDSR use cases
- **Global Open Facility Registry (GOFR)**: Core Development and Implementation of health facility data management tools
- **iHRIS Foundation**: Core software development, Community support, Initialize foundation
- **Open Data Kit 2 (ODK2)**: Core Development and prepare for transition to community
- **OpenLMIS**: Core software development and community support



Investing in Global and Regional Networks



Support regional digital health networks

- African Alliance for Digital Health
- Asia eHealth Information Network (AeHIN)
- PMP, COBIT, TOGAF training
- Interoperability labs

Support Regional Road Maps

- Digital REACH for East Africa Community member states

Coordinate with Global Community

- OpenHIE Supply Chain & Health Insurance Communities
- Health Data Collaborative Working Groups (DH&I Secretariat, LMIS)
- Global Good Governing & Advisory Boards, technical committees
- Support and foster uptake of Digital Health Atlas

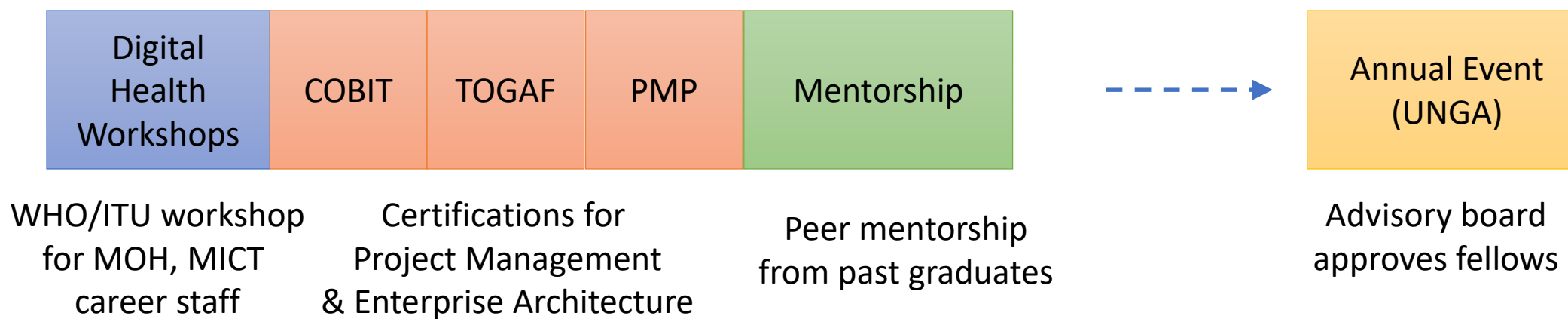
African Alliance of Digital Health Networks



An umbrella entity to provide technology and vendor-agnostic advisory services to digital health communities (governments, networks, etc.) across the continent. Modeled after AeHIN.

- Skills-building via webinars, online trainings, and in-person meetings
- Build capacity at policy level so that governments can develop their own national digital health strategies.
- Create a fellowship program for government staff to build digital capacity within ministries.
- Create a scholarship program for training opportunities for technology developers to build in-country capacity
- Liaise with other networks to share news about activities and disseminate learning more widely.

Fellowship Program



Digital REACH



Develop strategic roadmap for digital health to support regional health programs

EAC Member State Institutions (Burundi, Kenya, Rwanda, South Sudan, Tanzania, Uganda)	Global Technical Partners	Donor Institutions
<ul style="list-style-type: none">• EAC representatives and institutions• EAHRC working groups• Ministries of Health• Ministries of Technology and Communication• Universities• Hospitals and other health institutions	<ul style="list-style-type: none">• Vital Wave• FHI360• European Commission• WHO• Digital Square	<ul style="list-style-type: none">• USAID• Bill and Melinda Gates Foundation• Norad• Global Fund• World Bank

BENEFITS OF REGIONAL COORDINATION IN DIGITAL HEALTH



Achieve **economic efficiencies** through cost savings, economies of scale, and shared digital health resources across the region

Support **improved health systems** by enhancing data sharing, policies and standards, access to and continuity of health care, disease surveillance, and use of data for decision-making

Yield **faster and better implementation** by positioning region as a digital health leader, accelerating implementation progress within and across Partner States, supporting use of evidence for decision-making, and sharing best practices