

FIG WORKING WEEK 2019

22-26 April, Hanoi, Vietnam

Presented by the FIG Working Week 2019,
April 22-26, 2019 in Hanoi, Vietnam

"Geospatial Information for a Smarter Life
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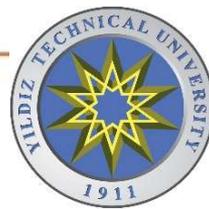


Design and Determine the LADM Infrastructure for Turkey Country Profile

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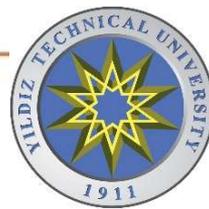
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Contents of the Paper

- INTRODUCTION
- THE CADASTRAL SYSTEMS IN TURKEY RELATED WITH COUNTRY PROFILE
- A BRIEF REVIEW OF LAND ADMINISTRATION DOMAIN MODEL (LADM)
- THE TURKEY COUNTRY LADM PROFILE BASED ON INTERNATIONAL STANDARDS
- DISCUSSIONS
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INTRODUCTION

- In this study aims to design and develop general declaration and standards for Turkish cadastral and land title systems also e-government case. This paper investigates of the Land Administration Domain Model (LADM, ISO 2012) associated with rights, restrictions and responsibilities (RRR) situations within Turkish cadastral registration system. For this purpose, the main components of LADM which are related within the Turkish land registry and cadastral system have been analysed regarding country profile aspect and have been designed a conceptual model under the legal-administrative components (RRR) of the standard LADM.
- This paper is structured as follows: the cadastral system in Turkey (including cadastral system structure and cadastral activities) is introduced in section 2; a brief land administration domain model 3; The Turkey Country LADM Profile Based on International Standards is given in section 4; and finally in section 6 discussion and conclusions is provided.

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THE CADASTRAL SYSTEMS IN TURKEY RELATED WITH COUNTRY PROFILE

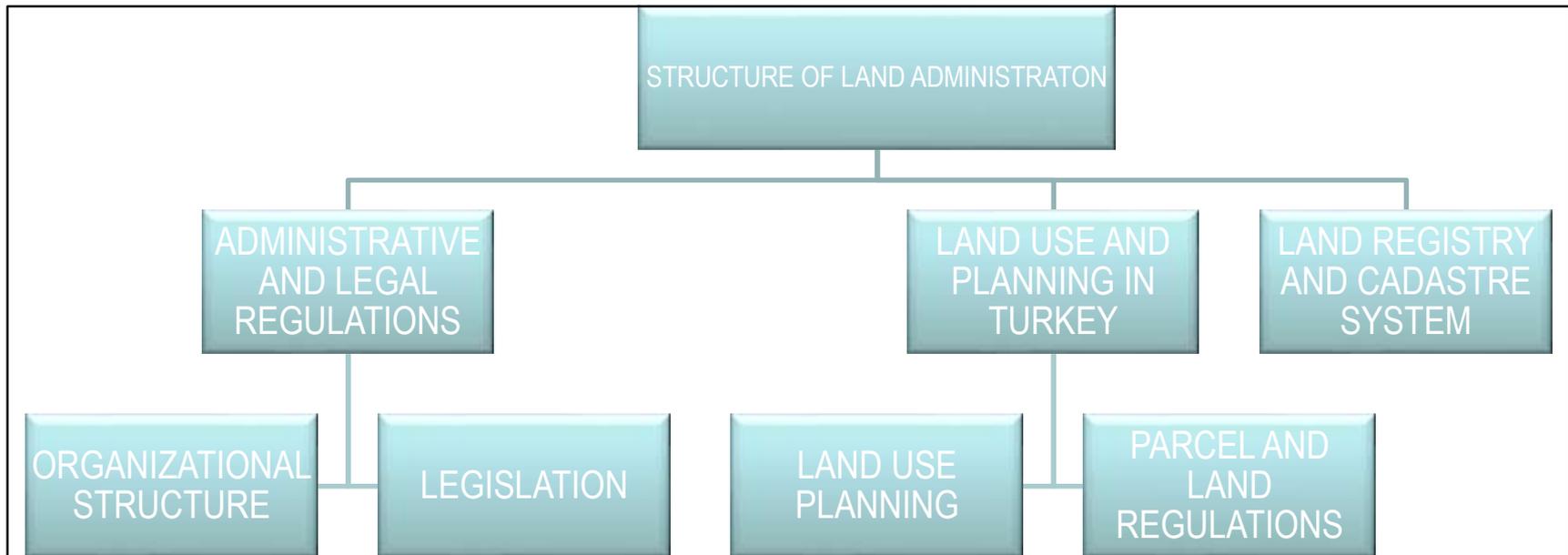
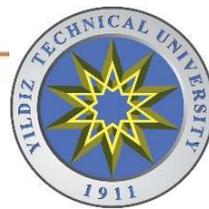


Figure 1 The general structure of land administration in Turkey (Ulger and Sevindik, 2015)

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THE CADASTRAL SYSTEMS IN TURKEY RELATED WITH COUNTRY PROFILE

Transaction types	registration required	no registration required	Land registry transaction	Cadastre transaction
Sales (Satış in Turkish)	X		X	
Donation (Bağış in Turkish)	X		X	
Exchange (Trampa in Turkish)	X		X	
Contract of support for life (Ölünceye kadar bakma akdi in Turkish)	X		X	
Transfer by inheritance (Miras yoluyla intikal işlemi in Turkish)	X		X	
Share (Taksim in Turkish)	X		X	
Mortgage (İpotek in Turkish)	X		X	
Usufruct right (İntifa hakkı in Turkish)	X		X	
Construction servitude (Kat irtifakı kurulması in Turkish)	X		X	
Condominiums (Kat mülkiyeti kurulması in Turkish)	X		X	
Subdivide (Ayırma in Turkish)	X		X	X
Land amalgamation (Birleştirme in Turkish)	X		X	X
land use conversion (Cins değişikliği in Turkish)	X		X	X
Easement (İrtifak hakkı in Turkish)	X		X	X

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Table 2 The relationship between each project and Six Statements on Cadastre 2014 and their realisation percentages.

Name of Activity/Project	Start/End date	The Six Statements on Cadastre 2014					
		1- Cadastre 2014 will show the complete legal situation of land, including public rights and restrictions	2- The separation between 'maps' and 'registers' will be abolished!	3- The Cadastral mapping will be dead! Long live modelling!	4- 'Paper and pencil - cadastre' will have gone!	5- Cadastre 2014 will be highly privatized! Public and private sector are working closely together!	6- Cadastre 2014 will be cost recovering!
Land Registry and Cadastre Information System (TAKBİS)	2005-2013	✓	✓		✓		
Spatial Property System (MEGSİS)	2011-continues		✓		✓		
Land Registry Archive Information System (TARBİS)	2005-2009		✓	✓			
Land Registry and Cadastre Modernization Project (TKMP)	2008- continues	✓				✓	
Map Data Bank (HBB)	2004-2008			✓	✓		✓
Turkey's National Geographic Information System (TUCBS) Project	2006-2011	✓		✓			
licenced mapping and cadastre offices	2005-continues					✓	
Tax and fees							✓
Applied percentages of Statements on Cadastre 2014 (in Turkey)		60-80	100	60-80	80-100	100	100



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A BRIEF REVIEW OF LAND ADMINISTRATION DOMAIN MODEL (LADM)

- The aim of LADM is to improve communication through introducing standard concepts or vocabulary in the land administration domain. According to Tjia and Coetzee (2012), *"this is aimed at improving interoperability between cadastral or related land information systems, thus improving exchange of land information between local, national, and international organizations (both private and public) and information society at large."*
- LADM has capability to provide an abstract description and conceptual schema (van Oosterom et al., 2015, Lemmen et al. 2015) concerning land administration components such as parties (person and organization), basic administrative units and RRR in case of ownership, spatial unit (e.g. parcels, buildings, and networks), spatial source (measurement) and spatial representation (geometry and topology). LADM also gives terminology (Lemmen et al. 2015, Paasch et al. 2013) for land administration based on either national or international system that is developed as simple as possible for practical purposes (Kalantari et al. 2015, Leksono et al. 2011).
- The Land Administration Domain Model is based on four (sub) packages classes with involved packages also (Fig 2.). The basic packages of LADM are described below.

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Figure 2. LADM Core Model Representation and involved packages (Ghawana *et al.* 2010).

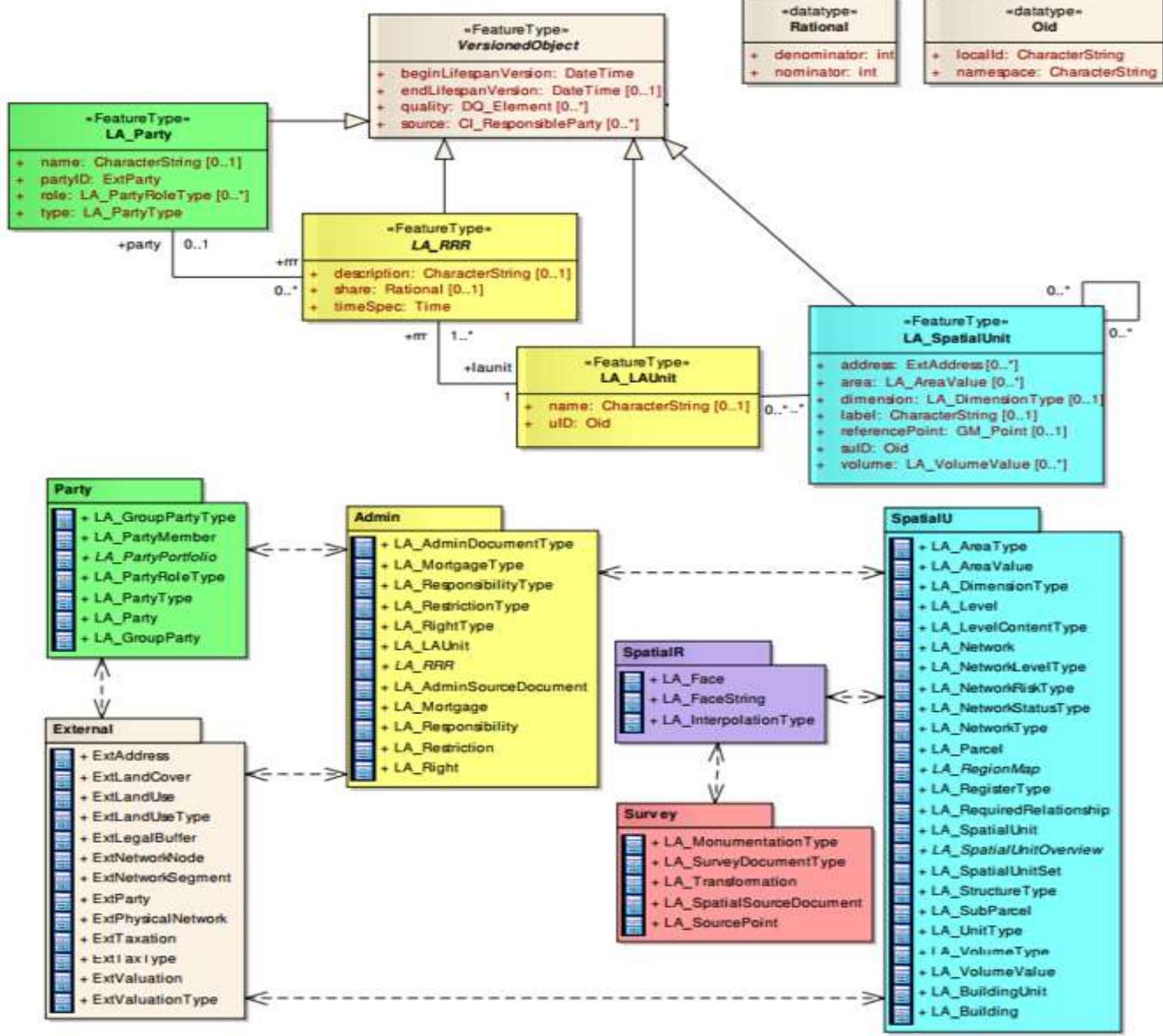




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THE TURKEY COUNTRY LADM PROFILE BASED ON INTERNATIONAL STANDARDS

In Turkey all the land registry and cadastral data under government guarantee which is operated by General Directorate of Land Registry and Cadastre (GDLRC). In other words, land registry and cadastral data are established under the control of GDLRC for the record of immovable properties in Turkey. Land registry is a registry recorded by the state with sole liability according to real openness system in order to indicate the existing real rights on immovable properties. Title registry does not mean a single deed or record that indicates the legal status of immovable properties. Title registry is the complete file that consists of various deeds, records and documents kept indicating all rights and liabilities on the immovable properties (Figure, next slide).

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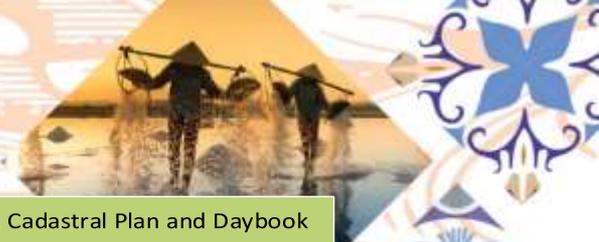
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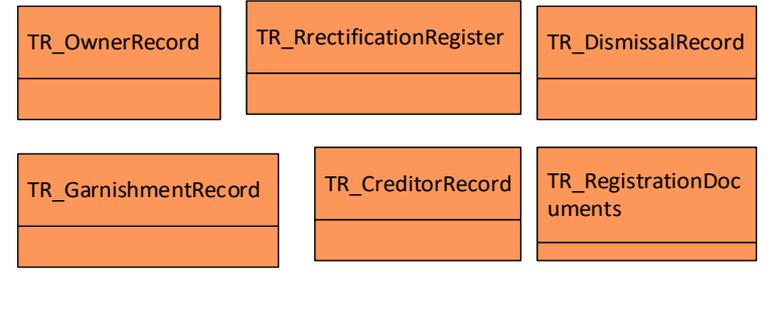


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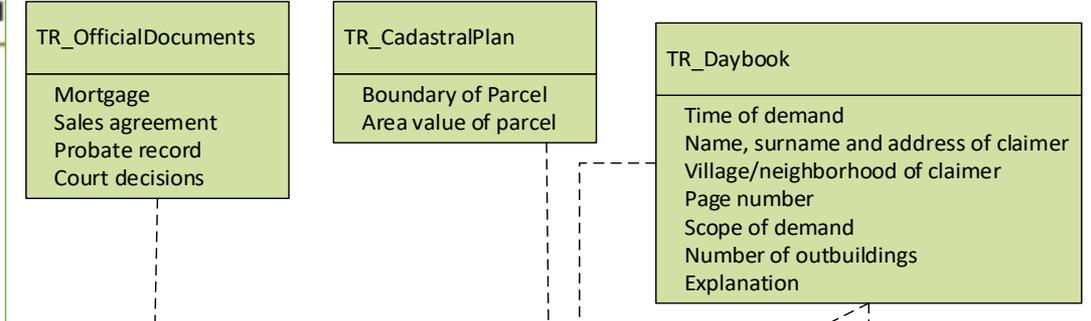
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Auxiliary register



Another primary register (Official Documents, Cadastral Plan and Daybook)



Primary register (land register and Condominium)

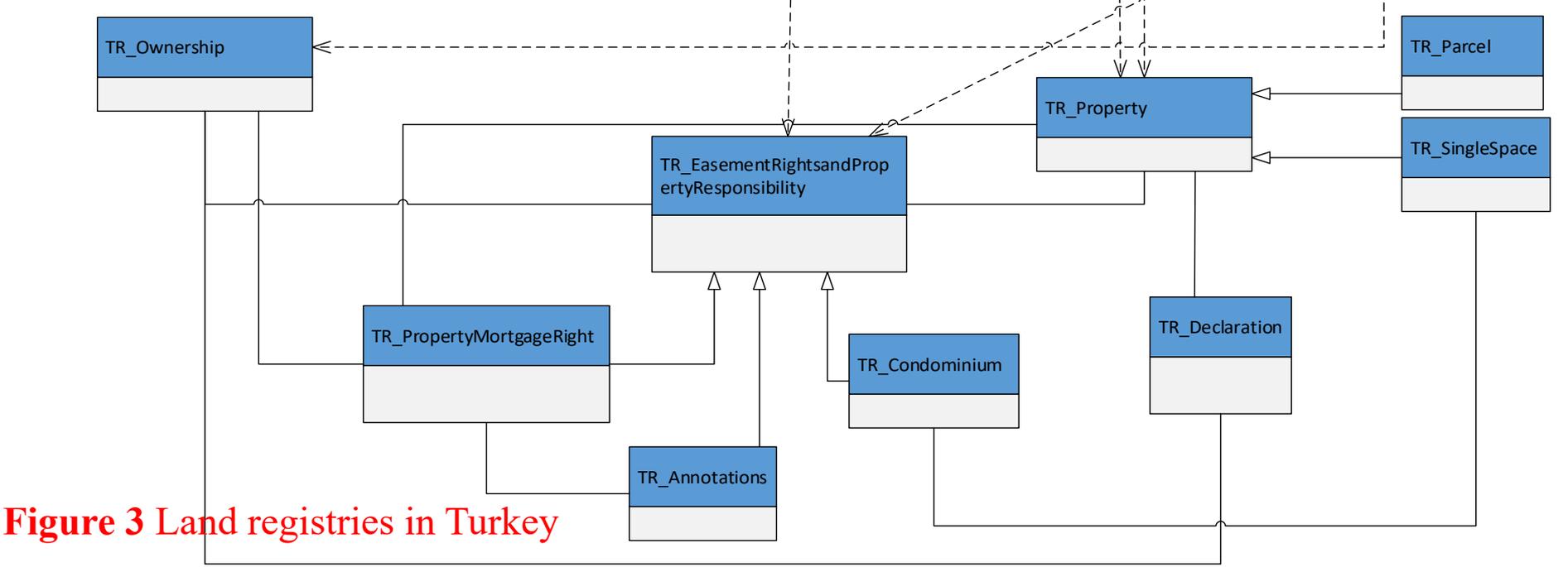


Figure 3 Land registries in Turkey



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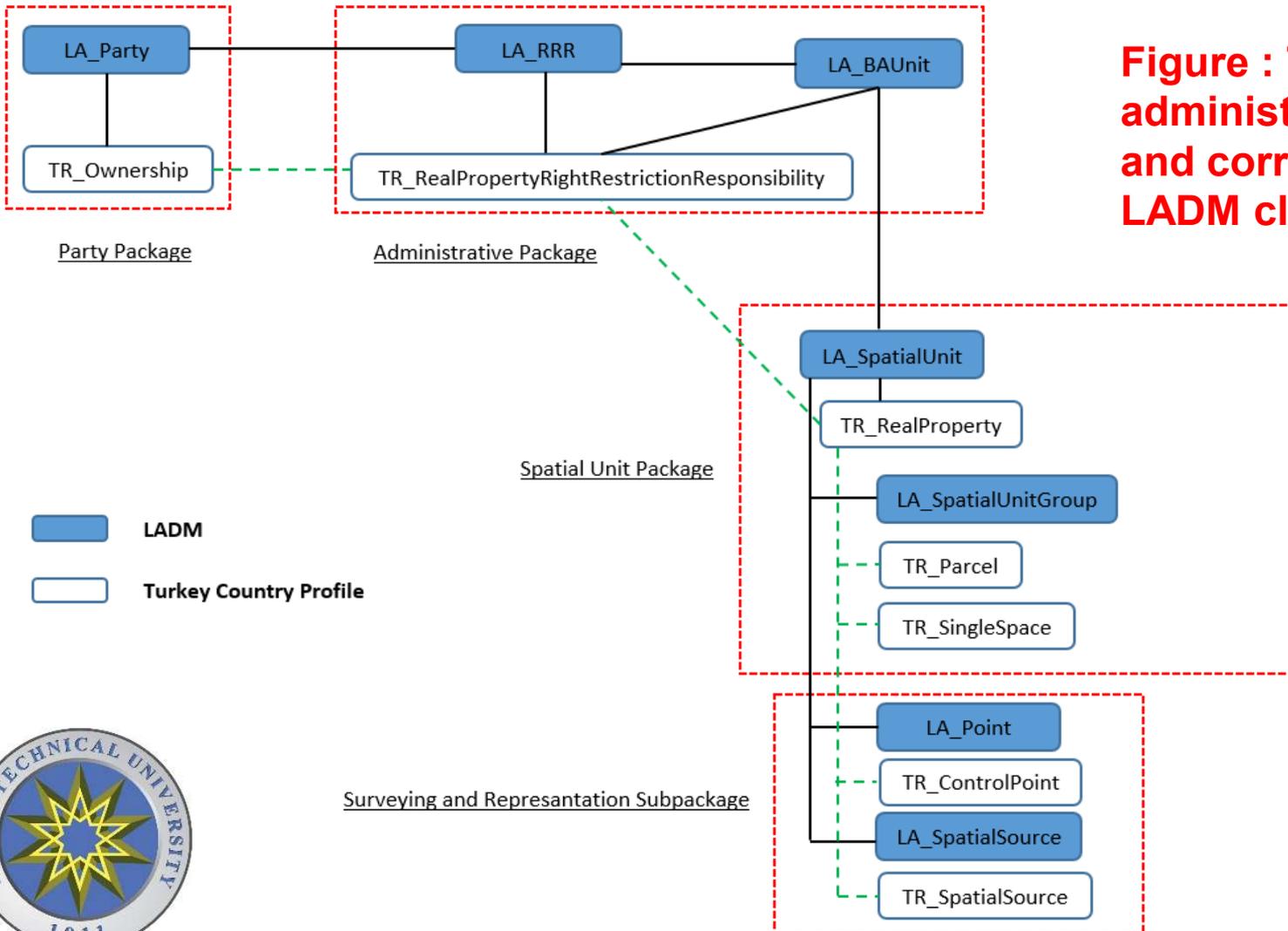


Figure : Turkey's land administration profile and corresponding LADM classes



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THE TURKEY COUNTRY LADM PROFILE BASED ON INTERNATIONAL STANDARDS

The main classes are related to land management for Turkey country profile which is determined primarily during the development of an ISO LADM compatible model. These main classes are separated into four classes: **(1) Ownership class**, **(2) Real estate class**, **(3) Rights, liabilities and limitations on the Immovable Property**, **(4) Legal and technical situation and documents about the immovable property**. The original names, names in country profile and the equivalents in ISO LADM of these classes are summarised in Table 3.

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Table 3 The main classes of Turkish cadastral model, classes of Turkey's country profile and related ISO 19152 classes

	Turkish model original class name	Name in the Turkey's profile	Corresponding LADM class
Ownership			
1	<u>TK GerçekKişi</u>	<u>TR NaturalPerson</u>	<u>LA Party</u>
2	<u>TK TüzelKişi</u>	<u>TR LegalPerson</u>	<u>LA Party</u>
3	<u>TK MüsterekMülkiyet</u>	<u>TR Co-Ownership</u>	<u>LA GroupParty</u>
4	<u>TK KamuKurumu</u>	<u>TR PublicInstitution</u>	<u>LA Party</u>
5	<u>TK KooperatifŞirket</u>	<u>TR CooperativeAssociation</u>	<u>LA GroupParty</u>
Real Properties			
1	<u>TK Parsel</u>	<u>TR Parcel</u>	<u>LA SpatialUnit</u>
2	<u>TK Bina</u>	<u>TR Building</u>	<u>LA LegalSpaceBuildingUnit</u>
3	<u>TK BinaBölümü</u>	<u>TR BuildingUnit</u>	<u>LA LegalSpaceBuildingUnit</u>
4	<u>TK BağımsızBölüm</u>	<u>TR SingleSpace</u>	<u>LA LegalSpaceBuildingUnit</u>
5	<u>TK Tesis</u>	<u>TR Premises</u>	<u>LA LegalSpaceBuildingUnit</u>
Rights related to properties			
1	<u>TK İrtifakHakları</u>	<u>TR Servitudes</u>	<u>LA Right</u>
2	<u>TK Kısıtlılıklar</u>	<u>TR Restrictions</u>	<u>LA Restriction</u>
3	<u>TK Sorumluklar</u>	<u>TR Responsibilities</u>	<u>LA Responsibility</u>
4	<u>TK Şerhler</u>	<u>TR Annotation</u>	<u>LA Restriction</u>
5	<u>TK İpotek</u>	<u>TR Mortgage</u>	<u>LA Mortgage</u>
6	<u>TK ÜstHakkı</u>	<u>TR RightOfSuperficies</u>	<u>LA RightType</u>
7	<u>TK YararlanmaHakkı</u>	<u>TR RightOfUsufruct</u>	<u>LA RightType</u>
8	<u>TK GeçitHakkı</u>	<u>TR RightOfPassage</u>	<u>LA RightType</u>
9	<u>TK DevremülkHakkı</u>	<u>TR RightOfTimeshare</u>	<u>LA RightType</u>
Address, Boundry Point, Lease and Legal Basis			
1	<u>TK SınırNoktası</u>	<u>TR BoundaryPoint</u>	<u>LA Point</u>
2	<u>TK KiraSözleşmesi</u>	<u>TR Lease</u>	<u>LA Responsibility</u>
3	<u>TK YönetimPlanı</u>	<u>TR Building ManagementPlan</u>	<u>LA SpatialSource</u>
4	<u>TK VaziyetPlanı</u>	<u>TR LayoutPlan</u>	<u>LA SpatialSource</u>
5	<u>TK ResmiDoküman</u>	<u>TR LegalDocument</u>	<u>LA AdministrativeSource</u>
6	<u>TK DokümanTipi</u>	<u>TR TypeOfDocument</u>	<u>LA AdministrativeSourceType</u>



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DISCUSSIONS

- Nowadays in Turkey cadastral system has 2D components with TAKBIS and MEGSIS. On the other hand, the cadastral parcel is the basic registration unit in Turkey, while some 3D/4D situations give in the text are defined and registered through limited rights, condominium rights, time sharing and other restrictions on intersecting parcels. Like many other countries, the traditional cadastral system has shown some limitations in Turkey to register and represent 3D/4D situations.
- In Turkey, current land title and cadastral data model should be improved to reflect better all dimensions of the land. In this context, In Turkey, initiatives projects are developed for providing integration to vision on the future of cadastres. These are namely, Turkey National Spatial Data Infrastructure with GIS (TUCBS or TRGIS) and as an information system the Land Registry and Cadastre Information System (TAKBIS in Turkish).

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DISCUSSIONS

- **The TAKBIS and TUCBS include attempts to achieve standardisation in the area of cadastral data based on international standardisation approaches.** The land registry data related to parcels are held in the Land Registry and Cadastre Information System. Therefore, all title data in our country is on e-government, but all parcel data not transferred at present. Turkey's Spatial Data Infrastructure with GIS Project (TUCBS in Turkish) has been designed according to the infrastructure of the ISO standard and compatible to Cadastre 2014 perspective. With this Project, land registry and cadastre metadata will be obtained by conformably to INSPIRE and LADM. Nowadays TUCBS has 2D components for the cadastral system in Turkey. **In this, his paper, conformity of LADM for modelling land registry and cadastre situations in Turkey country profile was evaluated compared approaches of TAKBIS and TUCBS.**

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CONCLUSIONS

- **LADM is critical components for cadastral systems all over the world countries profile. As stated in LADM with Turkey country profile, spatial-temporal cadastral databases are formed by defining the position of the boundaries of land parcels together with its creation date and its removal date, the hierarchy of land parcels including the attributes that attach on them which are presented in cadastral maps, map plans and land books.**
- **Furthermore, 3D/4D spatial cadastral data with international standards and LADM-based should be defined by subsequent studies. On the other hand, LADM presents the general conceptual schemas for land administration.**

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CONCLUSIONS

- In this study designed Turkey country profile cadastral data model provides the basis for national and regional profiles and enables the combination of land management information from different sources in a coherent manner. For this reason, several countries apply LADM to establish a country profile for their land administration system.
- The development of a conceptual schema could bring a common understanding within the domain of land administration with Turkey country profile for all land registry and cadastral data involved in the standardisation projects in Turkey, especially for TAKBIS and TUCBS.

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- ✓ **The study investigates and compared the basic entities in the Turkish TAKBIS and TUCBS which is concerning with basic land classes (e.g. parties, rights, restrictions and responsibilities, administrative, and spatial units) against the LADM basic classes. While there are similar Turkish country profile entities for the relevant LADM basic classes, there are semantic differences between Turkish cadastral system and LADM basic classes.**
- ✓ **Finally, in this paper, the application of LADM was discussed with a focus on the academic and institutional studies in Turkey. The results of the study indicate that effective functioning for the Turkey country profile based on the LADM which requires proper integration of data, preceded by analysing the contents of existing data sets, indicating key registers and defining a linkage system between them.**

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