

# Development of a Prototype for the Assessment of the Malaysian LADM Country Profile

Nur Amalina Zulkifli, Alias Abdul Rahman, Hasan Jamil, Chee Hua Teng (Malaysia) and Peter van Oosterom (Netherlands)

**Key words:** Cadastre; Digital cadastre; e-Governance; Geoinformation/GI; Land management; Standards; database; technical model; LADM; country profile; 3D cadastre

## SUMMARY

During the last couple of years, the potential of 3D and Land Administration Domain Model (LADM, ISO 2012) based cadastral registration in Malaysia has been investigated as described in several papers, and presented at various (FIG) meetings. Based on these preparations, a two day meeting between R&D staff from JUPEM and UTM has resulted in a proposal for a comprehensive LADM country profile supporting 2D and 3D cadastral registration in Malaysia. This conceptual model contains several novel aspects for the Malaysia: 3D representations (incl. legal spaces around utilities), full version management, linking of database information and source documents, and basic property units (grouping of spatial units in one basic administrative unit with same rights attached). In order to assess the new conceptual model, before taking further implementation decisions, a prototype system was developed. The purpose is to discover potential weak aspects of the conceptual model, and use experience from the prototype development to further improve the conceptual model, before actual implementation. The steps in developing this prototype include: 1. derive technical model (Oracle spatial) from conceptual model, 2. convert some sample JUPEM/land office data into model, and 3. develop prototype (based on MicroStation) to view and edit. Many decisions have to be taken to develop the database schema (technical model): which exact data types (with special attention for 2D and 3D spatial data types), how to implement topology, which references to store explicitly (and which to derive), how to physically organize the data in the various tables (clustering), on which (spatial and non-spatial) attributes should indices be created, how to implement various constraints (e.g. sum of shares must be equal to 1), etc. Modelling tools, such as Enterprise Architect, offer automated conversions from the conceptual model (UML class diagram) to the technical model, which will be explored. However, some manual fine-tuning of technical model is expected. Having the technical model, then existing (and if needed additionally created) sample data from JUPEM (spatial) and Land Office (legal, administrative) are converted into this structure and loaded in the database. Finally, the data from the Oracle database can be accessed by using Bentley MicroStation software for 2D and 3D visualisation and editing. The Structured Query Language (SQL) will be used to query and extract the data from the database. Based on the assessment, further steps could include (before actual implementation): • develop regulations/formats for digital certified plans with 3D objects, • redesign XML exchange formats for LADM based Malaysian data, and • also create prototype of web-interface for integrated access JUPEM/land office data.