

# The Architecture of Trust

## From digital public infrastructure to equitable AI

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# Every digital health system reflects choices and trade-offs... across contexts, levels of digital maturity and health system capacities

## TRUST

What conditions must be met?

Innovation ↔ Reliability  
Speed ↔ Safety  
Automation ↔ Accountability

## PEOPLE-CENTREDNESS

What outcomes matter?

Efficiency ↔ Equity  
National priorities ↔ Individual needs  
Standardisation ↔ Local context

## FOUNDATIONS

How do we achieve them?

Services ↔ Infrastructure  
Programme needs ↔ Shared capabilities  
Short-term delivery ↔ Long-term sustainability

## LEARNING

How do systems get better?

Certainty ↔ Experimentation  
Scale ↔ Local adaptation  
Action ↔ Evidence

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*"A complete absence of trust would prevent [one] even getting up in the morning."*  
Niklas Luhmann

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*"The aim is not to increase trust, but to place it well."*  
Onora O'Neill

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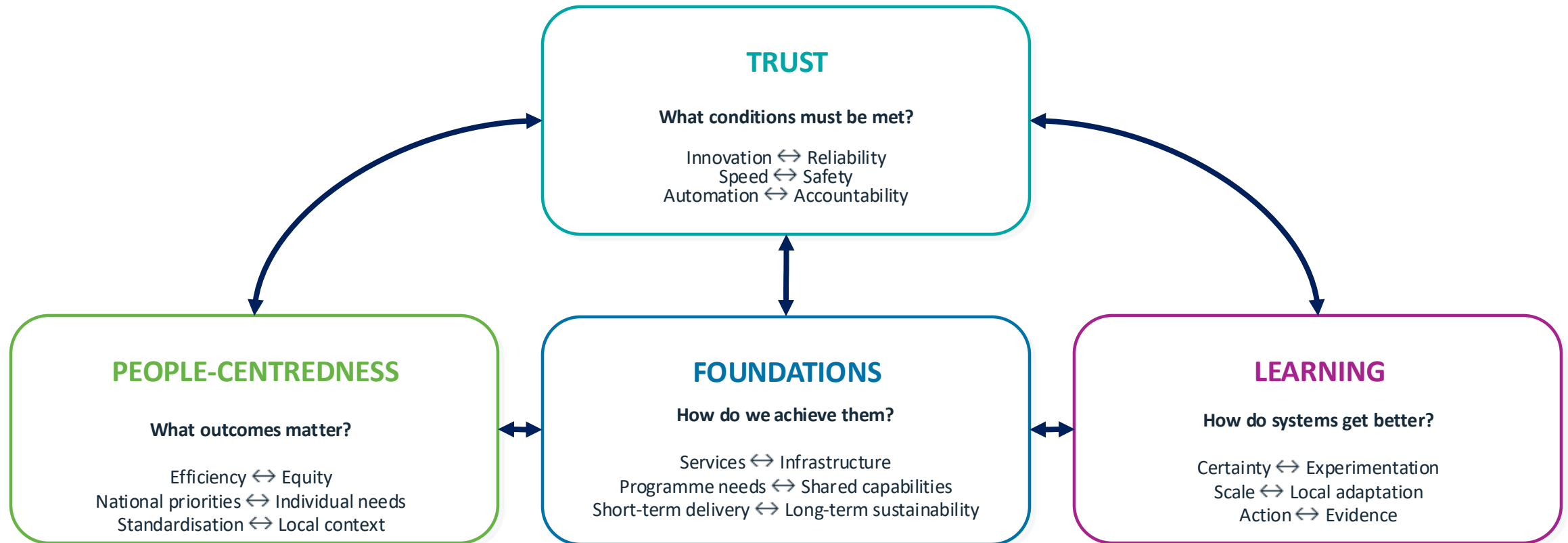
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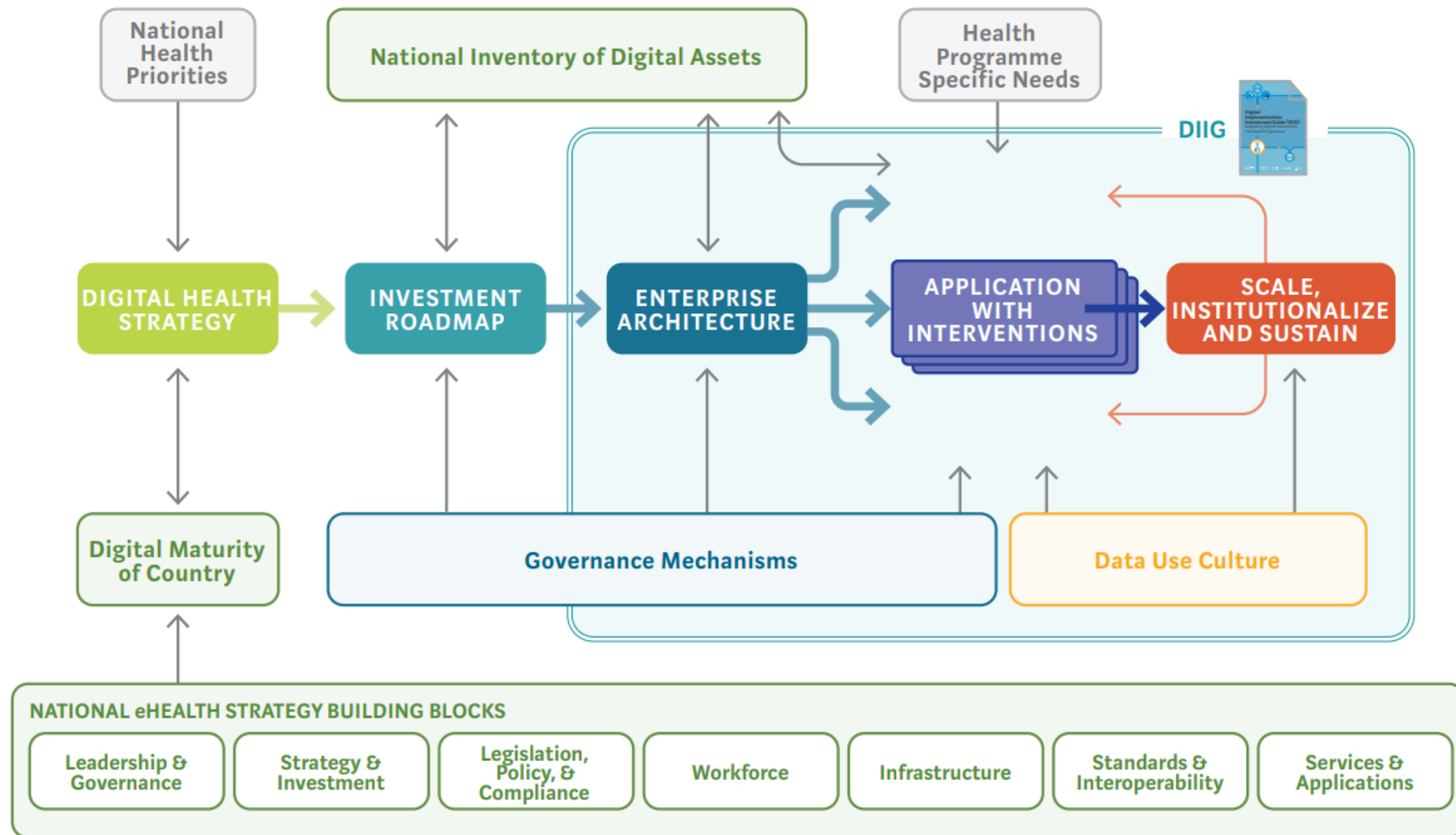
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# What have we learned?

Implementing sustainable digital health technologies in countries requires detailed planning

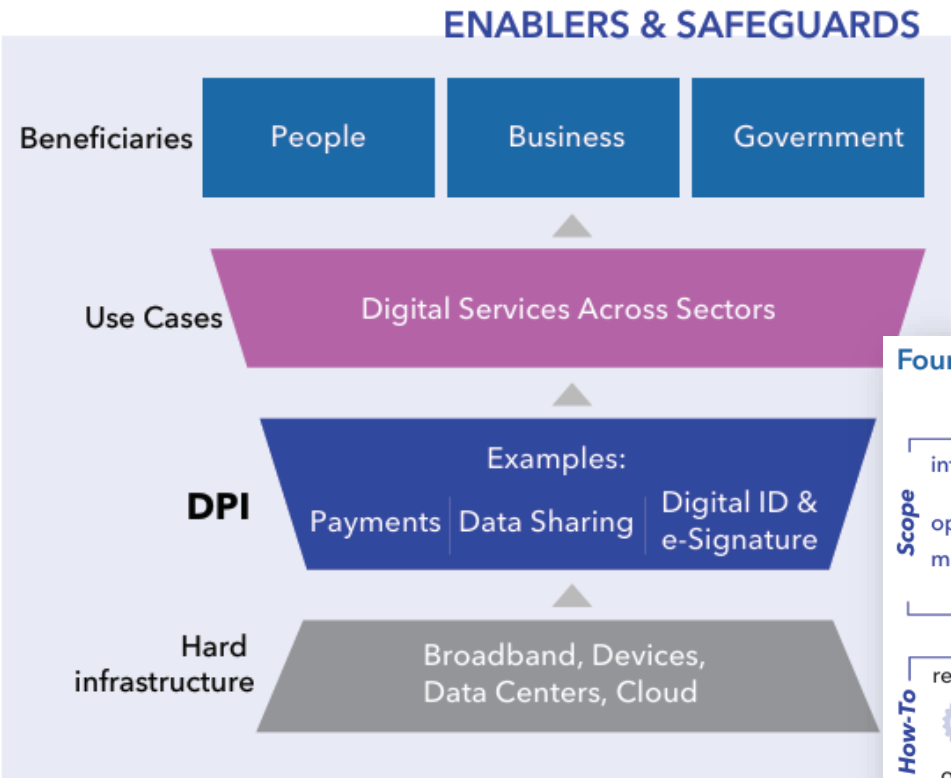


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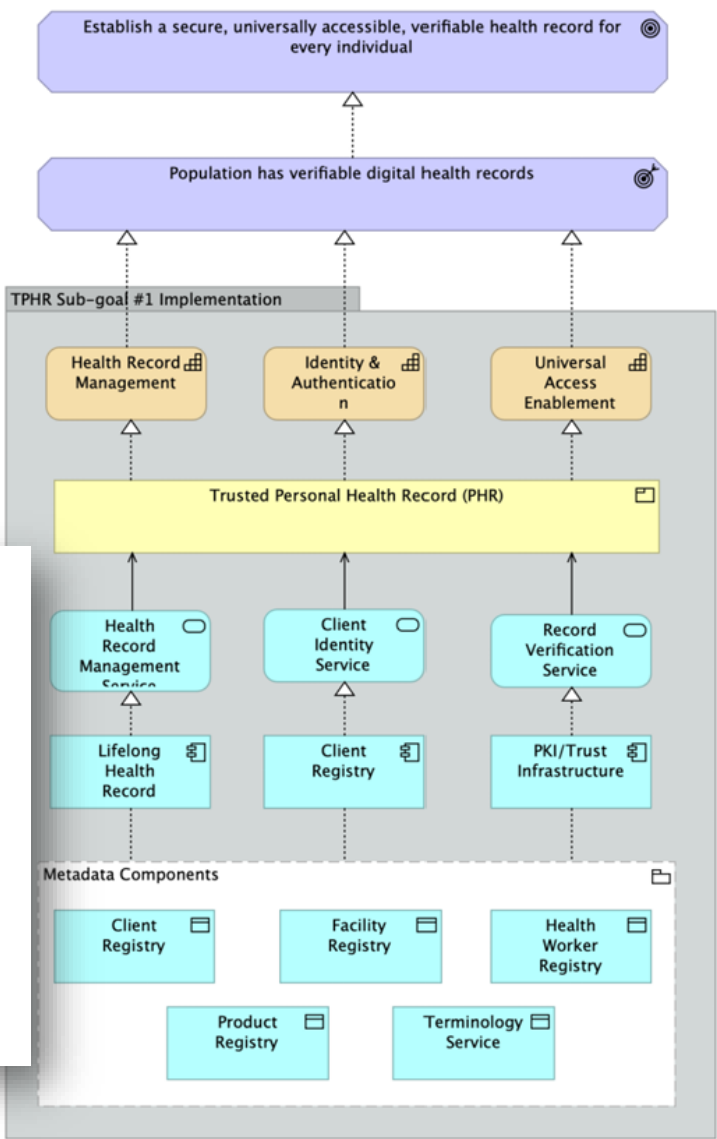
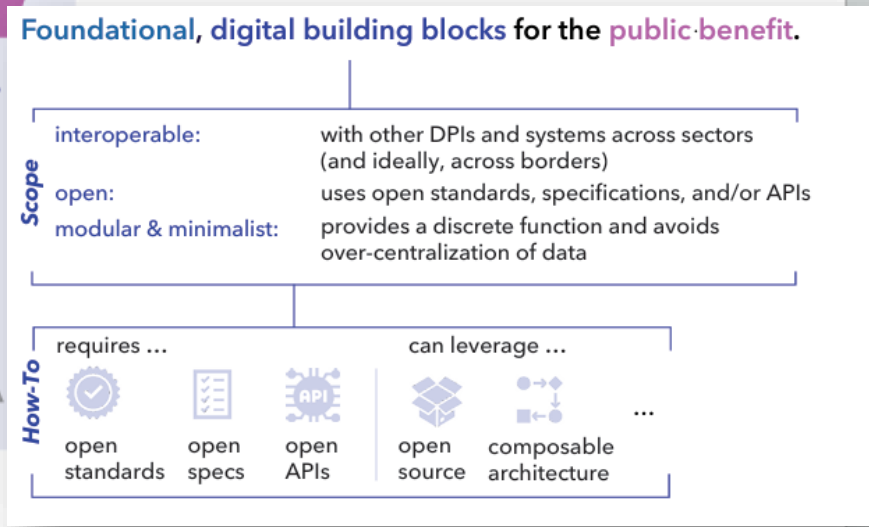
# What this looks like in practice



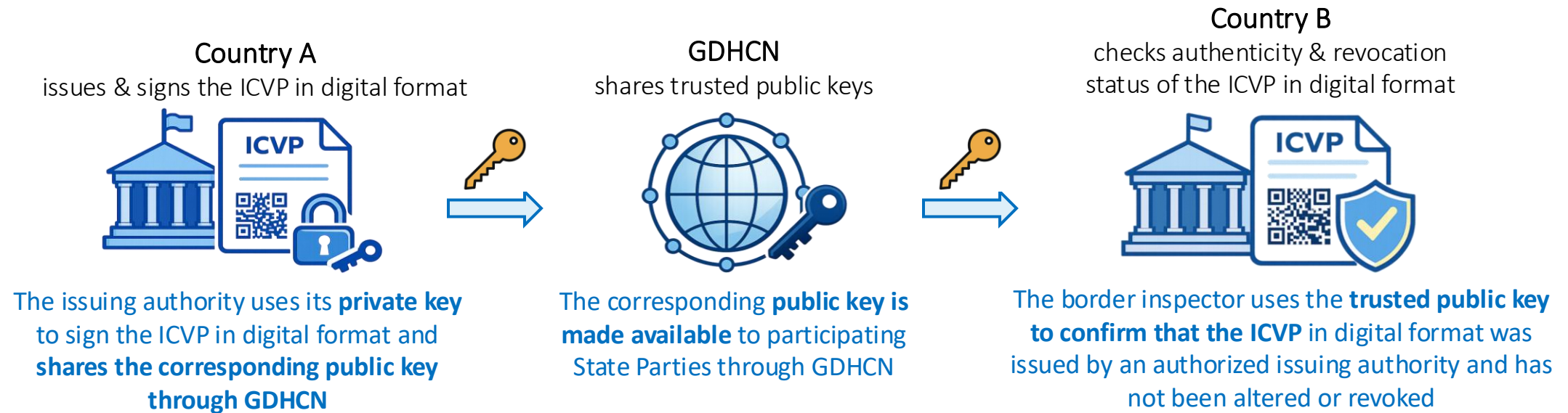
# Reference Architecture and Guidance for Digital Public Infrastructure for the Health Sector (2026)



Layered view for one sub-goal relating to Establish Trusted Personal Health Records — from sub-goal and outcome, through capabilities and services, to metadata components



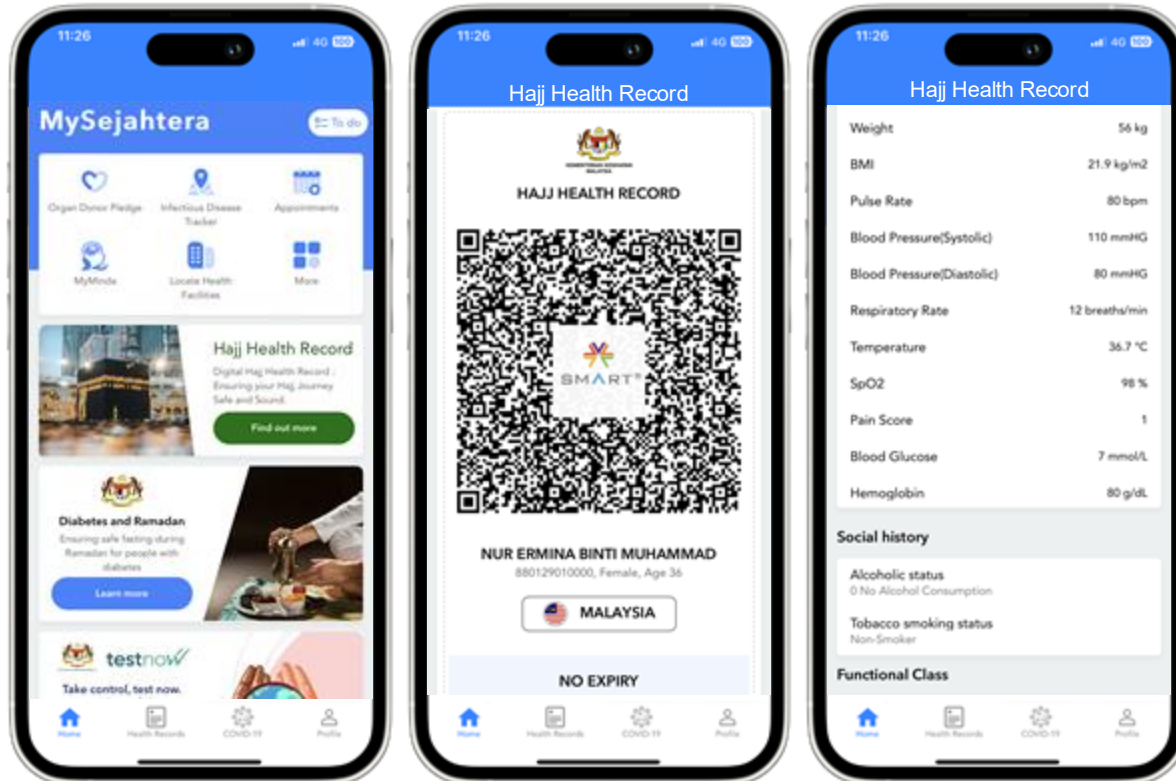
# How Public Key Infrastructure (PKI) supports ascertainment of authenticity through the WHO Global Digital Health Certification Network (GDHCN)



- Public keys are issued by **Certificate Authorities (CAs)** which can be (not-exhaustive list): **Private sector CA, Ministry of ICT/eGovernment, Ministry of Health, etc.**
- It is up to each country to **ensure proper key security** whether self-signed or through a third party
- Public keys need to adhere to GDHCN standards (common industry standards X509)

- Use of GDHCN **does not require new technical infrastructure** to be built
- Enables **cross border acceptance** of digital certificates
- Supports **interoperability** across systems and trust networks - **82 participants<sup>1</sup>** currently using GDHCN
- Builds on experiences from COVID-19 pandemic with verifiable credentials
- Builds on **regional initiatives** (i.e. EU DCC, Latin America/LACPass)
- Shown **success in expanding** to other use cases (i.e. Hajj health record)

# Example from Malaysia's MySejahtera application for Hajj Trust Domain



- Pilot among Kingdom of Saudi Arabia, Indonesia, Oman, and Malaysia
- Phase 1: Unplanned care with pilgrim consent
- First cross-border implementation of patient-mediated of health documents
- **Verifiable International Patient Summary (IPS)**
- **Future:**
  - Phase 2: Unplanned care in an emergency “break the glass” directives
  - Expansion to more countries
  - Expansion to Umrah

# Bridging climate and health data

## Untapped potential to apply climate services for health

74%

of National Meteorological and Hydrological Services (NMHSs) **provide climate data** to the health sector, but

only 23%

of Ministries of Health **use meteorological information** in their health surveillance systems, since

only 31%

of NMHSs have **full or advanced capacity** to deliver tailored climate services for the health sector.



# Climate-Health Surveillance (Dengue)

Climate variability significantly impacts vector-borne diseases (VBDs) like dengue, creating an urgent need for integrated surveillance systems that combine health and climate data. This **foundational interoperability documentation** focusses on trusted sources of data, exchange and practical implementation guidance to support climate-informed VBD surveillance.

## Defined Scope

**Epidemiological Data**  
FHIR

**Climate & Weather Data**  
WIS2.0 (WMO)

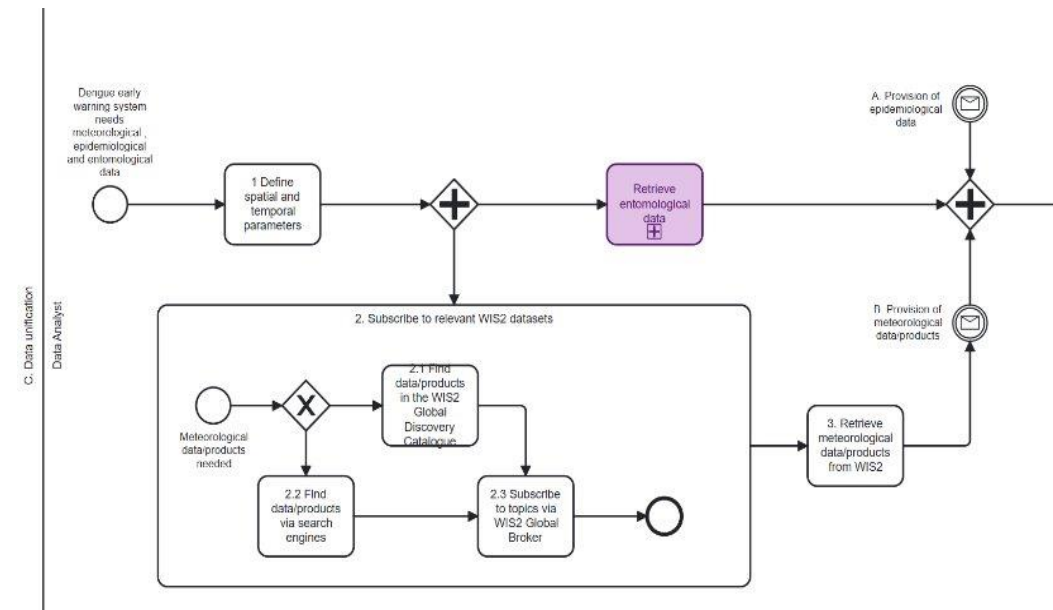
### Data Unification

- Charting both the system and human actors' workflows, from data origin and submission, quality control, through to temporal and spatial harmonization

## Documentation

### [GitHub: Draft \(Linked\)](#)

- Summary
- Generic Personas
- User Scenarios
- Business Processes
- Data Dictionary
- Functional and Non-functional requirements



# Supply chain, microplanning and GIS for Health

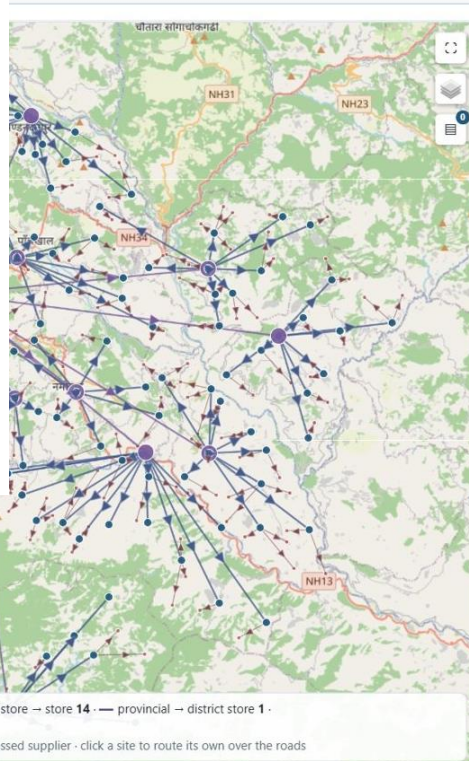
## SUPPLY CHAIN

### Can the vaccine reach them?

- Every leg of the chain routed over the road network: store → store → facility → session site
- Road distance and drive time per leg, by vehicle, with the terrain's effect on speed
- Which legs break the cold life of one delivery, and which sites have no supplier at all
- Where a new cold-chain point would bring the most sites inside one leg

Answers: where to put a fridge, and who supplies whom.

## | Kabhrepalanchok · 352 of 353 sites



Every link routed over the roads; arrow direction is the flow of vaccine



### Eight figures a district can quote

|          |                                                    |
|----------|----------------------------------------------------|
| 2,248 km | of supply links in one district                    |
| 13 min   | median link time — the chain is mostly short       |
| 29 sites | are not on their nearest supplier by road          |
| 12.7 h   | of driving saved if all 29 switched                |
| 0 sites  | have no supplier at all — the register is complete |
| 5 legs   | finish beyond the last band                        |

"12.7 hours saved" is what the model says if every one of the 29 switched. Some will not — a district boundary, an agreement, a road that closes in the monsoon. It is a question worth asking of 29 specific pairs, not a saving to book.

# Meeting people where they are across digital channels

**Social media policy and reporting misinformation:** working with platforms to make content guidelines fit for purpose. Fast-track access lets WHO flag and remove harmful content quickly

**Video Games & Health:** working with 40+ companies and research partners on how gaming environments shape health and wellbeing

**Fides:** 800+ healthcare influencers countering misinformation, reaching 150 million people worldwide across various digital channels



# Towards Equitable and Responsive AI for Health

# Enable policies, standards, guidance on AI for health



Guidance on ethics and governance of AI for health



Generating evidence for AI-based medical devices



Ethics and governance of AI for health: Large multi-modal models



The role of AI in sexual and reproductive health & rights



Mapping the application of AI in traditional and complimentary medicine



AI-related health research: ethics review and oversight



AI-enabled Health Innovation and IP: From idea to impact



WHO online course on an introduction to ethics and governance of AI for health

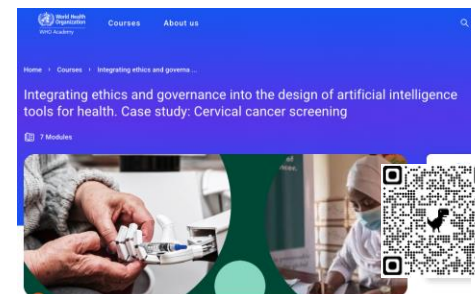
Regulatory considerations on AI for health

Benefits and risks of using AI for pharmaceutical development & delivery

WHO online course for AI designers, developers, and data scientists

Casebook on Real-World Impact of AI in Health

AI & evidence-informed policy



# Direction of Travel: Systems that plan, then act

Given a goal, an agentic system creates and executes a multi-step plan, applies tools, and adapts as it goes, rather than waiting on the next prompt.

*A co-pilot for every public health role?*



*Coordinated through shared protocols: MCP and agent-to-agent standards*

# How much should a system act on its own?

Human-in-the-Loop

## Assistance

AI prepares an output

Person decides and acts

## Execution following approval

AI prepares an output

Person Approves

System Acts

## Execution within limits

System acts within agreed limits

Person intervenes on exception

*The degree of autonomy should match the task's risk level, with safeguards.*

# A nuanced, multi-dimensional risk framework for AI is needed

## HOW CLOSE TO THE PATIENT-PROVIDER INTERFACE?



The further from the interface, the lower the inherent risk.

## HOW INGRAINED IN THE WORKFLOW IS THE AI?

### Dependence

Can staff still function if the tool stops working?

### Embeddedness

If an error occurs, which downstream systems already used its output?

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# Towards AI Verifiability: Digitally-native benchmarks and test-environments to maximize safety, alignment and stability

1

## WHO knowledge

Guidelines, algorithms and indicators, computable and traceable to source

2

## Accessible by any AI

Reachable through vendor-neutral skills

3

## Evaluation test harness

Tested against WHO norms before reaching a patient

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With **Harvard University, Anthropic, Google, and the Gates Foundation** – other partnerships welcome...

# Four open priorities for AI in Health

## 1 Strengthen the foundations

AI readiness for health systems: norms, policies, standards, guidance

## 2 Build governance capacity

Harmonized tools, risk-based classification, a shared taxonomy for regulators

## 3 Generate evidence together

Clinical, operational and economic evaluation, and verifiable, accountable AI

## 4 Redesign the analog systems underneath

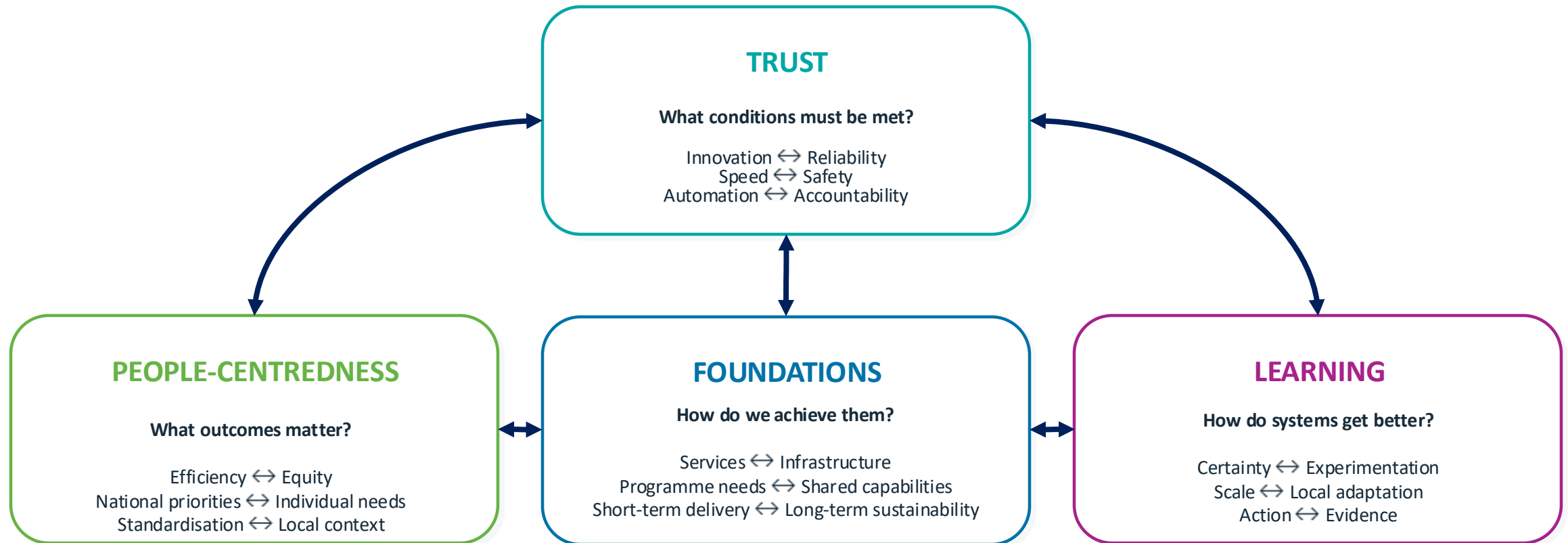
Challenge the analog scaffolding beneath existing workflows

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# Final Reflections



# Every digital health system reflects choices and trade-offs... across contexts, levels of digital maturity and health system capacities



**Architectures of trust** help transform digital capabilities into systems that people, health workers, governments and communities are willing to depend on, especially when the stakes are high