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IMOLA II

A comparative view from an EU perspective

A comparative view from an EU perspective

- I. Introduction
- II. Brief comparative overview
- III. EU perspective
- IV. Unintended impact?
- V. Concluding remarks

A comparative view from an EU perspective

- II. Brief comparative overview (1)
  - A. Several distinctions possible
  - B. Substantive land law and land registration law
    - EU law follows its own path (cf. the Kubicka case, interpreting the Succession Regulation)

A comparative view from an EU perspective

- II. Brief comparative overview (2)
  - C. Positive v. Negative systems
  - D. Title v. Deeds
  - E. Role of the registrar
  - F. Who has access (privacy, role of GDPR)
  - G. Evidence

A comparative view from an EU perspective

- III. EU perspective (1)
  - Land registration data may come within the ambit of the EU's new 5th freedom: free flow of data
    - See the draft *Regulation on a framework of non-personal data in the European Union*

A comparative view from an EU perspective

- III. EU perspective (2)

"The world is witnessing a dramatic increase in the amount and variety of data being produced. Alongside the data created by billions of people using digital devices and services for personal and professional reasons, and the data generated by the increasing number of connected objects, there is data from research, from digitised literature & archives and from public services such as hospitals and land registries. This "Big Data" phenomenon creates new possibilities to share knowledge, to carry out research and to develop and implement public policies.

Communication on a European Cloud Initiative, p. 2

A comparative view from an EU perspective

- III. EU perspective (3)
  - Technology is bypassing both positive and negative EU integration
  - Although land registries provide information on (rights in) immovables, the digital format of that information ("data") makes that information a movable and thus of a potentially cross-border nature

A comparative view from an EU perspective

- III. EU perspective (4)
  - This was, in fact, the background of the CROBECO project
    - However, CROBECO came too early (and did not fit very well within the practice regarding art. 345 TFEU: no integration without reciprocity), but did raise awareness

A comparative view from an EU perspective

- III. EU perspective (5)
  - CROBECO was based on three pillars:
    - Technological developments (interoperability)
    - National acceptance, flowing from private international law
    - No change of substantive law was envisaged

A comparative view from an EU perspective

- III. EU perspective (6)

  - The aim of IMOLA is to create a European Land Register Document +

    "*Implement a publication engine that takes a request and formats the results in a standard predefined form*".

A comparative view from an EU perspective

- III. EU perspective (7)
  - IMOLA does not link land registries, but provides a uniform extract
  - However, any uniform extract in digital format demands interoperability
  - The form will have to be accepted by each national legal system
  - No substantive law changes are envisaged

A comparative view from an EU perspective

- IV. Unintended impact? (1)
  - Could IMOLA result in crypto-harmonisation?
    - Digitalisation cannot take place without standardisation: IMOLA will create a standard e-document
    - Once a document has been standardised, non-lawyers might not perceive the different legal background and different degrees of evidence

A comparative view from an EU perspective

- IV. Unintended impact? (2)
  - Could IMOLA result in crypto-harmonisation?
    - The extensive comparative legal research underlying the form as such is unknown to its users
    - Users my invoke the standardised (for them: "EU") nature of the document as an argument that the information is meant to circulate ("data") and can be relied upon

A comparative view from an EU perspective

- IV. Concluding remarks
  - Comparative overview
  - EU perspective
  - Crypto-harmonisation?

A comparative view from an EU perspective

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the REUSE company

Ontologies and Semantic Web

uc3m | Universidad Carlos III de Madrid

Thursday, February 22, 2018

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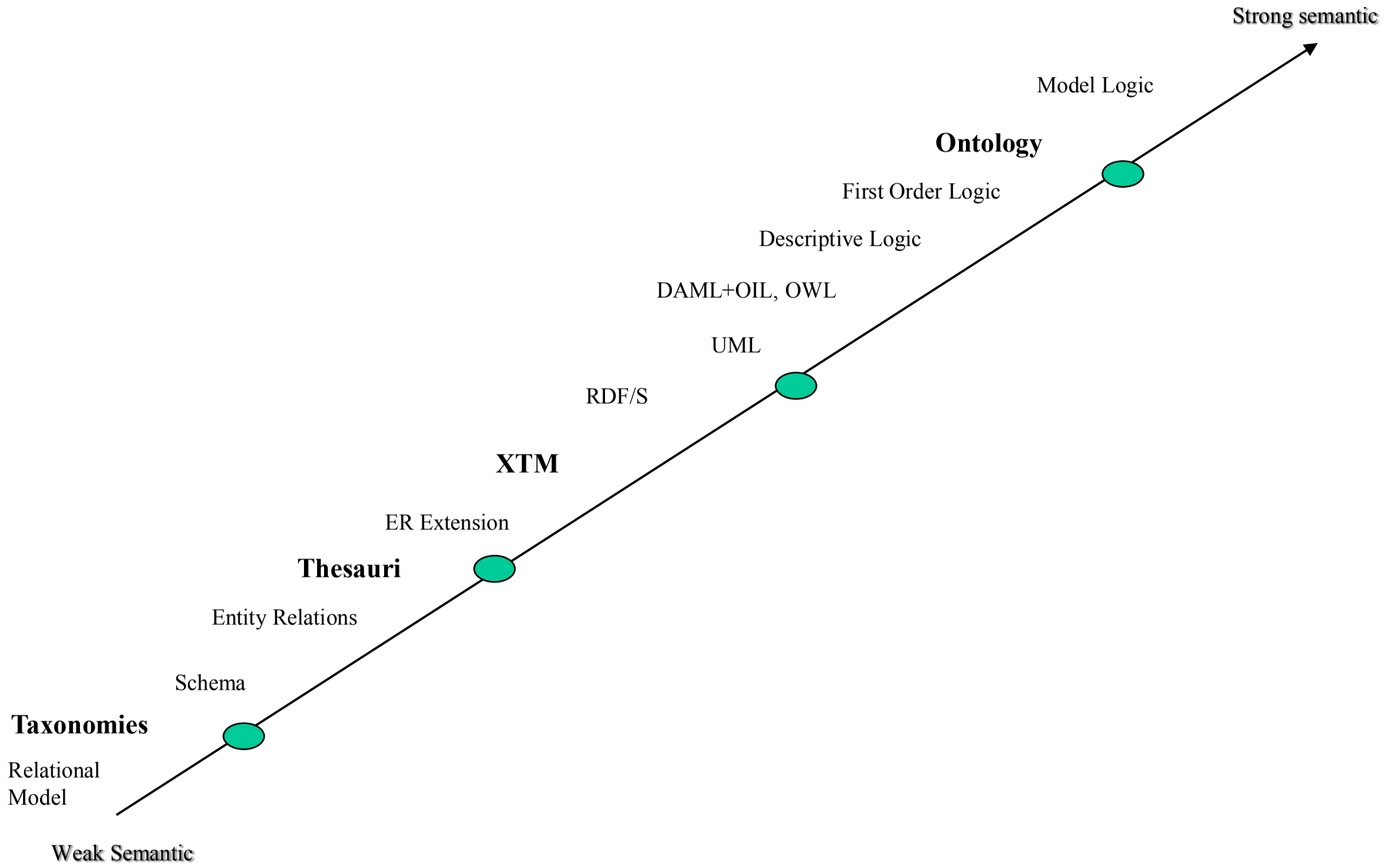
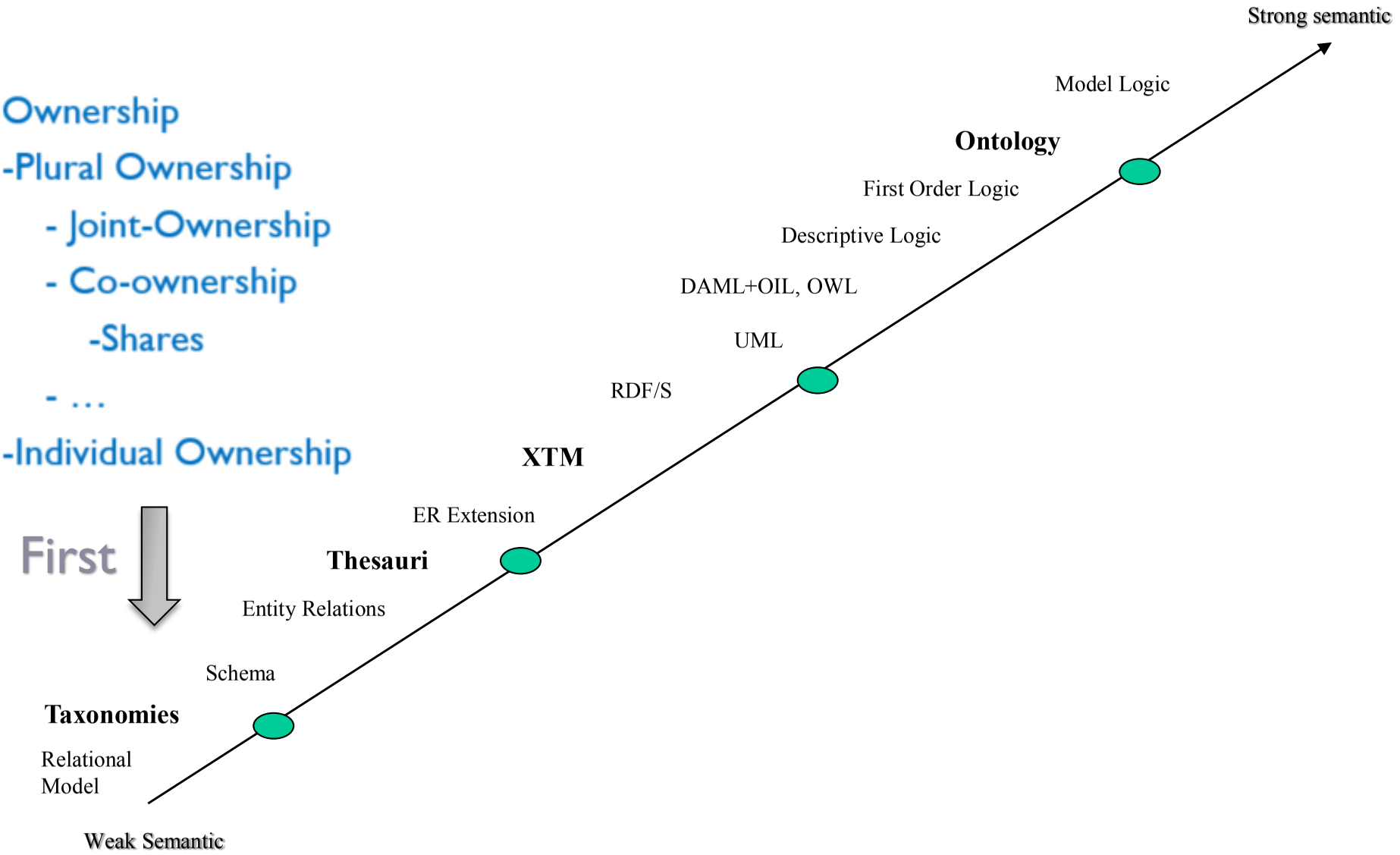
Spectrum of Knowledge



Spectrum of Knowledge

Ownership
-Plural Ownership
- Joint-Ownership
- Co-ownership
-Shares
- …
-Individual Ownership

First



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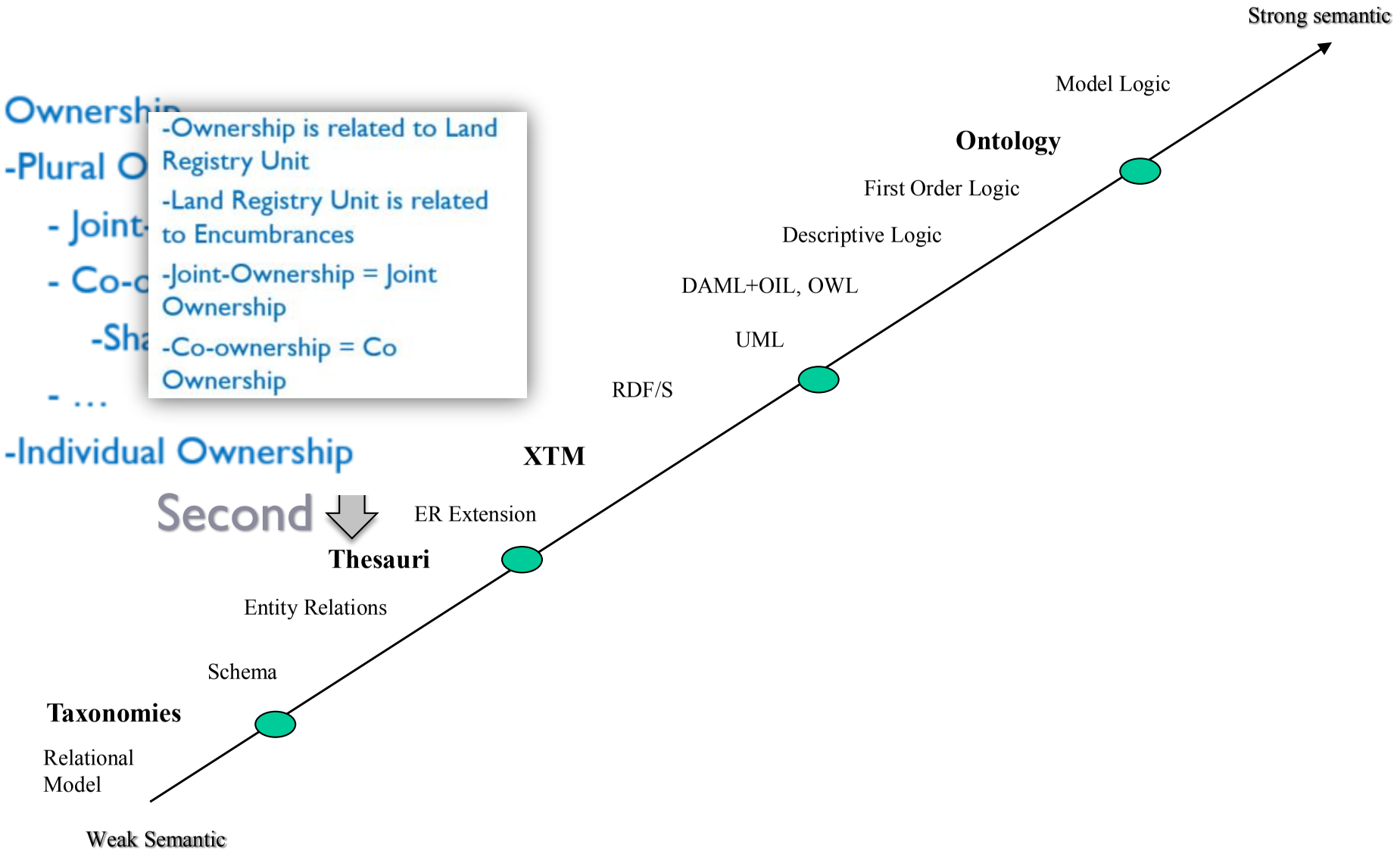
Spectrum of Knowledge



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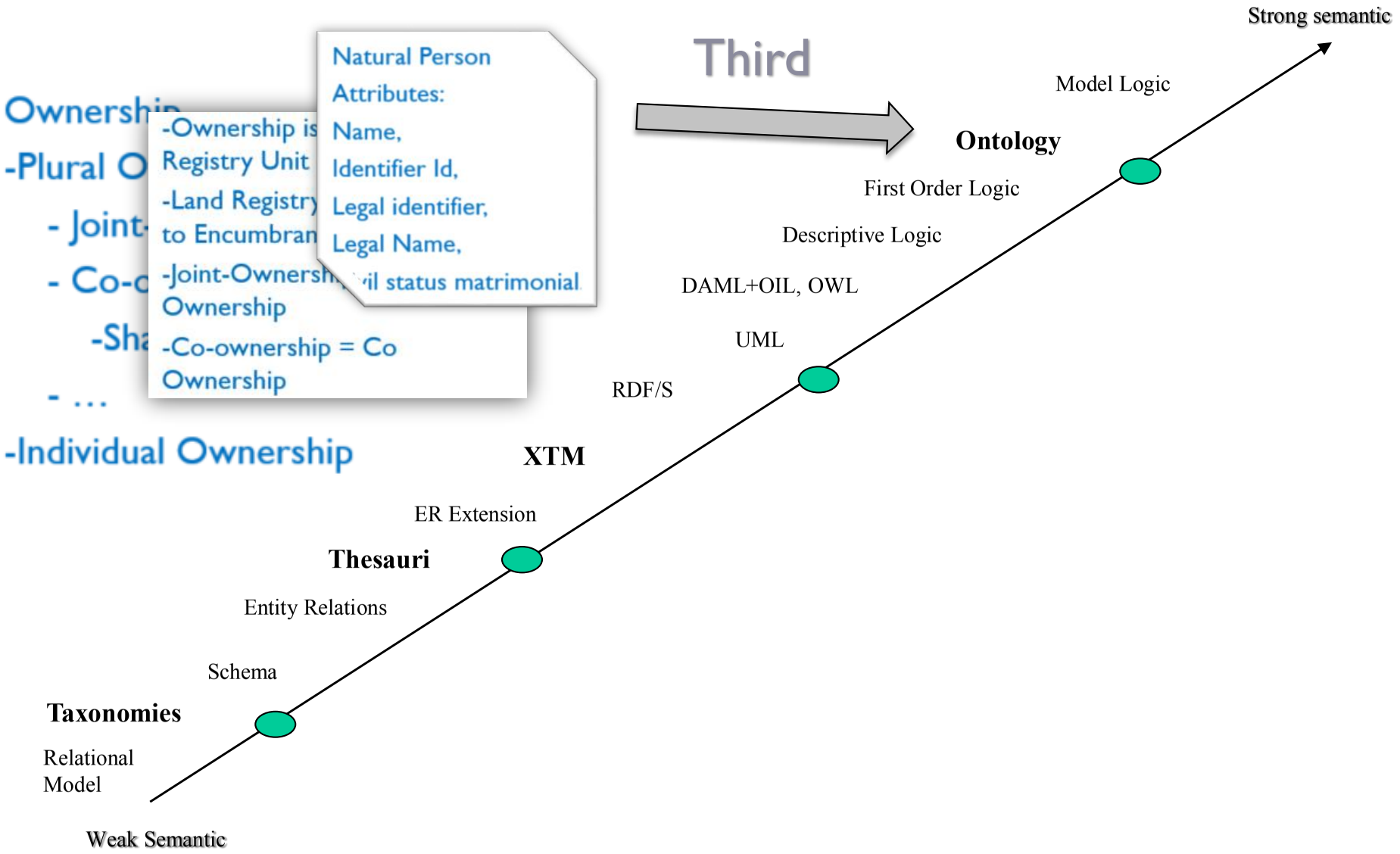

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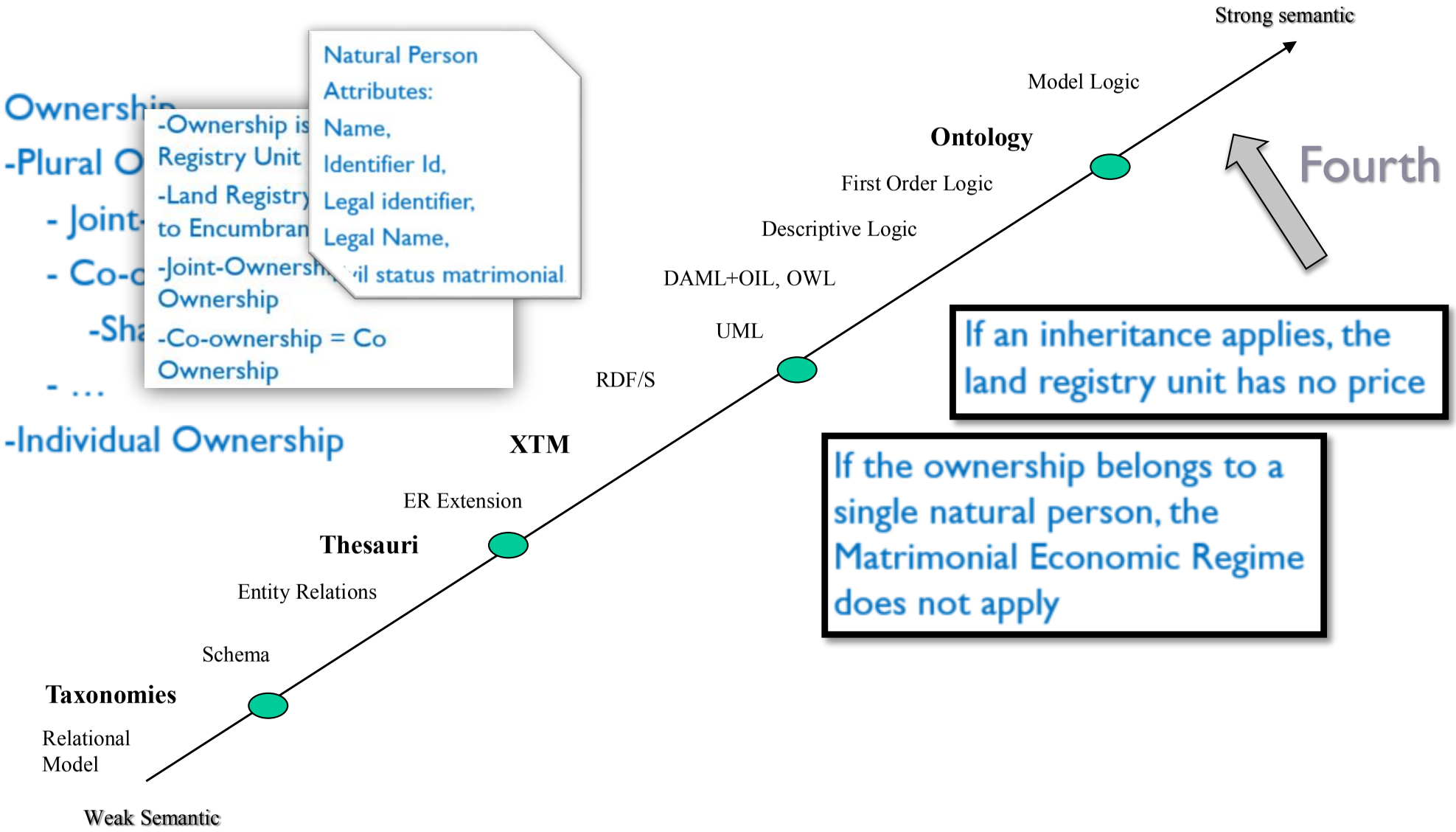
Spectrum of Knowledge



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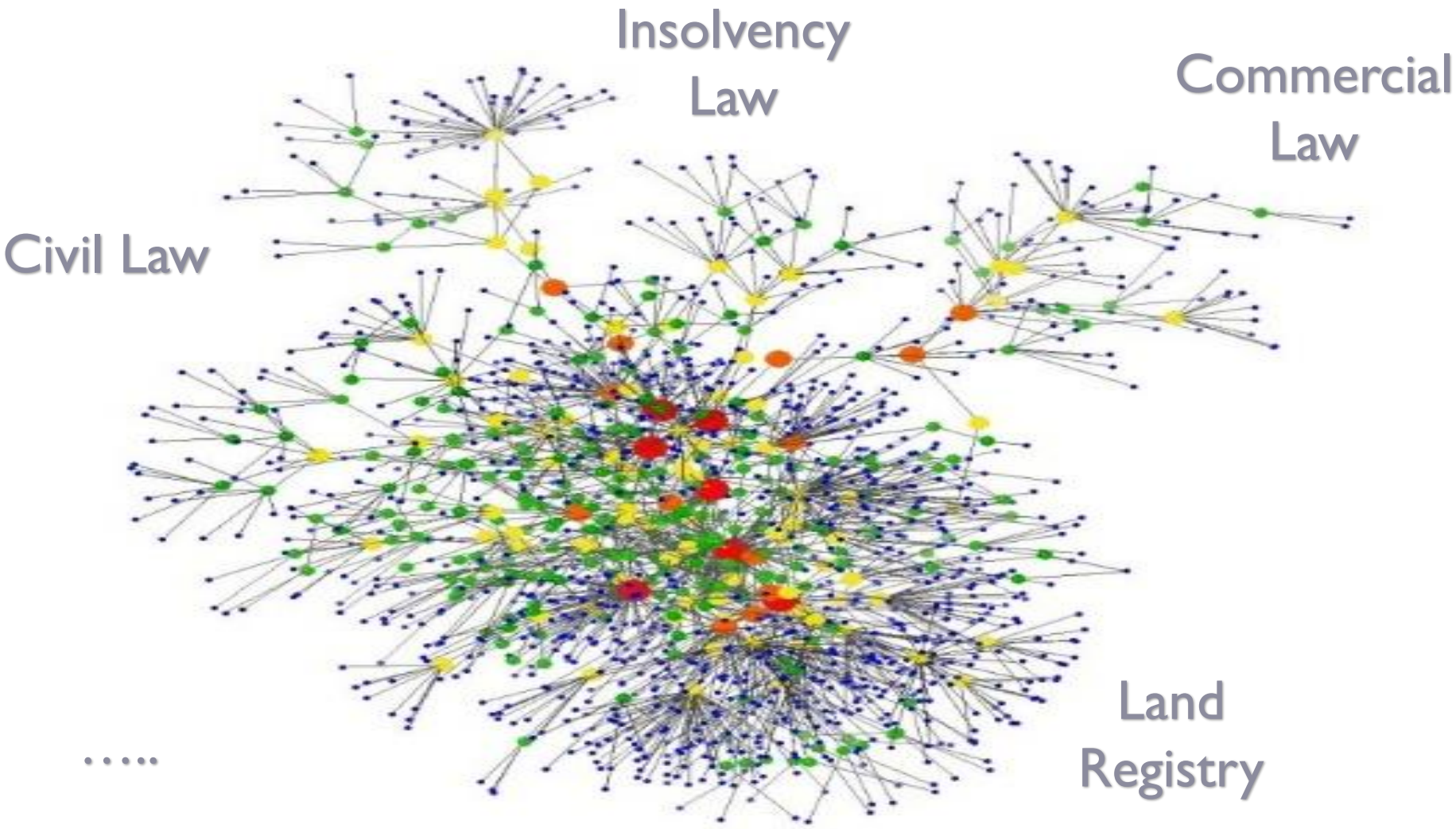
Spectrum of Knowledge



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A bit of History (1/4)

- The term "Ontology" originates from ancient philosophy.
- Philosophy of existence: essence vs. existence.
- Ancient Greece: They wanted to find the essence of things, even through changes:
  - What happens with a seed that germinates and grows to be a tree? When does it stop being a seed?
  - Parmenides: There are no changes; something that exist, never stops existing (the seed does not transform, its our senses that perceive them in a different form).
  - Aristotle: The seed is a non completed tree. The tree simply has changed its mode of existence (never stopped being a tree).

A bit of History (2/4)

- Middle Ages : focuses on the "universals", in contrast to "individuals".
  - In the modeling of knowledge:
    - Universals: Man, Book, Computer. (a type, a property, or a relation)
    - Individuals: Anabel, this book, my computer. (refers to a person or to any specific object in a collection)
  - William of Ockam (English Franciscan friar and scholastic philosopher) : Only individuals exist, rather than supra-individual universals. These are the products of abstraction from individuals by the human mind.
- Modern Age: The essence comes from the perception.
  - José Ortega y Gasset: The world depends from the person that perceive it.
  - Information Systems: Every system can represent the world in different forms, depending on its purpose.

A bit of History (3/4)

- Contemporary Age (XX-XXI): The focus of attention is on the Information Sciences.
  - Theoretical bases appear with Formal Ontology: Axiomatic, formal and systematic development of the logic in all the forms and modes of existence (formal properties, entities classification, categories for modeling the world, etc.).
- Ontological Engineering: Activities that concern the process of ontology development, methodologies, techniques, languages etc.

A bit of History(4/4)

- At the beginning of the 90s: Efforts have started on the construction of ontologies from scratch, on reusing other pre-existing ontologies, and for semi-automatizing methods for reducing the knowledge acquisition phase.
- Every group used its own principles.
- The absence of some common guides impeded its development.
- In 1996: The 1st Congress on Ontological Engineering.
- In 1997: The 2nd Congress: Use of methodologies for the design and evaluation of ontologies.

Systems of Knowledge: advantages & disadvantages

Ontologies advantages for Applications

- Improve reusability and interoperability
- Improvement on Searches
- Improvement of navigation
- They can permit inferences
- Contribute coherence and consistency rules

Ontologies disadvantages for Applications

- More useful when more complex, but:
  - Increases the creation difficulty
  - Visualization problems
  - It is difficult to find ready-made ontologies to match user's need.
  - The size of the resource (ontology) is inversely proportional to its specificity.
- All methodologies have 2 great problems:
  - Bottleneck on the knowledge acquisition
  - Difficulties on validation by domain engineers.

Definition and components (1/2)

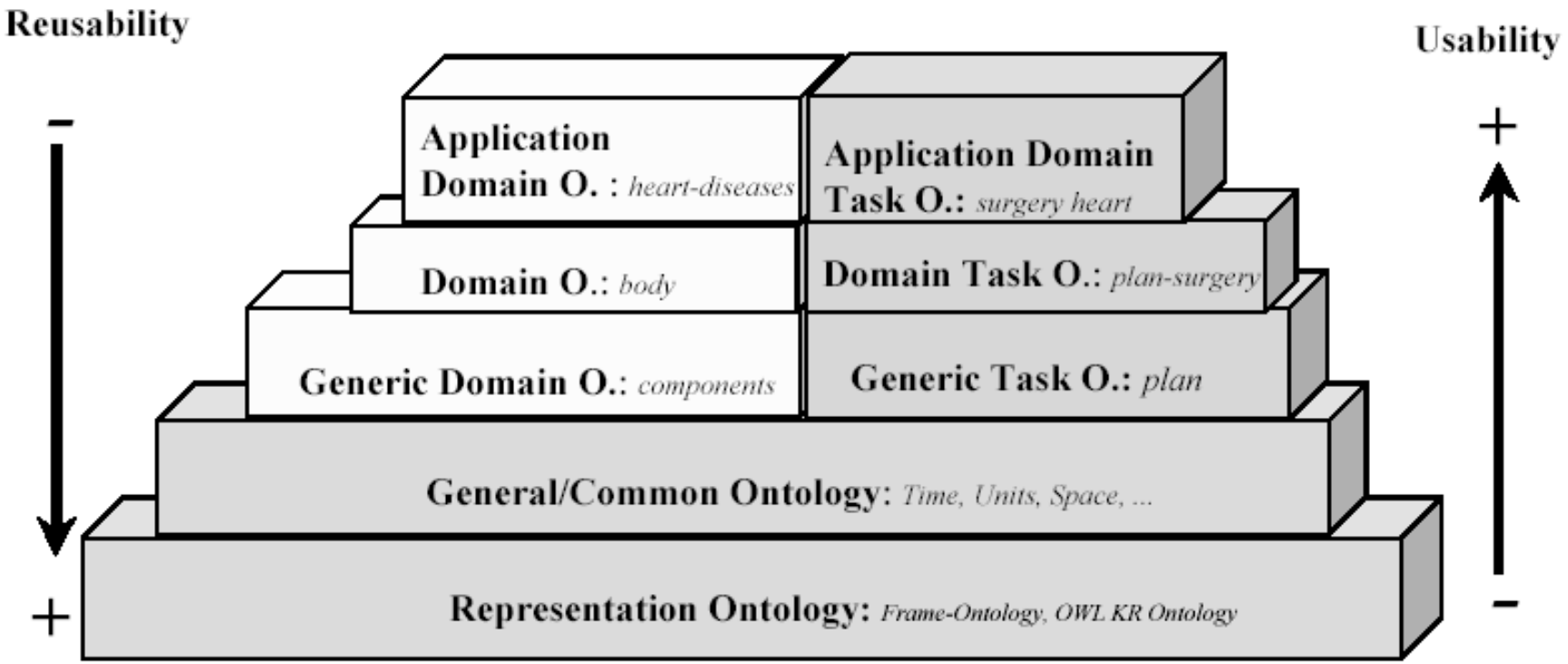
- Distinct definitions of "ontology":
  - Defines the terms and concerning relationships on a vocabulary of a determined area, and the rules for combining terms and relationships for extending the vocabulary. (Neches et al., 1991).
  - Is an explicit specification of a conceptualization (Gruber, 1993).
  - Is a formal specification of a shared conceptualization (Borst, 1998).
  - Is a formal and explicit specification of a shared conceptualization (Studer et al., 1998):
    - Conceptualization : Abstract model of a phenomenon of reality with its relative concepts.
    - Explicit: the concepts, their types and restrictions are explicitly defined.
    - Formal: Readable by a machine.
    - Shared: with consensual knowledge (accepted by a community).
  - Is a set of logical axioms designed for understanding the required significance of a vocabulary (Guarino, 1998).
- Heavy ontologies vs. Light Ontologies (only indicate subsumption relations between concepts).

Definition and components (2/2)

- Ontology Components:
  - Classes: Concepts, abstract or specific. Classes in an ontology should be organized in taxonomies.
  - Relationships: Association between domain concepts. Protegé supports only binary relationships: `rel(domain, range)`, which are represented by "object properties" (*slots*).
  - Functions: Is a special type of relationship in which one of the relationship's elements is the result of a formula
  - Axioms (restrictions) / Rules: Used for modeling sentences that are true. They represent knowledge that can not be formally defined with the rest of the terms. Should be used to preserve consistency.
  - Instances: Used for representing elements or individuals of an ontology.
  - Properties (and their values) of the above components

Ontology Types

- Equilibrium amongst reusability & usability:



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Design Principles

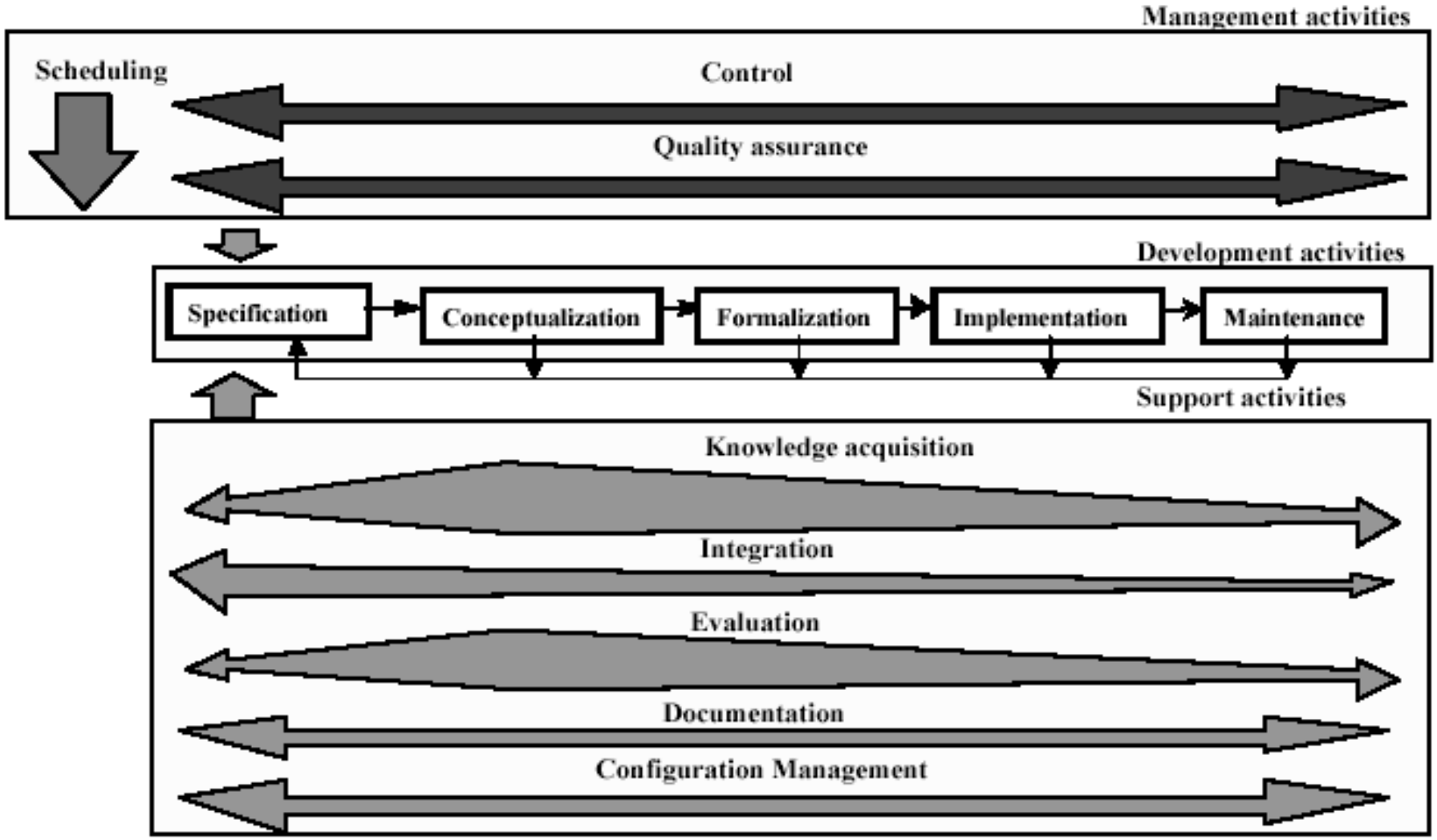
- Clarity: Communicate the significance of terms.
- Be language independent.
- Extensibility: Anticipate the shared use of the vocabulary.
- Coherence: The inferences that are realized should be consistent with the definitions of the ontology.
- Minimal ontological compromise: Compromises should be kept to a minimum, but guaranteeing the essentials. (Dates in American or English format)
- Other principles:
  - Classes and their subclasses should be well defined with disjunctive and exhaustive knowledge.
  - Name standardization

Methodologies

- Methontology: is a series of activities for realizing a methodology. Complicated but very near to the world of Software Engineering. Useful in dynamic and complex domains
- Uschold's methodology
- OTK Methodology
- Toronto Virtual Enterprise (TOVE): It has management properties and is used when the purpose is clear.
- Descriptive Ontology for Linguistic and Cognitive Engineering (DOLCE)

Methodology METHONTOLOGY (1/6)

- Gómez-Pérez et al.



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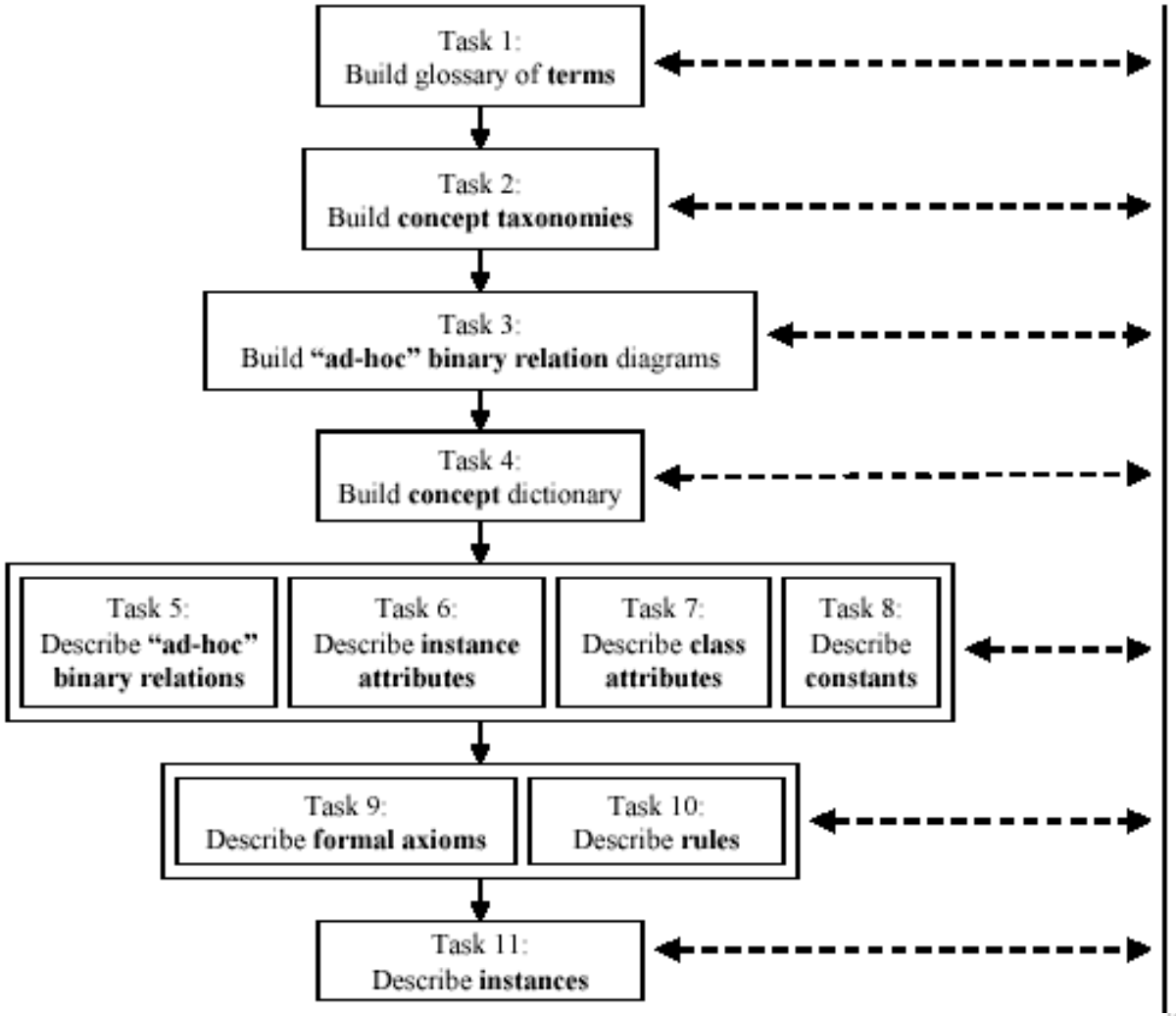
Methodology METHONTOLOGY (2/6)

- Conceptualization Tasks:



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Methodology METHONTOLOGY (3/6)

- TASK 1: Construct a glossary of terms. Every term that will be part of the ontology should include a brief definition such as synonyms and acronyms, their type etc.

- TASK 2: Construct taxonomies in order to classify concepts.
- Result: One or more taxonomies where the concepts are classified .
- The taxonomy should be created according to the relationships:
  - Subclass-of.
  - Disjunctive decomposition.
  - Exhaustive decomposition.
  - Partition.

Methodology METHONTOLOGY (4/6)

- TASK 3: Describe the existing relationships amongst concepts of the ontology, or amongst other existing ontologies. This will give rise to the **relations diagram**.
- TASK 4: Construct the **concepts dictionary**, in which the principle instances of concepts are included, the class and instance attributes, and their relationships with other concepts.

Methodology METHONTOLOGY (5/6)

- TASK 5: describe in detail every relation that appears in the relations diagram (Task 3). This will give place to the **relations table**.
- TASK 6: Describe in the table of instance attributes each instance attribute that appears in the concepts dictionary (Task 4).
- TASK 7: Describe in the table of class attributes each class attribute that appears in the concepts dictionary (Task 4).
- TASK 8: Describe in detail each constant in the table of constants. These constants are information relative to the stable domain, similarly to mathematical constants.

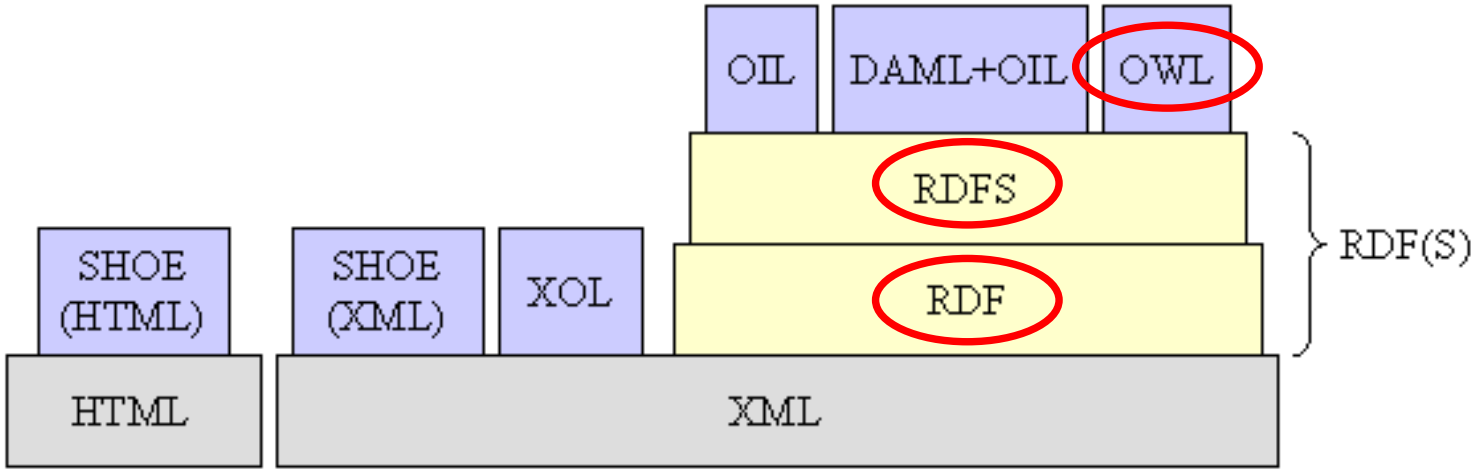
Methodology METHONTOLOGY (6/6)

- TASK 9: Definition of formal **axioms** for specifying **restrictions**.
- TASK 10: Definition of **rules**, for **inferring knowledge**, such as inferring values in the attributes, instances of relationships, etc.

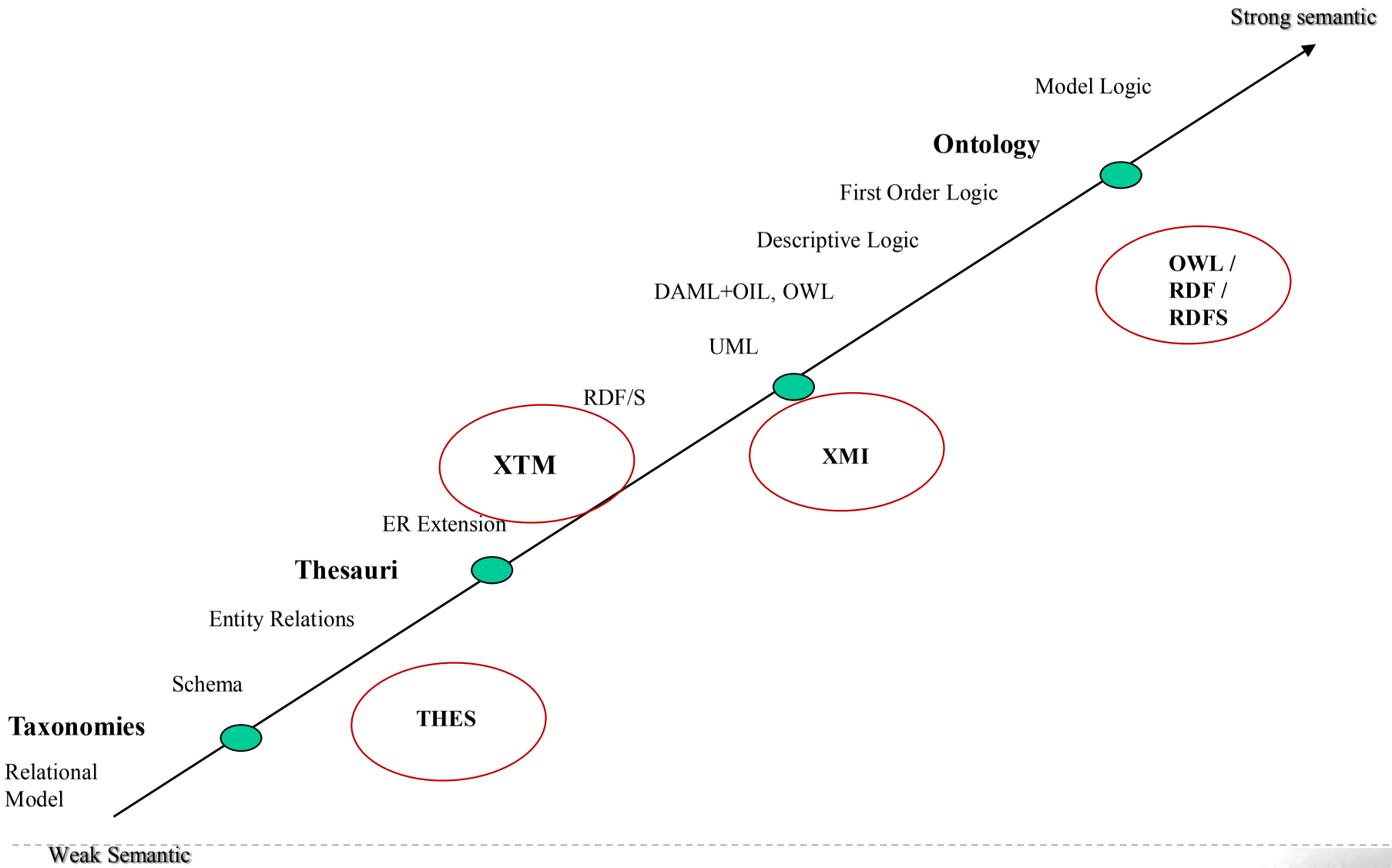
TASK 11: Describe some instances of the ontology. (optional)

Languages Evolution (1/2)

- Ontologies markup languages:



Spectrum of Knowledge



Languages Evolution (2/2)

- Remember:
  - Ontologies' languages should permit the writing of explicit and formal conceptualizations.
  - The main requisites are :
    - A well defined syntax.
    - Possibility of efficient reasoning.
    - Sufficient semantic wealth.
  - The richer the language, the more inefficient is its reasoning, up to the point of being "incomputable".
    - We need to compromise amongst those two things.

OWL

- Web Ontology Language (OWL) (2004): is based on RDF(S).
- Has 3 layers:
  - OWL Lite: Small subset based on frames, but with some reasoning.
  - OWL DL: Subset of First Order Logic (FOL) named *Description Logics*. Its inference capacity is now potent and decision based.
  - OWL Full: RDF Extension, permitting metaclasses.
- Various Syntaxes:
  - Abstract syntax (conceptualization): Corresponds to the common Description Logic (DL), easy to read and write
  - RDF/XML (implementation): Can be written as an RDF document.

SKOS

- SKOS (Simple Knowledge Organization System) is an OWL ontology to **represent knowledge organizations systems (KOS)** such as thesauri, classifications, subject headings, taxonomies, etc.
- SKOS consider those systems as **sets of concepts identified** with URIs and grouped into a concept scheme.
- SKOS concepts can be **linked** to each other using hierarchical and associative semantic relations.
- SKOS concepts can be **documented** with notes of various types: scope notes, definitions, editorial notes, etc.
- SKOS concepts can be **grouped** into collections, which can be labeled and/or ordered.
- SKOS concepts of different concept schemes can be **mapped**. SKOS provides four basic types of mapping link: hierarchical, associative, close equivalent and exact equivalent.

Core Vocabulary: Dublin Core

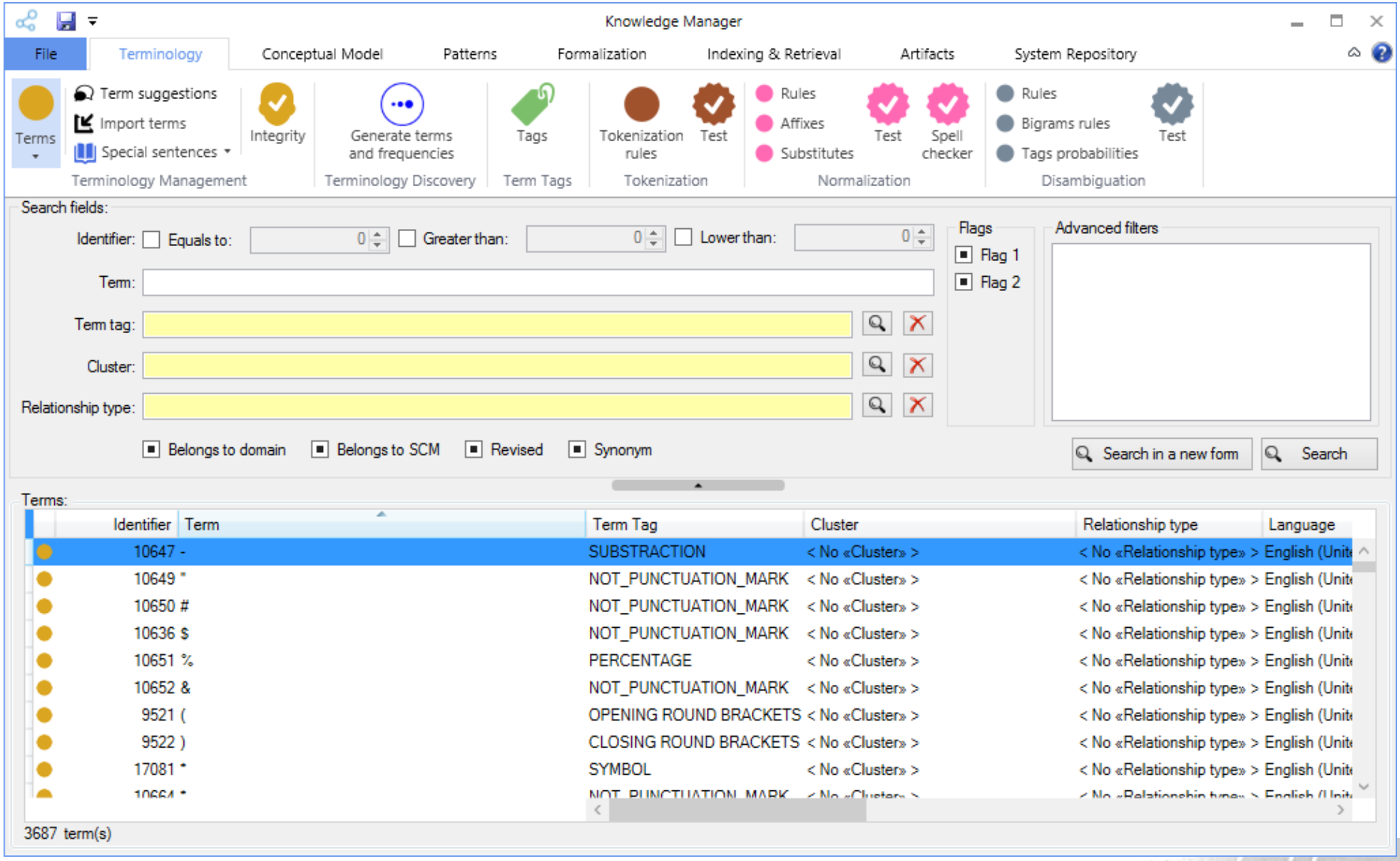
- Metadata for discovering resources: administrative, descriptive, use, preservation, structural or technical detail information.
- Open standard
- Fifteen core elements:

Creator	Title	Subject
Contributor	Date	Description
Publisher	Type	Format
Coverage	Rights	Relation
Source	Language	Identifier

Reasoning and Inferences – Its importance

- Why is reasoning important?
  - Tests the consistency of the ontology and its knowledge.
  - Test the consistency of the relationships
  - Classifies automatically instances in classes.
- When is it important?
  - When we design big ontologies, and we are many.
  - When we integrate and/or share ontologies from various sources.
  - When we edit/change the ontology
- So we need:
  - Semantic is a prerequisite in order to support inference.
  - Use automatic reasoners that already exist for those formalisms.

Development Tools



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Legal terminology and comparative law: the role of the operational rules

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Comparative Law

Comparative law as a science (20° century)

- «Society of comparative law» (London) and «Société de Legislation Comparée» (Paris)

- Comparative law was introduced in Italy in the 20° Century by prof. Rodolfo Sacco (University of Turin, Accademia Nazionale dei Lincei)
- Academic chairs in comparative law

Comparative Law

- Science
- Knowledge
- Methodology

Knowledge

Data = legal rules (norms)

The operational rules

Show as the system really works……

…beyond definitions and the legal language

-

A) Methodology: the Theory of the Formants

Legislation, constitutions, decrees (legislative formant)

Case law (case law formant)

Scholarly writtings (doctrinal formant)

R. SACCO, *Legal Formants: A Dynamic Approach To Comparative Law*, in *The American Journal of Comparative Law*, Volume 39, Issue 1, 1 January 1991, p. 1 ff.

The formants

Legal rules can be found in the different formants of the various countries (legal systems)

Example 1: l'erede apparente

A person who believes himself to be heir disposes of property (he has inherited) to a third person, who is in good faith.

The transfer is valid in Italy, under the definition «trasferimento dell'erede apparente al terzo»)

R. SACCO, *Legal Formants: A Dynamic Approach To Comparative Law*, in *The American Journal of Comparative Law*, Volume 39, January 1991.

The formants

Italy

Code art. 534: yes | Case law: yes | Doctrine: yes

France

Code: X* | Case law: yes | Doctrine: no

Belgium

Code: X | Case law: no | Doctrine: no

*This is a theoretical case. Note that the legislative formant might have changed after the French reform of the law of contract of 2016.

The operational rules

The definition «trasferimento dell'erede apparente al terzo» is present only in the Italian legal language, but the same operational rule exists in France too (case law formant).

The operational rules

The theory of the formants draws a distinction between the operational (working rules), the real practices of a legal system…

……and the definitions (legal language), the symbolic, linguistic set utilized by the jurists to decribe the legal rules.

Example 2: medical malpractice

In American law medical malpractice is classified as a Tort, whereas in France it is considered a Breach of Contrac.

French law on contractual liability is strict, so that the victim does not need to prove that the doctor was in fault.

In Usa tortious law medical malpractice is based on negligence and so the victim has to prove the doctor's fault.

The two systems are apparently at opposite

P.G. Monateri, *The ABC of comparative law: legal formants and comparison*, at https://www.researchgate.net/publication/290574779_ABC_of_Comparative_Law_Legal_Formants_and_Comparison

Medical malpractice

French case law has introduced a distinction between two different kind of contractual obligations : *obligations de moyen* and *obligations de resultat:*

- in routine medical operations a doctor is under a duty *de resultat* and so the victim of a damage has not to prove the fault of the doctor;
- in non routine operations the doctor is under a duty *de moyen*, which means that he just promised to use his professional skill, and so the victim of a damange must prove a doctor's fault, to be compensated.

P.G. Monateri, *The ABC of comparative law: legal formants and comparison*, at https://www.researchgate.net/publication/290574779_ABC_of_Comparative_Law_Legal_Formants_and_Comparison

Medical malpractice

American courts (case law):

in routine medical operations the courts apply the doctrine *res ipsa loquitur*, so the victim's damage is evidence of the doctor's fault and the victim is not required to prove it.

Res ipsa loquitur is not applied in non routine operations, and so the victim must prove that the doctor was in fault.

P.G. Monateri, *The ABC of comparative law: legal formants and comparison*, at https://www.researchgate.net/publication/290574779_ABC_of_Comparative_Law_Legal_Formants_and_Comparison

The operational rules in medical malpractice

The definitions (legal language) are different ……

Usa: tort (tortius iability)
France: contract (contractual liability)

…….and assume different legal rules:
France: victim has not to prove the doctor's fault;
Usa: victim needs to prove the doctor's fault.

The operative, working rules are the same in Usa and France:
In routine cases victims do not need to prove the fault.
In non routine cases victims must prove the doctor's fault.

B) Methodology: the Factual approach

How operational rules are collected

- Questionnaires;
- National answers and reports;
- Final reports.

The Factual approach

- Level 1:

Mr. White believes himself to be heir and disposes of property (he has inherited) to Mr. Blue, who is in good faith.

1: Is this transfer of property valid in your legal system?

2. If yes, where is the rule formulated?

3. If no, can Mr. White recover property? If yes, under which conditions?

Opertive rules of all the countries (legal systems) involved.

C) Methodology: genotypes and fenotypes

The construction of the common system

- Genotype

Elements that are fundamental of a specific category.

- Fenotype

The real characters of the operational rules present in the different legal systems.

When some of those characters coincide with the fondamental elements of the genotype, the operational rule belongs to that specific category.

- R. Sacco, Legal Formants: A Dynamic Approach To Comparative Law, in The American Journal of Comparative Law, Volume 39, January 1991.

Genotypes and fenotypes. Example n. 1

The Construction of the common system

- **GENOTYPE**

- Transfer of property by someone acting as an heir.
- Good faith of the receiving person.

- **FENOTYPE**

All the countries in which these elements are present……..

….regardless other characters, for instance the good/bad faith of the pretended heir and other detalis.

The Factual approach

- Level 2:

In 2017 Mr. Green underwent an appendectomy (routine operation) but contracted an infection during the operation.

1. Can Mr. Green take action for compensation against the doctor?
2. If yes, what is Mr. Green required to prove?
3. Particularly, must Mr. Green prove the doctor's fault?

The Factual approach

- Level 2:

In 2017 Mr. Green underwent an heart transplant (non routine operation) but after the surgery he needed the support of the heart machine anyway.

1. Can Mr. Green take action for compensation against the doctor?
2. If yes, what is Mr. Green required to prove?
3. Particularly, must Mr, Green prove the doctor's fault?

Genotypes and fenotypes. Example n. 2

The constraction of the common system.

- **GENOTYPE**

Routine operations no doctor's fault to be proved

Non routine operations doctor's fault to be proved

- **Fenotype**

All the countries in which these elements are present……..

….regardless the legal classification of the responsability is tort or contract, regardless the kind of action, regardless the prescription….

kadaster

BLOCKCHAIN & REAL ESTATE

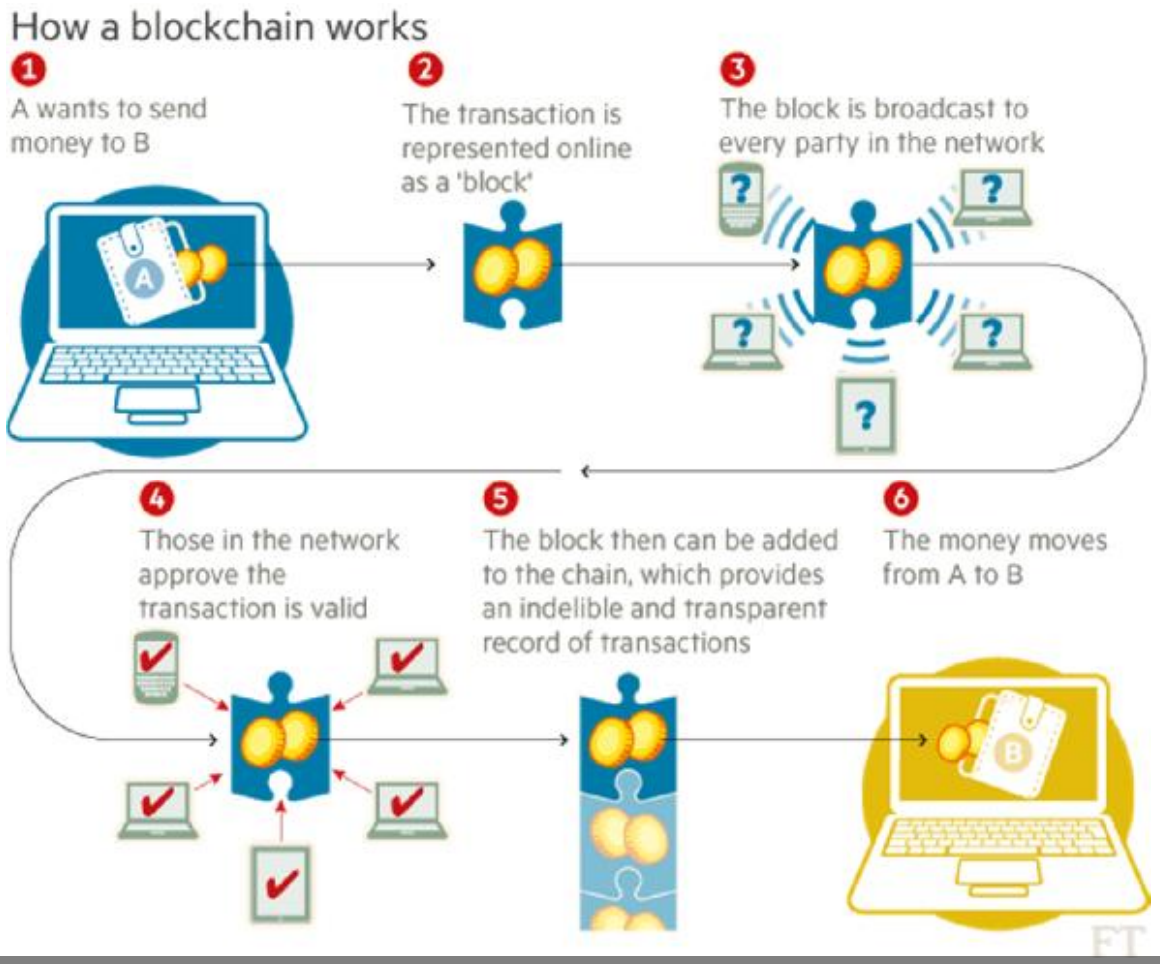
Opportunities, lessons & next steps

ELRN WORKSHOP 01-06-2018, Tallinn
Jacques Vos, Kadaster

kadaster

Last year…

“Land Registry and Commercial Registers – they will become obsolete.” (Emerce)



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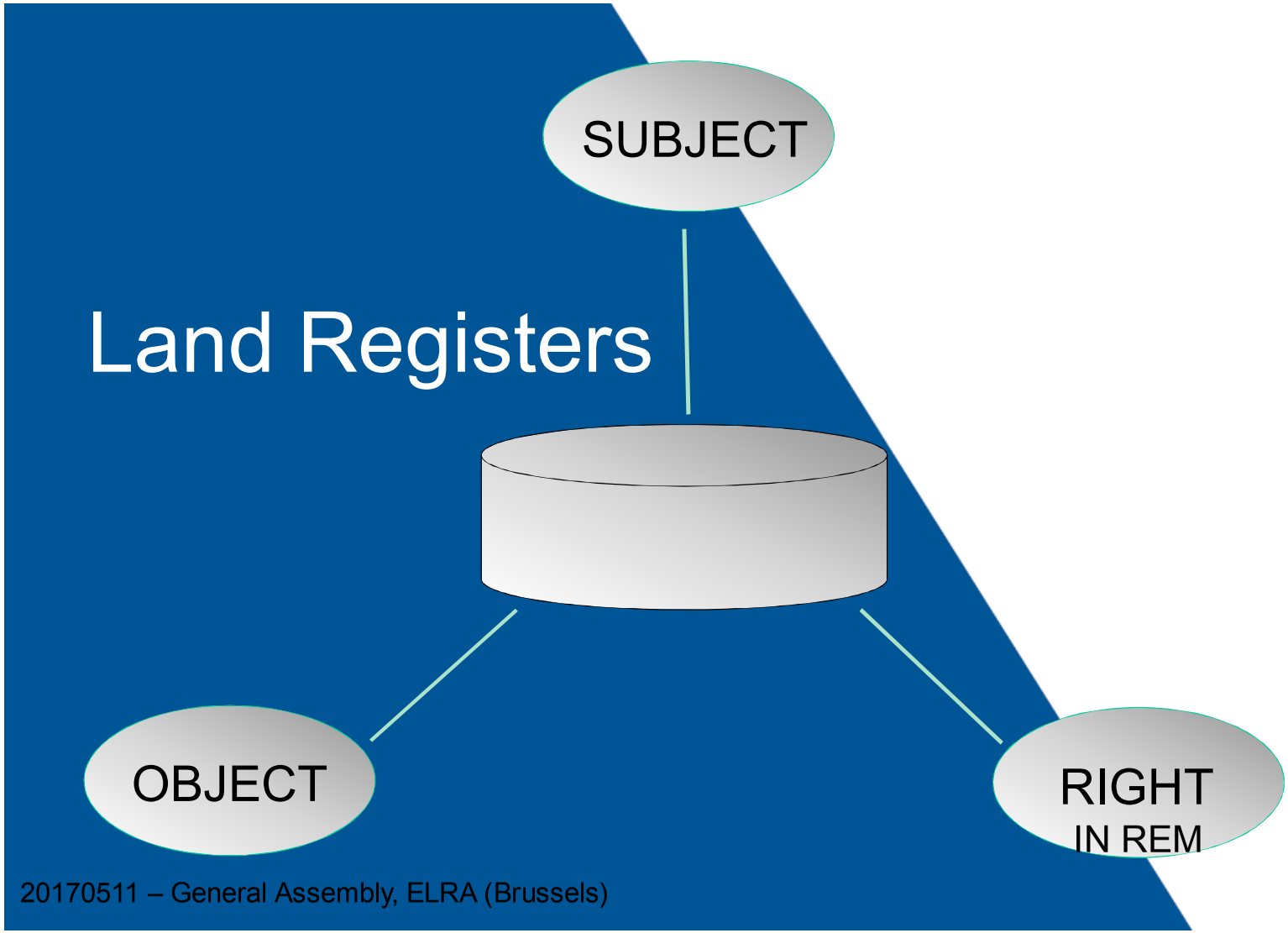
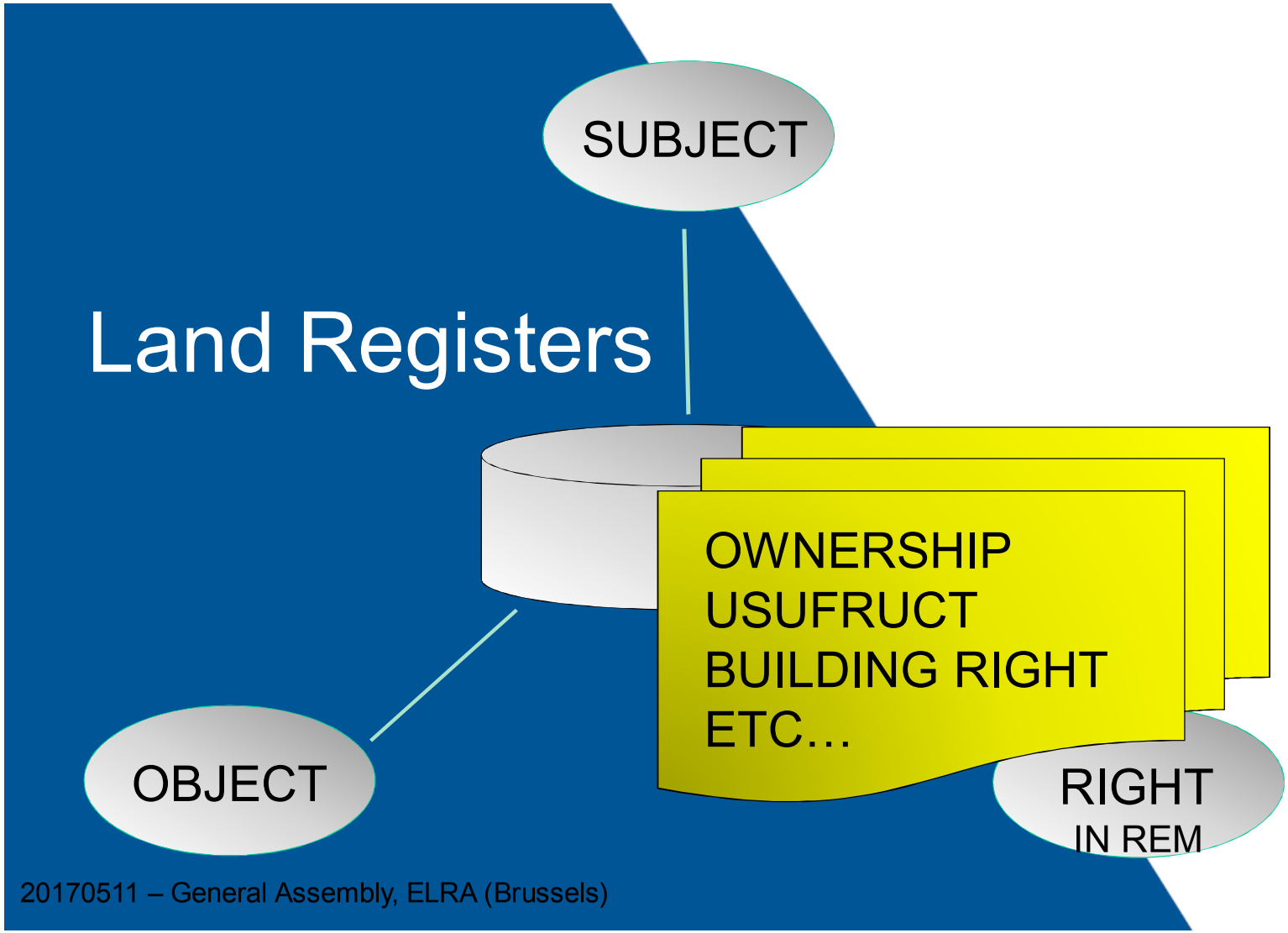
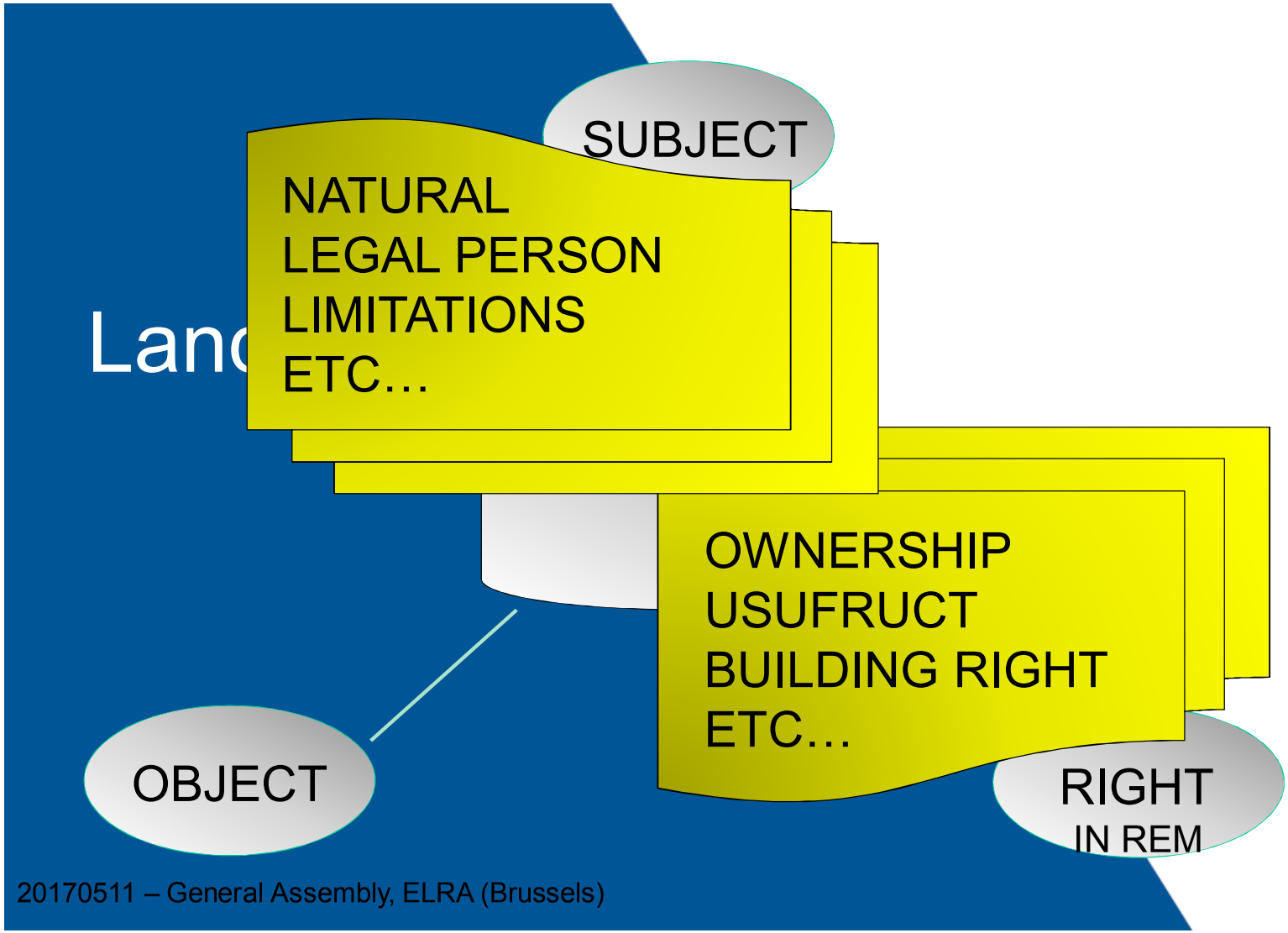
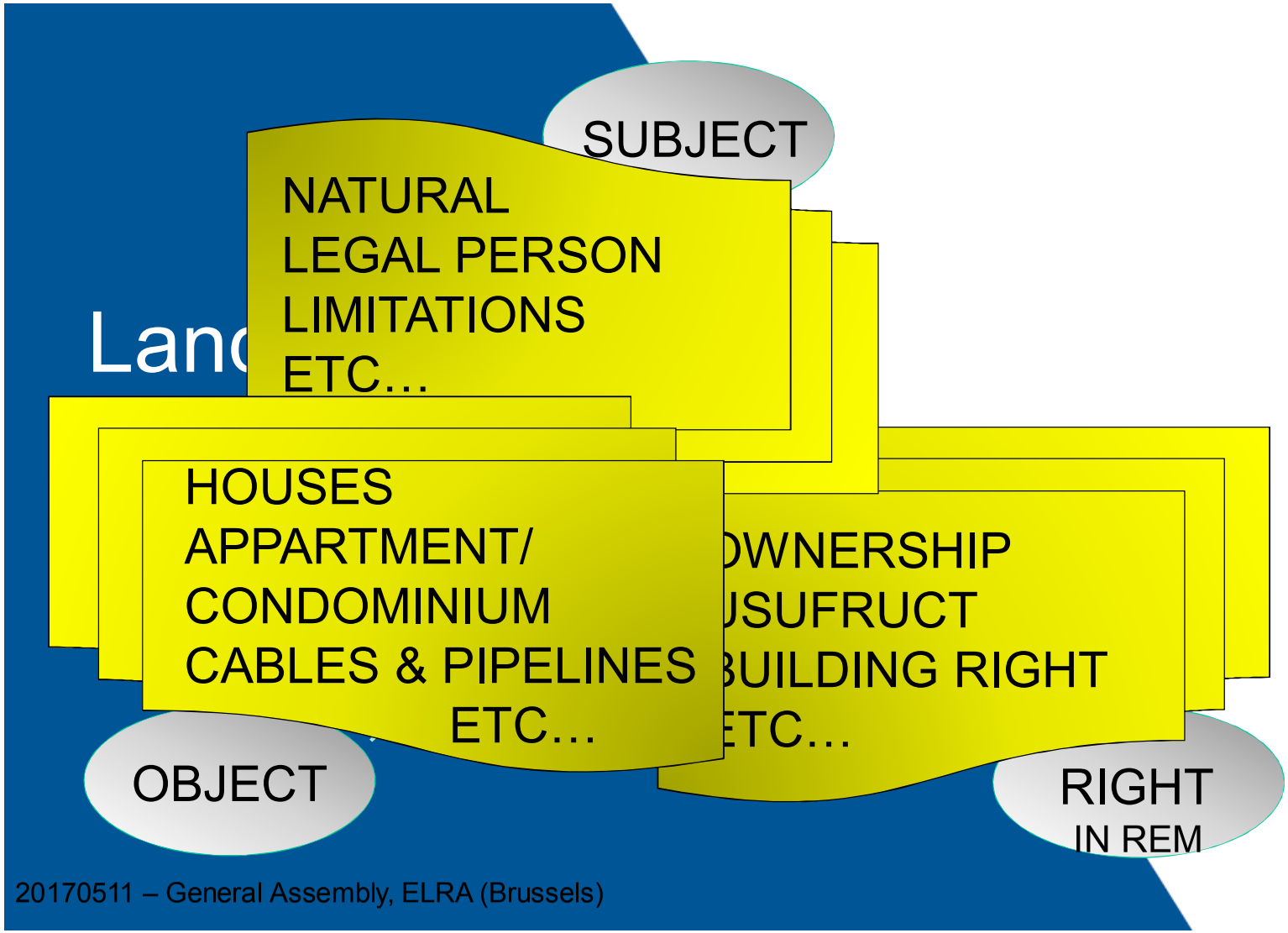
BLOCKCHAIN WILL BRING …

- INFORMATION SYMMETRY
- IMMUTABILITY
- TRANSPARENCY


SUBJECT
Land Registers
OBJECT
RIGHT
IN REM
20170511 – General Assembly, ELRA (Brussels)


SUBJECT
Land Registers
OWNERSHIP
USUFRUCT
BUILDING RIGHT
ETC…
OBJECT
RIGHT
IN REM
20170511 – General Assembly, ELRA (Brussels)


Land
SUBJECT
NATURAL
LEGAL PERSON
LIMITATIONS
ETC…
OWNERSHIP
USUFRUCT
BUILDING RIGHT
ETC…
OBJECT
RIGHT
IN REM
20170511 – General Assembly, ELRA (Brussels)


SUBJECT
NATURAL
LEGAL PERSON
LIMITATIONS
ETC…
Land
HOUSES
APPARTMENT/
CONDOMINIUM
CABLES & PIPELINES
ETC…
OWNERSHIP
USUFRUCT
BUILDING RIGHT
ETC…
OBJECT
RIGHT
IN REM

Blockchain (1)

ARCHIVE	Yes, hash/pointer
REGISTRATION	No, too complex
INFORMATION	No, data retrieval

Blockchain (2)

Genesis-block	Who? Quality- issue
Governance?	DAO, indemnity
Smart contracts	Code = **law = code**

Blockchain (3)

Vendor lock-in?	Who owns data
Bitcoin-based?	PoS & no PoW
Complete?	No, data retrieval

Trust as a fairytale?

SECURE DATA	C.I.A.? D.I.Y.?
IMMATURE	PoW? PoS? DAO?
OPEN & TRANSPARANT	Transparant: yes, open?

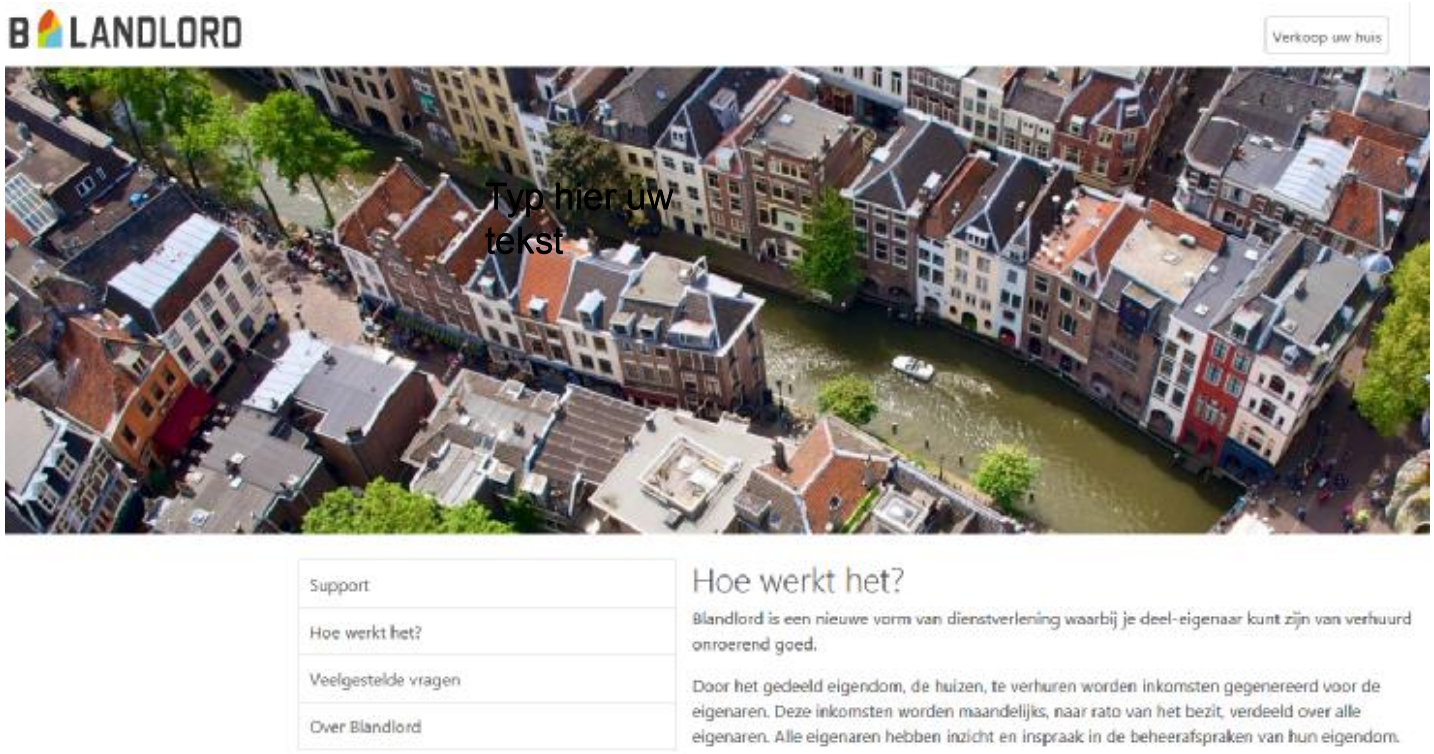
In Future?

VARIOUS INITIATIVES	Redundancy & privatization!
STANDARDIZATION	ISO/TC307, BIM, etc.
SMART CONTRACTS	Not all legal aspects

TRUSTED THIRD PARTIES…

- VALIDATE TRANSACTIONS
- GUIDE A CERTAIN PROCES
- DRAFT CONTRACTS
- IDENTIFY OBJECTS & SUBJECTS
- ARE AN INDEPENDANT WITNESS
- PREVENT FRAUD

FRACTIONAL OWNERSHIP



BRICKLAND
BRICKHOUSE
BLOQHOUSE
ETC.,
ETC

This year…

‘BLOCKCHAIN WILL REPLACE EVERYBODY’

- REMOVE SLACK FROM PROCESSES
- INCREASE TRANSPARENCY
- IMPROVE PRIVACY
- PREVENT FRAUD
- A NEW CHAPTER FOR A DIGITAL INFRA

STREAMLINING PROCESSES

KADASTER-ON-LINE

SELF- SOVEREIGN IDENTITY…?

GARBAGE IN …

POSSIBLE WHAT WAS NOT POSSIBLE, TOO COMPLEX OR TOO EXPENSIVE

‘BLOCKCHAIN WILL PERHAPS REPLACE EVERYBODY’

- SCALING: (INTER)NATIONAL
- STANDARDISATION (SEMANTICS)
- IDENTIFICATION
- ACCESS & CONTROL
- GOVERNANCE: QUALITY, RULE OF LAW, ENFORCEMENT
- TECHNOLOGY/ ARCHITECTURE
- SECURITY

‘BLOCKCHAIN WILL NOT REPLACE EVERYBODY’

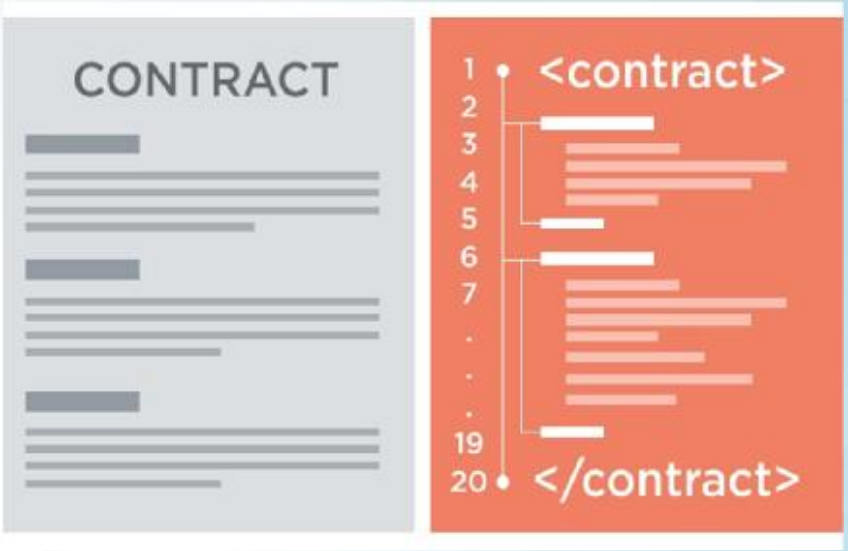
- ONLY PART OF THE SOLUTION:

  A. PROCESS OPTIMALISATION

  B. ORGANISATION FORM

  C. GOVERNANCE

  D. SEMANTICS



‘BLOCKCHAIN WILL REPLACE HARDLY ANYBODY’

- BUT: CRITICAL VIEW ON OWN ORGANISATION & ROLE
- AND: CRITICAL VIEW ON THE WHOLE (REAL ESTATE) CHAIN
- AND: STANDARDISATION IN SCOPE
- DIFFFICULT:
  ‘ISLANDS’ (SECTORAL, NATIONAL & INTERNATIONAL)

WHEN TO START WITH BLOCKCHAIN?

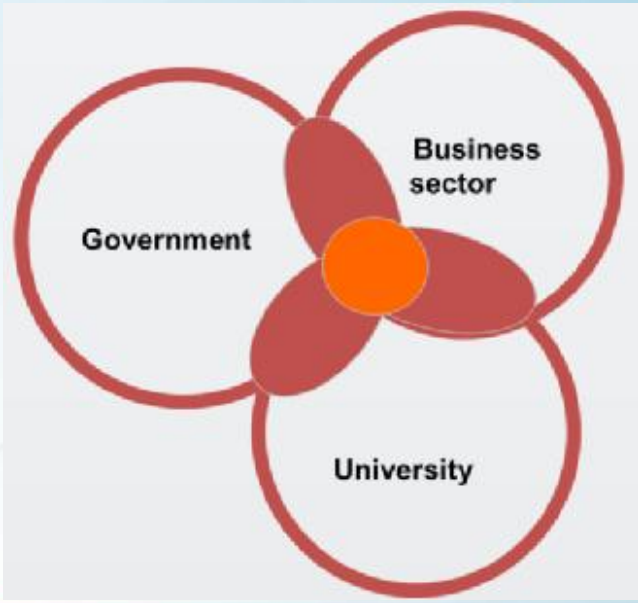
WHY IS BLOCKCHAIN INTERESTING?

- MULTIPLE OWNERSHIP
- NO NATURAL (UNWANTED) CENTRAL AUTHORITY
- RELIABLE EXCHANGE OF INFORMATION
- EASY INTERPRETABLE (EASY TO AUTOMATE) RULES

WHAT ELSE DO YOU NEED?

- OTHER WAYS OF ORGANISINGG & SHARING INFORMATION
- UNIQUE ID FOR OBJECTS & SUBJECTS
- (POSSIBLE) CHANGE OF LEGISLATION & POLICY
- ‘SHARED PRIVATE DATA’ SOLUTION

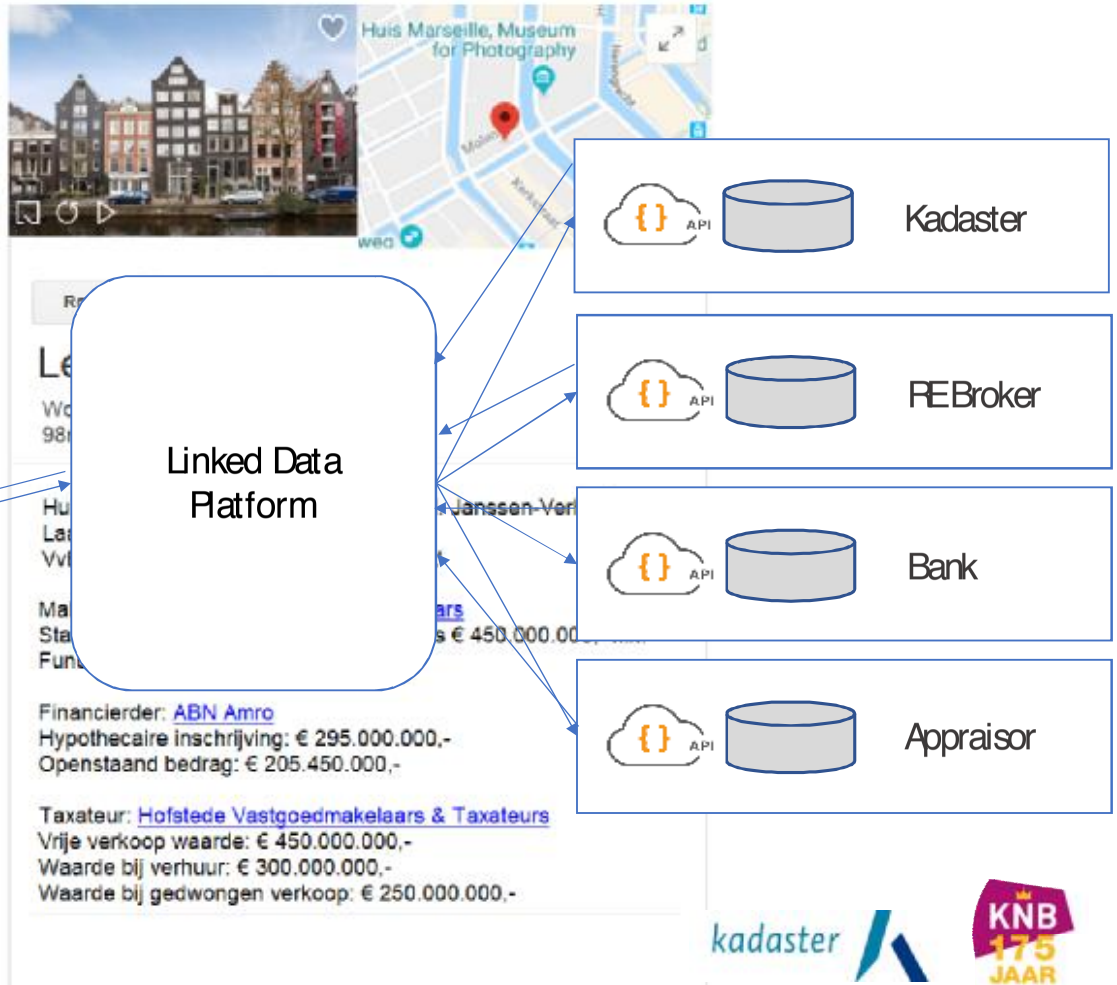
NEW DIGITAL INFRASTRUCTURE



TOWARDS AN INFRASTRUCTURE OF SMART OBJECTS

Vastgoed

Leidsegracht 82n, Amsterdam



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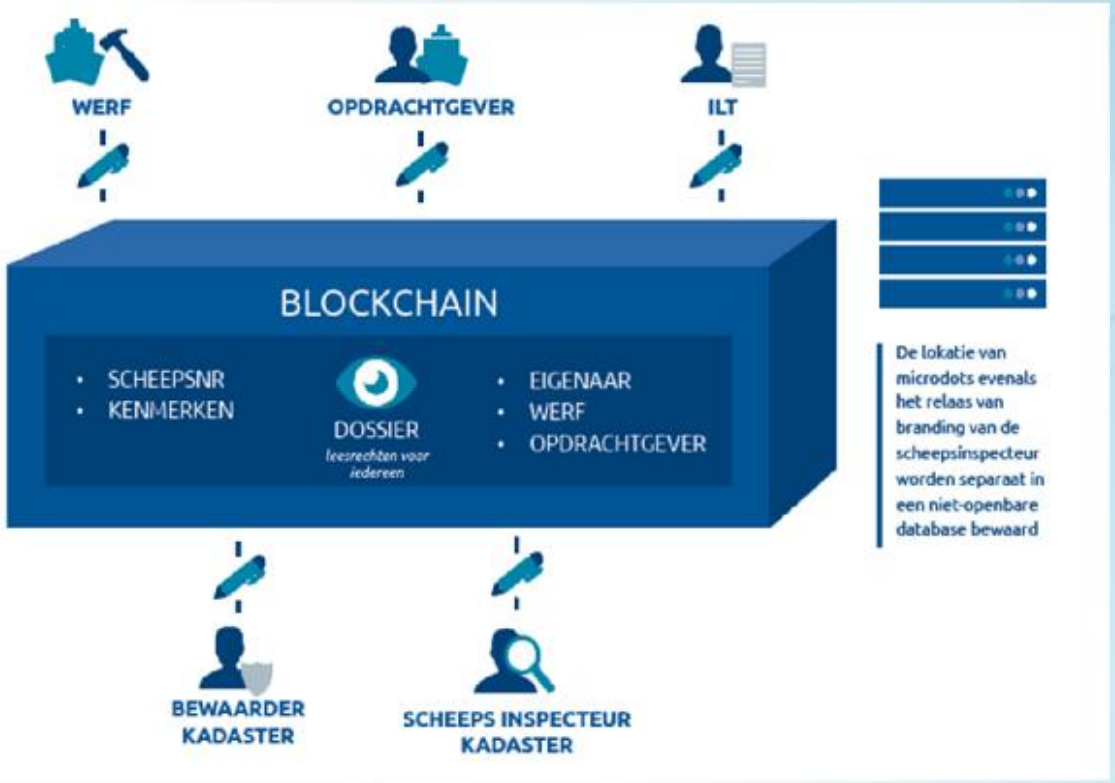
KNB 175 JAAR

FIRST TESTS: DBC-PILOTS

1ST REGISTRATION OF A SHIP



FIRST TESTS: 1ST POC: REQUEST PERMIT

A. VALIDATE ACTUALITY OF INFORMATION

B. VERIFY PROVISION BY SOURCE (KADASTER)

C. VERIFY USE OF INFO (BY USING *HASHES*)

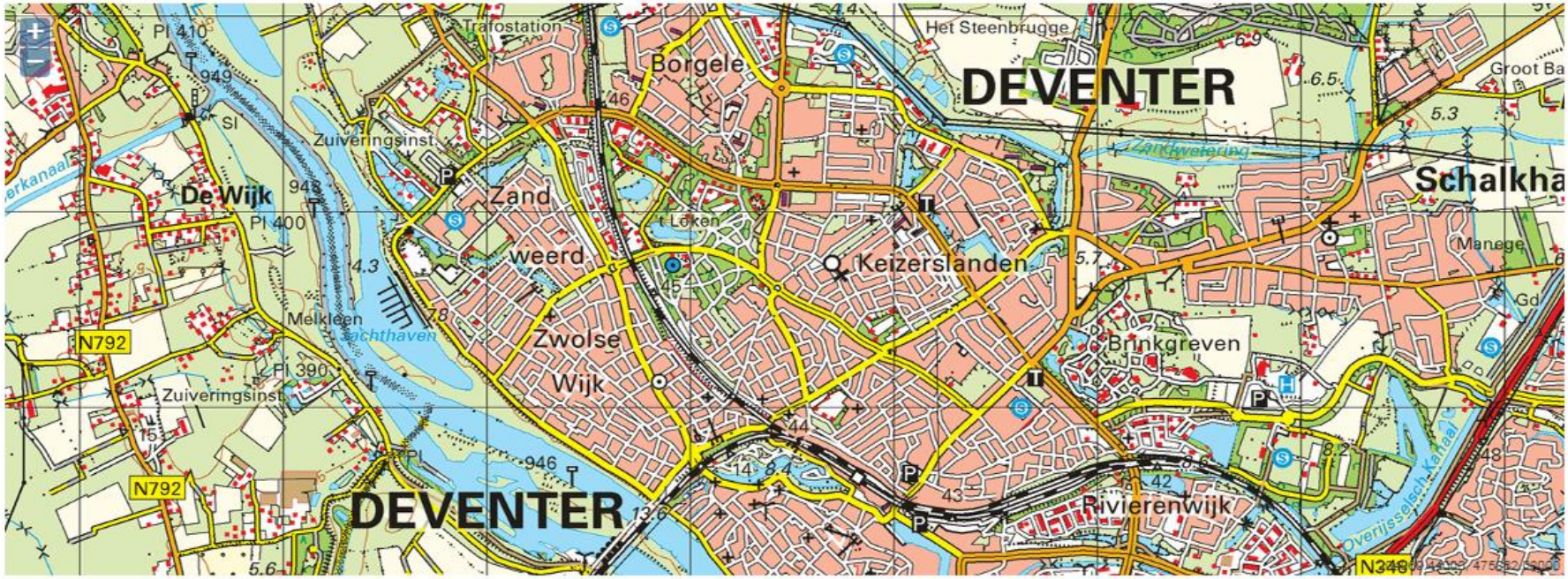
D. CONCLUSION: BC INTERESTING, BUT COOPERATION NEEDED

Niet veilig | eenvoudigbeterbouwen.nl/#

Eenvoudig beter bouwen | Account | Aanvraag | Dossiers | Controleren | Blockchain | Jasper

Nieuwe aanvraag

ZOOM VERDER IN OM TE STARTEN



Kaart: TOP50 Zoomniveau: 9

Proof of concept by kadaster

FIRST TESTS: 2nd POC: BUILDING FILE

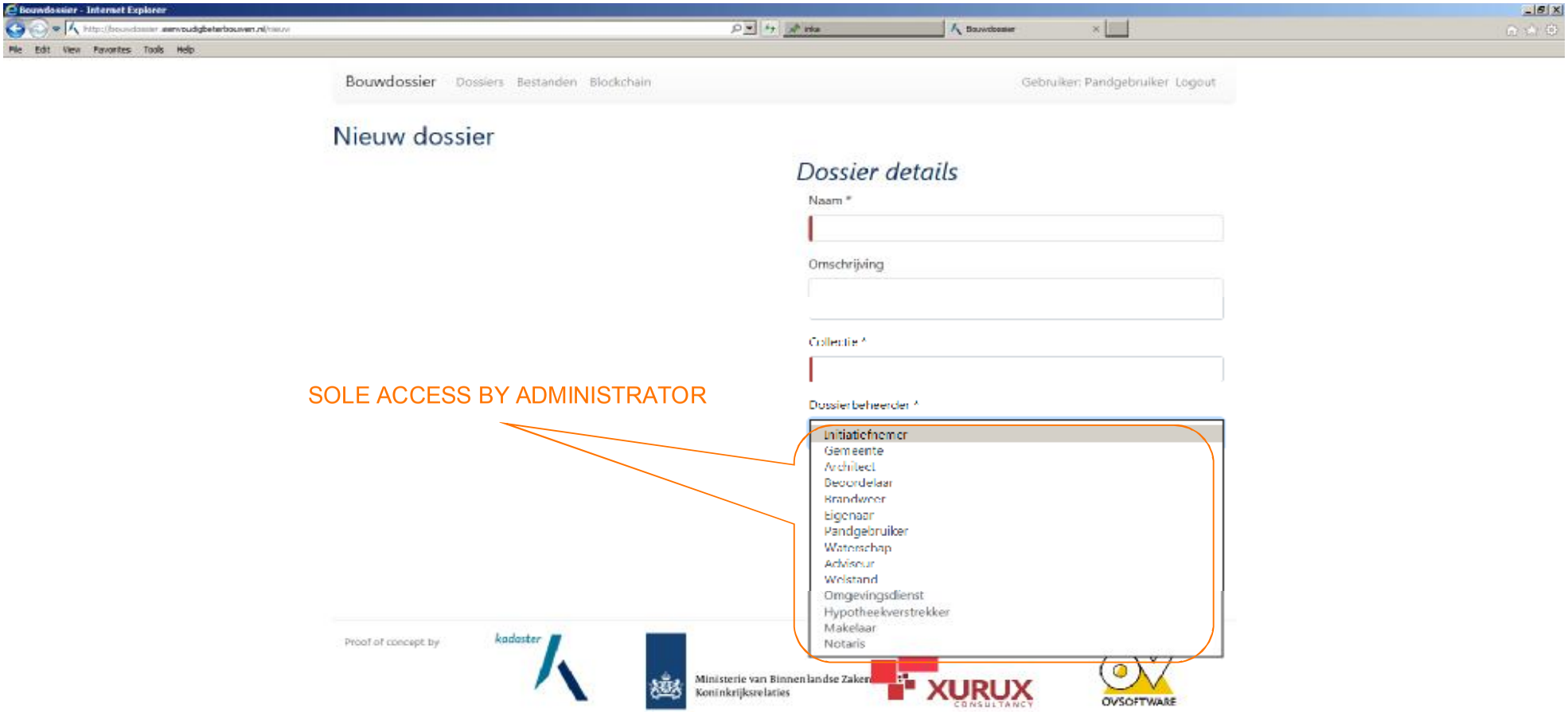
A. DECENTRALISED SOLUTION FOR BUILDING FILE

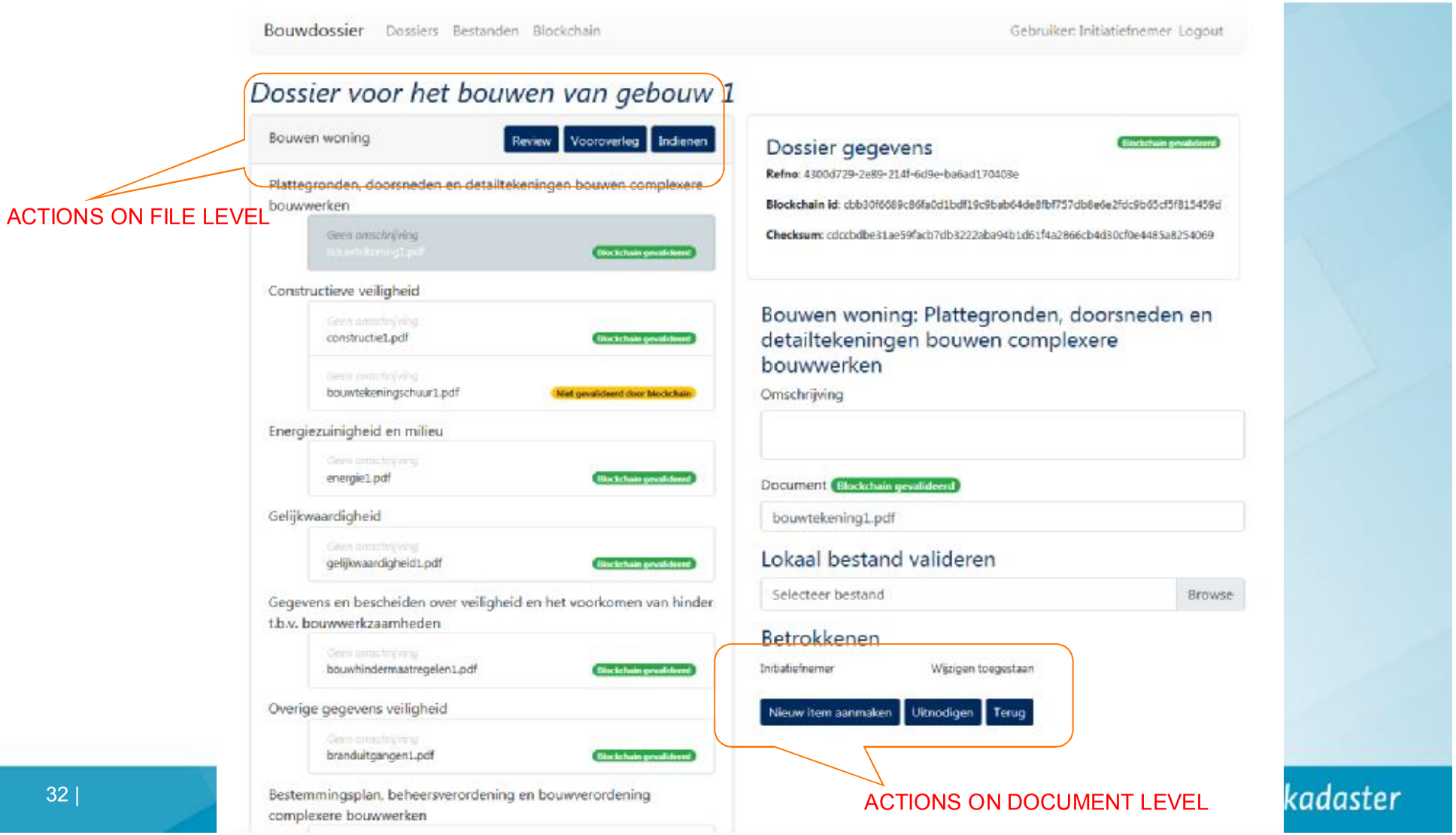
B. EVERYBODY CAN START A FILE AT ANY MOMENT

C. BC USED TO KEEP THE STATUS OF DOCUMENT/ DATA

D. VERIFICATION METHOD

EVERYBODY CAN START A FILE


Bouwdossier - Internet Explorer
File Edit View Favorites Tools Help
Bouwdossier Dossiers Bestanden Blockchain
Gebruiker: Pandgebruiker Logout
Nieuw dossier
Dossier details
Naam *
Omschrijving
Dossierbeheerder *
Initiatiefnemer
Gemeente
Architect
Beoordelaar
Brandweer
Eigenaar
Pandgebruiker
Waterschap
Adviseur
Welstand
Omgevingsdienst
Hypotheekverstrekker
Makelaar
Notaris
SOLE ACCESS BY ADMINISTRATOR
Proof of concept by
kadaster
Ministerie van Binnenlandse Zaken
Koninkrijksrelaties
XURUX
CONSULTANCY
OVSOFTWARE



ACTIONS ON FILE LEVEL

ACTIONS ON DOCUMENT LEVEL

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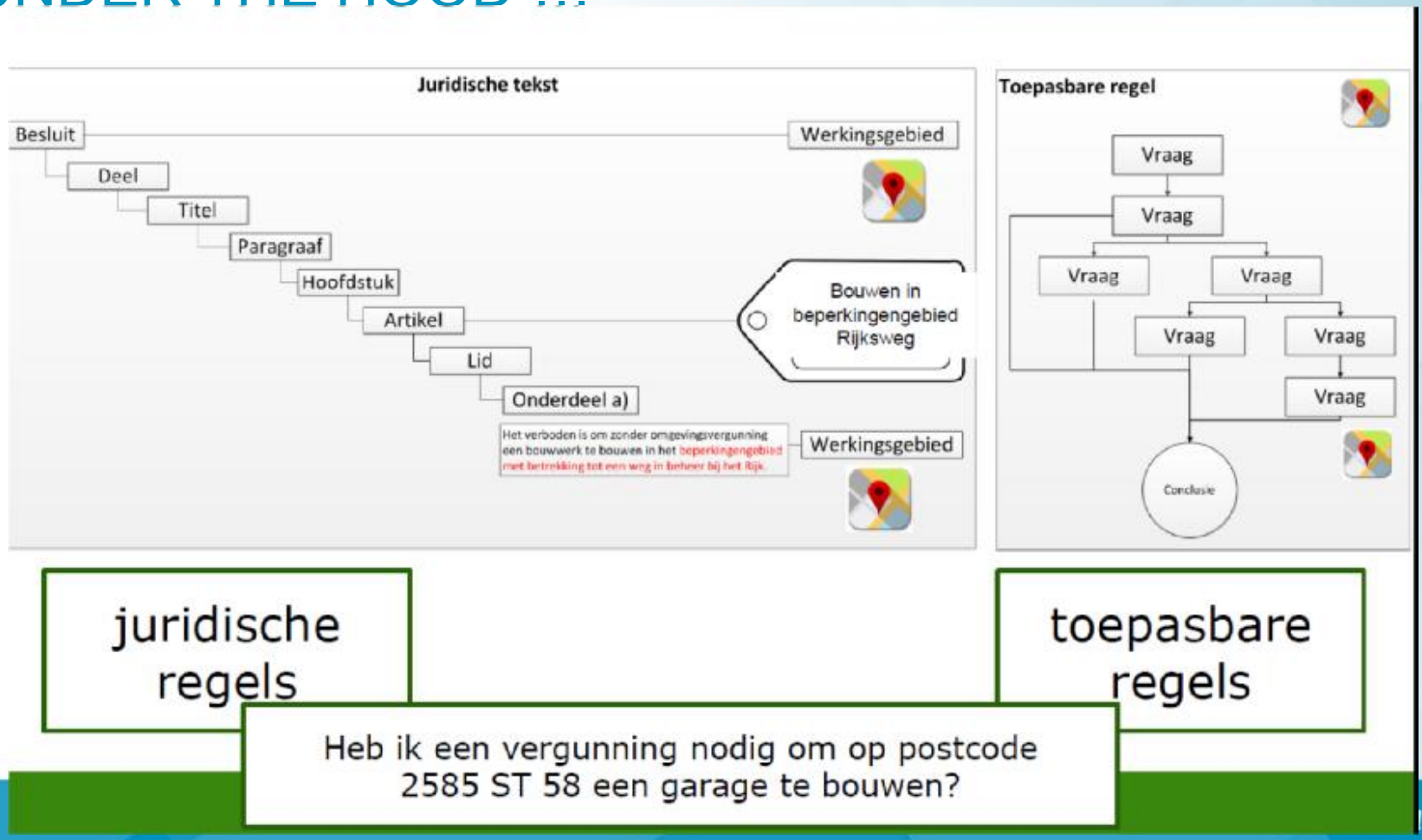
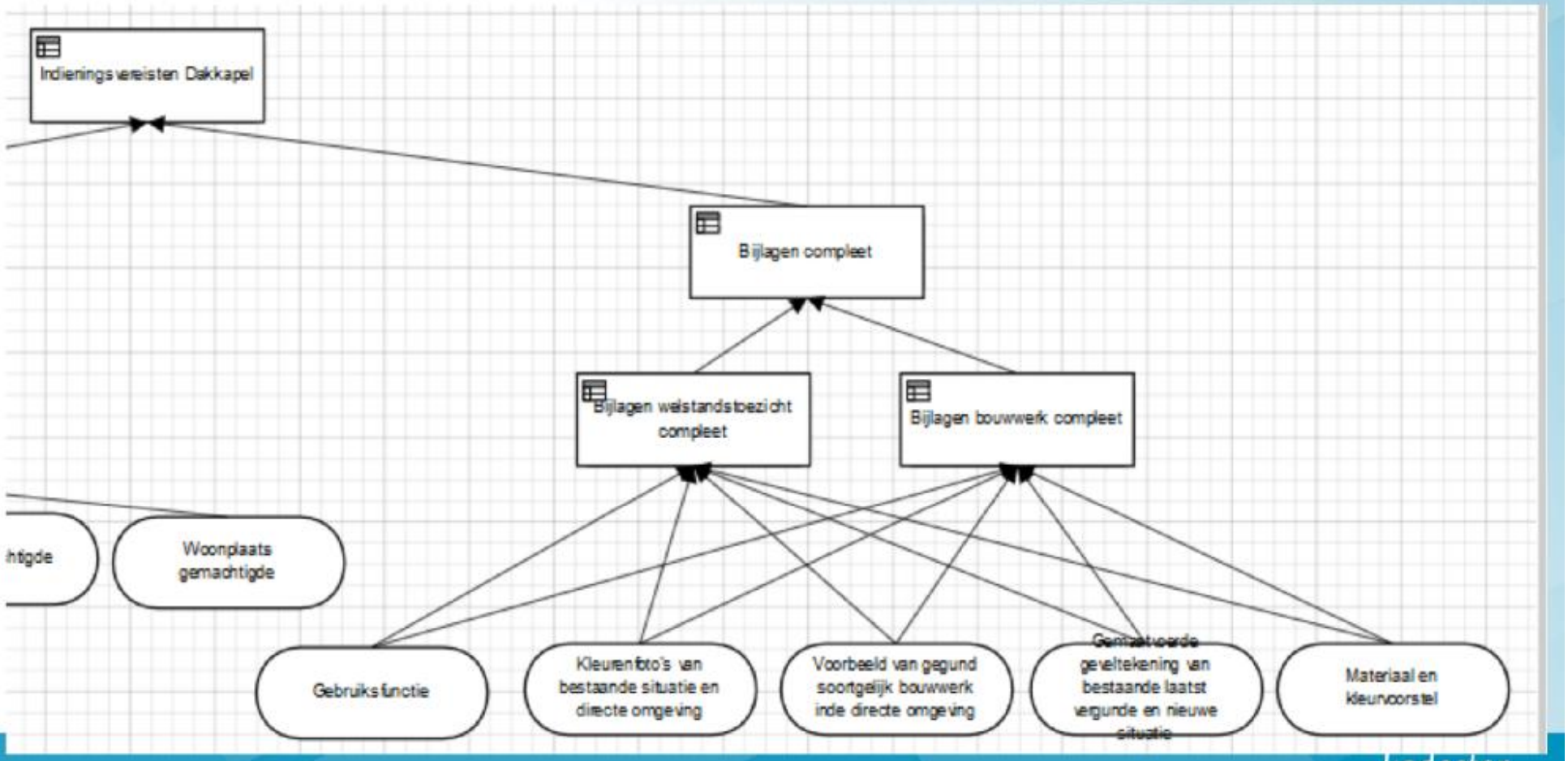
UNDER THE HOOD …



AND UNDER THE HOOD (2) …



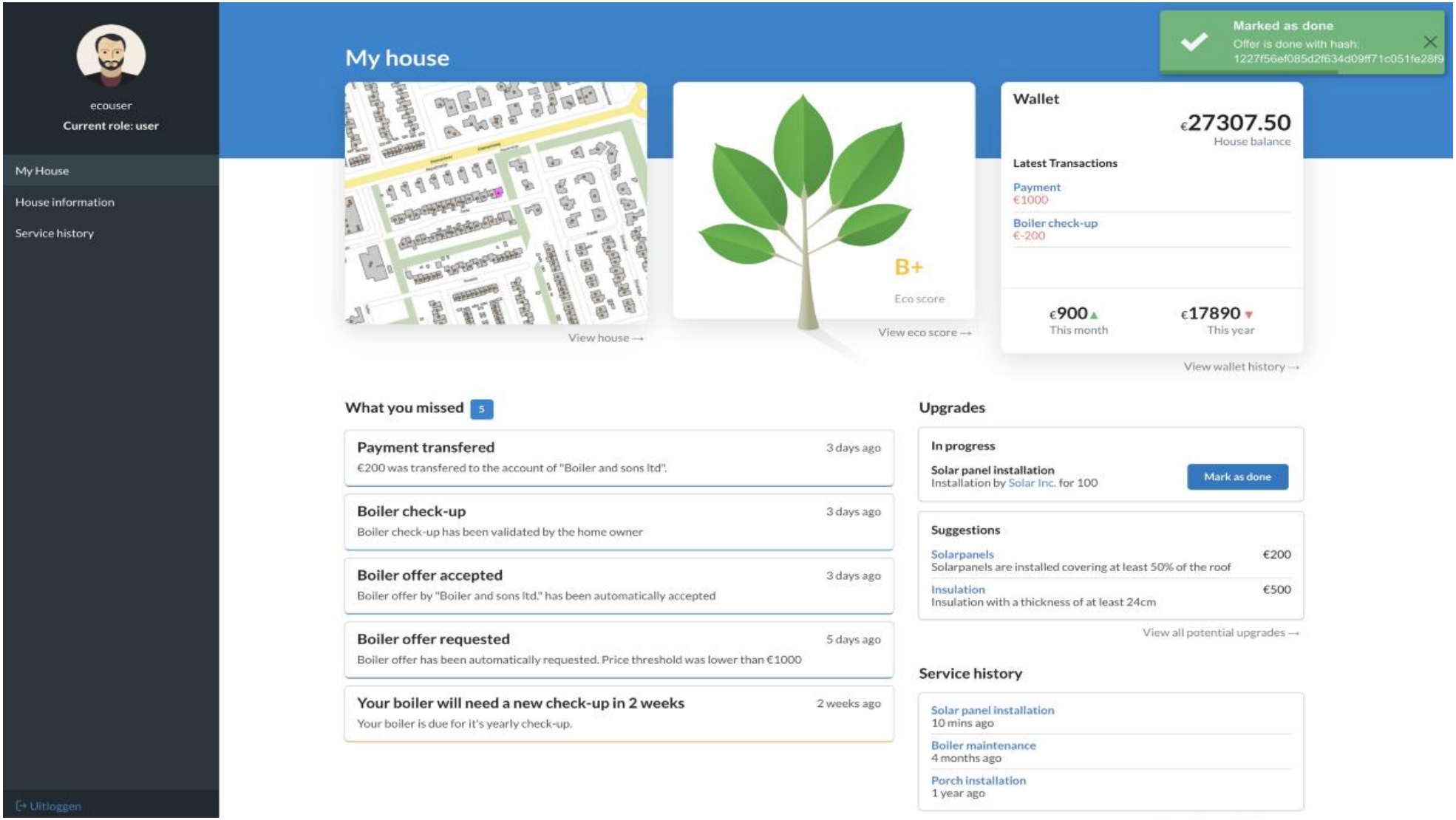
FIRST TESTS: 3rd POC: BLOCKCHAINGERS

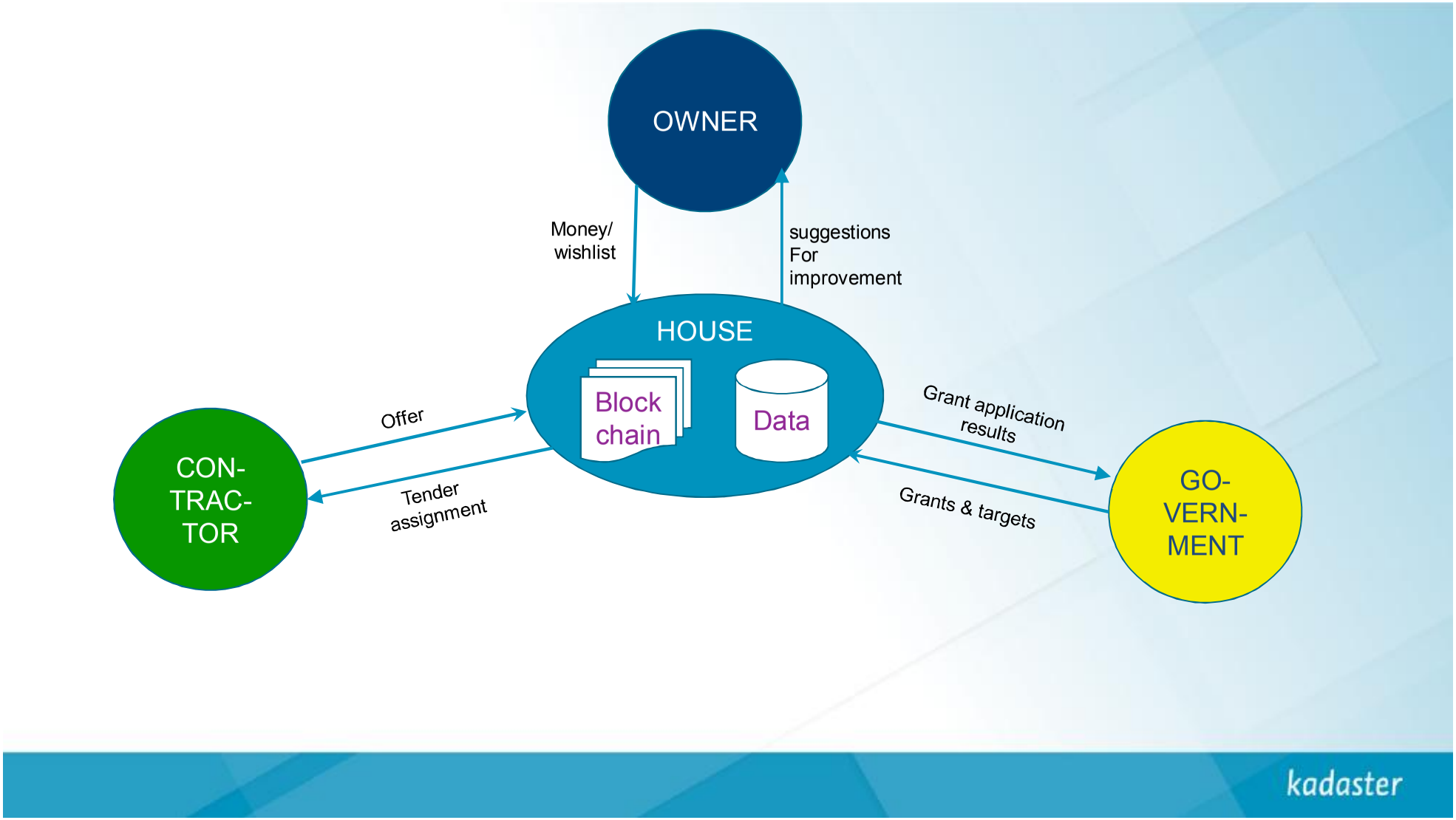
A. KADASTER *TRACK SPONSOR* WITH 'CHALLENGE'

B. 'CONSCIOUS HOUSE'

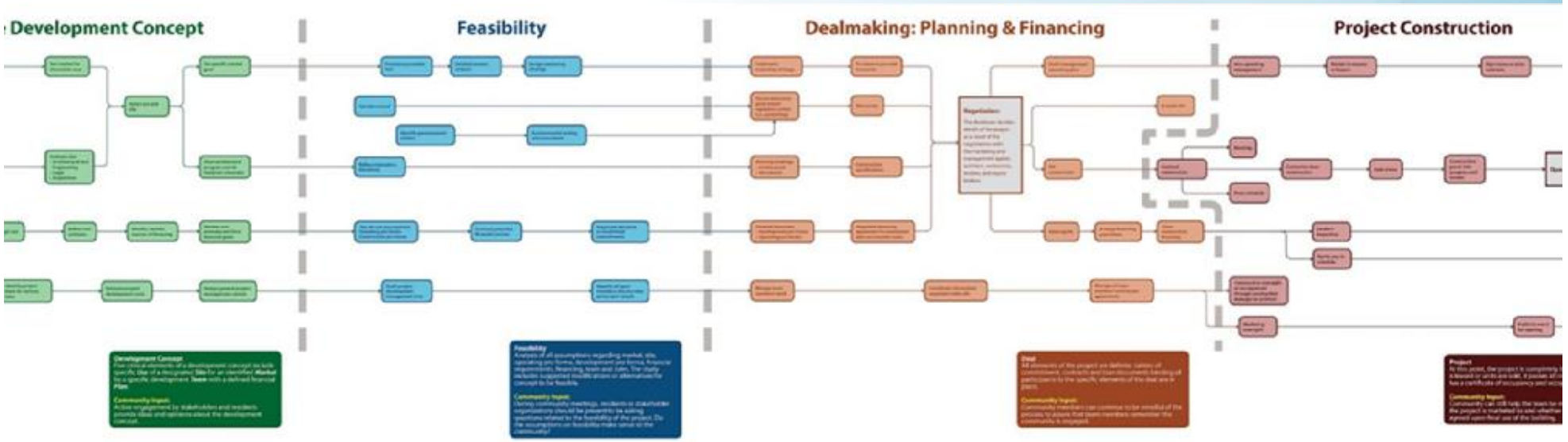
C. BC USED TO SHARE INFORMATION ON OBJECTS

D. DEMONSTRATOR (THE LEDGER)


ecouser
Current role: user
My House
House information
Service history
Uitloggen
My house
Marked as done
Offer is done with hash:
1227f56ef085d2f634d09ff71c051fe28f9
View house →
B+
Eco score
View eco score →
Wallet
€27307.50
House balance
Latest Transactions
Payment
€1000
Boiler check-up
€-200
€900
This month
€17890
This year
View wallet history →
What you missed 5
Payment transfered
3 days ago
€200 was transfered to the account of "Boiler and sons ltd".
Boiler check-up
3 days ago
Boiler check-up has been validated by the home owner
Boiler offer accepted
3 days ago
Boiler offer by "Boiler and sons ltd." has been automatically accepted
Boiler offer requested
5 days ago
Boiler offer has been automatically requested. Price threshold was lower than €1000
Your boiler will need a new check-up in 2 weeks
2 weeks ago
Your boiler is due for it's yearly check-up.
Upgrades
In progress
Solar panel installation
Installation by Solar Inc. for 100
Mark as done
Suggestions
Solarpanels
€200
Solarpanels are installed covering at least 50% of the roof
Insulation
€500
Insulation with a thickness of at least 24cm
View all potential upgrades →
Service history
Solar panel installation
10 mins ago
Boiler maintenance
4 months ago
Porch installation
1 year ago


OWNER
Money/
wishlist
suggestions
For
improvement
HOUSE
Block
chain
Data
Offer
Tender
assignment
Grant application
results
Grants & targets
CON-
TRAC-
TOR
GO-
VERN-
MENT
kadaster

FROM SHARED PROCESS



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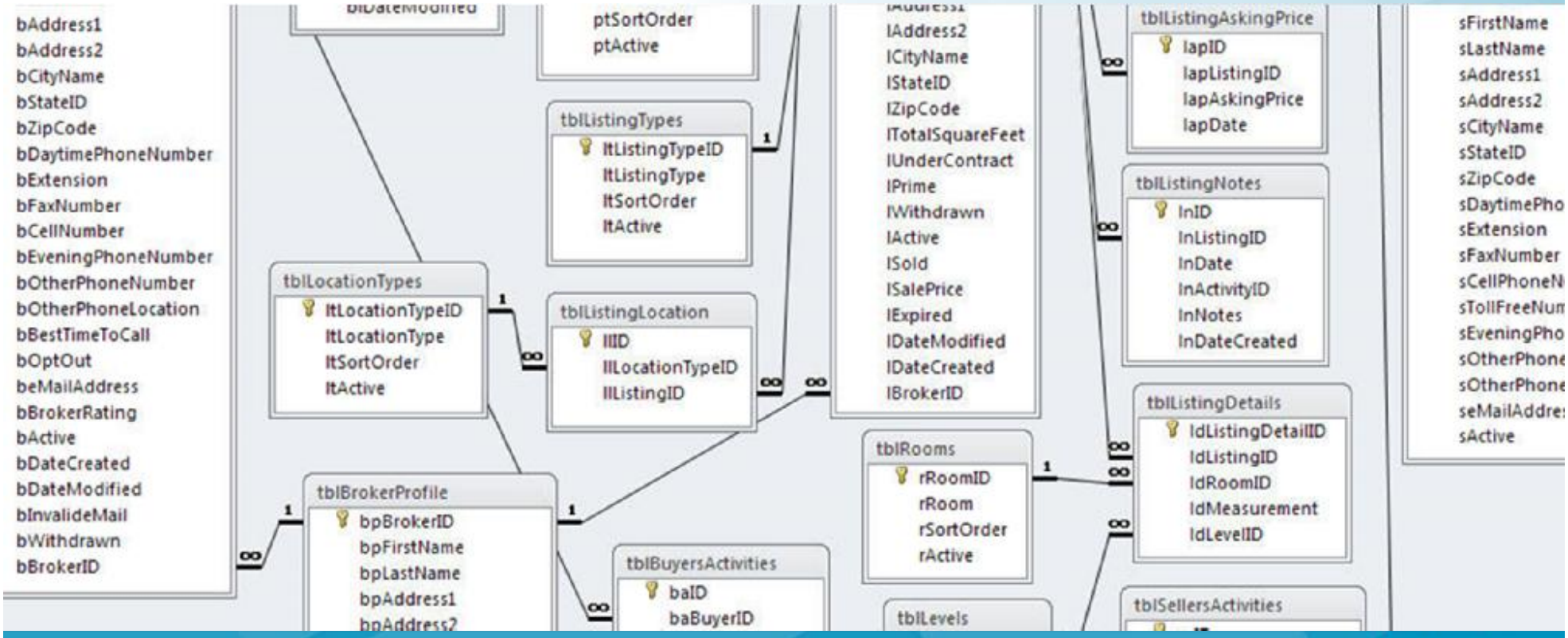
TO SHARED DATA



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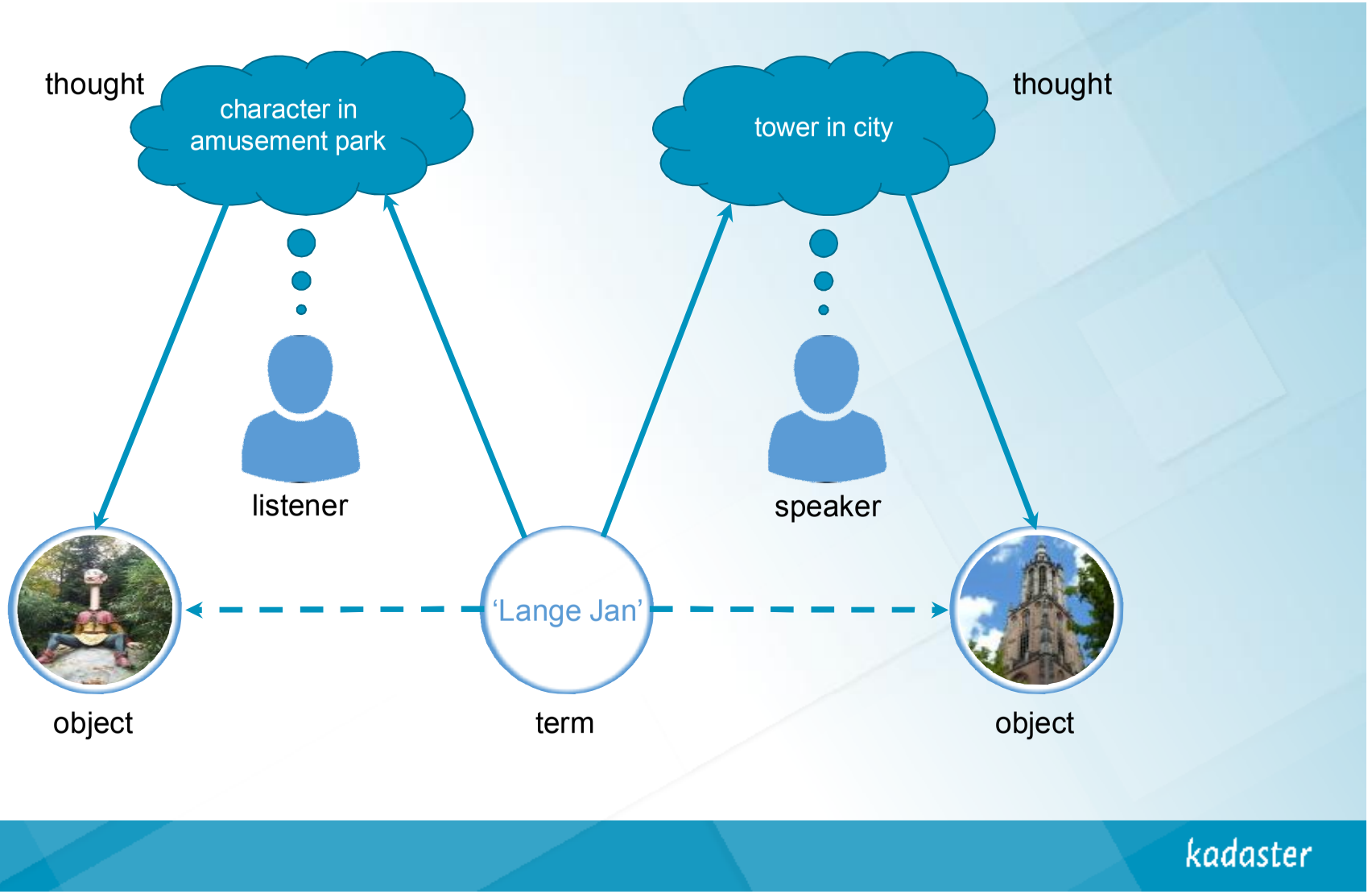
BUT BEFORE WE WILL BE REPLACED …

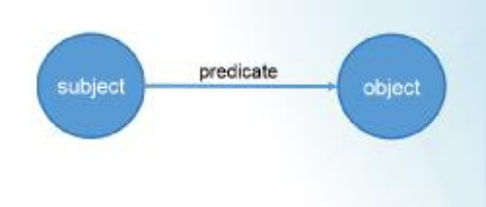
1. OPEN SOURCE (TRANSPARANCY, ACCEPTANCE)
2. ANALYSIS ADDED VALUE (ALTERNATIVE TECHNOLOGY?)
3. CONFIDENCE WITH PARTIES INVOLVED
4. MEANING OF DATA (AGREEMENTS & DESCRIBING)


thought
character in amusement park
tower in city
thought
listener
speaker
'Lange Jan'
object
term
object

1. TECHNOLOGICAL DEVELOPMENTS (2)

- Linked Data
  - Makes use of ‘URI`s to name (identify) things
  - 3 realities:
    - ‘Natural’ reality
    - Institutional reality
    - Administrative reality

triples:



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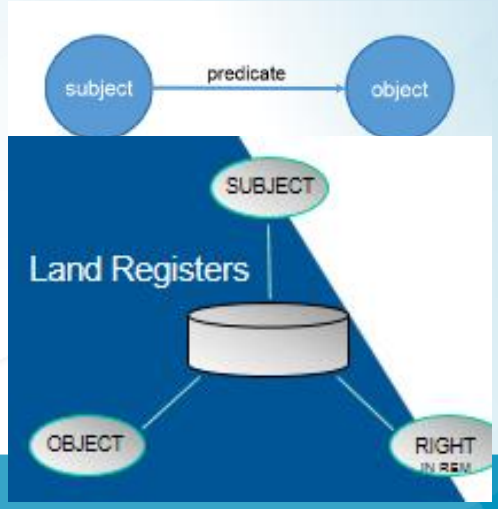
triples:



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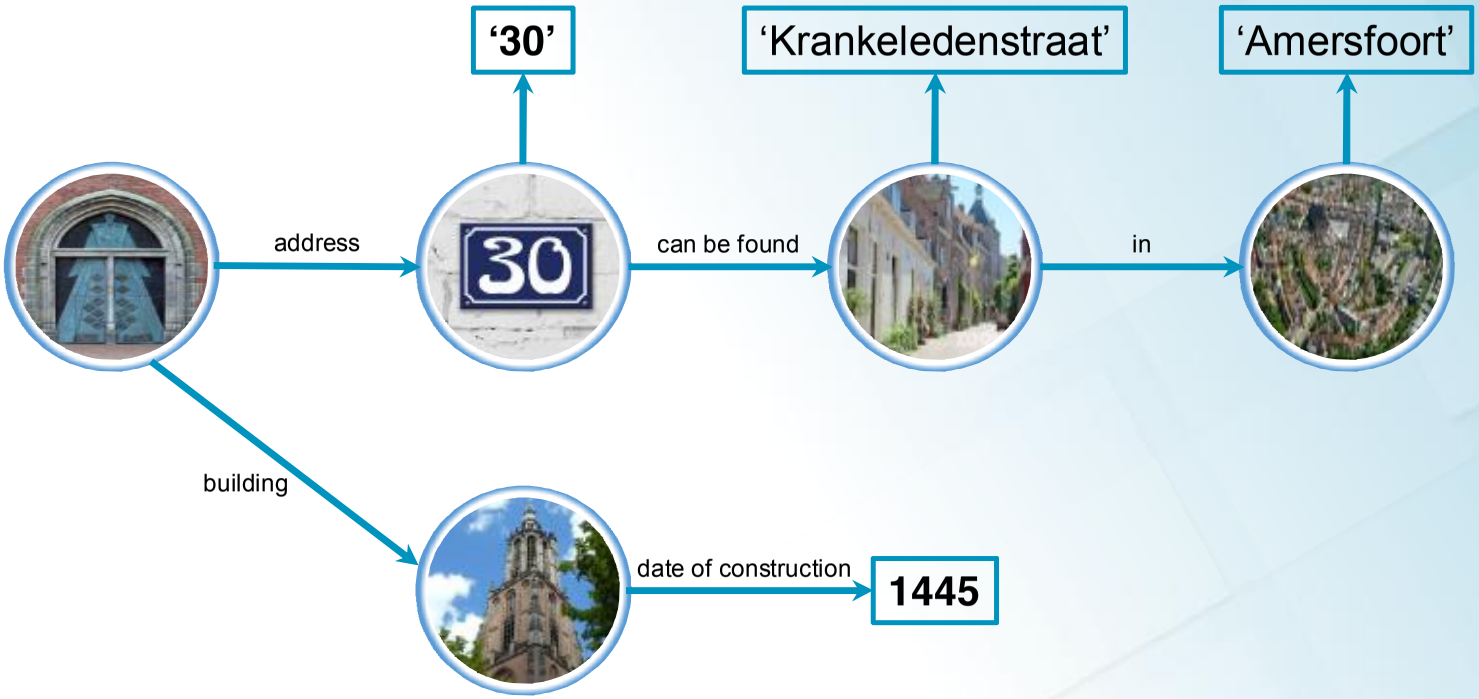
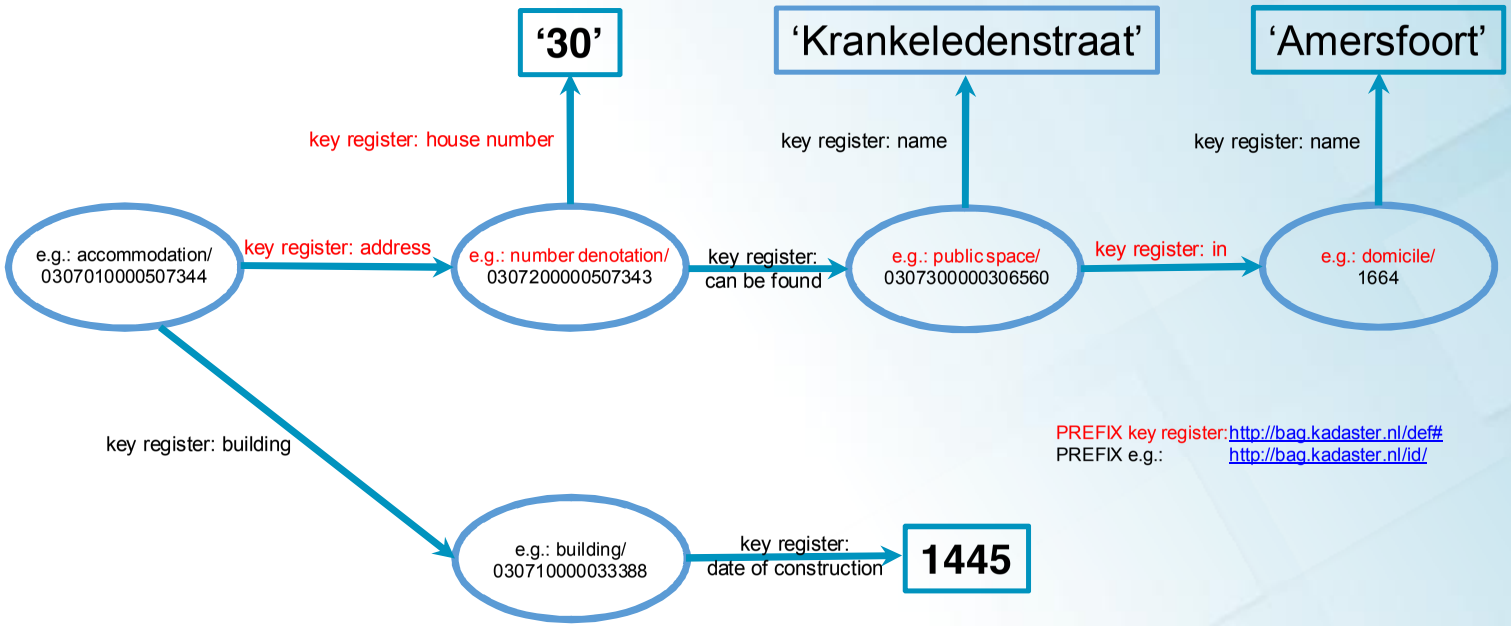
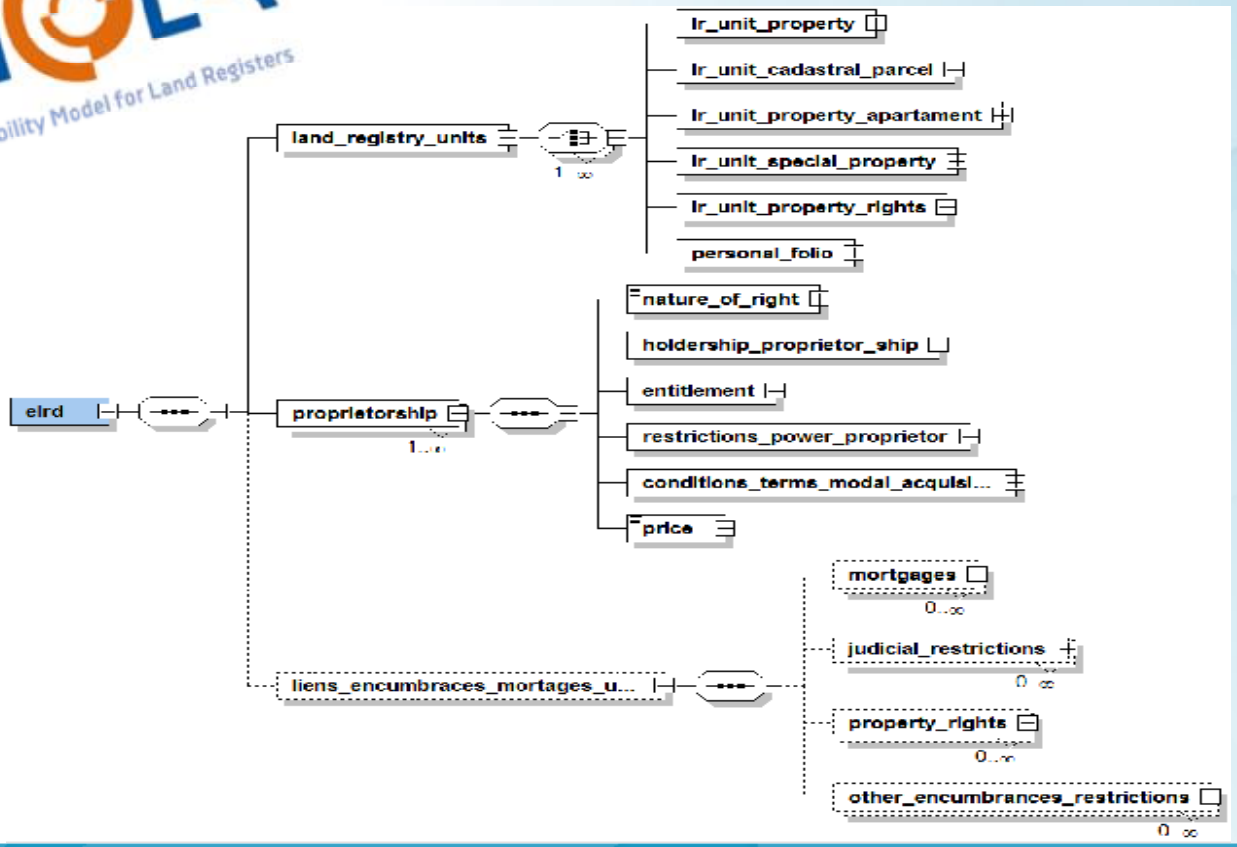


Source: Brattinga, et al



Source: Brattinga, et al

XML SCHEMA



Source: IMOLA project, Jesus Camy

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1N73LL1G3NC3
0141587H3158
43481L17Y480
7004D4P7870
183CH4NG304
-ST3PH3N H4WK1NG

ELRN EUROPEAN LAND REGISTRY NETWORK

ELRA European Land Registry Association

Tallinn
June 1, 2018

Digital Transformation of Registry System Opportunities of a Technological Ecosystem

ELRN Workshop.
Session: *Blockchain of Real State*

Teresa Rodríguez de las Heras Ballell
Professor of Commercial Law, Universidad Carlos III de Madrid
2017 Chair of Excellence, CLC, Harris Manchester College, Oxford University
teresa.rodriguezdelasheras@uc3m.es

uc3m | Universidad Carlos III de Madrid

1.- Rationales for registration – The Roles of Land Registers

Agreement and other situations related to real property

REGISTRY SYSTEM

CERTAINTY

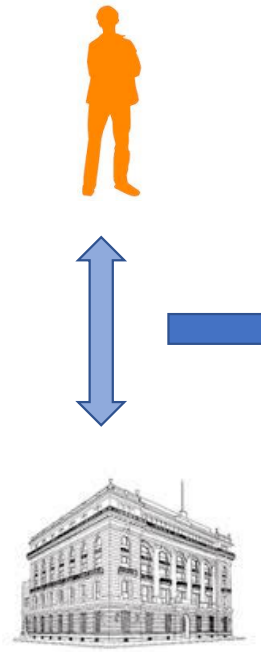
- *Accuracy*
- *Existence and priority*
- *Due diligence costs*

EFFECTIVENESS

- *Against third party – irrespective of actual knowledge*
- *Presumed validity*

TRANSPARENCY

1.- Rationales for registration – The Roles of Land Registers



REGISTRAR / REGISTER

- **INFORMATION PROVIDER ?**
- **TRUSTED THIRD PARTY ?**
- **LEGAL VALIDATION-GIVER ?**

A.- The Roles of Technology – APPLICATIONS AND USES

AS AN INSTRUMENT

AS AN ARCHITECTURE

THEORETICAL FRAMEWORK TO FACE TECHNOLOGY APPLICATIONS.
The Case of Blockchain as an illustration :

1.- Is then Blockchain a new instrument enabling a more effective performance of same functions?

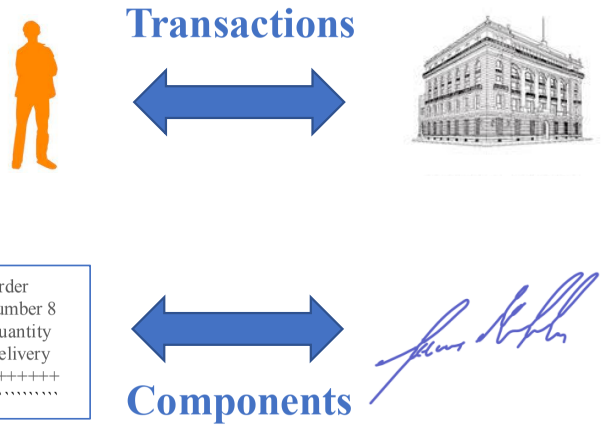
2.- Is Blockchain a new instrument enabling the performance of new functions?

3.- Is Blockchain a new architecture? Does it enable to perform same functions?

4.- Is Blockchain a new architecture enabling the performance of new functions?

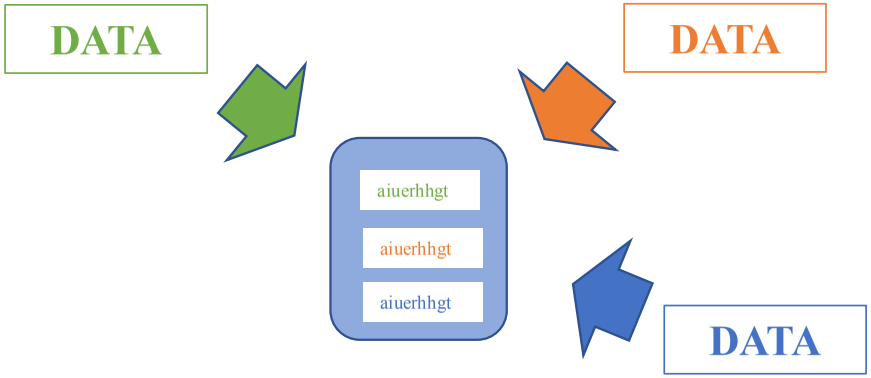
A.1.- Technology as instrument in transactions – PRIOR DISTINCTION OF RELEVANT TERMS

PRINCIPLE OF TECHNOLOGICAL NEUTRALITY



PRINCIPLE OF FUNCTIONAL EQUIVALENCE

'DYNAMIC OPEN RECORDS/DOCUMENTS'



A.1.- Technology as instrument in transactions – PRIOR DISTINCTION OF RELEVANT TERMS

ELECTRONIC

Use of electronic communications throughout the process

DIGITAL

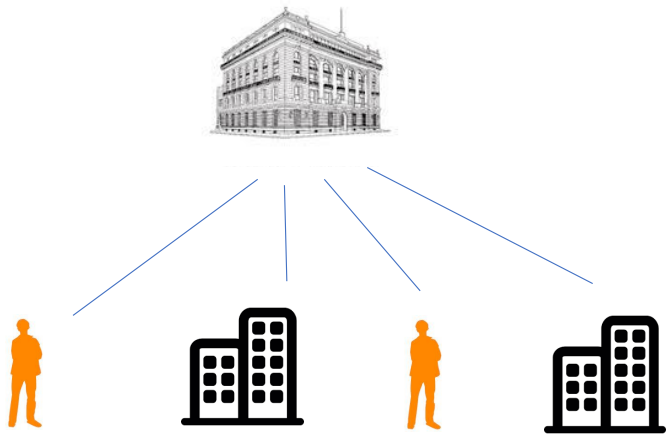
Information codified, produced, transmitted, and stored in digital medium

AUTOMATIC

Performance of tasks without human intervention: programming of instructions

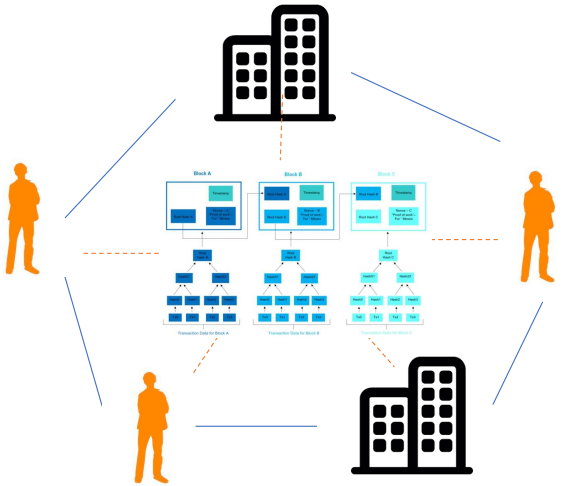
A.2.- Technology as Architecture – UNDERSTANDING TECHNOLOGY ARCHITECTURE

PRINCIPLE OF TECHNOLOGICAL NEUTRALITY



PRINCIPLE OF FUNCTIONAL EQUIVALENCE

PRINCIPLE OF SYSTEM/ARCHITECTURE NEUTRALITY

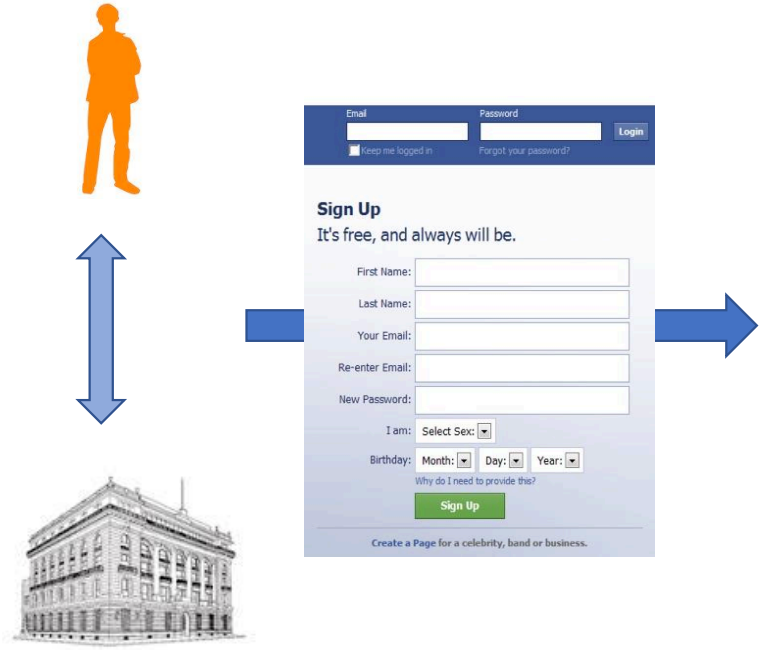


PRINCIPLE OF SYSTEM/ARCHITECTURE EQUIVALENCE

2.- Electronic Registry System as a Platform: Defining the Model A

2.- Electronic Registry System: Defining the Model - FEATURES

An electronic version of Registry

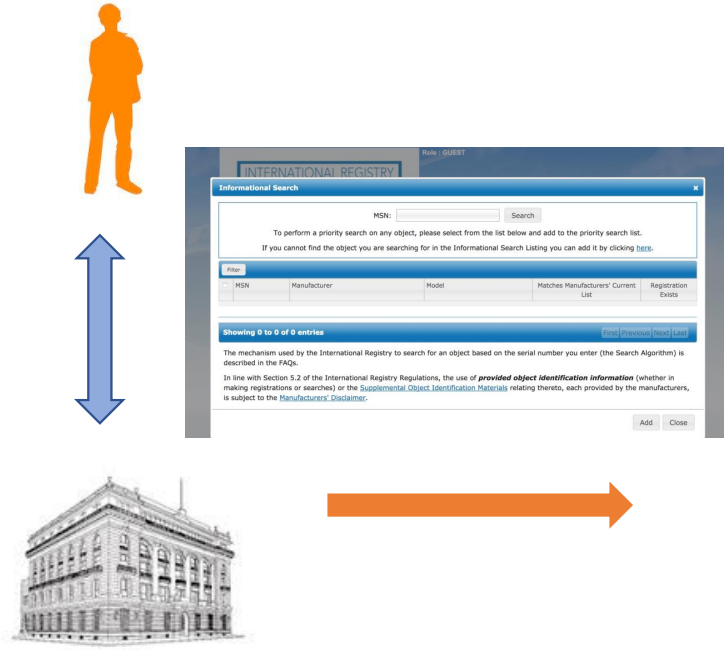


a). Use of electronic means and digital medium for all processes:

- Registration
- Further amendment and cancellation
- Search

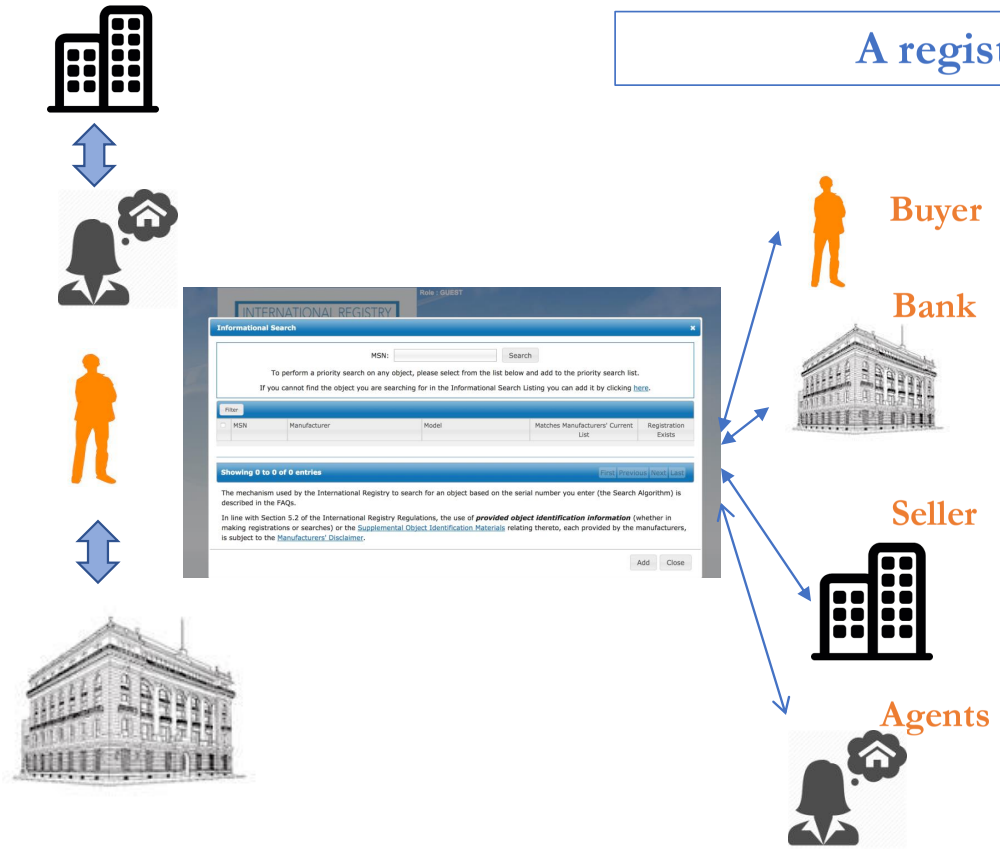
2.- Electronic Registry System: Defining the Model - FEATURES

An active registry model: bilateral flow of data



b). Register may interact with registered users and proactively transmit relevant notices and communications (i.e. expiration date, detected errors, etc)

2.- Electronic Registry System: Defining the Model - FEATURES



A registry system as a multilateral platform

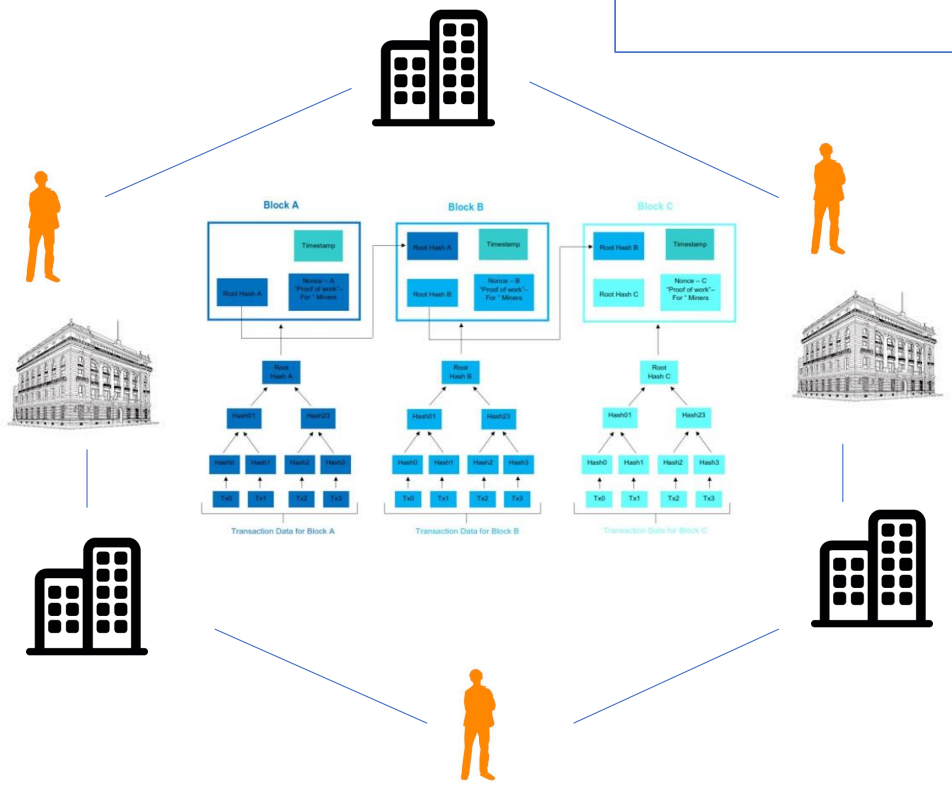
c). Users participate in the registry and interact each other

Multilateral communications are enabled

All relevant data are available to parties on the same platforms

All transactions are conducted through the platform

2.- Electronic Registry System: Defining the Model - FEATURES



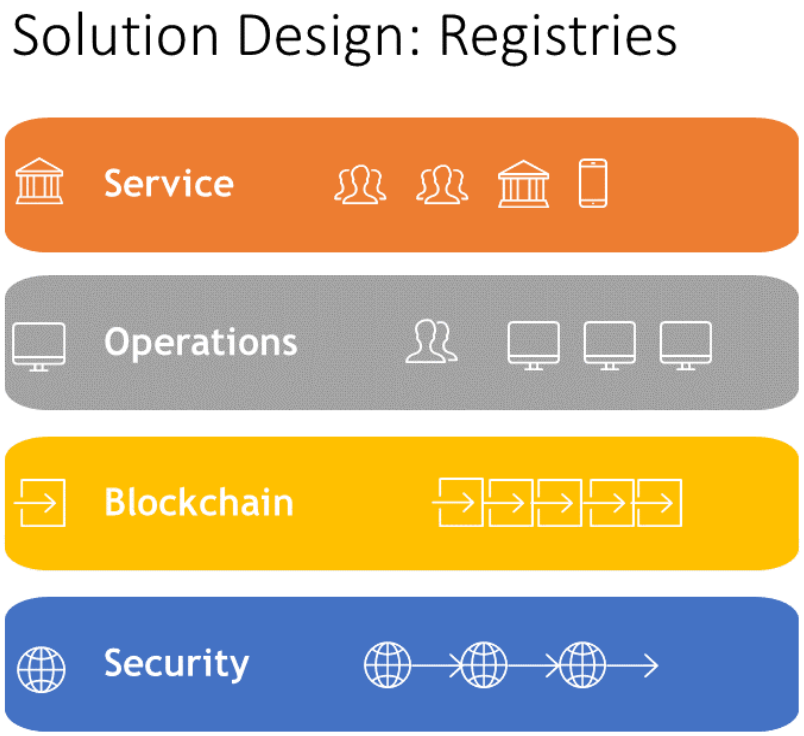
A decentralized registry?

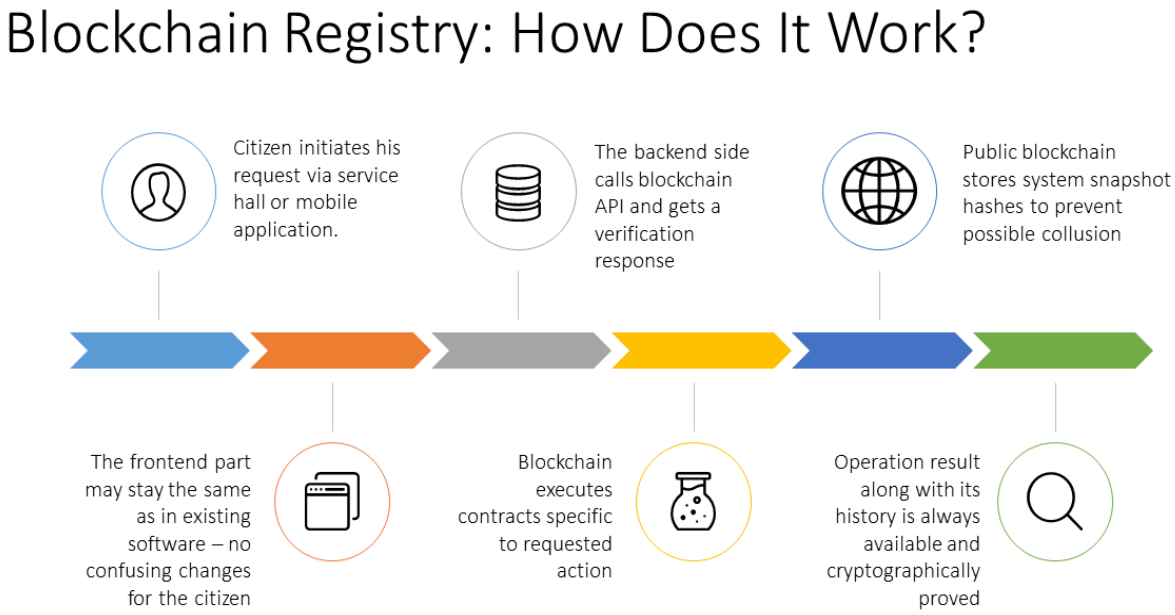
X). Might a blockchain-based registry be an option?

Y). Is blockchain operation compatible with legal design for secured transactions register?

** See next example for mixed models*

*** Example of Blockchain-based register design: BitFury for Georgia – a combination of descentralizaded and centralized schemes**





2.- Electronic Registry System: Defining the Model - FEATURES

A decentralized registry?
DECODING A BLOCKCHAIN-BASED MODEL

DECENTRALIZED SYSTEM:
disintermediation

DISTRIBUTED TRUST:
public / private / hybrid models

CRYPTOGRAPHY

VALIDATION

SCALABILITY

\+ **AUTOMATION**

\+ **SELF-EXECUTABLE TRANSACTIONS**

2.- Electronic Registry System: Defining the Model - FEATURES

A highly-automatic registry model in a ECOSYSTEM OF SMART CONTRACTS, SMART PROPERTY, AND TRUSTED THIRD PARTIES

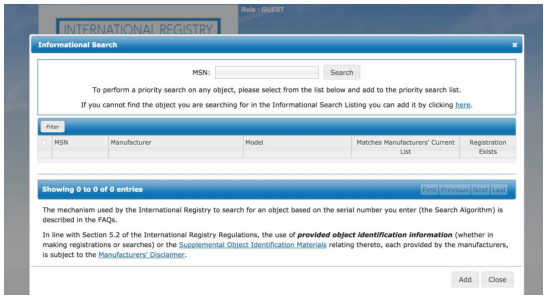
REGISTER AS A PLATFORM

Smart Property

Oracles

Feeding and verifying data

Other Registers



Flow of data

3.- Opportunities of a Technological Ecosystem

I.- Understanding Technology as an Instrument and as an Architecture

3.- Opportunities of a Technological Ecosystem

I.- Understanding Technology as an Instrument and as an Architecture

II.- Assessing Roles of Registries prior to Implementing Technological Solutions

3.- Opportunities of a Technological Ecosystem

I.- Understanding Technology as an Instrument and as an Architecture

II.- Assessing Roles of Registries prior to Implementing Technological Solutions

III.- New Opportunities for Registry Legal Design and Registrar Roles

- Registry as a Platform – multilateral interaction
- Proactive Registry
- Automation of Processes and Tasks
- Dynamic Registrations – Updated data

3.- Opportunities of a Technological Ecosystem

I.- Understanding Technology as an Instrument and as an Architecture

II.- Assessing Roles of Registries prior to Implementing Technological Solutions

III.- New Opportunities for Registry Legal Design and Registrar Roles

- Registry as a Platform – multilateral interaction
- Proactive Registry
- Automation of Processes and Tasks
- Dynamic Registrations – Updated data

IV.- Regulatory approach and policy options:

- General enabling legal framework based on functional-equivalence principle
- Registry-specific legal rules setting out principles, legal design, and legal effects
  - * *option 1: attributing legal effects to legal design*
  - * *option 2: attributing legal effects to reliability standards for technology*
- Second-level regulations defining processes, tasks, and outcomes

ELRN EUROPEAN LAND REGISTRY NETWORK

ELRA European Land Registry Association

Tallinn
June 1, 2018

ELRN Workshop.
Session: *Blockchain of Real State*

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“The methodology of formants to define the attributes of concepts in the IMOLA project”

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The aim of Comparative Law

«Comparative law is like other sciences, in that its aim must be the acquisition of knowledge».

R. SACCO, *Legal Formants. A dynamic approach to comparative law*, American Journal of Comparative Law, Vol. 39 No 1, 1991, p. 4.

Comparative law as a science

Science

Knowledge

Methodology

Methodology

The *Factual approach*

R. Schlesinger (ed.) Formation of Contracts: A study of the Common Core of Legal Systems, 2-3 (1968).

Donald E. Claudy, *Formation of Contracts a Study of the Common Core of Legal Systems*, Cornell Law Review, Volume 54 Issue 3 February 1969.

The Formants

- R. SACCO, *Définitions savantes et droit appliqué dans les systèmes romanistes*, in Revue Internationalede Droit Comparé, vol. 17, n. 4, 1965, p. 827 ss.
- R. SACCO, *Les buts et les méthodes de la comparaison du droit*, in Rapports nat. italiens au IX congrès intern. de droit comp. 1974.
- R. SACCO, *Legal Formants. A dynamic approach to comparative law*, American Journal of Comparative Law, Vol. 39 No 1, 1991. pp. 1-34.

Methodology

Functionalism

Structuralism ↔ *The formants*

The unity of the legal system

«It is misleading to speak of «the legal rule» in force in a given country as though there were only one such rule».

R. SACCO, *Legal Formants. A dynamic approach to comparative law*, American Journal of Comparative Law, Vol. 39 No 1, 1991, p. 21.

The unity of the legal system (?)

In a given country at a given moment the rule contained in the constitution or in legislation, the rule formulated by scholars, the rule declared by courts, and the rule actually en forced by courts, often haven’t an identical content and are not therefore the same.

The formants

Instead of speaking of "the legal rule" of a country, we must speak instead of the rules of constitutions, legislatures, courts, and, indeed, of the scholars who formulate legal doctrine.

Methodology

The Formants:

groups of rules sharing the same characteristics (legislative, case law, scholarly opinions/legal doctrine) and providing answers/solutions to a specific legal matter/problem.

Example

A person who belives himself to be heir disposes of property he has inherited by transaction to a third party in good faith.

Is the transaction effective?

R. SACCO, *Legal Formants. A dynamic approach to comparative law*, American Journal of Comparative Law, Vol. 39 No 1, 1991. p. 23.

The formants

Italy

Legislation: yes(art. 534 cc) Case law: yes Legal doctrine: yes

Belgium

Legislation : x Case law: no Legal doctrine: no

France

Legislation: x Case law: yes Legal doctrine: ?

The formants and the attributes of concepts in EU law and at IMOLA II

One

Supranational/common/uniform definition

Many different

National meanings

EU Terminology – IMOLA Terminology

- IMOLA Terminology: uniform terms expressed in a common language (English).
- EU Terminology: uniform terms expressed in all the official national languages (24 idioms).

EU Terminology

Neologisms (legal concepts)

…….“regulation” – “règelement”- “Verordung” – “regolamento” – ……..

Inter-lingual synonyms

WAGNER, J.C. GÉMAR, *Materializing Notions, Concepts and Language into Another Linguistic Framework,* International Journal for the Semiotic of Law, 2013.

EU Terminology

Uniform legal meaning is reached across languages, horizontally, among these neologisms (concepts) and through the form of their linguistic/semantic expression, but regardless the language chosen.

J.G. TURI, *Le droit linguistique et les droits linguistiques*, Les Chaiers de droit, Vol. 31, n. 2, 1990.

EU Terminology – IMOLA Terminology

The problems of the attributes of concepts to uniform definitions are similar!

Example: the formants and the EU concepts

Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste

«possession»

Art. 3 (definitions) “waste holder” means the waste producer or the natural or legal person who is in *possession* of the waste.

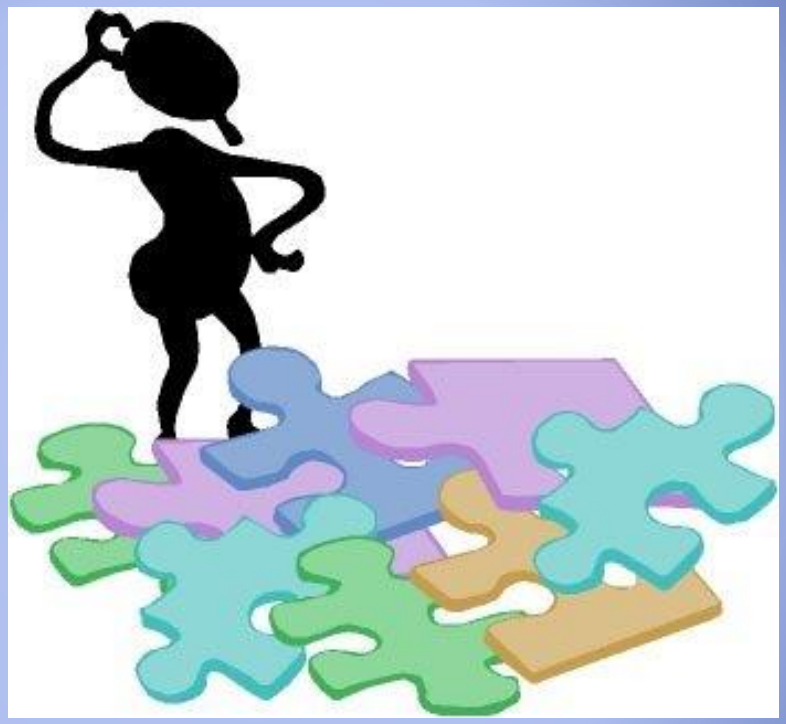
The meta-concept

- UK ↓ Possession
  IT ↓ Possesso
  DE ↓ Besitz
  FR ↓ Possession
  NL ↓ ↓ ↓ Bezit

- Possesso (ITA)/Bestiz (Austria)/Possession (France)…..material control on the good with animus domini

- Detenzione (ITA)/Innehabung (Austria)/ Détention (France)…… material control on the good without animus domini

The meta – concept and the national interpreter



The national formants

Italy (case law)

Decision of the *Tribunale Amministrativo Regionale* (29/01/2018) on Directive 2008/98/EC.

"The Italian notion of "**possesso**" and "**animus possidendi**" is not applicable as the cost of waste provided in the EU directive is not grounded on the intention of the holder/possessor to behave as an owner (with animus possidendi) but on the duty of care owed by him".

The national formants

Belgium (legislative formant)

- Décret 23/12/2011 relatif à la gestion durable de cycles de matériaux et de déchets (transposition de la Directive 2008/98/CE du Parlement européen et du Conseil du 19 novembre 2008).

- “The possessor is also the person who has not the physical possession of the waste” (qui n'ont pas la ***possession*** physique des *déchets*).

The EU concept

UK	IT	DE	FR	NL
↓	↓	↓	↓	↓
Possession	Possesso	Besitz	Possession	Bezit

possession in EU law (Directive 2008/98/EC) **:** material control on the good without animus domini

↑ ↑

National law and case law (formants)

Prof. E. Ioriatti, The EU multilingual legal system: top down or bottom up?, Faculty of Law and Governance, Utrecht University, 2018;
Prof. E. Ioriatti, Legal formants and EU terminology, General Congress of the Bar association, Trento, 2018.

XXI General Congress of Comparative Law (Fukuoka, July 2018)

Uniform definitions are not *final* (my definition: consolidated legal concepts and not meta – concepts) until they haven't been implemented through their application to material facts at the national level (national formants).

IMOLA NATIONAL CONCEPTS TEMPLATE

Real servitude

Real servitudes in IMOLA CONCEPT TEMPLATE

Real servitudes are treated as limited property right and always placed in C section, irrespectively of their content.

The real servitude in Italy

Article 1027 Civil Code: *A real (predial) servitude is a burden upon a land (plot) for the benefit of another land (plot) belonging to a different owner.*

The fundamental elements

Italy

Therefore a real servitude can be defined “as the relationship according to which Tizio, as owner of the land A, must tolerate the action of Caio, as owner of the land B”.

The fundamental elements

Italy

- 1) Tizio must tolerate not as such, but **“because he is the owner of land A”.**
- 2) Caio can act not as such, but **“because he is the owner of land B”.**

The fundamental elements

In Italy the servitudes are typical and, as all the other real rights, belong to a fixed *numerus clausus.*

Furthermore, transcription in the land registry is justified by the effect *erga omnes* of the servitude.

The fundamental elements

Italy

Until 2012, the presence of both the dominant and the servient lands (plots) were necessary elements for the creation of a real servitude and for its transcription in the land registry.

The legislative formant

Art 2645-quater Italian Civil Code

Need the registration in public records all acts if they have as their object real estate, acts and contracts of private law, even unilateral, as well as the agreements and contracts with which they are established in favor of the State, the region, the other local public bodies or bodies carrying out a service of public interest, constraints of public use or any other constraint for any purpose required by state and regional regulations, municipal urban tools as well as by the consequent territorial planning tools and by the urban conventions related to them .

The case law formant

The rule declared by courts, and the rule actually enforced by courts in Italy on article 2645-quater c.c. leaded the tabular praxis to register the servitudes for public use as servitudes in favor of public administrations or other legal entities.

The case law formant

Italy

Example: a servitude for public use in favor of a public administration (as the local municipality) which allows to place a garbage bin in the property of Tizio (servient land/plot).

The application of this practice does not require the existence of a dominant land (plot).

The tabular praxis

Italy

Before 2012 the servitudes for public use were registered on the servient land thanks to a fiction (inventing a fictional/theoretical dominant land).

According to the new practice instead it is nowadays possible to register a servitude for public use on a servient land without the identification of a dominant land.

IMOLA NATIONAL CONCEPTS TEMPLATE

Real Servitudes are treated as limited property rights and will always be placed in section C, regardless of their content.

The servitude for public use should therefore be placed in section C of the Imola Template, as according to Italian law it can be qualified as a real servitude (yes or no answer).

IMOLA NATIONAL CONCEPTS TEMPLATE

It follows that in section A of the Imola Template there would be no mention of a dominant land/plot, as it may not exist under Italian law.

IMOLA NATIONAL CONCEPTS TEMPLATE Definitions

The meta – concept

Real servitudes

the definition implies the presence of a dominant and a servient land for the creation of a real servitude and for its transcription in the land registry

IMOLA NATIONAL CONCEPTS TEMPLATE Definitions

The concept

Real servitude:

~~*burden upon a piece of land for the benefit of another piece of land belonging to a different owner.*~~

burden upon a piece of land for the benefit of……

↑ ↑

National law and case law (formants)

Italy	France	Spain	The Netherlands ……and so on……
No dominant land/plot	?	?	?

The formants

Two suggestions:

- General definitions are necessary, but the attributes of concepts must take into account the national formants as components of the definition (and not simply as linked to it), regardless the semantic aspect of the definition.

- Questionnaires are necessary, but alongside yes/no answers the national formants might be showed so as to give dynamicity to IMOLA CONCEPT TEMPLATE.

Blockchain, smart contracts, Internet of Things: Land registration and the data economy

Sjef van Erp

Maastricht University

Blockchain, smart contracts

- 1. Introduction
- 2. What are ‘smart contracts’?
- 3. What is ‘distributed ledger technology’(‘DLT’, or ‘blockchain’)?
- 4. What/who are ‘oracles’?
- 5. Who are ‘trusted third parties’ (‘TTP’)?
- 6. Does Artificial Intelligence (‘AI’) play a role?
- 7. What is the ‘Internet of Things’ (‘IoT’)?
- 8. Legal framework
- 9. Do we still need ‘trusted third parties’?
- 10. Object/subject: a diffuse world
- 11. Summary and conclusions

Blockchain, smart contracts

- Digitalisation of information
- Interconnectivity (Internet)
- Collecting data: big data and databases
- Connecting databases
- Connecting “nodes”
- Self-executing software
- Artificial intelligence

Blockchain, smart contracts

- What do you think of these statements?

  - You are no longer a person, you are your data
  - You no longer exist when you stop adding data to Google's servers
  - Objects and subjects can no longer be clearly separated

Blockchain, smart contracts

"The data they collect includes tracking where you are, what applications you have installed, when you use them, what you use them for, access to your webcam and microphone at any time, your contacts, your emails, your calendar, your call history, the messages you send and receive, the files you download, the games you play, your photos and videos, your music, your search history, your browsing history, even what radio stations you listen to."

Dylan Curran: Are you ready? Here is all the data Facebook and Google have on you (The Guardian)

Blockchain, smart contracts

CODE

and other laws of cyberspace

Lawrence Lessig

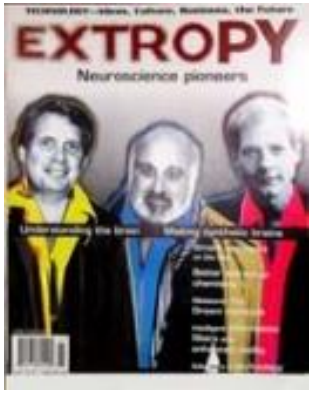
Blockchain, smart contracts

- Two (or more?) worlds:
  - IT and law (Lawrence Lessig ‘code is law’)
  - Standardised (form based, and yes/no) thinking v. reflexive thinking
  - Younger v. older generation
  - Yes or no access to the Internet

Blockchain, smart contracts

- New developments build upon existing architecture:
  - Internet protocols: TCP/IP
  - Blockchain: Examples are Bitcoin, Ethereum
  - ‘Decentralised app’ (‘Dapp’) framework (cf. more traditional apps, such as Gmail or Uber)
  - ‘Dapp’ applications by using these apps

Blockchain, smart contracts



Blockchain, smart contracts

```
1 contract Puzzle{
2   address public owner;
3   bool public locked;
4   uint public reward;
5   bytes32 public diff;
6   bytes public solution;
7
8   function Puzzle() //constructor{
9     owner = msg.sender;
10    reward = msg.value;
11    locked = false;
12    diff = bytes32(11111); //pre-defined difficulty
13  }
14
15  function(){ //main code, runs at every invocation
16    if (msg.sender == owner){ //update reward
17      if (locked)
18        throw;
19      owner.send(reward);
20      reward = msg.value;
21    }
22    else
23      if (msg.data.length > 0){ //submit a solution
24        if (locked) throw;
25        if (sha256(msg.data) < diff){
26          msg.sender.send(reward); //send reward
27          solution = msg.data;
28          locked = true;
29        }}}}
```

Figure 3: A contract that rewards users who solve a computational puzzle.

Blockchain, smart contracts

- 2. Smart contracts: Nick Szabo

  - Self-executing programmes
  - Example: insurance against flight delays