The 7th Land Administration Domain Model Workshop
Zagreb, Croatia, 11-14 April 2018

Are Croatian Official Registers complying with the LADM Fiscal/Valuation Extension?

Hrvoje TOMIĆ, Siniša MASTELIĆ IVIĆ, Miodrag ROIĆ, Goran JURAKIĆ

RAZVOJ VIŠENAMJENSKOG SUSTAVA UPRAVLJANJA ZEMLJIŠTEM
DEVELOPMENT OF MULTIPURPOSE LAND ADMINISTRATION SYSTEM

Motivation/problem/goal

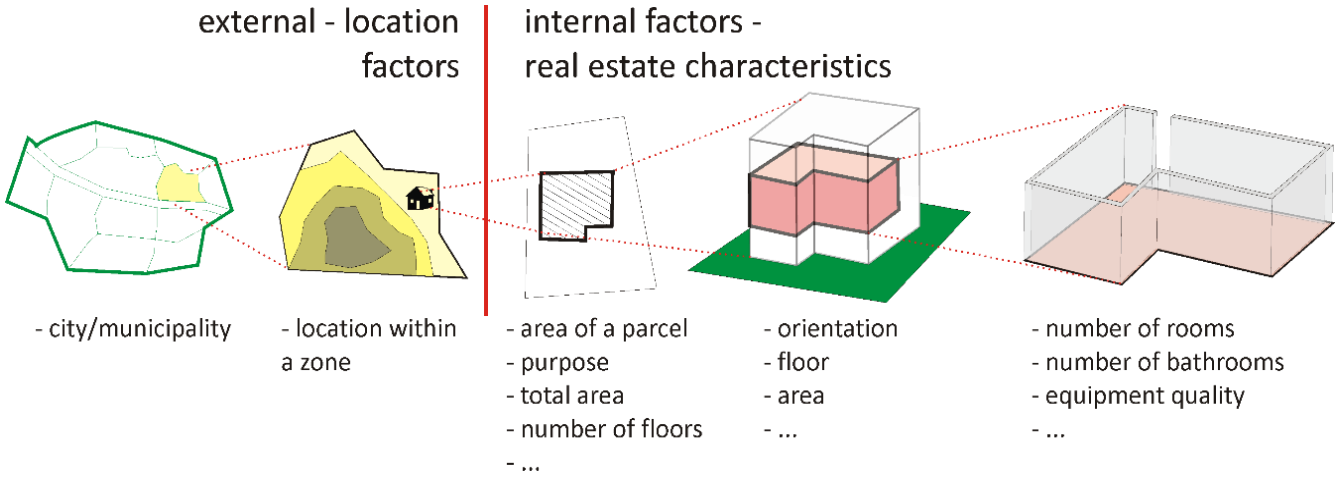
- Non existing taxation (and other purposes) mass real property valuation system – valuation of real properties using automatized procedures (Automatized Valuation Models - AVM)

- Development of mass valuation system:
  - Selection of valuation model
  - Classification of real property / identification of valuation indicators
  - Identification and assessment of appropriate official datasets (data completeness and whether data are up-to-date)
- **Complex geoinformation system which uses datasets distributed across different authorities**

Approach/solution/result

- International best practices + Use of existing Croatian LADM country profile (Vučić et al. 2012) + LADM fiscal/valuation extension (Çağdaş et al. 2016)

Compliance analysis using manual schema matching of needed real property attributes – valuation indicators:



Most of the LADM_FM attributes were matched, only few are found to be missing. High level of compliance was confirmed.

A database implementation of LADM Valuation Information Model for Turkish case study

Abdullah Kara, Yıldız Technical University, Turkey
Ümit Işıkdağ, Mimar Sinan Fine Arts University, Turkey
Volkan Çağdaş, Yıldız Technical University, Turkey
Peter van Oosterom, Delft University of Technology, The Netherlands
Christiaan Lemmen, University of Twente, The Netherlands
Erik Stubkjær, Aalborg University, Denmark

7th International FIG workshop on the Land Administration Domain Model, 12-13 April 2018, Zagreb, Croatia

Motivation – Problem – Goal

Motivation

Developing a prototype for the LADM Valuation Information Model Turkish Country Profile

Problem

There is no internationally accepted data standard for property valuation (especially for recurrently levied immovable property taxation). LADM can be used as a base to develop such a model.

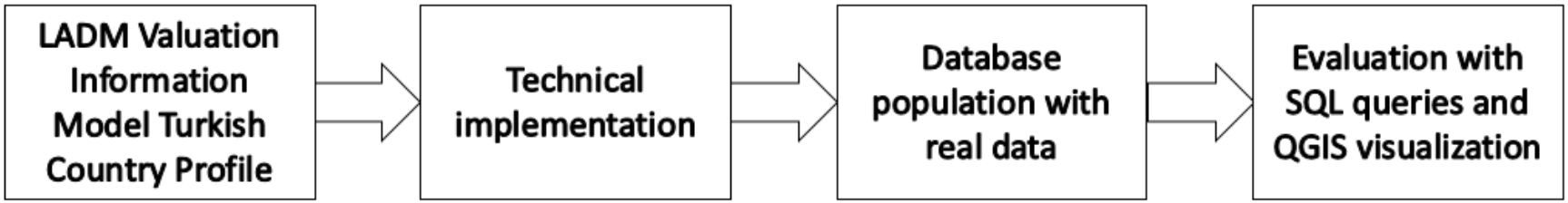
Goal

Investigating whether the LADM Valuation Information Conceptual Model fulfill the needs of information management aspects of valuation activities for property taxation

Approach – Solution - Results

Approach

Figure below shows the methodology followed.



Solution

A prototype was developed for assesing the models (database (Oracle 11g) + GUI (QGIS)) via loading/converting real data and conducting test using prototype system.

Results

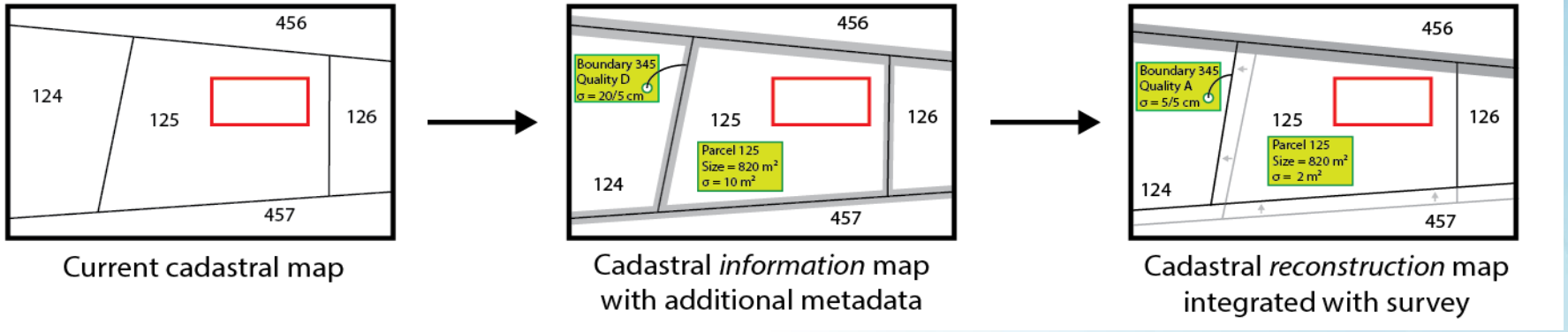
- The LADM Valuation Information Model and its Turkish Country Profile is feasible in terms of information management aspects of valuation activities.
- The model should be tested with further valuation activities, for example, mass valuation conducted for property taxation purposes. 3D aspects of valuation activities.

kadaster

Semantically enriching and reconstructing the cadastral map of the Netherlands – an LADM approach

Pieter Soffers en Eric Hagemans

The cadastral map improvement program



Current cadastral map

Cadastral *information* map with additional metadata

Cadastral *reconstruction* map integrated with survey

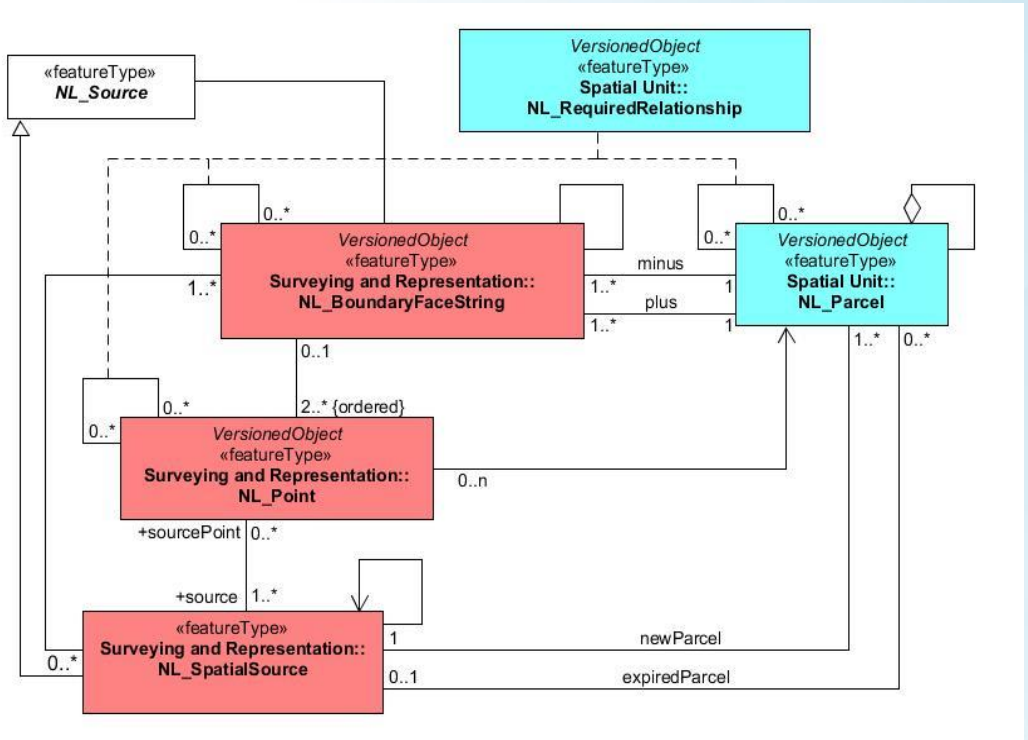
Motivation:

- The cadastral map have to be more than just a visualization
- Better understanding and use of the cadastral map

Goals:

- Quality description and metadata of each boundary
- Geometrically correct location of a boundary

Implementation of the survey and representation sub package



- A direct connection between objects and survey documents
- Storage of different steps in processing survey data
- Points and boundaries considered as own entities

An LADM-based approach to developing and implementing national 3D cadastre: A case study of Malaysia

Abbas Rajabifard, Muyiwa Agunbiade, Mohsen Kalantari, Kit Meng Yip, Behnam Atazadeh, Farshad Badiee, Dato' Mohd Noor Bin Isa, Mohamad Kamali Bin Adimin, Chan Keat Lim, Ali Aien, Hamed Olfat, Davood Shojaei, and Mohsen Rahimipour Anaraki

THE UNIVERSITY OF MELBOURNE

JUPEM

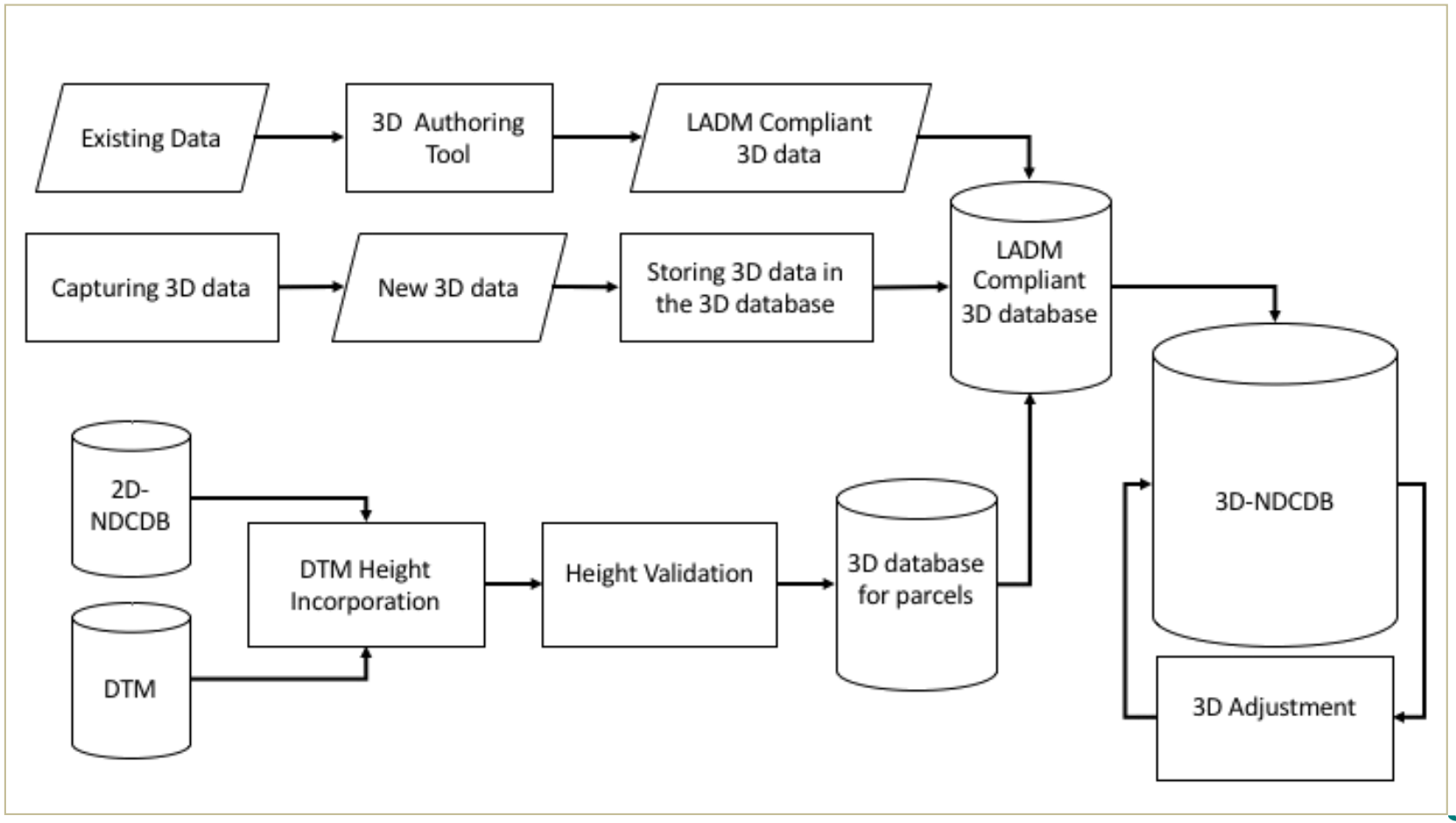
ENVIRO LAND SERVICES SDN BHD

CSDILA
THE CENTRE FOR SPATIAL DATA INFRASTRUCTURES & LAND ADMINISTRATION

Current Challenges in Malaysian Cadastre

- Measurements and data storage issues: NDCDB that is a 2D-based database (X, Y), in the form of 2-dimensions (X, Y) planimetric coordinates but reality is 3D.
- Determining the accuracy of height measurements is challenging
- Maintenance issues: The NDCDB currently resides in Oracle 10g RDBMS. Oracle is a proprietary technology → recurrent maintenance cost
- Concerns about the methods of data collectionand adjustment of existing survey to generate 3D spatial information (X, Y, Z).
- The challenge of conforming to the FIG recommendation, which requires the development of a comprehensive Land Administration Domain Model (LADM) that supports 2D and 3D cadastral registration.

Implementation of 3D-NDCDB



TUDelft

NATIONAL TECHNICAL UNIVERSITY OF ATHENS

3D CADASTRE AND LADM:

NEEDS AND EXPECTATIONS TOWARDS LADM REVISION

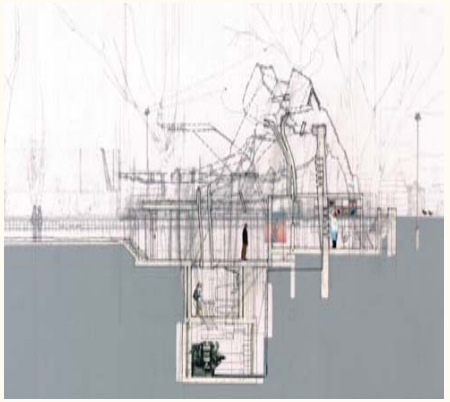
EFTYCHIA KALOGIANNI

EFI DIMOPOULOU

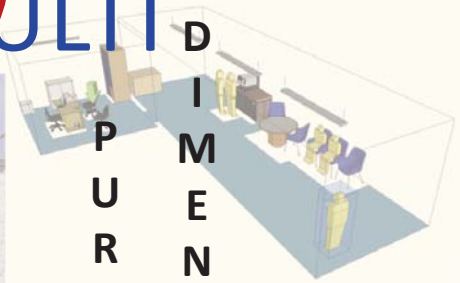
PETER VAN OOSTEROM

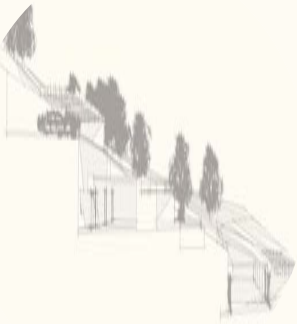
11-12-13 April, 2018

Zagreb, Croatia

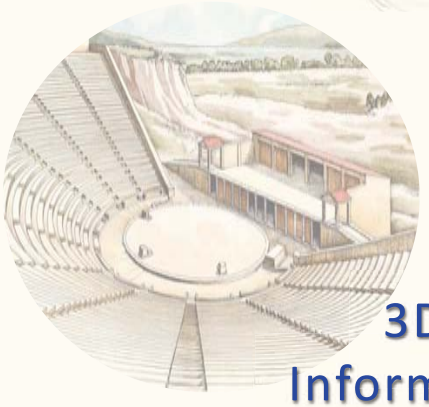


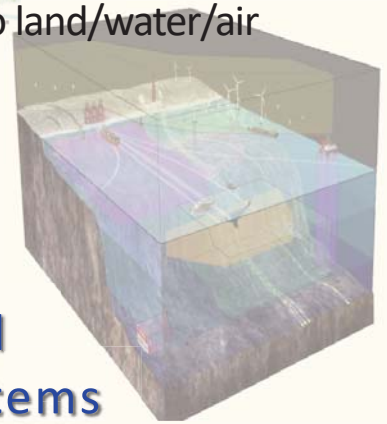
Need for MULTI PURPOSE DIMENSIONAL





management of RRRs attached to land/water/air





3D Cadastral Information Systems

The number of 3D parcel registrations is significantly increased

HOWEVER

Today, **NO** country has a complete & fully operational 3D Cadastral Information System

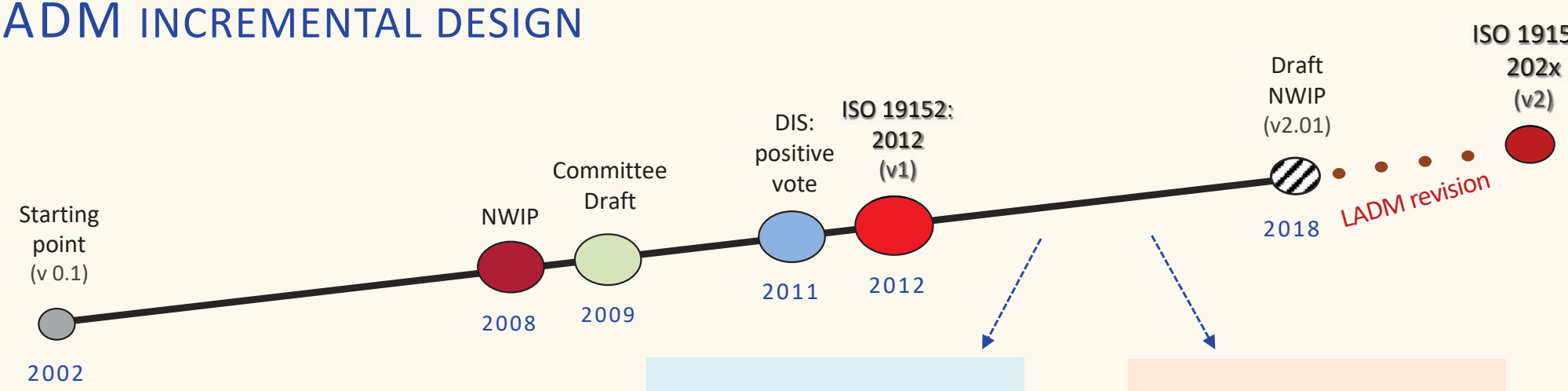
3D CADASTRE DEVELOPMENTS

In terms of

- ✓ 3D legislation
- ✓ 3D survey/ data acquisition techniques
- ✓ 3D RRRs registration
- ✓ Management, validation & dissemination of 3D parcels
- ✓ Correspondence to parcel's physical counterparts

GAP between LADM conceptual model and its technical implementation → Multiple implementation approaches according to user needs, end product, available data and technologies → Interoperability issues !

LADM INCREMENTAL DESIGN



LADM implementation efforts

LADM based country profiles

FIG ISO OGC Making location count.

1 identify current possibilities of LADM v1 - in terms of 3D support - derived from LADM experience

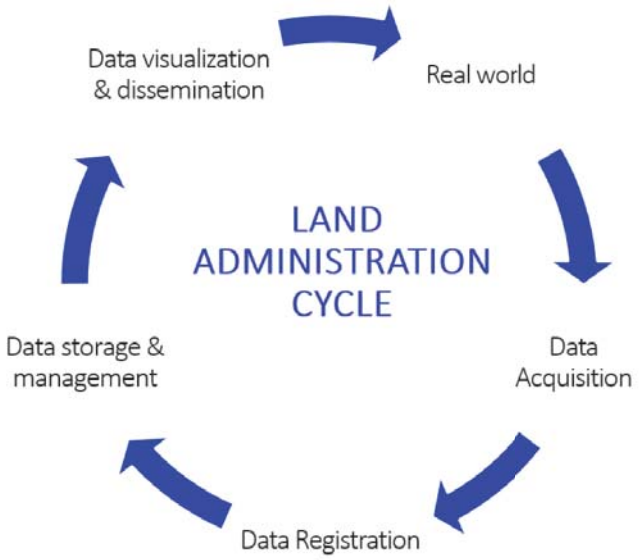
2 explore the needs and prospects towards further 3D modelling of LADM v1

3 estimate the LADM user requirements need to be updated in the context of the upcoming revision

APPROACH

- multiple approaches to further model current or sharpen new spatial representations & spatial profiles
- explicitly model use cases of 3D Cadastre, including different types of spatial units (marine, archaeology, planning, mining, air, etc.)
  → *potential new user requirement.*

3D CADASTRES WITHIN THE SPATIAL DEVELOPMENT CHAIN



Zoning,
Designing,
Permitting,
Surveying,
Registering,
Maintaining,
Constructing

Connecting LADM and IFC Standards: Pathways towards an Integrated Legal-Physical Model

Behnam Atazadeh, Abbas Rajabifard, Mohsen Kalantari

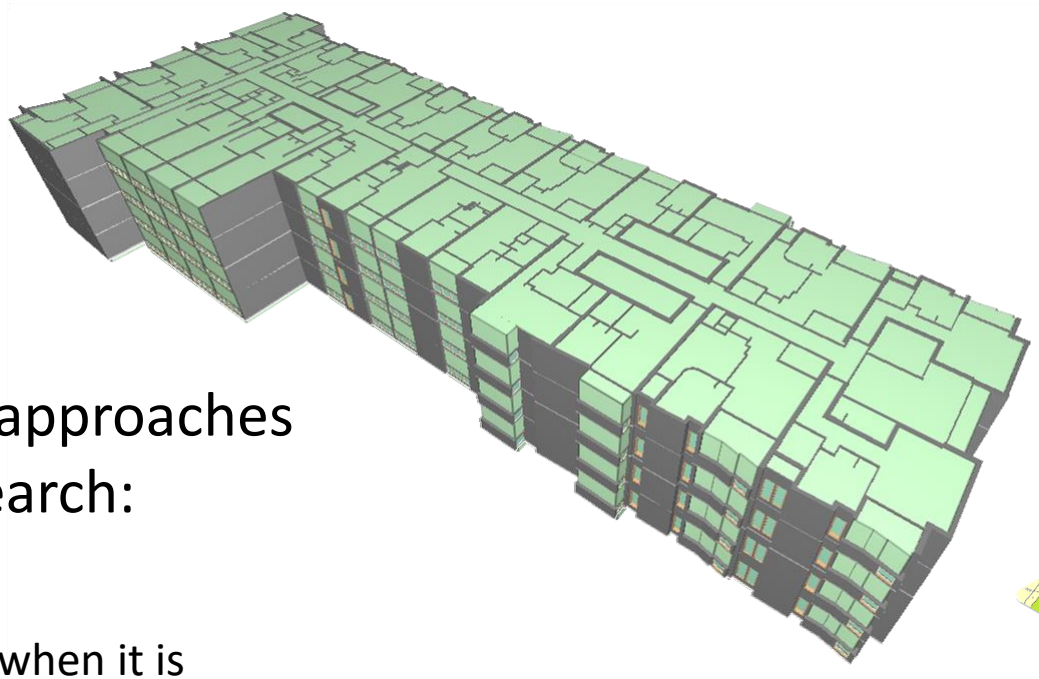
Centre for SDIs and Land Administration,
The University of Melbourne

Australian Government
Australian Research Council

VICTORIA State Government | Environment, Land, Water and Planning
ICSM ANZLIC COMMITTEE ON SURVEYING & MAPPING
CITY OF MELBOURNE

Legal View and Physical View of Buildings

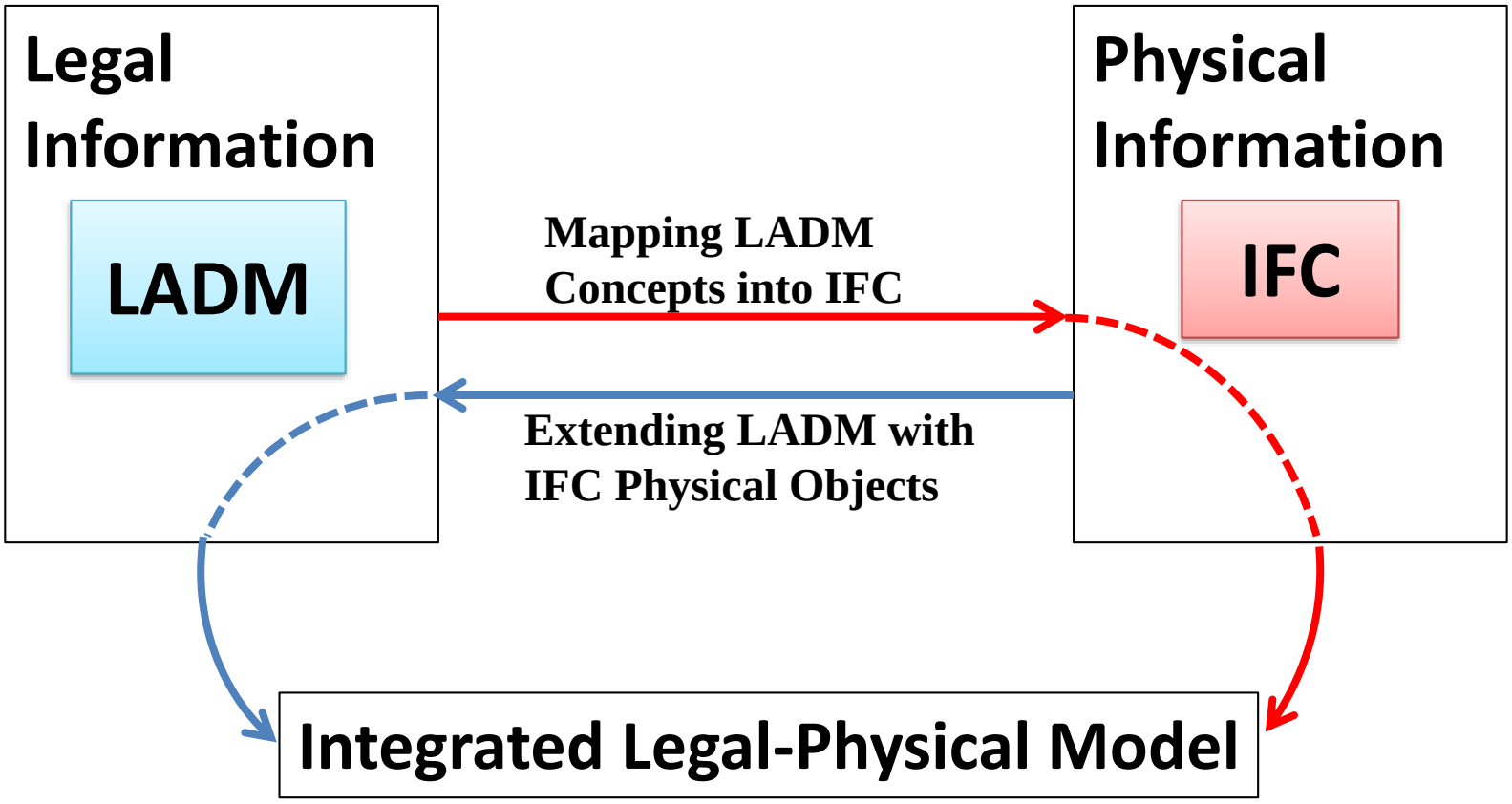
- Legal spaces are adequate to subdivide and register ownership of land and properties.
- Physical spaces are ancillary to the communication of legal spaces with non-specialist.



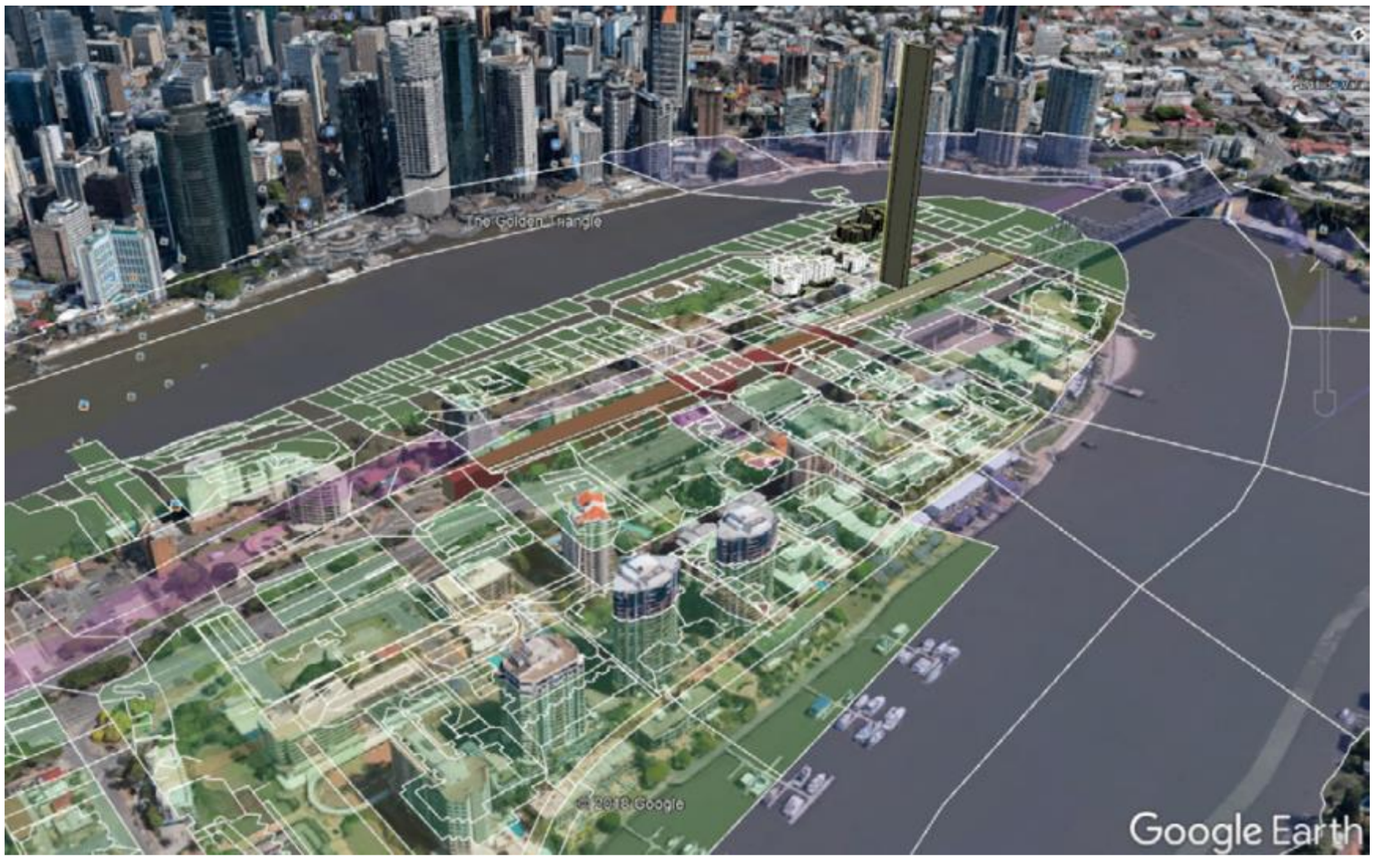
Emergence of integrated approaches in 3D digital cadastre research:

- At visualisation level
- Defining specific relationships, when it is required, between legal and physical spaces

Pathways Towards an Integrated Model



Developing an LADM Compliant Dissemination and Visualization System for 3D Spatial Units



Rod Thompson,
Peter van Oosterom,
Barbara Cemellini,
and Marian de Vries

TU Delft

Motivation: With more and more countries having studied 3D Cadastres use cases, having developed prototypes, or have production status, clear 3D visualization is needed

Problems:

- Create complete list of 3D Cadastres web-visualization requirements
- Combine 3D legal spaces and 3D physical (reference) objects
- Obtain representative (2D and) 3D Cadastres sample data: 3D DCDB
- Disseminate information based on accepted standards (meaningful/semantics)
- Select most appropriate 3D geoweb viewing platform (note: subsurface parcels)

Goal: The aim of the research is further progress 3D Cadastres visualization

Approach: There are several stages in developing the 3D Cadastres web prototype:

1. **Map model** behind collected data to LADM concepts (implemented via SQL views)
2. **Develop communicate** between server and WebGL client (protocol, data encoding)
3. **Create Web viewer** to visualize and interact with 3D Cadastral data
4. **Conduct usability study** to assess the effectiveness of the dissemination

Main results:

- 3D Cadastres test data set: 2D Parcels, 3D volumetric Parcels, 3D building format parcel, 2.5D terrain surface, 3D topographic reference data
- Initial version of 3D Cadastres prototype (for city center of Brisbane, Queensland)

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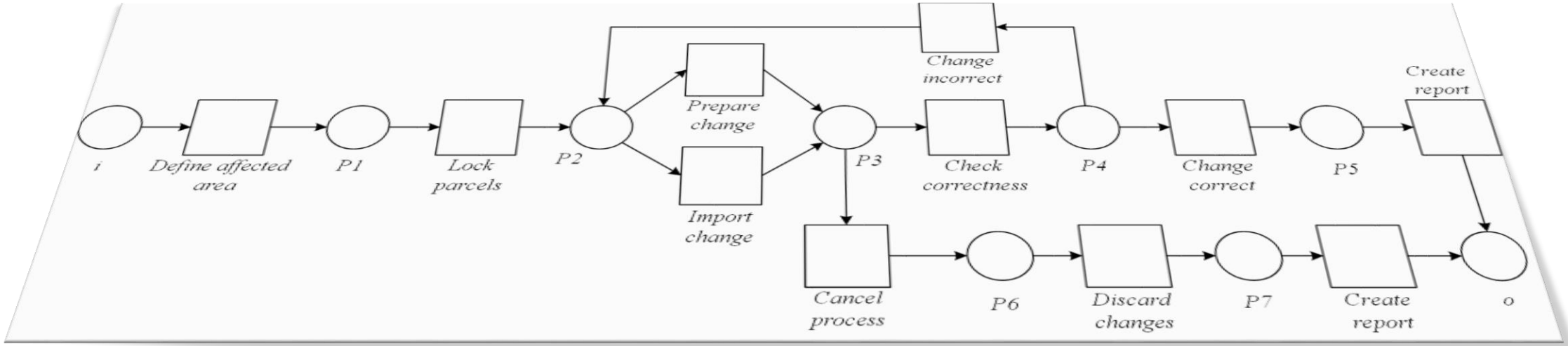


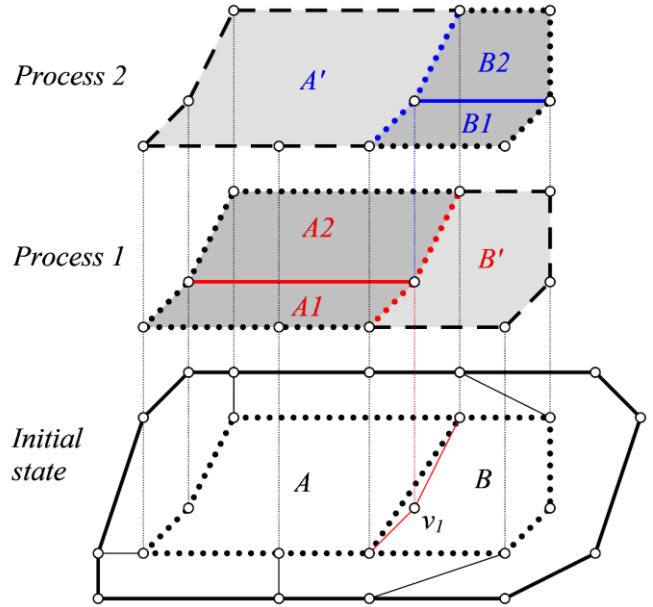
Application of workflow management system to the modelling of processes in land administration systems

Saša Vranić, assist. prof. Hrvoje Matijević, prof. Miodrag Roić

RAZVOJ VIŠENAMJENSKOG SUSTAVA UPRAVLJANJA ZEMLJIŠTEM

DEVELOPMENT OF MULTIPURPOSE LAND ADMINISTRATION SYSTEM

Motivation and idea

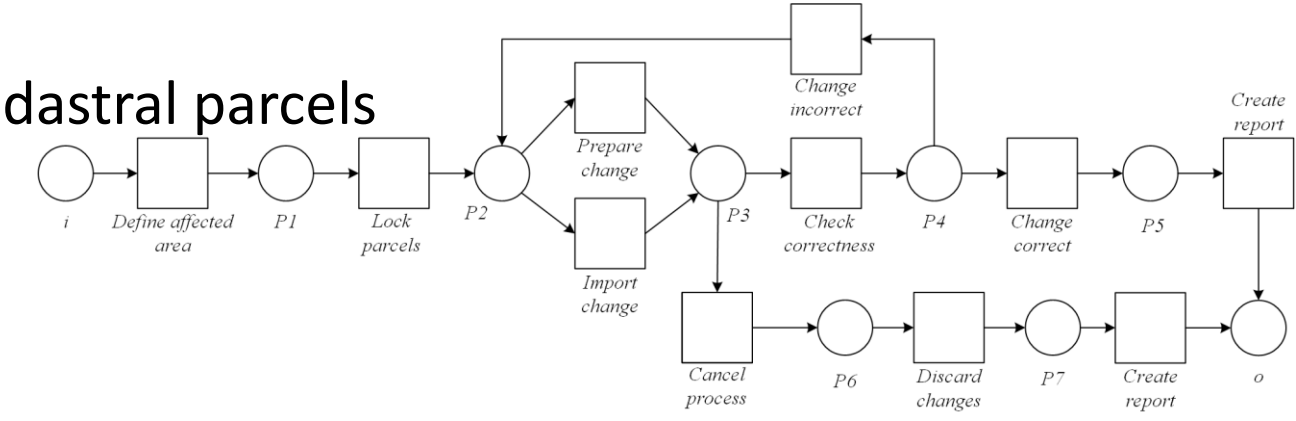


- Motivation
  - Efficiency is important in every administrative domain
    - land administration as well
  - WFMS as a technology is aimed on implementing efficient process management.
  - Transactional WFMS enables integration of transactional concepts into WFMS
- Idea
  - Increase efficiency of land administration by applying transactional WFMS
  - Processes over spatial data are more complex than those over those without spatial component
    - If spatial component would be supported, non-spatial should be also supported

Approach/solution/result

- Approach
  - Primary: Can transactional WFMS be used to execute processes over spatial component of land administration data?
  - How could LADM be extended to support processes using the transactional WFMS concepts?
- Solution
  - Test case with set of basic transactional concepts
  - Developed transactional WFMS data model
- Results
  - Can it be done for polygon based cadastral parcels
  - Can it be integrated with LADM

Petri net diagram of a process



Exploring Options for Standardisation of Processes and Transactions in Land Administration

Christiaan LEMMEN, Peter van OOSTEROM, Eva-Maria UNGER, Kees de ZEEUW and Mohsen KALANTARI

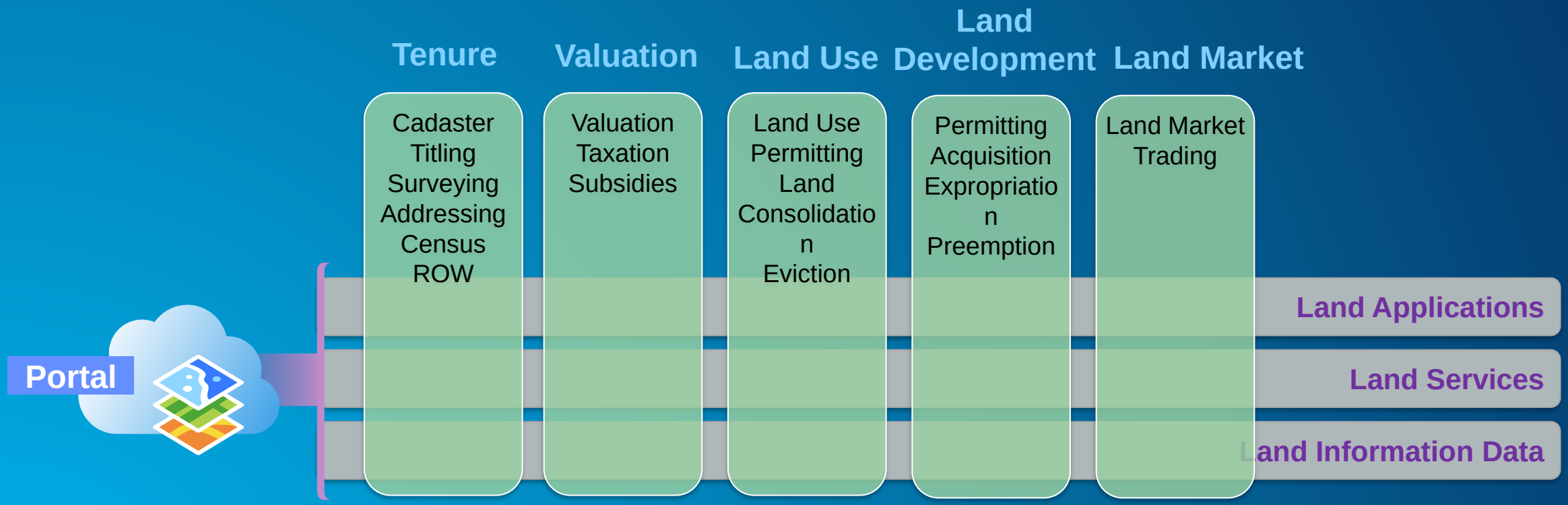

1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH AND WELL-BEING
4 QUALITY EDUCATION
5 GENDER EQUALITY
6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY
8 DECENT WORK AND ECONOMIC GROWTH
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11 SUSTAINABLE CITIES AND COMMUNITIES
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS

Photo: Liliana Merizalde Gonzalez

Advances in GIS Technology

Supporting the Land Administration Domain Model

Technology Components of Land Administration



Understanding Web GIS – The Modern Cadastral Platform

Supporting Global Cadastre Requirements