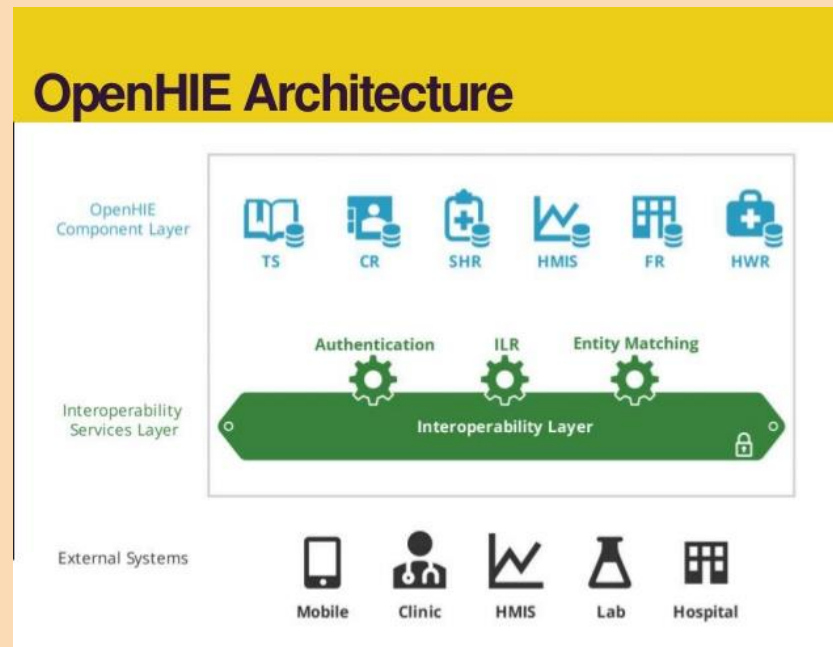# Global Goods Software

Lecture 11: CSE 490c

Announcements

- New Homework Available
- Revised Lecture Schedule

| Lecture 10	Wednesday, October 17	Global goods software	Richard Anderson
Lecture 11	Friday, October 19	Software Architecture	Richard Anderson
Lecture 12	Monday, October 22	DHIS2	Fahad Pervaiz
Lecture 13	Wednesday, October 24	Networking Technologies	Matt Johnson
Lecture 14	Friday, October 26	UW-Pesa	Clarice Larson

Programming Assignment 2

- Prototype immunization system
- Demonstrate some of the key use cases
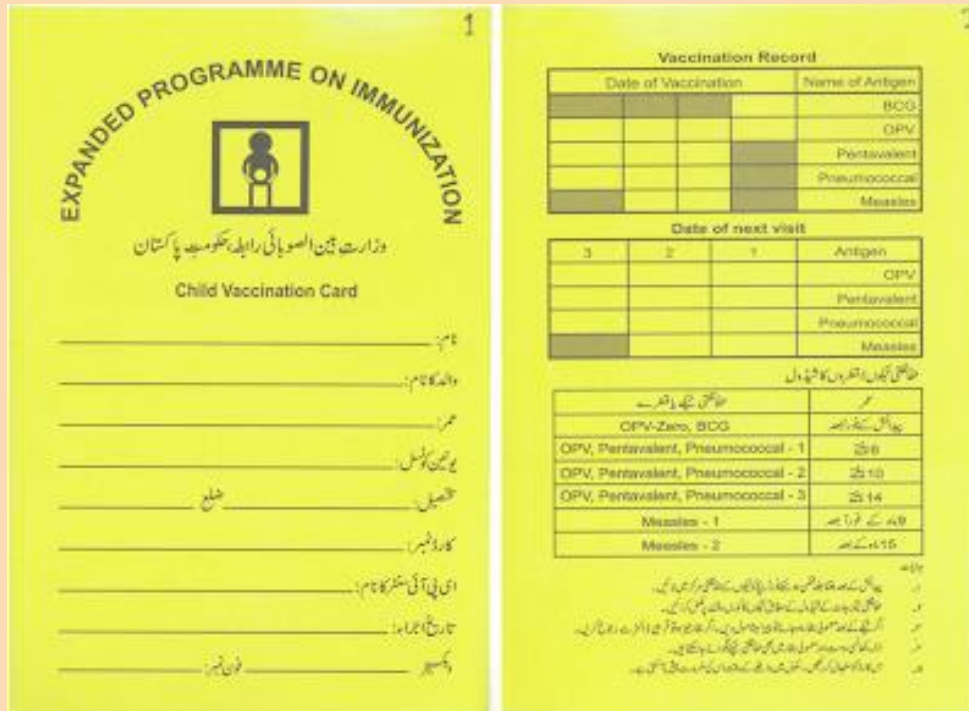
Homework 4

- Background report on immunization systems

- How does one design an electronic immunization registry?

University of Washington, Autumn 2018
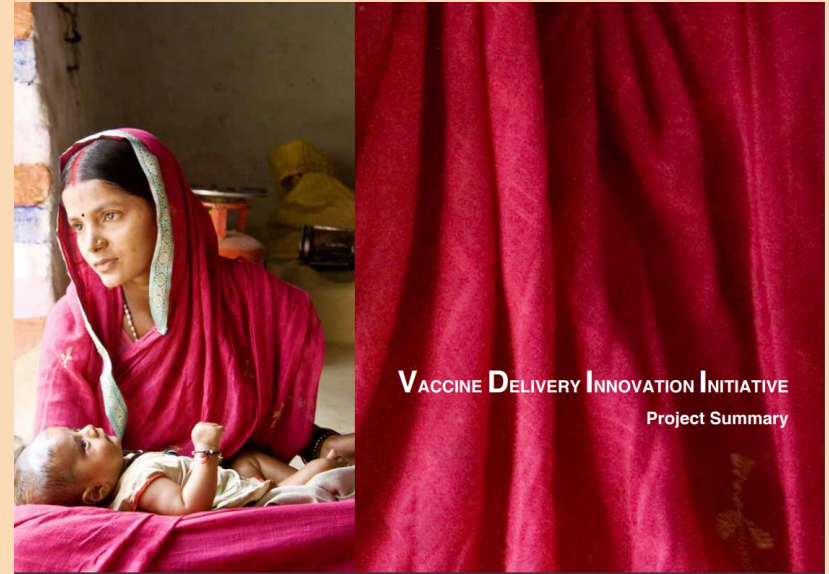
Global Goods Software

- National level systems
- Non-commercial systems
- Examples
  - Aggregate Reporting
  - Case Reporting
  - Surveillance
  - Logistics – Ordering
  - Logistics – Stock Levels
  - Medical Record Systems
  - Laboratory Information
  - Registries
  - Vital Registration
  - Workforce management

Key questions

- What are the primary use cases for the system?

- How can the system be of benefit to stakeholders?

- What are the architectural considerations in building the system?

- Why not utilize commercial solutions?

- Is the use case best covered by a stand-alone solution or part of a system?

Challenges

- Funding model
- Technologist vs Programmatic needs
- Siloed domains
- Process complexity
- Infrastructure

Funding Model

- Donor funding for project implementation
- Donor funding for public goods
- Little funding available for routine deployment
- Commercial software based on high cost vendor lock in

Technologist vs Programmatic needs

- Technology people are drawn to the domain
  - But then they focus on technology
- Business model for technologists is still a challenge

Siloed Domains

- Health Programs (and other donor programs) target specific domains
  - Malaria
  - Immunization
  - HIV
  - Specific Agricultural Crops
- Development of systems for specific programs
  - Determined by funding
  - Difficult to fund goods outside programs
  - Feeling that individual programs are privileged

Complexity of the process

Medicines & Technologies supply chain complexity – Tanzania 2007
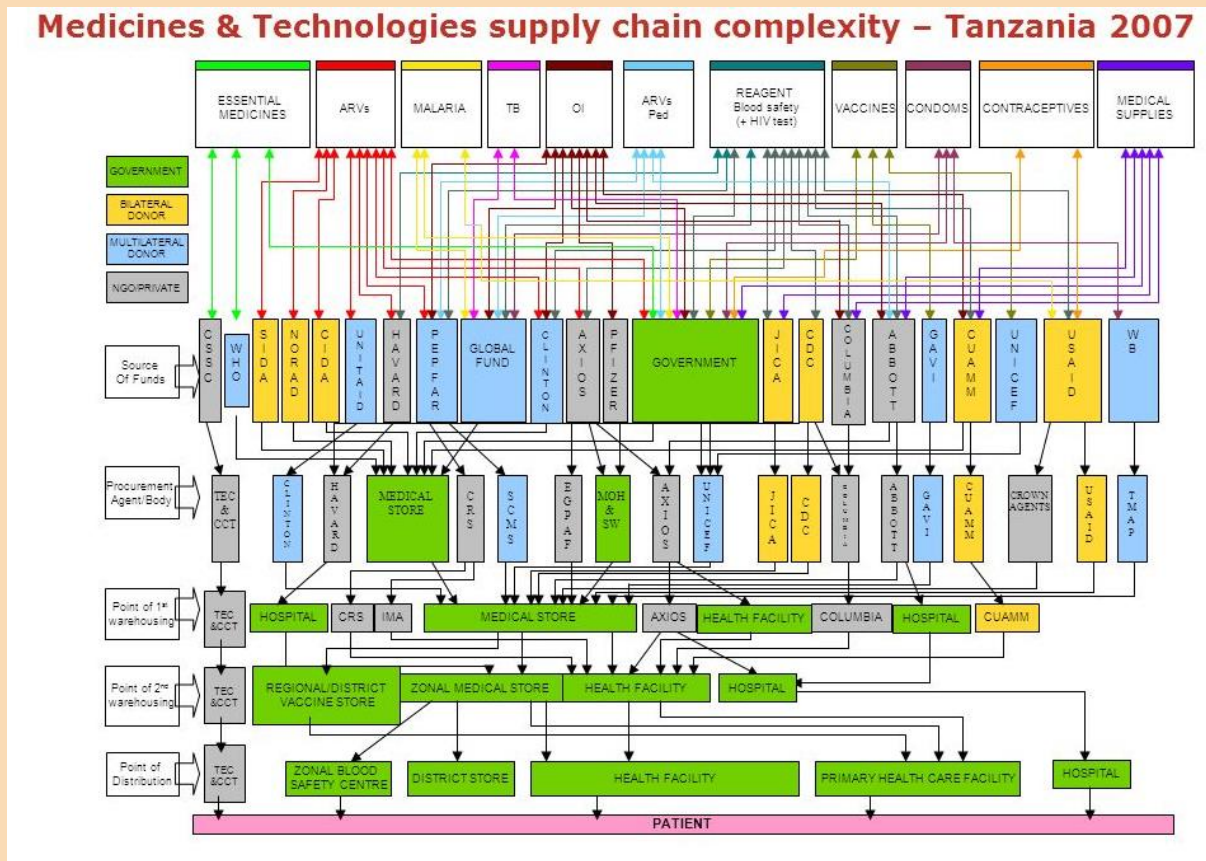
Infrastructure

- Last mile connections
- Power and bandwidth
- Server hosting
- Technical capacity

Structure of global goods

- Donors
  - Money and governance
- Platforms
  - Systems deployed at country level
- Products
  - Single use applications

History of Global Goods Software

- Microsoft Era:
  - Visual Basic and Microsoft Access
  - Data transfer through feed-forward files

- Server:
  - Storage, Service, Presentation layers
  - Mysql, Tomcat, Java

- Hosted:
  - Micro service architecture
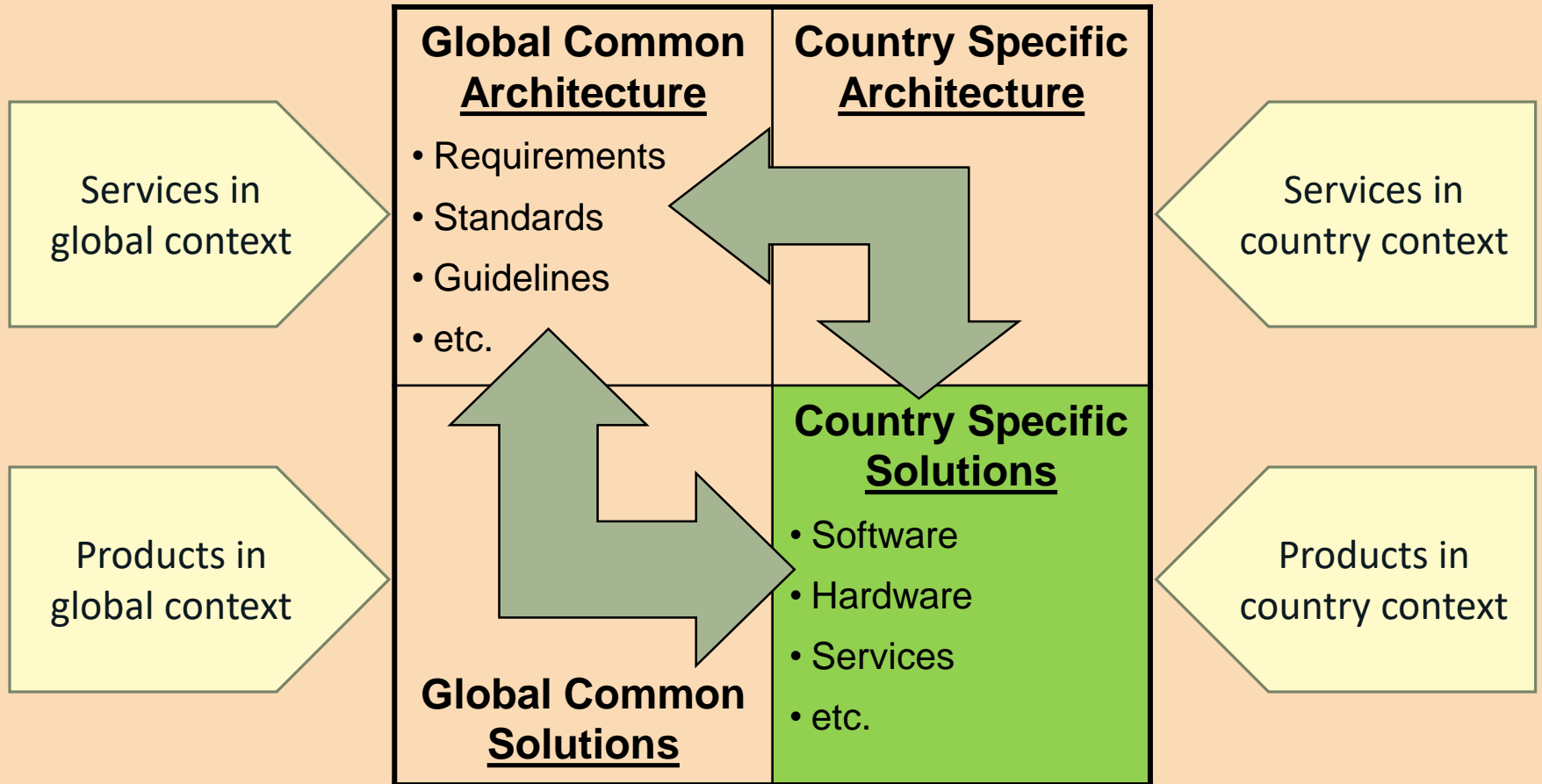 - Docker, Server side javascript, Nosql DB
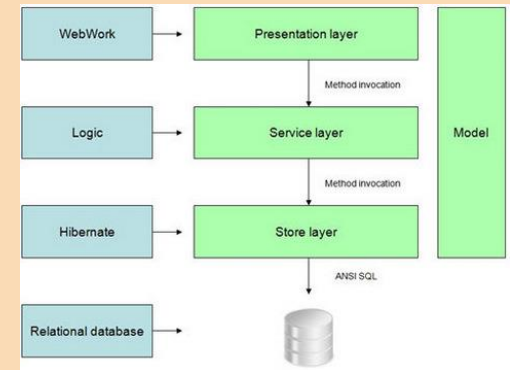
National Software Architecture

- How do the different systems work together?

- Avoid duplication of systems and work

- Solution one
  - One system to rule them all

- Solution two
  - Place nice together, interoperability

2x2 Architecture Grid (Lubinski)

Services in global context

Products in global context

Global Common Architecture
- Requirements
- Standards
- Guidelines
- etc.

Country Specific Architecture

Country Specific Solutions
- Software
- Hardware
- Services
- etc.

Global Common Solutions

Services in country context

Products in country context

Conceptual HIS Framework

Data Sources

- Census
- Individual Records
- Civil Registration
- Service Records
- Population Surveys
- Resource Records

Routine and Non-Routine Data Collection Activities

Integrated Health Information System

Extract and Integrate Data

Integrated Data Repository

Dashboard, Reports, Queries, Events & Alerts

HIS Actors Using Evidence for Decision Making

- Senior Country Official
- National Public Health Official
- International M&E Officer
- District Health Manager
- Senior Country Official
- Facility Health Officer
- Civil Society

Policies, Resources and Processes
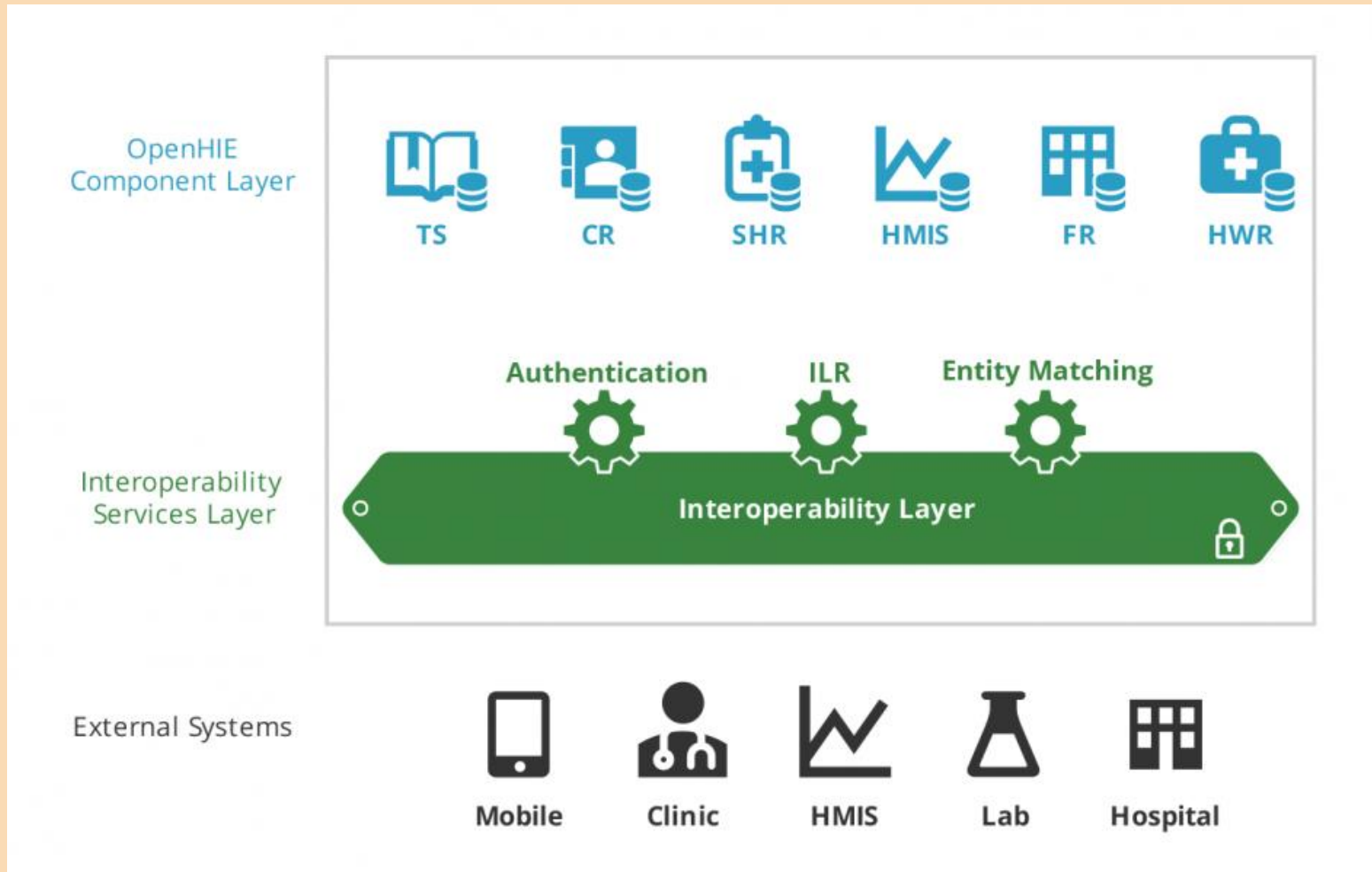
OpenHIE

OpenHIE Communities

- Client Registry

- Facility Registry

- Interoperability Layer

- Health Worker Registry

- Shared Health Record

- Terminology Service

Open Source

- What does open source mean to you?
- Global "Open" projects
  - Generally have some form of open source license
  - Generally are "free"
  - Generally are on Github
  - Generally have implementation communities
  - But generally have centrally managed software development and maintenance