New evidence of land management in the frame of Common Agricultural Policy of the EU

Needs for standardization

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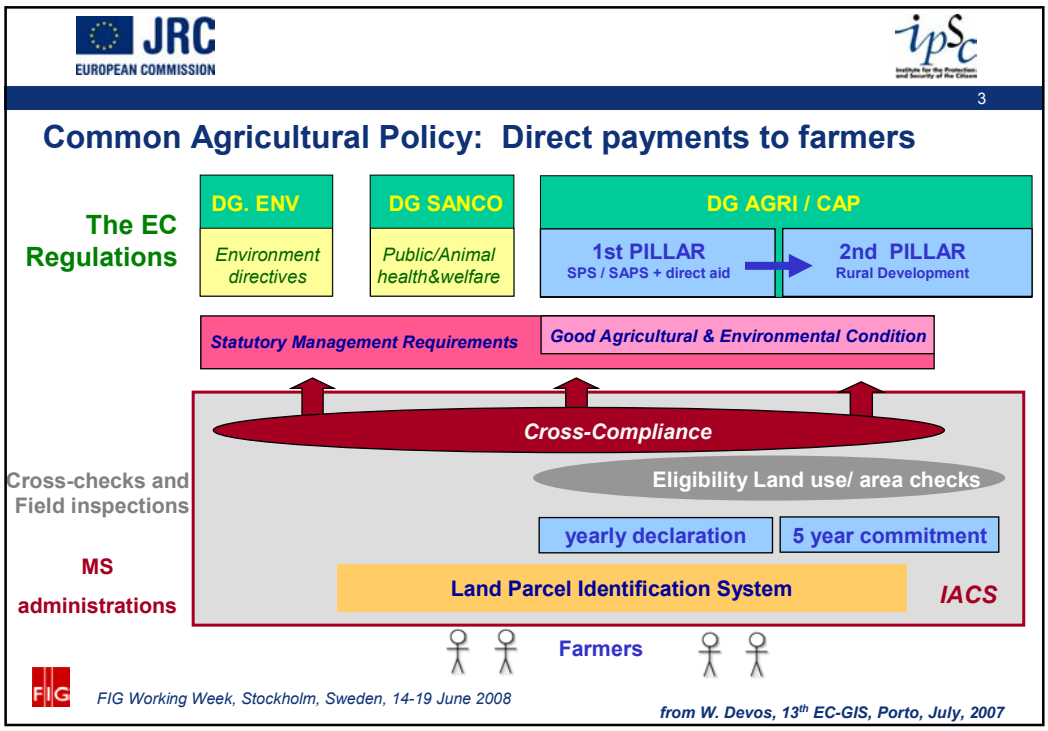
Outline

- **Background and rational**
- **Definitions and methodology**
  - Key spatial and non-spatial concepts
- **LPIS Core Conceptual Model (LCM)**
  - Model Boundaries
  - LPIS Data Model
  - Reference parcel of LPIS
- **Conclusions**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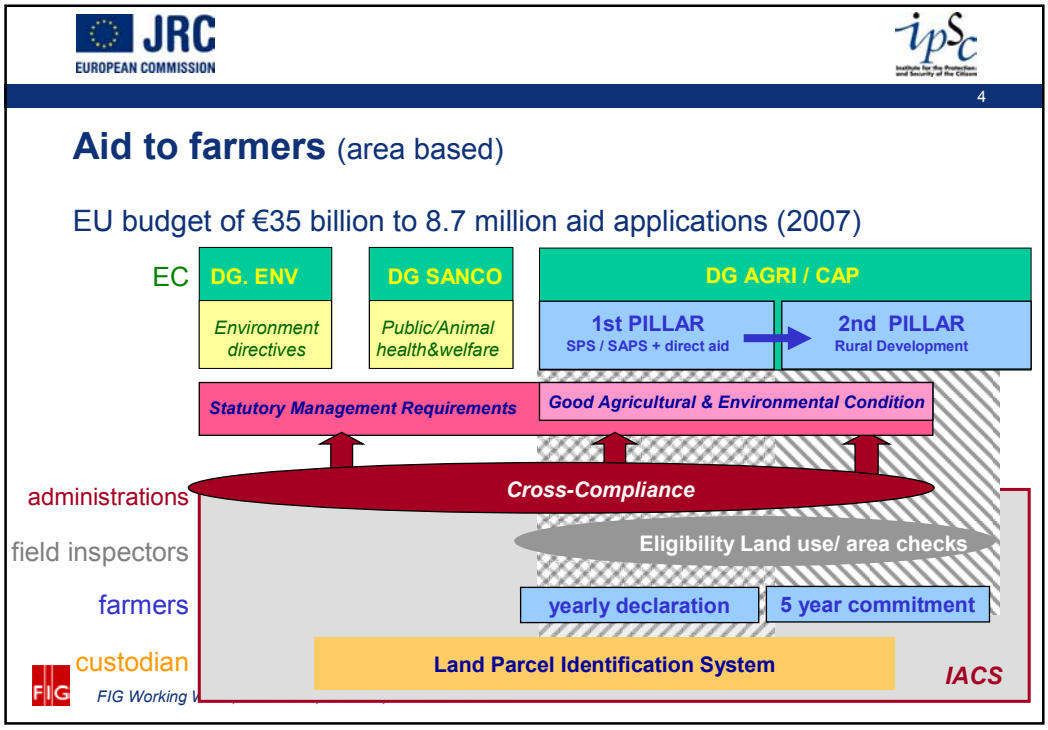
Common Agricultural Policy: Direct payments to farmers
The EC Regulations
DG. ENV
Environment directives
DG SANCO
Public/Animal health&welfare
DG AGRI / CAP
1st PILLAR
SPS / SAPS + direct aid
2nd PILLAR
Rural Development
Statutory Management Requirements
Good Agricultural & Environmental Condition
Cross-Compliance
Cross-checks and Field inspections
Eligibility Land use/ area checks
yearly declaration
5 year commitment
MS administrations
Land Parcel Identification System
IACS
Farmers
FIG Working Week, Stockholm, Sweden, 14-19 June 2008
from W. Devos, 13th EC-GIS, Porto, July, 2007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Aid to farmers (area based)
EU budget of €35 billion to 8.7 million aid applications (2007)
EC
DG. ENV
Environment directives
DG SANCO
Public/Animal health&welfare
DG AGRI / CAP
1st PILLAR
SPS / SAPS + direct aid
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custodian
Land Parcel Identification System
IACS

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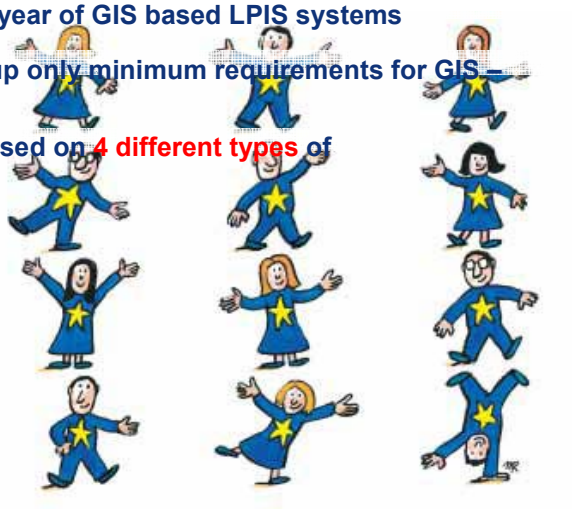
- 1992 - first IACS-LPIS implementations, alpha-numerical databases
- 2005 - first operational year of GIS based LPIS systems
- The EU regulation set up only minimum requirements for GIS – subsidiarity principle
- 27 implementations based on 4 different types of Reference Parcel



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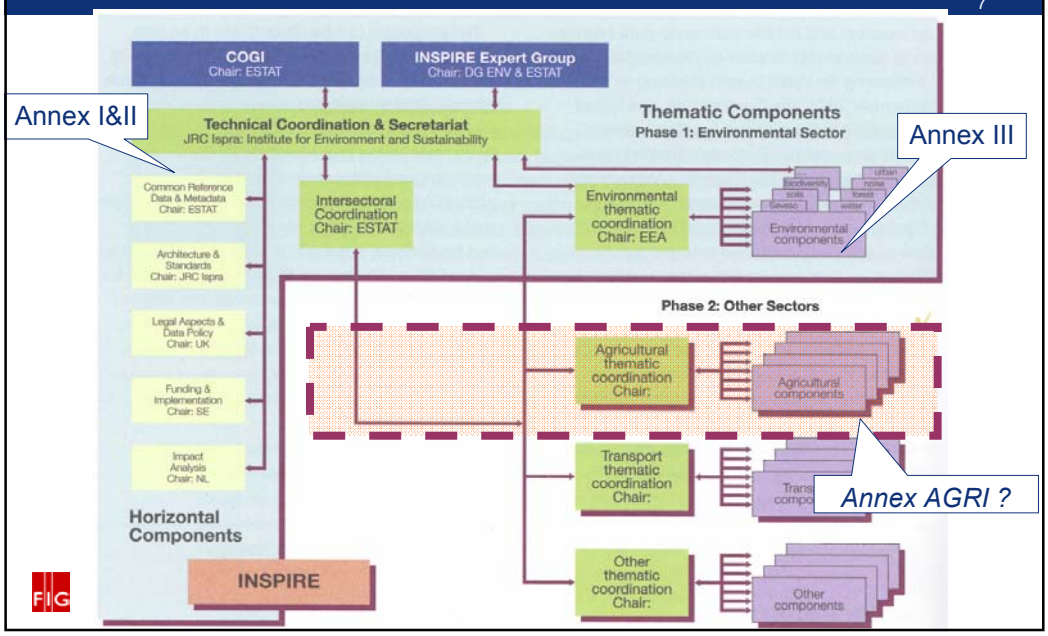
Why standardization?

- CAP issues: geographic data for support of 1st and 2nd pillar, integration of environmental and rural development data, agricultural indicators
- European initiatives: INSPIRE, GMES, LUCAS
- Cross-sector issues of data flow at the farm level: FieldFact, AgriXchahge

FIELD	MACHINERY	PEOPLE	ENVIRONMENT
XML, GML, KML ISO19100	ISO 11783 ISOBUS task controller XML	vCard FOAF XMeld	DWML, Weather XML,

EU Initiative – INSPIRE Directive EC 2007/2



Purpose and Scope

Data interoperability and sharing through harmonisation within a service architecture requires:

- promote tools and international standards (ISO 19100 series, OGC) for creation spatial data infrastructure (SDI),
- introduce the framework of conceptual modelling for thematic data application schemes

In particular, for the IACS-LPIS domain, harmonisation needs:

- 'As-is analysis' - inventory and analysE of the European regulatory requirements & National implementations
- develop a generic LPIS Core Model (LCM)
- produce a UML/GML schema and architecture for compliance testing

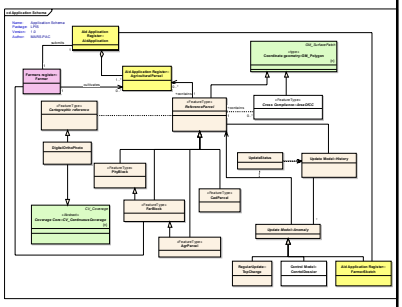
What is extend of standardisation in LPIS?

OBJECTIVE

- Standardization does NOT aim at having a single system running in all MS
- The purpose of standardization consists in identifying and documenting common structures in data and process models

Conceptual Core Model

- represents general modelling knowledge that can be reused and permits the translation:
  - →from generic model to national implementation
  - ↔from one conceptual realm into another,
- domain (national) models used to extract commonalities for the core model,
- domain (national) models will extend the core model according to their own requirements
- to test conformity, individual mapping is needed between each national model and the core model



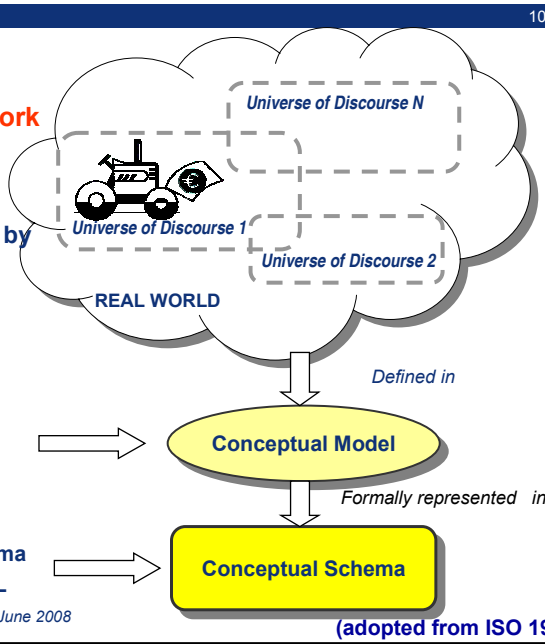
Methodology

instruments:

Conceptual formalism framework

methodology is provided by ISO 19100 series

the same methodology is applied by INSPIRE working documents, e.g. D2.6: 'Data Specifications'



(adopted from ISO 19101)

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From the real-world to data

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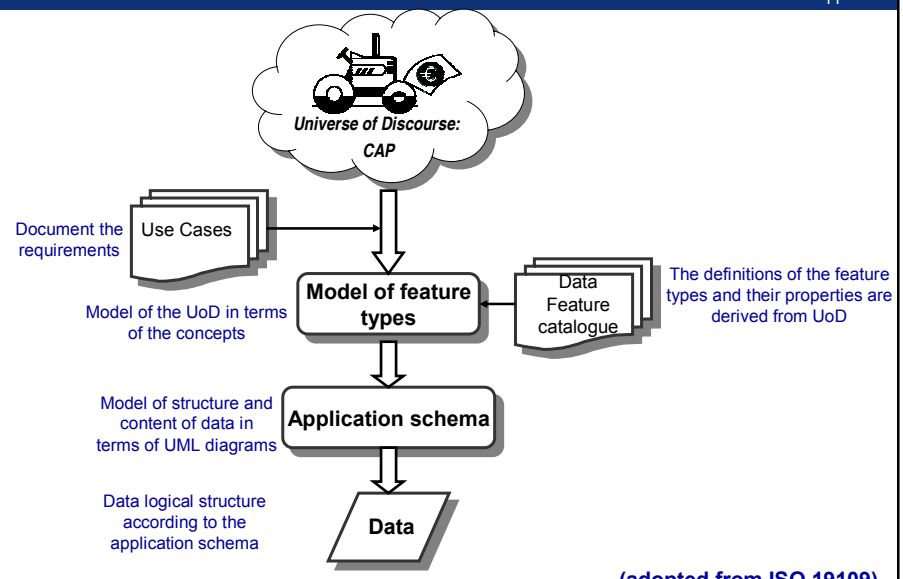

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Use Cases

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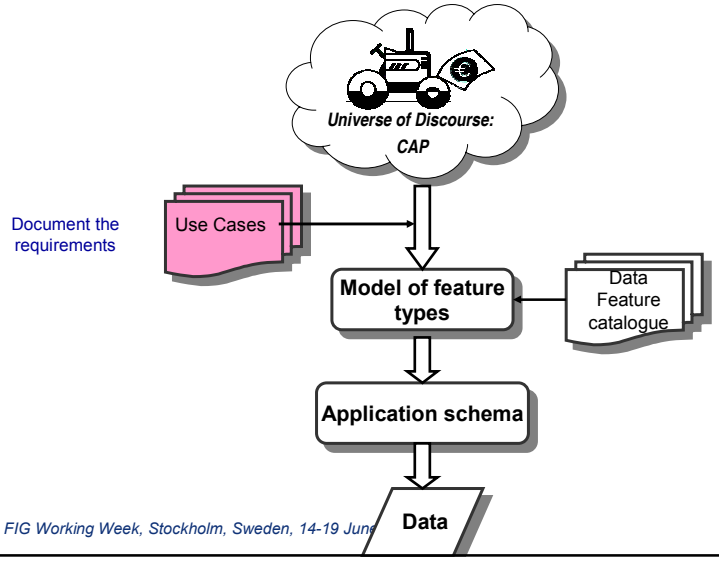
System functionality – goal oriented analysis



Definition of IACS

The Regulation (Council Reg (EC) No 1782/2003, Art 17) state that each MS shall set up an Integrated Administration and Control System (IACS) as a tool to manage direct payment support at national level. IACS should be established as (Art.18(1)) 'computerised data base' (read = information system) and containing following components:

(b) an identification system for agricultural parcels; →**LPIS**

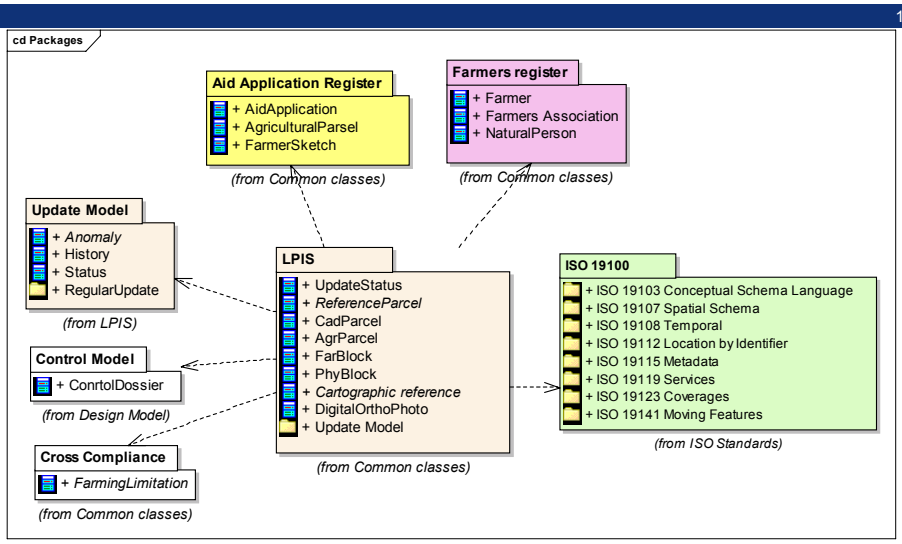
(c) a system for identification of entitlements;

(d) register for aid applications;

(e) an integrated control system;

(f) identification system for farmers.

Model Packages



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Key spatial concepts

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Commission Regulation (EC) No 796/2004 Art 2

(1a) Agricultural parcel

shall mean a continuous area of land on which a single crop group is cultivated by a single farmer. However, where a separate declaration of the use of an area is required in the context of this Regulation that specific use shall further limit the agricultural parcel;

(26) Reference parcel

shall mean a geographically delimited area retaining a unique identification as registered in the GIS in the Member State's identification system referred to in Article 18 of Regulation (EC) No 1782/2003;

Art 6(1) CR 796/2004

the identification system for agricultural parcels …. shall operate at **reference parcel** level such as cadastral parcel, or production block which shall ensure unique identification each of reference parcel

from W. Devos, CAPIGI, Dublin, 8-9 April, 2008

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Key spatial concepts

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Agricultural parcel (AP)

- Concept of IACS; subject of payment and control
- Represented in aid application register
- Related to farmers' register

Reference parcel (RP)

- concept of LPIS for referencing and allocating of AP as well as determining of area;
- core data layer maintained and updated in LPIS

1st step - Modeling Core content

Areas of farming limitation

- concepts of SMR's: Environment Directives and Directives on public and animal health
- concepts of good agricultural and environment conditions -GAECs (national measures)
- external data layers from different sources,
- standardization and harmonization links to INSPIRE directive

2nd modeling step

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Logical business model

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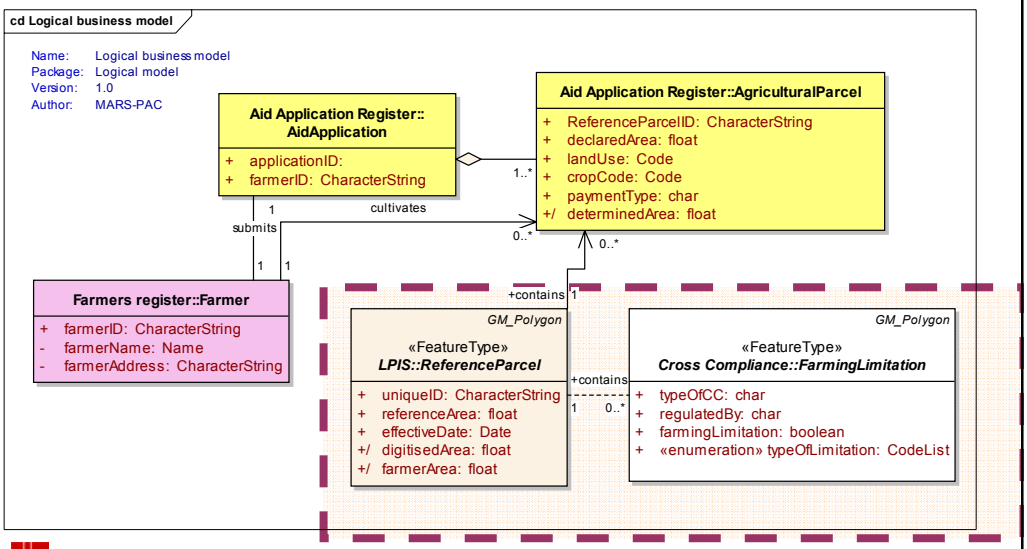

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Spatial objects

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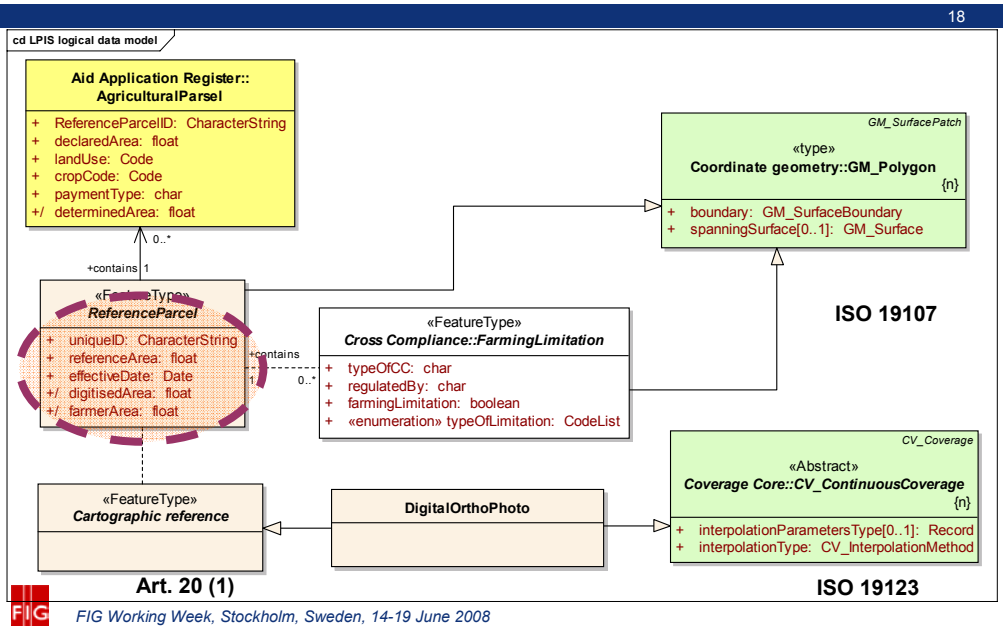


Art 6(1) CR 796/2004

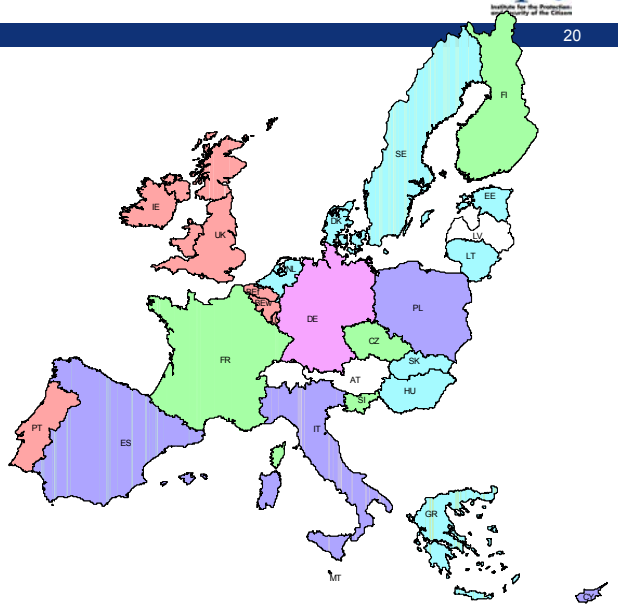
the identification system for agricultural parcels …. shall operate **at reference parcel level** such as cadastral parcel, or production block which shall ensure unique identification each of reference parcel

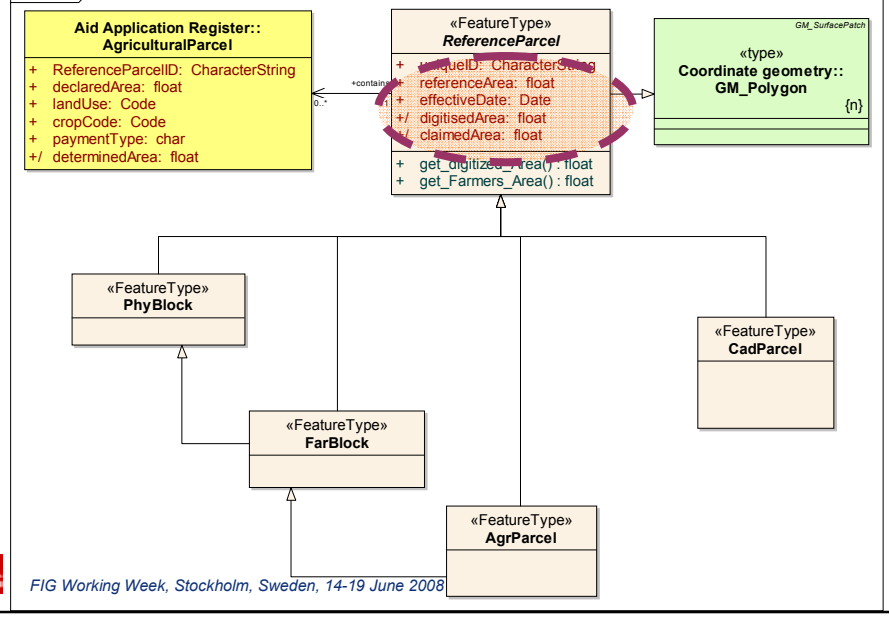
	= Agricultural parcel	< Farmer block/ilot	< Physical block	Cadastral parcel
content / coverage	one single crop group	one or several crop groups	one or several crop groups	do not match agricultural pattern
applicants	single farmer	single farmer	one or several farmers	one or several farmers
temporal aspect	annual	multi-annual	semi-permanent	n/a

LPIS type (2006)

- 5 agriculture parcel
- 3 cadastral parcel + 1
- 4 farmer block
- 8 physical block + 1
- 1 varies by Laender
- 2 MS in accession

4 MS have recently switched type of reference parcel

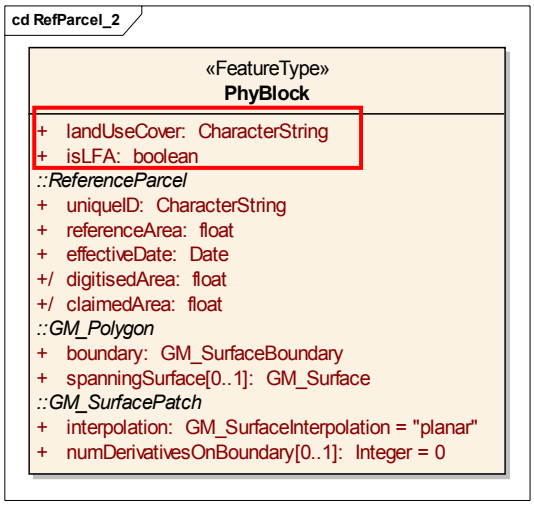




Reference Parcel: mandatory attributes

- **Unique identifier**
  - ✓unambiguous geographical identification of agricultural parcels for aid application.
  - ✓unique under the national system
  - ✓a key attribute for connection with other IACS and MS national registers
- **Reference area**
  - ✓ calculation of the aid amount, also referred in the Regulations as 'maximum eligible area' and caps the area of all APs that can be claimed for the RP concerned.
  - ✓ It is an attribute has official status (compare to legal area in cadaster system)
  - ✓ calculated once, at the time when current version of the RP is approved.
- **Effective date of the parcel**
  - ✓ date new version and new attribute values of the RP come in to force with respect to third parties (e.g. Paying Agency) and registers
  - ✓crucial for all bodies working with LPIS register

  possible dates are (i) those of the proposal for RP modification made by farmer, LPIS operator or inspector; or (ii) those specified within the time period when it is certain that a change will occur in the future (e.g. changes in use rights, lease contract, activating/transferring of entitlement).
- **Geometry**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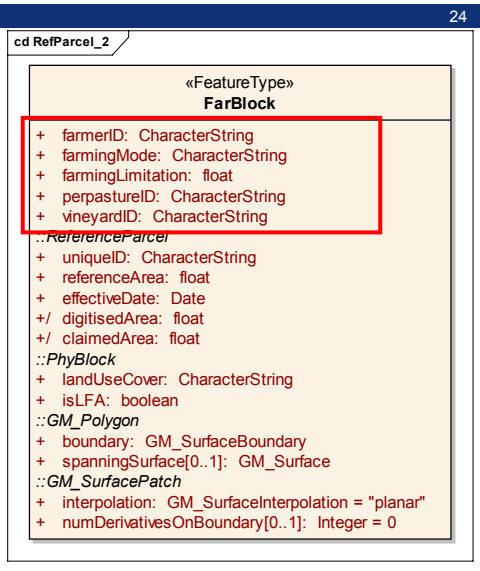
«FeatureType»
PhyBlock
+ landUseCover: CharacterString
+ isLFA: boolean
::ReferenceParcel
+ uniqueID: CharacterString
+ referenceArea: float
+ effectiveDate: Date
+/ digitisedArea: float
+/ claimedArea: float
::GM_Polygon
+ boundary: GM_SurfaceBoundary
+ spanningSurface[0..1]: GM_Surface
::GM_SurfacePatch
+ interpolation: GM_SurfaceInterpolation = "planar"
+ numDerivativesOnBoundary[0..1]: Integer = 0


cd RefParcel_2
«FeatureType»
FarBlock
+ farmerID: CharacterString
+ farmingMode: CharacterString
+ farmingLimitation: float
+ perpastureID: CharacterString
+ vineyardID: CharacterString
::ReferenceParcel
+ uniqueID: CharacterString
+ referenceArea: float
+ effectiveDate: Date
+/ digitisedArea: float
+/ claimedArea: float
::PhyBlock
+ landUseCover: CharacterString
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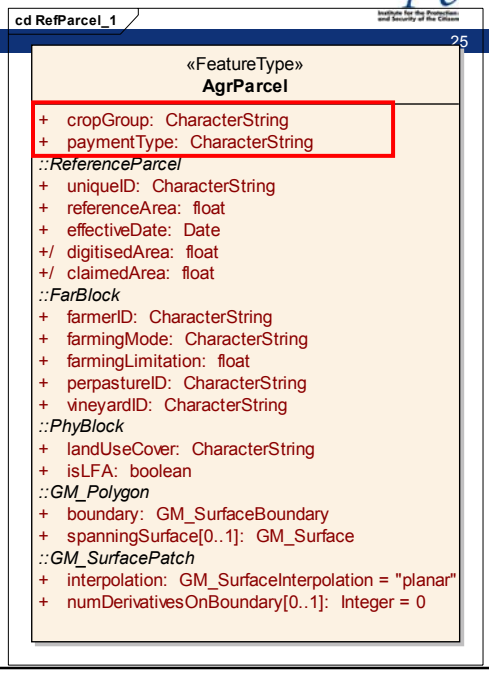
cd RefParcel_1
«FeatureType»
AgrParcel
+ cropGroup: CharacterString
+ paymentType: CharacterString
::ReferenceParcel
+ uniqueID: CharacterString
+ referenceArea: float
+ effectiveDate: Date
+/ digitisedArea: float
+/ claimedArea: float
::FarBlock
+ farmerID: CharacterString
+ farmingMode: CharacterString
+ farmingLimitation: float
+ perpastureID: CharacterString
+ vineyardID: CharacterString
::PhyBlock
+ landUseCover: CharacterString
+ isLFA: boolean
::GM_Polygon
+ boundary: GM_SurfaceBoundary
+ spanningSurface[0..1]: GM_Surface
::GM_SurfacePatch
+ interpolation: GM_SurfaceInterpolation = "planar"
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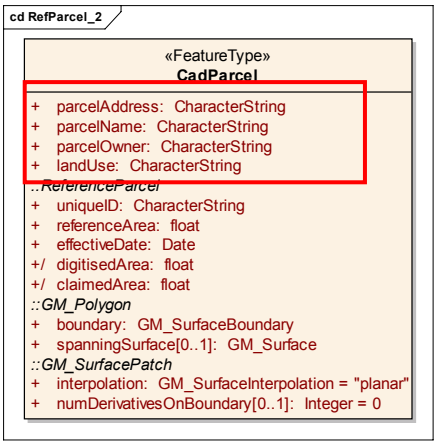
cd RefParcel_2
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+ parcelAddress: CharacterString
+ parcelName: CharacterString
+ parcelOwner: CharacterString
+ landUse: CharacterString
::ReferenceParcel
+ uniqueID: CharacterString
+ referenceArea: float
+ effectiveDate: Date
+/ digitisedArea: float
+/ claimedArea: float
::GM_Polygon
+ boundary: GM_SurfaceBoundary
+ spanningSurface[0..1]: GM_Surface
::GM_SurfacePatch
+ interpolation: GM_SurfaceInterpolation = "planar"
+ numDerivativesOnBoundary[0..1]: Integer = 0

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Reference Parcel types

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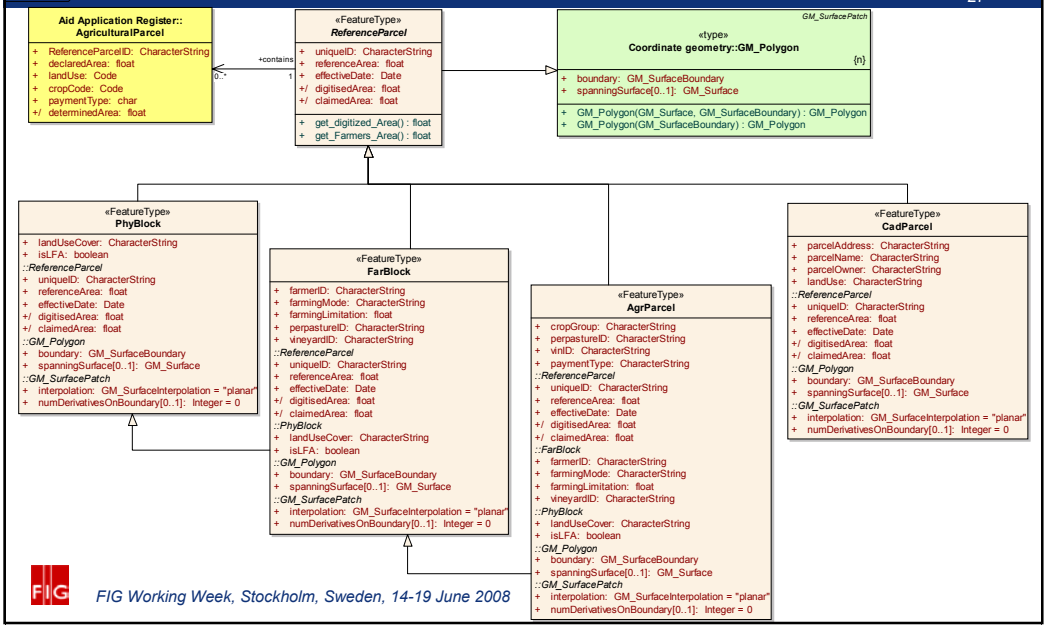

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Aggregated Schema

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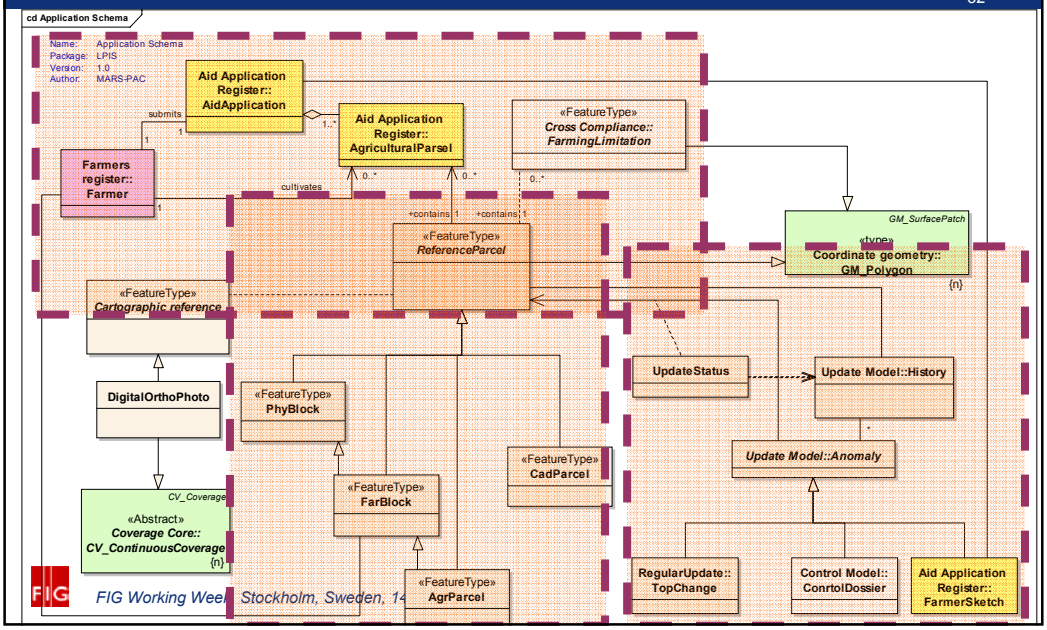
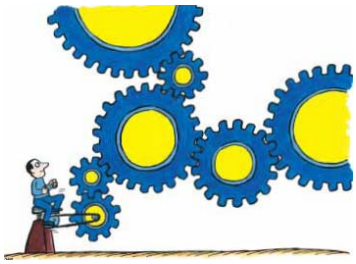


Expected impact

Development of Core Conceptual Model could

- resolve many of communication problems
- facilitate meaningful exchange of information
- provide basis for efficient component-based system development, which can easily adopt to changes in domain and technology



Conclusions

Standard methodology is in place and used by others domains.

Use of standard methodology insure interoperability of LPIS data with other domains (INSPIRE)

We need to speak UML and GML!

Thank you for your attention!