Digital Health
with Self Sovereign Identity

INTEGRATING THE INTERNATIONAL PATIENT SUMMARY (IPS)

WITH VERIFIABLE CREDENTIALS (VC'S)
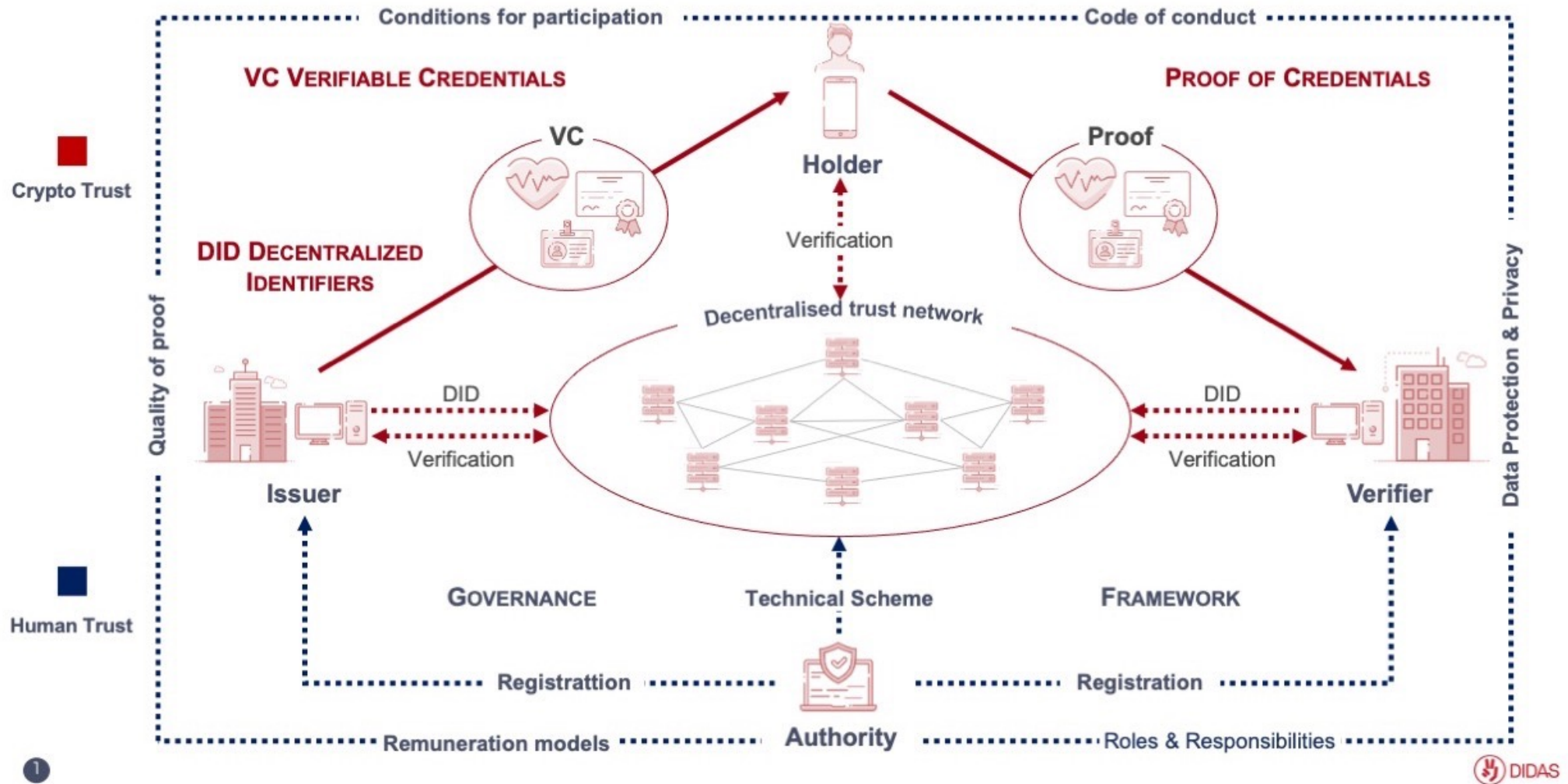
February 2025
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OUTLINE

- Motivation for Self-Sovereign-Identity for Health Data
- Overview of the International Patient Summary
- Proof of Concept Solution Overview
- Demo of Patient Registration Use Case

SSI ECOSYSTEM OVERVIEW

https://www.didas.swiss/

WHY SSI FOR HEALTH?

- Patient-Centric Data Control
  - ownership of health data with patient
- Improved Security & Privacy
  - Confidentiality, integrity & availability
- Reduced Data Breach Risks
  - less reliance on centralized systems
- Better Interoperability
  - SSI as a unifying trust and exchange layer on top of common health data standards

WHAT DOES IT ENABLE?

- Ecosystem of secure health data exchanges - a patient centric decentralized EHR
- Verifiable medical history / diagnosis
- Secure Prescriptions Management
- Lab Test Results Verification
- Cross-Border Healthcare & Insurance
- Medical Identity Verification & Fraud Prevention
- Telemedicine & Remote Consultations

ARCHITECTURE & PROJECT REPOSITORY

https://github.com/Abdagon/health-ssi-2
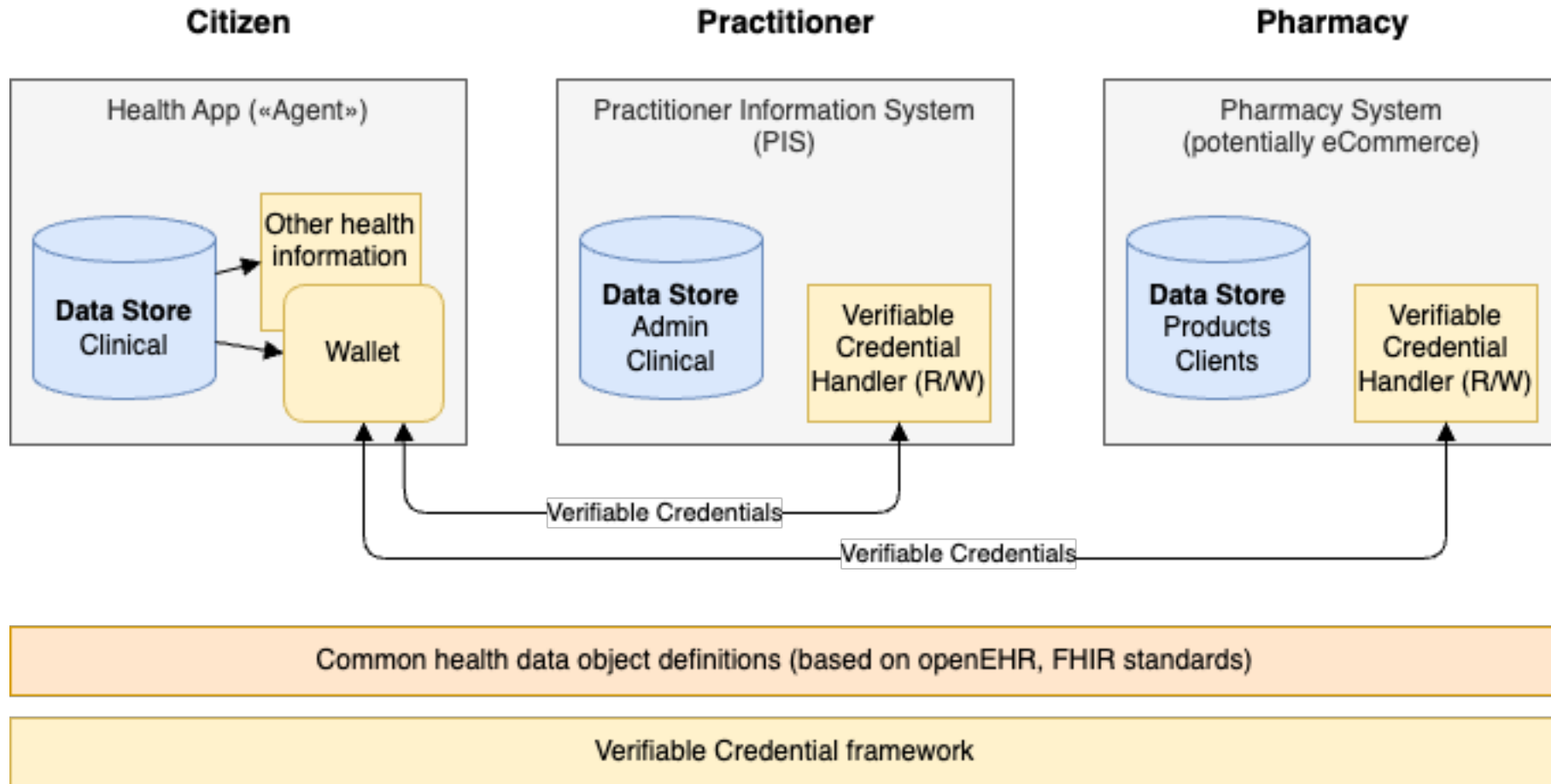
INTERNATIONAL PATIENT SUMMARY

- Contains essential healthcare information
  - minimal and non-exhaustive; specialty-agnostic and condition-independent; but still clinically relevant
  - designed for but not limited to 'unplanned, cross border care'
  - for global application beyond a particular region or country
- International collaborative effort for a health summary
  - Multiple Standards Orgs: ISO, CEN, SNOMED, HL7, IHE
  - Promoted by G7and Global Digital Health Partnership (GDHP)
    - https://gdhp.health/about/whos-involved/ (40 countries + WHO)
  - Strong momentum: https://international-patient-summary.net/looking-back-on-2024-great-uptake/

The International Patient Summary

https://www.youtube.com/watch?v=zAmywqbTkC0

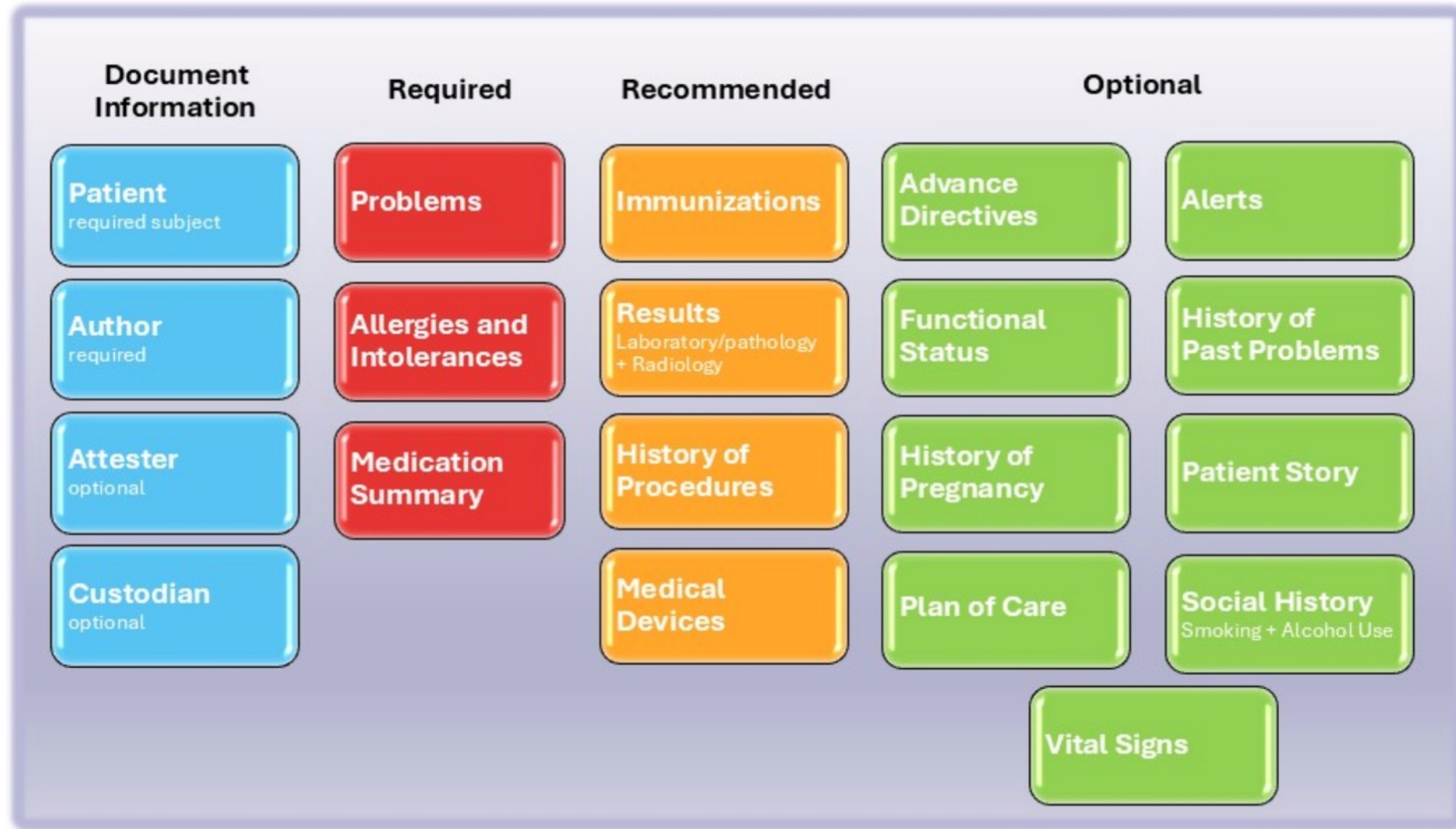# HOW DO YOU GET AN IPS?

- EHR systems leveraging FHIR servers (HAPI, Smile CDR, Kodjin)

- AI powered medical scribe solutions like https://44ai.ch

- https://www.healthintersections.com.au/passport.html

- https://www.commonhealth.org/international-patient-summary

- eHealthPass by Gnomon: https://ehealthpass.eu/

- Epic plans IPS support for 2025
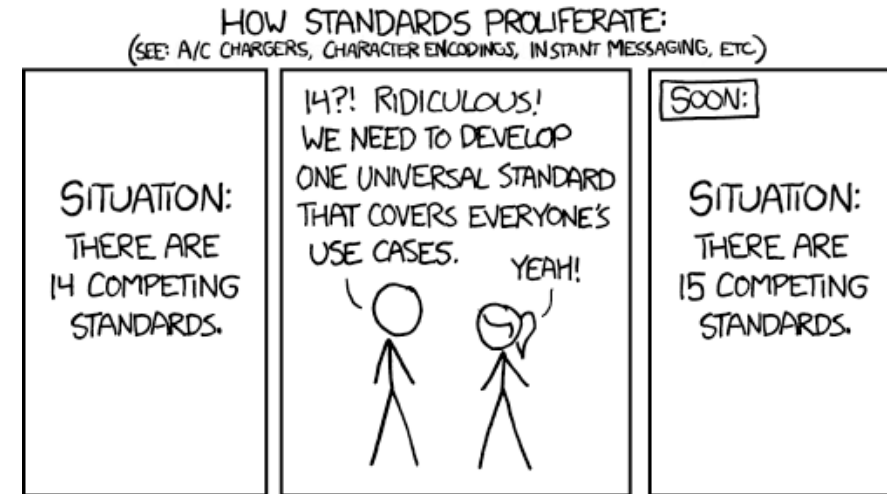
IPS COMPOSITION

HEALTH DATA AS VERIFIABLE CREDENTIALS

- SSI based Smart Health Cards emerged during COVID-19 pandemic, predominantly in the US, UK, Japan, UAE and some other countries: SMART®
  - https://spec.smarthealth.cards/

- Simple mapping of FHIR resources (bundle) as the credential payload
  - Different granularities possible

HOW STANDARDS PROLIFERATE:
(SEE: A/C CHARGERS, CHARACTER ENCODINGS, INSTANT MESSAGING, ETC)

SITUATION: THERE ARE 14 COMPETING STANDARDS.

14?! RIDICULOUS! WE NEED TO DEVELOP ONE UNIVERSAL STANDARD THAT COVERS EVERYONE'S USE CASES. YEAH!

SOON:
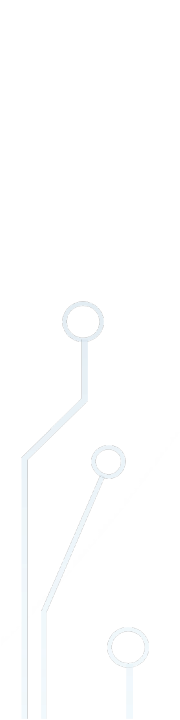SITUATION: THERE ARE 15 COMPETING STANDARDS.

Resulting payload for the `"credentialSubject"`:

```
{
  "...",
  "fhirVersion": "4.0.1",
  "fhirBundle": {
    "resourceType": "Bundle",
    "type": "collection",
    "entry": [
      "..."
    ]
  }
}
```

OBJECTIVES OF PROOF-OF-CONCEPT APP

- Develop self-sovereign PHR mobile application capable of loading a full International Patient Summary (IPS) in FHIR

- Link the data of the IPS with an SSI wallet and map FHIR Resources to Verifiable Credentials

- Implement Patient registration at medical practice through SSI presentation mechanism

SOLUTION OVERVIEW
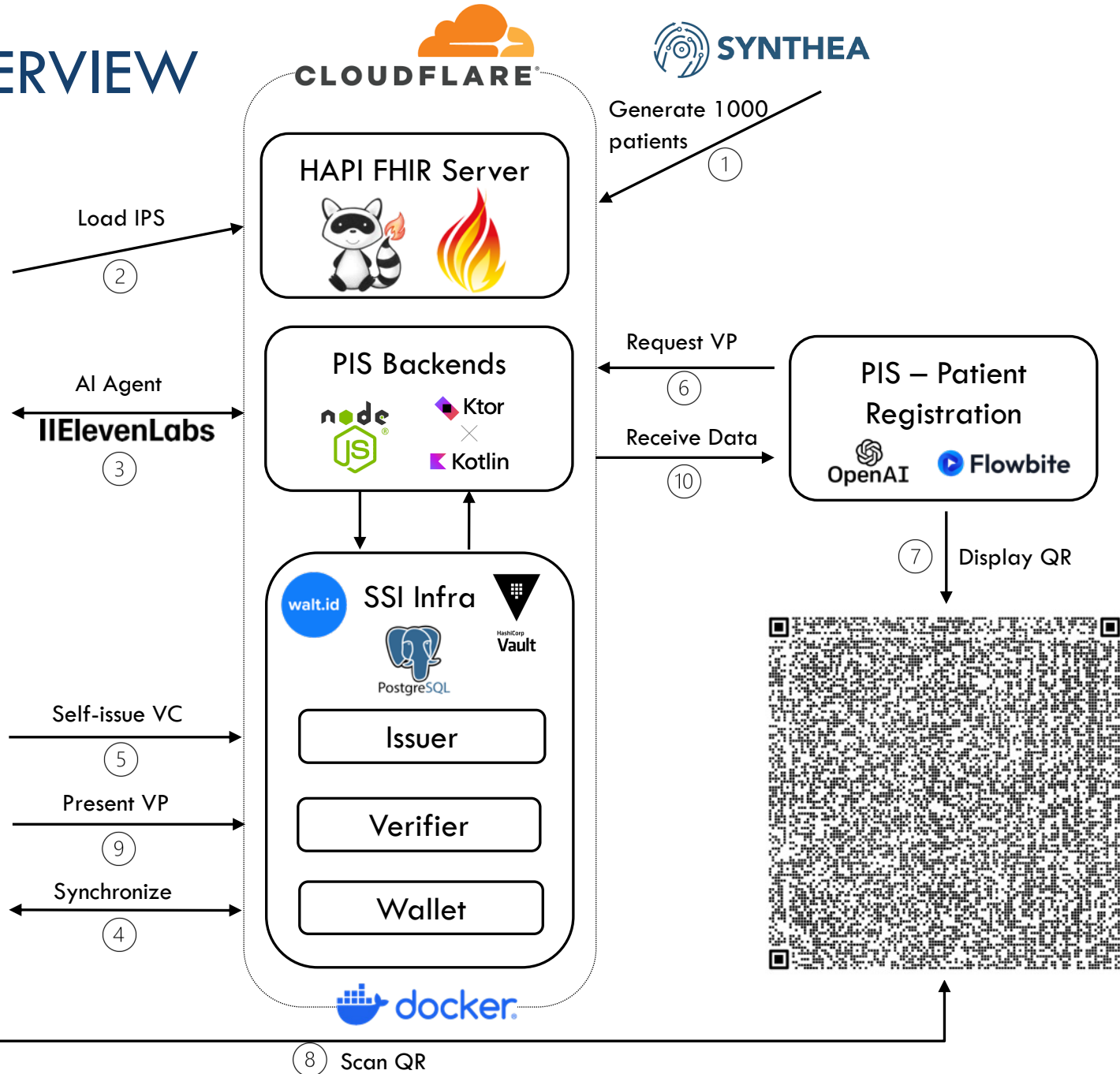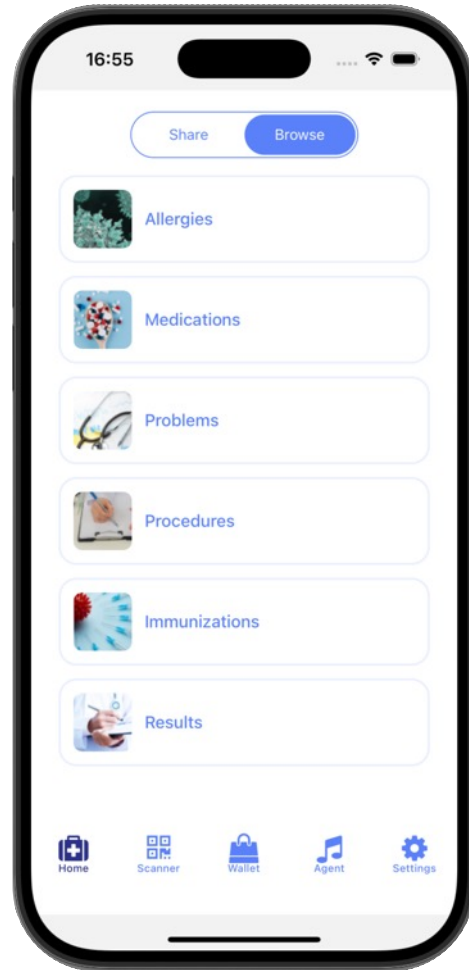
NEXT STEPS

- Polishing
  - Code cleanup, finalize build system, publish to app stores and make code available

- Swiss Public Beta Integration
  - Trust layer, revocations, issuer/verifier

- Move away from hosted wallet to local mobile wallet
  - Investigate Procivis, Veramo, OS native wallets and others

- Personal Data Store integration
  - Evaluate DWN (unfortunately lost funding), Solid pods etc.

- Self-hosted AI model integration
  - Deepseek/Patientseek etc.

ACKNOWLEDGEMENTS

- Peter Janes, for his relentless efforts to drive ahead the digital transformation of the Swiss healthcare system

- Karim Khouja and Nawress Brigui from Wind Consulting Tunisia (last minute support to enhance Mobile App UI/UX)

- Windsurf IDE with Claude 3.5 Sonnet (my core dev team ;-)