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**The LADM**  
**based on INTERLIS**

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## Overview

1. Introduction
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3. Integration with LADM
4. Comparison with other Standards
5. Future Work
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## Introduction

- The Land Administration Domain Model (LADM) and the conceptual schema language INTERLIS share the same MDA principles
- Swiss Land Management (SLM) combined those standards and presented first results to Dutch Cadaster International in November 2014
- It was decided spontaneously to promote this approach as an interesting alternative to implement LADM

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## INTERLIS Concepts

### Short History of INTERLIS

The first version of the Swiss cadastral model was introduced in 1993 and revised in 2001

With the introduction of the Swiss Geo Information Law **160 new data models** will be completed by end of 2016

**INTERLIS** is the common modelling language to define all models of the Swiss GDI (since 1993)


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## INTERLIS Concepts

### INTERLIS Key Features

<b>System neutral</b> modelling language to describe relational or object-oriented data models
<b>XML based</b> data exchange
<b>Directly processable</b> by modern software tools
<b>Compatible</b> with the relevant international Standards (UML, XML)


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## INTERLIS Concepts

### Available Software Tools for INTERLIS

<b>Compiler</b>	Tests the syntactic correctness of INTERLIS models (free).
<b>Checker</b>	Validates XML data sets against a model (free & commercial).
<b>Other</b>	DB-Generator, Translators, UML-Editor, etc. (free & commercial).

see also [www.interlis.ch](http://www.interlis.ch) for more information

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## Integration with LADM

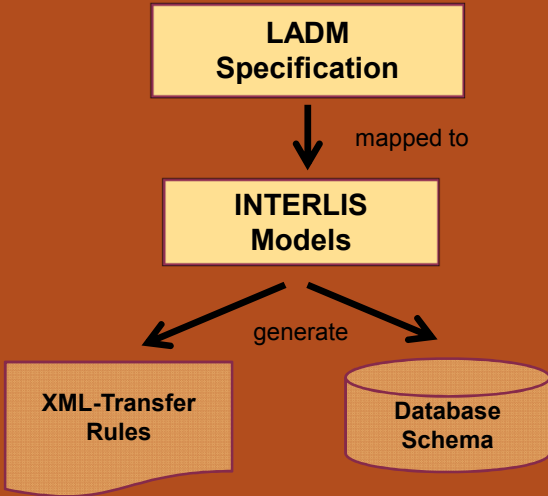
### ISO19152 / LADM

- Conceptual model covering basic information-related components of land administration
- Basis for the development and refinement of efficient and effective land administration systems
- ISO Standard since December 2012


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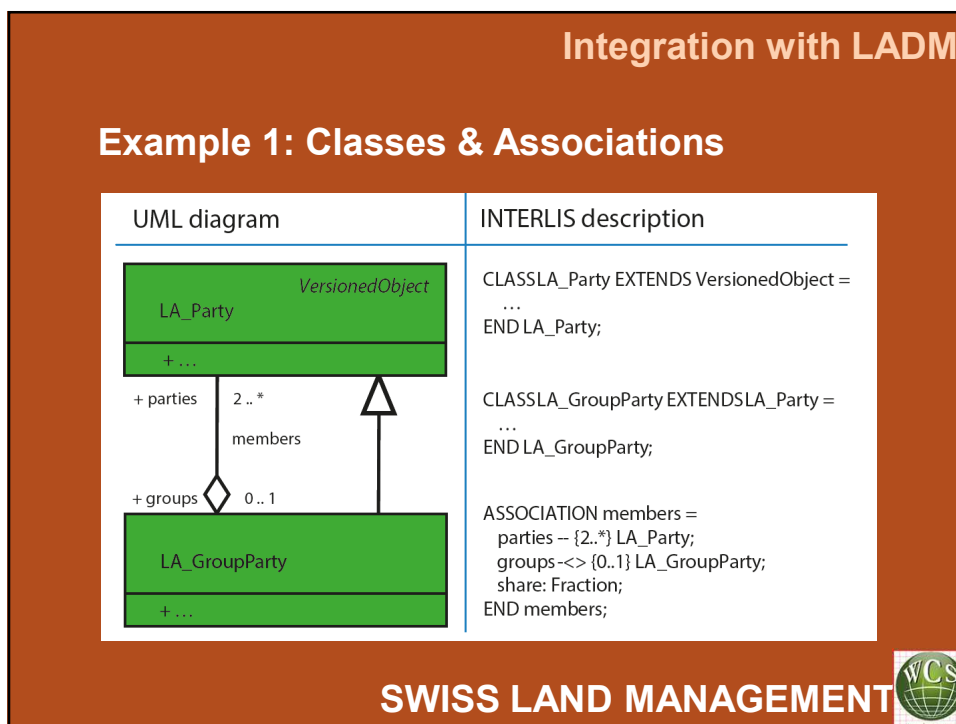
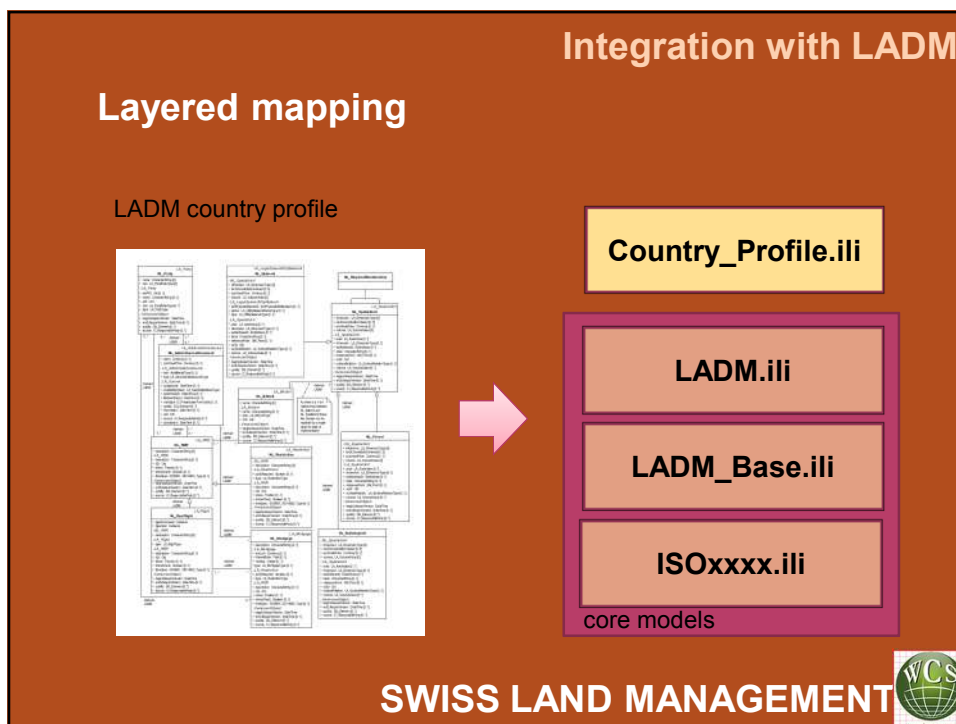
## Integration with LADM

### The LADM / INTERLIS Approach



```
graph TD; A[LADM Specification] -- mapped to --> B[INTERLIS Models]; B -- generate --> C[XML-Transfer Rules]; B -- generate --> D[(Database Schema)];
```

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## Integration with LADM

### Example 2: Constraints

```
CLASS LA_SpatialUnit EXTENDS VersionedObject =
  area: LIST {0..*} LA_AreaValue;
  dimension: LA_DimensionType;
  extAddressID: LIST {0..*} LADM_Base.External.ExtAddress;
  label: CharacterString;
  referencePoint: GM_Point;
  suID: MANDATORY Oid;
  surfaceRelation: LA_SurfaceRelationType;
  volume: LIST {0..*} OF LA_VolumeValue;
MANDATORY CONSTRAINT
  !! if dimension=2D then volume not specified
  NOT (
    dimension == #2D
  )
  AND (
    DEFINED(volume)
  )
END LA_SpatialUnit;
```

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## Comparison with other Standards

### Benefits of the LADM / INTERLIS Approach

**In General** reduced complexity by concentration on the most basic tasks (modeling and data exchange)

**To UML** great tool to document all phases of software development, but no geometric types or data exchange

**To GML** a flexible transfer but no modeling language

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**Future Work**


**Work in progress**

**Swiss Country Profile** sponsored by Federal Office of Topography swisstopo

**INTERLIS 2.4** better constraints formulation and other language improvements

**Improved LADM description** coverage of all spatial types

**3D Support**

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**Conclusions**

- ✓ By translating LADM to INTERLIS we get directly computer process able data models and data exchange formats
- ✓ We can use all available INTERLIS tools (compiler, checker, translators) for LADM
- ✓ Translated models can be downloaded from the SLM website at

**swisslm.ch**

for free

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