

# LADM based

# **Cyprus Land Information System model**

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WORKSHOP

LADM from Research to Implementation

– Land Administration Domain Modelling at a threshold

Delft, 6 July 2012

# PRESENTATION CONTENT

- The Cyprus Land Information System (CLIS)
- The Cyprus country profile based on LADM
- Development and pilot implementation

Conclusions

# **The Cyprus**

# **Land Information System**



WORKSHOP LADM from Research to Implementation – Land Administration Domain Modelling at a threshold Delft, 6 July 2012 Area:9,250 Km<sup>2</sup> Population: 862,000 1,579,019 Parcels 1,788,904 Property units (incl. parcels) 2,846,927 Ownership shares State land: 26% (17.7% forests) Private land: 74%

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AREA UNDER TURK

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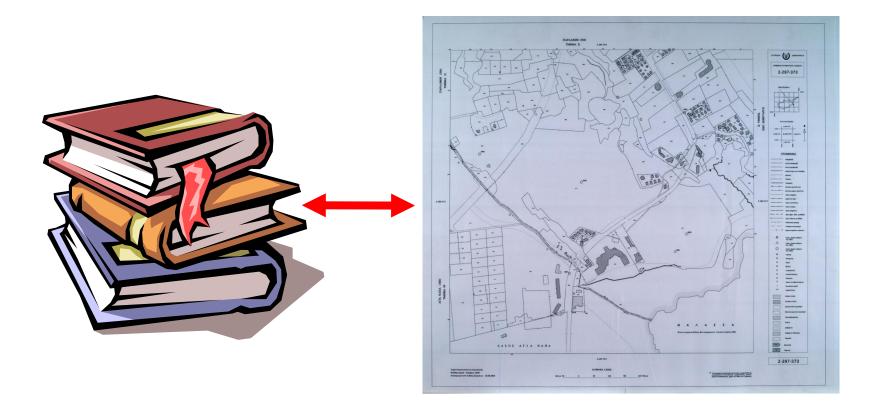
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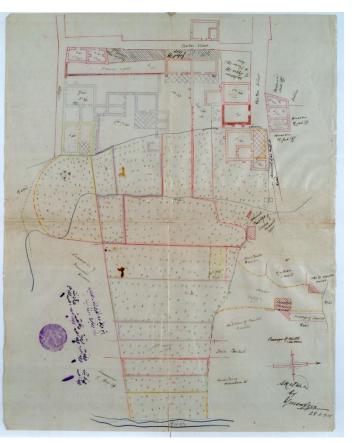
Kleides Island Case Anapolio Andress Cyprus has a reliable cadastral system supporting the administration of land and other immovable property related activities. The cadastral system is based on two components: The Registry and the Cadastral Plans



### The system of land registration is that of title

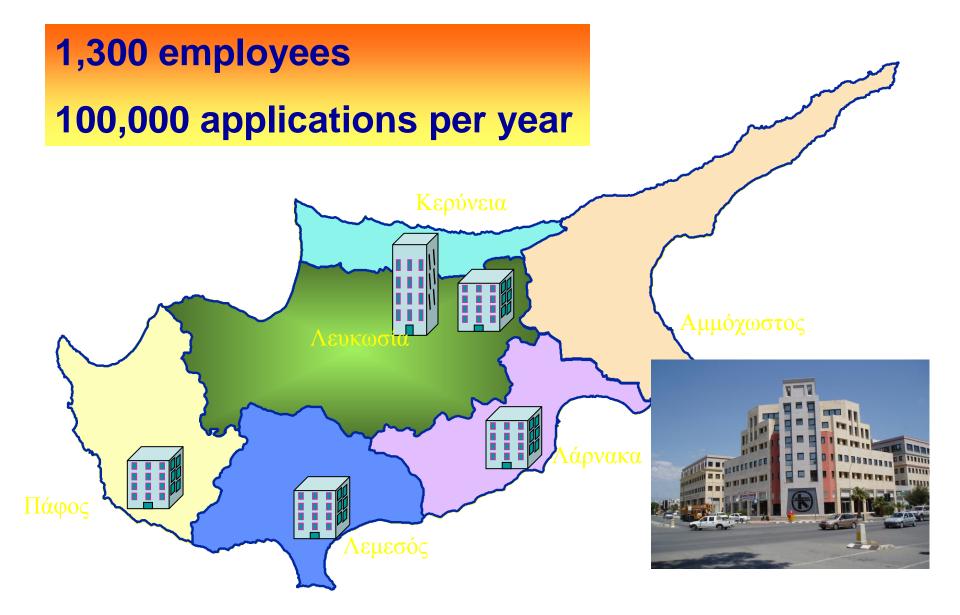
The authority responsible for the operation of the cadastre is the Department of Lands & Surveys (DLS). It is the oldest Department of the public sector in Cyprus, starting its operation in 1858. Its initial responsibility was the registration of immovable property.

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Throughout the years, DLS expanded its activities and services offered to the public, emerging into a dynamic organization supporting a multipurpose cadastre.

### **Department of Lands & Surveys**



### **Department of Lands and Surveys Activities**

Property transfer by sale, gift, exchange

**Easements, Leases** 

Valuation

Land demarcations/ Land divisions

**Boundary disputes** 

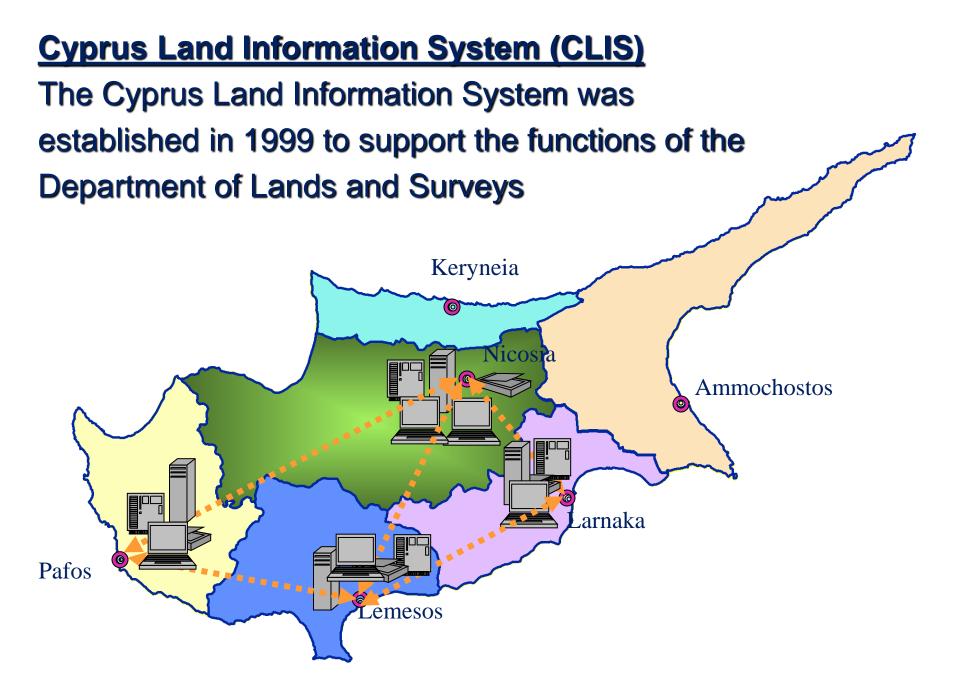
**Management of State Land** 

Mortgages

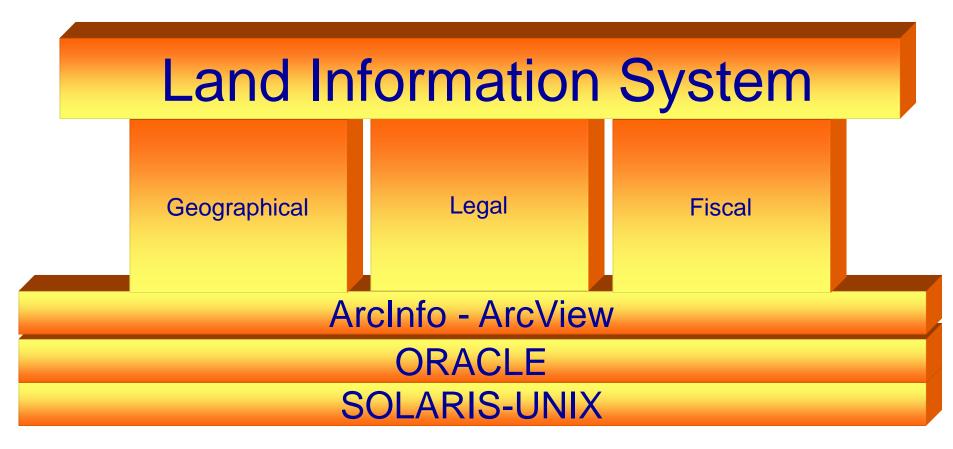
**Acquisitions** 

**Property searches** 

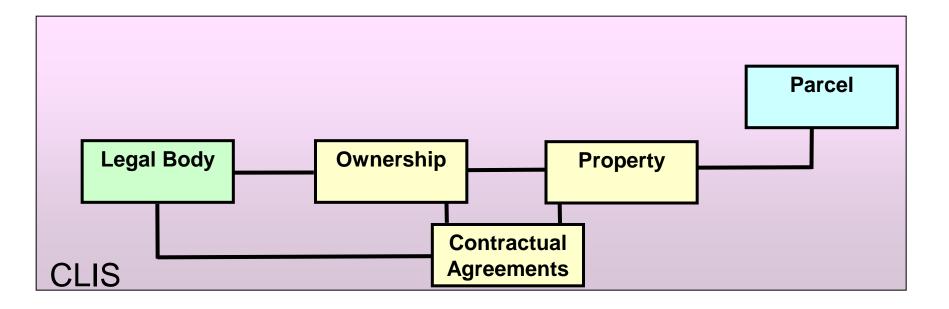
Surveying Photogrammetry Hydrography National Mapping Agent



# **CLIS COMPONENTS**



### **CLIS Data Model**



# The need to upgrade CLIS

It is broadly accepted that CLIS should be improved and upgraded, and a new data model should be introduced to facilitate the manipulation and provision of data to internal and external users/customers in a more effective way. The need to enhance the CLIS coincides with the introduction of the LADM.

# The need to upgrade CLIS The current CLIS

- Unstructured data model.
- At the end of its life cycle.
- Not a suitable programming framework.
- Two generations behind on the technology curve.
- Difficult to migrate to new technologies.
- Problematic expansion of operations and limitations in supporting a National LA System.

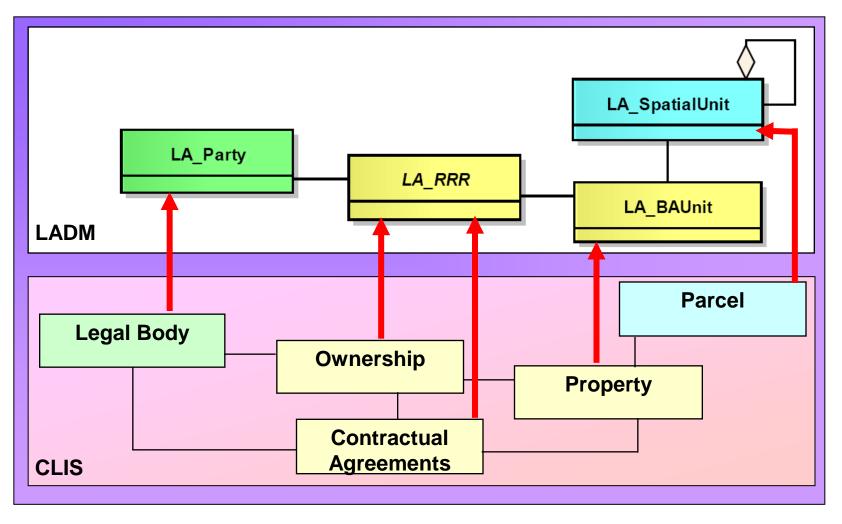
# **The Cyprus Country Profile**

# based on LADM

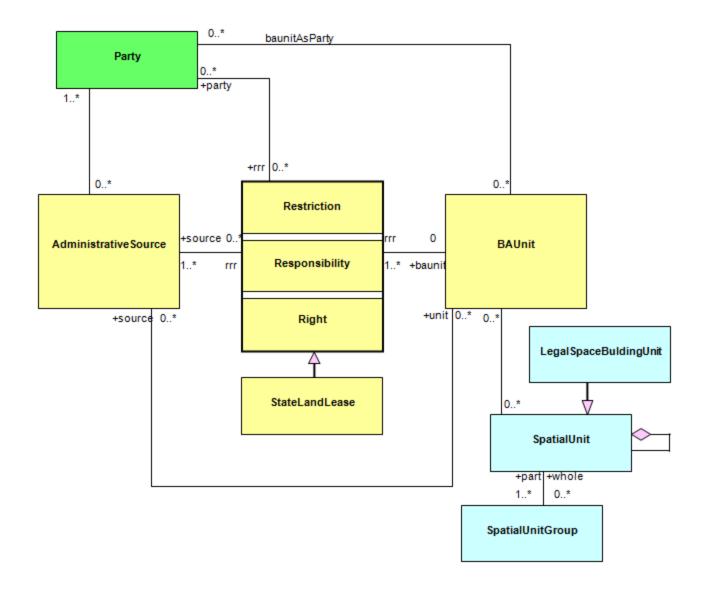


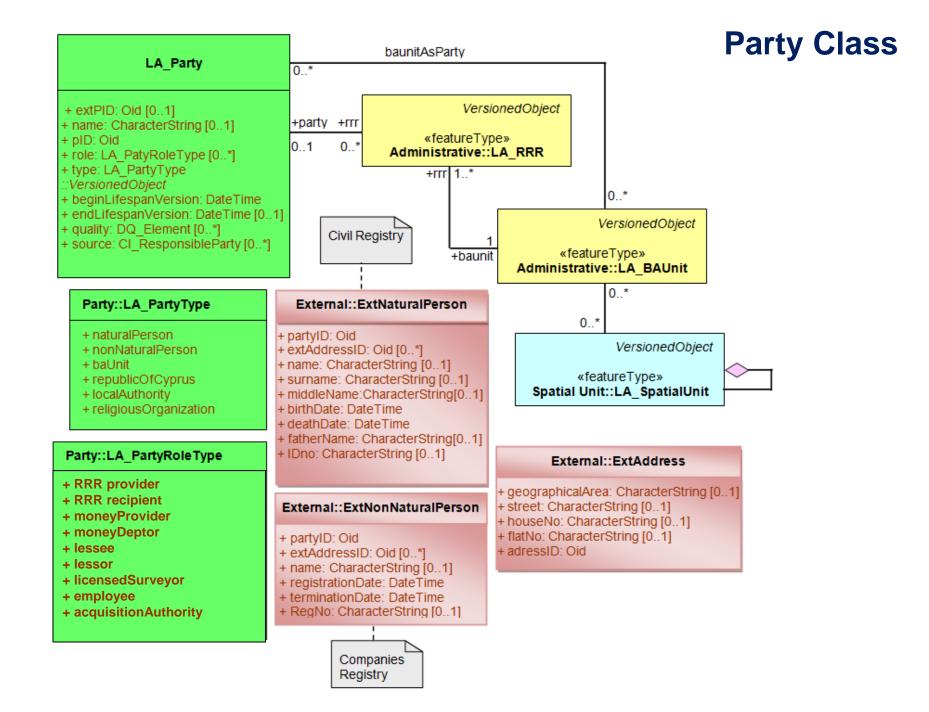
WORKSHOP LADM from Research to Implementation – Land Administration Domain Modelling at a threshold Delft, 6 July 2012

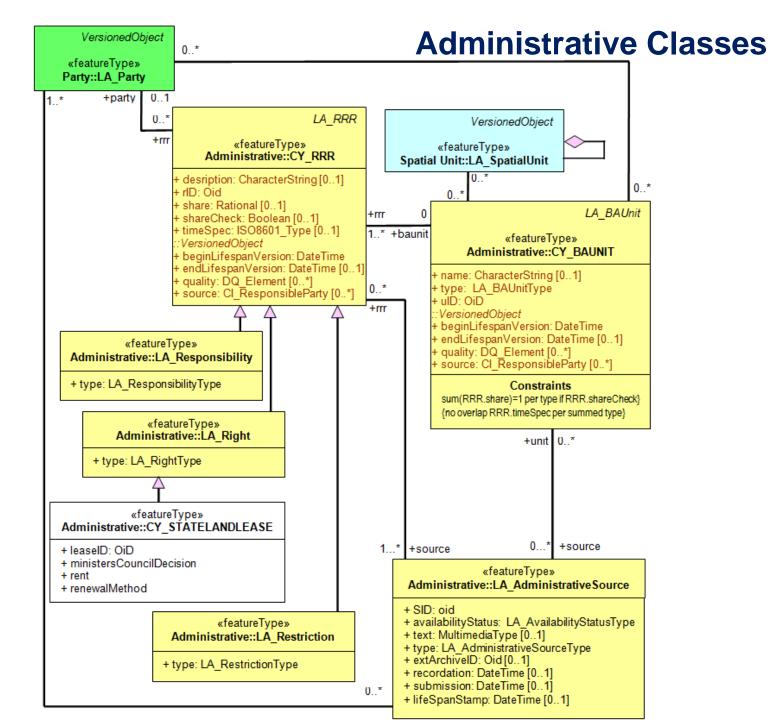
### "Migration" of CLIS entities to LADM classes

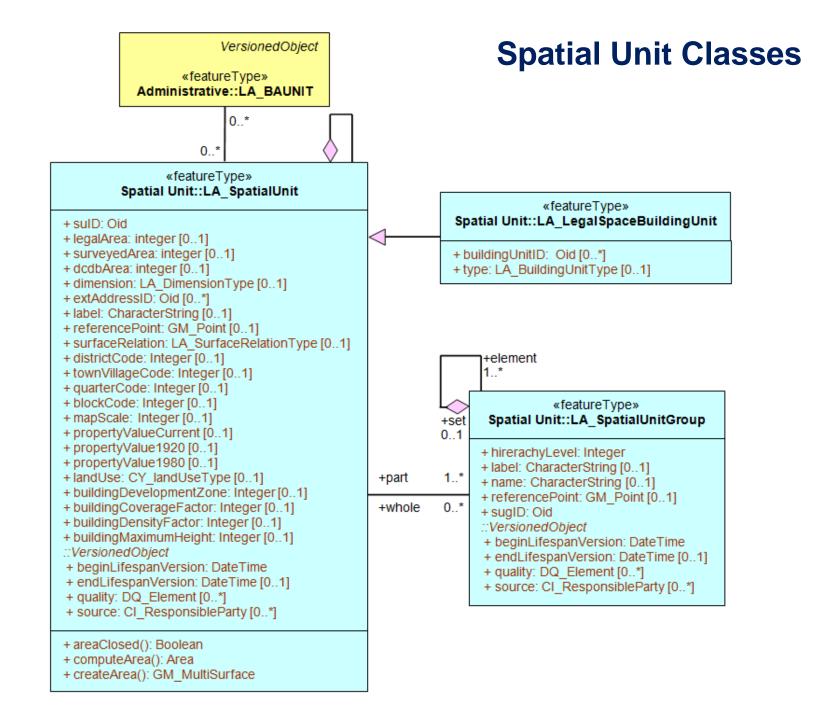


# **Basic classes of the proposed model**

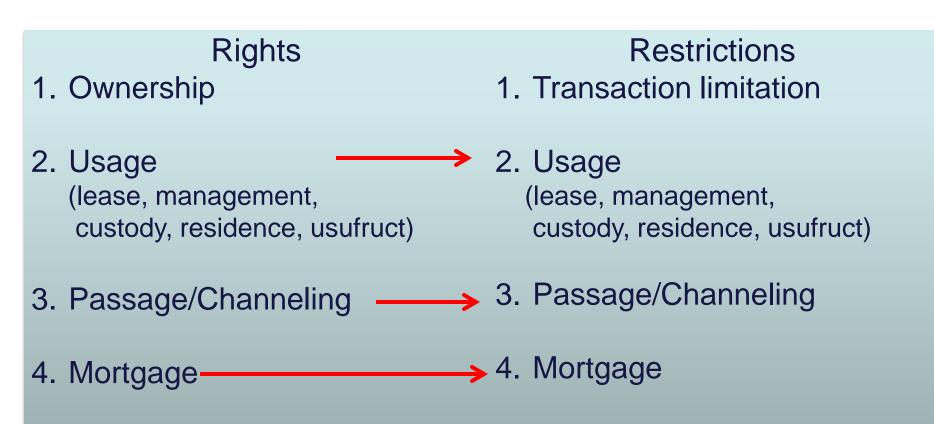








# **Rights vs Restrictions**



The model is designed in a way that the negative side (restriction) is derived from the positive side (right)

# **Rights/Restrictions/Responsibilities**

### LA RIGHTTYPE

- **1 OWNERSHIP**
- **DISPUTED OWNERSHIP** 2
- ILLEGAL POSSESSION
- ADVERSE POSSESSION
- PASSAGE
- CHANNELING ACCESS
- STOREY ERECT
- 8 EXCLUSIVE USE
- USUFRUCT 9
- **10 RESIDENCE**
- **11 USE**
- **12 CHANNEL ING (FOR PARTY)**
- **13 CUSTODY**
- **15 AGRICULTURAL LEASE**
- **16 INDUSTRIAL LEASE**
- **17 FARM LEASE**
- **18 TOURISM LEASE**
- **19 MINE LEASE**
- **20 FOREST LEASE**
- **21 SPORTS LEASE**
- **22 COMMUNAL LEASE**
- **23 UTILITY LEASE**
- **24 SPECIAL LEASE**
- **25 MORTGAGE**
- **26 CONTRACT OF SALE**
- **27 REVENUE**

### LA RESTRICTIONTYPE

- MORTGAGE 1
- 2 **CONTRACT OF SALE**
- WRIT OF SALE 3
- **4 BANKRUPT**
- **5 DISPUTED OWNERSHIP**
- 6 ILLEGAL POSSESSION
- 7 ADVERSE POSSESSION
- 8 PASSAGE
- 9 CHANNELING ACCESS
- **10 STOREY ERECT**
- **11 EXCLUSIVE USE**
- **12 USUFRUCT**
- **13 RESIDENCE**
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- **19 FARM LEASE**
- **20 TOURISM LEASE**

- **21 MINE LEASE**
- **22 FOREST LEASE**
- **23 SPORTS LEASE**
- **24 COMMUNAL LEASE**
- **25 UTILITY LEASE**
- **26 SPECIAL LEASE**

### LA RESPONSIBILITYTYPE

**1 PROPERTY TAX DUE 2 DLS FEES DUE 3 LEASE FEES DUE** 

# **CODE LIST**

#### LA PARTYTYPE

- 1 NATURAL PERSON
- 2 NON-NATURAL PERSON
- 3 BA-UNIT
- 4 REPUBLIC OF CYPRUS
- 5 LOCAL AUTHORITY
- 6 RELIGIOUS ORGANIZATION

#### LA BAUNITTYPE

- 1 PARCEL
- 2 BUILDING UNIT
- 3 PARCEL AND BUILDING
- 3 OTHER CONSTRUCTION
- 4 LAKE
- 5 MARINE/SEA AREA
- 6 ROAD
- 7 RIVER
- 8 WELL
- 9 TUNEL
- 10 CHANNEL
- 11 OTHER

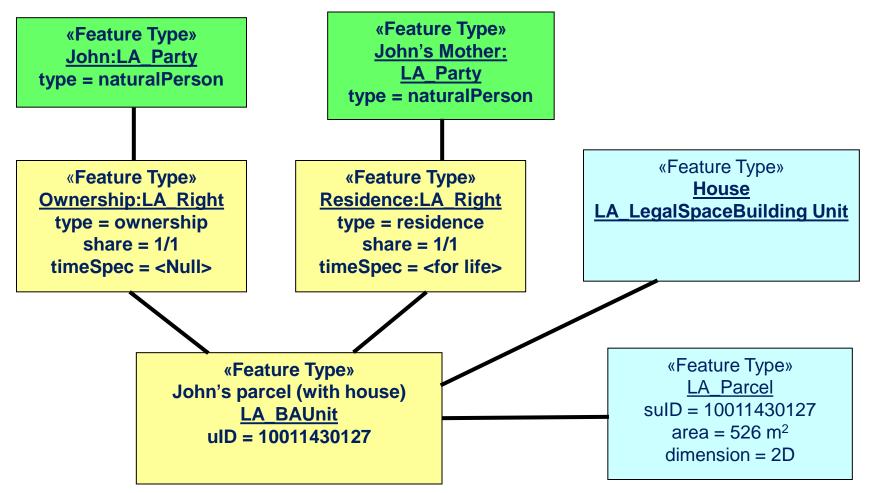
#### LA ADMINSOURCE TYPE

- 1 TITLE CERTIFICATE
- **2 TRANSACTION DOCUMENT**
- **3 LEASE DOCUMENT**
- **4 MORTGAGE DOCUMENT**
- **5 CONTRACT OF SALE**
- **6 RIGHT DOCUMENT**
- 7 RESTRICTION DOCUMENT
- **8 RESPONSIBILITY DOCUMENT**

### LA AVAILABILITYSTATUS 1 ARCHIVED DOCUMENT 2 DESTROYED DOCUMENT 3 CONVERTED DOCUMENT 4 LOST DOCUMENT

### **Example of Instance Level Diagram**

## **Residence Right**



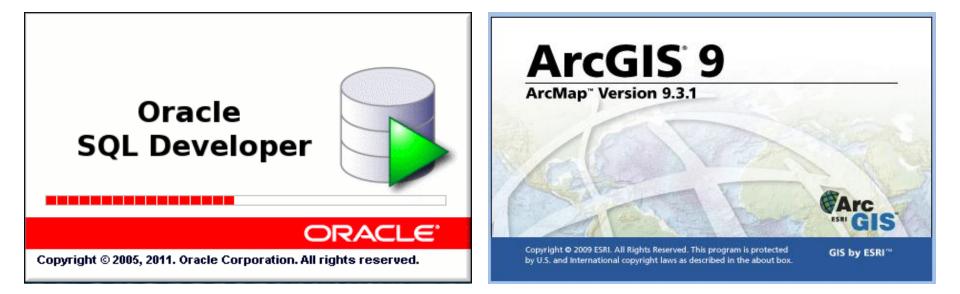
# Development

# and pilot implementation

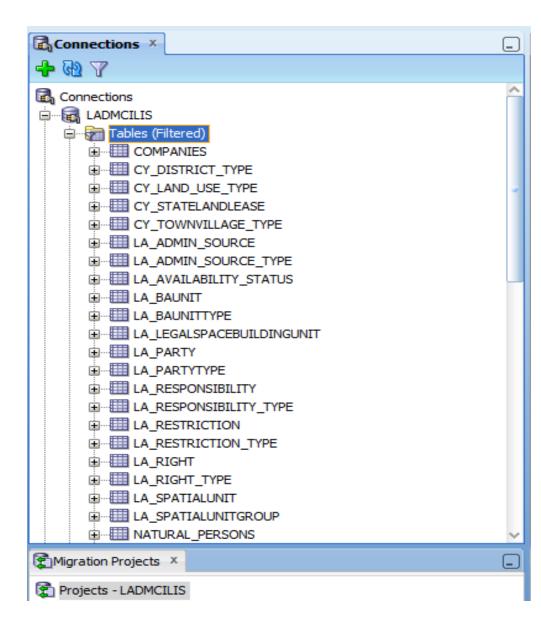


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# **Development of proposed model**



# **Class creation**



CREATE TABLE "ELIKKOS"."LA\_PARTY"

("PID" NUMBER NOT NULL ENABLE,

"EXTPID" VARCHAR2(40 BYTE), "NAME" VARCHAR2(50 BYTE), "ROLE" NUMBER,

"TYPE" NUMBER NOT NULL ENABLE,

"BEGINLIFESPANVERSION" TIMESTAMP (6) DEFAULT sysdate NOT NULL ENABLE,

"ENDLIFESPANVERSION" TIMESTAMP (0), "SOURCE" NUMBER,

CONSTRAINT "LA\_PARTY\_PK" PRIMARY KEY ("PID") USING INDEX PCTFREE 10 INITRANS 2 MAXTRANS 255 STORAGE(INITIAL 65536 NEXT 1048576 MINEXTENTS 1 MAXEXTENTS 2147483645 PCTINCREASE 0 FREELISTS 1 FREELIST GROUPS 1 BUFFER\_POOL DEFAULT FLASH\_CACHE DEFAULT CELL\_FLASH\_CACHE DEFAULT) TABLESPACE "ELIKKOS" ENABLE,

CONSTRAINT "LA\_PARTY\_TYPE\_DESCRIPTION" FOREIGN KEY ("TYPE") REFERENCES "ELIKKOS"."LA\_PARTYTYPE" ("PARTY\_CODE") ON DELETE CASCADE ENABLE )

SEGMENT CREATION IMMEDIATE PCTFREE 10 PCTUSED 40 INITRANS 1 MAXTRANS 255 NOCOMPRESS LOGGING STORAGE (

INITIAL 65536 NEXT 1048576 MINEXTENTS 1 MAXEXTENTS 2147483645 PCTINCREASE 0 FREELISTS 1 FREELIST GROUPS 1 BUFFER\_POOL DEFAULT FLASH CACHE DEFAULT CELL FLASH CACHE DEFAULT )

TABLESPACE "ELIKKOS" ;

CREATE OR REPLACE TRIGGER "ELIKKOS"."PID\_OID" before

INSERT ON "ELIKKOS"."LA\_PARTY" FOR EACH row BEGIN IF inserting THEN IF :NEW."PID" IS NULL THEN

SELECT PID\_OID.nextval INTO :NEW."PID" FROM dual; END IF; END IF; END;/

ALTER TRIGGER "ELIKKOS"."PID\_OID" ENABLE;

# **Data Input**

<u>Current System</u>		Proposed system
LEGAL_BODY	>	LA_Party
PARCEL		LA_SpatilaUnit
PARCEL_MAP_REFERENCE	>	LA_SpatilaUnit
PROPERTY_VALUATION	>	LA_SpatilaUnit
PROPERTY_IDENT		LA_BAUnit
OWNERSHIP		LA_Right
V_ALL_AGREEMENTS		LA_Right or LA_Restriction

# Scanned documents loaded in LA\_AdministrativeSource class

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ΚΑΙ του Σωκράτη Ανδρέα Αδάμου από τη κοινότητα Σωτήρας (που

6-3.12.661-

1. Με τη Σύμβαση αυτή ο Ιδιοκτήτης εκμισθώνει και ο Μισθωτής δέχεται υπό την μίσθωση του ΟΛΟΚΛΗΡΟ το τεμάχιο γης, (που στο εξής θα αναφέρεται ως το «κτήμα»), το οποίο βρίσκεται στη κοινότητα Σωτήρας της Επαρχίας Αμμοχώστου και αποτελεί μέρος της κρατικής γης με αριθμό τεμαχίου 158 του Κτηματικού Σχεδίου 2-283-376, τμήμα 07, συνολικής έκτασης ενός (1)

# Data management/presentation and testing of results

SELECT LA BAUNIT.U ID, CY DISTRICT TYPE.DISTRICT, CY TOWNVILLAGE TYPE.TOWNVILLAGE, LA BAUNITTYPE.UNIT DESCRIPTION, LA SPATIALUNIT.LEGAL AREA, LA SPATIALUNIT.BUILDINGCOVERAGEFACTOR, LA SPATIALUNIT.BUILDINGDENSITYFACTOR, LA SPATIALUNIT.BUILDINGMAXIMUMHEIGHT, LA SPATIALUNIT.LABEL. LA SPATIALUNIT.MAP SCALE, LA SPATIALUNIT.DISTRICTCODE, LA SPATIALUNIT.TOWNVILLAGECODE, LA SPATIALUNIT.QUARTERCODE, LA SPATIALUNIT.BLOCKCODE. LA SPATIALUNIT.PLAN, LA SPATIALUNIT.PROPERTY VALUE, CY LAND USE TYPE.LAND USE DESCR, LA PARTY.NAME, LA RIGHT TYPE.RIGHT DESCRIPTION. NULL RESTRICTION\_DESCRIPTION, LA RIGHT.RIGHT SHARE FROM LA PARTY, LA RIGHT TYPE, LA RIGHT, "LA RIGHT" CATEGORY, LA BAUNIT, LA BAUNITTYPE, LA SPATIALUNIT, CY DISTRICT TYPE, CY\_TOWNVILLAGE\_TYPE, CY LAND USE TYPE WHERE LA RIGHT.PID = LA PARTY.PID AND LA RIGHT.RIGHT TYPE = LA RIGHT TYPE.RIGHT TYPE AND LA RIGHT.U ID = LA BAUNIT.U ID AND LA BAUNIT.U TYPE = LA BAUNITTYPE.UNIT\_TYPE AND LA BAUNIT.U ID = LA SPATIALUNIT.U ID AND LA SPATIALUNIT.DISTRICTCODE = CY\_DISTRICT\_TYPE.DISTRICT\_CODE AND LA SPATIALUNIT.TOWNVILLAGECODE = CY TOWNVILLAGE TYPE.TOWNVILLAGE CODE AND LA SPATIALUNIT.LAND USE = CY LAND USE TYPE.LAND USE ID AND LA BAUNIT.U ID = 29952

#### UNION

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#### IMMOVABLE PROPERTY CERTIFICATE of RIGHTS/RESTRICTIONS

District: Famagusta Town/Village: Agia Napa (3100) Area: 678 sq. m. Sheet/plan: 2-290-373 Property kind: Parcel with building Planning Zone: Residential Building factor: 0.90 Value: €167000 Registration ID: 29952 Quarter: 0 Block: 4 Parcel No: 134 Scale: 1:2000 Coverage factor: 0.50 Maximum Height: 8.30

#### <u>RIGHTS</u>

a/a	RIGHT	SHARE	PARTY/UNIT	ID
1	Ownership	1⁄2	George Zacharia Demosthenous	547189
2	Ownership	1⁄2	Androula George Demosthenous	689191
3	Residence	1	Maria Zacharia Demosthenous	45689

### RESTRICTIONS

a/a	RESTRICTION	SHARE	PARTY/UNIT	ID
1	Mortgage		Bank of Cyprus	c789
2	Passage		29981	29981

Date: May 30, 2012

### RIGHTS/RESTRICTIONS CERTIFICATE OF A PARTY

Name: Nikos

Middle Name: Andreas

Surname: Georgiou ID Number: 456789

### <u>RIGHTS</u>

a/a	RIGHT	SHARE	UNIT	PROPERTY KIND	Town/ Village
1	Ownership	1⁄2	78934	PARCEL	Sotira
2	Ownership	1⁄2	89789	PARCEL WITH BUILDING	Paralimni
3	Ownership	1	18789	PARCEL WITH BUILDING	Sotira
4	Ownership	1	767	PARCEL	Paralimni
5	Agricultural Lease	1	34456	PARCEL	Sotira

### RESTRICTIONS

a/a	RESTRICTION	UNIT	PROPERTY KIND	TOWN/ VILLAGE
1	Usufruct	767	Parcel	Paralimni
2	Transaction Prohibition			

Date: May 30, 2012

# Conclusions



WORKSHOP LADM from Research to Implementation – Land Administration Domain Modelling at a threshold Delft, 6 July 2012

### **Advantages of proposed model**

- •Rigid structure and efficient administration of all RRRs in CLIS.
- •Clarification of the concept of IMMOVABLE PROPERTY and inclusion of sea/marine areas.
- •The ADMINISTRATIVE SOURCE class solves the problem of handling paper documents.
- •The **STATE** is defined as one of the other parties with RRRs associated with it.
- •The model supports INTEROPERABILITY and the implementation of an e-Cadastre and an e-PAS (Property Administration System)

# It is estimated that the development of the new CLIS will cost up to € 45.000.000

January 2012

DEPARTMENT OF LANDS AND SURVEYS

### EXECUTIVE SUMMARY

of the tender documents

for the Preparation of a Strategic Plan for the Department of Lands and Surveys and Three Tender Document Sets for the Development of a new Land Information System, the Development of an Infrastructure for Spatial and Other Data in Cyprus and the Implementation of a Pilot Program

#### Contract Budget:

Six hundred ninety one thousand three hundred four euro (€691.304)

without V.A.T.



EUROPEAN UNION



The project is co-financed 85% by the European Regional Development Fund and 15% by national resources

# The tender document specifies that:

# 5.3.6.2 ISO "LAND ADMINISTRATION DOMAIN MODEL"

The development of the new CLIS should be based on the Land Administration Domain Model (LADM). LADM is under development within the Technical Committee 211 (TC211) of the International Organization for Standardization and identified as ISO 19152...

## Conclusion

The adoption of LADM is a great opportunity for the Cyprus Department of Lands and Surveys to introduce an ISO standard model, improving and expanding the services provided by CLIS and the broader Property Administration System to the Cyprus community.

## Conclusion

The new functionality includes: better structuring of the rights, responsibilities and restrictions (and related source documents), better fitting in the information infrastructure both national (e.g. registration, valuation, taxation) international (e.g. INSPIRE cadastral parcels), and future capabilities for representing 3D spatial units (e.g. legal spaces related to apartment or utility infrastructure).

# THANK YOU FOR YOUR ATTENTION



