AXMEDIS Tutorial on Content Production

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References, Info & Contacts
Tutorial presentation (I)

- Rationale
  - Open to all and based on AXMEDIS 2005 Content production tutorial
  - Adopts examples selected to explain both the process modifications and related benefits
  - Limits & constraints are pointed out to keep a fair and concrete perspective.

Tutorial presentation (II)

- Intended audience
  - Decision makers
  - Technical managers

- Prerequisites
  - Basic knowledge of Production cycle & tools
  - Basic knowledge of Protection tools
Objectives & Outcomes (I)

- Objectives
  - Recall overall content production process
  - New tools location in the process
  - Hints & suggestions on environment set-up
  - AXMEDIS content production framework usage know-how

Objectives & Outcomes (II)

- Outcomes
  - AXMEDIS & MPEG-21 models know-how
  - AXMEDIS & MPEG-21 license know-how
  - AXMEDIS content production know-how
  - SMIL editing know-how
  - Content descriptors/fingerprint & metadata usage know-how
The context

Content Production & AXMEDIS

Objectives
- Recall overall content production process
- New tools location in the process
- Hints & suggestions on environment set-up

Outcomes
- AXMEDIS relation to standard content production context know-how
The process

AXMEDIS Environment
Environment set-up (I)

- Preliminary actions
  - Retrieve install requirements & documentation
  - Organise work environment following requirements (HW/SW)
  - Organise needed space and infrastructure

- Select and download tools
  - Identify needed tools and related install pack
  - Download the install pack

Environment set-up (II)

- Install tools
  - Follow install pack instructions (automatic configuration recommended)

- Configure tools
  - Insert required data for custom configurations or wherever needed

- Get acquainted with user interface & commands
  - Read available documentation, suggestions, tips and FAQs
  - Look at provided examples
Content production – Intro

Starting from Own or Acquired Content

Objectives
- Recall of production process based on own content
- Recall of production process based on acquired content
- Exposition of differences among the two approaches

Outcomes
- AXMEDIS relation to standard content production context know-how
Production from own content

The search for similar titles/products is aimed to prevent IPR infringement and allow proper IPR protection, licensing and enforcement.

Each stage of product acceptance represents the start for a new IPR management step, from copyrighting to licensing and enforcement.

Production from acquired content

As in previous case the search for similar titles/products is aimed to prevent IPR infringement and allow proper IPR protection, licensing and enforcement.

Each stage of product acceptance represents the start for a new IPR management step, from copyrighting to licensing and enforcement.

IPR is external therefore focus is on clearance due to lack of it may cause great damage (including product abort), yet protection of work done has to be taken carefully into account. Copyrighting, Licensing and enforcement are still possible.
Content production – Detail

From models to tools usage

Objectives

- Recall of basic & AXMEDIS principles
- New tools presentation & location in the process
- Hints & suggestions on AXMEDIS content production framework usage

Outcomes

- AXMEDIS & MPEG-21 models know-how
- AXMEDIS content production know-how
- SMIL editing know-how
- Content descriptors/fingerprint & metadata usage know-how
AXMEDIS Model – Definitions

- **AXMEDIS Objects**
  - MPEG21 Digital Item with a specific structure
  - Can be protected
  - Has several kinds of metadata
  - Can embed or refer resources and other AXMEDIS objects

- **AXMEDIS Objects Kinds**
  - Basic – with resources and the related metadata
  - Composite – containing / referencing other Basic or Composite AXMEDIS Objects

AXMEDIS Model – Singularities

- **Structure**
  - Hierarchical with one level for resources
  - Hierarchical with more levels for embedded AXMEDIS objects

- **Protection**
  - Only AXMEDIS Objects can be protected

- **Metadata**
  - Only AXMEDIS Objects have metadata not their components
  - AXMEDIS Objects metadata are always accessible
AXMEDIS Object structure

- **AxObject**
  - **AxOID**
  - **AxMetadata**
  - **AxContent**
  - **AxInfo**
  - **AxDublinCore**
  - **AxResource**

- **MPEG-21 Digital Item**
  - resource embedding
  - hierarchical composition
  - external content referencing

- **content description** special B2B metadata

- **unique identification**
- **mandatory**

AXMEDIS Object example

- AXMEDIS view
- MPEG-21 view

- AXMEDIS Object
- AxOID
- AxMetadata
- AxContent
- AxInfo
- AxDublinCore
- AxResource

- resource embedding
- hierarchical composition
- external content referencing

- unique identification
- mandatory

- content description special B2B metadata
The AxInfo part of the metadata contains B2B and AXMEDIS specific information like:

- ObjectCreators (ID, Name, Company, Nationality, etc.)
- Owner (ID, Company etc.)
- Distributor (ID, Name, Company, etc.)
- Object version & revision
- ObjectStatus, ObjectType
- IsPromoOf (AXOIDs)
- History of object production

Furthermor AxInfo contains specific information like:

- Workflow information
- Fingerprints algorithms used
- Internal Potential Available Rights (the rights owned)
- Potential Available Rights (the rights on sell)
- Metadata certification and status
Metadata – Dublin Core (I)

Dublin Core Metadata are a standard set of metadata usable for multimedia cataloguing, comprising 15 basic elements:

- title
- creator
- contributor
- description
- coverage
- format
- date
- Identifier
- language
- publisher
- rights
- source
- subject
- type
- relation

Dublin Core Metadata comprises also other and derived elements:

- abstract
- audience
- available
- conformsTo
- dateAccepted, ...

Metadata Example (DC)
Metadata & object querying

Metal data will be always accessible for indexing and querying.

AXMEDIS Object: an example

Metadata will be always accessible for indexing and querying.
AXMEDIS Object Manager

Execution of commands:
- add, delete, ...
- change resource
- edit metadata
- save, upload on DB

DRM enforcement

Trusted manipulation

On-the-fly unprotection

AXOM

Data access
Resource streaming

Object

Protected Object

Protected Object

Metadata

Resource

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AXMEDIS Editor

- **Objectives**
  - Definition of AXMEDIS Editing suite
  - New tools presentation & location in the process

- **Outcomes**
  - Understanding of AXMEDIS Editor
  - Usage of AXMEDIS Editor
  - Embedding Digital Resources know-how
  - Integration and composition know-how of
    - SMIL
    - HTML
    - MPEG-4....
The AXMEDIS Editor is an application allowing:
- manual production of AXMEDIS objects
- inspection of automatically produced objects
- finishing AXMEDIS objects pre-produced automatically

### AXMEDIS Editor – Functionalities

It integrates many Editors & Viewers to handle all the aspects of the AXMEDIS Objects production:
- Resource
- DRM
- Protection
- Presentation
- Annotation
- Metadata
- ...  
- Workflow
AXMEDIS ActiveX / plug-in(s)

Purpose
- Fruition of AXMEDIS Objects within other Windows applications and web pages

Functionalities
- Show resources inside AXMEDIS object
- Hide/show AXMEDIS Hierarchy
- Control resources fruition

AXMEDIS Player Mozilla plug-in

Purpose
- Display protected content into HTML pages
- Use Java-script to dynamically control player’s properties and call its methods

Availability
- Internet Explorer
- Mozilla
Content Processing usages

- AXMEDIS objects creation/processing/adaptation
  - For audio/video
  - For multimedia

- Content and Metadata adaptation/processing
- Estimation of descriptors/fingerprinting
- Content protection and governance

- A combination of all this thanks to integration with
  - Workflow
  - Crawler

Adaptation of audio content

- Functionalities supported
  - Down-sampling
  - Channel-mixing
  - MPEG-21Digital Item adaptation
  - Adaptation to terminal output capabilities
  - Selection of a precisely specified file portions
  - Adaptation to specific user’s presentation / rendering preferences

- Supported formats & codecs
  - mp3, wav, aiff, wma…
Multimedia content adaptation

- **Functionalities supported**
  - Add, remove and delay Media tracks
  - Extract single track from multimedia files
  - Conversion between different formats
  - Concatenation of multimedia files
  - File splitting by size or time

- **Supported formats**
  - MPEG-4, MPEG-1/2, JPEG, AVI, BT, XMT, SWF, X3D, SMIL, 3GP…
  - SRT subtitles…

Usage of Fingerprint

- **To monitor**
  - Distribution channels
  - Published content
  - Acquired content
  - Distributed content
  - Used content

- **To detect usage / passage of content by**
  - Estimating in real time the fingerprint
  - Searching into the database
Content Processing plug-ins

Examples of operations using
- AXMEDIS Editors
- Metadata editor
- Plug in for processing content
- Access to the database
- Creation of composed objects
  - Digital resources
  - Formats (SMIL, HTML, ...MPEG-4)
  - Nesting levels
- AXMEDIS Players as ActiveX / plug-in(s)
AXMEDIS Content Protection

Tools & Methods to grant content tracking & protection

- Objectives
  - Protecting content
  - Creating licenses
  - Using licenses

- Outcomes
  - Protecting content know-how
  - Creating licenses know-how
  - Using licenses know-how
AXMEDIS Content Protection

Protection and Supervising tools

AXMEDIS Content Processing Engines and Scheduler GRIDs

AXMEDIS Players

AXMEDIS Production area

Automatic creation of licenses

Content owner Registered in AXMEDIS

License A

License B

License C

Add, update, include, define:
Rights, terms, territory, payment models, duration..

Finally I include the protection info that allow to open the resource accordingly to license conditions

Reference to paper contracts – open negotiation possible
Protection Editor

Protection Editor

Protection & Control Process

Protection & Control Process
Protection Manager Support

**Objectives**
- Provide the licensing functionality to the system
  - Verification, storage, management, authorisation of user actions
- Connect clients to AXMEDIS Certifier and Supervisor through secure channels
  - Keep track of user actions, even off-line

**Outcomes**
- Several levels of control and governance: PMS Client, PMS Domain and PMS Server
- Allow on-line and off-line operation to the users

**PMS Client**
- Provide licensing functionality on the client side
- Establish secure connection to the PMS Domain / Server
- Tracking of user actions for allowing off-line operation

**PMS Server**
- Storage of licenses to be able to verify license chain
- Connection to AXMEDIS Certifier and Supervisor for checking off-line user actions, tools certification and verification, etc

**PMS Domain**
- Support for Domains at two levels: Home and Factory
DRM Editor & Viewer and PMS

License Production
DRM Editor and Viewer

- **Purpose**
  - Edit and display licenses and Potential Available Rights (PAR)

- **Availability**
  - Stand-alone application
  - Integrated into AXMEDIS Editor (PAR Support)

License edition
- License root element

Permissions
- Grants in MPEG-21 standard nomenclature

Issuer
- The one who issues the license (content owner, distributor, etc.)
DRM Editor and Viewer

- Principal
  - The licensee

- Resource
  - Multimedia content

- Right
  - The right given to make use of the resource

- Conditions
  - Time interval
  - Number of times
  - Territory
  - ...

DRM Editor and Viewer and PMS

- Sending license to Protection Manager Support (PMS) Server from DRM Editor and Viewer
  - When the license is finished, the PMS Client sends the license through a secure connection to PMS Server
  - The license is verified against parent license(s) or PAR. If it is valid, then it is stored into License Database
  - This process can be automated using JScript rules
Practice section

- Examples of operations using
  - Protection mechanisms
  - DRM Editor and viewer
  - Metadata editor
  - License production and storage
  - Usage of Protected Objects

AXMEDIS Tools (II)

Content crawling and Focuseek
AXMEDIS Crawler

Objectives
- Definition of AXMEDIS Crawler
- Tool location in the process

Outcomes
- Understanding of AXMEDIS Crawler
- Usage of AXMEDIS Crawler know-how
Crawling process

- Objectives
  - Ingestion into AXMEDIS Database

- Input
  - List of sources
  - Definition of Rules & Timers
  - Supporting scripts

- Output
  - Ingestion into AXMEDIS Database
  - Content and Metadata adaptation/processing
  - Estimation of descriptors/fingerprinting

Crawling & Content processing

- Crawling is a way to populate AXMEDIS database and can be profitably connected to content processing to maximise benefits.
- AXMEDIS content processing is a powerful solution to optimise time and resource consumption in relation to repetitive content production operation.
AXMEDIS Content Processing

Powerful automation tools for content processing

Objectives
- Definition of AXMEDIS Content Processing
- Tool location in the process

Outcomes
- Understanding AXMEDIS Content Processing
- Usage of AXMEDIS Content Processing know-how
Content Processing

- **Objectives**
  - AXMEDIS objects creation/processing
  - AXMEDIS objects transcoding/adaptation

- **Input**
  - Definition of Rules & Timers
  - Supporting scripts

- **Output**
  - AXMEDIS objects creation/processing/adaptation
  - Estimation of descriptors/fingerprinting
  - Content and Metadata adaptation/processing
Content Processing Definition

- AXMEDIS Content Processing (AXCP)
  - A distributed tool based on a GRID
  - Workflow / Crawler connected
  - Uses rules

AXMEDIS Publishing Tools

Powerful tool to enable content delivery
AXMEDIS Publishing Tools

Objectives

- Introduce AXMEDIS publishing tools
- Explain their relation with the content production chain

Outcomes

- Understanding of Programme & Publication (P&P)
- Understanding of AXMEDIS Query on demand
- Understanding of AXMEDIS distribution mechanism

Introduction to P&P

Aim

- Operations and applications of the P&P area
  - AXMEDIS P&P programmes: create, edit, test, activate
  - multi-channel distributions

Overview

- P&P Area within the AXMEDIS architecture
- Tools and functionalities
- P&P Editor
- Create and edit a P&P programme
- “Test”, “Activate” or “Stop” a P&P programme
- AXMEDIS P&P Engine and P&P Engine Monitor
- “On-Demand” requests
Programme & Publication

P&P overview
P&P Area Tools

- AXMEDIS Programme and Publication
  - P&P Programme Editor (GUI)
    - Editing
    - Search (P2P, AXDB)
    - Testing and Activating
    - Quick test; Full test
  - P&P Engine
    - Links to AXMEDIS Content Processing area
    - Links to the AXMEDIS Distribution Servers
    - GUI monitor
- On-Demand

AXMEDIS Query On Demand
Query On Demand

- The actor wants to select and download specific content according to his wishes, e.g. based on
  - Artist
  - Title
  - Year of publication

- AXMEDIS provides a simple search mechanism
  - Simple queries are enriched using information about the client device and the distribution channel
  - User can select a specific content or refine the query

- The P&P Engine adapts On-Demand content to fit with the user's device (client profile)
  - Content is produced on demand based on client and distribution profile
  - Content is downloaded and played on the client device

Querying

Please enter your query.

The resulting content should match 0 / 0 / 0 of the following criteria.

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Search
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