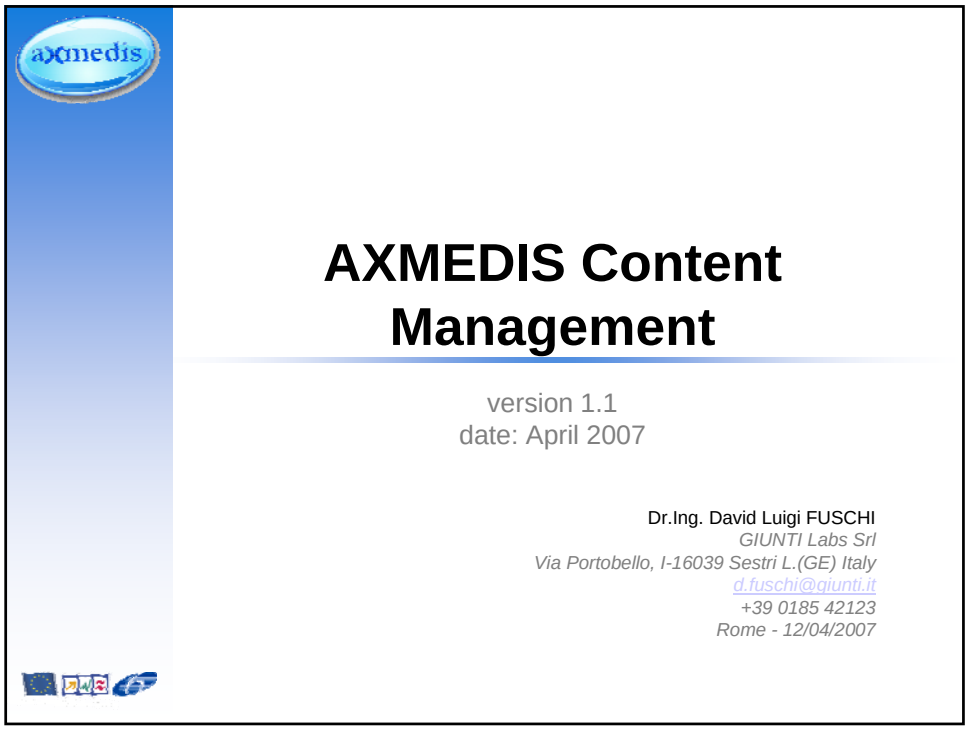
AXMEDIS Content Management
version 1.1
date: April 2007
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Rome - 12/04/2007

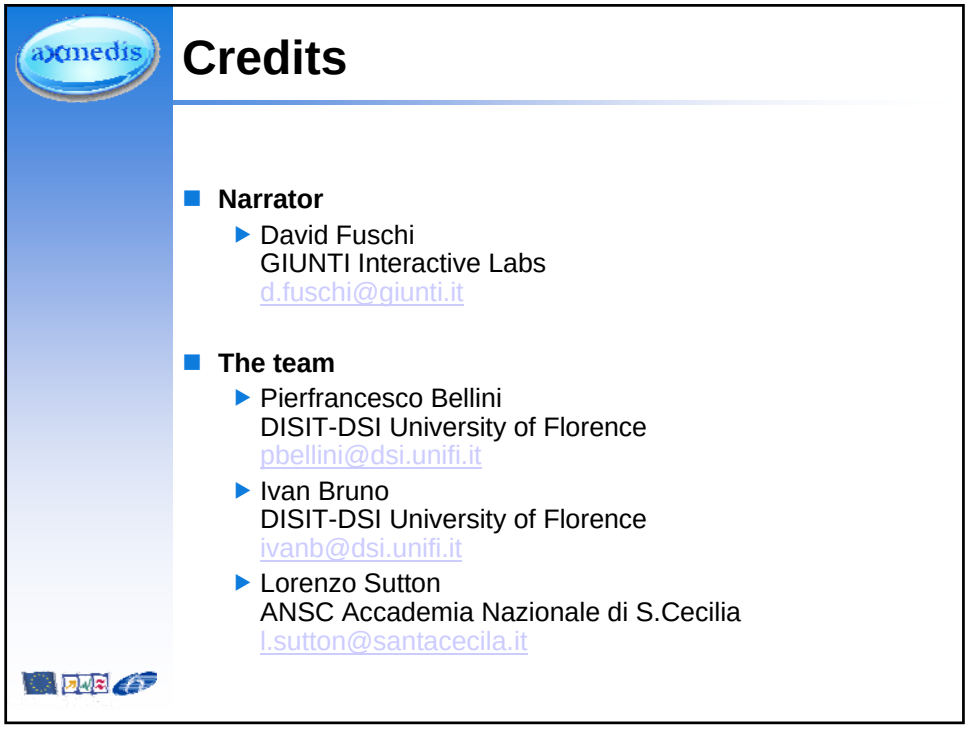
Credits
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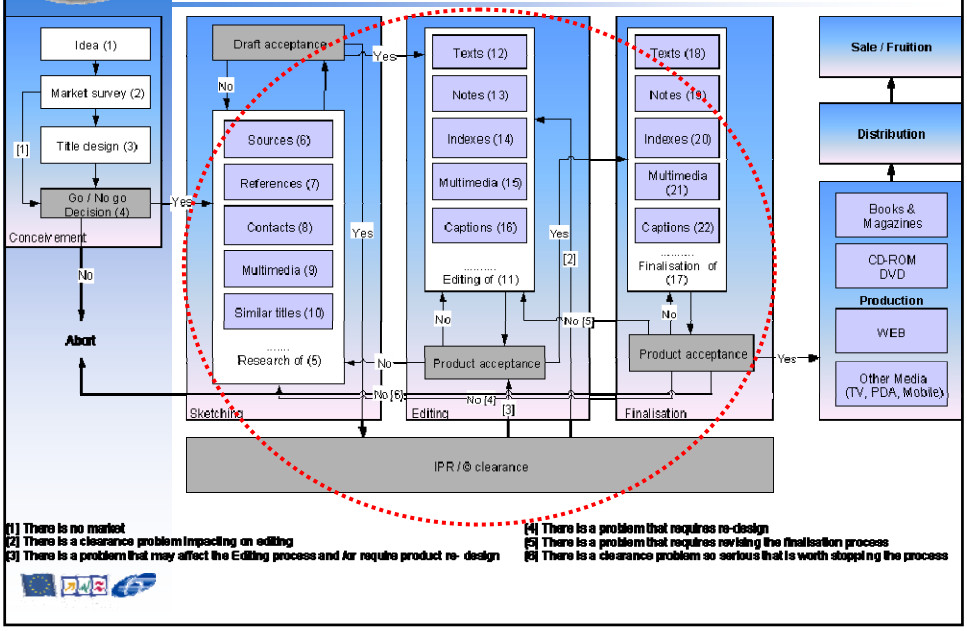
Table of Content

Content production – Intro

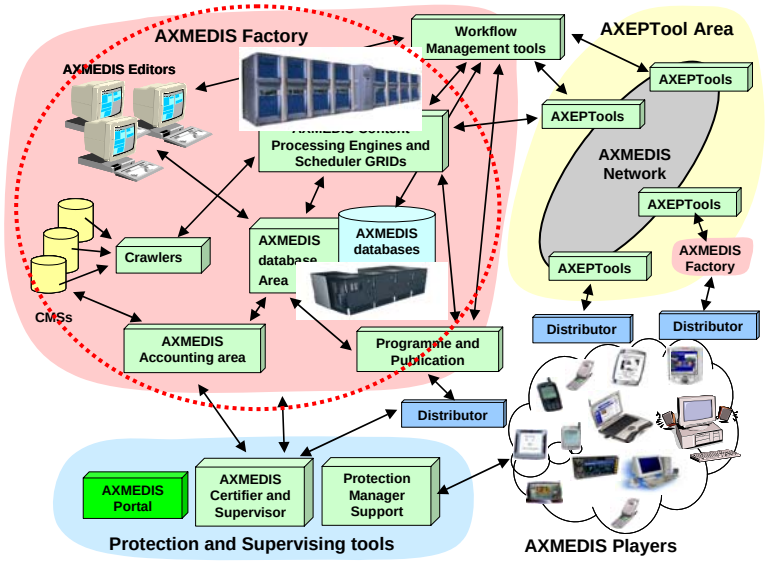
Content Production & AXMEDIS

The process



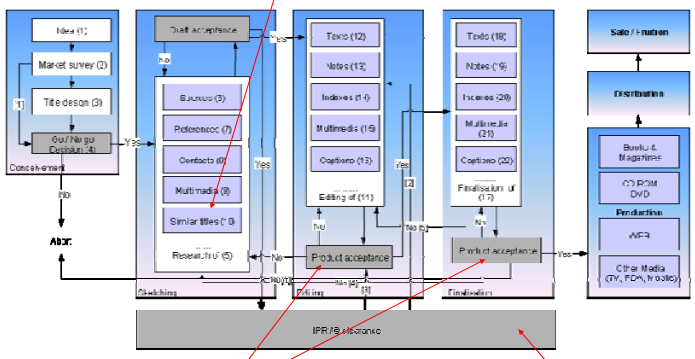
[1] There is no market
[2] There is a clearance problem impacting on editing
[3] There is a problem that may affect the Editing process and /or require product re- design
[4] There is a problem that requires re-design
[5] There is a problem that requires revising the finalisation process
[6] There is a clearance problem so serious that is worth stopping the process

AXMEDIS Environment



Production from own content

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

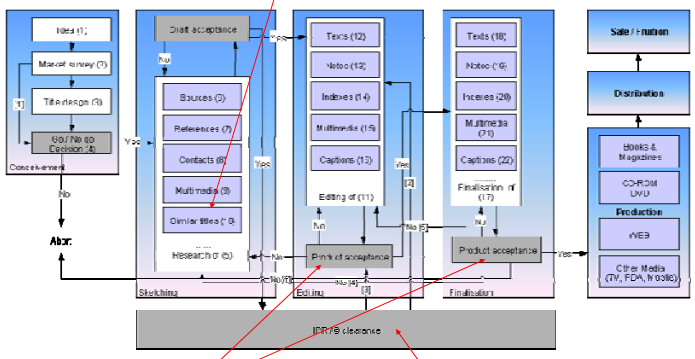


Each stage of product acceptance represents the start for a new IPR management step, from copyrighting to licensing and enforcement

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

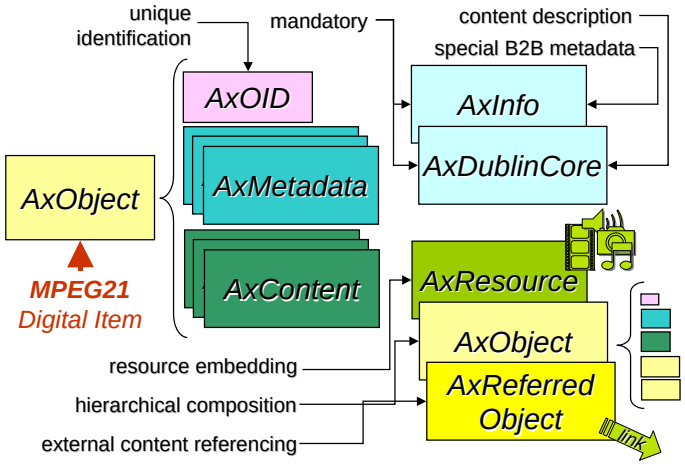
AXMEDIS Model – Definitions

- **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

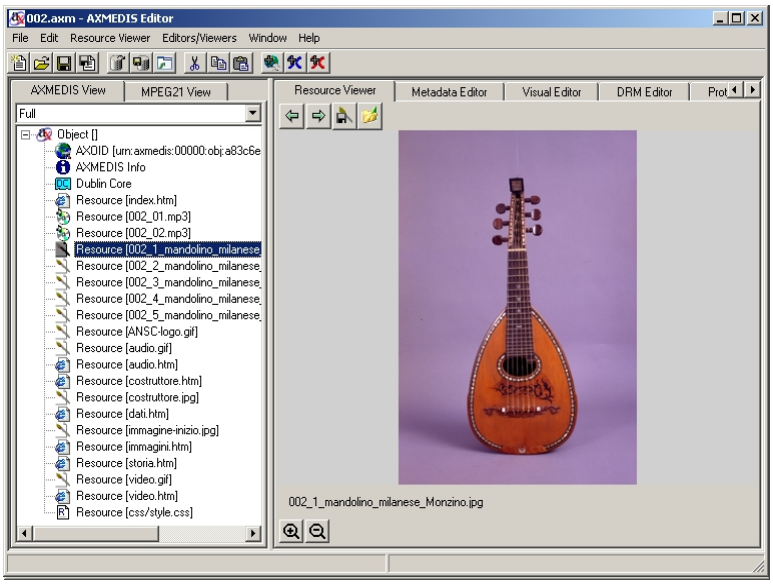
AXMEDIS Model – Singularities

- **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

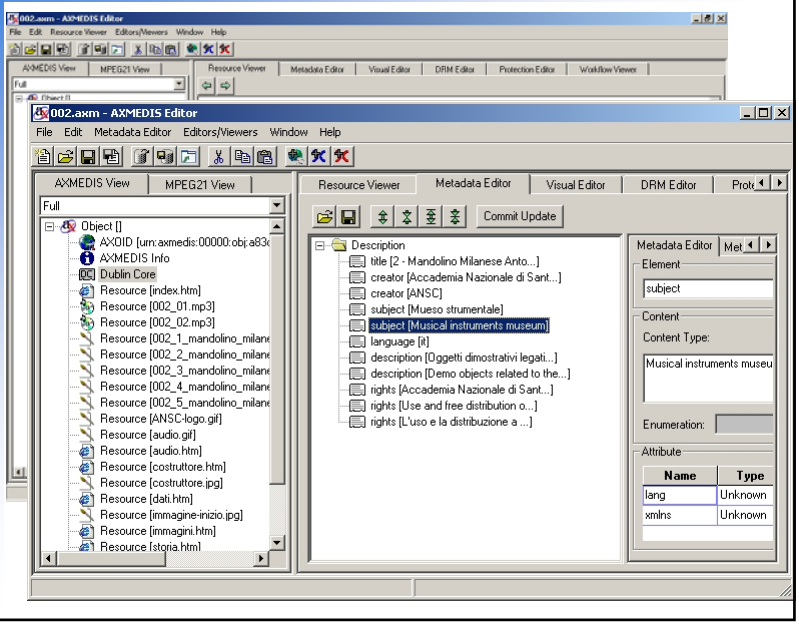
AXMEDIS Object structure



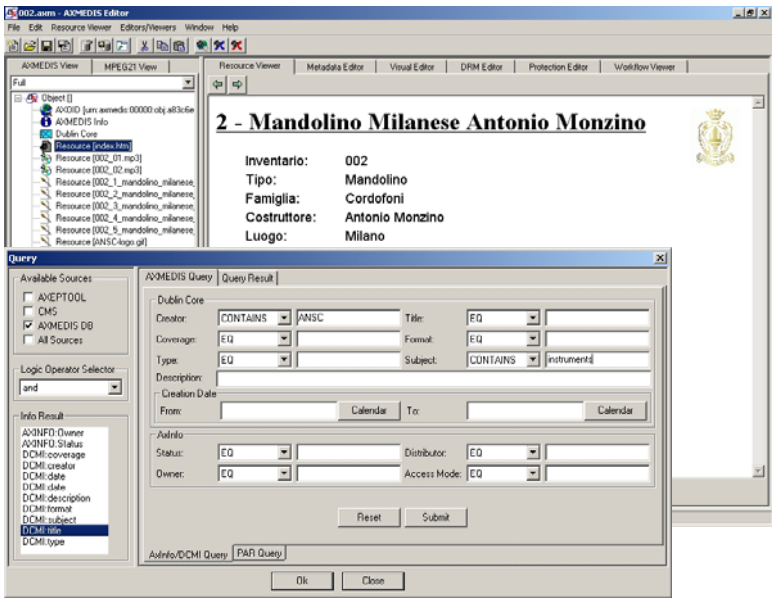
AXMEDIS Object example



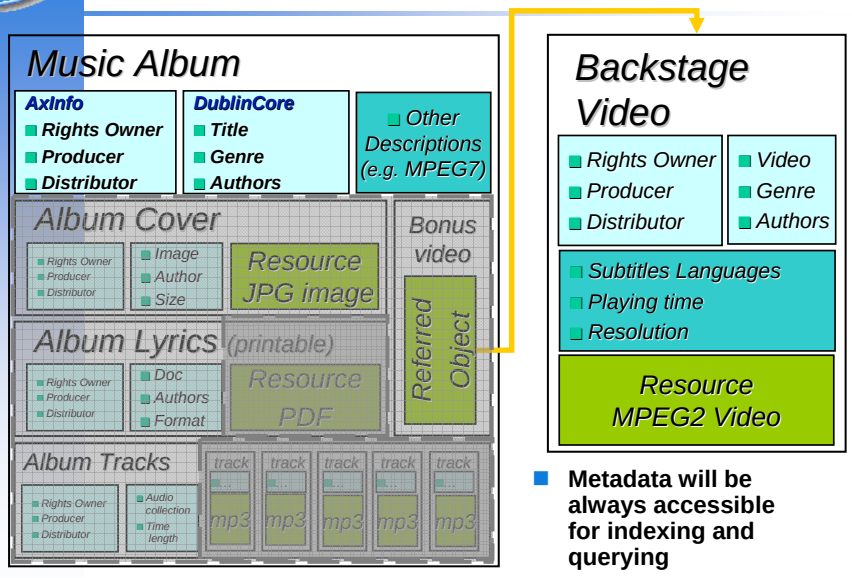
Metadata Example (DC)



Metadata & object querying



AXMEDIS Object: an example

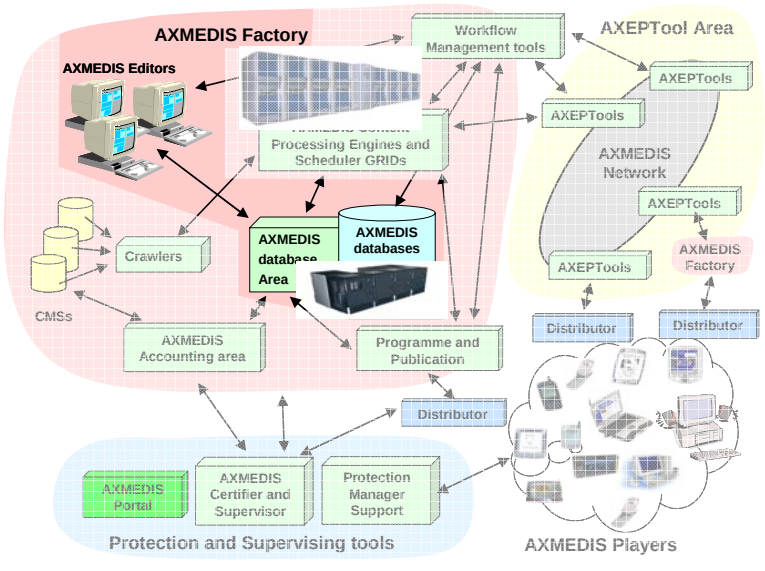


- **Metadata will be always accessible for indexing and querying**

AXMEDIS Tools (I)

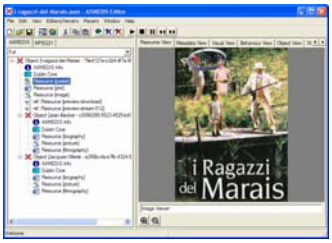
Editor, ActiveX and Plug-ins

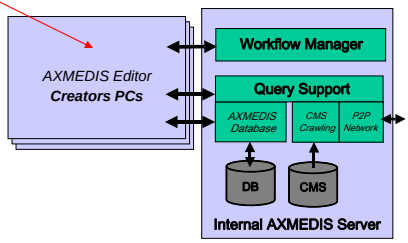
AXMEDIS Editor



AXMEDIS Editor – Definition

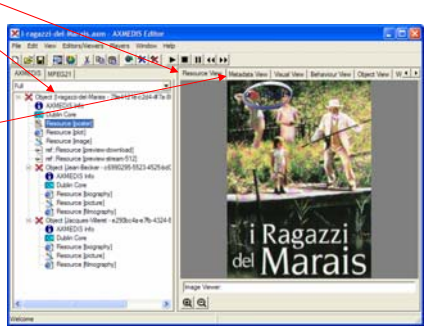
- **The AXMEDIS Editor is an application allowing**
  - manual production of AXMEDIS objects
  - inspection of automatically produced objects
  - finishing AXMEDIS objects pre-produced automatically





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)

AXMEDIS Player Mozilla plug-in

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…

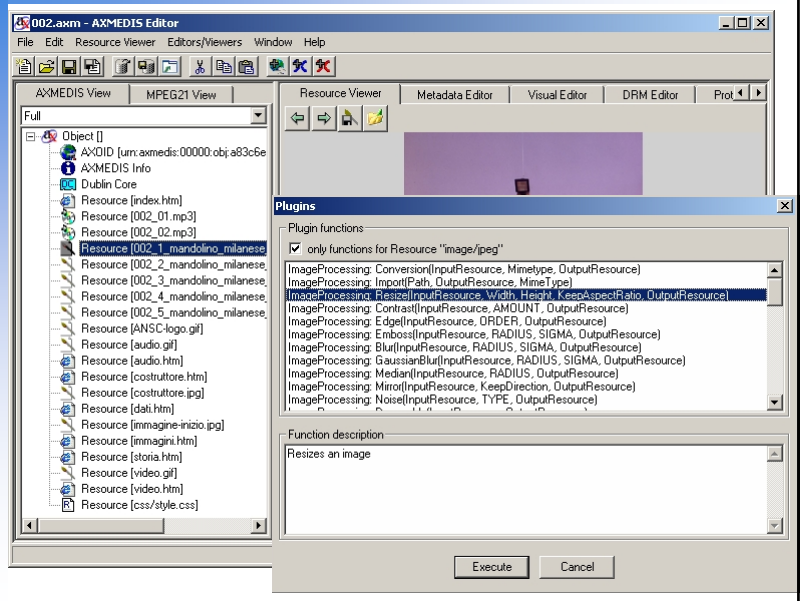
Multimedia content adaptation

- **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

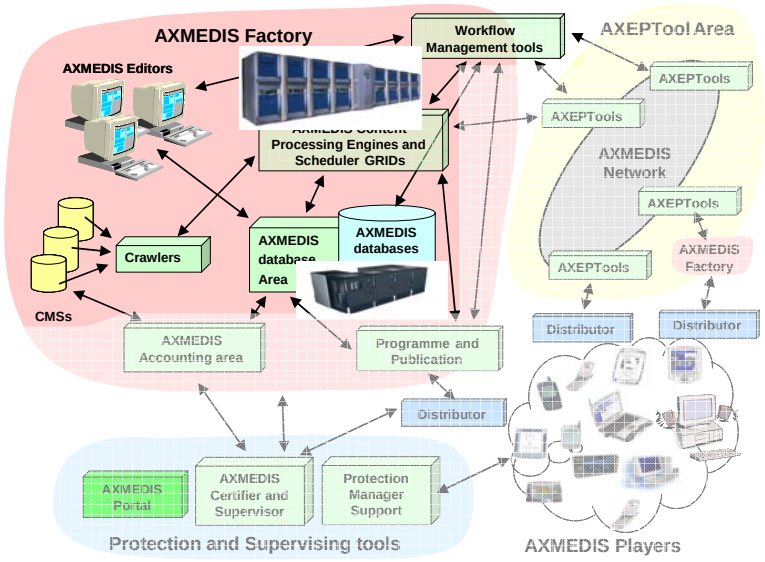
Content Processing plug-ins



AXMEDIS Tools (II)

Content crawling, Content Processing

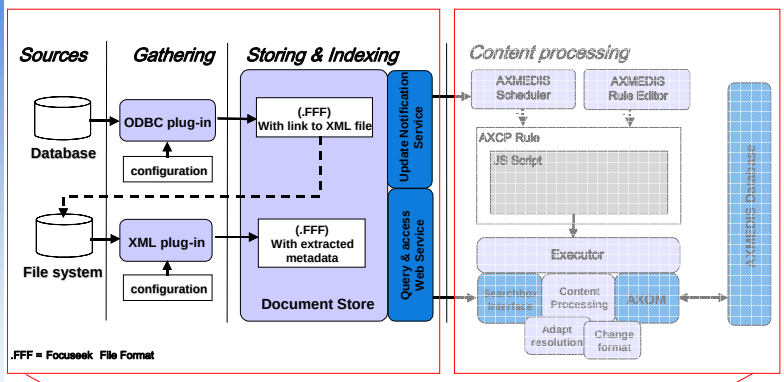
AXMEDIS Crawler



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

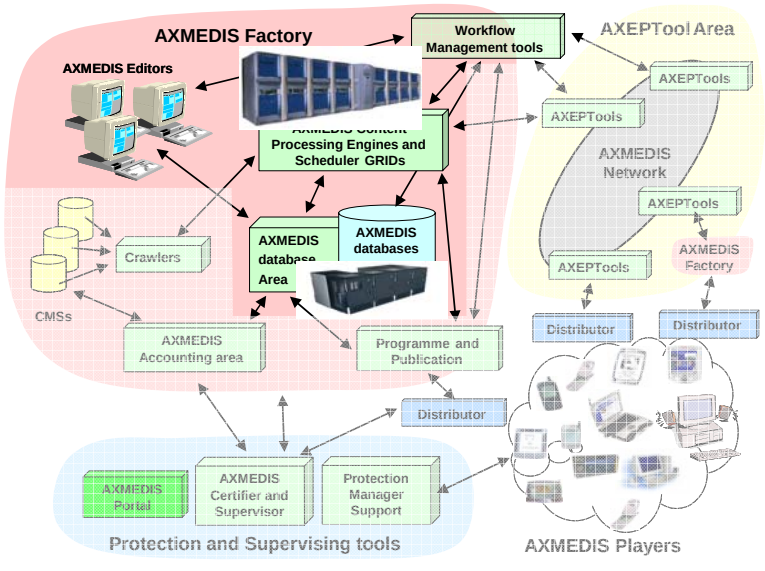
Crawling & Content processing



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

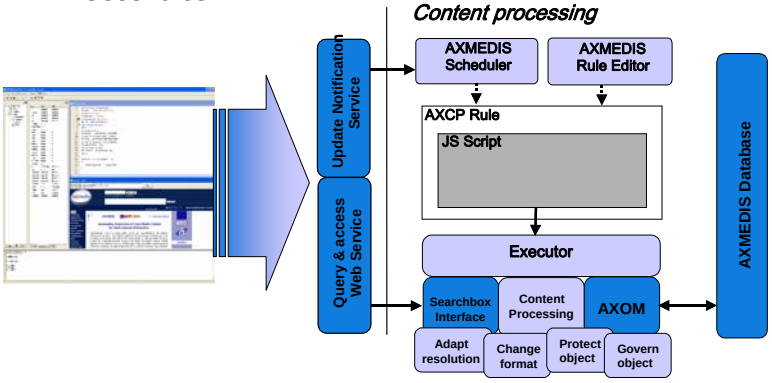


Content Processing

- **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

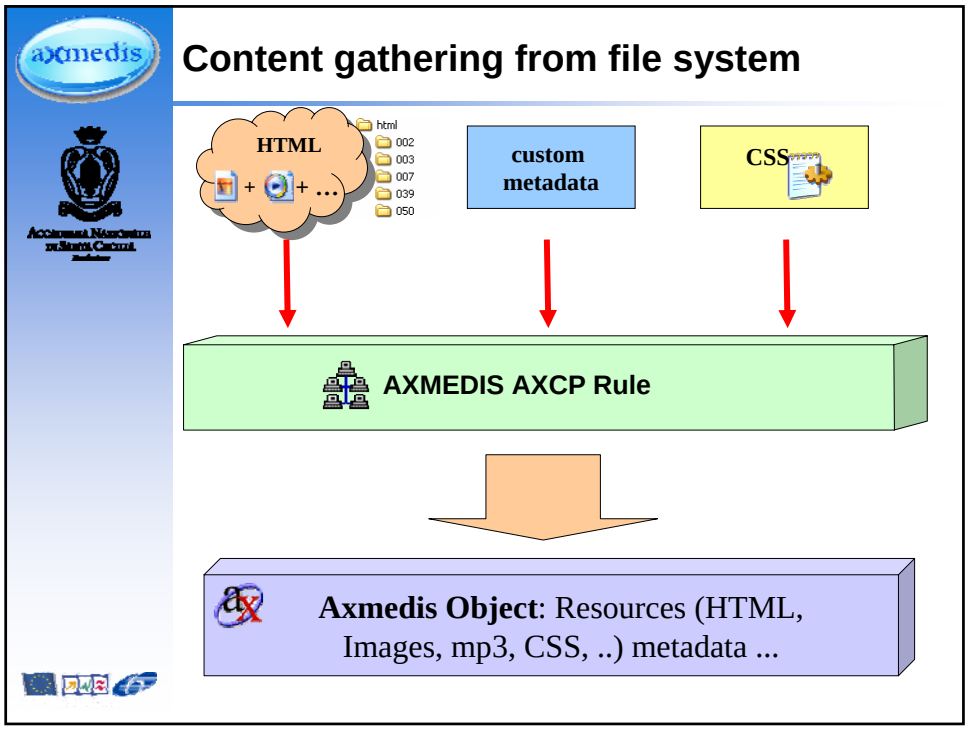


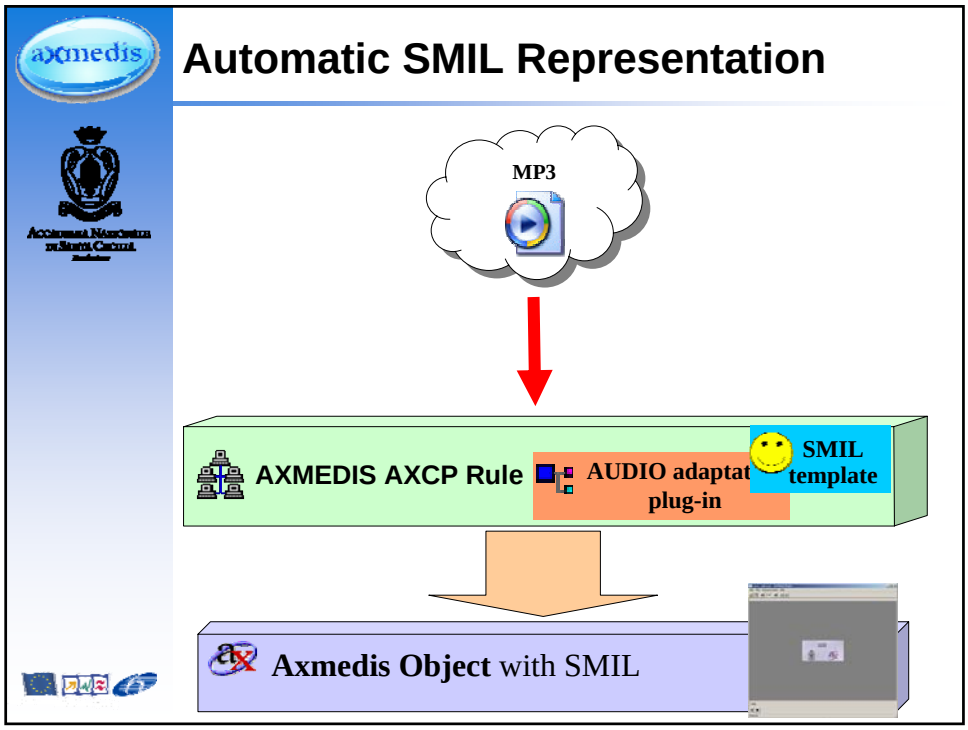
Complex Scenarios

- **Accademia Nazionale di Santa Cecilia,** http://www.santacecilia.it
- **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)

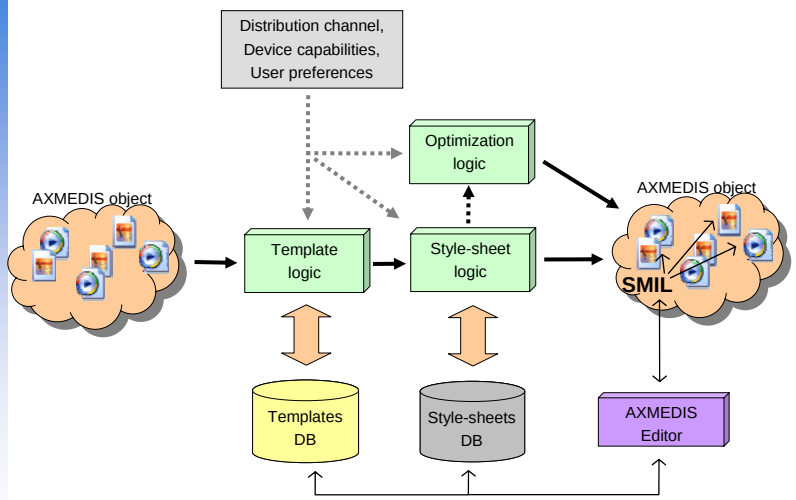
Crawling TISCALI Media Club

- **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
+ + ...
html
002
003
007
039
050
custom metadata
CSS
AXMEDIS AXCP Rule
Axmedis Object: Resources (HTML, Images, mp3, CSS, ..) metadata ...


Automatic SMIL Representation
MP3
AXMEDIS AXCP Rule
AUDIO adaptat
plug-in
SMIL template
Axmedis Object with SMIL

AXMEDIS Content Formatting



AXCP GRID

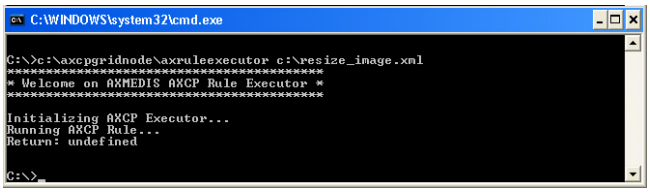
Managing the Rule Execution in the AXMEDIS Grid

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



  - Node of the GRID
- **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

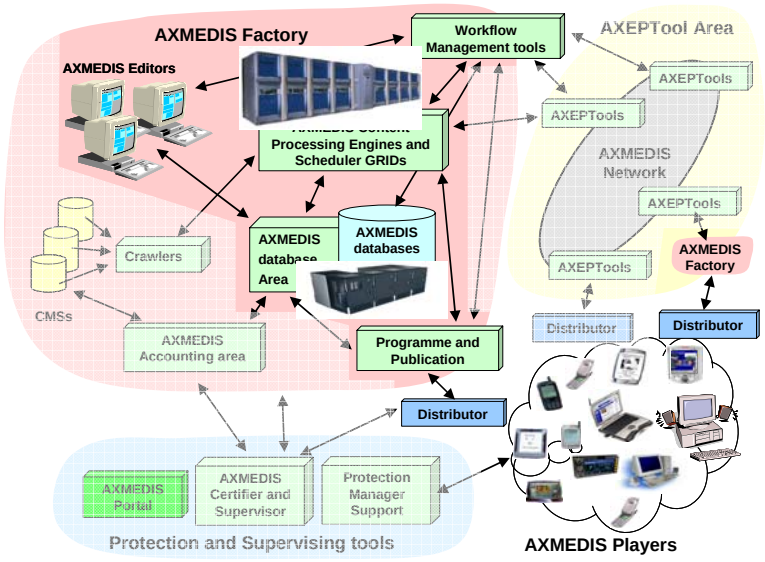
AXMEDIS Tools (III)

Publishing Tools – Powerful tools to enable content delivery

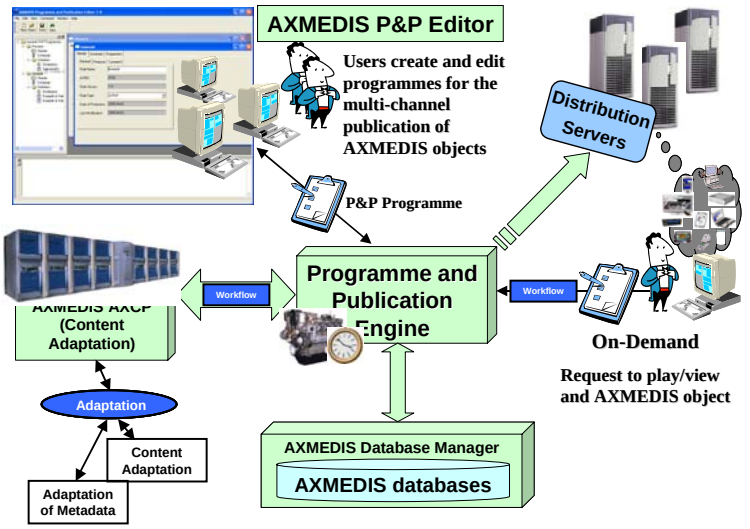
Introduction to P&P

- **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

Programme & Publication

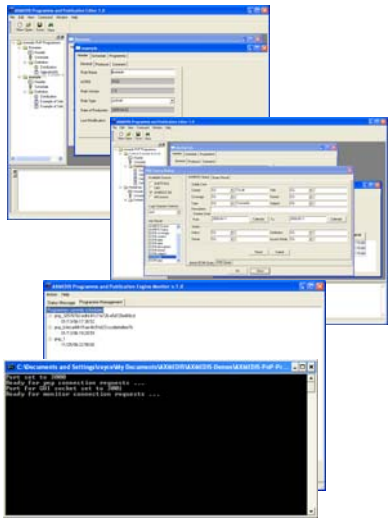


P&P overview

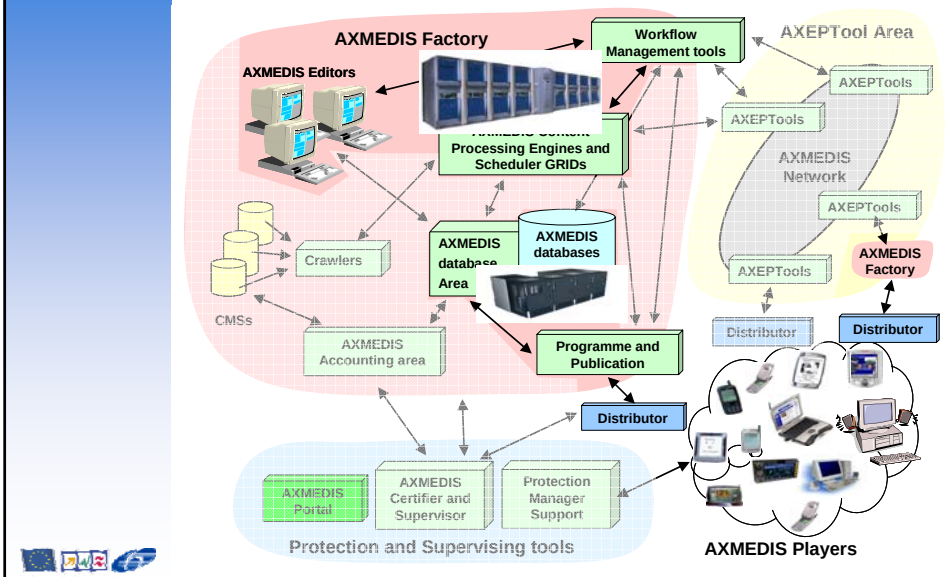


P&P Area Tools

- **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**



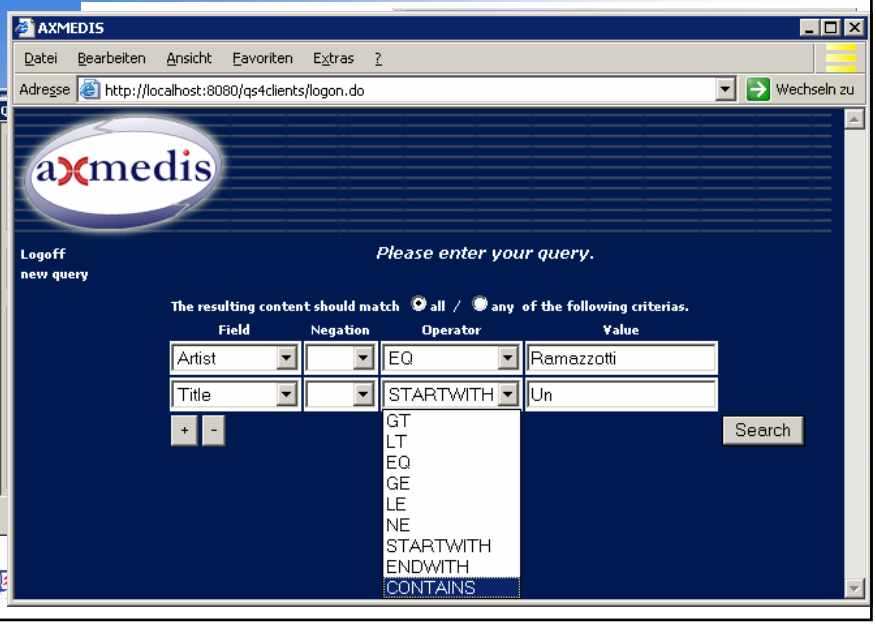
AXMEDIS Query/On Demand



Query/On Demand (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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