3D Strata Objects Registration within LADM Framework for Malaysia

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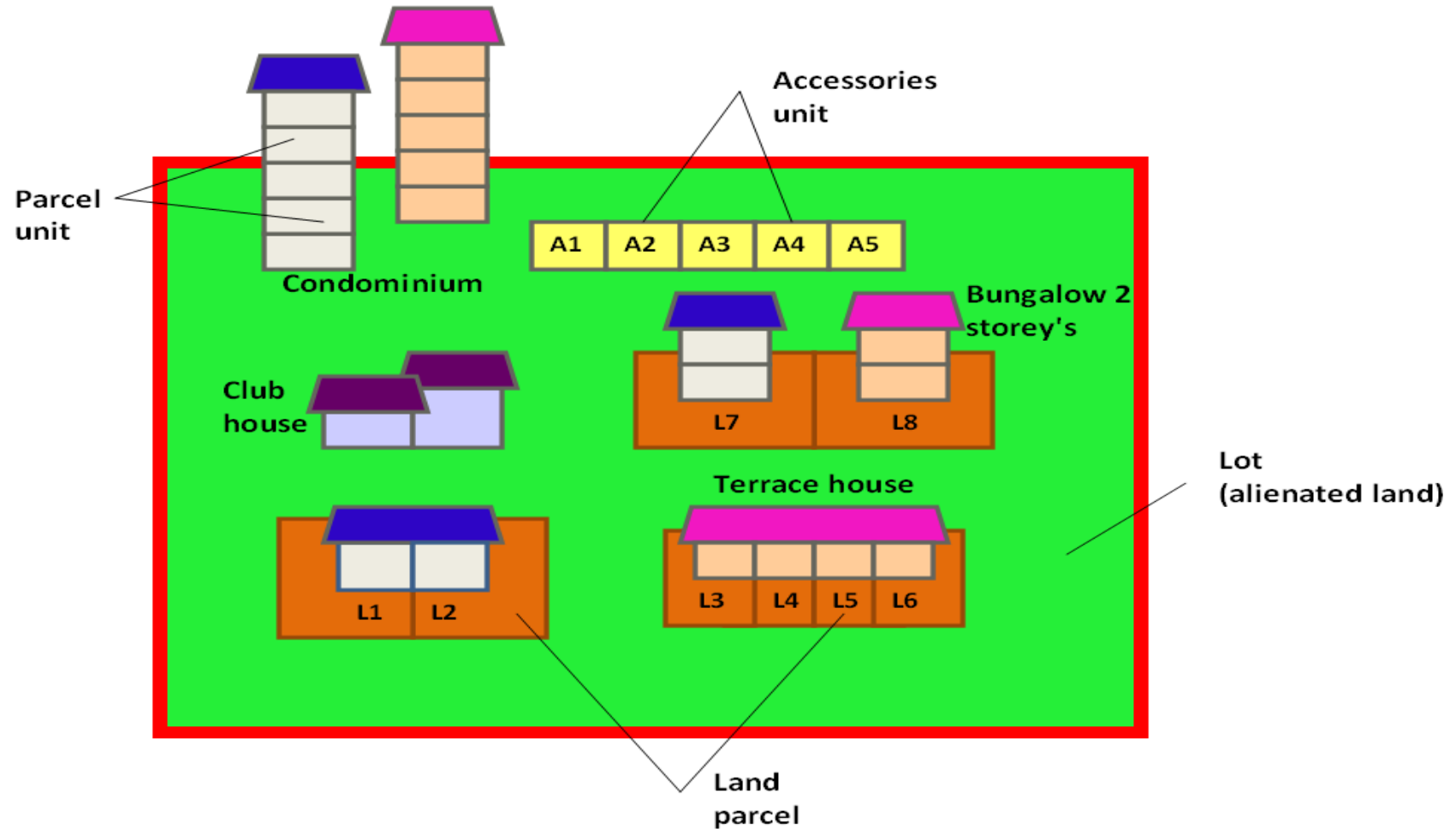innovative ● entrepreneurial ● global

Introduction

- Strata (parcels within multilevel buildings)
- Recently revised (2013) Strata Titles Act
- The amendments include:
  - Introduction of the Electronic Land Administration System of Strata Titles
- Thus, LADM
- 3D strata objects registration.

3D strata objects registration

- All multilevel buildings with multi-owners have a Management Corporation (MC).

- The MC:
    - all proprietors are automatically members
    - responsibility of administering the strata scheme
    - looking after the maintenance of the common property
    - enforcing bylaws and regulations
    - collecting levies from the proprietors to finance all the necessary maintenance.
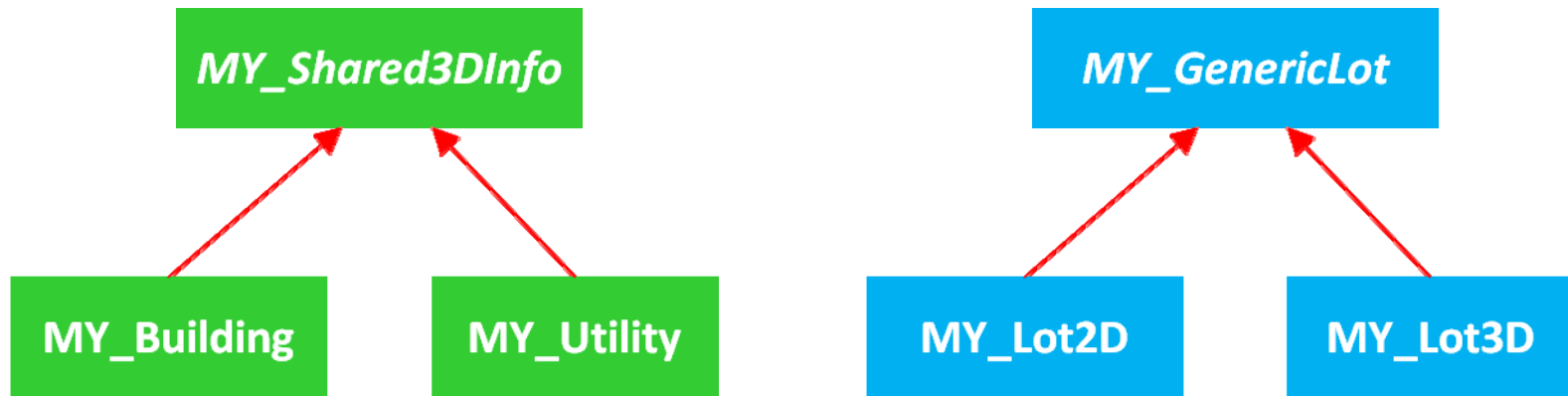
Cadastral objects related to strata titles
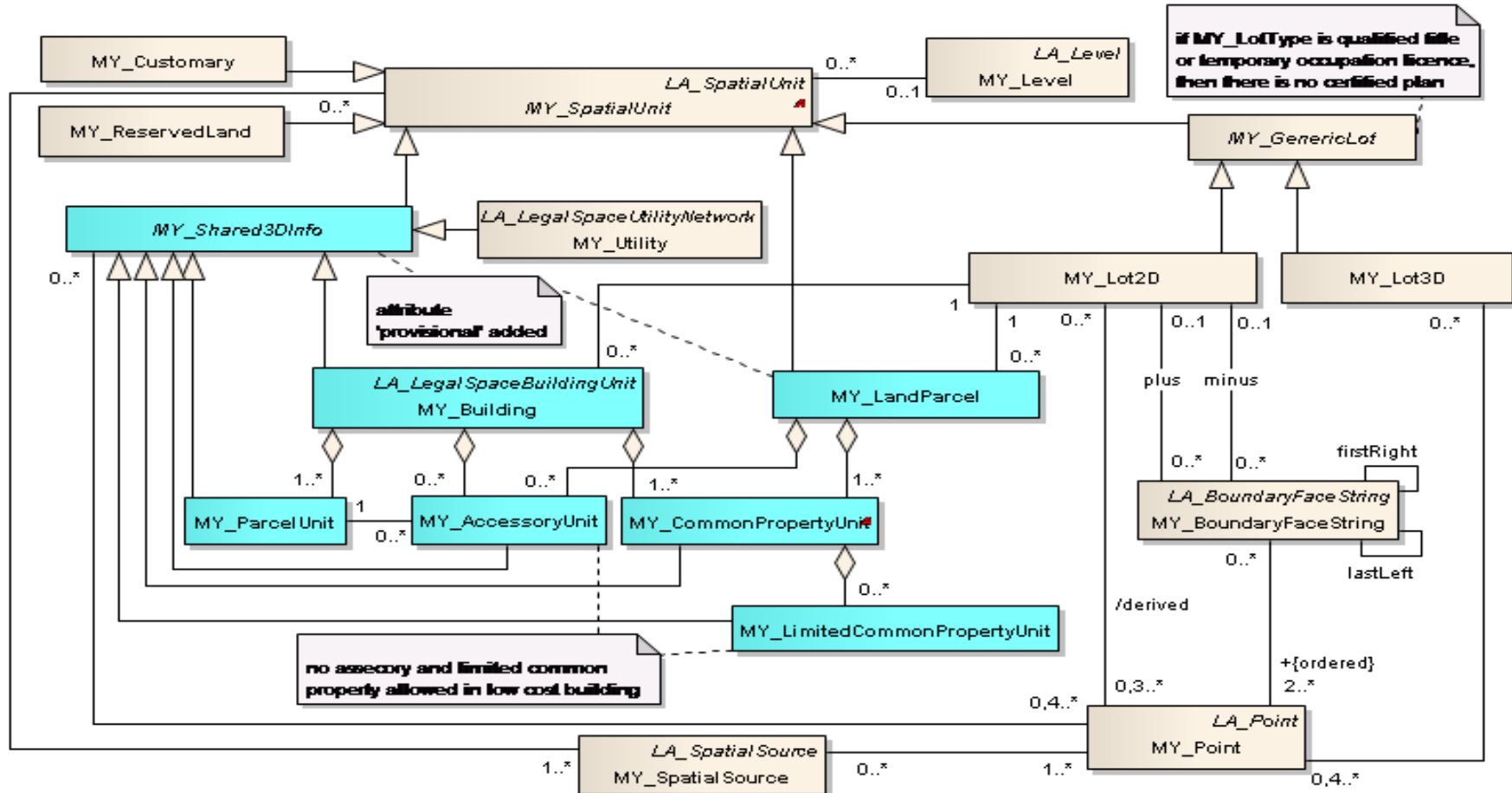
The conceptual model

- All classes in the Malaysian country profile are based on the inheritance of the LADM classes.

- The country profile covers

  - Spatial, and

  - Administrative (legal)

The spatial part

- 3D spatial units representations:
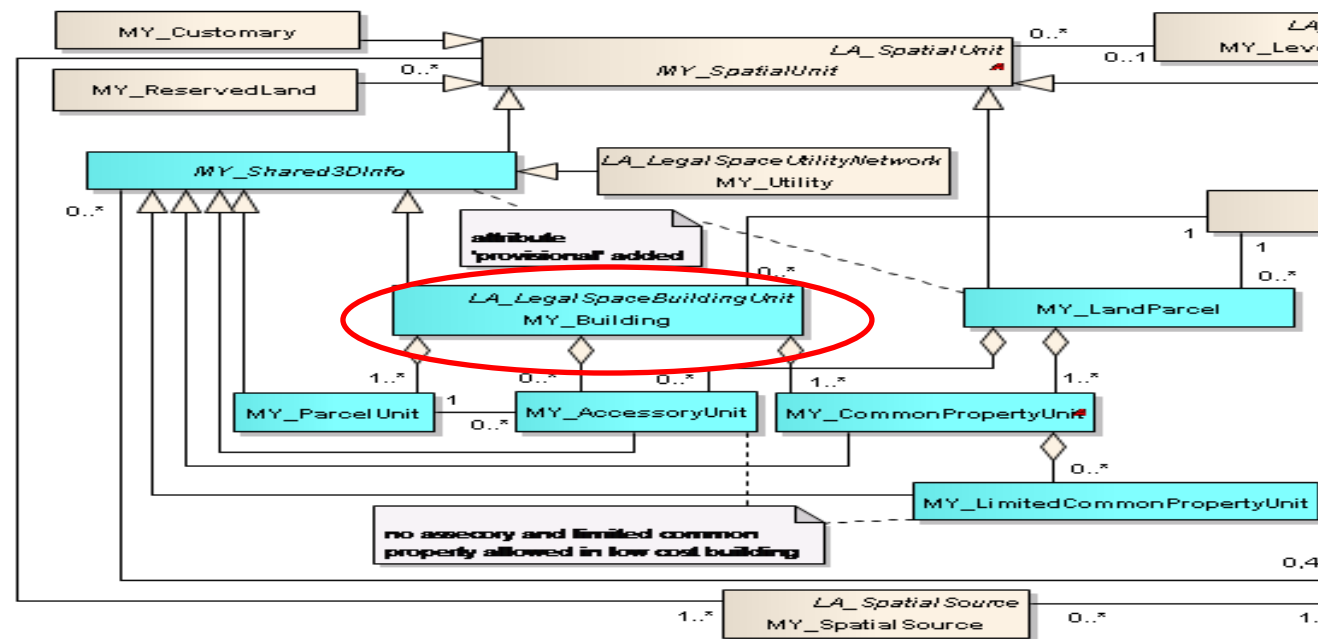 - MY_Building
  - MY_Utility
  - MY_Lot3D

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MY_LADM country profile (spatial part)

Spatial Part (cont…)

- MY_Shared3DInfo
  - Abstract class – does not have any instances
  - Superclass of MY_Building and MY_Utility
  - Has geometry attribute

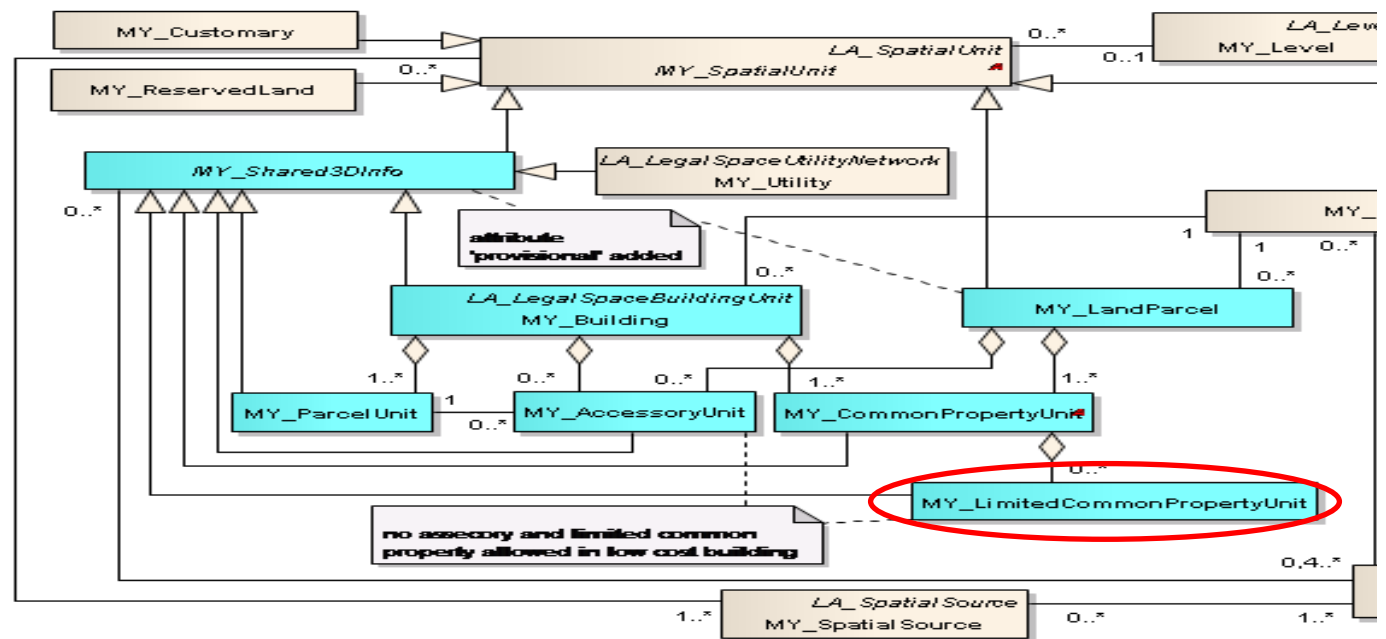# Spatial Part (cont...)

- MY_Building
  - 3D represention
  - Subclasses: MY_ParcelUnit, MY_AccessoryUnit and MY_CommonPropertyUnit
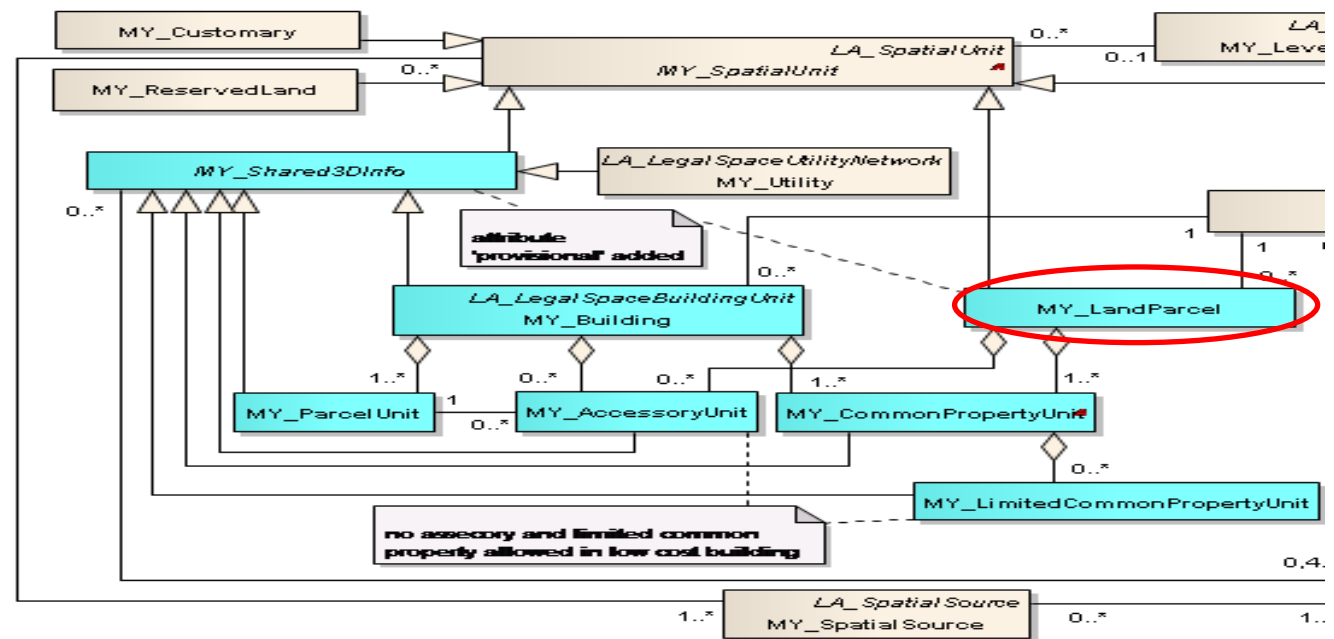
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Spatial Part (cont…)

- MY_LimitedCommonProperty
  - 2D and 3D representions
  - Part of relationship to MY_CommonProperty

Spatial Part (cont…)

- MY_LandParcel
  - 2D represention
  - 2D topology
  - MY_AccessoryUnit, MY_LimitedCommonPropertyUnit – part of relationship
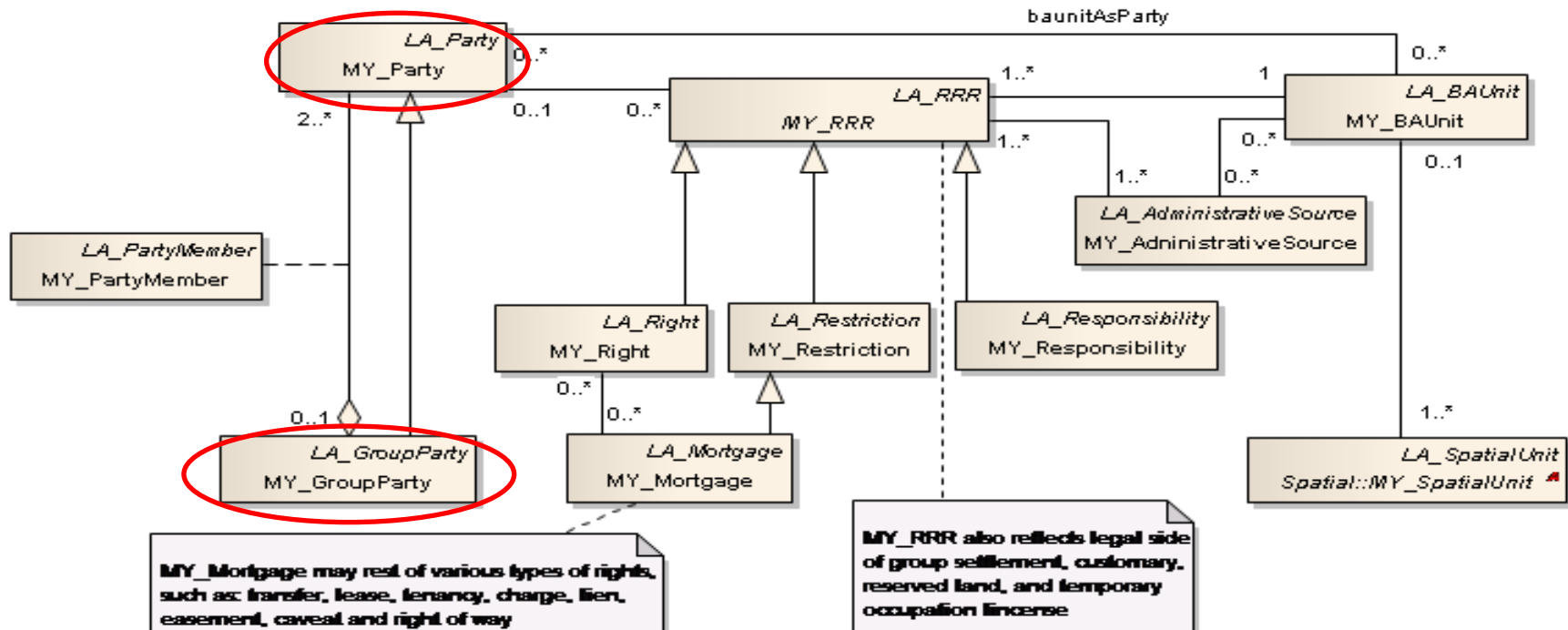
Spatial Part (cont...)

- Spatial source documents (i.e certified plans) – link with spatial unit and point tables

- Spatial unit - suID

- Spatial source - sID

- suID is based on Unique Parcel Identifier (UPI)

- sID for spatial source is the certified plan number

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Unique Parcel Identifier (UPI)

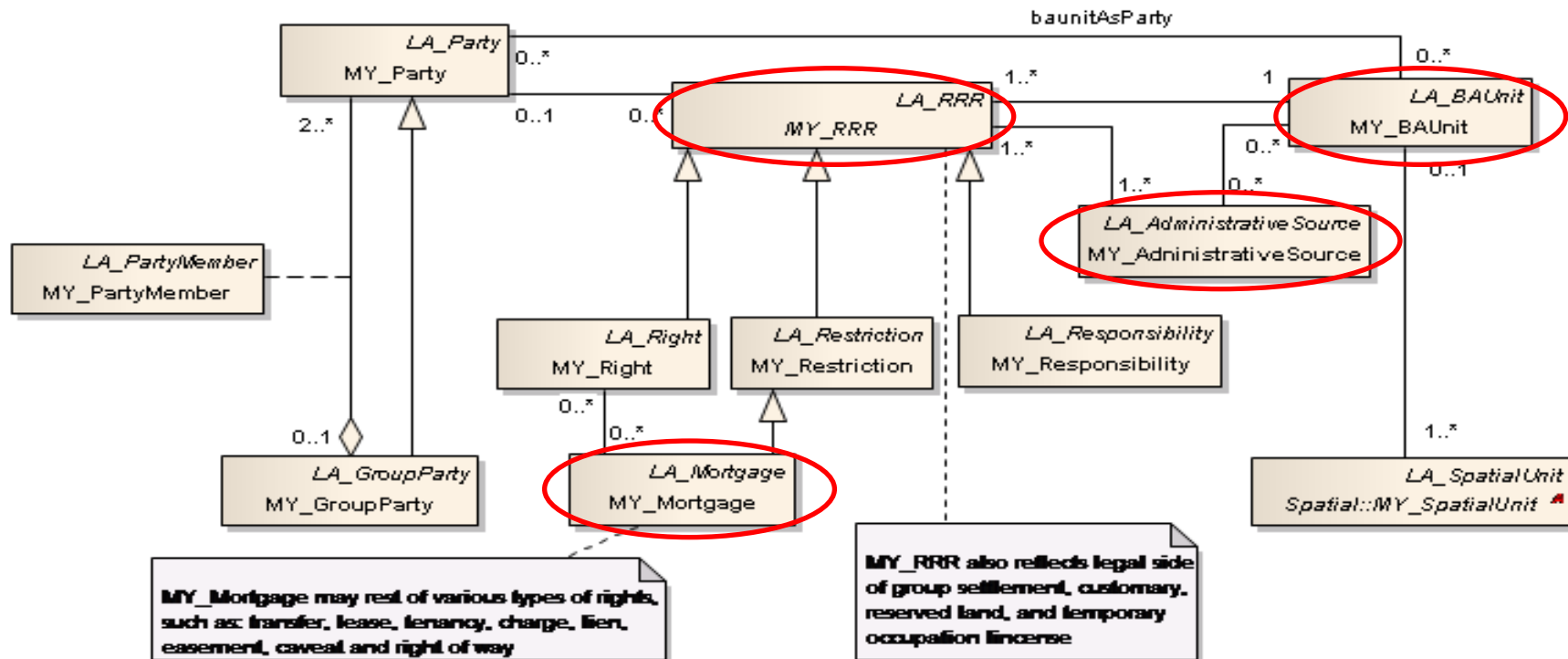| OBJECT	UPI
Lot ('Normal')	04010800015662
Building unit; - main block (M) - provisional block* (P)	04010800015662(S)846(B)M1(M)A 04010800015662(S)846(B)P1
Strata objects (inside building) - parcel unit ** - accessories unit - common area unit	04010800015662(S)846(B)M1(M)A(T)1(P)1 04010800015662(S)846(B)M1(M)A(T)1(A)1 04010800015662(S)846(B)M1(M)A(T)1(C)1
Strata land parcel*** Accessory unit, outside building Common property, outside building	04010800015662(S)846(L)1 04010800015662(S)846(A)1 04010800015662(S)846(C)1

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Administrative Part

- The legal part contains Party and Administrative package
- Main class: **MY_Party**
- Specialisation class: **MY_GroupParty**
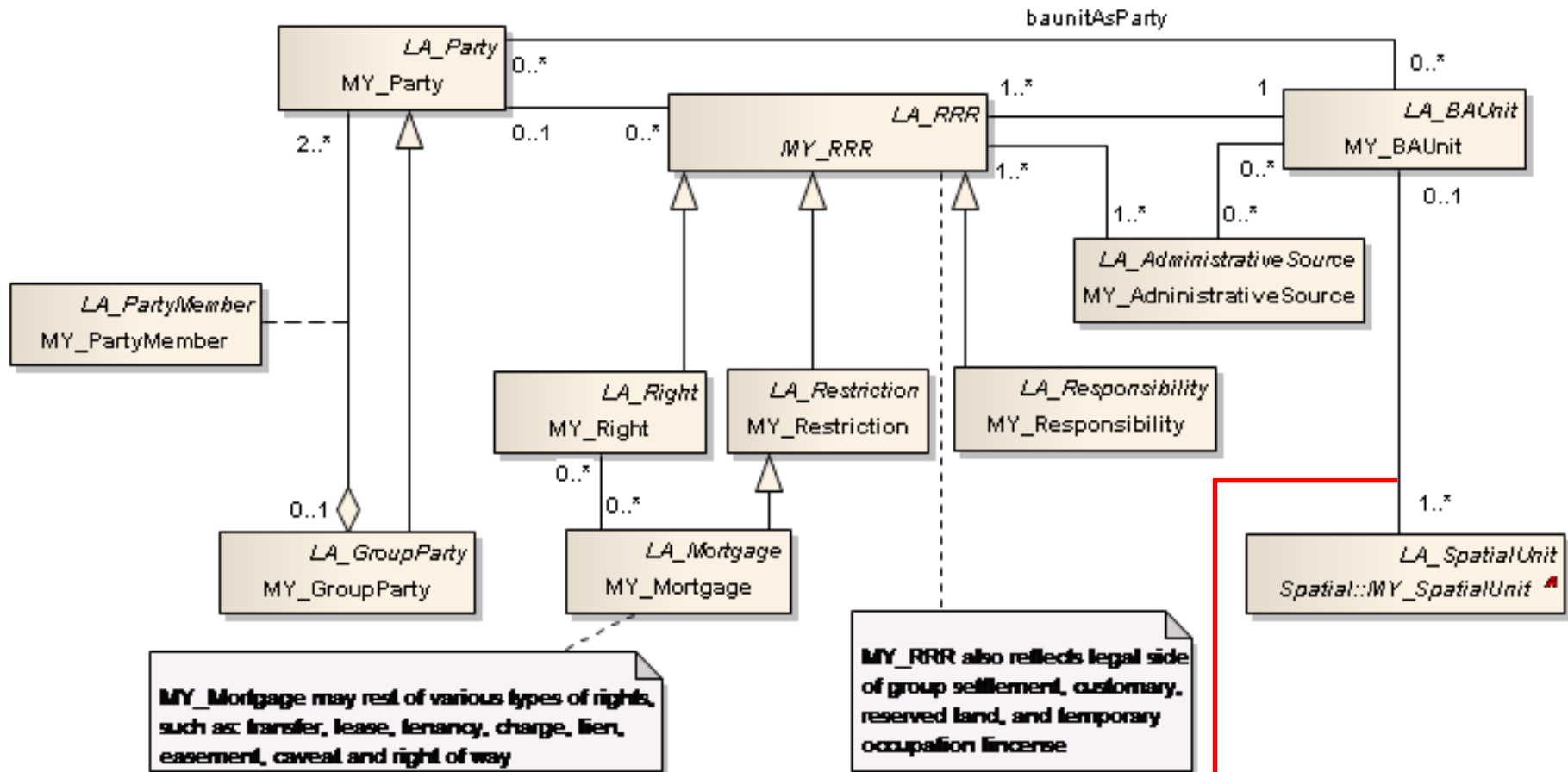
Administrative Part (cont…)

- The administrative package consists:
  - MY_RRR (abstract class), MY_BAUnit
    MY_AdministrativeSource and MY_Mortgage

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Administrative Part (cont…)

- All information originate from source documents.
- MY_AdministrativeSource - links with MY_RRR and MY_BAUnit.
- sID for administrative source - title number.
- All classes in LADM (except source documents) - subclass of VersionedObject
- VersionedObject
  - to manage and maintain historical data.

MY_LADM Country Profile (administrative part)

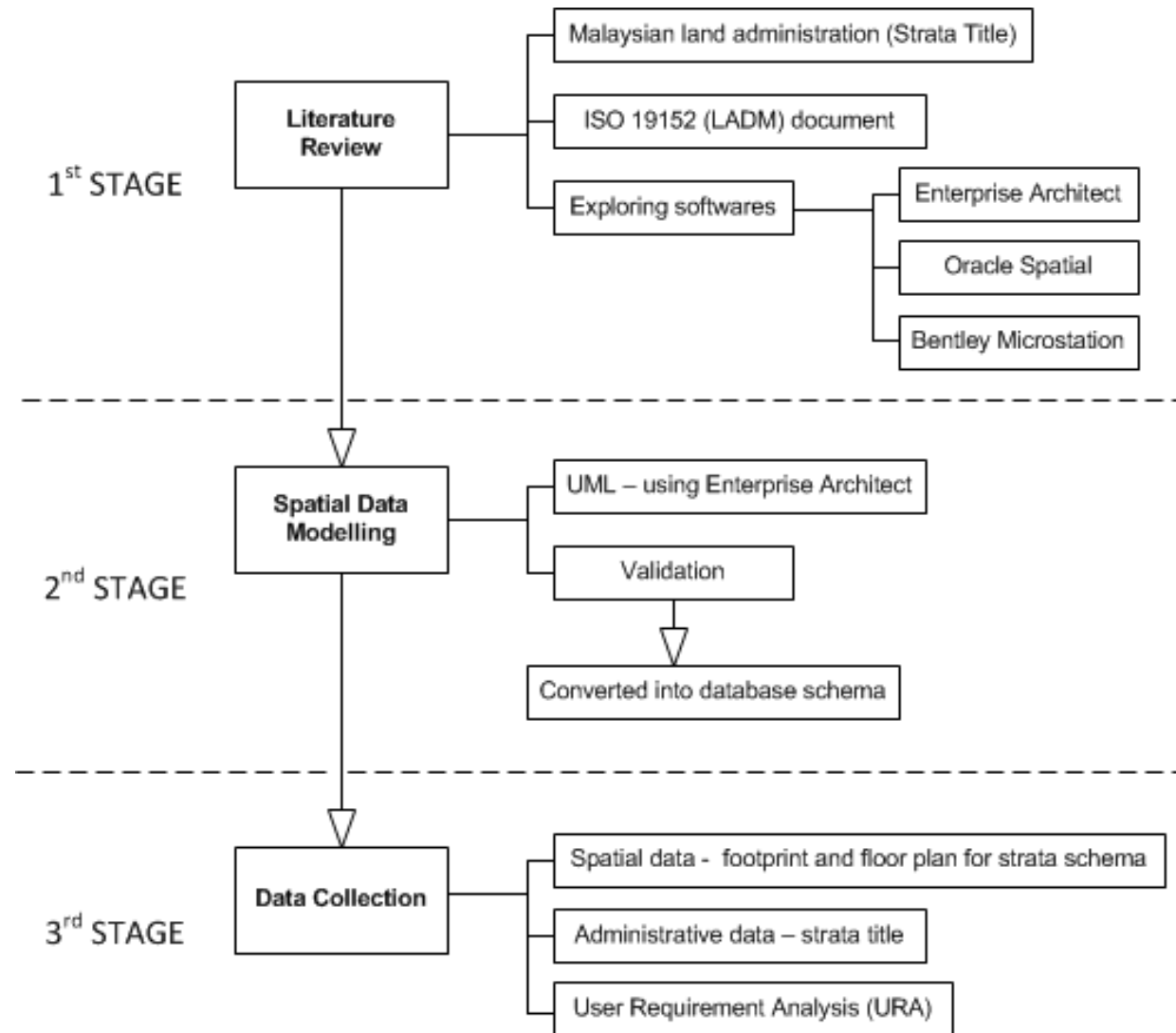**The linkage between administrative and spatial parts**

The technical model

- Sample data are converted into the technical model
- Database construction (Oracle Spatial)
- Visualization and query (Bentley Microstation)
- MY_ParcelUnit represents 3D strata volume objects
- Geometry of parcel unit is stored by multipolygon method (GTYPE = 3007)
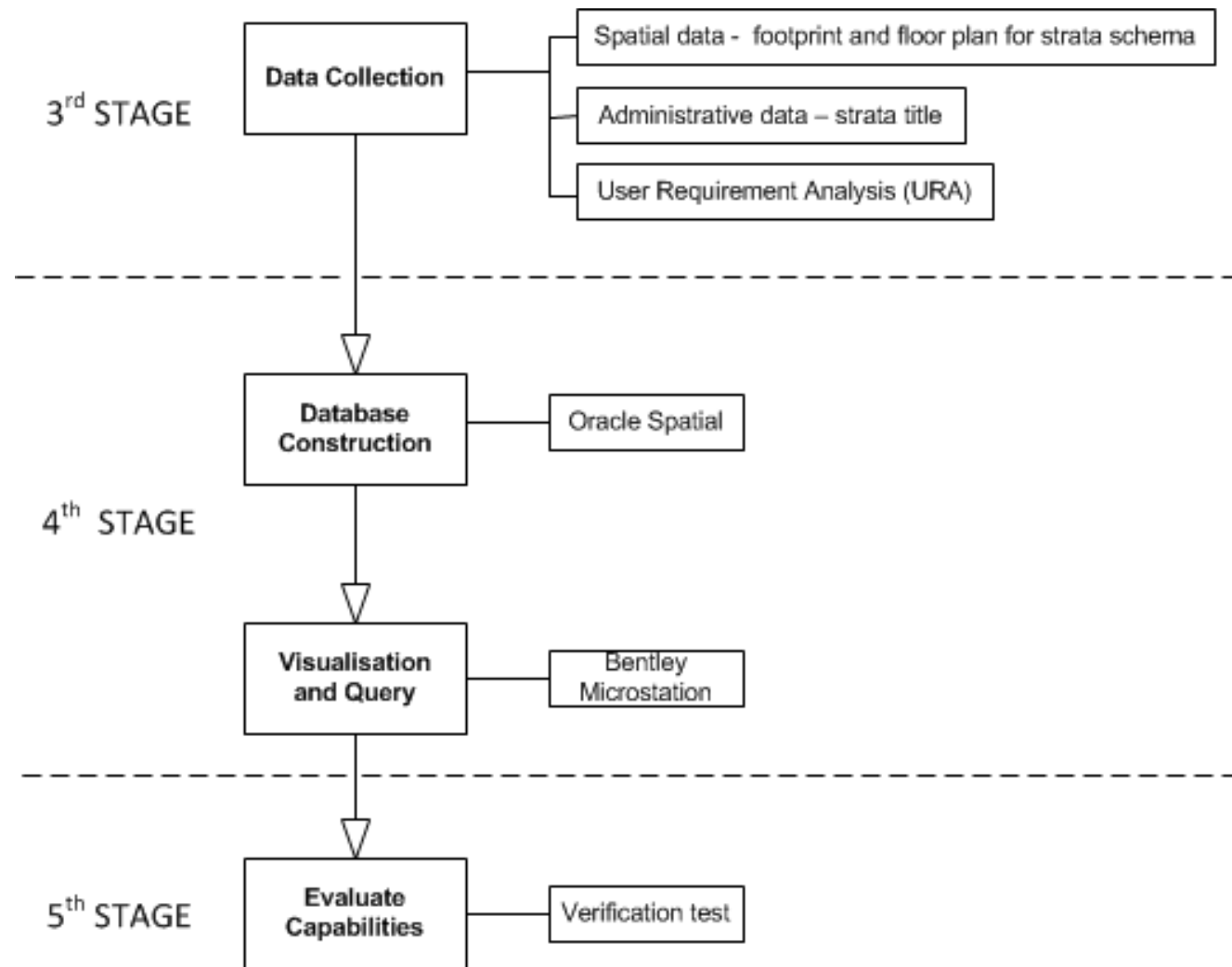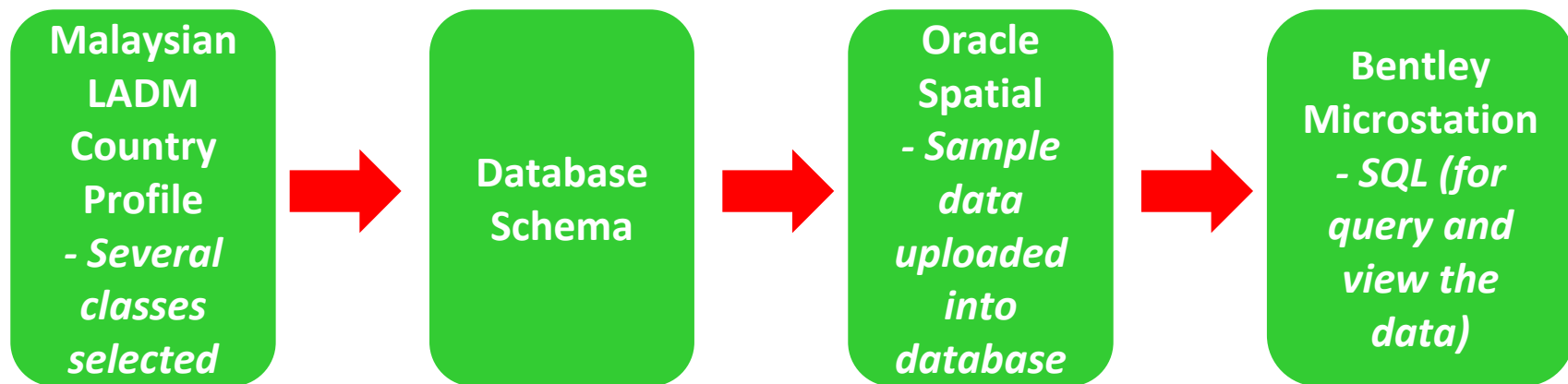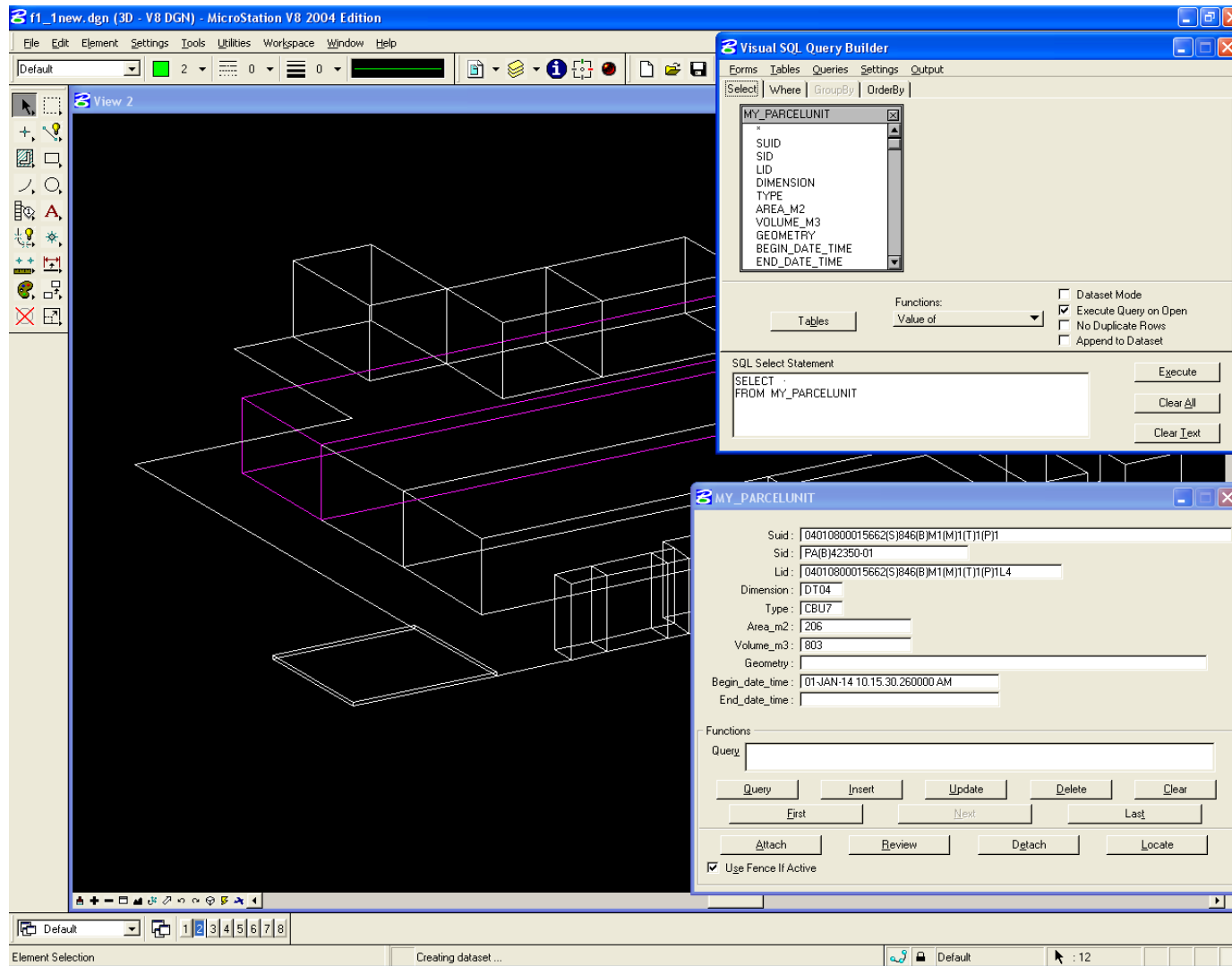
The study area

The WYF building

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Schematic diagram

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Schematic Diagram (cont…)

Prototype development process

Malaysian LADM Country Profile
- Several classes selected

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Database Schema

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Oracle Spatial
- Sample data uploaded into database

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Bentley Microstation
- SQL (for query and view the data)

Query and visualization (MY_ParcelUnit)

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Concluding remarks

- 3D representations (for strata units)
- Explicit linking of all land administration information and source documents (titles, certified plans)
- Full version management and inclusion of historic information
- Next phase
  - Fully operational prototype for national authority (Mapping Agency and Land Office)

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Acknowledgement

- Ministry of Education, Malaysia
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- Department of Surveying and Mapping Malaysia
- Melaka State Land Office