UNIVERSITI TEKNOLOGI MARA

COMPARISON ON 3D XML DERIVATION OF STRATA TITLE SURVEY DATASETS FOR LADM DATABASE

NURSHAZANA ATHIRAH BINTI MOHD FARIS

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ABSTRACT

The registration and implementation of 3D strata objects inside the Land Administration Domain Model (LADM) framework in Malaysia are discussed in this study. LADM - ISO 19152:2012 is a conceptual description of a land administration system that includes the recording of 3D strata items. Standardization gives the data model more flexibility, making geographical data handling easier. The conceptual model, which has yet to be implemented by the national authority, is the research's main issue. This study will look at the practical steps of implementing LADM-based 3D strata object registration in Malaysia, taking into account the legal framework. The land administration system requires an exact 3D cadastre for a property that includes strata. The following aspects of strata object registration are parcel unit, accessory unit, common property unit, limited common property unit, and land parcel. All of these objects are currently represented in 2D in Malaysia. The goal of this research is to expand the representation of those strata objects to 3D. The prototyping process starts with data modelling, which entails choosing important object classes and augmenting them with attributes. It focuses on converting data from an existing database, such as strata XML, to Mapinfo platform. After that, the Mapinfo platform in E-Cadaster System will be used to construct the visualisation. The Mapinfo will read the information of XML data and checking the data before entering it in the database. I hope that this study will serve as a model for other national governments with similar land administration systems, particularly for the registration of strata items, such as Malaysia's upcoming Spatial Data Infrastructure (SDI) initiative. The capture, processing, and management of height of survey points that define parcel borders is a crucial aspect of the transition from a 2D to a 3D environment. According to this study, the LADM standard plays a crucial role in realising a 3D-enabled system for Malaysian land management.

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CHAPTER ONE
INTRODUCTION

1.1 Research Background

Due to land scarcity and population increase in Malaysia, there have been considerable stratified underground and aboveground developments in urban centres. The implication is that Malaysia's 2D-based land administration system (LAS) is having trouble capturing and mapping land ownership in densely populated areas. One issue is that flat and 2D-based representations may fail to convey 3D delimitation of spaces within and outside structures with irregular and complex geometries conclusively. Another issue is that establishing the economic, social, environmental, and legal ramifications of stratified urban growth would necessitate a large amount of cognitive work for urban planners (Rajabifard et al., 2021).

Currently, Malaysian LAS is based on surveying and cadastral measurements, which are stored as horizontal coordinates (X, Y) in the National Digital Cadastral Database (NDCDB). NDCDB is a two-dimensional geographical database for cadastral and survey data management. However, because land parcels in the actual world have a three-dimensional physical dimension, two-dimensional approaches to collecting and storing land parcels are insufficient to transmit ownership rights in complex scenarios (Atazadeh et al., 2016a, 2016b; Stoter et al., 2017; van Oosterom, 2013). There are also some places where there is room for improvement:

- Data Redundancy: Many attributes are replicated across tables, resulting in data duplication.

- Data inconsistency: Due to data redundancy, several values for the same attribute appear in different tables.

- Lack of relationships between entities are frequently undefined, resulting in data consistency and quality issues.