Plan

- **Context**
- **Goals**
- **Achieved tasks**
- **Conclusions and prospects**

Stakes of geographical information

- **Geographical Information**
  - Strategic aspect
  - Customers/users diversity
- **Approach of reconciliation**
  - Technical agreements
  - Organizational agreements
- **Technological advances**
  - Norms
  - Formalisms
  - Models

Geographical information in Morocco !

- New needs
- Accompaniment framework
- Technical and legal aspects

Extant and needs Diagnostic

Producers / Users

- **Governmental institutions**
  - **ANCFCC**
    - **Cadastre**
    - **Cartography**
    - **Land registry**
  - **CRTS**
    - **Remote Sensing**
  - **Statistic direction (HCP)**
  - **Highway administration of Morocco, …**
  - **Hydraulic direction, ONEP, …**
- **Territorial communities**
  - **Regions**
  - **Provinces and prefectures**
  - **districts**
- **None Gouvernemental Institutions**
- **Schools, Formation and training centers …**

Extant and needs Diagnostic

Available Geographical Data

- **Handling difficulties of available numerical data**
  - *Data Structure (product object)*
  - *Geographical data / cartographic representation*
  - *Information redundancy*
  - *Lack of pre-definite conceptual data models (CDM)*
- **Coordination Lack**
  - *DB Independency (management)*
  - *Heterogeneity (structure and semantic inconsistencies)*
  - *Multitude of actors*
- **Integration**

Reflection !

How to bring closer the doers?

- **Legal aspect**
  - Dialogue remains essential to initiate agreements
- **Technical aspect**
  - responsibilities clearness
  - information adaptability to user's needs
  - maintain of a common and coherent language
  - optimization of information use

General Object :

Modeling of Reference data in Morocco

Specific Objects

- Establishment of **ontology** for **reference data**
  - ➔ *responsibilities clearness of various doers*
- Features **Cataloguing**
  - ➔ *adaptability to user's needs*
- Setting up of **data dictionaries**
  - ➔ *Maintain of a common language*
- Setting up of a **global model** adapted to applications using reference data**.**
  - ➔ *Optimization of information use*

Plan

- Context
- **Achieved tasks**
  - **Ontology for reference data** ✔
  - Concretization elements
    - Features cataloguing
    - Conceptual modeling
    - Reference model implementation
- Conclusions and Prospects

Ontology for reference data

Establishment frame of the ontology

- Context
- Goals
- Ontology
  - Approach
  - Principles
  - Cataloguing
  - Modeling
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Existent :

- Reference data identification

Object :

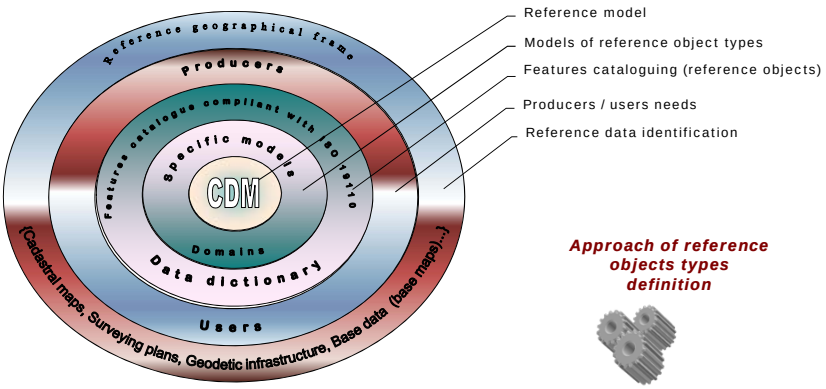
- Reference model

Approach :

- Definition of reference objects types
- Establishment of an ontology for reference data

Ontology for reference data

Establishment frame of the ontology



Approach of reference objects types definition

Ontology

Common practices of reference data producers and users

Ontology for reference data

Principles of the established ontology

- Independence and the complementarity of objects types
  - 11 objects types (1ère classification)
  - Consistency checks at a **general** level (**Independency**)
  - **Multiple inheritance** according to the level of **detail**
- Adaptability of objects types to specific domains
  - Definition is **independent from context**
  - **Exploitation** in a particular application must be **functional**
- Hierarchy
  - Relations of **specialization** (SOT / ROT)
  - **Generic** features classes / sub-classes

Plan

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    - **Features cataloguing** ✔
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Concretization elements

Features cataloguing

- Context
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- To clear up the knowledge of the geographical field described
  - Definition of eleven reference objects types
  - Features cataloguing
  - Definition of concepts ensuring the adaptability of the definite structure
- Development of a features catalogue compliant with ISO standards (ISO 19110).

Normalisation

Concretization elements

Data dictionary

- Context
- Goals
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  - Modeling
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- Conclusions and Prospects

- Textual definitions
  - Feature classes
  - Attributes
  - Associations
  - Domain values
- Setting up data dictionary

Communication

Plan

- Context
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    - Features cataloguing
    - **Conceptual modeling** ✔
    - Reference model implementation
- Conclusions and Prospects

Concretization elements

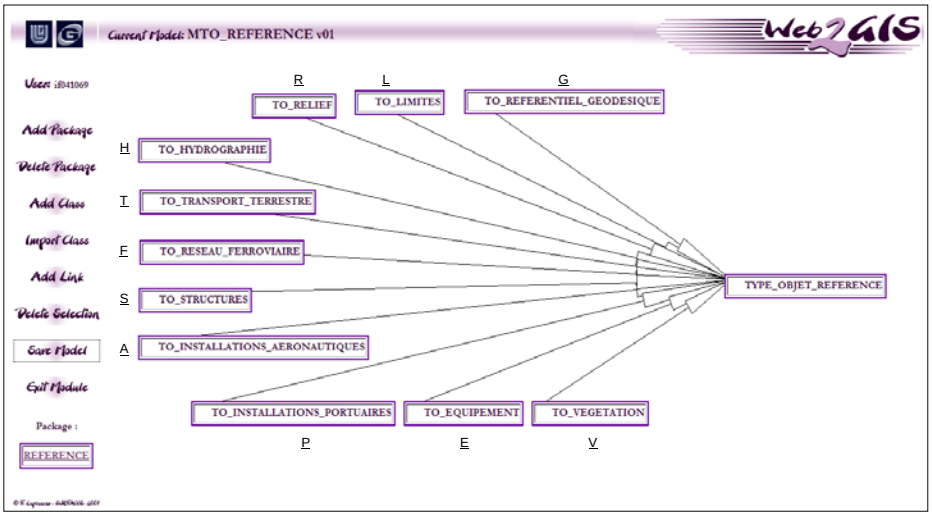
Conceptual modeling

- Contexte
- Objectifs
- Ontologie
  - Démarche
  - Principes
  - Catalogage
  - Modélisation
  - Implémentation
- Conclusions et Perspectives

- Establishment of a reference data conceptual model
  - 11 Specific CDM
  - Global Model (Hierarchy)
  - Modeling of topological relations (CONGOO within Web2GIS AGL)
- Constitution of data bases resulting from the same CDM

Integration

  - Conceptual modeling
  - Structure of data bases
  - Features spatial modeling
  - Objects semantic



Reference model MTO_REFERENCE

Plan

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    - Features cataloguing
    - Conceptual modeling
    - **Reference model implementation** ✔
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Concretization elements

Application

- Context
- Goals
- Ontology
  - Approach
  - Principles
  - Cataloguing
  - Modeling
  - Implementation
- Conclusions and Prospects

- Exploitation and adaptation of reference model to user intention
- Confrontation of this research developments to genuine datasets
- Lacks in terms of data documentation
- Topology control / Problem of data quality
  - Cadastre / Cartography
  - Geographical data / Cartographic representations

Plan

- Context
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Conclusions

Establishment of an ontology for reference data

- Context
- Goals
- Ontology
  - Approach
  - Principles
  - Cataloguing
  - Modeling
  - Implementation
- Conclusions and Prospects

- To moderate problems associated to data use, the approach was guided by :
  - Purposes of data producers and users
  - Available data configurations
  - Anterior application domains
- To establish principles
  - Independence / Complementarity
  - Adaptability
  - Hierarchy

Prospects

Ontology for reference data

- Context
- Goals
- Ontology
  - Approach
  - Principles
  - Cataloguing
  - Modeling
  - Implementation
- Conclusions and Prospects

- To go deeper into an ontology aspect concerning relations and spatial attributes of reference data to assure their adaptation to various applications
- To illustrate the reference notion through the extension of the reference model (ontology of reference / domain)

Prospects

Reference model exploitation

- Context
- Goals
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  - Approach
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  - Cataloguing
  - Modeling
  - Implementation
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- To implement developed models
- To illustrate various detail levels to concretize possibilities of multiple inheritance of some feature classes illustrating transition mechanisms
  - Feature classes
  - Spatial modeling