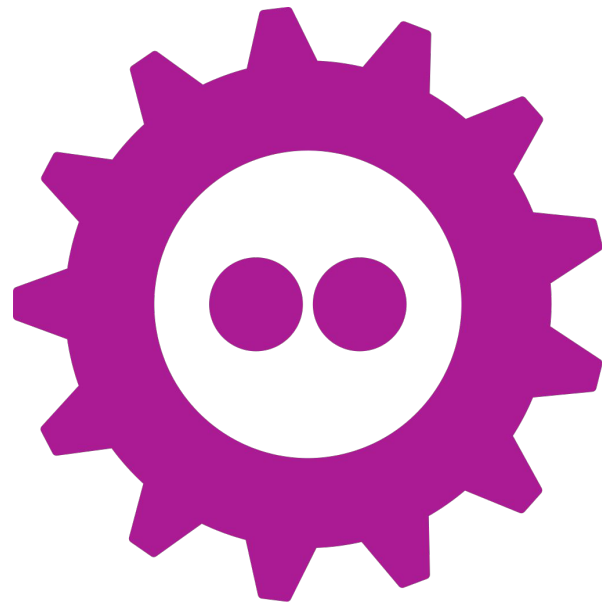# Iaso: Geo-aware Data Collection, Curation and Analysis.

A new web+Android platform geared toward enhancing geographical data by benefitting from the routine health data collection activity.

FOSDEM 2021

# Me

**Martin De Wulf**

Software Engineer working at Bluesquare, a public health software company based in Brussels, Belgium

Project lead
Python/Android/Javascript/Kotlin

Long history in startups, PhD in CS from ULB

# Iaso's Origins


Iaso is the 3rd one

- Named after a Greek Goddess (not an acronym)
- Built at [Bluesquare](#), a public health software and service company
- Sleeping sickness project with ITM Antwerp and PNLTHA showed the possibility to use routine data collection to enhance geographical data
- Multiple native mobile apps for data collection (derived from ODK) provided the technology to setup generic solution for surveys


Health Facility in DRC

- We merged both ideas

- Now used in 2+ projets for Health Facility Registries (Niger and DRC)
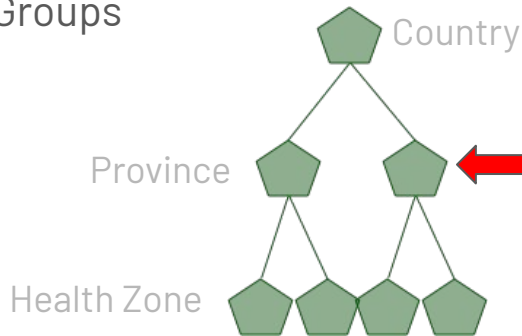- Routinely used for our Performance Based financing projects and Covid reporting (DRC)

# Concepts

Forms in the xlsform format linked to org. units

Hierarchy(ies) of org. Units

- Name(s)
- Parent
- GPS
- Territory
- External IDs (to link to other systems)
- Groups
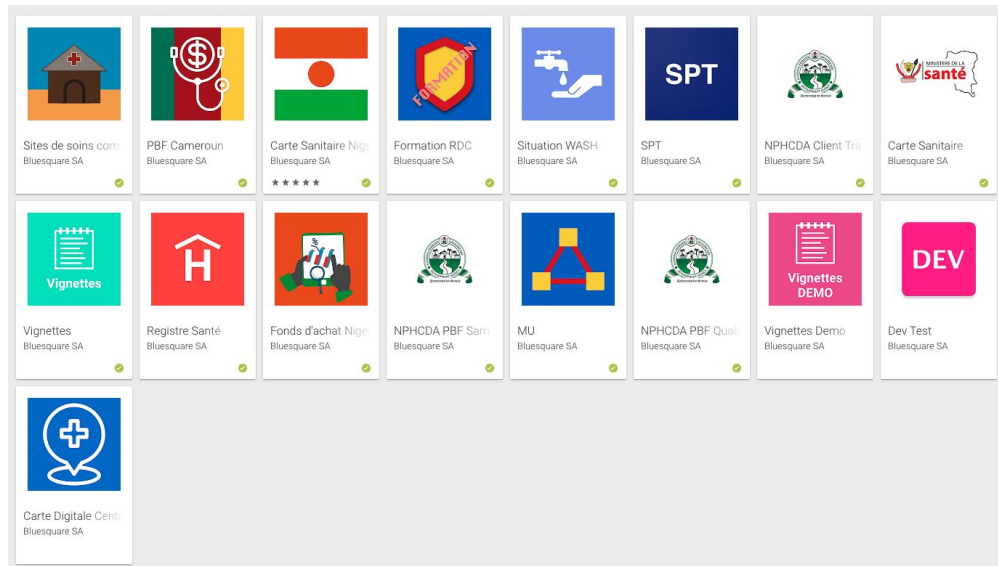
# Part 1: Routine data collection



Multiple white labelled apps

Centered around the notion of territorial hierarchy

Offline data collection
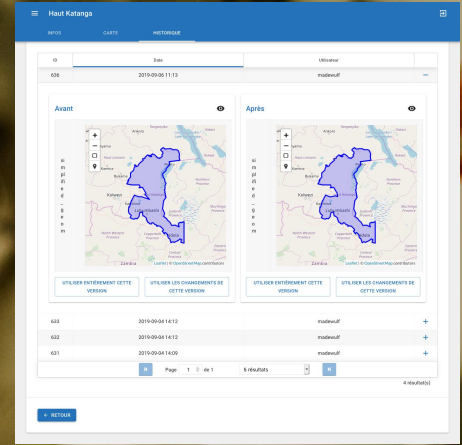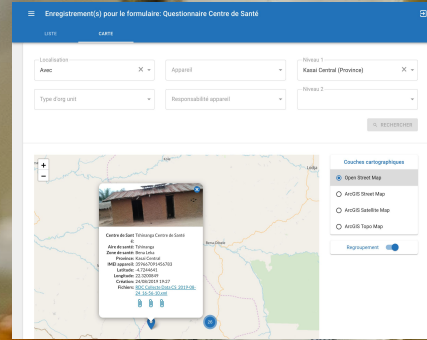
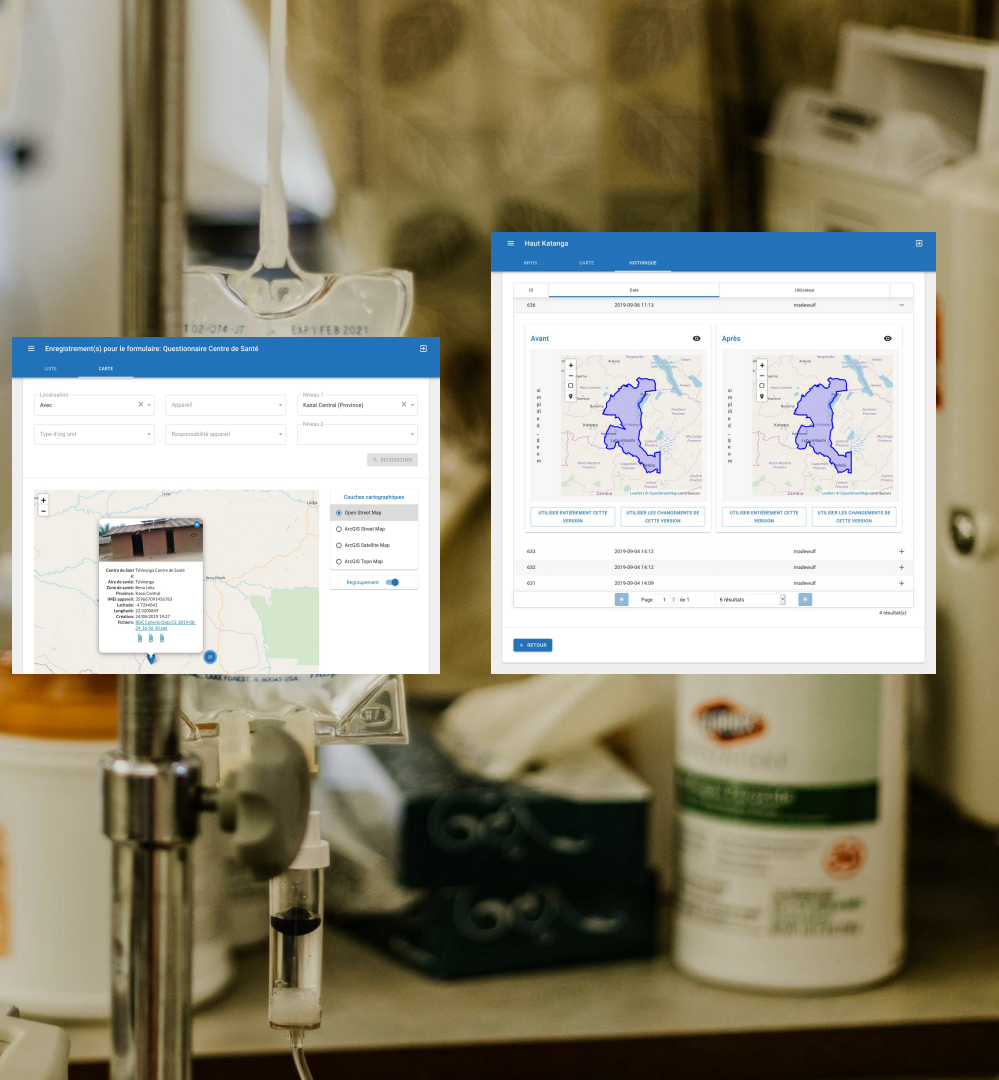Possibility to suggest org units

DEMO!

# Data management

Facilities located through GPS

Comparison and merging of multiple data sources
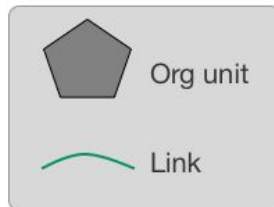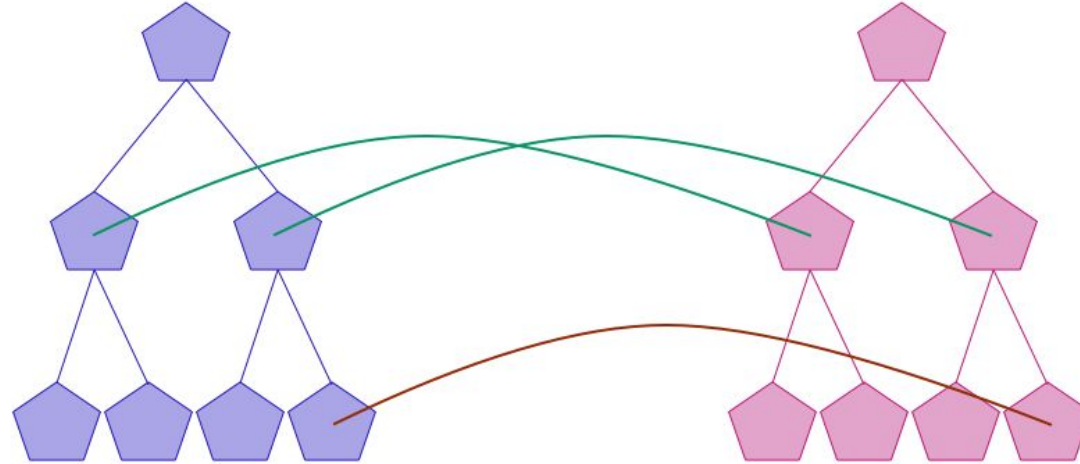
Validation work distributed along geographical hierarchies

Change traceability and possible rollbacks

# Part 2: Georegistry



Reference Health Pyramid

Pyramid from data source 1 of x

Org unit

Link

Different links can be found by different matching algorithms
Links can be validated individually or in batch
Data can be migrated to the reference pyramid by following the links
The reference pyramid will typically be extracted from an HMIS and
exported back to it after being enhanced.

# Example use:
# Building a health and administrative pyramid
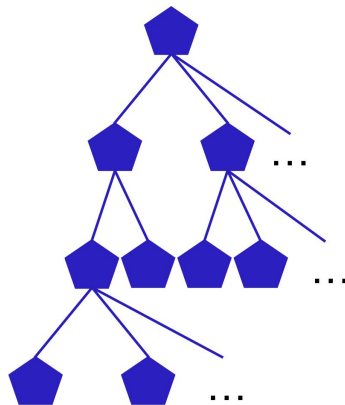
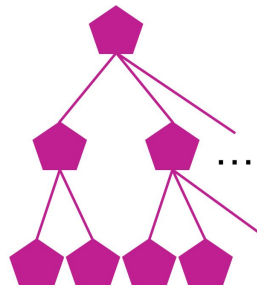SNIS + Commune + RENALOC = Résultat

Niger

Districts

Aires

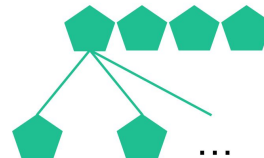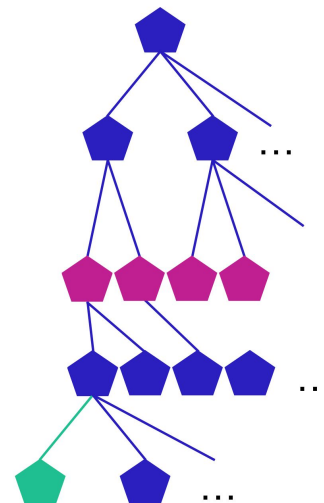FOSA

...

Niger

Districts

Communes

.

Communes

Localités

...

Niger

Districts ...

Communes

Aires ...

FOSA/Localités ...

# The big picture



DHIS2

API

Jupyter

Iaso
Georegistry

Branded
Mobile
App

Org Units Info

Source 1  Source 2  …

Additional sources
of master lists

= master list

= surveys
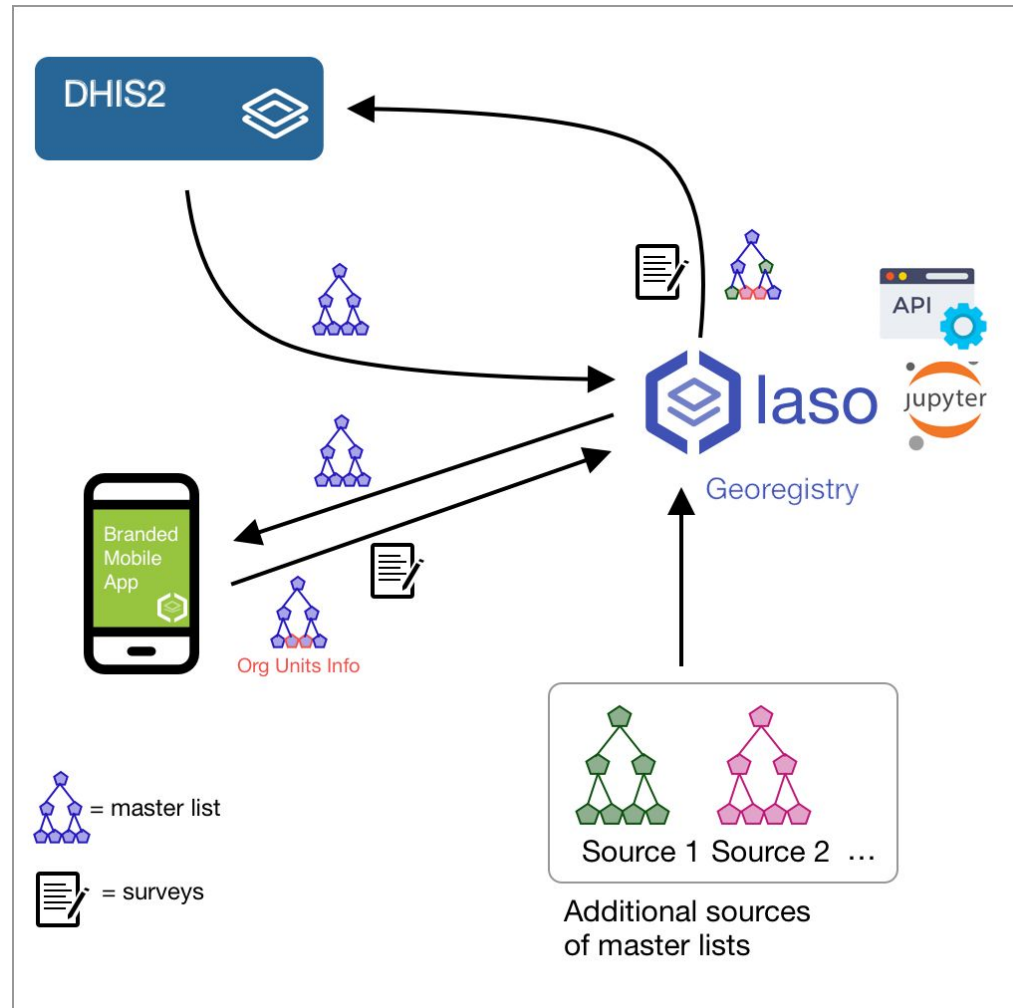
# Multiple hierachies + links
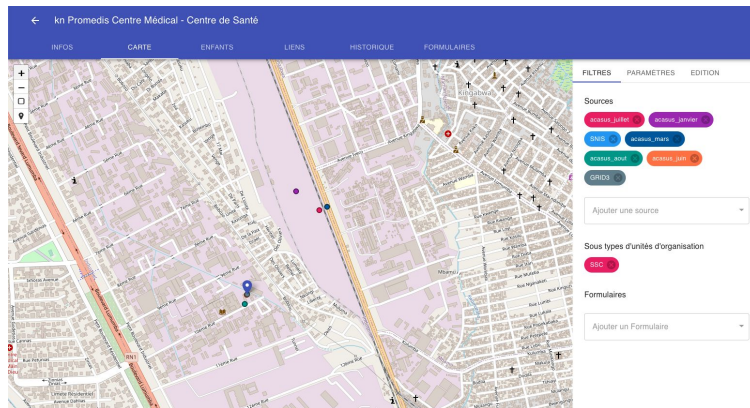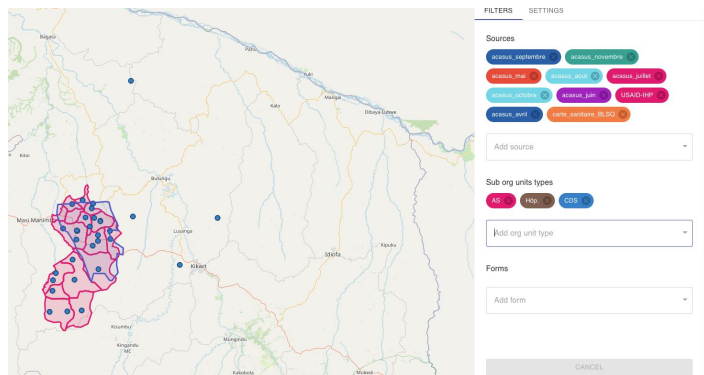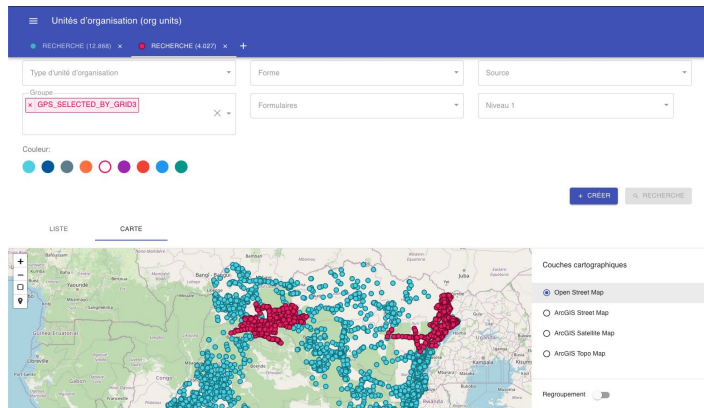


DEMO!

(A hierarchy is called a "source" in Iaso)

# Additional Features

1. DHIS2 Exports
2. Multi search
3. Programmable through a Rest API (Jupyter)
4. Designed to allow adding custom algorithms run as long running tasks on workers
5. Exports to CSV/Geopackage
6. Multi tenant
7. Lots of feature flags for the mobile apps
   (GPS on, authentication, auto upload)
8. Open source (MIT License):
   https://github.com/BLSQ/iaso

# Tech

ODK for the form engine



Jetpack + Kotlin for the mobile app

Android Jetpack
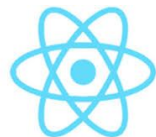
PostGIS for the DB



(geo)Django for the dashboard

django

Frontend:
Leaflet/React/Material UI

Leaflet

React

# Roadmap

**Short term**

- Fine grained dashboard permission

- Better data source management in the dashboard (now, mainly in command line)

- Monitoring of data collection (with an eye on privacy problems)

- More imports/exports (OpenStreetMap/Odata)

**Middle term**

- Data collected for "mobile entities" (patients, hardware, etc ....)

- Microplanning

# What Iaso is

Routine data collection supported through generic mobile apps

+

Enhancement of geographical data thanks to mobile devices GPS

+

Comparison and merging of multiple data sources in a single dataset

+

Validation tools for officials

+

Interfaces for both users from non programming background and data scientists

**Bluesquare**

# Contacts/Links

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mdewulf@bluesquarehub.com

Iaso
https://github.com/BLSQ/iaso

It's iaso, not Iaso