AXMEDIS Content Management

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AXMEDIS: www.axmedis.org
Table of Content

- Credits
- Content production – Intro
- Content production – Detail
- AXMEDIS Tools (I) – Editing
- AXMEDIS Tools (II) – Processing
- AXMEDIS Tools (III) – Publishing
- Contacts
The process

AXMEDIS Environment

AXMEDIS: www.axmedis.org
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.

IPR is internal therefore focus is not on clearance but on protection. 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 as 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

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
AXMEDIS Object example

Metadata Example (DC)
Metadata & object querying

AXMEDIS Object: an example

Music Album

DublinCore
- Title
- Genre
- Authors
- Other Descriptions (e.g. MPEG7)

Backstage Video
- Rights Owner
- Producer
- Distributor
- Subtitles Languages
- Playing time
- Resolution
- Resource MPEG2 Video

Album Cover
- Image
- Author

Album Lyrics
- DOC
- Authors

Album Tracks
- Rights Owner
- Producer
- Distributor

Resource JPG image
- Title

Resource PDF
- Author

Resource Print (printable)
- Title

Bonus Video
- Titles
- Description
- Markup
- Text

Metadata will be always accessible for indexing and querying
AXMEDIS Tools (I)

Editor, ActiveX and Plug-ins

AXMEDIS Editor
AXMEDIS Editor – Definition

- 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

AXMEDIS Tools (II)

Content crawling, Content Processing
AXMEDIS Crawler

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
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
Complex Scenarios

- Dipartimento Sistemi ed Informatica (Unifi) http://www.axmedis.org

Examples:
- Crawling from TISCALI MediaClub CMS (DSI)
- Content gathering from file system (ANSC)
- Automatic production of SMIL representation (ANSC)
- Automatic formatting of content (DSI)

Crawling TISCALI Media Club

- Crawling using searchbox
  - a postgres database via ODBC
  - XML files with metadata on file system
- The script produces AXMEDIS objects
  - One for each movie with:
    - Plot & poster (HTML)
    - Preview
    - Subobjects on:
      - The director
      - The actors
      - …
Content gathering from file system

- HTML
- custom metadata
- CSS

AXMEDIS AXCP Rule

Axmedis Object: Resources (HTML, Images, mp3, CSS, ...) metadata ...

Automatic SMIL Representation

- MP3

AXMEDIS AXCP Rule

Axmedis Object with SMIL
AXMEDIS Content Formatting

Distribution channel, Device capabilities, User preferences

Optimization logic

AXMEDIS object

Template logic

Style-sheet logic

Templates DB

Style-sheets DB

AXMEDIS object

AXCP GRID

Managing the Rule Execution in the AXMEDIS Grid
**AXCP Grid**

- **Consists of**
  - One Rule Scheduler (Server Side)
  - Many Rule Remote Executors (Client Side): AXCP GRID Node

- **Rule Scheduler: Internal Scheduler and Dispatcher for**
  - rule installation
  - rule firing
  - rule executor discovering and management
  - rules scheduling and dispatching according to the executor profile
  - communication with the AXMEDIS environment (workflow)
  - ...

- **Rule Remote Executor**
  - Consisting of the same AXCP script language engine

**AXCP Rule Executor**

- **Applications**
  - Standalone

- **Properties**
  - CPU Monitoring
  - CPU Workload Constraints
  - Communication with the Scheduler (GRID Node)
Installing Rules on Grid

- Manually using the scheduler

- Installing rules with the AXCP Rule Editor
  - Script for Automated Production of content and production of licenses

- Activating rule using external application
  - AXCP Rule Editor, Workflow, Web application, etc…
  - Workflow is activating them

- Running a rule
  - On-demand execution

AXMEDIS Tools (III)

Publishing Tools – Powerful tools to enable content delivery
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
P&P overview

AXMEDIS P&P Editor
Users create and edit programmes for the multi-channel publication of AXMEDIS objects

Programme and Publication Engine

Distribution Servers
On-Demand Request to play/view and AXMEDIS object

AXMEDIS Database Manager
AXMEDIS databases

P&P Programme

On-Demand

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
Query/On Demand (Scope)

- 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/On Demand (Usage)

Contact Information

To know more about AXMEDIS framework and other AXMEDIS technologies / functionalities please contact the project coordinator:

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