UGANDA AND TANZANIA LAND ADMINISTRATION MODERNIZATION BASED ON IT-LEAP CONCEPT & LADM

IGN FI, GEOFIT, INNOLA SOLUTIONS

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ISO LADM CONFERENCE
• Over past several years the group of three companies - IGN FI, GeoFIT and Innola Solutions – is implementing projects in Africa and Caribbean region using Innola Framework as a LADM-based software solution for Land Administration.
• Additionally to core system and processing objects in Innola, each project has own extensions and logic to the base LADM model.
DESINLIS  |  ILMIS

2015 – 2020
Beneficiary: Ministry of Lands, Housing and Urban Development (MLHUD)
Funded by The World Bank.
National wide project
Pilot stage (DESILISOR 2010–2015)

2016 – 2019
Beneficiary: Ministry of Lands, Housing and Human Settlements Development (MLHHSD)
Funded by The World Bank.
Pilot in Dar es Salaam Region but designed to be easily scaled up for all Zonal Offices in Tanzania.
ILMIS APPLICATION - IT-LEAP

• ILMIS is built on second version of the Innola Framework. The Core data model does not change between projects significantly, but only extended as needed.

• Like in all projects, the principal questions that are not covered by ISO LADM were as follows:
  • Country specific practices - like using Tenancy in Common shares to track ownership of 3Dunits without changing parent land title
  • Extending base LADM with Valuation sub-model
  • Extending base LADM with Town Planning sub-model
ILMIS ARCHITECTURE

Client Side - Web
- Workstation
- Administrator
- Staff Portal
- Gateway

Client Side - Windows Desktop
- Scan Client
- Desktop GIS

InnoLA Application Server (Tomcat)
- Workflow Service
- Security Service
- Audit Service
- Business Logic Service
- Domain Service
- Data Access Service
- Reporting Service
- GIS Service

InnoLA Application Server (ESRI or GeoServer)

DBMS and Storages
- CMS
- Scanned documents and attachments
- DBMS
- System
- Registry
- GIS/Cadastre

Application Framework (Spring)
- Workflow Engine (Camunda)
- Report Engine (BIRT)
- Business Rules Engine (Drools)
- MapModule (OpenLayers)
- ORM (Hibernate)

GIS/Cadastre Registry System
- ORM
- Hibernate
- Spring
- Hibernate
- Hibernate

Workflow Service

INNOLA
LADM
Implemented in “canonical” way, no changes. But significantly extended...
In real word, RRR and Party implementation are more complex to support “traditions” and legal practices...
LA_SPATIALUNIT, LA_POINT, LA_BOUNDARY_FACE_STRING – REPRESENTATION OF THE PARCELS LINKED TO THE TITLE CADASTRE LAYER
LA_SOURCE – CERTIFICATE OF TITLE LINKED TO THE BAUNIT, LA_PARTY AND LA_RRR

Actual implementation of Source file/image depends on CMS in use.
'APPLICATION' & 'TRANSACTION' – EXTENSION CLASSES

‘When?’ and ‘By Whom?’ and ‘How’? registry is changed is very critical for developing countries. Not covered by ISO LADM...
EXTENSION CLASSES - ‘SYSTEM TRANSACTION’, ‘WORKFLOW’
**Registration/system transaction history. BPMN standard.**
While fee collection is not necessarily the part of LADM, it is critical for every registration authority to ensure payment requirements are met.
The Innola physical model is an implementation of the conceptual LADM Model, which was a good starting point.

However, the full model contains modifications on the LADM model in order to:

• Collect processing and transactional data in more details for auditing and tracking purposes

• Be more flexible and reusable for different contexts and country-specific cases

• Make object processing easier
ILMIS

PHYSICAL

DATA MODEL

LADM VERSIONING IS IMPLEMENTED, EACH OBJECT HAVE INHERITED THE VERSIONED ATTRIBUTES:

LA_BAUNIT, LA_RRR, LA_PARTY, LA_SPATIALUNIT, LA_POINT, LA_BOUNDARYFACESTRING ETC.

- VERSION_LIFE ON UNIQUE OBJECT DEFINED BY ITS OID
- BEGIN_LIFE
- END_LIFE

ADDED BY INNOLA:

- VERSION NUMBER
- STATUS (PENDING, REGISTERED, PREVIOUS, ARCHIVE, REJECT)
CONCLUSION – LADM MODEL IN INNOLA

- Includes all necessary LA objects and relation in the core
- Allows to extend easily the model
- ISO LADM sometime too restrictive in term of relation to implement and maintain it in a real-life system. Should it be simplified?
- The versioning conception is well defined and can be improved with status and version number attribute to manage object in short and long life, and make user firendly
- Management of the class LA_RRR can be optimized in order to not have duplicates of RRR for each party involve in the RRR. *That is why we use LA_Interest in between.*
- Spatial objects except parcels are managed as GIS layers in a specific schema (e.g. administrative boundaries)
To add some recommendations to add others business units objects involved in LA - *at least basic minimal data* - for Valuation, maybe Town Planning and Finances. This is still part of Land Administration...

To propose and standardize transaction/processing classes

Cover cases for mixed legal systems – both Title and Deeds at the same time in the same database/applications

Extend with more practical cases on specific rights – Legal Representatives, Guardians etc.
Thank you.

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