Standardisation initiatives around Digital Rights Management

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IPR Issues (2/2)

- …
- Negotiation: Protocol
- Agreement: Contract
- Control : Passive and active

MANAGEMENT

Multimedia content

- Identification
- Description
- Coding
- Business Models
- Distribution / Communication
- **Digital Rights!** (IPR, Intellectual Property Rights)

IPR Issues

- **Representation: Metadata**
- Negotiation: Protocol
- Agreement: Contract
- Control : Passive and active

IPR Issues (1/2)

- Protection: Watermarking, …
- Information representation:
  - Metadata
  - Rules *(Rights expression language)*
  - Dictionary *(Rights Data Dictionary)*

Metadata for Multimedia Content

- **Different approaches for different applications.**
- **Examples of initiatives:**
  - **Dublin Core:** Widely used. Originated in libraries
  - **IEEE LOM:** For educational material
  - **MPEG-7:** Focus on audiovisual material
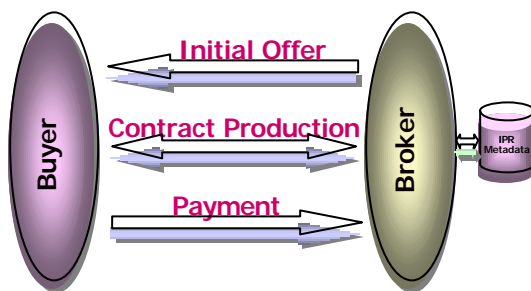- **Interoperability problem.**
- **IPR specific?**

IPR Issues

- Representation: Metadata
- **Negotiation: Protocol**
- Agreement: Contract
- Control : Passive and active

IPR Issues

- Representation: Metadata
- Negotiation: Protocol
- **Agreement: Contract**
- Control: **Passive and active**

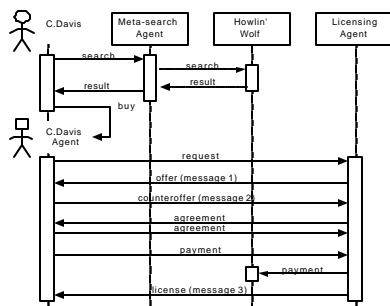## IPR Negotiation

Standardisation on DRM

- Information representation:
  - Metadata
  - Rules
    (*Rights expression language*)
  - Dictionary
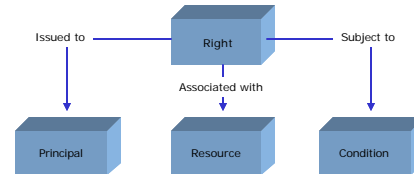   (*Rights Data Dictionary*)

Negotiation example

Different initiatives

- \<indecs\> 2 rdd
- XrML
- ODRL
- MPEG-21
- Others
- IPR ontology

<indecs> 2rdd Project

- *<indecs> 2 Rights Data Dictionary* Consortium based in previous <indecs> Project
- Objective: Interoperability of metadata
- Logical Data Models
  - *Context Model:* Basic structure for descriptions of Rights and Permissions. Action Model based.
  - *Resource Model:* Resource-based descriptive metadata
  - *Ascriptive Model:* Relationships between descriptive metadata and rights metadata at the semantic level

XrML Data Model

<indecs> 2rdd Context Model
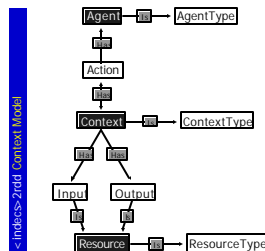
Open Digital Rights Language

- Expressions rights language and definitions of elements in the data dictionary
- ODRL Foundation Model (core entities):
  - *Assets:* Physical or digital content
  - *Rights:* Permissions which can contain Constraints, Requirements and Conditions
 - *Parties:* End Users and Rights Holders

eXtensible rights Markup Language

- **XrML** is a general purpose language based in XML to describe rights and conditions for using digital resource.
- XrML Data Model
  - *License:* Container of grants
  - *Grant:* Conveys to a principal the right to use a resource subject to certain conditions
  - *Principal:* Identify a resource
  - *Right:* Action that the principal may perform on or using the associate resource
  - *Resource:* Object to which the principal can be granted a right
  - *Condition:* Something that must exist before a right can be exercise or granted

ODRL Foundation Model

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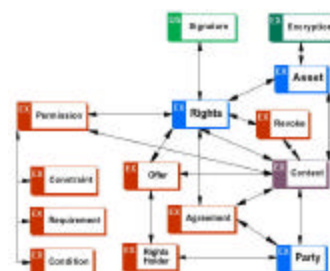
Open Digital Rights Language

- ODRL Foundation Model for rights expressions
  - Permissions: Usage, Reuse, Transfer and Asset Mangement
  - Constraints: User, Device, Bounds, Temporal, Aspect, Target and Rights
  - Requirements: Fee, Interactions and Usage
  - Conditions: Permission and Constraint
  - Rights Holders: Royalty (Percentage, Fixed Amount)
  - Contexts: UID, Name, Role, Remark, Version, Date Time, Event, Physical Location, Digital Location, etc.
  - Offers: Asset, Rights Holder, Permission and Context
  - Agreements: Asset, Party, Permissions and Context
  - Revoking Rights: Context
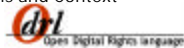
MPEG-21
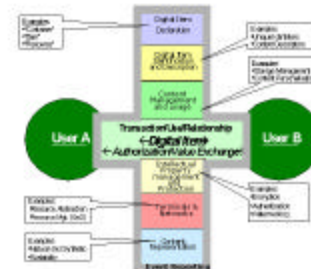
MPEG

Working Group ISO/IEC
Development of standards for coded representation of digital audio and video

- **Moving Picture Experts Group**
  - MPEG-1: Standard for storage and retrieval of moving pictures and audio on storage media
  - MPEG-2: Standard for digital television
  - MPEG-4: Standard for multimedia applications
  - MPEG-7: Standard for description and search of audio and visual content
  - **MPEG-21: Multimedia Framework**

MPEG-21 Multimedia Framework

- Part 1: Vision, Technologies and Strategy
- Part 2: Digital Item Declaration
- Part 3: Digital Item Identification and Description
- **Part 4: Intellectual Property Management and Protection (IPMP)**
- **Part 5: Rights Expression Language (REL)**
- **Part 6: Rights Data Dictionary (RDD)**

MPEG-21 Multimedia Framework

- **MPEG-21 Key Elements:**
  - Digital Item Declaration
  - Digital Item Identification and Description
  - Content Handling and Usage
  - **Intellectual Property Management and Protection (IPMP)**
  - Terminals and Networks
  - Content Representation
  - Event Reporting

MPEG-21 and DRM

- **Call for Requirements**
- **Call for Proposals** (March – Dec. 2001)
  - *Rights Data Dictionary* (**RDD**)
  - *Rights Expression Language* (**REL**)
- **Fulfil Requirements for Standard development**
- **Model to support the creation of a RDD and REL useful for Standard development**

Different initiatives

- <indecs> 2 rdd
- XrML
- ODRL
- MPEG-21
- **Others**
- IPR ontology

IPR ontology

- Existing initiatives use a syntactic approach (hidden semantics not machine-readable).
- MPEG syntactic approach (XML-Schema).
- Syntactic to semantic level ✍ avoiding ambiguity and better interoperability of approaches.
- Development of a full **ontology** (expressed in RDF) that helps structuring IPR information and still allows to get a XML Schema and a Rights Data Dictionary?

Other initiatives

- The Open eBook Forum (OeBF)
  - Digital Rights Management Strategy WG
- Publishing Requirements for Industry Standard Metadata (PRISM):
  - XML metadata standard
- OASIS Rights Language TC (XrML)

IPR ontology

- Development by **UPF – DMAG**, *http://dmag.upf.es*
- IPR ontology to formalise the IPR domain (Semantic Web approach). It describes:
  - IPR contracts, actors, intellectual property creations, rights, etc.
  - Complete metadata framework.
  - Textual expression of semantics.
  - Rights data dictionary.
  - RDFSchema, DAML+OIL, ...

Other initiatives

- TV-Anytime Forum
  - Working Group on Rights Management and Protection
- Digital Video Broadcasting (DVB)
  - Content Protection & Copy Management
  - Conditional Access
- Secure Digital Music Initiative (SDMI)

IPR content life cycle
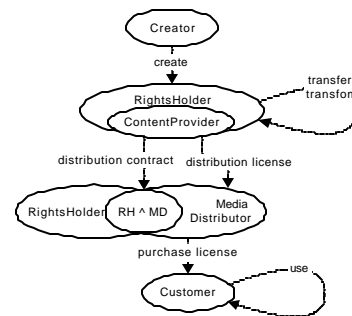
IPROnto

Rights transfer event

IPROnto

RDFSchema

IPROnto

Distribution contract event
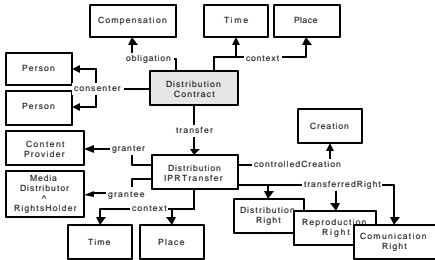
Conclusions

- Digital Rights (IPR) management:
  - Representation, Negotiation, Control, …
- Rights Expression Languages
- Rights Data Dictionaries
- Many unrelated initiatives
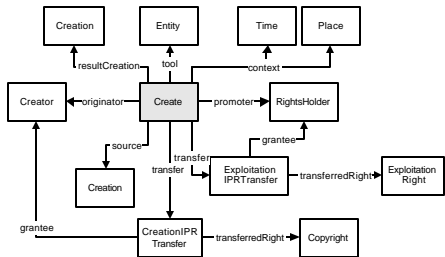- MPEG-21?
- IPR ontology? **IPR knowledge management!**

IPROnto

Creation event

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