From Narrative Contracts to Electronic Licenses: A Guided Translation Process for the Case of Audiovisual Content Management

Víctor Rodríguez, Jaime Delgado, Eva Rodríguez

Narrative Contracts and Electronic Licences


```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<r:license xmlns:r="urn:mpeg:mpeg21:2003:01-REL-R-NS"
    ...    ="http://www.w3.org/2001/XMLSchema-instance"
xsi:schem...    ="urn:mpeg:mpeg21:2003:01-REL-R-NS
./schemas/rel...    urn:mpeg:mpeg21:2003:01-REL-SX-NS
./schemas/rel-s...    :mpeg:mpeg21:2003:01-REL-MX-NS
./schemas/rel-mx...
  <r:grantGroup>
    <r:grant>
      <r:keyHolder>
        <r:info>
          <dsig:KeyNa...
xmlns:dsig="http://www.w...    00/09/xmldsig#">DemoEndUser</dsig:
KeyName>
        </r:info>
      </r:keyHolder>
      <mx:play xmlns:mx...    mpeg21:2003:01-REL-MX-NS"/>
      <r:digitalResource>
        <r:nonSecureIndire...
URI="urnaxmedis00000obj36ed2d7040504fcca05112a74322ee14"/>
      </r:digitalResource>
      <r:allConditions>
        <sx:territory xmlns:sx="urn:mpeg:mpeg21:2003:01-REL-SX-
NS">
          <sx:location>
            <sx:country xmlns:iso="urn:mpeg:mpeg21:2003:01-REL-
SX-NS:country">iso:CN</sx:country>
          </sx:location>
        </sx:territory>
      </r:allConditions>
    </r:grant>
  </r:grantGroup>
  <r:issuer>
    <r:keyHolder>
      <r:info>
        <dsig:KeyName
xmlns:dsig="http://www.w3.org/2000/09/xmldsig#">DemoDistributor</d
sig:KeyName>
```
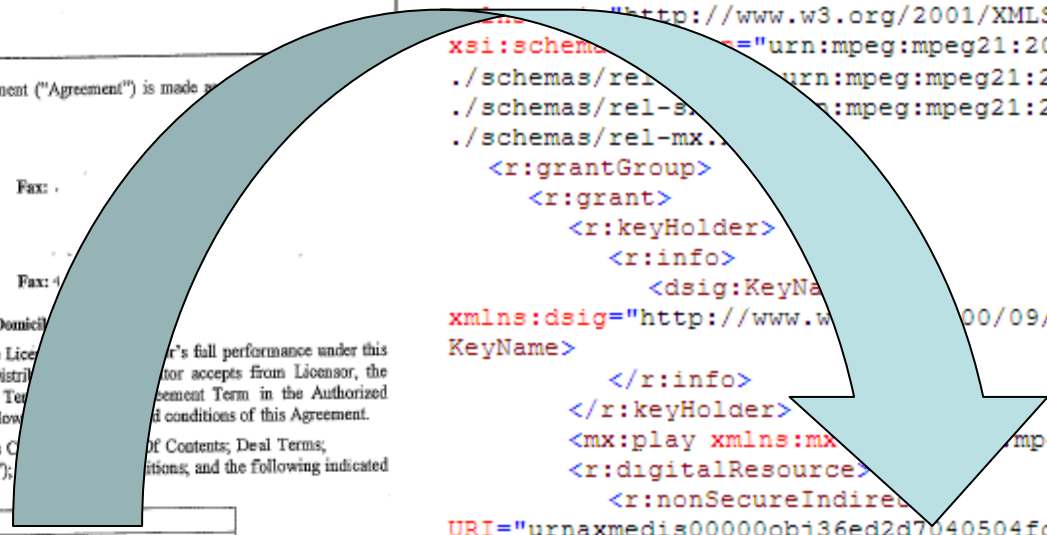
Agreements along the Value Chain
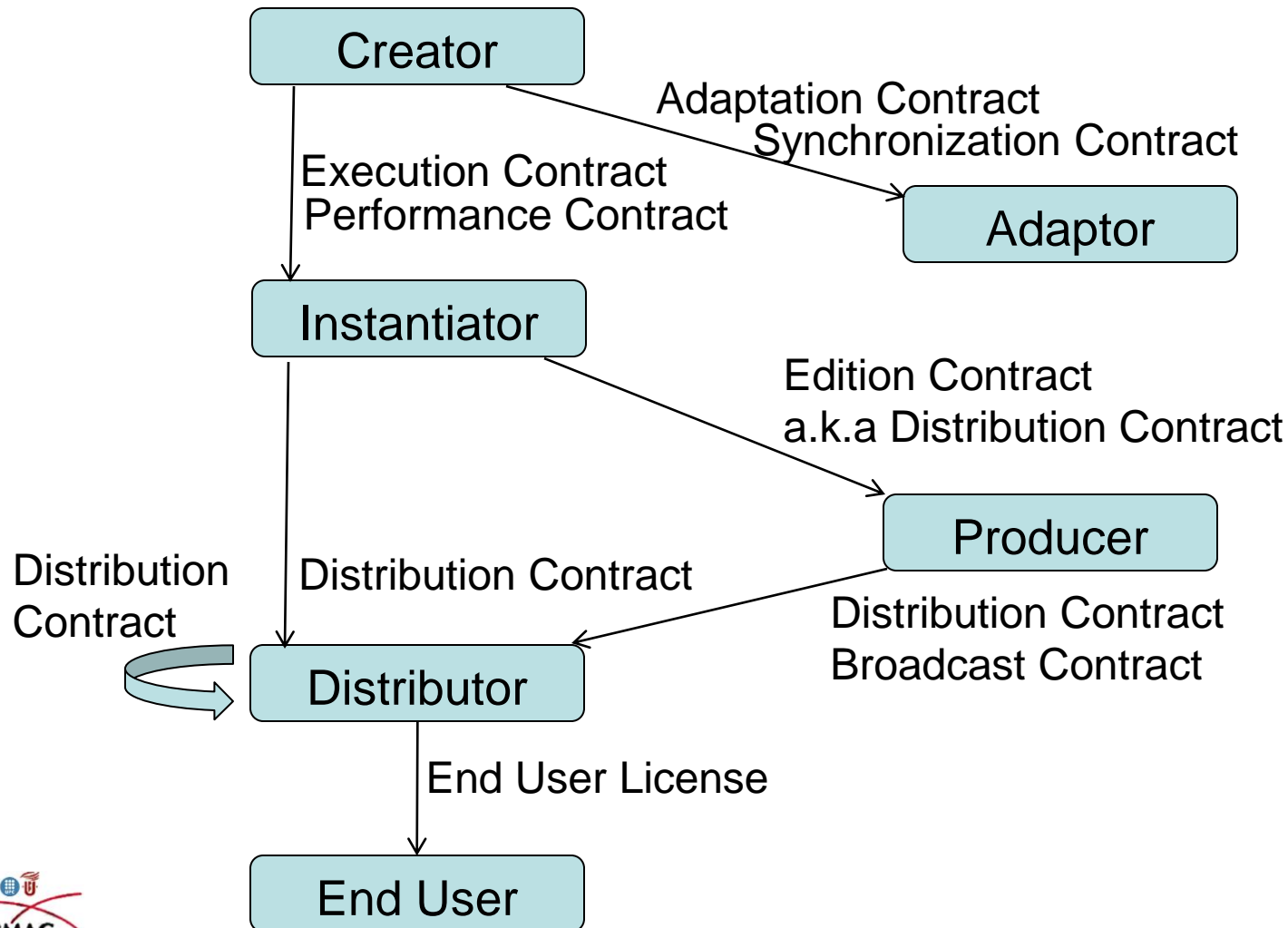
Benefits of having electronic contracts

- Potentially faster contract negotiation
    - Two parties can negotiate contracts with external software
- Allows exporting contract management data
    - Obligations at certain times can be integrated with external applications: calendar, project management, payments etc.
- Allows better storage of precedent contracts
    - Lawyers use to re-cycle clauses from previous contracts, and it is better managed from electronic contract
- Expressivity is far poorer, but ambiguity dissapears
    - Clauses are classified and help understanding of contracts
- As an electronic *license*, the keystone of DRM
    - Governing authorisation systems like the Axmedis' one

Do current REL licenses suffice?

- MPEG-21 REL or OMA licenses act effectively already as *electronic contracts* governing DRM systems, but…

Do REL licenses suffice?

Classification of Contract Clauses

- Assertions: *claim.* Deontic logic: *permission, duty, ban.*

	MAY	*MUST and MUST NOT*
Licensor	permission of the licensor	duties and bans of the licensor
Licensee	permission of the licensee	Duties and bans of the licensee

- REL License
  - Metadata
  - Rights
  - Conditions

	A (Licensor)	B (Licensee)
Claim	SOMETHING IS	
Grant	**B MAY**	A MAY
Ban	A MUST NOT	B MUST NOT
Duty	A MUST	**B MUST**

Contracts in the MPEG-21 terminology

	Contracts jargon	*MPEG-21 jargon*
Grant	Rights	Rights
	Term and Territory	Conditions (Term, Territory)
Fee	Payments	Conditions (Fee)
Parties	Licensor	Issuer
	Licensee	Principal
Object	Text reference	Resource (URN, ID)
Signature	Handwritten signature	Digital Signature
Metadata	Date	Date
	Title	Title
Rest of clauses	Jurisdiction, Termination, Breachment, Warranties, Disclaimers, Reporting, Confidentiality, etc.	Other Info

Enforceable / not enforceable

	Contracts jargon	MPEG-21 jargon
Grant	Rights	Rights
	Term and Territory	Conditions (Term, Territory)
Fee	Payments	Conditions (Fee)
Parties	Licensor	Issuer
	Licensee	Principal
Object	Text reference	Resource (URN, DigitalItem)
Signature	Handwritten signature	Digital Signature
Metadata	Date	Date
	Title	Title
Rest of clauses	Jurisdiction, Termination, Breachment, Warranties, Disclaimers, Reporting, Confidentiality, etc.	Other Info

MPEG-21 REL license structure
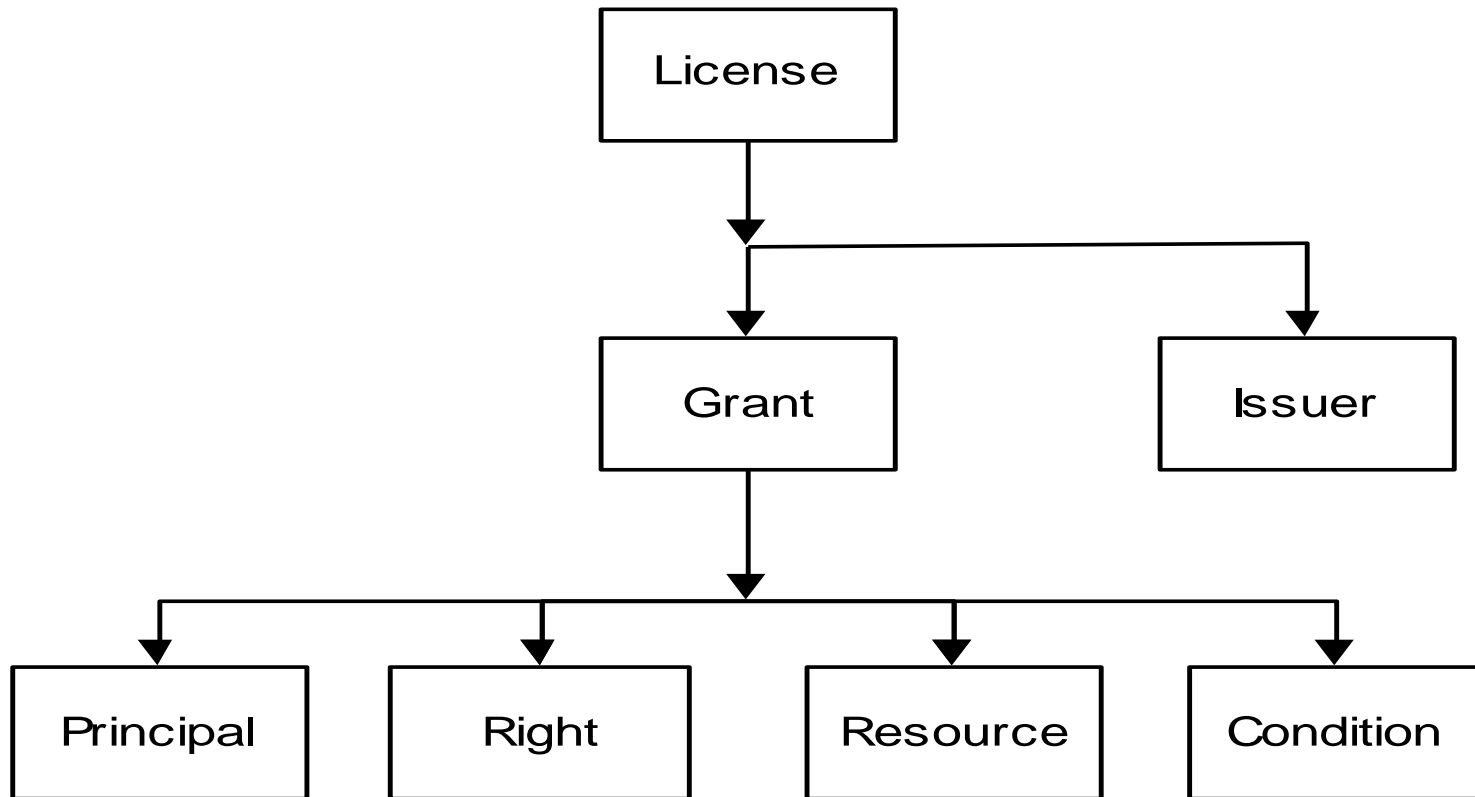
Evaluation of REL as contract expression

- Evaluated over 40 real narrative contracts in the multimedia market
- All the segments in the Value Chain

- Classify the clauses according to the table
- Do REL rights match contract rights?
- Do REL conditions match contract conditions?

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Rights expressed in REL

MPEG-21 REL rights core, multimedia

issue	extract	reduce
revoke	embed	move
possessproperty	play	adapt
obtain	print	uninstall
modify	execute	delete
enlarge	install	

- Defined in a Rights Data Dictionary (MPEG-21 RDD)
- Ignored here: mx1,mx2 defined for the MAM and DAC profiles etc.

Most common rights appeared in contracts

Reproduce	Broadcast	Adapt	Lease
Download	Copy	Convert	License
Upload	Print	Transcode	Promote
MakeAvailable	Record	Remix	Stream
PubliclyPerform	Modify	Distribute	
Exhibit	Translate	Sell	
Transmit	Dub	Advertise	

Mapping Contracts Rights To REL Rights

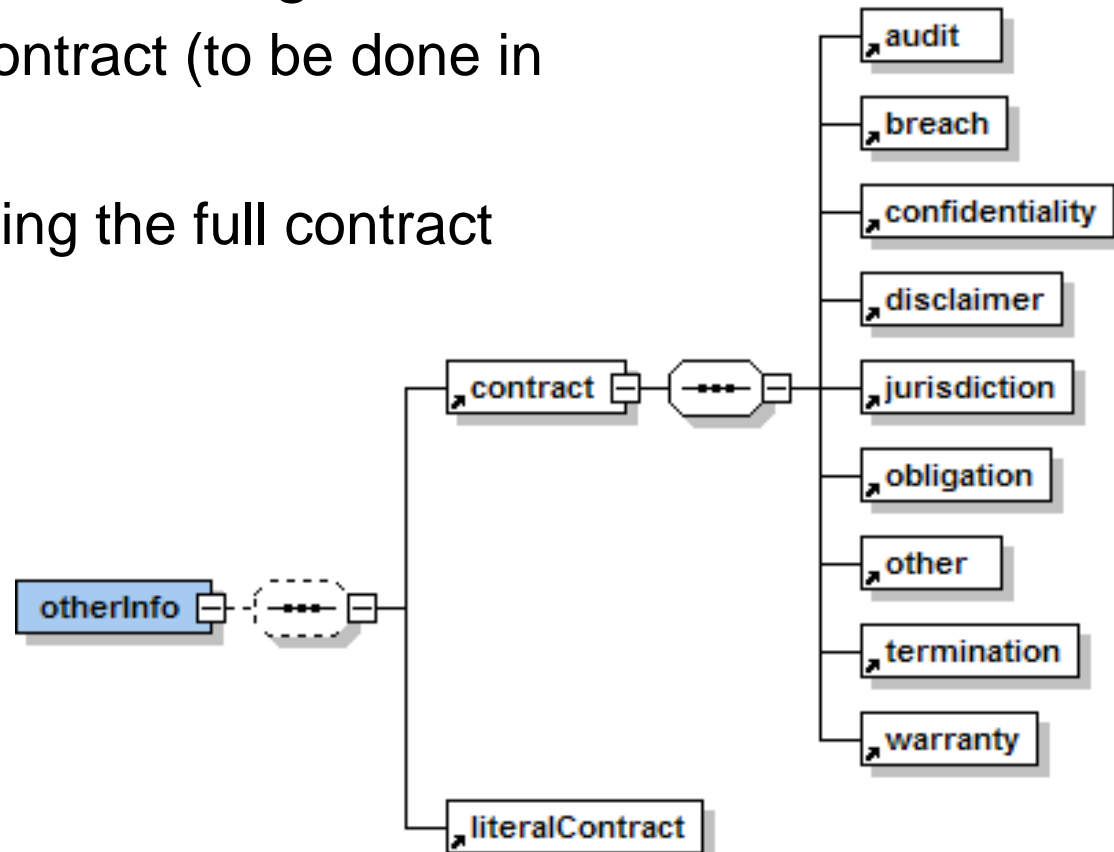| CONTRACT	MPEG-21 REL	CONTRACT	MPEG-21 REL	CONTRACT	MPEG-21 REL
reproduce	axm:reproduce	dub	axm:dub	record	axm:record
download	m1x:governedCopy	adapt/edit	mx:adapt	modify	mx:modify
upload	m1x:governedMove	convert	mx:adapt or mx:modify	translate	axm:translate
make available	r:issue	transcode	mx:adapt or mx:modify	synchronize	axm:synchronize
perform	axm:perform	remix	axm:remix	license	r: issue r:delegationControl
exhibit	axm:perform	distribute	r: issue	sub-license	r: issue r:delegationControl
transmit	axm:transmit	sell	r:issue (sx:FeeFlat | sx:FeeMetered | sx:FeePerInterval | sx:FeePerUse | sx:FeePerUsePrePay)	promote	axm:promote
broadcast	axm:broadcast			lease	Right + Payment Condition + validityInterval
copy	m1x:governedCopy	advertise	r: obtain and axm:publicize	print	mx:print
publish	axm:publish				

Conditions expressed in REL

- More difficult to represent than rights
- Many cannot be enforced
- MPEG-21 REL: 24 conditions, not defined in RDD

Most common conditions in REL	Conditions in contracts	
Term	Exclusivity	Term
Territory	Reporting	Territory
Number	Many fee types	Format
Fee	Auditing	Content type

Enforcement of clauses

- **Enforceable information (at least potentially), goes in the REL license**

- **Non-enforceable information, goes in the otherInfo field**
  - Formated in a XML contract (to be done in
  eContracts format)
  - As a text field containing the full contract

Conclusion

- MPEG-21 REL has a proper structure to represent a contract…

- … but it lacks sufficient rights and conditions as to model narrative contracts.

Extensibility of MPEG-21 REL

- ## Use of existing rights plus conditions
  - The concept must be derived, attributes may be used

- ## Use `rightUri`.
  - An sx:RightUri indicates a right using a URI rather than an XML Schema element or type. Right definition: *URI value* of its attribute `definition`.
  - `<sx:rightUri definition="urn:mpeg:mpeg21:2002:01-RDD-NS:2348"/>`

- ## Use Type Extension (`xsi:type`)
  - `<r:right xsi:type="acme:Copy"/>`

- ## Use Element Extension (substitutionGroup)
  - Derivations of the type r:Right
  - Substitutions of the element r:right in REL, via a W3C XML Schema extension mechanism, `xsd:substitutionGroup`, that is built in the W3C XML Schema etc.
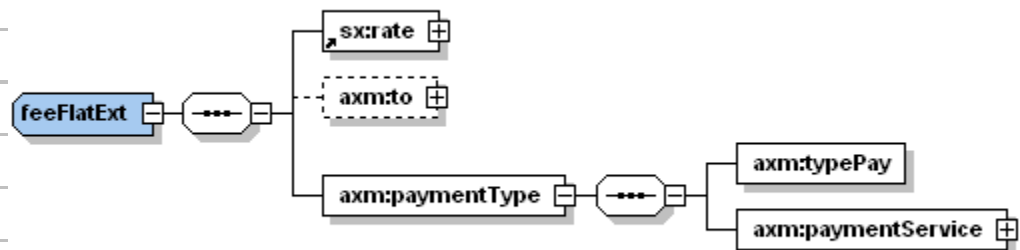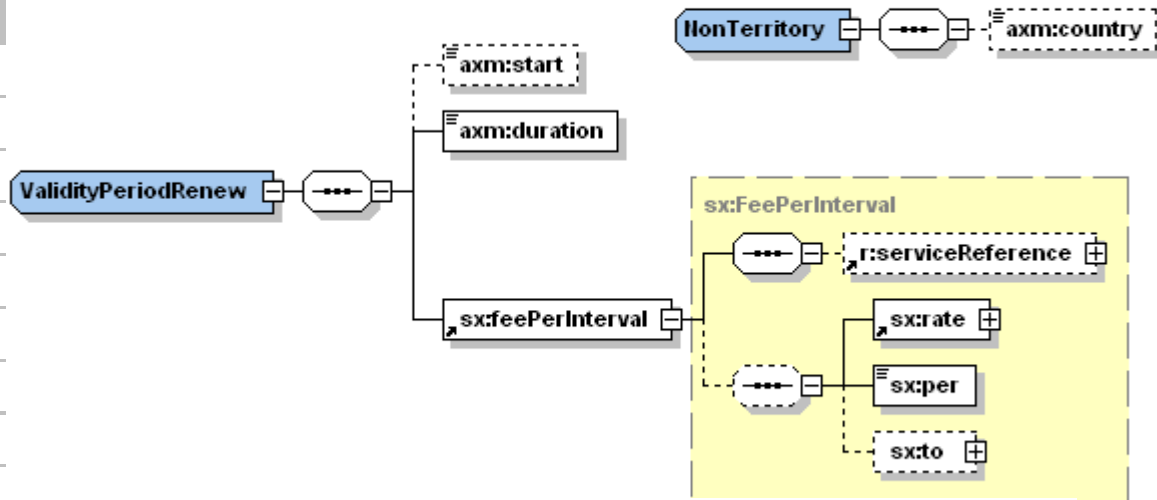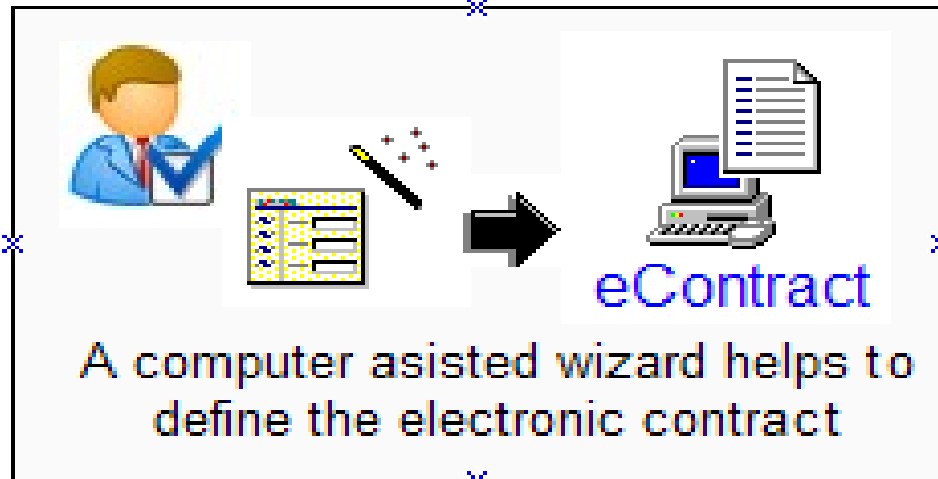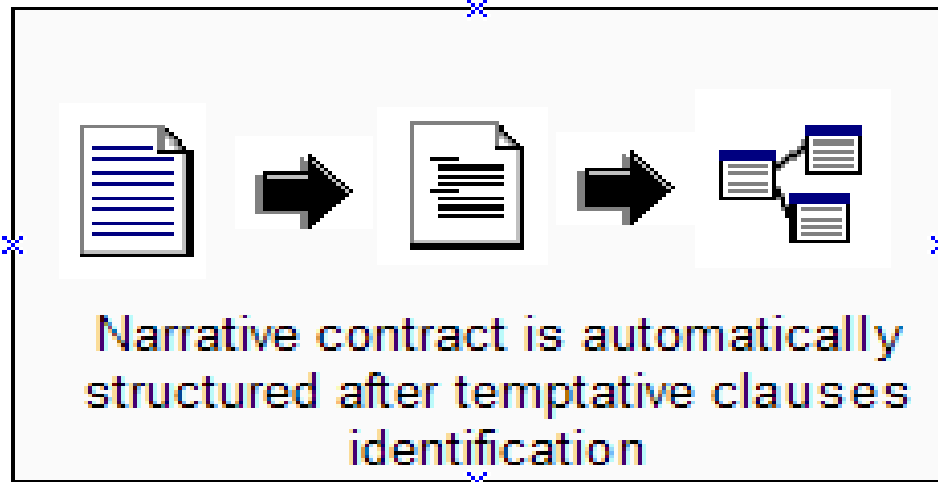
Tasks to do

- How to make the extension of MPEG-21 REL
  - XML Schema

- How to develop a new application on electronic contracts
  - Narrative contracts in XML 'as tagged-format' contract
  - From tagged-formats to electronic license

Extension of REL for contracts

From contracts to licenses (eContracts)

Narrative contract is automatically structured after temptative clauses identification

A computer asisted wizard helps to define the electronic contract

Step 1: Analyze the text contract

- **Goal: Given a narrative contract, to achieve a XML structure for the clauses**
- Contract is converted from its original format into a text file
  - Some information may be lost (pictures in a PDF etc.)
  - Empty lines are normalized
- Clauses are separed (paragraphs) and stored as clauses
- A minimal Natural Language Processing is done to identify kinds of clauses

Step 2: From XML contract to license

- **Goal: Given a XML contract, to achieve an Exteded MPEG-21 REL License**

- The user must conform the license terms, assisted by the temptative computer recognition of the previous step

- The elements of the MPEG-21 REL licenses are filled

- Note: The XML contract should adhere to a standard, of which the OASIS eContracts is the newest and most authoritative

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State of development

- Still in course, within the context of the Axmedis project.
  - The concept analysis and design has been carried out.
  - Most of the required modules are ready, excepting eContracts XML format writer
  - A first test prototype has been done
  - Pending to finish the implementation and test

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