BLUESQUARE

laso

From data collection to geospatial data management in public health and more!

FOSS4G - 17/11/2022

Bluesquare - Who are we?

- Belgium global data company focused on digital health in low- and middle-income countries
- Founded in 2012
- Active in more than 30 countries, donors, international partners and governments
- Support governments and their partners to digitize public health services and make performance data available to decision-makers
- Domains: Health Financing, Geospatial Information, M&E, logistics management, data sciences for health, infrastructure hosting
- laso is one of our open-source tools developed in order to enhance offline data collection with a spatial focus and help coordinate multiple sources of data.

IASO

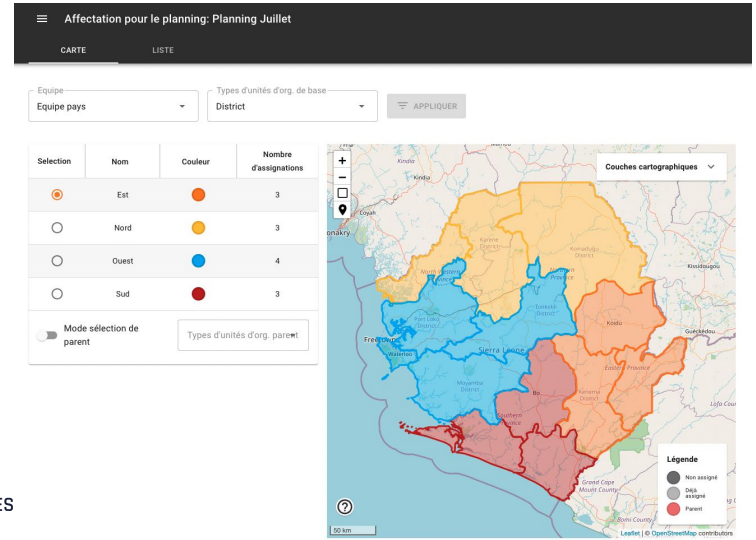
YOUR ALLY FOR DATA COLLECTION CAMPAIGNS

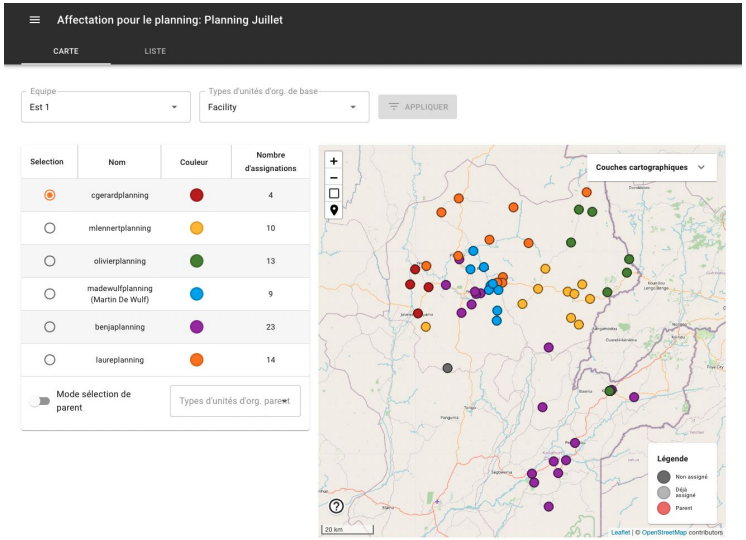
IASO is a data collection platform with advanced geospatial features developed by Bluesquare to support the continuous management of geographical information, microplanning of data collection activities and data collection itself.

- Bi-directional integration with DHIS2
- Already more than **547 374** forms collected
- Open-source
- Used in more than **10** large-scale projects
- Online & Offline features

Main features

- **Managing reference GIS data** (territories / hierarchies / locations)
- **Microplanning data collection activities** based on the GIS data
- **Collecting data** (online/offline) and **monitoring** data collection
- **Open Source** (Python/Django/Postgres+PostGIS)/React based)





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Boring technologies for innovative platform

ODK for the form engine

Jetpack + Kotlin for the mobile app

Android Jetpack

PostGIS for the DB

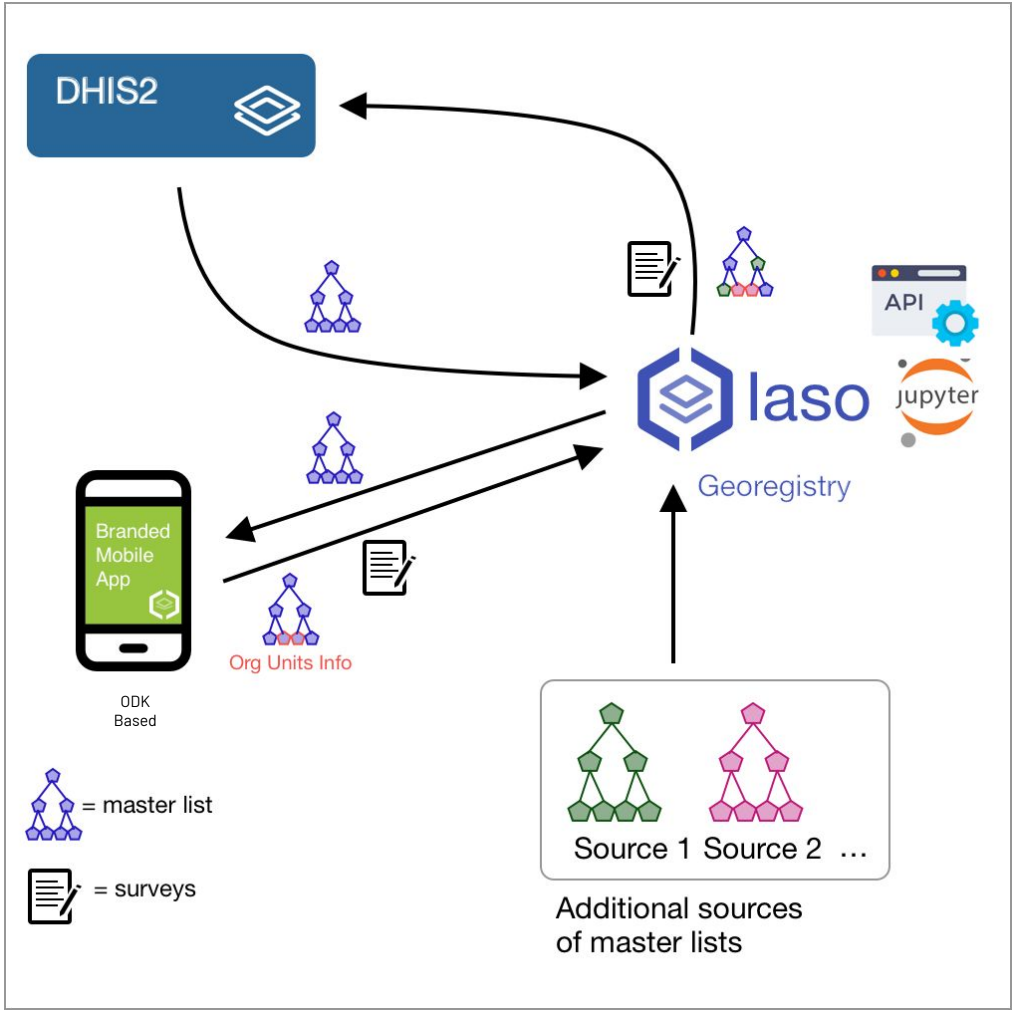
(Geo)Django

django

Frontend:
Leaflet/React/Material UI

It is not only about laso

- laso integrated in multiples workflow by being able to share data (forms, hierarchies) with other infrastructure
- In Performance Based Financing programs, data are collected through laso shared with the DHIS2 platform where the invoicing is generated and shared back with the health centers and stakeholders.
- In Polio distribution vaccines campaign, laso is part of tracking of delivery infrastructure

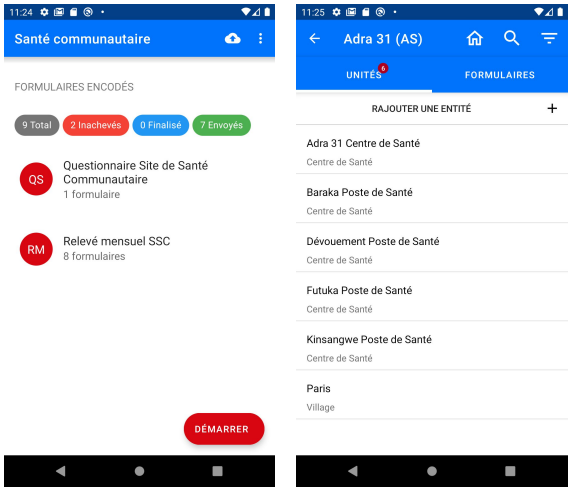


How is laso currently used?

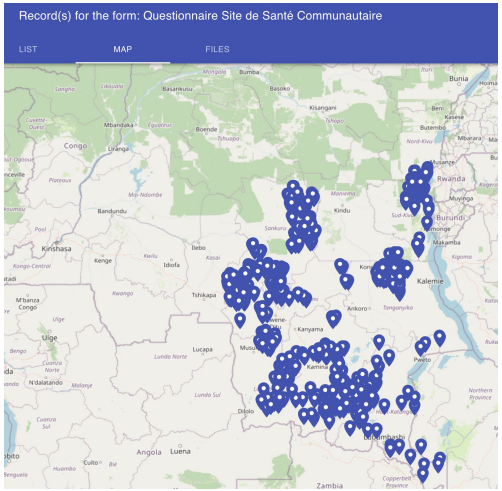
- Monitoring of 48 polio campaigns where each campaign target 2.5M children
- To identify and geolocate the Integrated community care management sites (iCCMs) in DRC through USAID Integrated Health Program
- To identify and geolocate 109K schools on DRC's schools map (funded by Cordaid)
- To collect health data periodically for financing purpose in DRC, Ivory Coast, Burundi, Niger, Haïti and Cameroon.
- For the census of over 30,000 health facilities and villages in Cameroon (Cameroon's Expanded Program for Immunization)

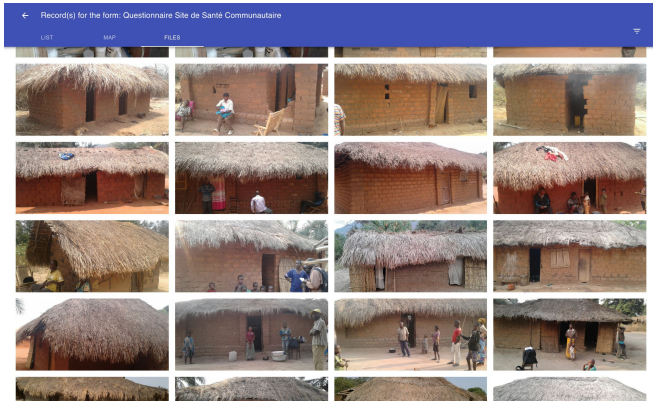
Mobile application : data collection

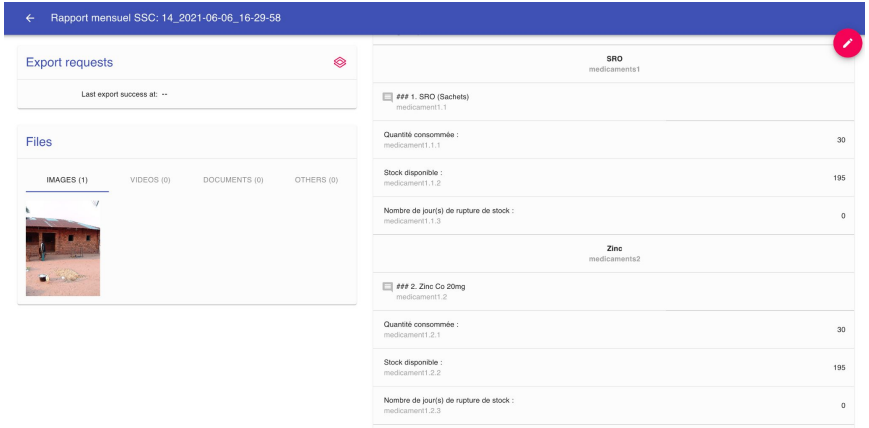
- Used to support surveys as routine data collection processes
- Customized to the branding of the project
- Forms based on ODK (XLSForms)
- Offline and online data collection
- GPS coordinate acquisition can be:
  - In the background during form filling process
  - Actively taken during the form filling process
  - Pointed on a map in the form
- User activated tracking GPS to cover an area by taking location sampling points at regular time intervals
- Validation phase before enriching the general georegistry



Example data collection: Community Health Sites







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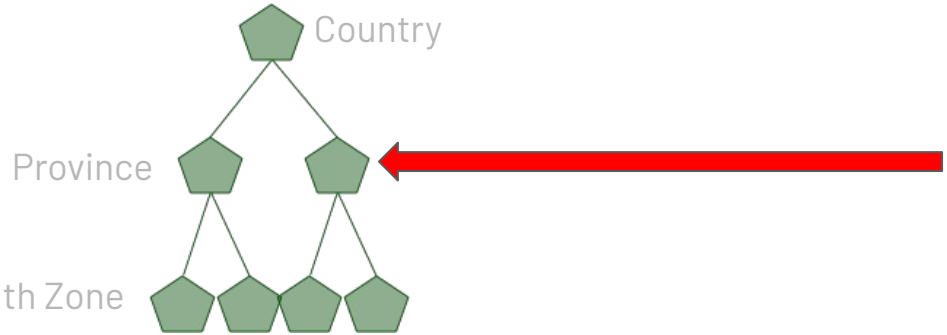
Concepts

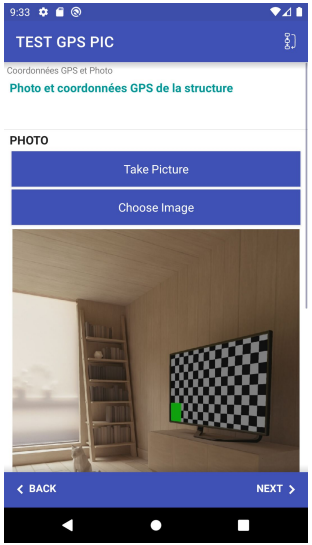
Hierarchy(ies) of org. Units

- Name(s)
- Parent
- GPS
- Territory
- External IDs (to link to other systems)
- Groups



Forms in the xlsform format linked to org. units

	A	B	C
1	**type**	**name**	**label**
2	note	titre	TEST
3	select_one yesno	soumission_test	Est-ce une soumission test ?
4	**begin group**	**CAN_part_1_**	**Coordonnées GPS et Photo**
5	**note**	**CAN_part_1_note**	**Photo et**
6	image	imgUrl	PHOTO
7	geopoint	gps	Coordonnées GPS
8	end group		
9			



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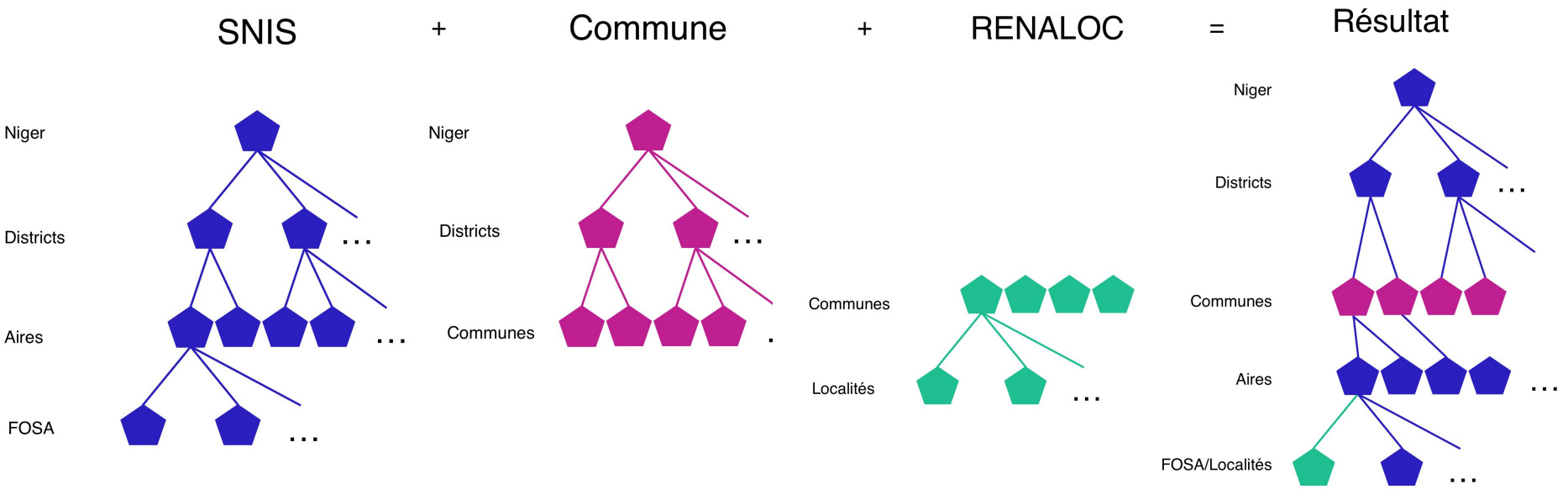
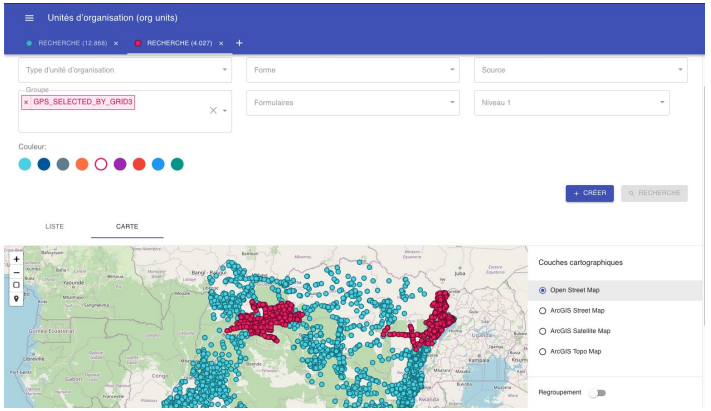
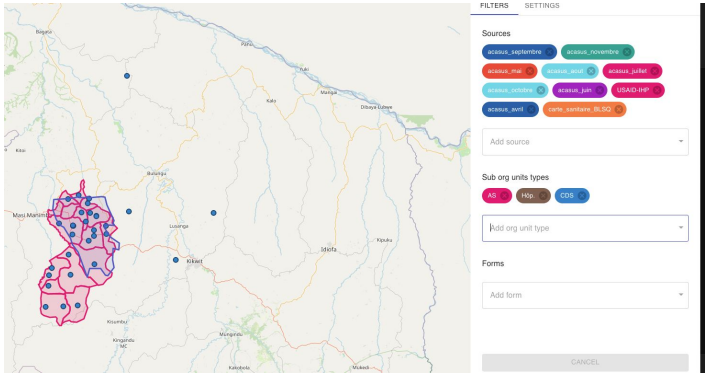
Example use:
Building a health and administrative pyramid



Georegistry: Multiples hierarchies/sources

- Dataset
  - Grouping concept for one source
  - Versionned fully
  - Can be externally imported (DHIS2/Geopackage)
- Full data/metadata history kept for every data element; change traceability and possible rollbacks
- Support any PostGIS geometry during import/export
- Geopackage follows a specific format to leverage laso grouping features as Organization Units Type





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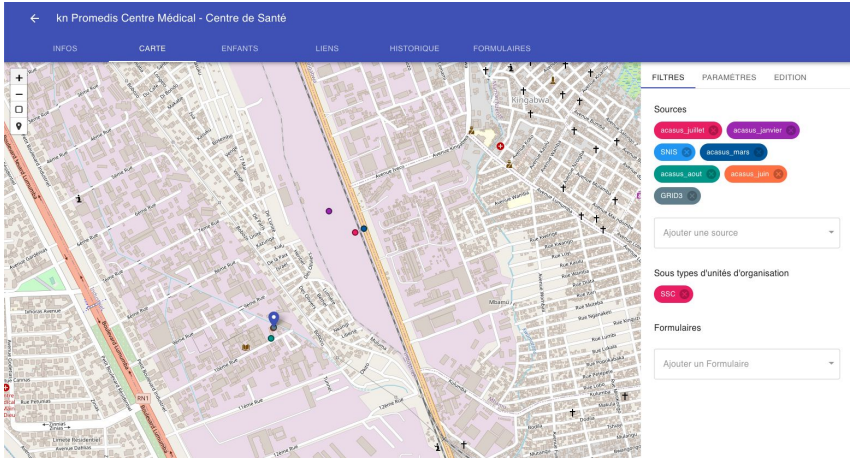
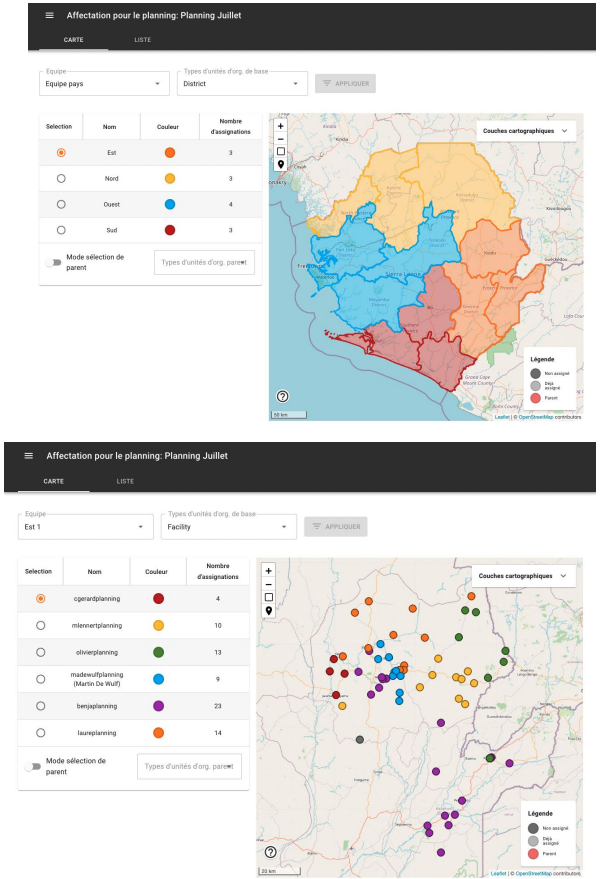
Georegistry: Links between sources and API

- Basic matching algorithms directly available
- Possible to create a "link" between two elements (= being the same)
  - Across versions of the same dataset
  - Across datasets
- Comparison and merging of multiple data sources
- Data model exposed through the API allow to use more sophisticated algorithms to evaluate the data element



Microplanning (team/individual assignments and monitoring)

- Allocation of places to visits and forms to fill to users
- Support in the mobile application: each users receives an easy to navigate list of tasks
- Monitoring of execution of the planning by the team/user/region/supervisor



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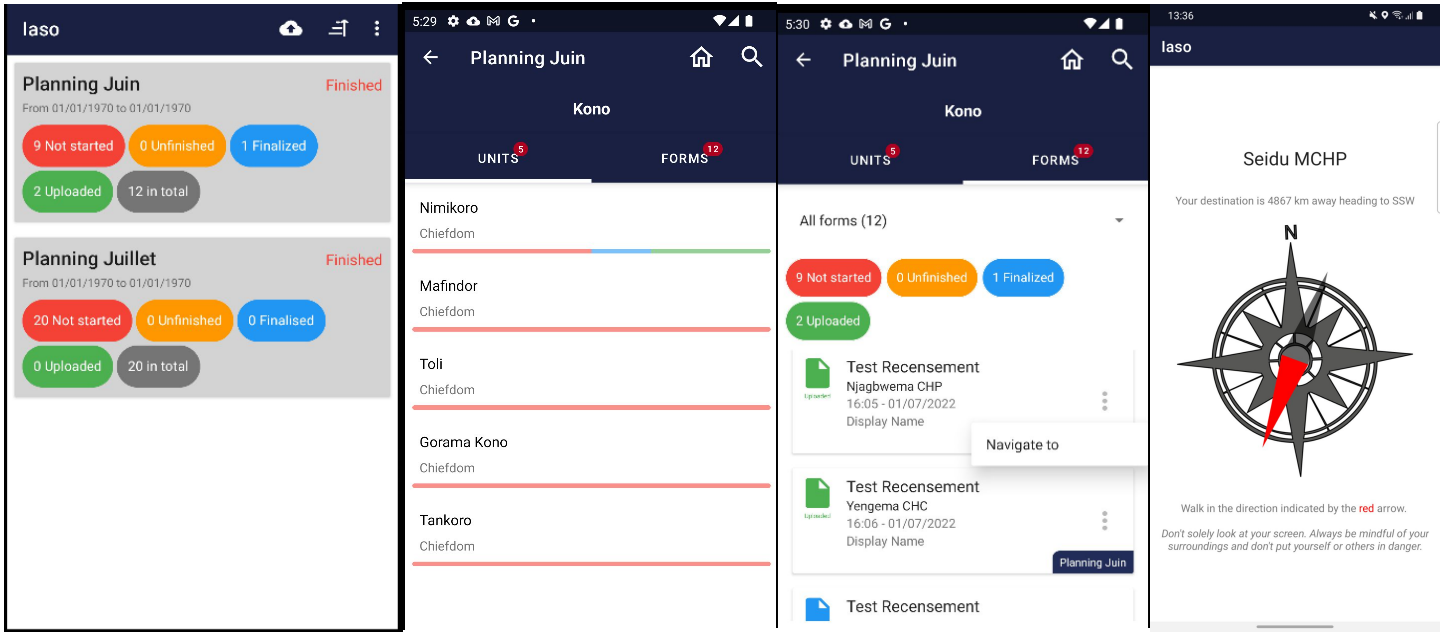
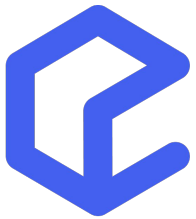


Additional Features

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 and imports 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
9. Hostable locally



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Thank you!

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