FAIR Federated Data Space - A proposed Landscape

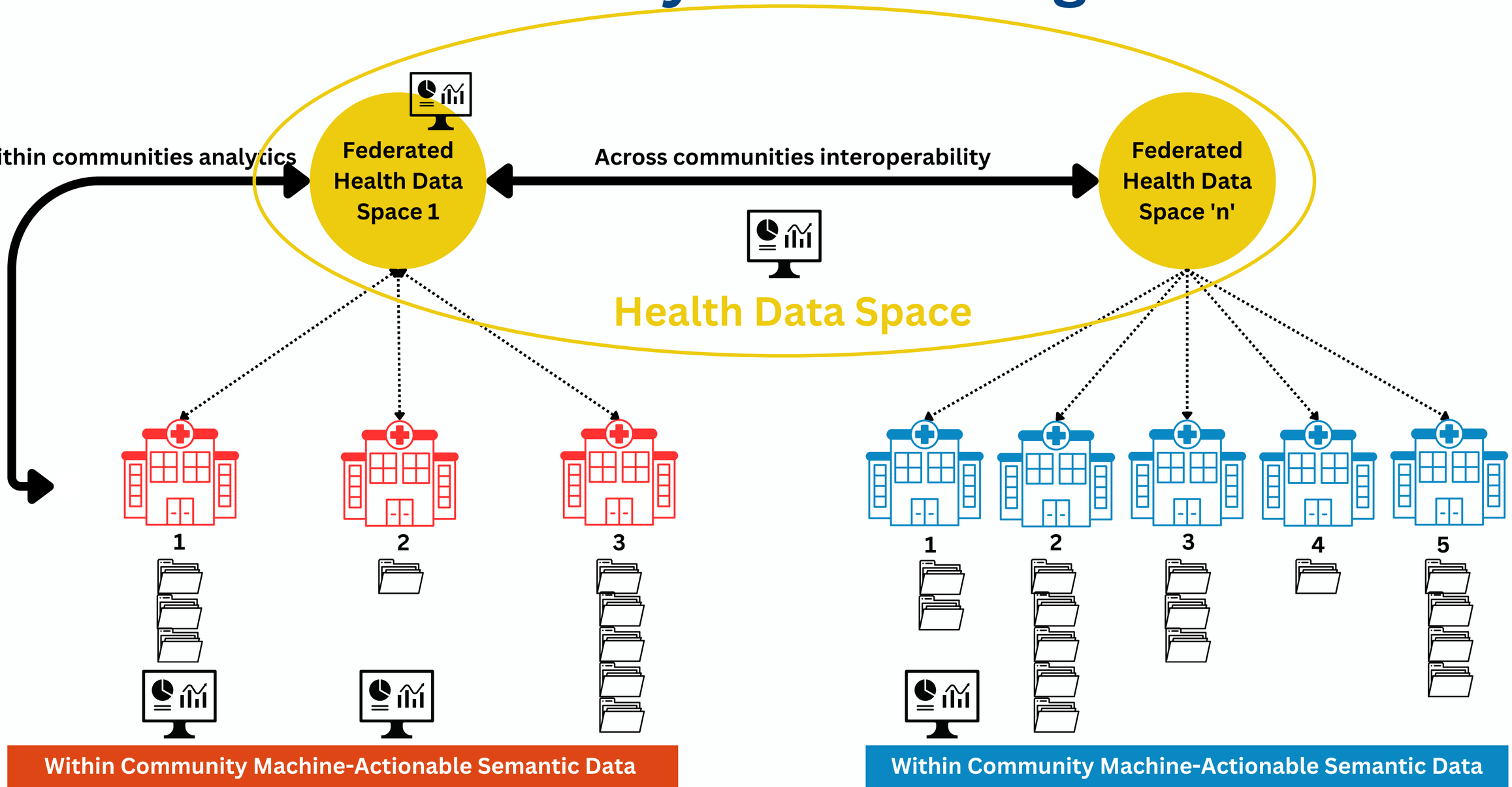
Presentation for the Conference
“Connected Data - Connected Everything”
Wageningen University, 20 October 2023

Mirjam van Reisen

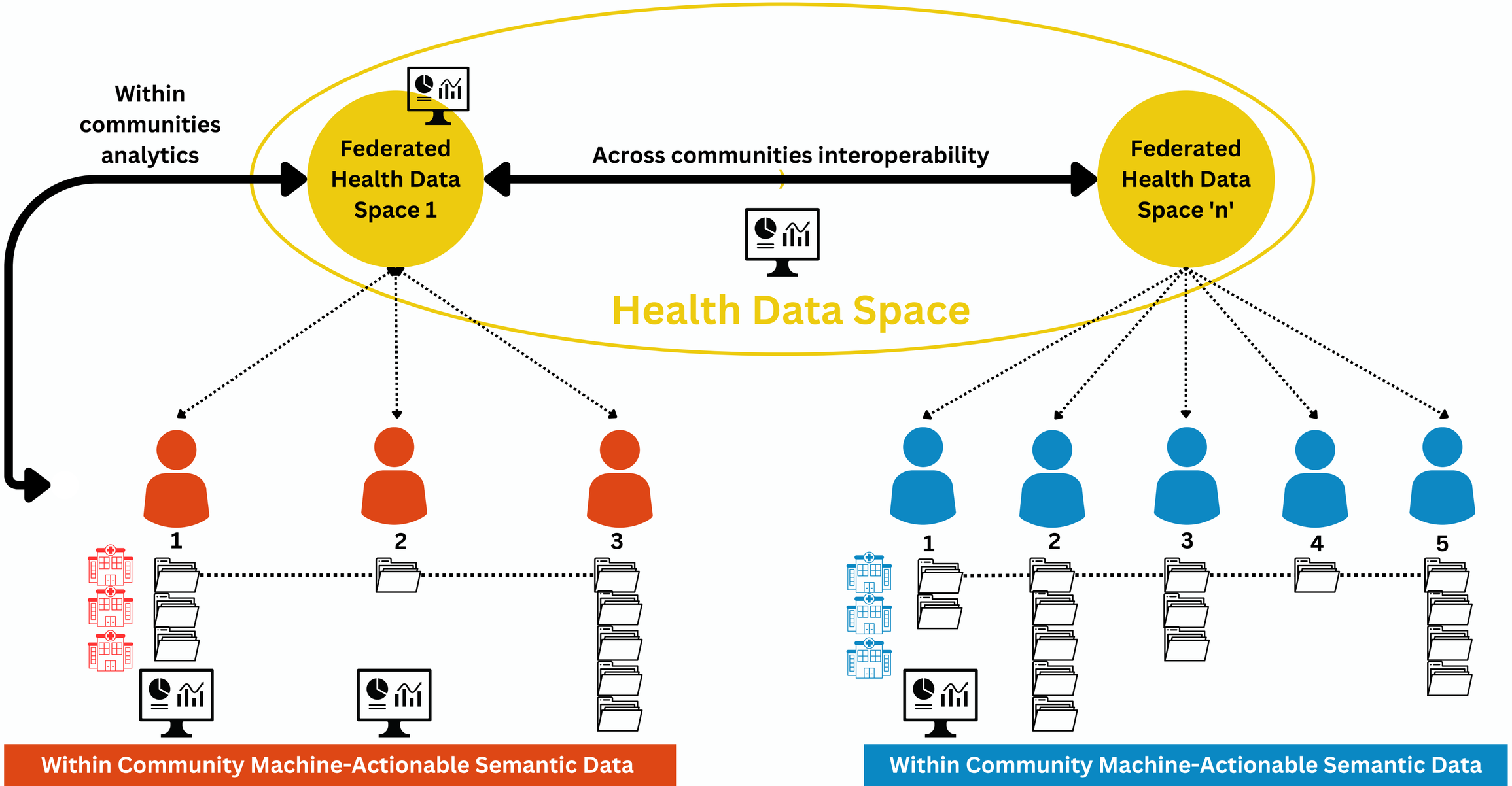
Slide authors: Mirjam van Reisen, Samson Yohannes Amare, Getu Tadele, Tesfit Gebremeskel, Ruduan Plug, Putu Hadi Purnama Jati, Joëlle Stocker for VODAN

20 October 2023

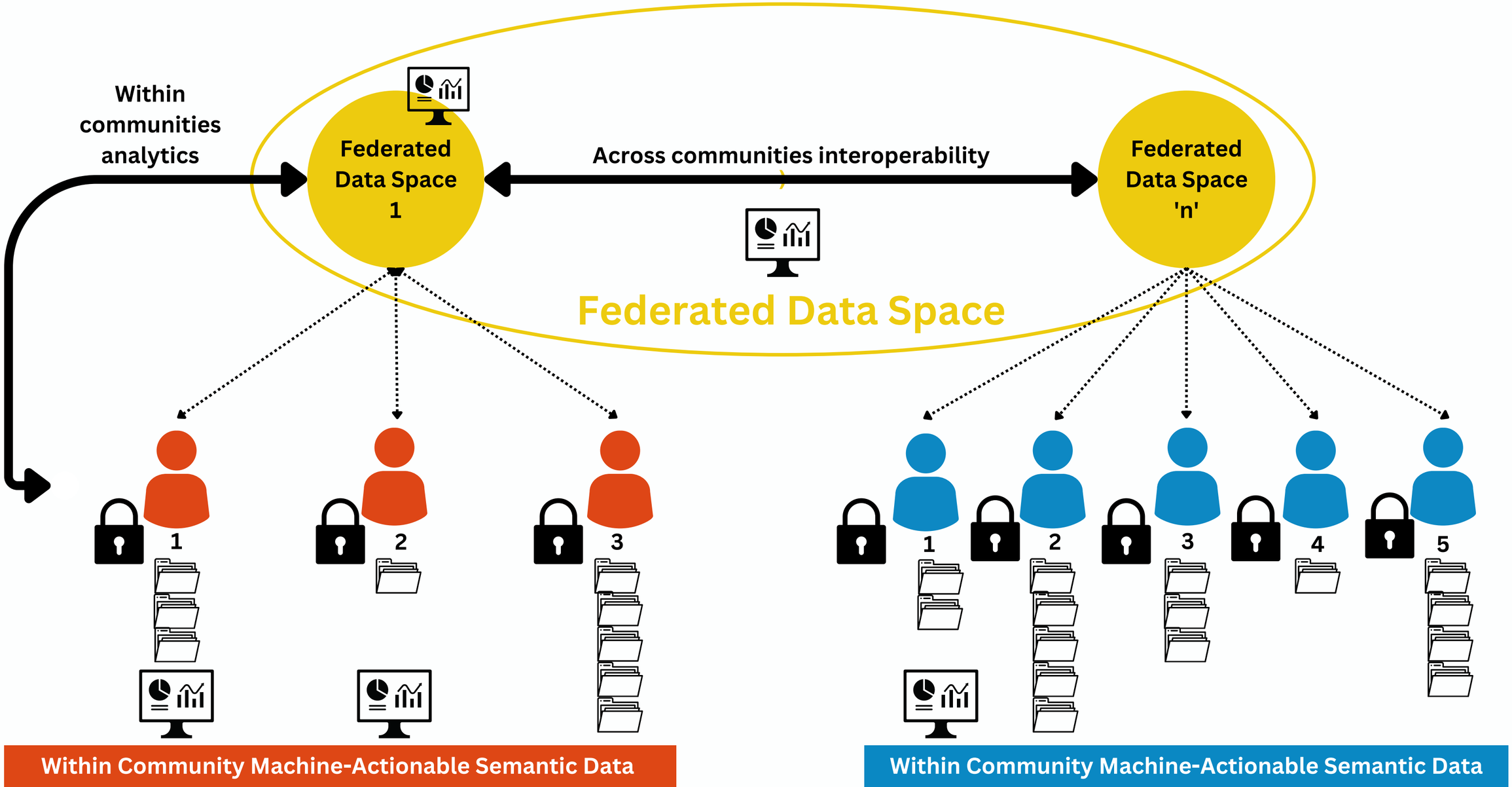
FAIR-OLR Federated analysis & learning



FAIR-OLR Federated Personal Pods

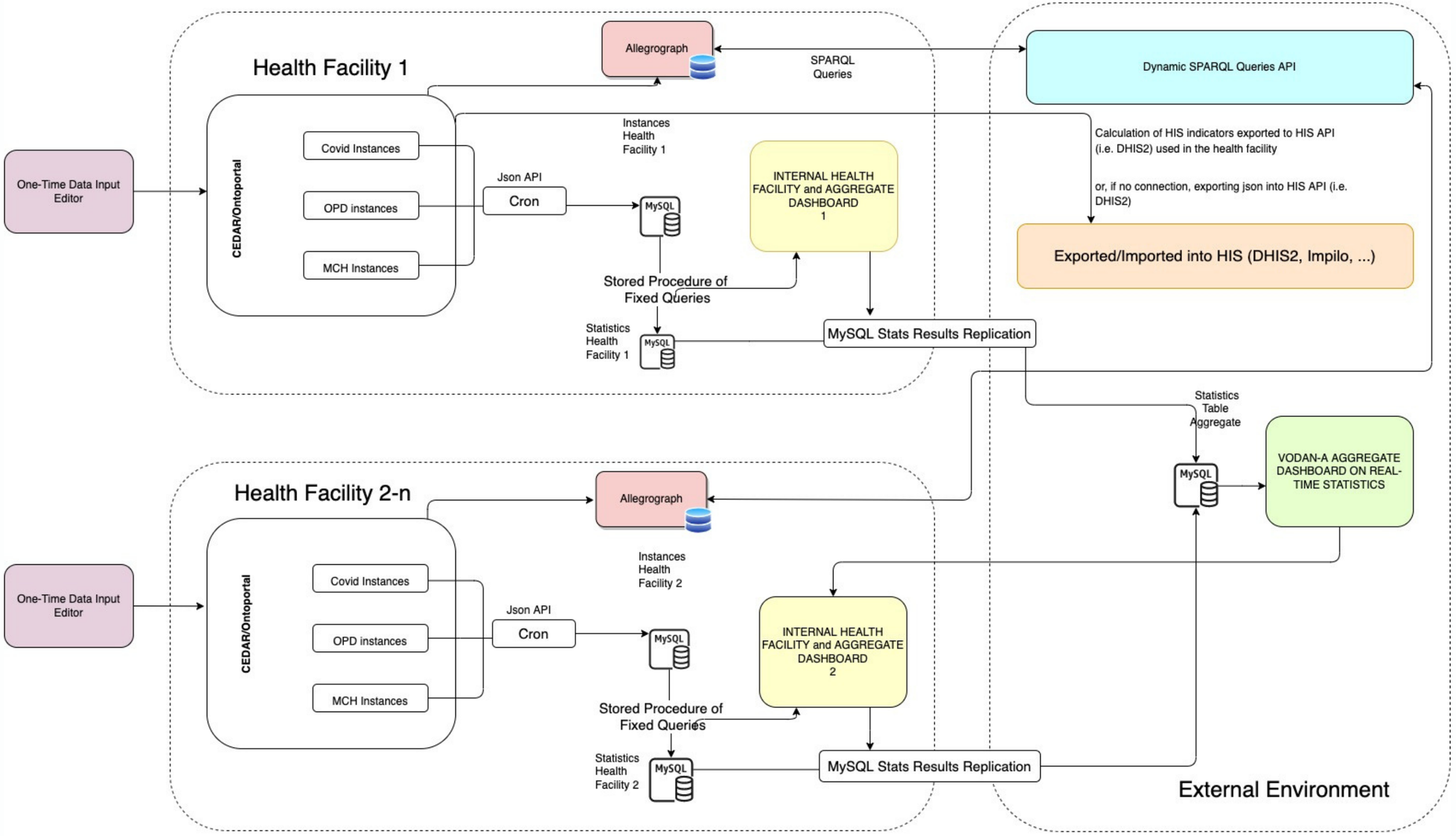


FAIR-OLR Federated Personal Pods

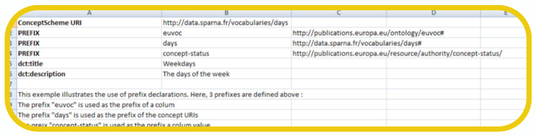


VODAN AFRICA

VODAN-AFRICA INTERNAL & AGGREGATE DASHBOARD & HIS INTEGRATION



Authored by: Mariam Basajja, Mwesigwa Ezra, Oluwole Afolabi, Samson Yohannes Amare, Ruduan Plug, Mirjam van Reisen, 2022



	A	B	C	D	E
1	**ConceptScheme URI**	http://data.sparna.fr/vocabularies/days			
2	**PREFIX**	euvoc	http://publications.europa.eu/ontology/euvoc#		
3	**PREFIX**	days	http://data.sparna.fr/vocabularies/days#		
4	**PREFIX**	concept-status	http://publications.europa.eu/resource/authority/concept-status/		
5	**dct:title**	Weekdays			
6	**dct:description**	The days of the week			
7					
8	This exemple illustrates the use of prefix declarations. Here, 3 prefixes are defined above :				
9	The prefix "euvoc" is used as the prefix of a colum				
10	The prefix "days" is used as the prefix of the concept URIs				
11	The prefix "concept-status" is used as the prefix a colum value				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"@id": "http://dbpedia.org/resource/John_Lennon",
"name": "John Lennon",
"born": "1940-10-09",
"spouse": "http://dbpedia.org/resource/Cynthia_Lennon"
}
```

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Machine actionable semantic vocabulary

RDF or JSON-LD

Triple store Data storage

n

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Machine actionable semantic vocabulary

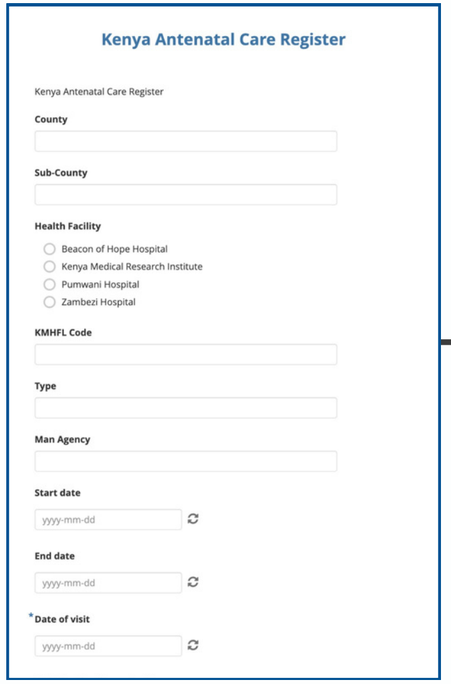
RDF or JSON-LD

Triple store Data store

API for queries

FAIR Data production and processing

Data creation process



Vocabulary does not exist

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Vocabulary exists

SKOS

SKOS PLAY:
to test and verify a vocabulary during the conception phase to exchange and communicate the vocabulary when validating it with domain experts to publish it when it is shared on the web.

OWL

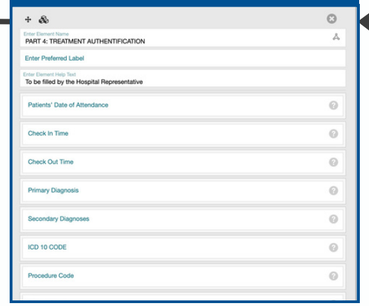
Open Web Language
RDF or JSON LD

Bioportal

Ontology repository

Link: https://bioportal.bioontology.org/

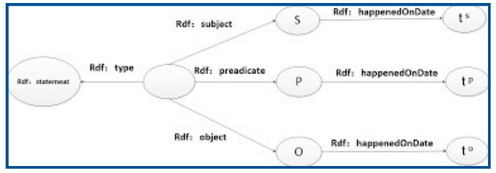
CEDAR template



Link: https://more.metadatacenter.org/tools-training/cedar-template-tools

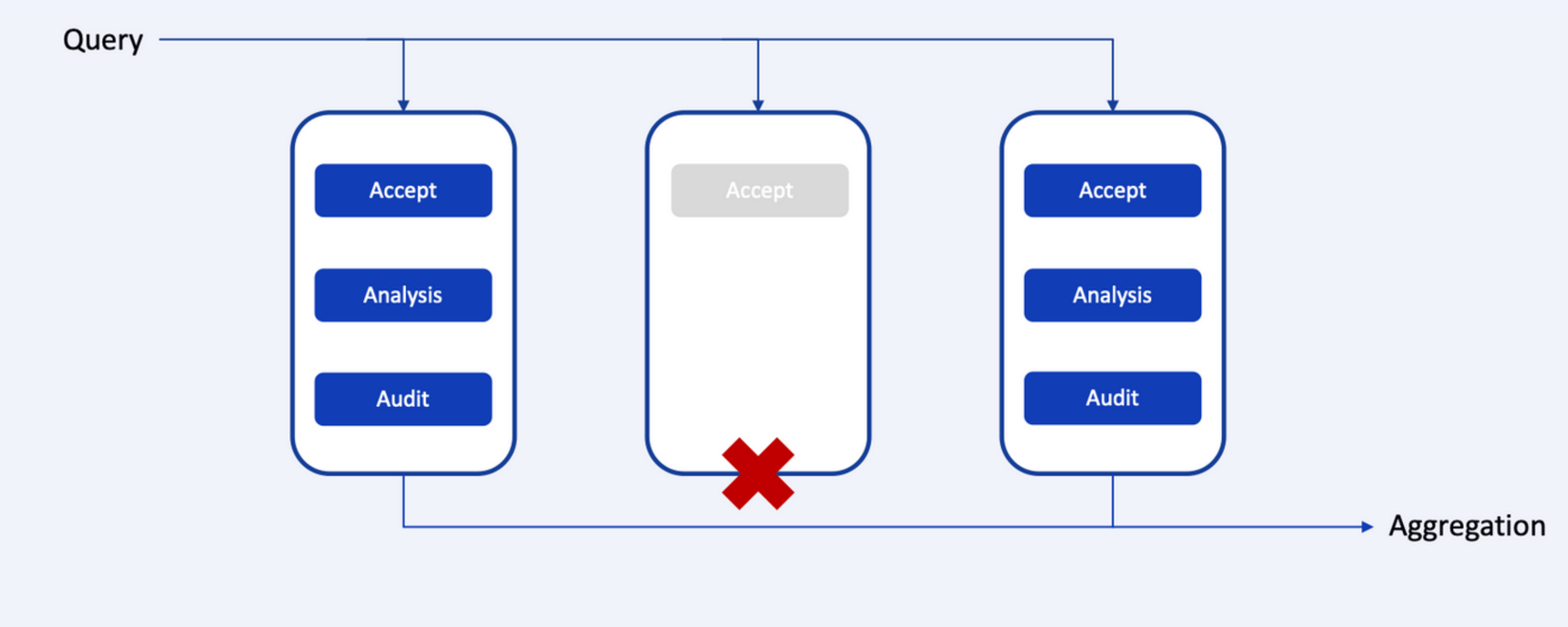
Triple store

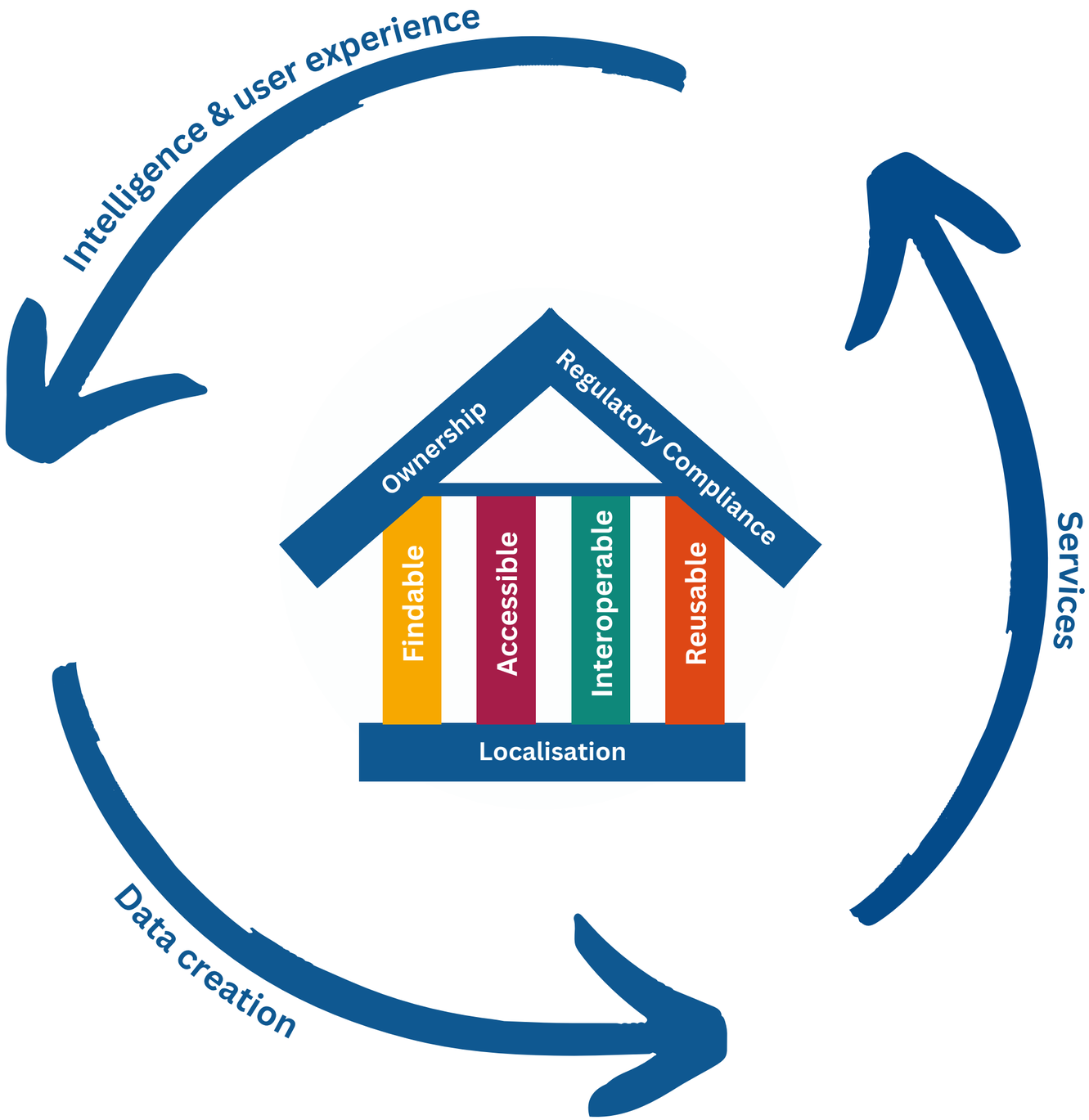
Storage and data analytics



Source: Haixia Li and Li Yan. 2021. A Temporal RDF Model for Multi-grained Time Information Modeling. In 2021 4th International Conference on Data Science and Information Technology (DSIT 2021), July 23-25, 2021, Shanghai, China. ACM, New York, NY, USA, 9 Pages. https://doi-org.tilburguniversity.idm.oclc.org/10.1145/3478905.3478908

FAIR Federated Analysis




Intelligence & user experience
Ownership
Regulatory Compliance
Findable
Accessible
Interoperable
Reusable
Localisation
Services
Data creation

Federated Health Data Space – a proposed landscape

Generic connective capabilities - users

Ecosystem APIs

Intelligence

User Experience

Infrastructure services

Data storage and hosting

Hosting & operations

Hybrid in location & local cloud

Generic Data Capabilities - services

Federated data management

Regulatory Compliance, Privacy & Protection

Data Visiting & interoperability

Digital IT & Customer service

Data layer-single copy, machine actionable data creation

Machine-actionable and semantically linked clinical, operational & research data at point of creation

(produced for instance : in point of care, point of service, or at research data collection)

Federated Data Space – a proposed landscape

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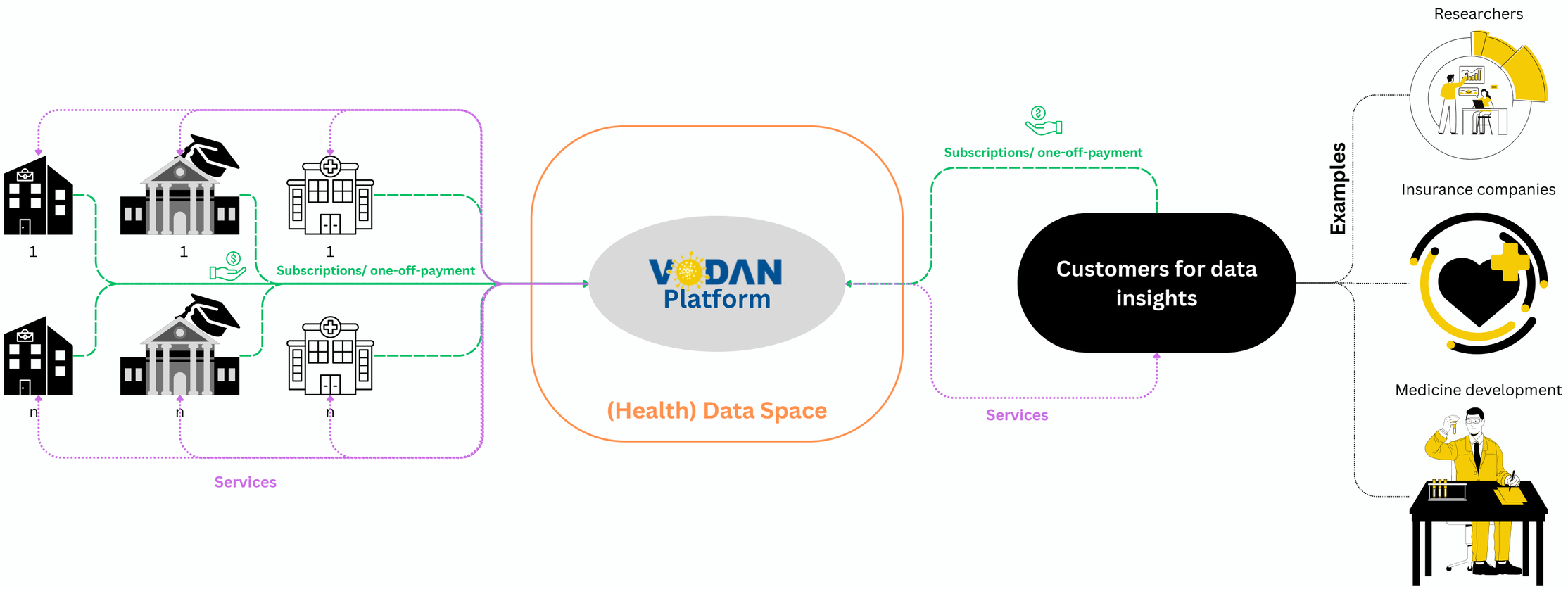

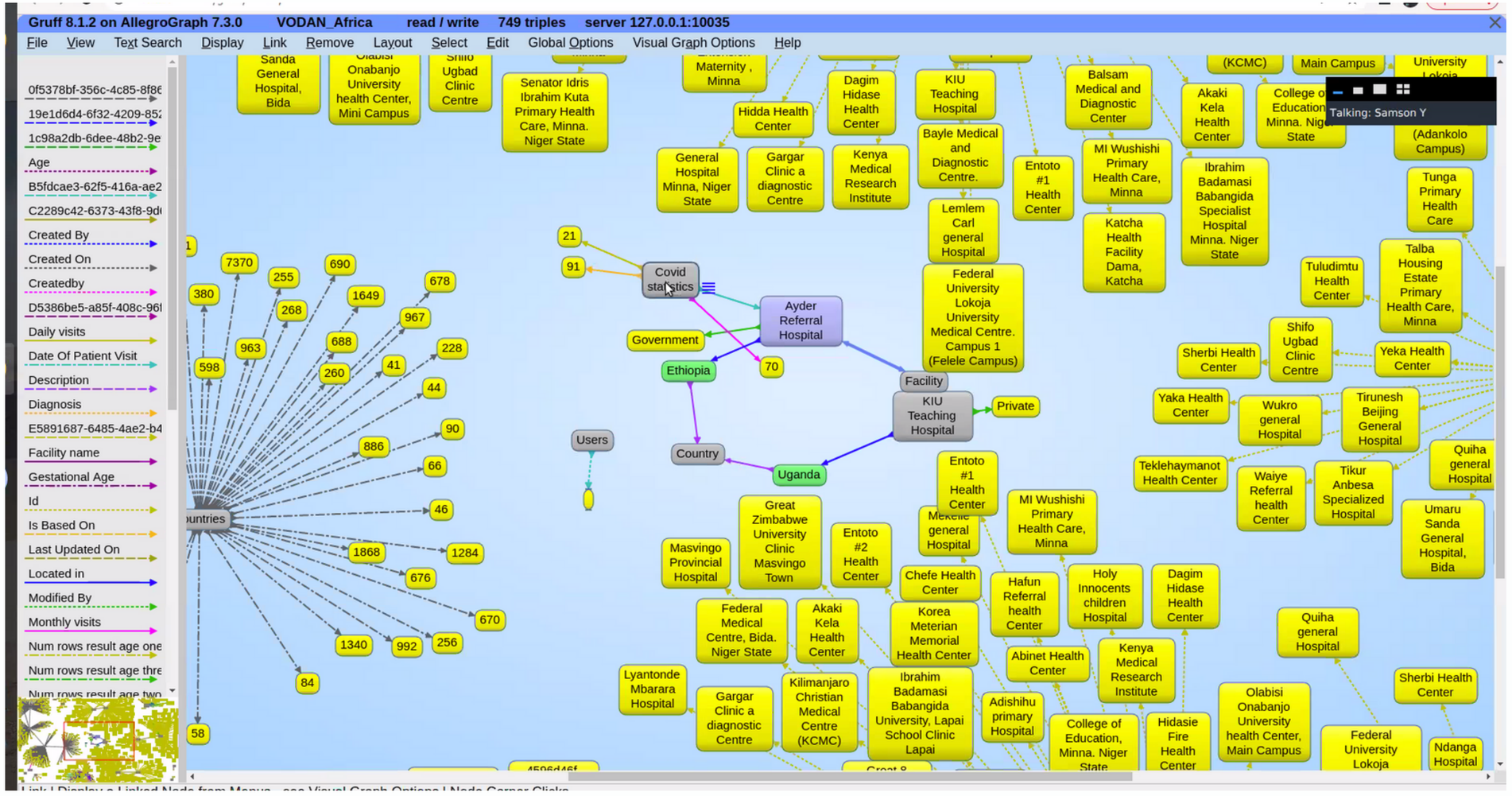
Gruff 8.1.2 on AllegroGraph 7.3.0 VODAN_Africa read / write 749 triples server 127.0.0.1:10035
File View Text Search Display Link Remove Layout Select Edit Global Options Visual Graph Options Help
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Onabanjo University health Center, Mini Campus
Shifo Ugbad Clinic Centre
Senator Idris Ibrahim Kuta Primary Health Care, Minna. Niger State
Maternity , Minna
Hidda Health Center
Dagim Hidase Health Center
KIU Teaching Hospital
Balsam Medical and Diagnostic Center
Akaki Kela Health Center
(KCMC)
Main Campus
University Lokoja
(Adankolo Campus)
General Hospital Minna, Niger State
Gargar Clinic a diagnostic Centre
Kenya Medical Research Institute
Bayle Medical and Diagnostic Centre.
Entoto #1 Health Center
MI Wushishi Primary Health Care, Minna
Ibrahim Badamasi Babangida Specialist Hospital Minna. Niger State
Tunga Primary Health Care
Lemlem Carl general Hospital
Katcha Health Facility Dama, Katcha
Federal University Lokoja University Medical Centre. Campus 1 (Felele Campus)
Tuludimtu Health Center
Talba Housing Estate Primary Health Care, Minna
Covid statistics
Ayder Referral Hospital
Government
Ethiopia
Facility
KIU Teaching Hospital
Private
Sherbi Health Center
Shifo Ugbad Clinic Centre
Yeka Health Center
Yaka Health Center
Wukro general Hospital
Tirunesh Beijing General Hospital
Teklehaymanot Health Center
Waiye Referral health Center
Tikur Anbesa Specialized Hospital
Quiha general Hospital
Umaru Sanda General Hospital, Bida
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Entoto #1 Health Center
Great Zimbabwe University Clinic Masvingo Town
Entoto #2 Health Center
MI Wushishi Primary Health Care, Minna
Masvingo Provincial Hospital
Chefe Health Center
Hafun Referral health Center
Holy Innocents children Hospital
Dagim Hidase Health Center
Federal Medical Centre, Bida. Niger State
Akaki Kela Health Center
Korea Meterian Memorial Health Center
Abinet Health Center
Kenya Medical Research Institute
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Lyantonde Mbarara Hospital
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Ibrahim Badamasi Babangida University, Lapai School Clinic Lapai
Adishihu primary Hospital
College of Education, Minna. Niger State
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Olabisi Onabanjo University health Center, Main Campus
Federal University Lokoja
Sherbi Health Center
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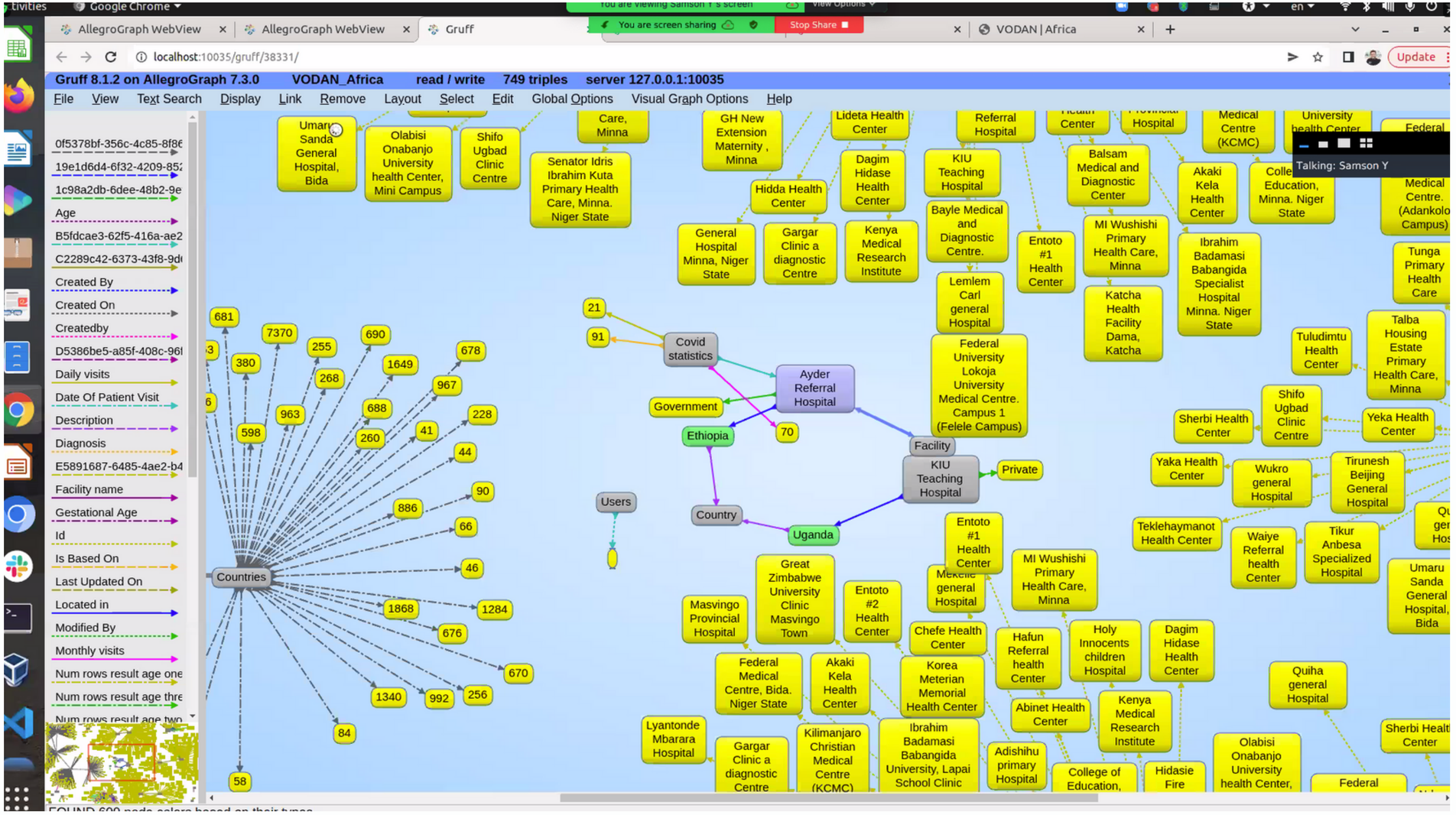
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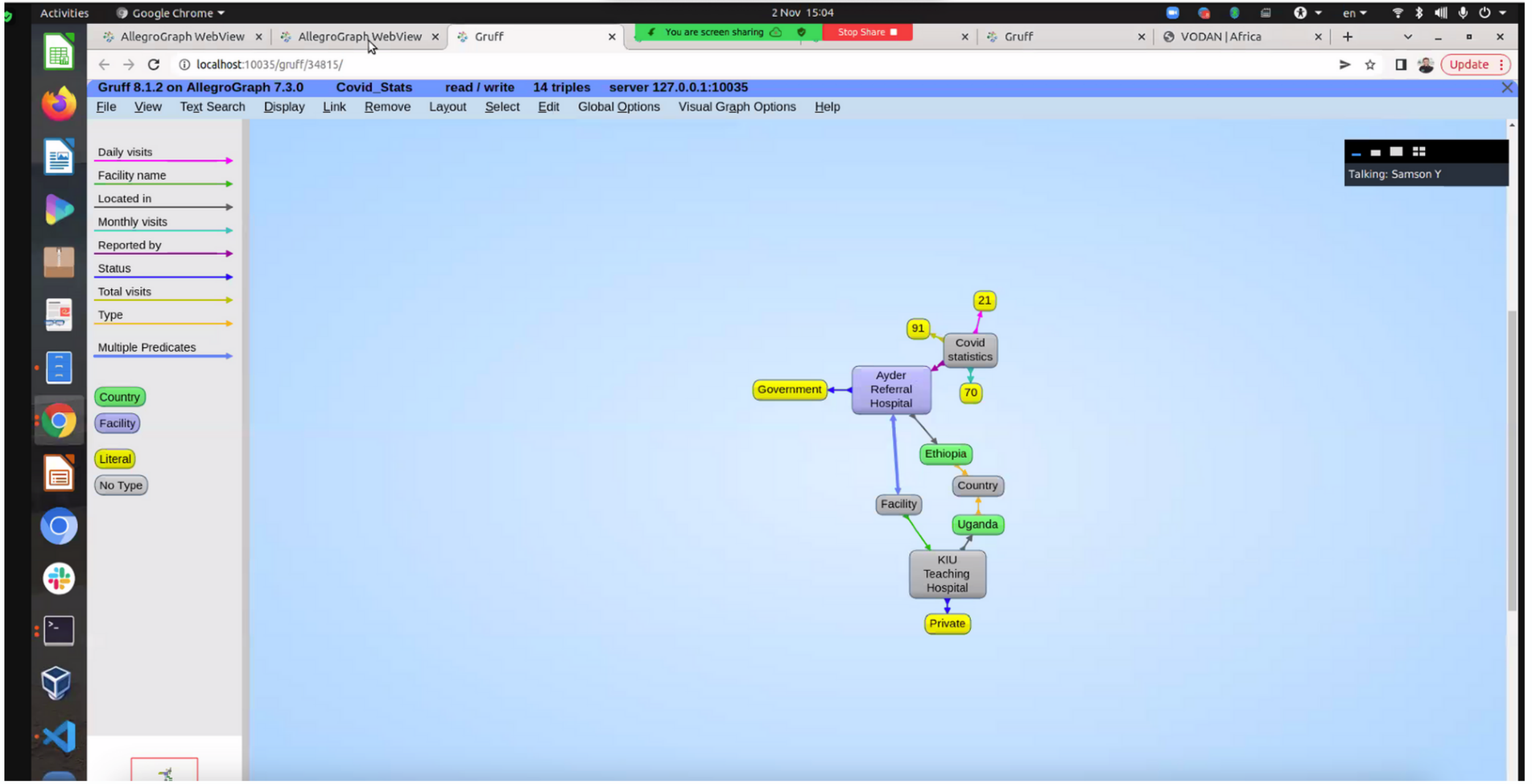
Activities
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AllegroGraph WebView
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Gruff
You are screen sharing
Stop Share
Gruff
VODAN | Africa
localhost:10035/gruff/34815/
Update
Gruff 8.1.2 on AllegroGraph 7.3.0 Covid_Stats read / write 14 triples server 127.0.0.1:10035
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Facility name
Located in
Monthly visits
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Status
Total visits
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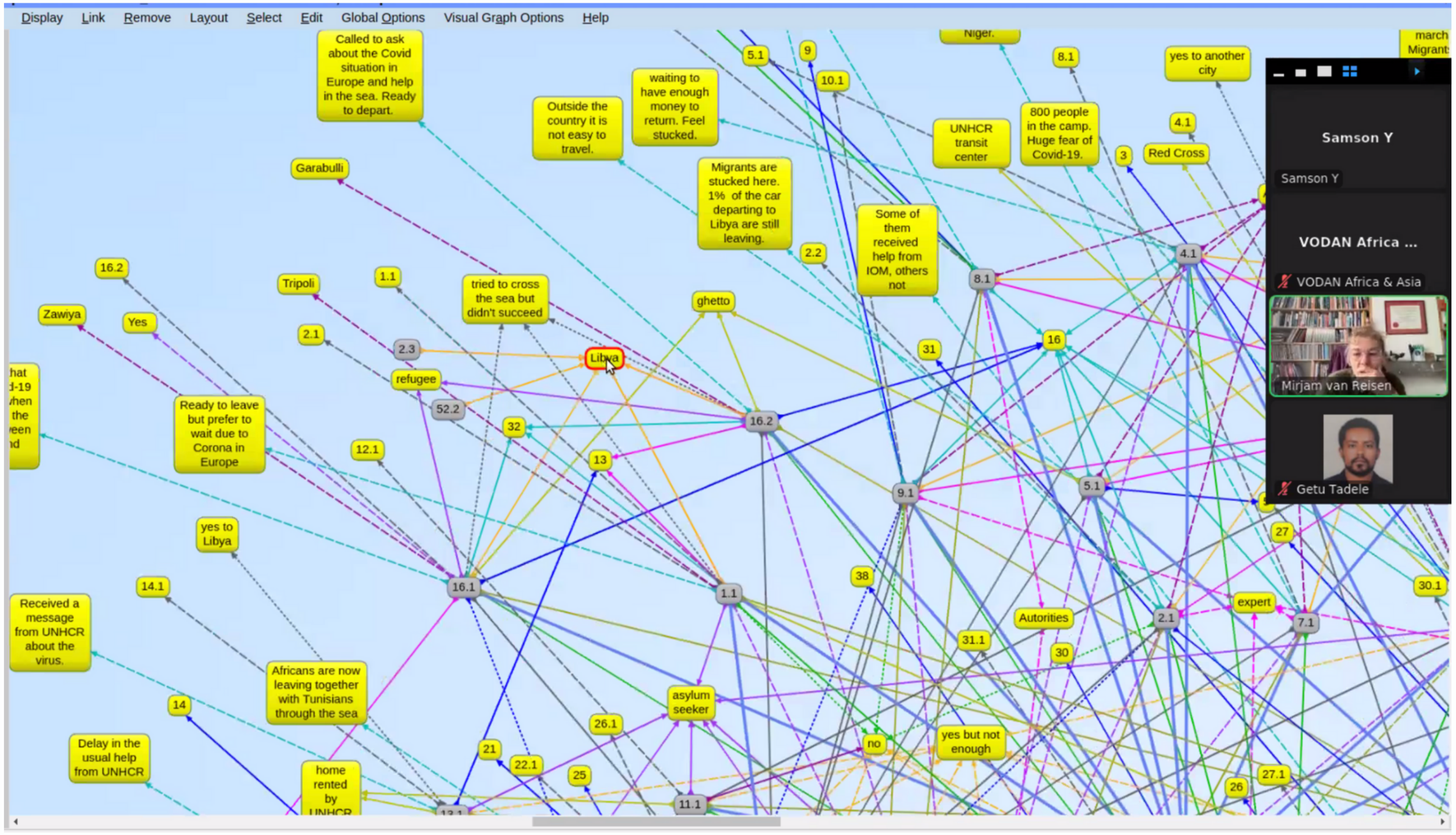
Display
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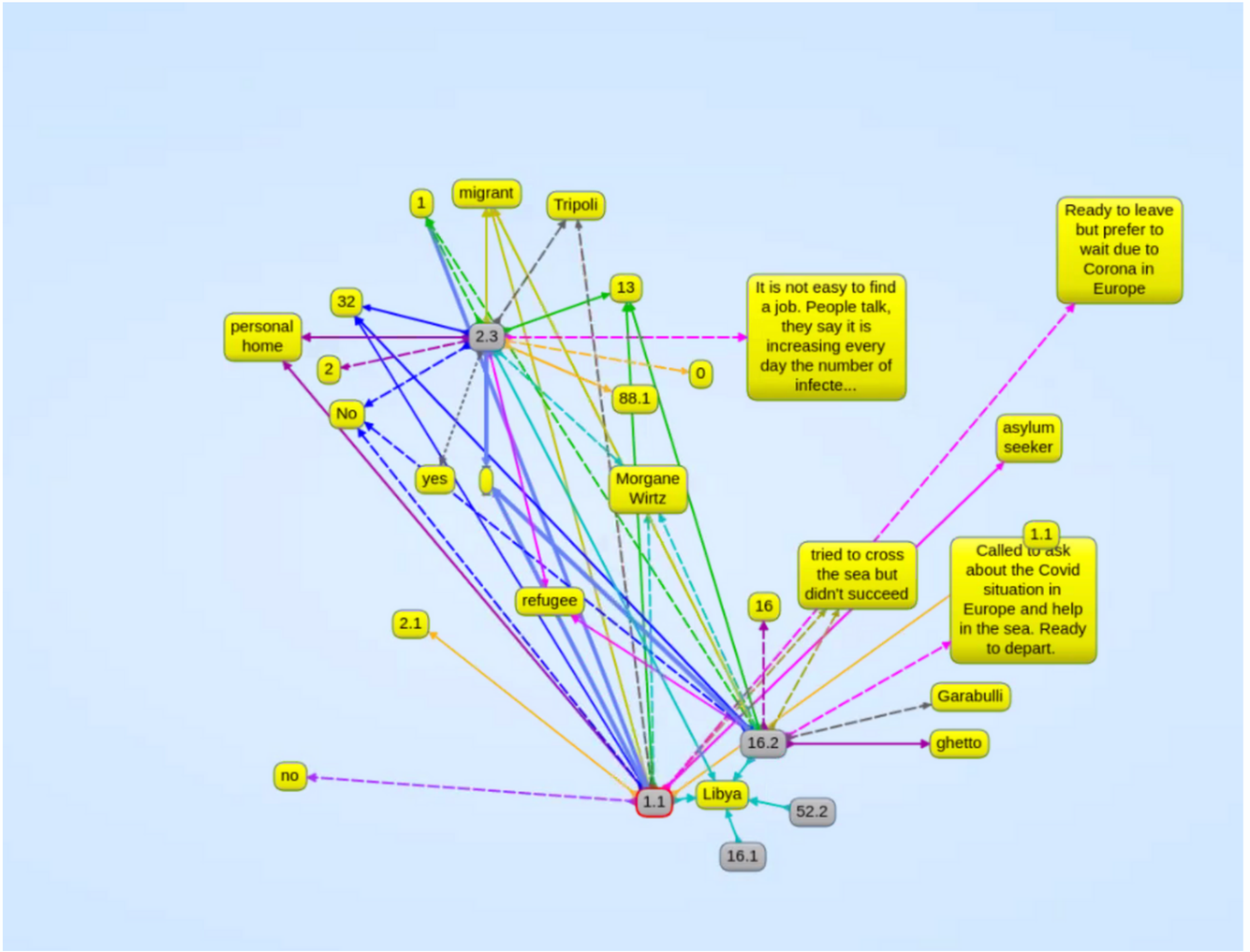
Help
Called to ask about the Covid situation in Europe and help in the sea. Ready to depart.
Outside the country it is not easy to travel.
waiting to have enough money to return. Feel stucked.
Migrants are stucked here. 1% of the car departing to Libya are still leaving.
Some of them received help from IOM, others not
UNHCR transit center
800 people in the camp. Huge fear of Covid-19.
Red Cross
yes to another city
Niger.
march
Migrant
Garabulli
Tripoli
Zawiya
Yes
tried to cross the sea but didn't succeed
ghetto
Libya
refugee
Ready to leave but prefer to wait due to Corona in Europe
yes to Libya
Received a message from UNHCR about the virus.
Africans are now leaving together with Tunisians through the sea
Delay in the usual help from UNHCR
home rented by
asylum seeker
no
yes but not enough
Autorities
expert
Samson Y
VODAN Africa ...
VODAN Africa & Asia
Mirjam van Reisen
Getu Tadele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Morgane Wirtz
refugee
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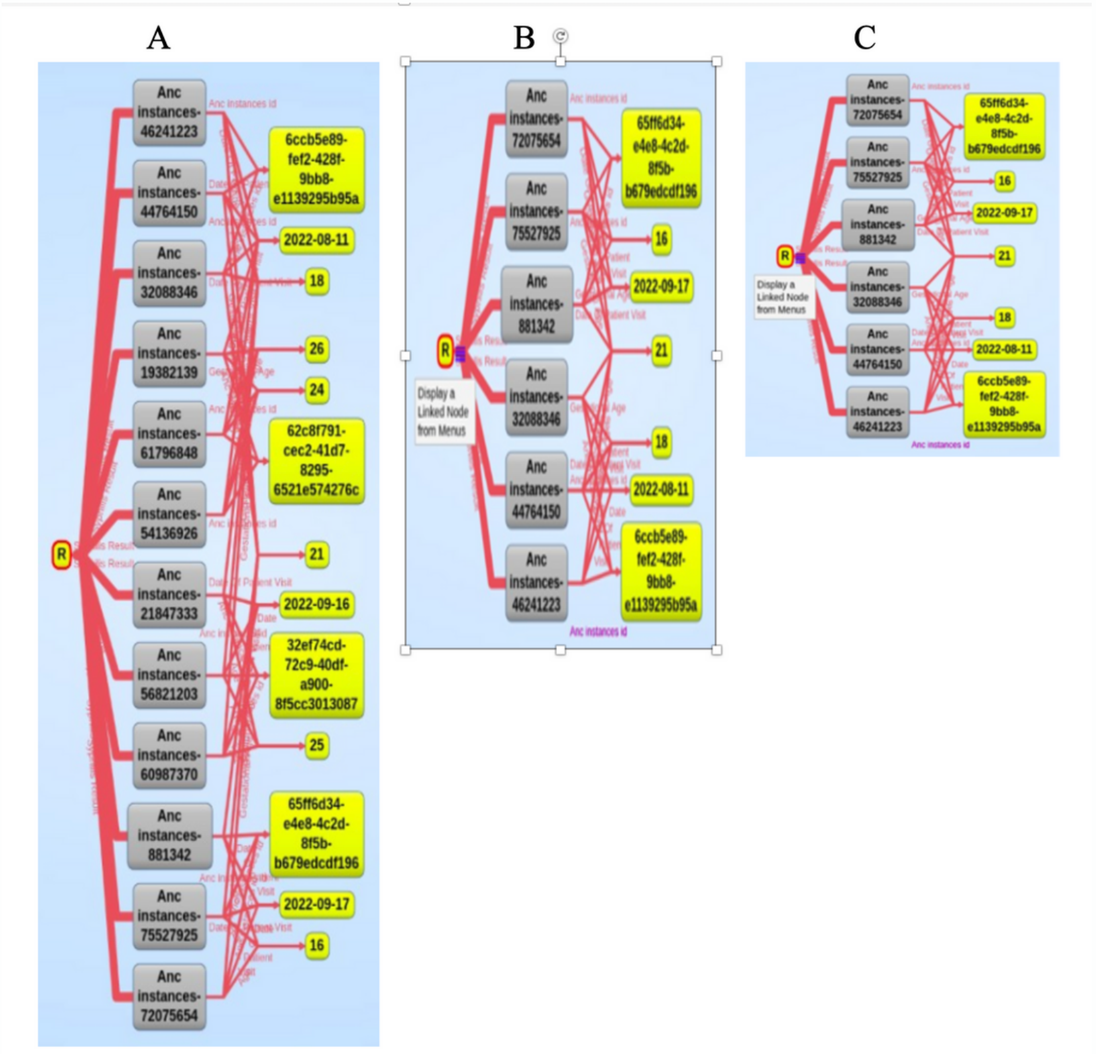
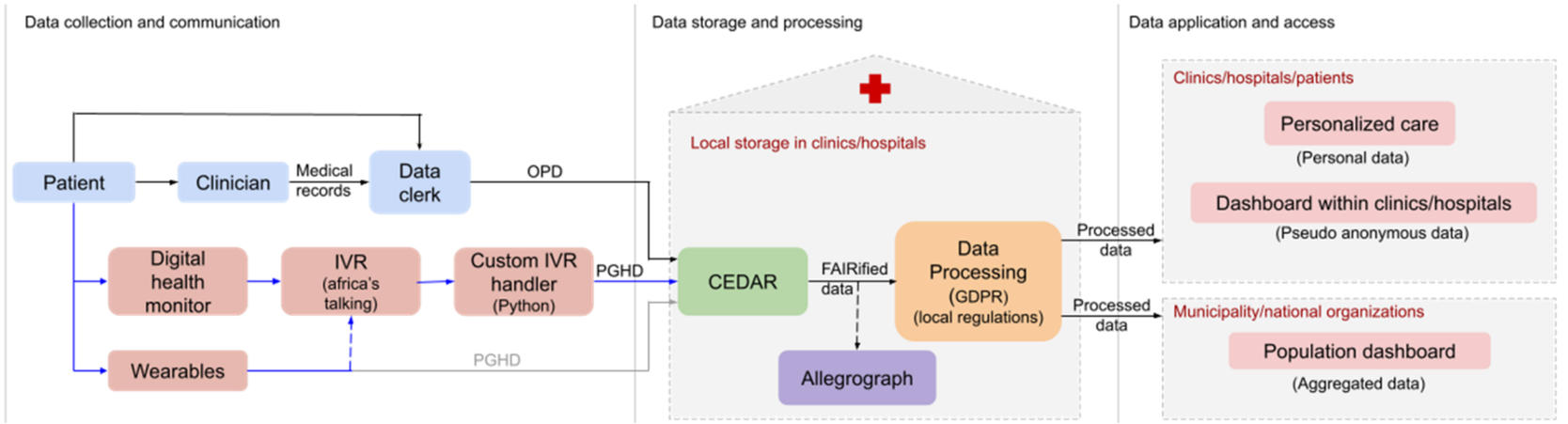
16
16.2
no
1.1
Libya
52.2
16.1
It is not easy to find a job. People talk, they say it is increasing every day the number of infecte...
Ready to leave but prefer to wait due to Corona in Europe
asylum seeker
tried to cross the sea but didn't succeed
1.1
Called to ask about the Covid situation in Europe and help in the sea. Ready to depart.
Garabulli
ghetto

(A) All Syphilis Reactive Cases; (B) Syphilis Reactive Adolescent Cases; (C) Congenital Syphilis (CS) at Risk Cases

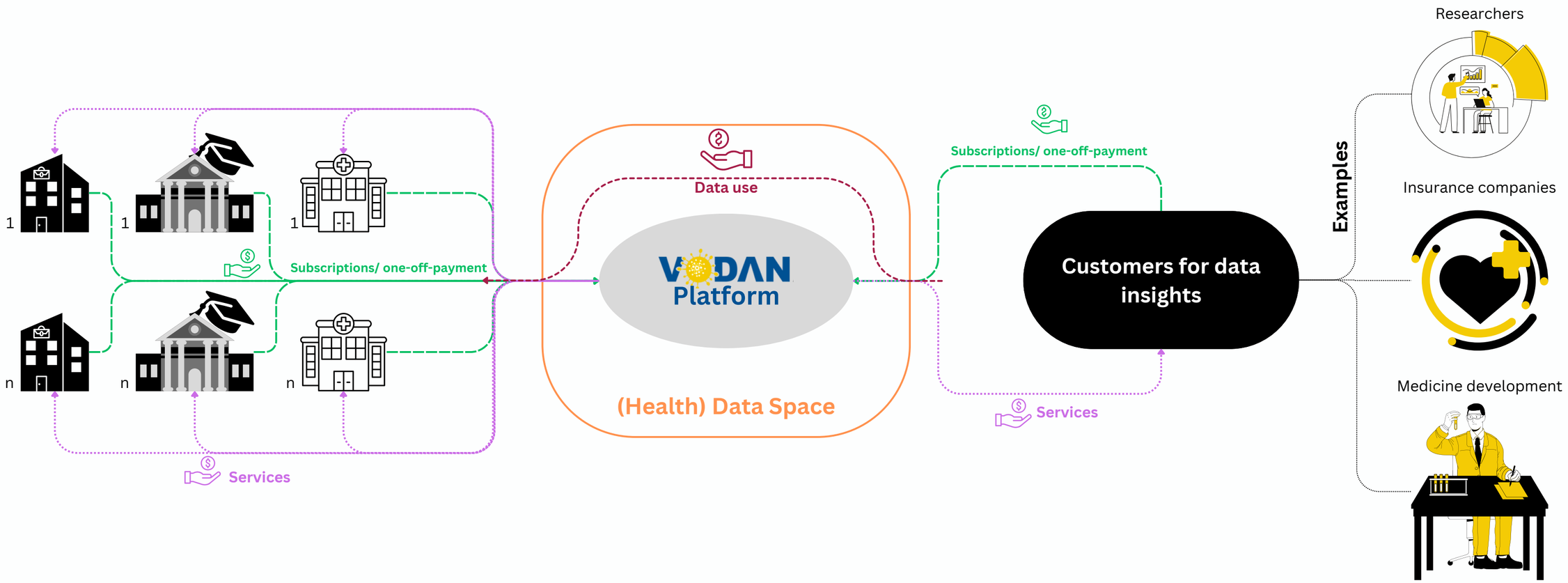


Sample of a Knowledge Graph Created in Allegrograph from the FAIRified Data on Labour and Delivery Data from Saving Little Lives Project in Tigray Region

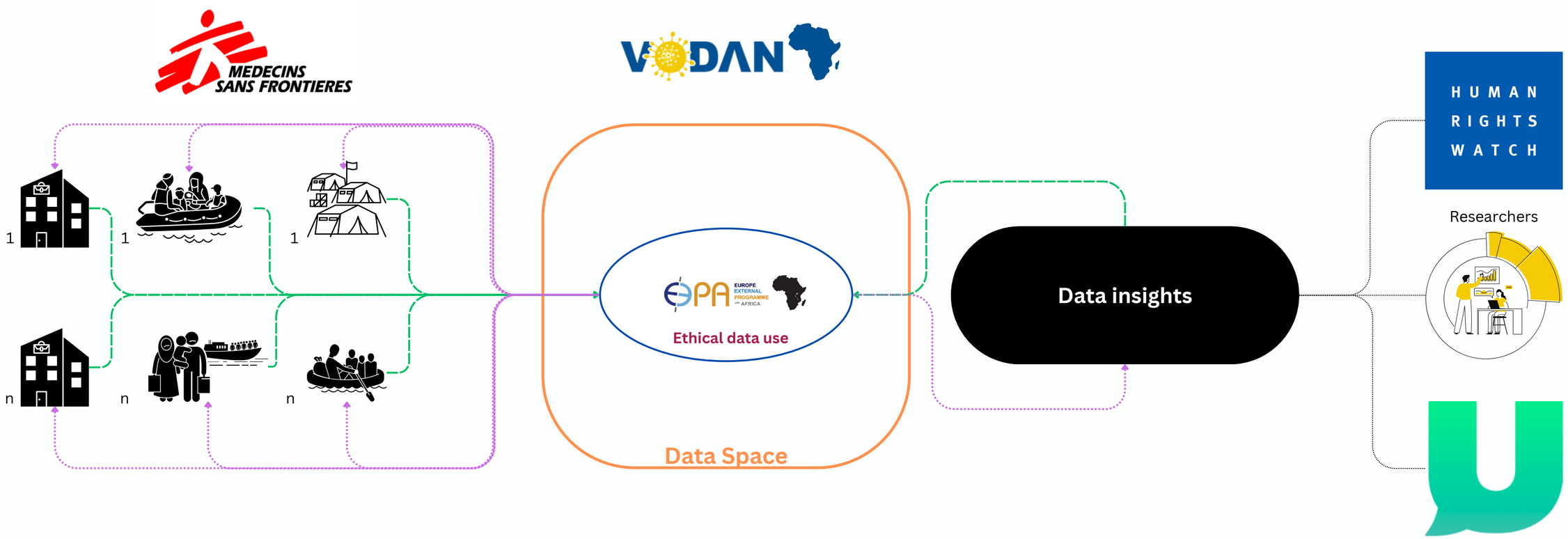
Proposed Architecture of Federated Patient Generated Health Data (PGHD) Interoperability with Patient Data Curated at Health Facility



Customers data stewardship	Services	Customers third party data re-use



Data stewardship	Technical services	Advocacy for Ethical Digital Data Ownership & Re-use



Advocating an ethical Federated FAIR Data Space for All

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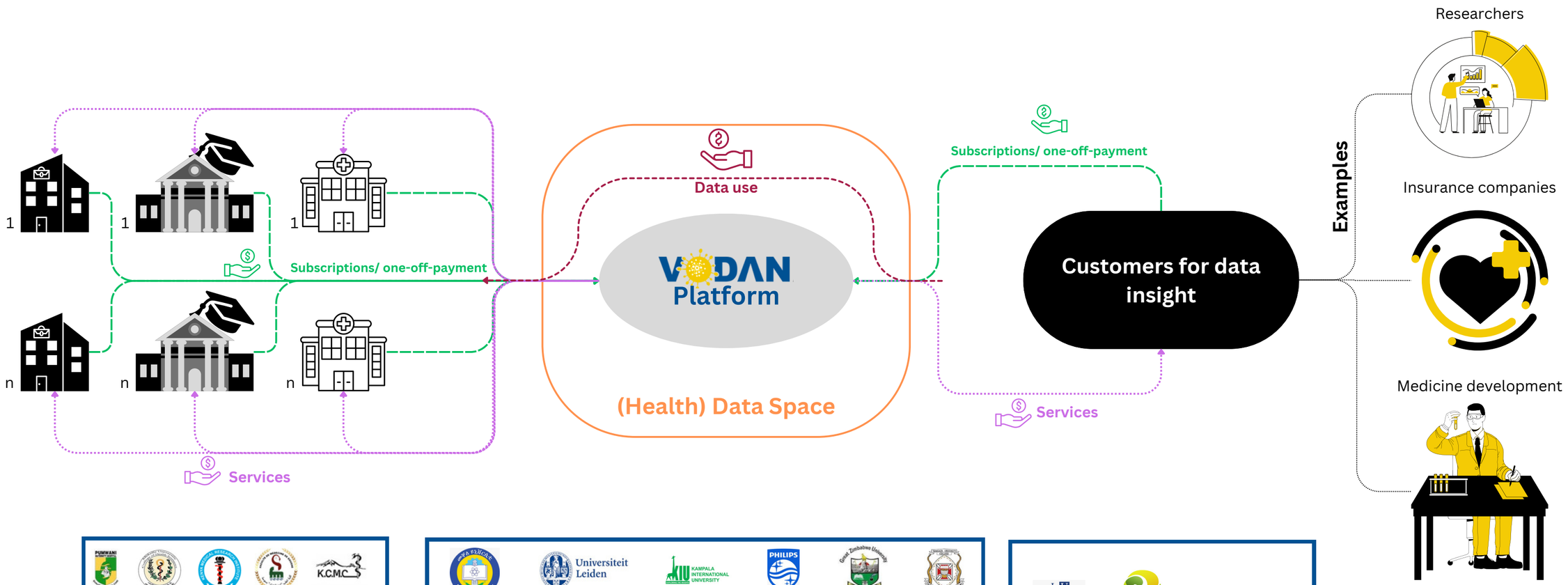

Proof of Concept	*Minimal Viable Product and adoption assessment*	*Africa Health Data Space - Africa data Space with selected partners*	*Professional Service Organisation linked to the Africa University Network on FAIR Open Science to root capacities*	*Integration of domains in the Global Data Space with private sector customers*
LUMC-KIC	8 countries in Africa, 88 health facilities, research data	Partnership of 10 countries in Africa, 2 countries in Asia, 3 countries in the EU and US	Africa-based HQ	Leader for service development with new content domains
Go-FAIR tooling	CEDAR-based tooling, business proposition	VODAN software, test of business model, strengthen permission control, security and protection	Administrative independent business operation	VODAN software, test of business model
Philips Foundation	Philips, Philips Foundation and Invest International	Philips, IMS, Microsoft, Achmea, Accenture, ..	Soft loan and investment partnerships and strengthening of market position	Solid products and strengthening of market position
Article advanced genetics	Special Issue & Datastewardship manual	Book FAIR Data Science in Africa, research group established in GAIC Research Network	6 dissertations published by PhDs	20 dissertations published by PhDs
2 Datastewards	30 Datastewards and technical data science team	40 Datastewards, software engineering team, data quality assessment team, data analytics capacity, permission and security capacity	Leadership available in all business domains, and specialised data-stewardship service	Integration of interoperable services in data production and data analytics and services provision

Researchers

Abdullahi Kawu	FAIR-data based Interoperable Digital Generated Data
Aliya Aktau	Vocabulary creation for interoperable FAIR-data
Charles Kahiro	Models for ethical value creation on federated FAIR Data production
Getu Tadele Taye	Modeling a regional surveillance health system of FAIR-data
Ibrahim Bwaga	Identifying communities of differentiated risk profiles
Joëlle Stocker	FAIRification of soundscape data for resilience modeling
Kai Smits	Human Trafficking analytics in Libya
Kudakwashe Kindoza	Deployment factors of federated FAIR-Data for interoperable solutions
Liya Manu	Integration of harmonised federated FAIR Data information for off-line use
Mariam Basajja	Creation of a FAIR-data based digital information system in Uganda
Mildred Akandinda	Identifying communities of differentiated profiles in Uganda
Morgane Wirtz	Migrants health analytics in Tunisia
Natascha Buchs	Business disruption through the FAIR-data based Federated Data Space
Putu Hadi Purnama Jati	GDPR-based access and control permission architecture
Rens Kievit	Automated permission controls for a GDPR compliant secure dynamic architecture
Ruduan Plug	Statistical models for federated FAIR Data models of privacy data produced
Samson Yohanes Amare	Federated software services for FAIR-data
Tesfit Gebremeskel	Modeling of vocabularies of federated FAIR-data

KIU Senate (Uganda)

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Presidency of the VODAN-Africa Foundation

Mohamed Mpezamihigo; Francisca Oladipo; Han Baartmans, James Wilderspin

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VODAN Executive Board

Country coordinators	Technical Team	Medical & Outreach Team	Research Team
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