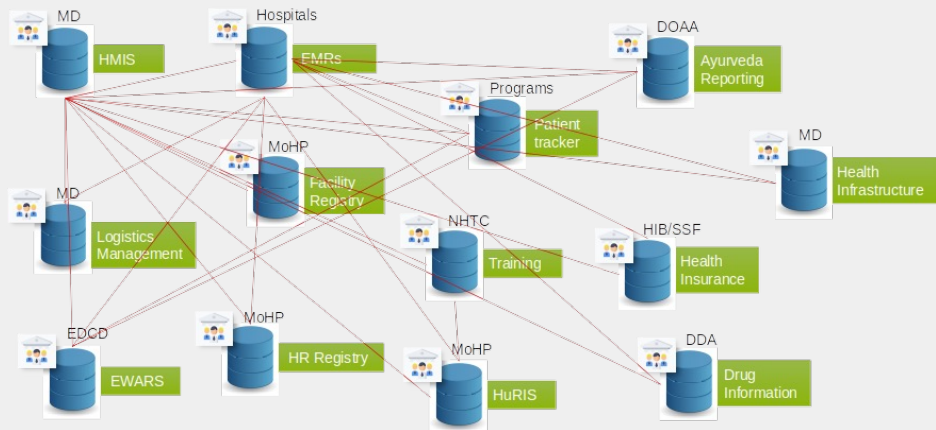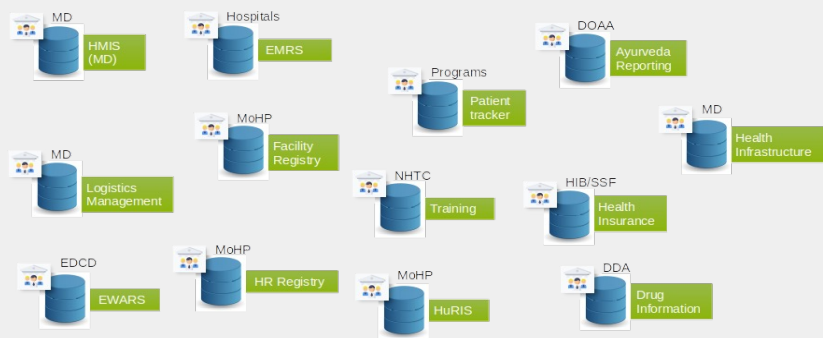# Standards and Interoperability Lab (SIL) Nepal
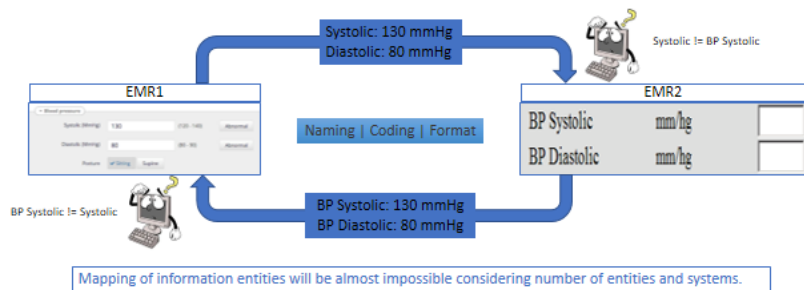
Health Information System Present Context

Representative Health Information System Landscape

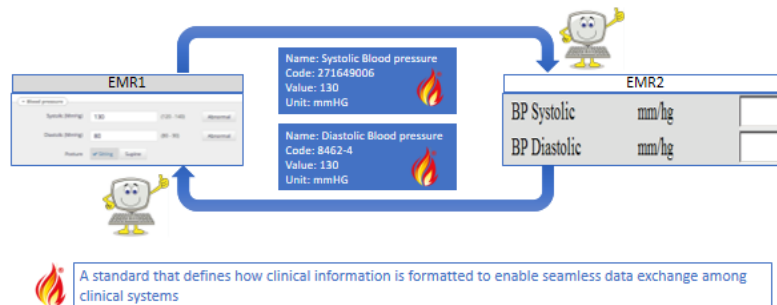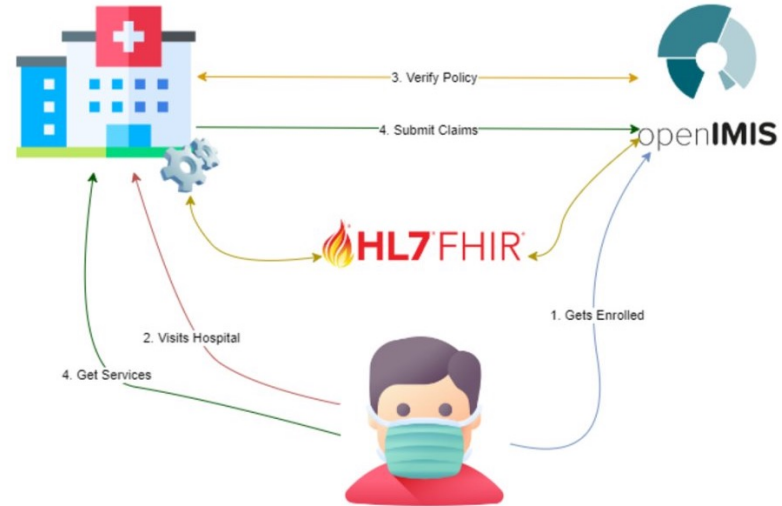# What Next ?

Slide 1: Data Exchange Without Standards

Systolic: 130 mmHg
Diastolic: 80 mmHg

Systolic != BP Systolic

EMR1

Naming | Coding | Format

EMR2

BP Systolic   mm/hg
BP Diastolic   mm/hg

BP Systolic != Systolic

BP Systolic: 130 mmHg
BP Diastolic: 80 mmHg

Mapping of information entities will be almost impossible considering number of entities and systems.

Slide 2: How does FHIR help?

EMR1

Name: Systolic Blood pressure
Code: 271649006
Value: 130
Unit: mmHG

Name: Diastolic Blood pressure
Code: 8462-4
Value: 130
Unit: mmHG

EMR2

BP Systolic   mm/hg
BP Diastolic   mm/hg

A standard that defines how clinical information is formatted to enable seamless data exchange among clinical systems
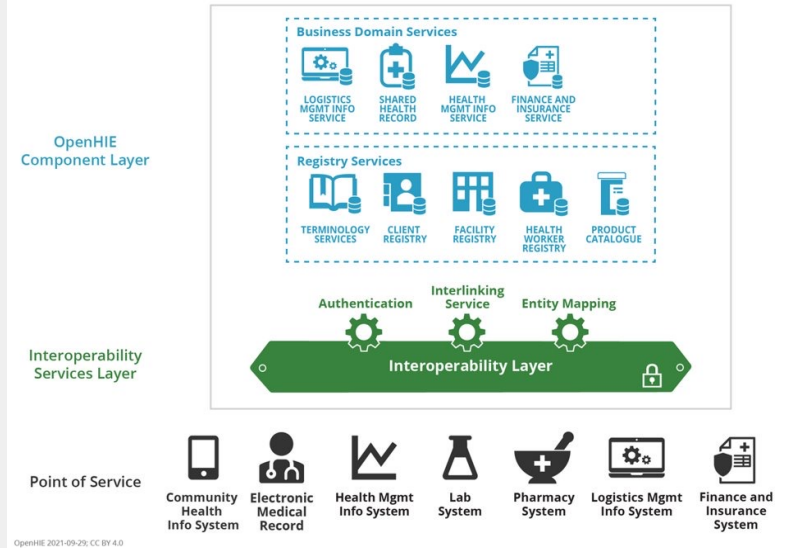
Current Interoperability
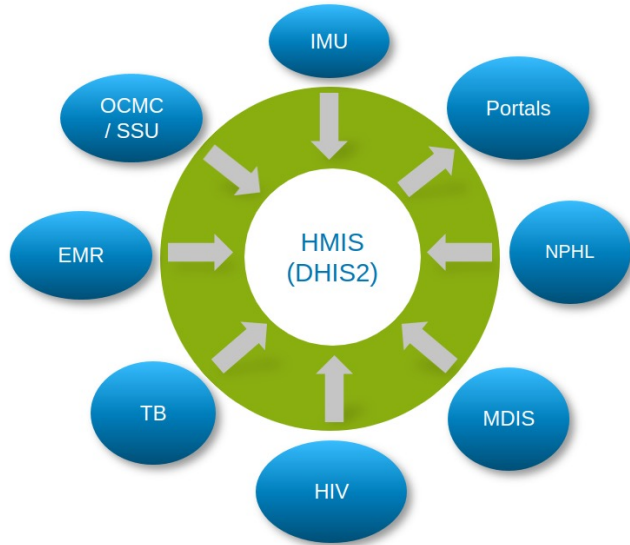
Desired Interoperability

SIL-Nepal Technical Concept

| eLMIS Server | Shared EHR | eLMIS Server | HMIS | EWARS |

| Terminology Server | Client Registry | HF Registry | HR Registry | Product Registry |

Interoperability Manager

HMIS terminal at HF · Mobile Tracker · Hospital EHR · Laboratory · eLMIS at HF · Pharmacy system

OpenHIE Component Layer

Business Domain Services: LOGISTICS MGMT INFO SERVICE · SHARED HEALTH RECORD · HEALTH MGMT INFO SERVICE · FINANCE AND INSURANCE SERVICE

Registry Services: TERMINOLOGY SERVICES · CLIENT REGISTRY · FACILITY REGISTRY · HEALTH WORKER REGISTRY · PRODUCT CATALOGUE

Interoperability Services Layer

Authentication · Interlinking Service · Entity Mapping

Interoperability Layer

Point of Service

Community Health Info System · Electronic Medical Record · Health Mgmt Info System · Lab System · Pharmacy System · Logistics Mgmt Info System · Finance and Insurance System

OpenHIE 2021-09-29; CC BY 4.0

OpenHIE Component Layer

Business Domain Services
- LOGISTICS MGMT INFO SERVICE
- SHARED HEALTH RECORD
- HEALTH MGMT INFO SERVICE
- FINANCE AND INSURANCE SERVICE

Registry Services
- TERMINOLOGY SERVICES
- CLIENT REGISTRY
- FACILITY REGISTRY
- HEALTH WORKER REGISTRY
- PRODUCT CATALOGUE

Interoperability Services Layer
- Authentication
- Interlinking Service
- Entity Mapping

Interoperability Layer

National ID

Nepal Health Facility Registry

Nepal Health Worker Registry

Technical Specification Bank

openHIM

- HMIS Indicators/ Data Dictionary
- ICD 11
- FHIR

Point of Service
- Community Health Info System
- Electronic Medical Record
- Health Mgmt Info System
- Lab System
- Pharmacy System
- Logistics Mgmt Info System
- Finance and Insurance System

OpenHIE 2021-09-29; CC BY 4.0

How to do ?

What is SIL?

A **collaborative space** within MoHP to bring every stakeholders together to make the healthcare systems of Nepal **interoperable** through **International Standards**

Standards

- **Standards in healthcare define the set of requirements (data structure, file format, protocol, procedures, processes, systems, etc) that must be met and agreed upon by all organizations within a determined health ecosystem to deliver quality healthcare service to its people.**
  - Terminology standards (ICD 11, SNOMED, …)
  - Content standards (HL7, …)
  - Data exchange standards (FHIR, ADX, DICOM, …)
  - Privacy and security standards (HIPPA - US, GDPR - EU, …)
  - International Patient Summary

Why Interoperability Lab?

Facilitates compatibility between systems

Facilitates to exchange the data between system

Facilitates for integrating diverse technologies

Reduces risks of compatibility issues

SIL-Nepal Functions

1 Teaming

2 Tooling

3 Testing

4 Training

SIL-Nepal Functions

1

Teaming
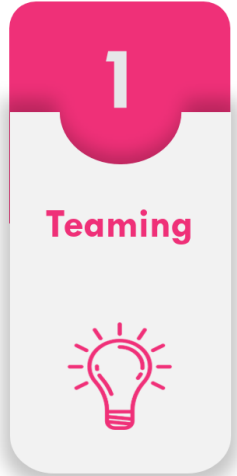
Collaborate with stakeholders such as government, private sector and academia
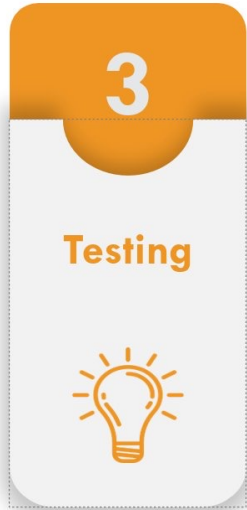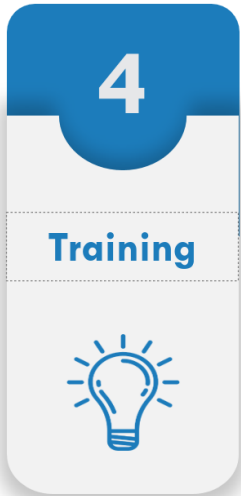
SIL-Nepal Functions

2

Tooling

Develop standards, guidelines, prototypes, training materials

SIL-Nepal Functions

3

Testing

- OpenHIE environment for stakeholders to test their systems
- Test healthcare systems for standards and interoperability

SIL-Nepal Functions

4

Training

Training, workshops and webinar on standards and interoperability

Workplan

Teaming	Tooling	Testing	Training
- Develop SOP for governance and certification - Collaborate with academic institutions for the Interoperability and train academic institutions - Coordinate with SIL-ASIA, AEHIN, and global ecosystem to capacitate in country resources.	- Develop SOP for Lab - Develop standards and guidelines for development - Develop training materials and simulation of the project - Develop web artifacts representing SIL and support to develop the content - Develop standards/ specifications for EMR - Install necessary hardware and software components	- Initialise the OpenHIE based testing environment and POC for Data exchange within the simulated environment - Test health care systems for standards for opensource system e.g DHIS2, OpenMRS	- Webinars on the standards, registries, Interoperability, FHIR Workshop through global practitioner, Train developers through workshop - Webinar every month.

Infrastructures required for the Interoperability Lab

- Hardware (Network Storage, Server, Firewall)

- Cloud Server

- Space on MoHP.

- Fully equipped space for the open collaboration and interaction (White Board, Screen, MiC, Round Table).

- Proper internet connectivity (Take Ref).

- Proper Server system following minimal government compliance.

- Cooling System with Power backup

Current Status	Moving forward
- Server Space allocated - Approved the Interoperability and materialized Digital Nepal Framework to move towards standards and its importance - Facilitated Workshops and orientation to stakeholders - https://digitalhealth.mohp.gov.np/public/ dedicated web space for Digital Health Initiatives and showcase of ecosystem - Technical experts are in place	- Governance for Lab - Facilitate to finalize the SOP for EMR Specifications and terminologies standards - Sustainability Plan

Way Forward

- Awareness session in MoHP along with EDPs, department, academic, MoICT, NTA and relevant stakeholders
- Industry Visit to global ecosystem.
- Financial planning for the sustainability of Lab

Questions?