

# DYNAMIC DATA SHARING HUB WITH CONSENT FLOW

Transforming  
information sharing  
in the health sector

## Demonstration

*From Dynamic Data Sharing Hub  
To*

**Data Sharing Engine**

*A criteria search solution for  
Decentralized structured data*

Robert - Paul - Philippe  
Mitwicki Knowles Page

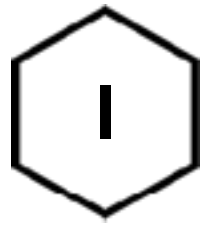
June 28<sup>th</sup> 2021



ESSIF-LAB



HUMAN COLOSSUS  
FOUNDATION



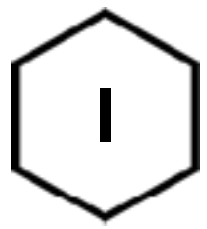
## Our project submission

April 2020  
Project Submission cover sheet



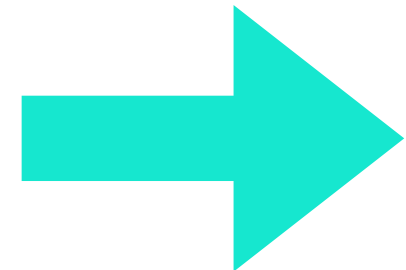
The cover sheet features a dark grey background with a yellow horizontal bar at the top. On the right side, there is a large, stylized illustration of a human head and neck, composed of a grid of white and grey squares, with many squares appearing to float away, suggesting data or information. The text is arranged as follows:

- The Human Colossus Foundation** (in yellow)
- eSSIF-Lab First Business-oriented Open Call
- Project Funded* (in yellow)
- Project Name:**  
Dynamic Data Sharing Hub with Consent Flow
- Project Description:**  
a nine month project to build a data sharing hub allowing to search multiple sources with privacy-by-design and consent-by-design architecture
- Logo of the Human Colossus Foundation (a blue and white geometric shape) with the text "HUMAN COLOSSUS FOUNDATION" below it.



### What you should take away from today

**Faster Patient Recruitment**

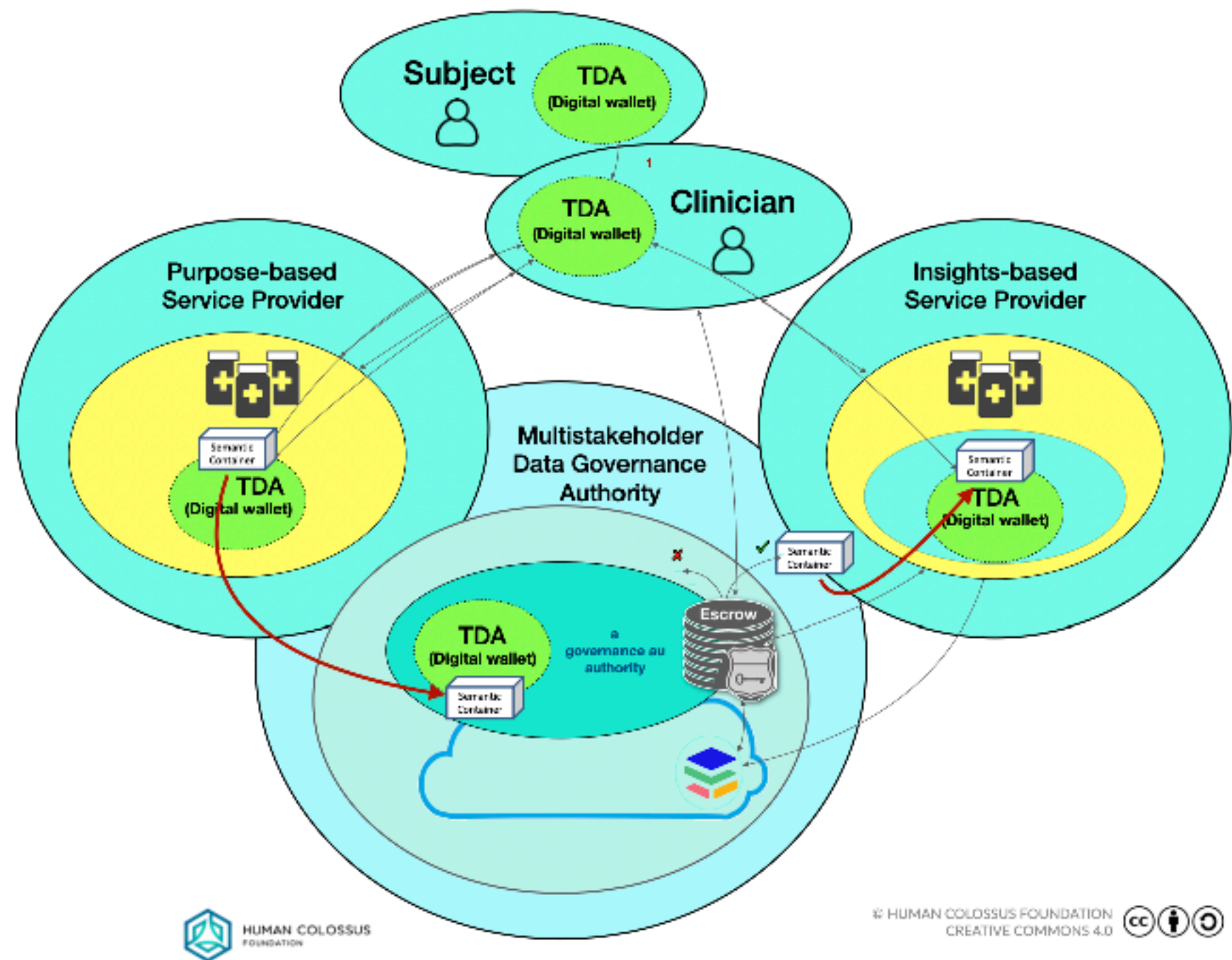
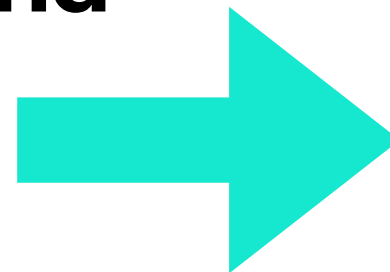


**Made Possible**

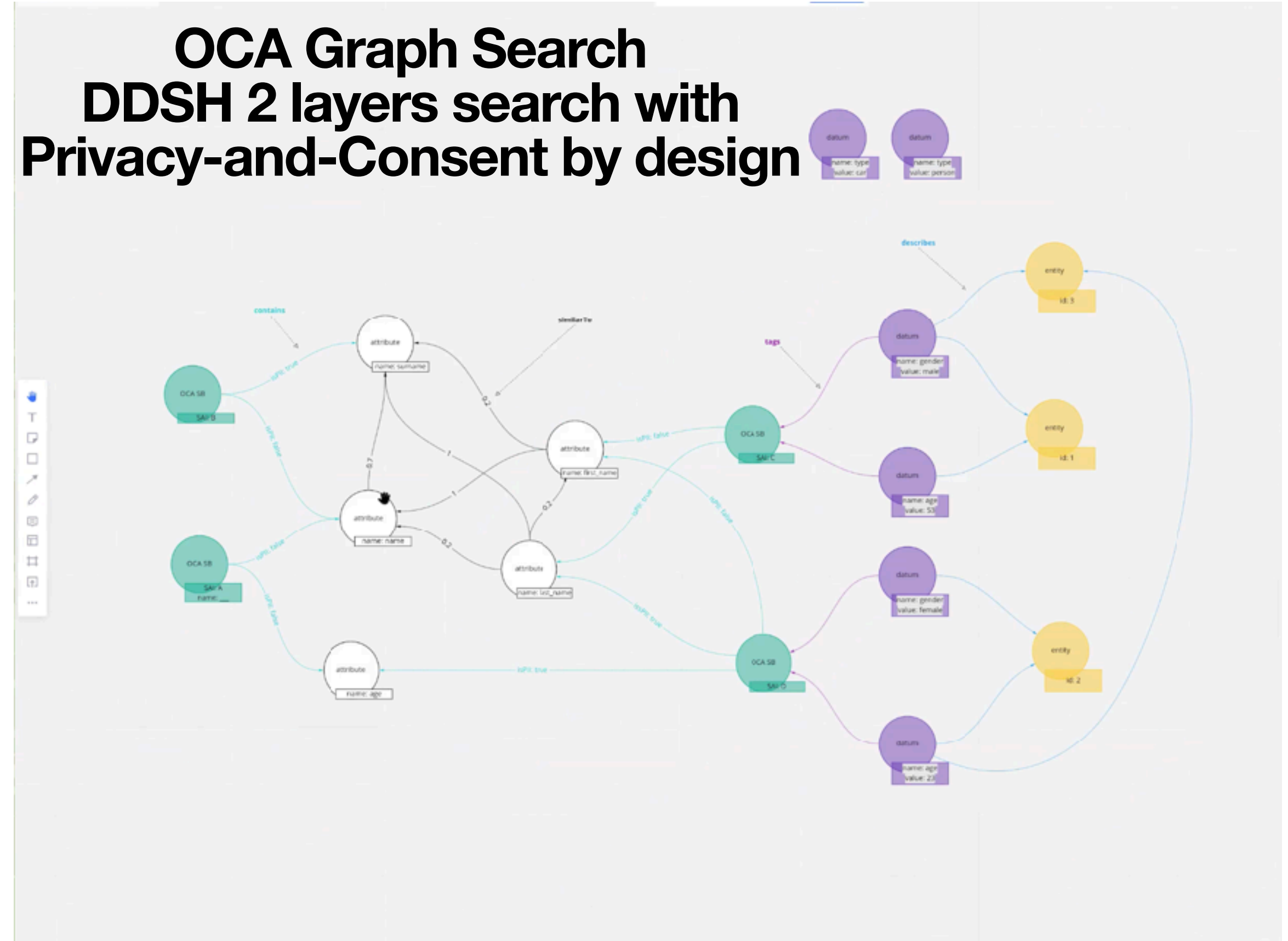
**By**

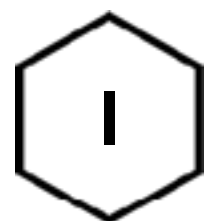
**DDE**

**and**



### OCA Graph Search DDSH 2 layers search with Privacy-and-Consent by design





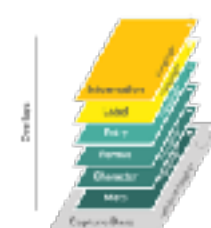
## Technical demonstration focusing on DDSH

### A. Introduction (data transformation pipeline)



Hospital  
Provide a vaccine and other health  
Information

W3C Verifiable Credential



OCA Repository



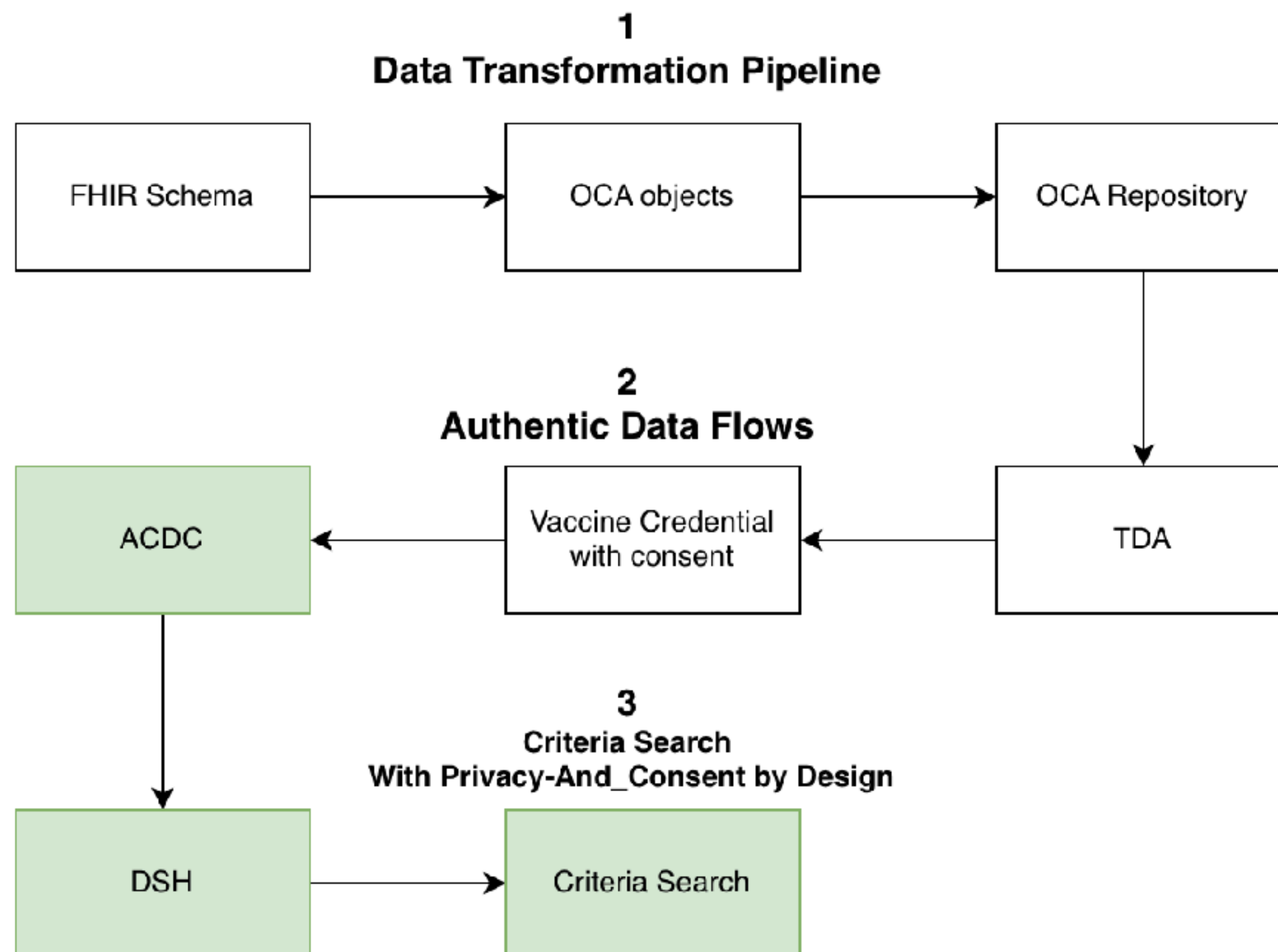
### B. Technical Demo



1 OCA Repository

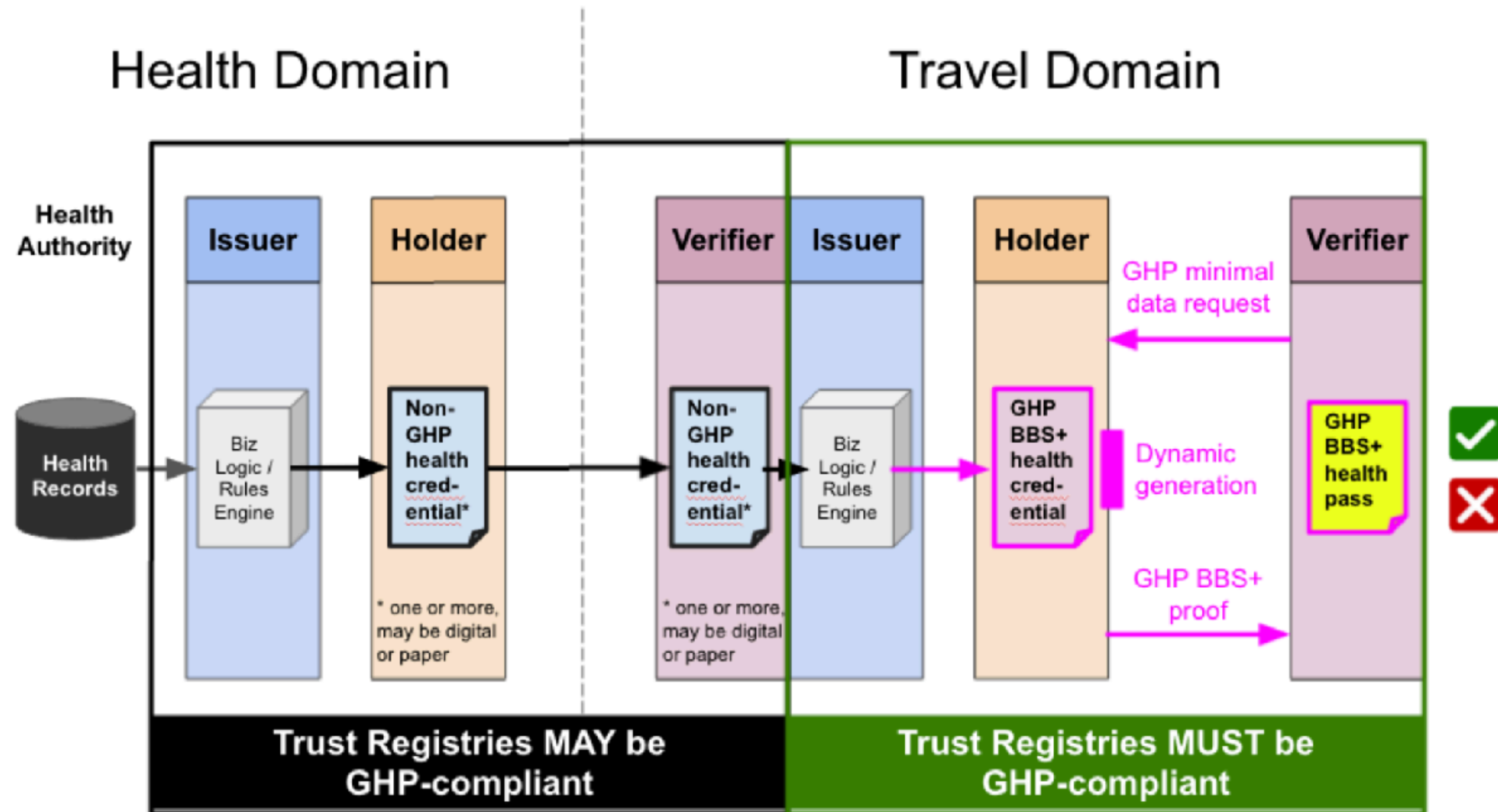
2 Authentic Data Flows

3 Criteria Search



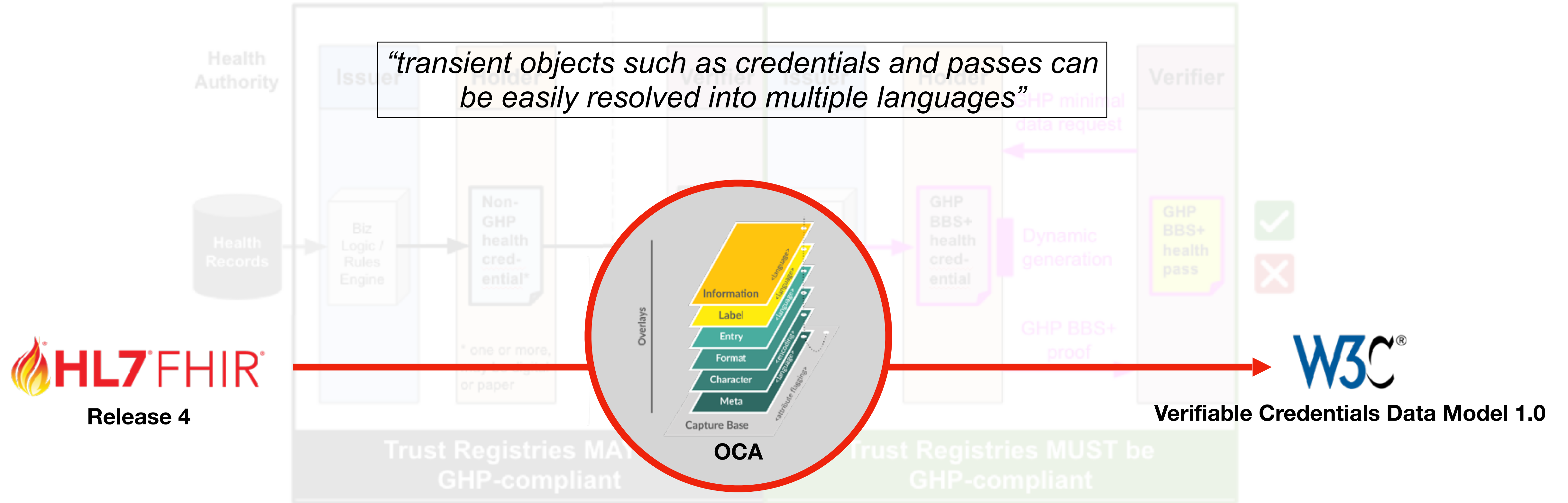


## The **GOOD HEALTH PASS** Transformation Pipeline





## The GOOD HEALTH PASS Transformation Pipeline





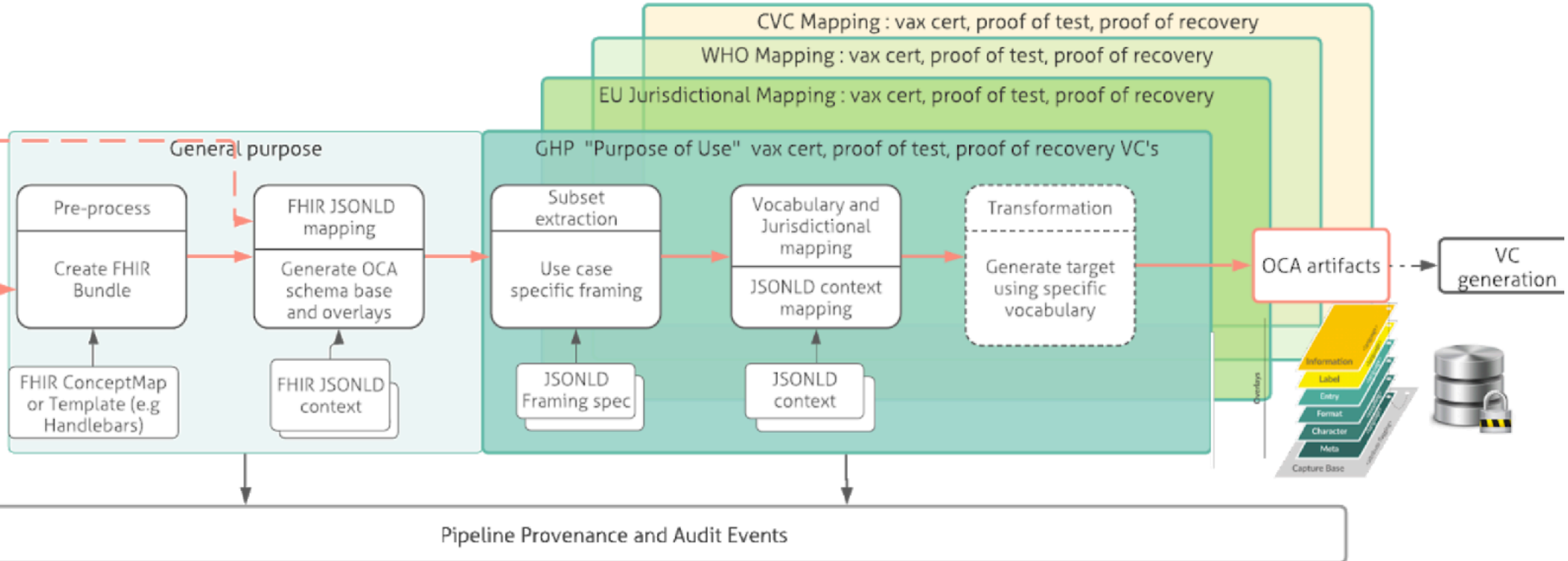
## The GOOD HEALTH PASS Transformation Pipeline

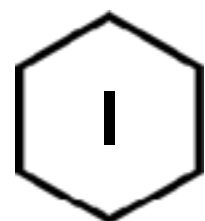
### Semantic Data Pipeline

FHIR Validation, Security Labels and Consent obligations are applied



Input bundle from FHIR data source  
CSV





# Live Screenshare by Robert

## Technical Demo by Robert Mitwicki

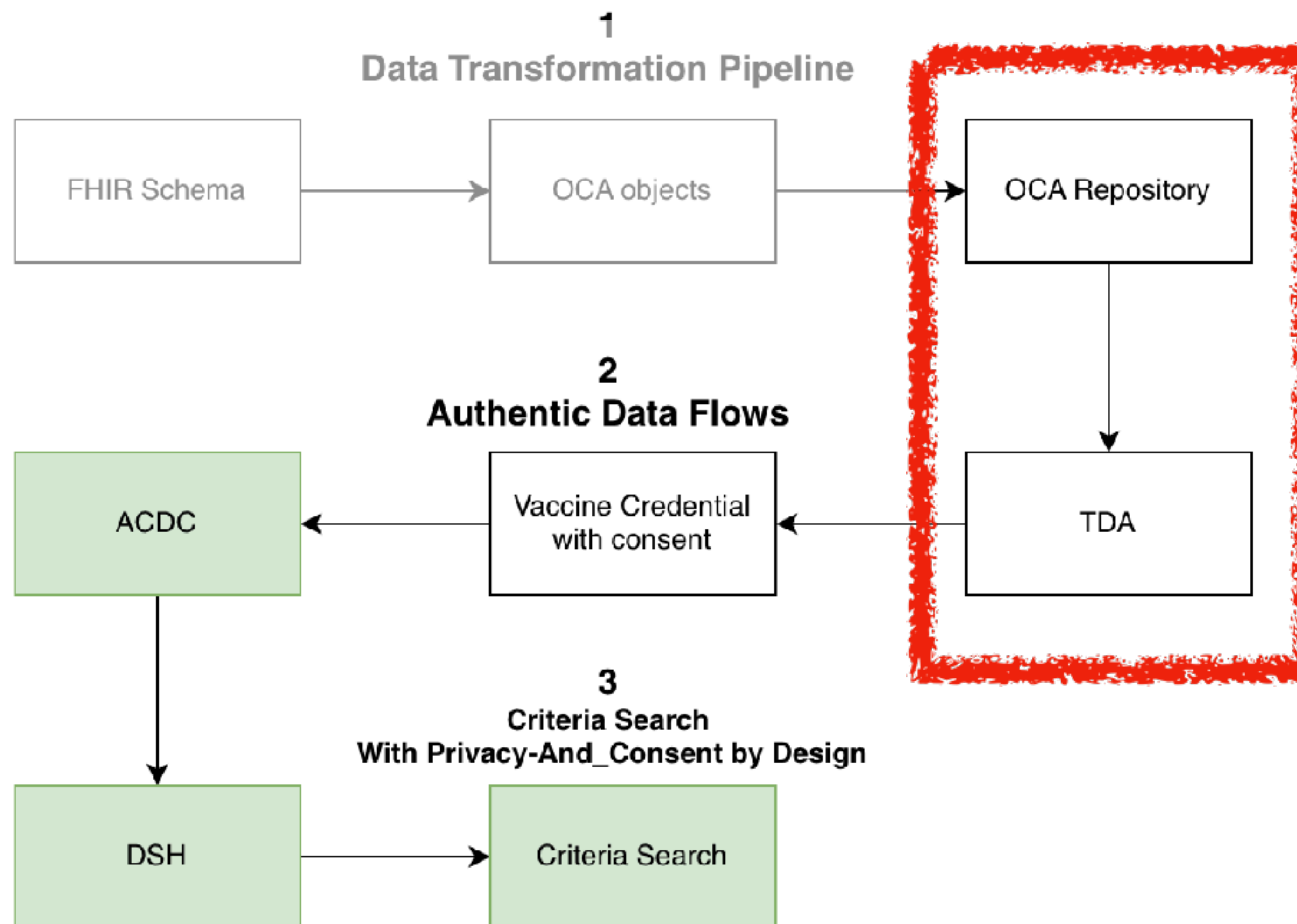
### Part 1 5 minutes

What you will see

- OCA Repository
  - The power of OCA forms
  - Consent Form
  - Internationalisation through language overlay
- TDA = you in the Digital Space
  - Your access to services
  - Patient - Doctor SSI Guardianship

▶ TDA

- ▶ <https://github.com/THCLab/tda-cloudagent-python>
- ▶ <https://github.com/THCLab/agent-api-spec>
- ▶ <https://github.com/THCLab/agent-acceptance-tests>
- ▶ <https://github.com/THCLab/tda-web-client>



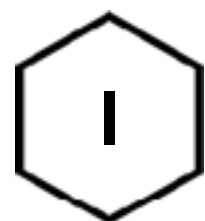


# Live Screenshare by Robert

This screenshot shows the 'Create OCA' and 'Upload OCA' sections of a web application. The 'Create OCA' section includes a text input for 'Enter name', a text input for 'Enter description', and a 'Create' button. The 'Upload OCA' section includes a search bar for 'Search in OCA Repository', a file upload area with 'No file chosen' and a 'Browse' button, and an 'Upload' button. Below these are sections for 'Import base layer' and 'Convert CSV file to OCA', each with a search bar and a 'Browse' button.

This screenshot shows a detailed form for creating a 'Vaccination Credential'. The form is organized into several sections: 'Personal information' (Name, ID), 'Vaccination/physician information' (Event description, Vaccine information), 'Disease or agent targeted' (Medical product name, CVR code, CVR code (North America only)), 'Marketing authorization holder' (Marketing authorization holder, Number of doses administered (EU QMS), Number of dose administrations in a cycle, Number of expected doses for a complete cycle), 'Date of vaccination' (Date of vaccination, Province or territory of vaccination, Country of vaccination), 'Vaccine/physician' (Classification of Disease), 'Certificate metadata' (Vaccine description, Vaccine type), 'Certificate issuer' (Certificate issuer), and 'Certificate holder' (Certificate holder). Each field has a text input or a dropdown menu.

This screenshot shows the 'Trusted Digital Assistant' interface for an 'Accountant [5347c1ed-8f48-40c2-b7eb-5bdc24d77312]'. The interface includes a sidebar with navigation options: My Documents, Address Book, Services, Consent management, Settings, Help, and Logout. The main content area shows 'Services' and 'Applications' sections. The 'Services' section lists 'Vaccination Credential' services offered by 'Bob Smith [5347c1ed-8f48-40c2-b7eb-5bdc24d77312]'. A modal window titled 'Offer new service' is open, showing a dropdown for 'Service' (selected as 'eSSIF / Vaccination Credential'), a 'Consent' dropdown, and a 'Certificate' dropdown. 'CANCEL' and 'SUBMIT' buttons are at the bottom right of the modal.



# Live Screenshare by Robert

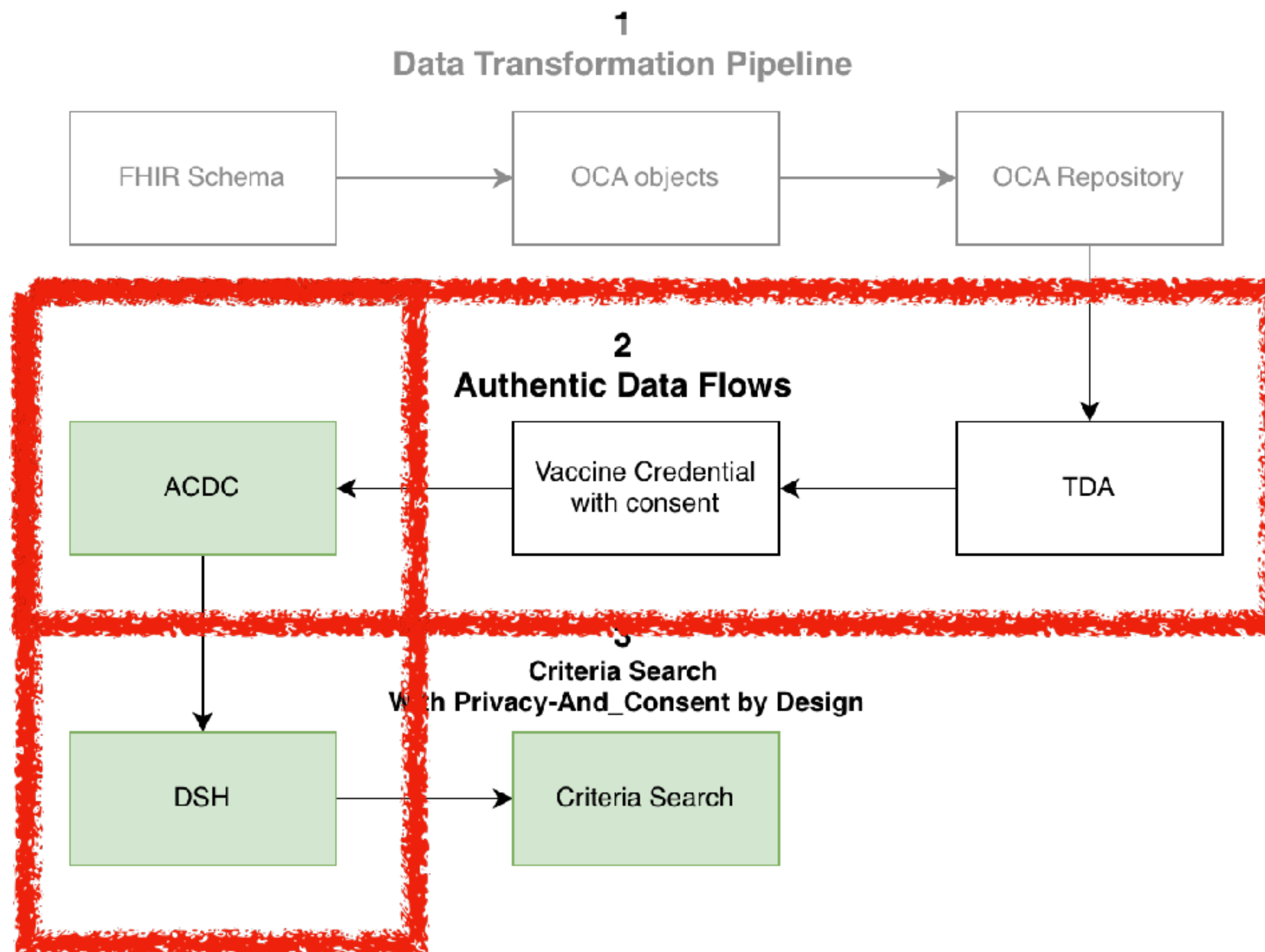
## Technical Demo by Robert Mitwicki

Part 2 5 minutes

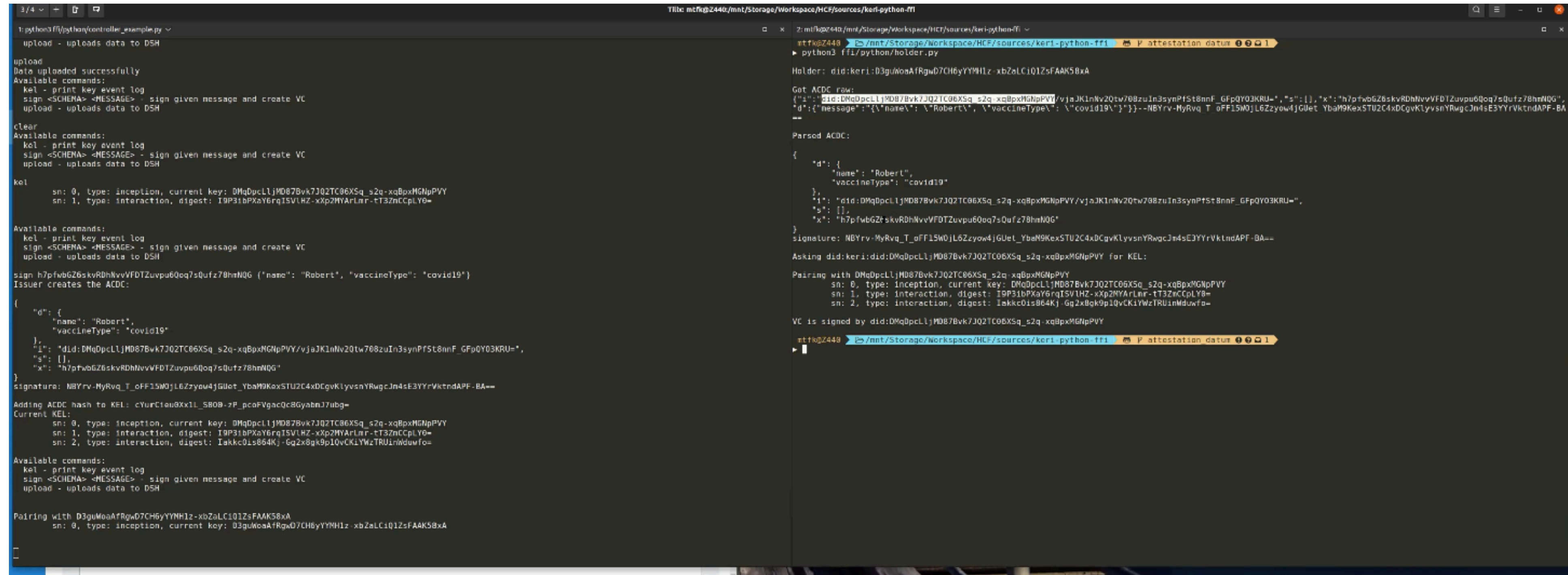
What you will see

- Verifiable Credential Generation
  - From Industry standards to W3C through OCA
- Authentic Data Flows
  - Interoperability without DIDs
  - Security
  - Provenance assurance
  - Self-Identified Container (VC, Data)

- ▶ KERI
  - ▶ <https://github.com/decentralized-identity/keriox>
- ▶ ACDC
  - ▶ <https://github.com/THCLab/acdc-rust>
  - ▶ <https://github.com/THCLab/keri-python-ffi>



# Live Screenshare by Robert



```
1: python3 ffl/python/controller_example.py
upload - uploads data to DSH

upload
Data uploaded successfully
Available commands:
kel - print key event log
sign <SCHEMA> <MESSAGE> - sign given message and create VC
upload - uploads data to DSH

clear
Available commands:
kel - print key event log
sign <SCHEMA> <MESSAGE> - sign given message and create VC
upload - uploads data to DSH

kel
sn: 0, type: inception, current key: DMqDpcLlJMD87Bvk7JQ2TC06XSq_s2q-xqBpxMGNpPVY
sn: 1, type: interaction, digest: I9P31bPXaY6rqISV1HZ-xxp2MYArLnr-tT3ZnCCpLY0=

Available commands:
kel - print key event log
sign <SCHEMA> <MESSAGE> - sign given message and create VC
upload - uploads data to DSH

sign h7pfbwG26skvRDhNvvVFDTZuvpu60oq7s0ufz78hmNQG ("name": "Robert", "vaccineType": "covid19")
Issuer creates the ACDC:
{
  "d": {
    "name": "Robert",
    "vaccineType": "covid19"
  },
  "i": {
    "did": DMqDpcLlJMD87Bvk7JQ2TC06XSq_s2q-xqBpxMGNpPVY/vjaJK1nNv20tw788zuIn3synPfst8nnf_GFpQY03KRU=",
    "s": [],
    "x": "h7pfbwG26skvRDhNvvVFDTZuvpu60oq7s0ufz78hmNQG"
  }
}
signature: NBYrv-MyRvq_T_oFF15W0jL6Zzyow4jG0et_YbaM9KexSTU2C4xDGvKlyvsnYRwgcJn4sE3YYrVktndAPF-BA==

Adding ACDC hash to KEL: cYurC1au8Xx1L_5B0B-zP_pcaFVgacQc8GyabnJ7ubg=
Current KEL:
sn: 0, type: inception, current key: DMqDpcLlJMD87Bvk7JQ2TC06XSq_s2q-xqBpxMGNpPVY
sn: 1, type: interaction, digest: I9P31bPXaY6rqISV1HZ-xxp2MYArLnr-tT3ZnCCpLY0=
sn: 2, type: interaction, digest: Iakkc01s864Kj-Gq2x8gk9p10vCK1YwzTRUlnMduwfo=

Available commands:
kel - print key event log
sign <SCHEMA> <MESSAGE> - sign given message and create VC
upload - uploads data to DSH

Pairing with D3guWoaAfrGwD7CH6yYMH1z-xbZaLC1Q1ZsFAAK58xA
sn: 0, type: inception, current key: D3guWoaAfrGwD7CH6yYMH1z-xbZaLC1Q1ZsFAAK58xA
```

```
2: mlfq@2448: /mnt/Storage/Workspace/HCF/sources/kerl-python-ffl
python3 ffl/python/holder.py

Holder: did:keri:D3guWoaAfrGwD7CH6yYMH1z-xbZaLC1Q1ZsFAAK58xA

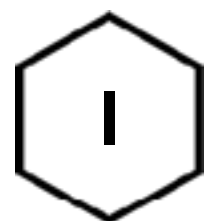
Got ACDC raw:
{"d":{"name":"Robert","vaccineType":"covid19"},"i":{"did":"DMqDpcLlJMD87Bvk7JQ2TC06XSq_s2q-xqBpxMGNpPVY/vjaJK1nNv20tw788zuIn3synPfst8nnf_GFpQY03KRU=", "s": [], "x": "h7pfbwG26skvRDhNvvVFDTZuvpu60oq7s0ufz78hmNQG"}, "signature": "NBYrv-MyRvq_T_oFF15W0jL6Zzyow4jG0et_YbaM9KexSTU2C4xDGvKlyvsnYRwgcJn4sE3YYrVktndAPF-BA=="}

Parsed ACDC:
{
  "d": {
    "name": "Robert",
    "vaccineType": "covid19"
  },
  "i": {
    "did": DMqDpcLlJMD87Bvk7JQ2TC06XSq_s2q-xqBpxMGNpPVY/vjaJK1nNv20tw788zuIn3synPfst8nnf_GFpQY03KRU=",
    "s": [],
    "x": "h7pfbwG26skvRDhNvvVFDTZuvpu60oq7s0ufz78hmNQG"
  }
}
signature: NBYrv-MyRvq_T_oFF15W0jL6Zzyow4jG0et_YbaM9KexSTU2C4xDGvKlyvsnYRwgcJn4sE3YYrVktndAPF-BA==

Asking did:keri:did:DMqDpcLlJMD87Bvk7JQ2TC06XSq_s2q-xqBpxMGNpPVY for KEL:

Pairing with DMqDpcLlJMD87Bvk7JQ2TC06XSq_s2q-xqBpxMGNpPVY
sn: 0, type: inception, current key: DMqDpcLlJMD87Bvk7JQ2TC06XSq_s2q-xqBpxMGNpPVY
sn: 1, type: interaction, digest: I9P31bPXaY6rqISV1HZ-xxp2MYArLnr-tT3ZnCCpLY0=
sn: 2, type: interaction, digest: Iakkc01s864Kj-Gq2x8gk9p10vCK1YwzTRUlnMduwfo=

VC is signed by did:DMqDpcLlJMD87Bvk7JQ2TC06XSq_s2q-xqBpxMGNpPVY
```



# Live Screenshare by Robert

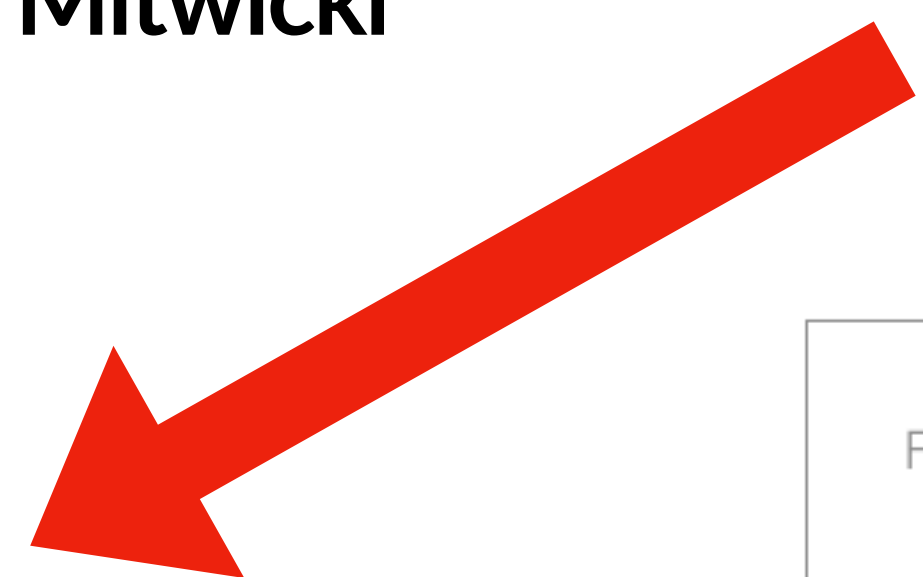
## Technical Demo by Robert Mitwicki

### Secret Sauce of Dynamic Data Sharing Hub

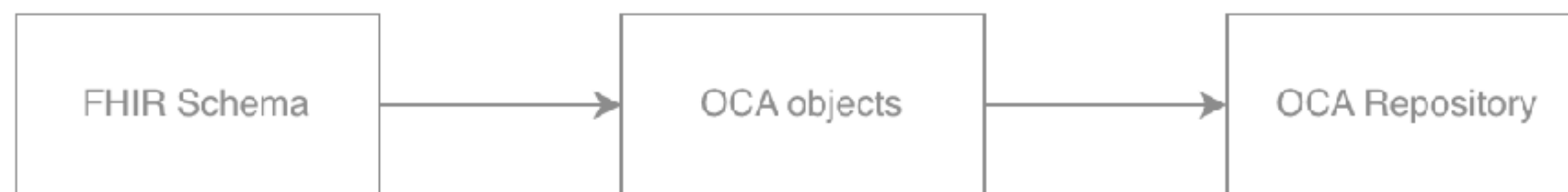
Part 3 10 minutes

What you will see

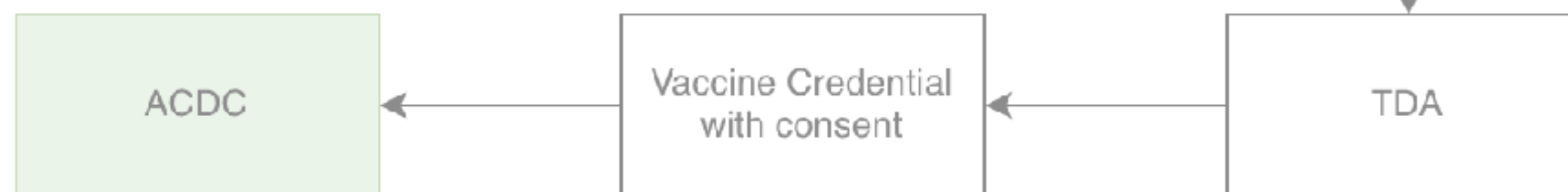
- 2 level criteria search:
  - Semantic level (OCA)
  - Data level (ACDC)
- A Data sharing hub with > 10'000 clinical trials
- An example of criteria search



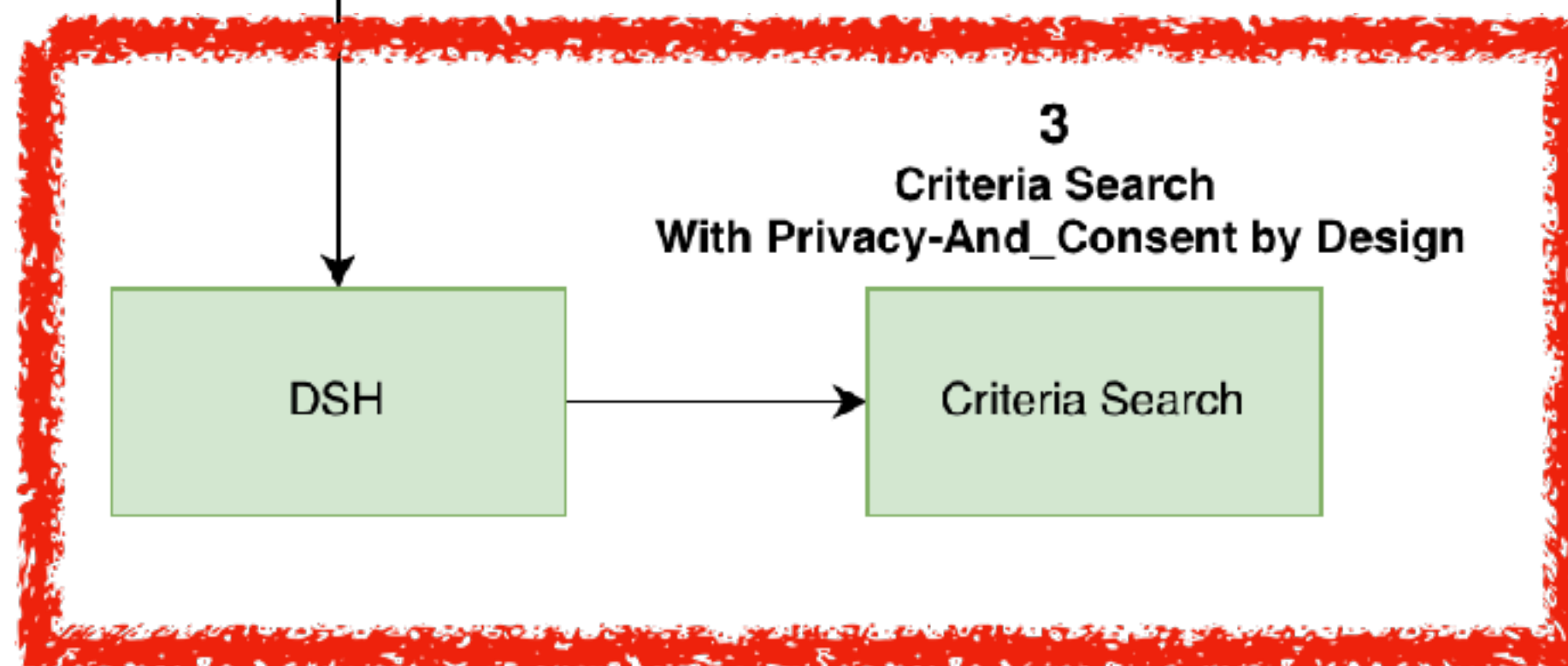
#### 1 Data Transformation Pipeline



#### 2 Authentic Data Flows



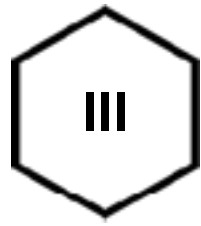
#### 3 Criteria Search With Privacy-And\_Consent by Design



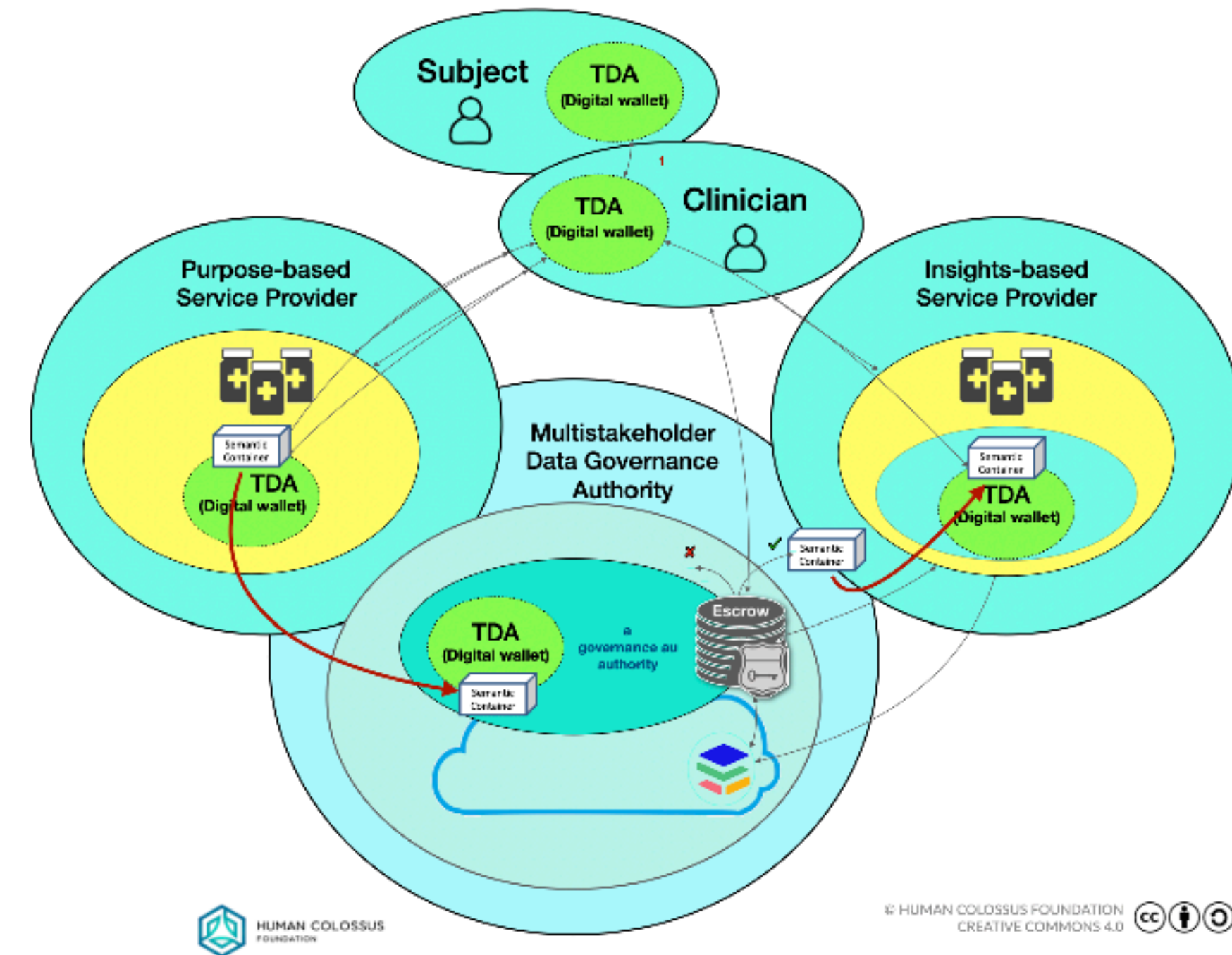
#### ▶ DDSH criteria search

- ▶ <https://github.com/THCLab/oca-graph-search>
- ▶ <https://github.com/THCLab/oca-graph-search-frontend>





## eSSIF DDSH Team

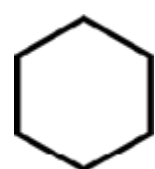




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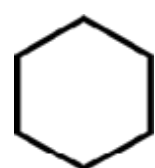
# Dynamic Data Economy for all

## Stem Cells Contact



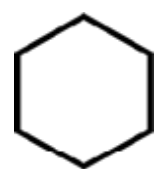
**Decentralized Authentication**

[robert.mitwicki@humancolossus.org](mailto:robert.mitwicki@humancolossus.org)



**Decentralized Semantic**

[paul.knowles@humancolossus.org](mailto:paul.knowles@humancolossus.org)



**Decentralized Governance**

[philippe.page@humancolossus.org](mailto:philippe.page@humancolossus.org)

The Human Colossus Foundation  
Home for Synergies  
bringing  
Data Sovereignty  
to all economic actors