



AXMEDIS Tutorial on Content Production

version 1
date: November 2007

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Barcelona - 29/11/2007



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Credits

- **Narrator**
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Tutorial presentation

■ Rationale

- ▶ Open to all
- ▶ Adopts examples to explain process modifications, related benefits, limits and constraints

■ Intended audience

- ▶ Decision makers
- ▶ Technical managers

■ Prerequisites

- ▶ Basic knowledge of Production cycle & tools
- ▶ Basic knowledge of Protection tools



Objectives & Outcomes

■ Objectives

- ▶ Recall overall content production process
- ▶ Help locating new tools in the process
- ▶ Give suggestions on environment set-up
- ▶ Provide know-how for AXMEDIS content production

■ Outcomes

- ▶ AXMEDIS & MPEG-21 models / license know-how
- ▶ AXMEDIS content production know-how
- ▶ SMIL editing know-how
- ▶ Descriptors & metadata usage know-how





Practice section outline

- **Examples of manual operations using**
 - ▶ AXMEDIS Editors
 - ▶ Plug in for processing content
 - ▶ Protection & Licensing
 - ▶ AXMEDIS Players
- **Creation of composed objects**
 - ▶ Manual
 - ▶ Automated
- **Business usage of created objects**
 - ▶ Templates
 - ▶ Samples
 - ▶ Rules
 - ▶ Mass production



The context

Content Production & AXMEDIS





The context

Objectives

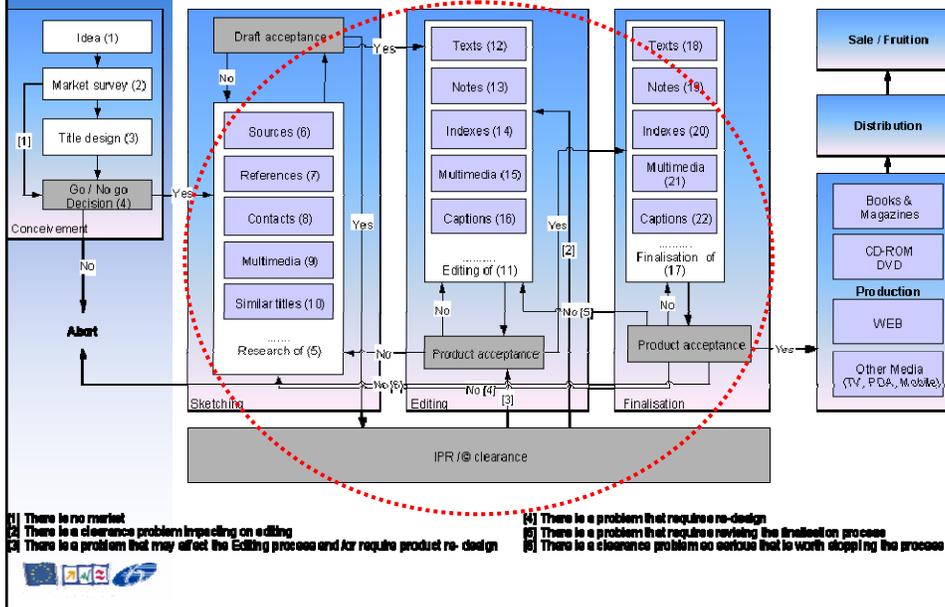
- ▶ Recall overall content production process
- ▶ New tools location in the process
- ▶ Hints & suggestions on environment set-up

Outcomes

- ▶ AXMEDIS relation to standard content production context know-how

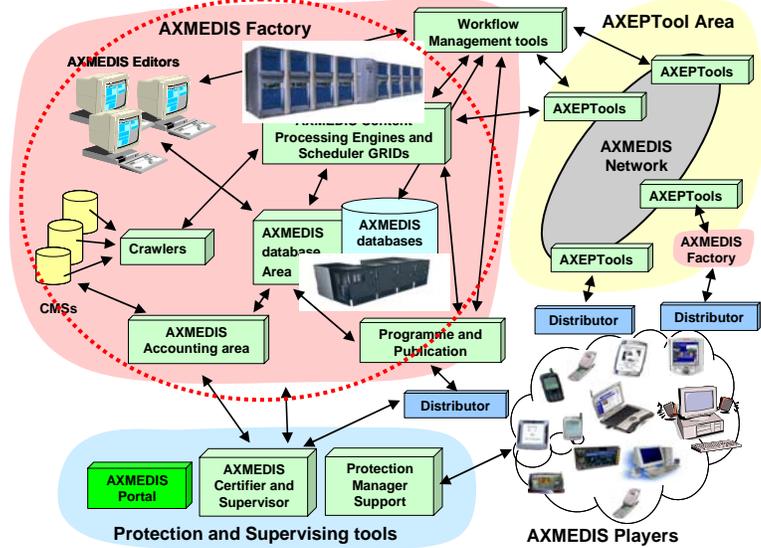


The process





AXMEDIS Environment



Environment set-up

■ 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

- **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



Intro to Content Production

Starting from Own or Acquired Content





Intro to Content Production

Objectives

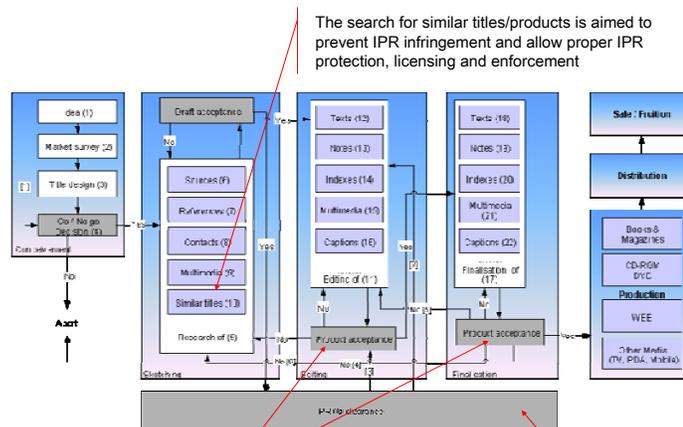
- ▶ Recall of production process based on own content
- ▶ Recall of production process based on acquired content
- ▶ Exposition of differences among approaches

Outcomes

- ▶ AXMEDIS relation to standard content production context know-how



Starting from own content



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

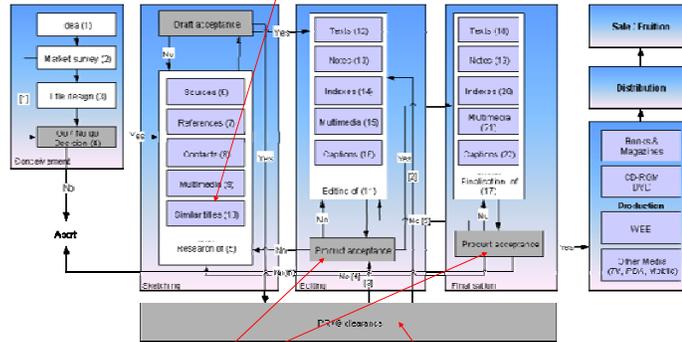
IPR is internal therefore focus is not on clearance but on protection. Licensing and enforcement





Starting 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



AXMEDIS Content production

From models to tools usage





Content production – Detail

■ 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
- ▶ Descriptors & metadata usage know-how



AXMEDIS Model

■ 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 Singularities

■ Structure

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

■ Protection

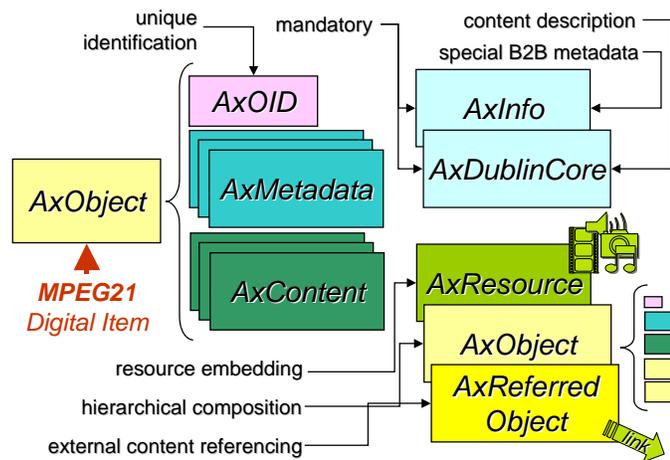
- ▶ Only AXMEDIS Objects can be protected

■ Metadata

- ▶ Only AXMEDIS Objects have metadata not their components
- ▶ AXMEDIS Objects metadata are always accessible



AXMEDIS Object structure





AXMEDIS Metadata (AxInfo...)

- **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



AXMEDIS Metadata (AxInfo...)

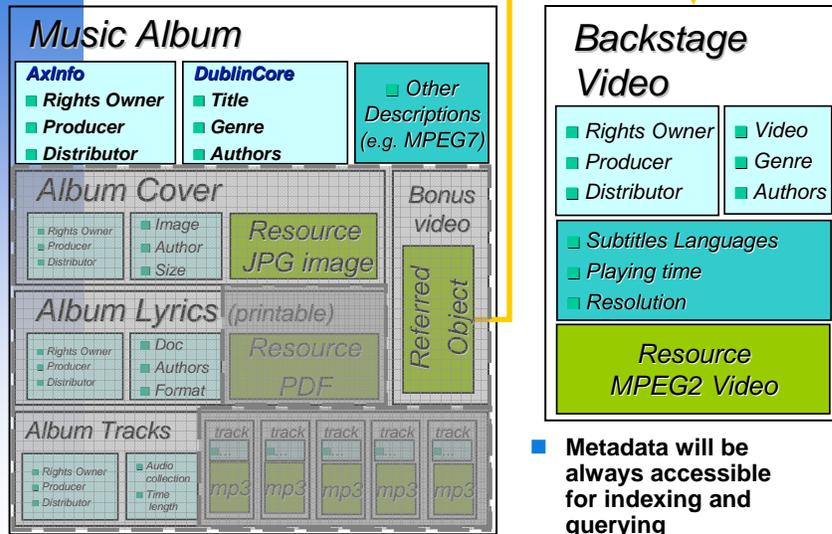
- **Furthermore AxInfo contains specific information like:**

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





An example to wrap it all up



- Metadata will be always accessible for indexing and querying



AXMEDIS Editing Suite

Manual Object Creation, Manipulation and Protection





AXMEDIS Editor

■ Objectives

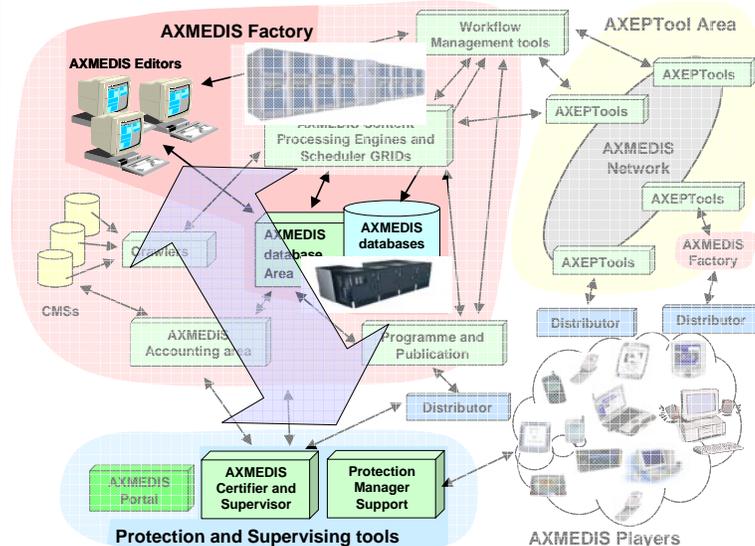
- ▶ Definition of AXMEDIS Editing suite
- ▶ New tools presentation & location in the process

■ Outcomes

- ▶ Understanding of AXMEDIS Editor
- ▶ Usage of AXMEDIS Editor
- ▶ Embedding Digital Resources know-how
- ▶ Integration and composition know-how of
 - SMIL
 - HTML
 - MPEG-4....



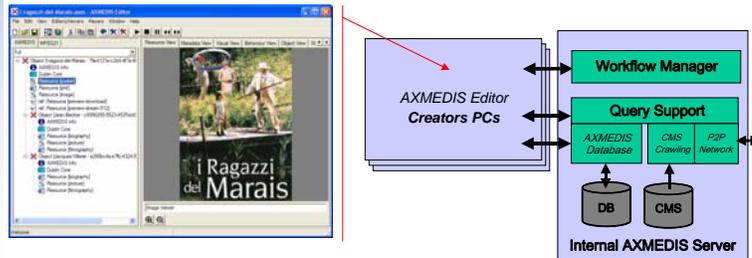
AXMEDIS Editor





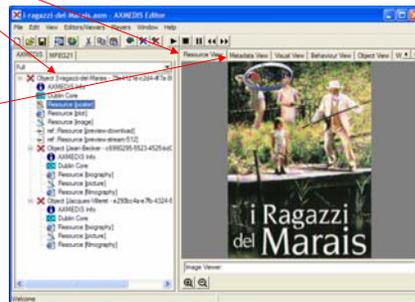
AXMEDIS Editor

- 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

- It integrates many Editors & Viewers to handle all the aspects of the AXMEDIS Objects production
 - ▶ Resource
 - ▶ DRM
 - ▶ Protection
 - ▶ Presentation
 - ▶ Annotation
 - ▶ Metadata
 - ▶ ...
 - ▶ Workflow





Protection Manager Support

■ Functionalities

- ▶ 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

■ Benefits

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



Protection Manager Support

■ 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





AXMEDIS Automation Tools

Content crawling and Focuseek



AXMEDIS Crawler

■ Objectives

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

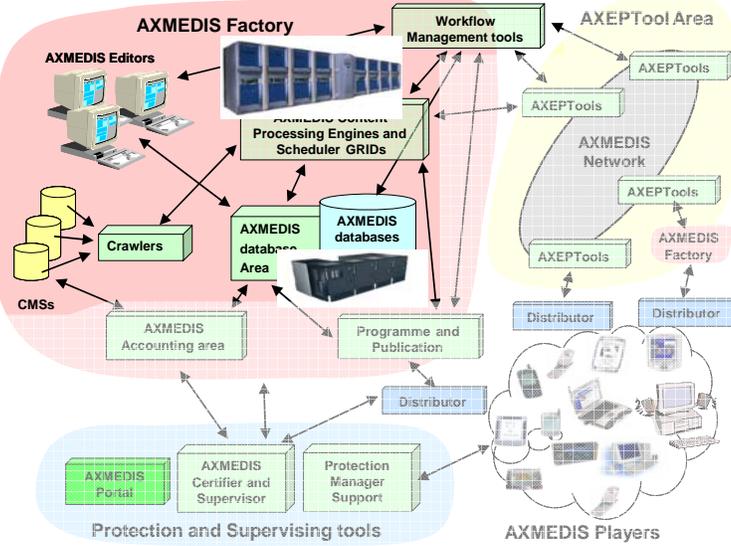
■ Outcomes

- ▶ Understanding of AXMEDIS Crawler
- ▶ Usage of AXMEDIS Crawler know-how





AXMEDIS Crawler



Crawling process

■ Objectives

- ▶ Ingestion into AXMEDIS Database

■ Input

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

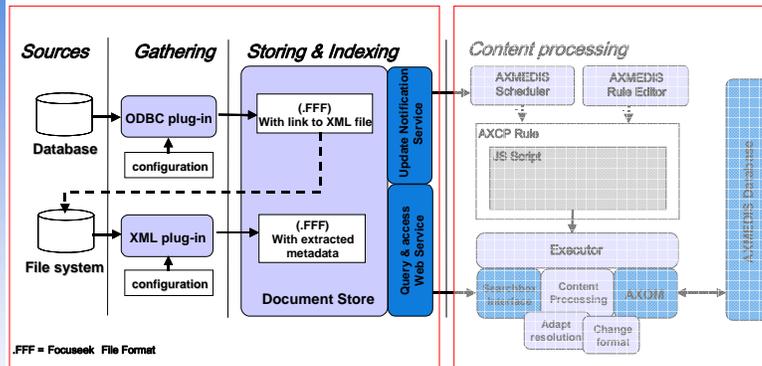
■ Output

- ▶ 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

Powerful automation tools for content processing





AXMEDIS Content Processing

■ Objectives

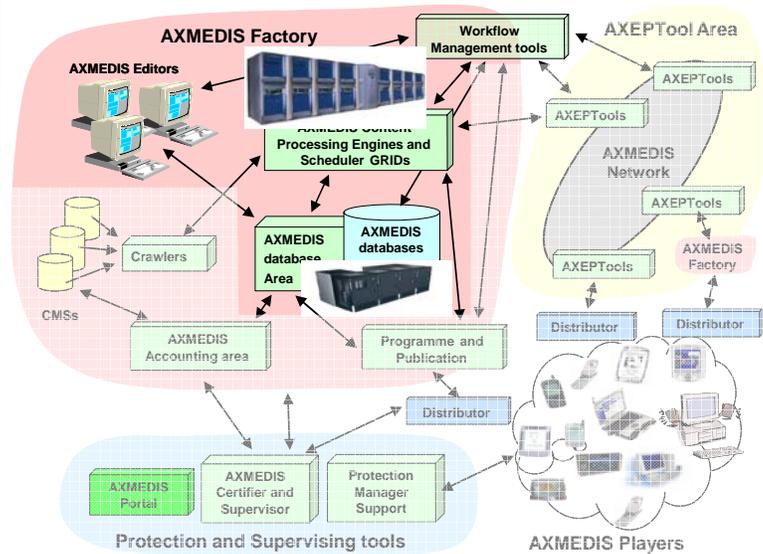
- ▶ Definition of AXMEDIS Content Processing
- ▶ Tool location in the process

■ Outcomes

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



AXMEDIS Content Processing





Content Processing

■ Objectives

- ▶ AXMEDIS objects creation/processing
- ▶ AXMEDIS objects transcoding/adaptation

■ Input

- ▶ Definition of Rules & Timers
- ▶ Supporting scripts

■ Output

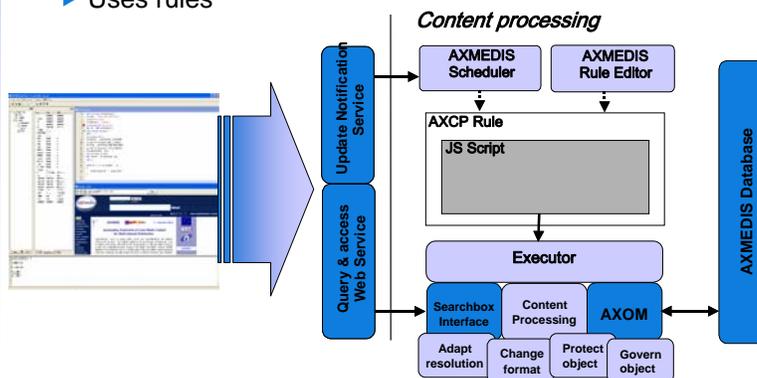
- ▶ AXMEDIS objects creation/processing/adaptation
- ▶ Estimation of descriptors/fingerprinting
- ▶ Content and Metadata adaptation/processing



Content Processing Definition

■ AXMEDIS Content Processing (AXCP)

- ▶ A distributed tool based on a GRID
- ▶ Workflow / Crawler connected
- ▶ Uses rules





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-21 Digital 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...



Content Fingerprinting

■ 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





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 differences among:
 - Programme & Publication (P&P)
 - Production on demand (QoD)
 - AXEPTool
 - AXEMedia





AXMEDIS Publishing Tools

- ▶ Programme & Publication (P&P)
 - Configurable flexible multi-channel distribution engine
- ▶ Delivery on demand (QoD)
 - Configurable flexible user oriented production distribution tool based on query able also to adapt content to user needs
- ▶ AXEPTool
 - B2B devoted secure P2P
- ▶ AXEMedia
 - B/C2C devoted secure P2P



Thank you for the attention!

Any question or feedback?

Please remember that this tutorial, the related documentation and produced objects will be available on project web-site and wiki pages:

www.axmedis.org

www.axmedis.org/tiki





Contact Information

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

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