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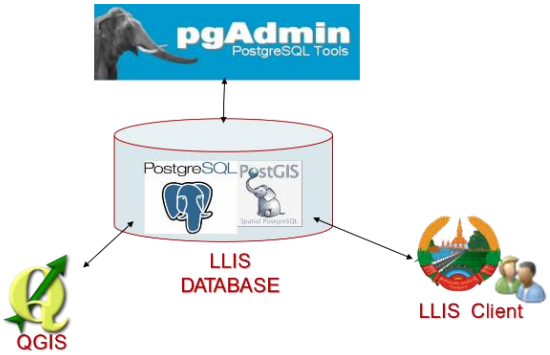
Briefing Paper - Digital Cadaster Database Management System

Introduction

The digital cadaster "Lao Land Information System" (LLIS) was developed under the umbrella of development cooperation between Lao PDR and the Federal Republic of Germany, implemented by GIZ. The first prototype was developed in 2009 as database with a basic front-end client to capture cadaster information from systematic land registration in rural pilot districts. Since then the database and the front-end client have been gradually extended and improved. The responsible Ministry of Environment and Natural Resources (MoNRE) managing LLIS has recently decided to install the LLIS as the national standard system, to be set-up in the whole country.

What is LLIS?

The LLIS is a digital cadaster database management system to import, process and maintain cadaster information (geometry and textual data) with the potential for a modular extension to a land information system comprising additional land related information such as land use, land value and land development. It consists of a backend database part for data keeping, a front-end client part for data entry and generation of outputs such as land title document, reports and survey certificates.

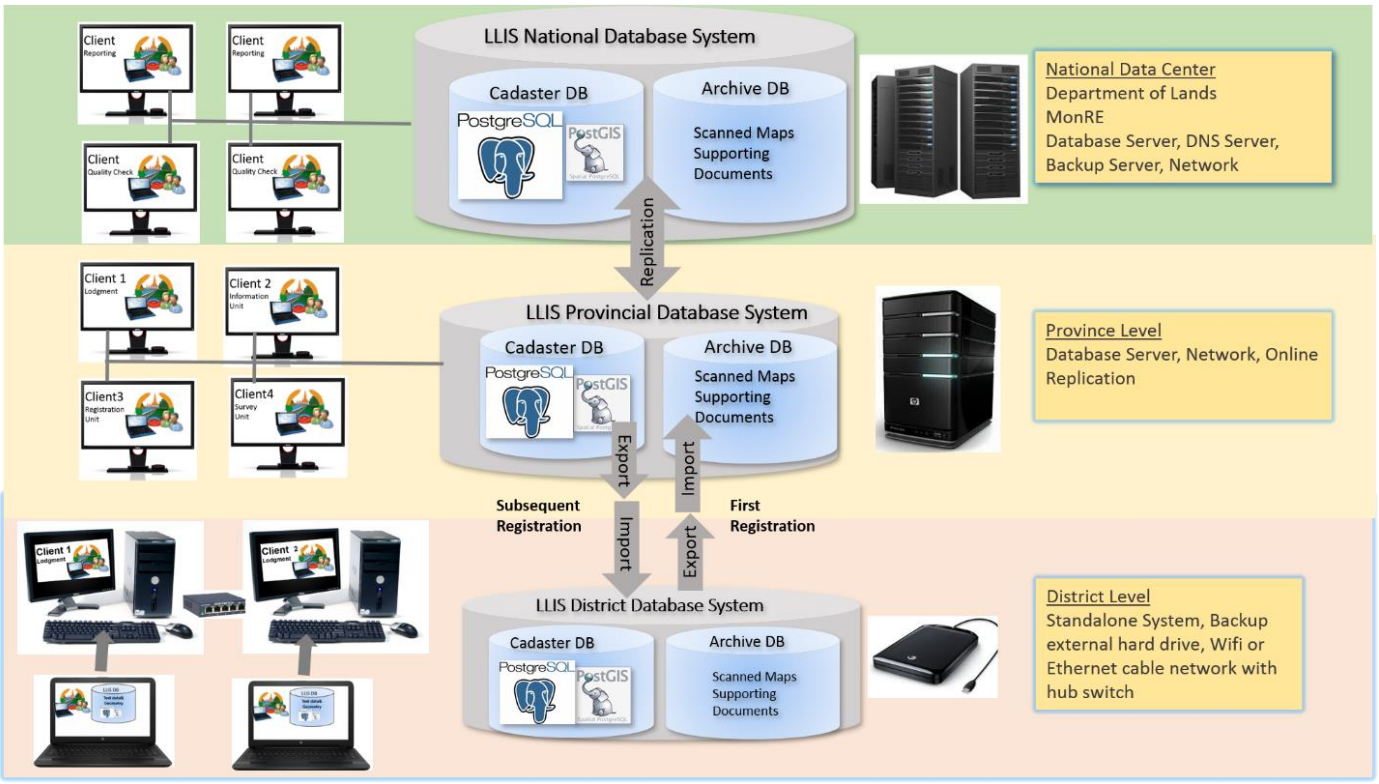


It also contains a GIS interface for quality control, data editing, data imports, composing of maps and interface to other databases systems. The front-end client has a module for first registration as well as subsequent registration. The system can manage changes on the land parcel's geometry such as subdivision, consolidation or boundary reestablishment.

What are the strengths of LLIS?

The system is in line with all 7 success factors for a modern digital cadaster formulated by the FIG (1995). To meet these criteria completely, extensions and improvements to the existing system have been identified and are currently under development.

a) **Security** through duplicate storage of records in case of disaster & controls is given through storage of cadaster records at district, province and national level.
b) The establishment of an archive database to store all supporting documents digitally and an automatized data replication from province to national level has already started and is expected to be finished by the end of 2018.
c) **Clarity and Simplicity** through a database model which follows the ISO 19151 Geographic Information - Land Administration Domain Model
d) **Timeliness** for provision of up-to-date and complete information is provided by the existing functionalities for subsequent registration. Trained staff from the DoL will assist the decentral land offices to transfer all existing land records from predecessor systems to LLIS.
e) **Fairness** is kept through equitable access to the system by decentralized offices at district and province level and trainings provided by national master trainers to the decentral level to assure the procedures are understood and can be applied.
f) **Accessibility** is provided to all authorized user at different level through a user management which gives access according to defined roles and responsibilities.
g) The interface to QGIS allows easy display and extraction of data for third parties. The LLIS database can be linked to the **web-based Geoinformation System** (Geonetwork) provided by the Natural Resource & Environment Information Center of the Ministry to display extracts of the database in an online system.
h) **Costs** are reduced by using almost solely open source software



i) **Sustainability** is achieved through capacity development of land administration staff for system administration, system maintenance and by training master-trainers. Every development step of the system over the last years has been done in close cooperation with GIZ, the external IT service provider and DoL, and therefore the ownership level on the Laotian side is very high.

Where is LLIS used and how much cadaster data is managed in LaoLandReg?

In 2017 LLIS has been officially approved as the database system for land registration in Laos. It is used to store, maintain and process cadaster records in 92 districts in the country in 12 provinces. Currently there are nearly 76,000 cadastral records stored in LLIS. The amount of cadaster records will increase in the nearer future through ongoing & planned Systematic Land Registration and through migration of existing cadaster data from digital predecessor cadaster management systems (BC Account & LLMS) to LLIS. Migration routines have been developed, trained and tested and are now applied in 4 provinces already.

Approximately 130,000 cadaster records (textual & geometry) are going to be transferred to the system by the end of 2018. Trainings on setup and usage of LLIS are going to continue in 2018 in 6 more provinces to cover the total of 18 provinces by the end of 2018 to the beginning of 2019.

How is data storage and compilation organized between decentral and national level?

The systematic land registration is done at village level and the data is compiled in the district database. The district databases are compiled at province level and the province data is synchronized with the national database. An automatized replication between province database and national database is piloted in Xaignabouli province.

The data transfer from one database to another is done by extracting all relevant database tables and storing them in a compressed XML file. This exchange file is used to update the compiled databases at a higher administrative level. This exchange system is usefull in an environment where a strong & stabil internet link is not given. This is still reality in most of the districts and provinces in LaoPDR.

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