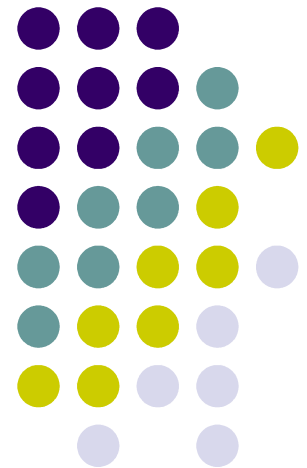


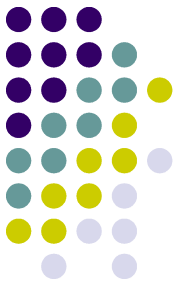
LegalURN

**a framework for organizing and
surfing legal documents
on the web**

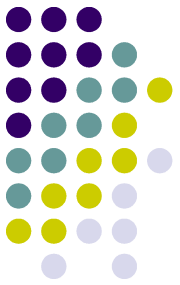
C. Lupo, L. De Santis, C. Batini –
LegalURN: a Framework for Organizing and Surfing Legal Documents on the Web
Centro Nazionale per l'Informatica nella Pubblica Amministrazione (CNIPA) –
Università degli Studi di Milano-Bicocca



Innovation Drivers for the juridical domain

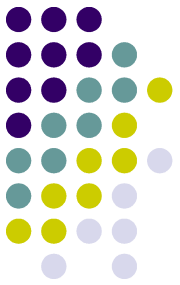


- eEurope
 - Citizens and professionals need to access norms to fulfil their rights and manage their business (*legal data* are defined “essential public data” by the eEurope 2000 Action Plan).
- Decentralization of powers and digitalization of resources need well designed information infrastructures.
- ICTs (e.g., the Internet) are becoming pervasive and enabling technologies.



The NormeinRete project

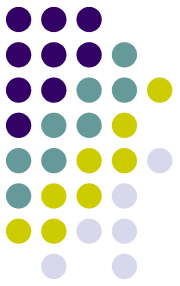
- NormeinRete (NIR) “Norms in the net”
 - is a National project proposed by the Italian Ministry of Justice that involves the most important Italian Public Administrations
- The project aims to
 - reach and maintain high juridical interoperability through standardization
 - **define standards to represent and unambiguously identify laws**
 - for more effective and efficient law searching and consultation functionalities
 - implement innovative tools for law drafting and consolidation
 - realize a cooperative infrastructure for free and comprehensive access to laws through the Internet



NormeinRete project facts

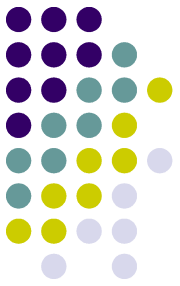
- LegalURN and XML national standards
 - Parsing and automatic hypertexting >97% success
- A legal data management infrastructure
- A web-portal (www.nir.it) that provides
 - official access for searching and browsing the Italian laws
 - juridical documentation, e-learning facilities and software tools
 - Currently NIR portal has more than 4000 visitors and 7000 searches a day

Laws references management



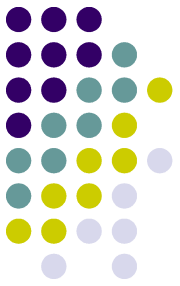
- Legal documents usually contain a lot of references to other legal documents
 - e.g., a law that repeals another law or a norm that modifies some articles of an existing law
- To build the “in force” laws on a matter, users need to navigate among such documents
- References are usually made using a well formalized (natural) language

Laws references management

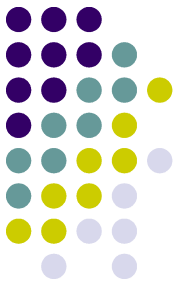


- Computer supported law navigation requires:
 - To “recognize” references to laws
 - To find the “physical address” of laws (if exists)
 - e.g., a law published on the web site of a Ministry
 - To “mark up” the references
- References Marking up is usually managed by means of Uniform Resource Locators (URLs)

URLs are not a good choice!



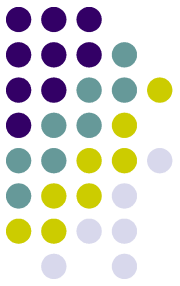
- It can be difficult to know the “location” of a law.
- Over time, **locations can change**, as well as their URLs
- How to refer to enacted laws that have not yet been published?
- A **continuous monitoring** is needed to ensure effectiveness of the hyperlinking mechanism.
- To cope with low quality issues (typos, errors) of legal (web) documents, some **automatic hyperlinking** is needed.



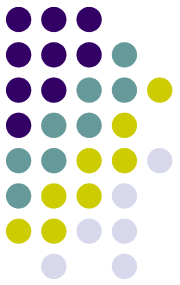
URL vs URN

Characteristic	URL	URN
Uniqueness	Network resource	Law (document)
Persistence	No	Yes
Link maintenance	On documents	Resolution service
Resources access	Direct	Resolution service
Physical resources	One	One or more
Building process	Not applicable	Namespace rules
Automatic linking	Not applicable	Normative references
Actionability	yes	yes
Browser support	yes	No (not yet)

The LegalURN

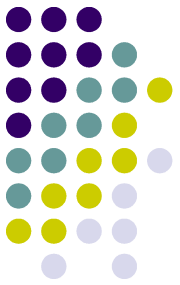


- It is a **standard syntax**
 - to simplify **retrieval** and **navigation** between legal documents in a **distributed environment**.
 - compliant to IETF - URN syntax (RFC2141)
 - officially issued by the Italian Authority for IT in the Public Administration (**AIPA**, now CNIPA)
 - adopted by the most important Italian Public Administrations and Institutions (e.g. Supreme Court of Cassation, the ministry of Justice)
 - more than 100 000 laws (norms, decrees, etc.) unambiguously identified and indexed



The LegalURN /2

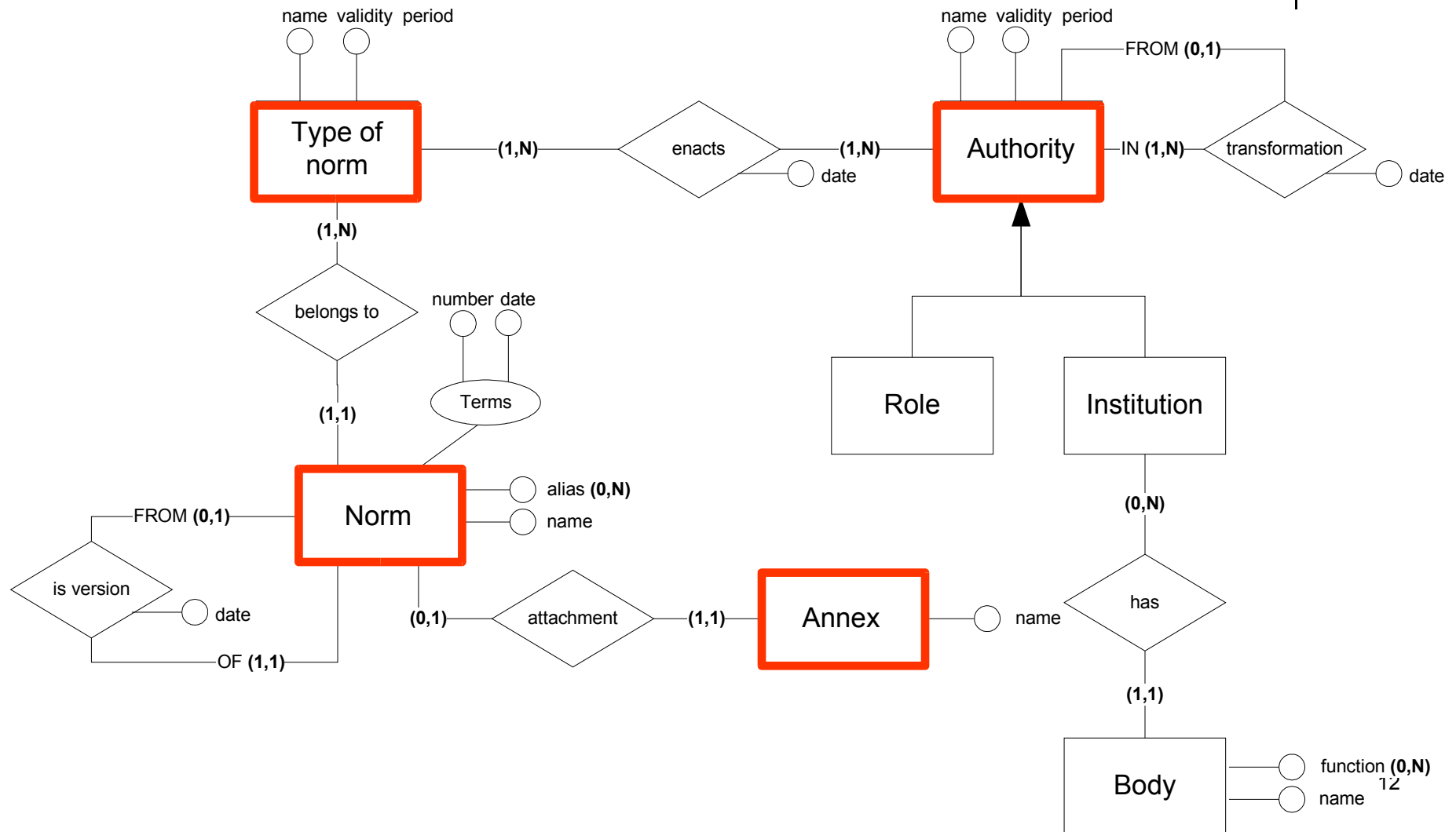
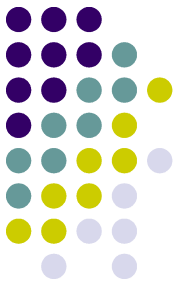
- also the management **infrastructure** by which to register laws as LegalURNs and resolve LegalURNs into physical resources (IP addresses) is made possible.
- so we say it is a **framework** for classifying, organizing and surfing legal documents made available on the web.

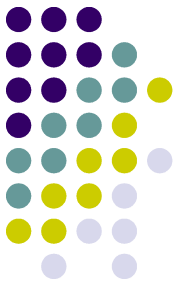


LegalURNs characteristics

- Unambiguousness and Uniqueness
 - Each LegalURN identifies one and only one law (norm) (1:1 relationship)
- Persistency
 - LegalURN system infrastructure ensures the persistence of the identifier
- Actionability
 - By means of them, goals can be reached, actions done.
 - Resolution System allows navigation (searching and browsing) among references
- Intelligence
 - Each element composing the LegalURN is meaningful
 - By analyzing the LegalURN information can be extracted

LegalURN data model





LegalURN syntax (1)

- LegalURN syntax in the last version of the standard:

<URN> ::= urn:nir:<NSS>

“nir” is the Namespace IDentifier (the acronym of the project)

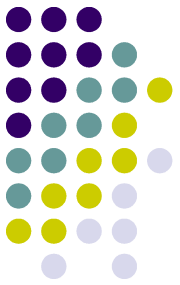
<NSS> is the Namespace Specific String...

Mind: this structure holds for the Italian context.

A national identifier <STT> can be used to extend the notation to handle other national legislative corpus:

<URN> ::= urn:nir:<STT>:<NSS>

<STT> can be ISO 3166 compliant (eg.: DEU for Germany)



LegalURN syntax (2)

- <NSS> is defined as follow:

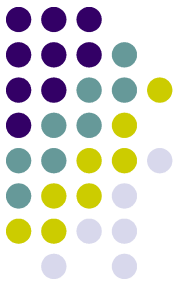
`<NSS> ::= <document>[@<version>]`

- <document> contains the “core” information about the norm resource

`<document> ::= <authority>:<type>:<terms>[:<annex>]`

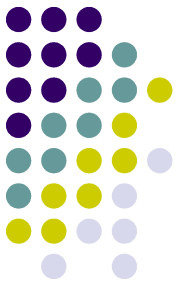
- the <authority> element represents the public institution(s) (or representative roles) that promulgates the norm (e.g., ministry of finance).
- the <type> element represents the typology of the norm (e.g., constitutional law, decree)
- the <terms> contains the promulgation date and a number identifier (usually 'norm number')
- the optional element <annex> is used when the legalURN identifies the annex of a norm
- The optional element <version> allows to manage different versions of the same norm

NIR	AUTHORITY	TYPE	TERMS	ANNEX
-----	-----------	------	-------	-------



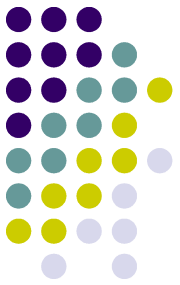
LegalURN semantics

- Rules to build well formed LegalURNs (grammar) are expressed in Backus-Naur Form.
- The grammar satisfies the following requirements:
 - Each LegalURN **uniquely** identifies a law (support for versioning)
 - Rules are easy, unambiguous and self-explanatory
 - LegalURNs can be build **automatically**



LegalURN semantics /2

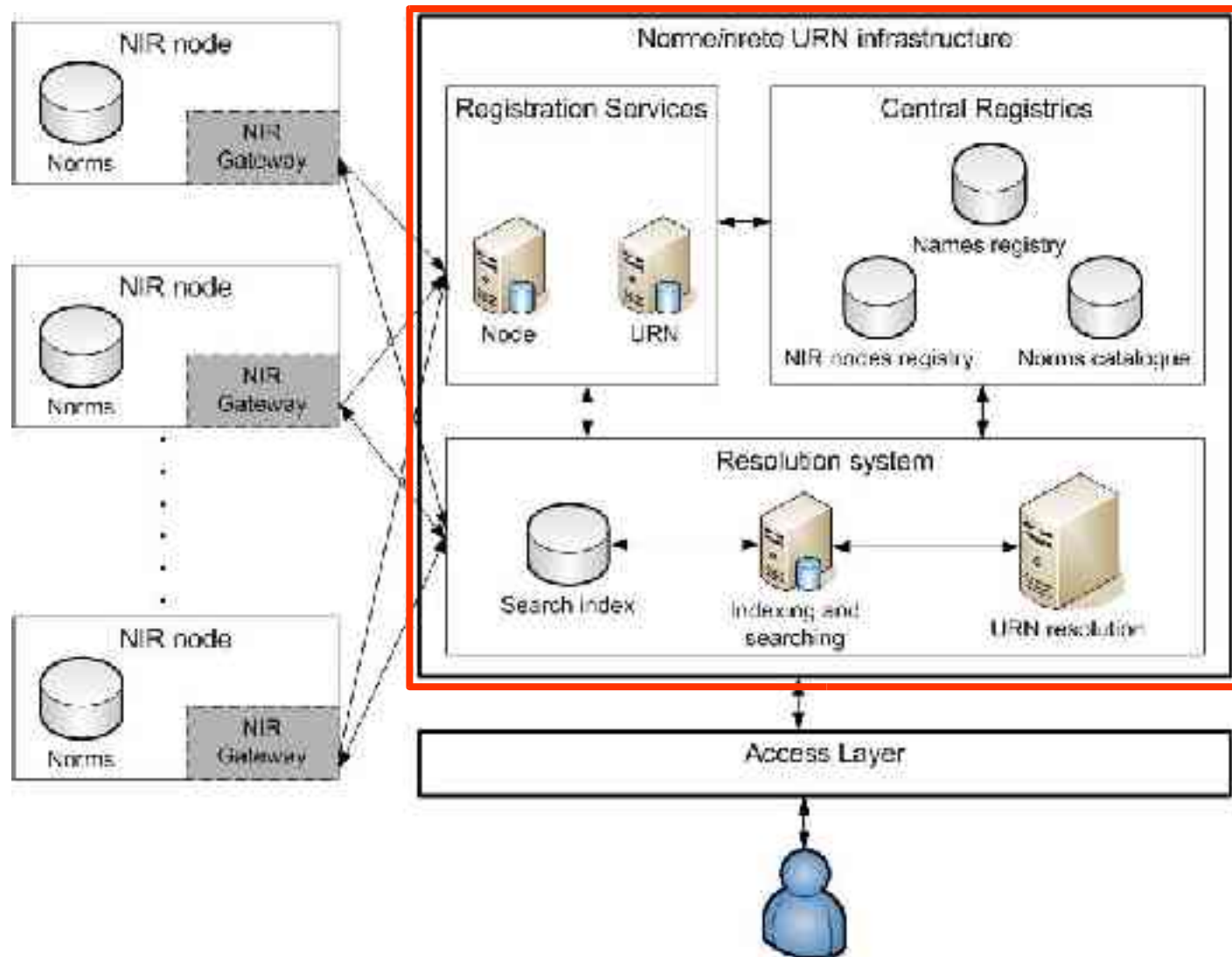
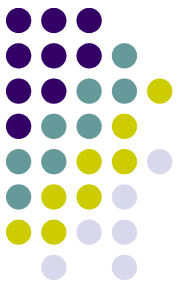
- Syntactic rules alone do not ensure the meaningfulness of LegalURNs
- Possible problems:
 - Semantics of single elements:
`urn:nir:aaaa:bbbb:100-1-1`
 - Intra-elements semantic inconsistency:
`urn:nir:ministry.defense:constitutional.law:1978-4-10;142`
 - Temporal inconsistency:
`urn:nir:ministry.finance:decree:2003-1-12;24`

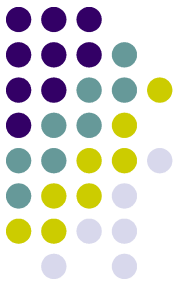


Semantic issues

- We need to limit, if possible, the allowable value sets of LegalURN elements
 - To define rules of **normalization** for URN strings
 - To define **lists** of allowable values for some elements, such as “authority” and “type”
- The value of some LegalURN elements can affect allowable values of other elements
 - The infrastructure must also manage **meta-information** to cope with temporal relationship among authorities, terms and norm typologies

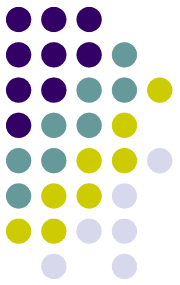
System architecture





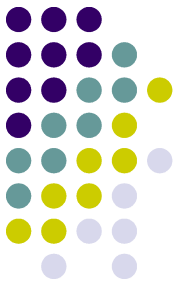
Registration Services

- Administrations/Institutions can register:
 - a norm document (e.g., URL) to a new or existing LegalURN
 - Manual loading of norms: useful to register few norms
 - Metadata related to the norm must be inserted contextually
 - themselves as NIR nodes
 - Automatic loading: useful to register a lot of norms
 - a previous serialization (XML) is needed



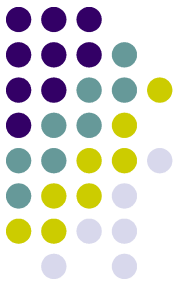
Central Registries

- CRs store the information needed to allow effective standard management
- Three main registries:
 - **Names registry**, containing the information needed to control the semantic consistency of LegalURNs (e.g., lists of allowable authorities, temporal constraints)
 - **Norms Catalogue**, containing a basic set of norm metadata (e.g. title, classification, etc.) and the information needed to resolve LegalURNs (1:many URLs)
 - **NIR-nodes registry**, containing information needed to allow automatic interaction between NIR agents, (e.g., data retrieving Agent and spider Agent, and the application gateways located in each NIR-node)

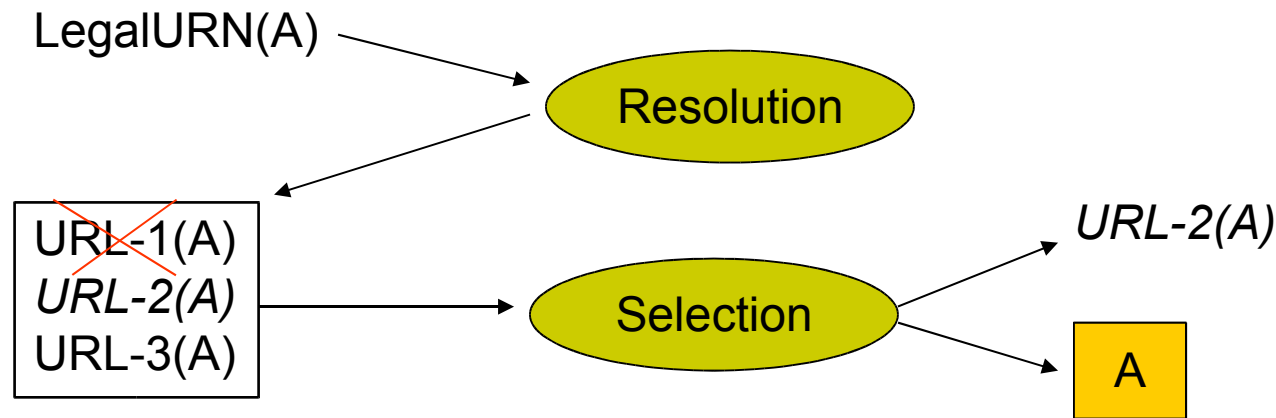


Resolution service

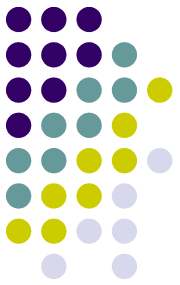
- This service makes LegalURN an actionable identifier.
- Adopts a mechanism quite similar to the Internet DNS
 - However, current implementation is centralized
- Given a LegalURN, a physical resource (either its location or a document) is returned.



Resolution service (2)



- **Selection phase:**
 - When more than one physical resource can be associated with a LegalURN (one (LegalURN) to many (resources) relationship)
 - Simple criteria, such as currency or data source completeness, can be used to select the resource



Conclusion

- LegalURN is a component of a general (Italian) framework, which
 - allows to manage the complete norm life cycle
 - is widely adopted in the Italian context (reliable testbed)
 - is constantly refined by a national working group (public research centres, academic centres, private firms) (e.g., ITTIG, Cirsfid)
- Current work is on
 - support for drafting
 - support for law classification and re-order (laws as an oriented, acyclic graph)
- Future work will on
 - internationalization issues
 - defining a distributed system architecture, especially focusing on the resolution mechanism (decentralized norm catalogue)

Thank you!

Any question?
Any comment?

