Standardisation initiatives around Digital Rights Management

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23rd April 2002

Multimedia content

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

IPR Issues

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

IPR Issues (2/2)

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

MANAGEMENT

IPR Issues (1/2)

- Protection: Watermarking, ...
- Information representation:
  - Metadata
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IPR Issues

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

MANAGEMENT

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 Negotiation**

- Initial Offer
- Contract Production
- Payment

**Standardisation on DRM**

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

**Different initiatives**

- <indcs> 2 rdd
- XrML
- ODRL
- MPEG-21
- Others
- IPR ontology
2rdd Project

- 2 Rights Data Dictionary Consortium based in previous 2rdd Project
- Objective: Interoperability of metadata
- Logical Data Models
  - Resource Model: Resource-based descriptive metadata
  - Ascriptive Model: Relationships between descriptive metadata and rights metadata at the semantic level

XrML Data Model

- Issued to
- Right
- Subject to
- Associated with
- Principal
- Resource
- Condition

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

XrML Data Model

- Right
- Resource
- Condition
- Principal

ODRL Foundation Model

- Signature
- Description
- Asset
- Rights
- Permission
- Condition
- Requirement
- Agreement
- Party
Open Digital Rights Language

- ODRL Foundation Model for rights expressions
- Permissions: Usage, Reuse, Transfer and Asset Management
- 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

Moving Picture Experts Group
Development of standards for coded representation of digital audio and video

- 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 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**

- Creator
- RightsHolder
- ContentProvider
- Distributor
- Distribution contract
- Distribution license
- Customer
- Purchase license
- RDF
- Transfer
Digital Rights (IPR) management:
- Representation, Negotiation, Control, ...
- Rights Expression Languages
- Rights Data Dictionaries
- Many unrelated initiatives
- MPEG-21?
- IPR ontology? IPR knowledge management!

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