

**Automating Production of Cross Media Content
for Multi-channel Distribution**

www.axmedis.org IST-2-511299

AXMEDIS Overview and Content Distribution

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<http://www.axmedis.org/>
 version 1.6
 February 2008, User Group Meeting

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- AXMEDIS Content Protection and Tracking
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- Conclusions and references



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What is AXMEDIS ?

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- **AXMEDIS is a consortium/project of the European Commission proposed by companies and institutions to solve a set of problems in the area of e-commerce of digital content**
 - ◆ approved by the EC for reaching specific objectives, among them the creation of an Open Platform for the digital content production, protection and distribution.
 - ◆ partially funded by the EC and partially from the Companies and Institutions involved
- **Start: 1st September 2004**
- **Cost: about 14 Meuro, >8 Meuro of Funding**
- **About 200 people are working on AXMEDIS every day**
- **More than 35 partners (contractors and affiliated)**

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Partners

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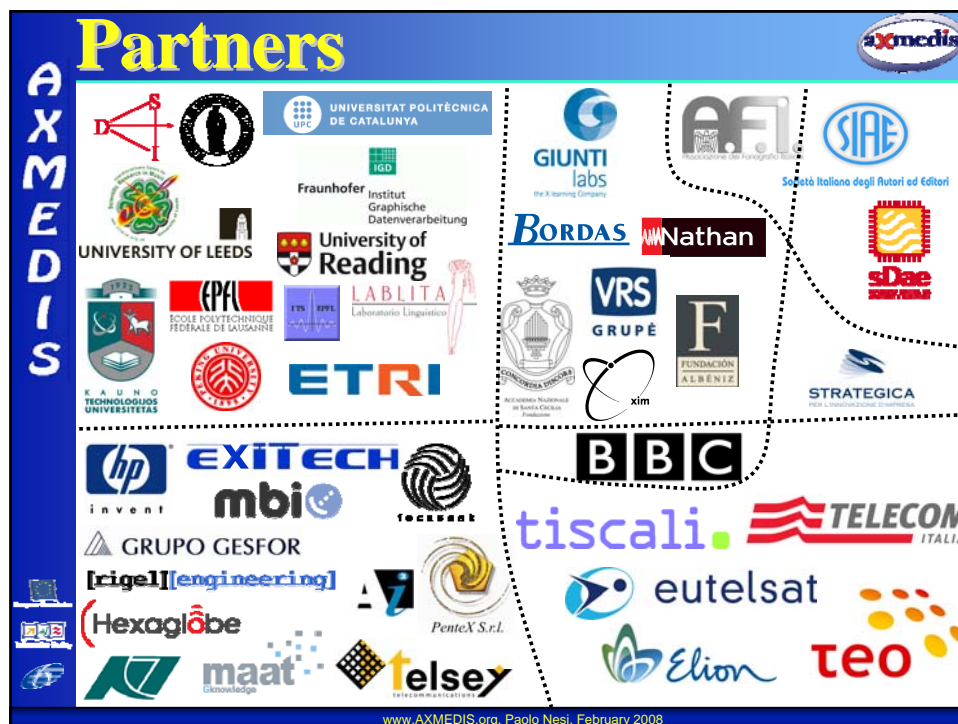







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Growing and numbers



- **AXMEDIS started in Sept 2004 with fewer partners**
 - ◆ GIUNTI, TISCALI, EUTELSAT, HP, AFI, SEJER, etc.
 - ◆ Univ. Florence, Univ. Leeds, FHG, Univ. Politecnica Catalogna, Univ. Reading, etc.
- **Added 10 more partners in the December 2006:**
 - ◆ BBC, TEO, ELION, TI, SDAE
 - ◆ MBI, VRS, KTU, ETRI, PKU
- **Added Affiliated partners:**
 - ◆ SIAE, PENTEX, GESFOR, MAAT-G, FIA, RIGEL, HEXAGLOBE, Focuseek, AI2, TELSEY
- **Now**
 - ◆ >700 AXMEDIS technical documents/tools have been downloaded
 - ◆ >1.2 Millions of accesses





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Objectives






- **exploiting new models, methods and tools for content production, protection and distribution**
 - ◆ Content more
 - interactive:cross media, multimedia
 - interoperable:device, DRM, formats
- **reduction of costs for content production, management and distribution considering activities of B2B and B2C**
- **Supporting massive processing for content production and distribution (on demand)**
- **Harmonize B2B and B2C**
 - ◆ Enforcing flexibility in business and transaction models
 - ◆ Integration of B2B and B2C areas
 - ◆ Modeling secure/legal P2P content sharing for both B2B and B2C
- **Create the AXMEDIS Framework for all**



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Applications and Customers

- **Applicative areas of AXMEDIS automation**
 - ◆ Entertainment, edutainment, infotainment, educational, etc.
 - ➔ Real-time and non-real-time content production, distribution and sharing
 - ➔ Internet, P2P, broadcast, IPTV, mobiles, DVB-T, DVB-S, DVB-H, etc.
 - ◆ And also:
 - ➔ banking, governmental, military and healthcare
- **AXMEDIS Customers**
 - ◆ content management, production, protection and distribution
 - ➔ Broadcasters, satellite, terrestrial, etc.
 - ➔ Telecom operators, multichannel operators
 - ➔ Content producers, editors, publishers
 - ➔ Collecting societies
 - ➔ Multimedia and cross media archives and WEB Portals
 - ➔ Etc.

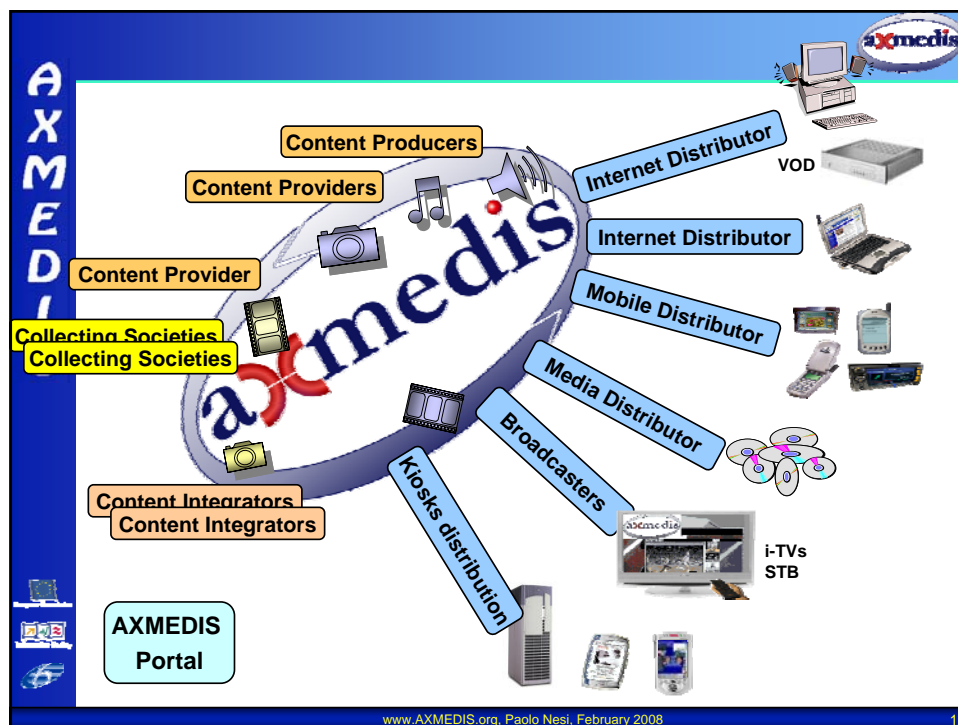
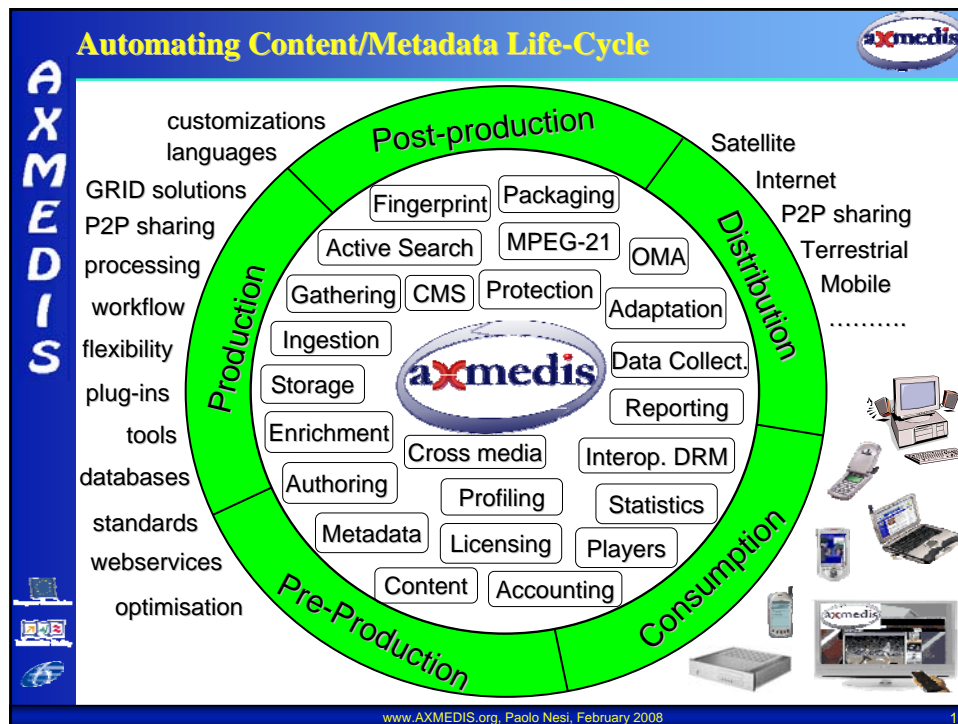
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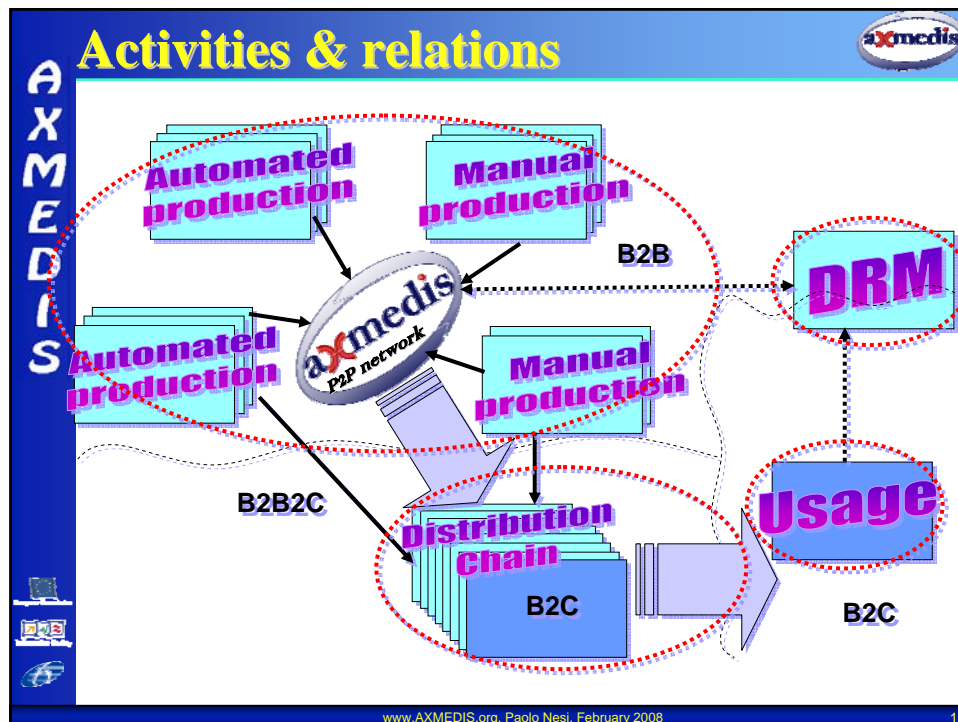



Technical Applications

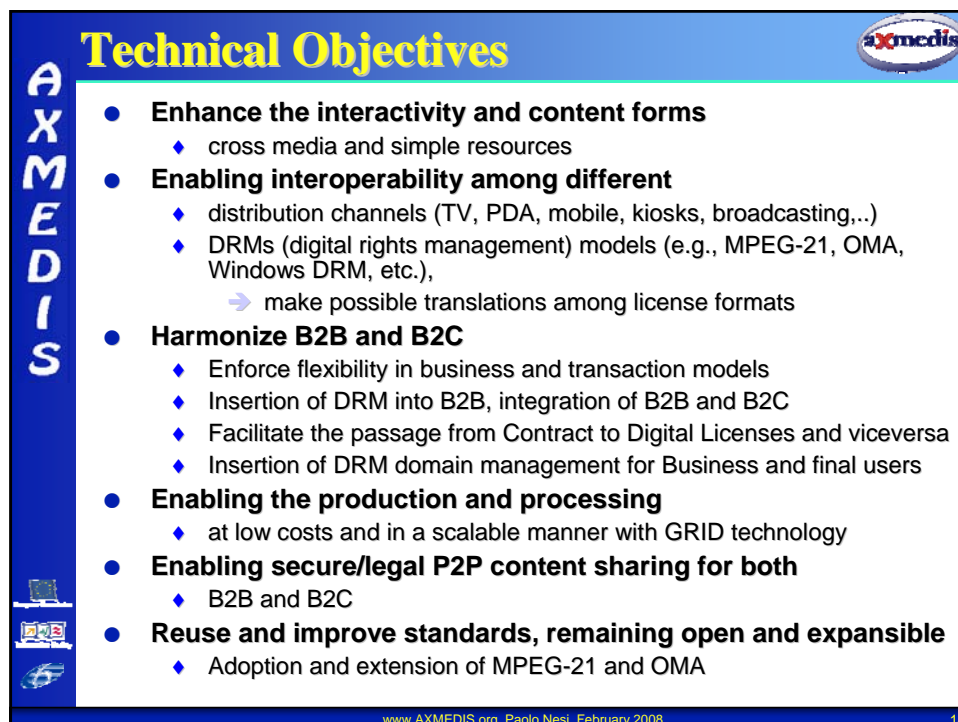
- General content management and processing
- Multi-channel production and distribution: broadcasting, IP/Internet, WEB sites, P2P, mobile, PDA, IPTV, interactive TV and channels, etc.
- Multi-channel experience for customers
- Video on Demand (VOD), and production on demand solutions
- Control of P2P content sharing and distribution, involving your customers in distribution (super-distribution)
- Involve customers and final users in content production and social networking
- interoperable DRM (MPEG-21, OMA, etc.)
- different business models and/or transactions on the same distribution channels: pay per play, monthly rate, preview, renting, advertising, etc.

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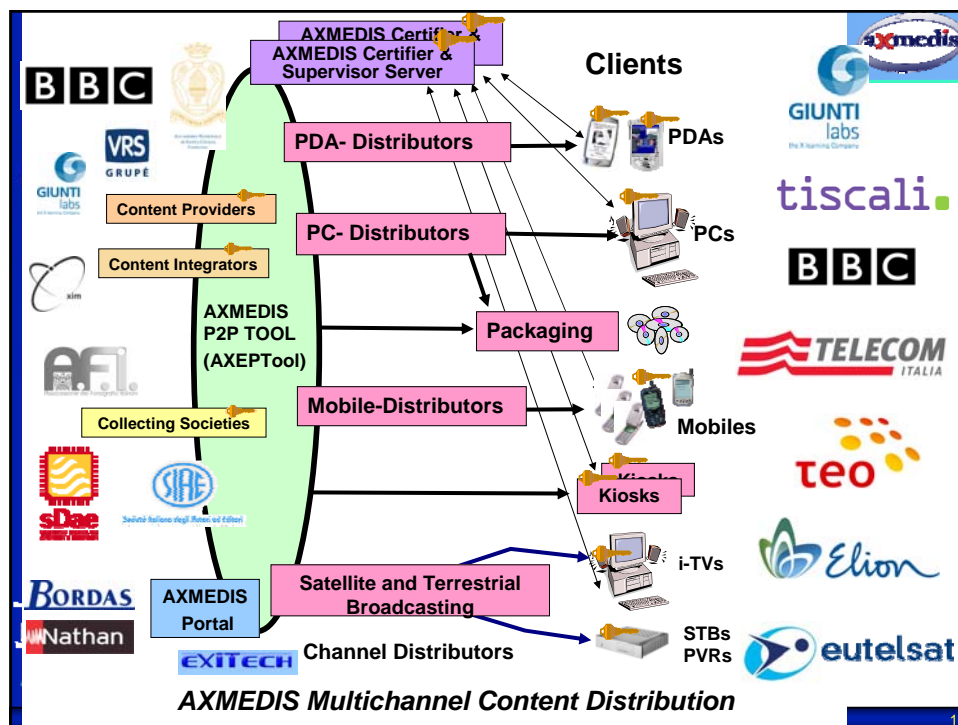
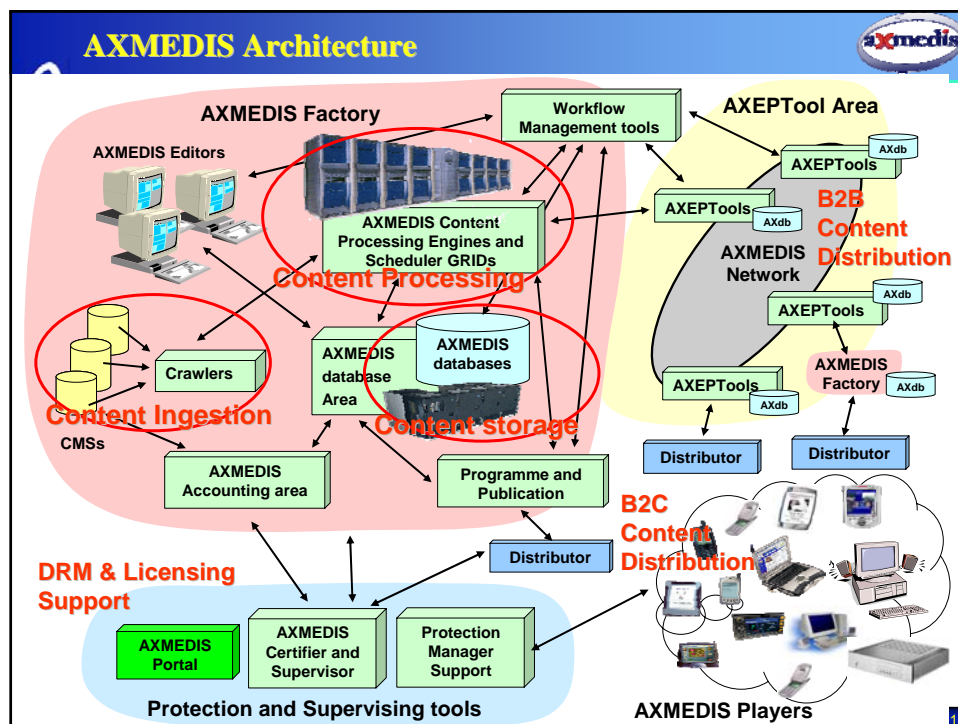




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AXMEDIS Framework

- **A unified European platform for content production and distribution, AXFW**
 - ◆ Improve standards
 - ◆ Development of the AXFW
 - ◆ Make the AXFW open, expansible and accessible to all
 - ◆ Open the Affiliation Programm to access at the AXFW
 - ◆ Set up of trials and demonstrators

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AXMEDIS Framework for all

AXMEDIS Framework

Partners

trials, and channels

AXMEDIS Based solutions

- Content Distributors
- Content Providers
- Content Integrator, editors
- IT Companies
- Telecom Operators
- Broadcasters
- Collecting societies
- Associations
- Research institutions
- Cultural Institutions
- Etc.

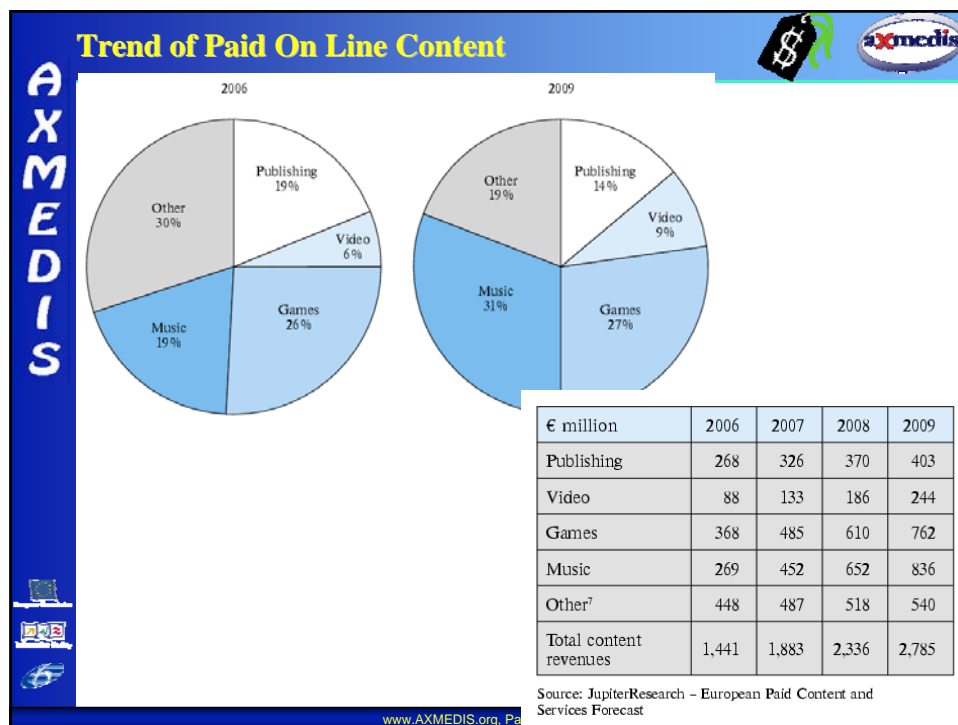
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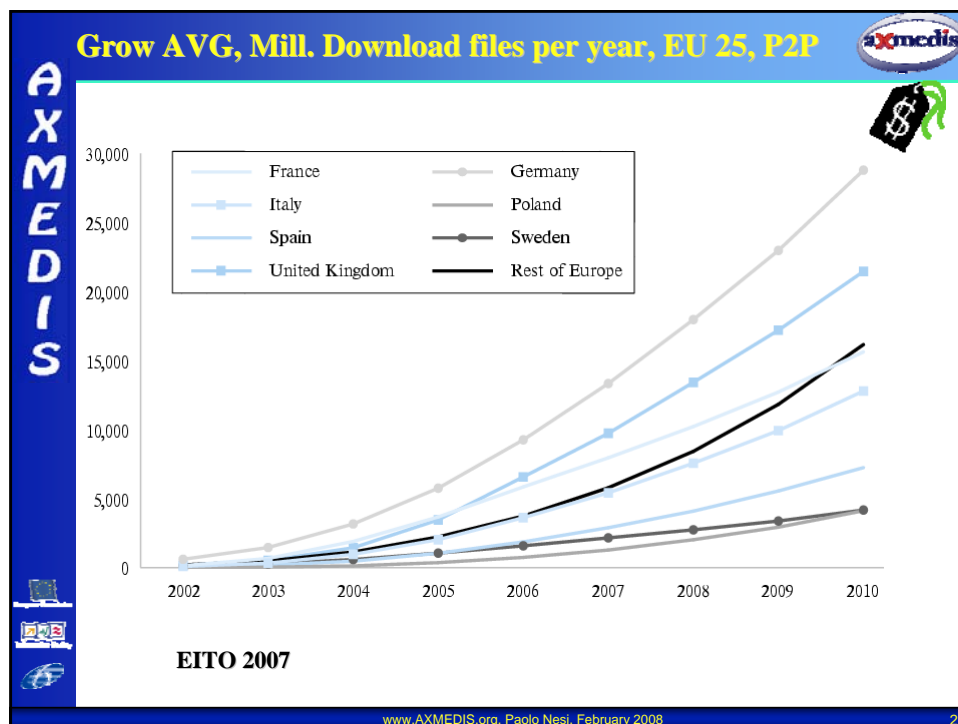
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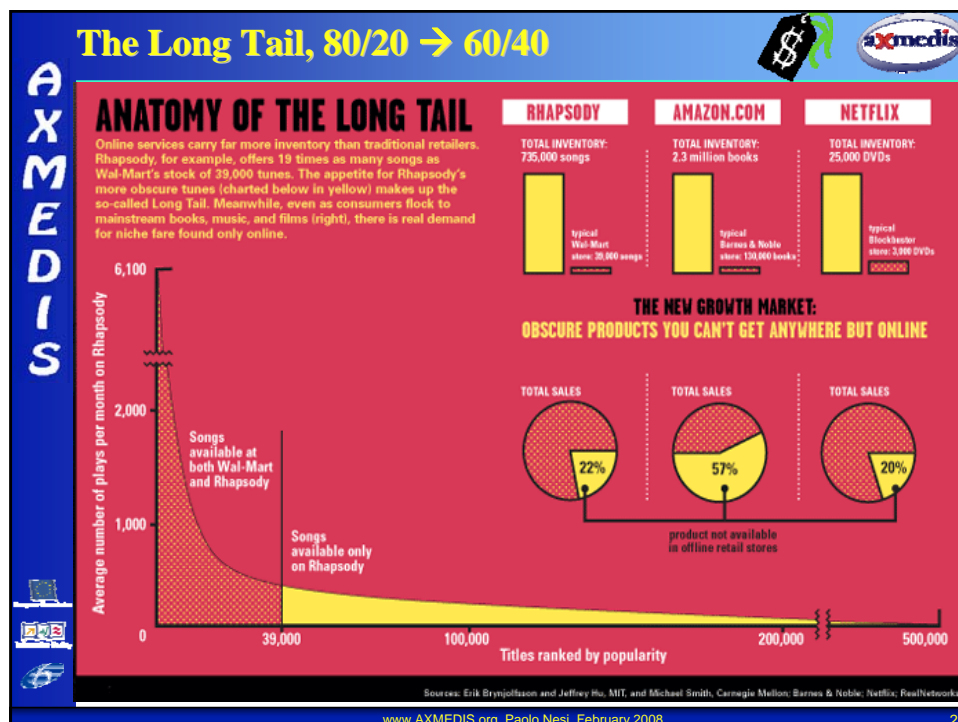
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Needs and the cure



- **Lower costs for**
 - ◆ production (packaging, protection, management, advertising, etc.), distribution and advertising
 - ◆ contract management, licensing, accounting, reporting, etc.
 - ◆ P2P distribution
- **Automation is THE cure/solution to**
 - ◆ reduce the costs
 - ◆ make the long tail access possible and convenient for all





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Contingency




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- **Trend of the market for digital content:**
 - ◆ Audio and Video distribution growing
 - ◆ Issues regarding the market loss for piracy (60-80%)
 - ◆ Issues regarding the P2P as primary source of piracy
 - ◆ High costs of content production and distribution
 - ◆ long tail of content (the low of 80/20, 60/40)
 - ◆ High business risks
- **High demands on**
 - ◆ content interactivity
 - ◆ interoperability of content and devices
 - ◆ tools for cultural valorization of content
- **Issues on DRM**
 - ◆ Legal and technical capabilities
 - ◆ Lack of interoperability, openness
 - ◆ Flexibility in the business and transaction models
- **Massive processing in content production and distribution, and in license processing and event tracking**
- ***These are a real challenge for many industries that are discovering the complexity of managing large digital content factories and distribution chains.***

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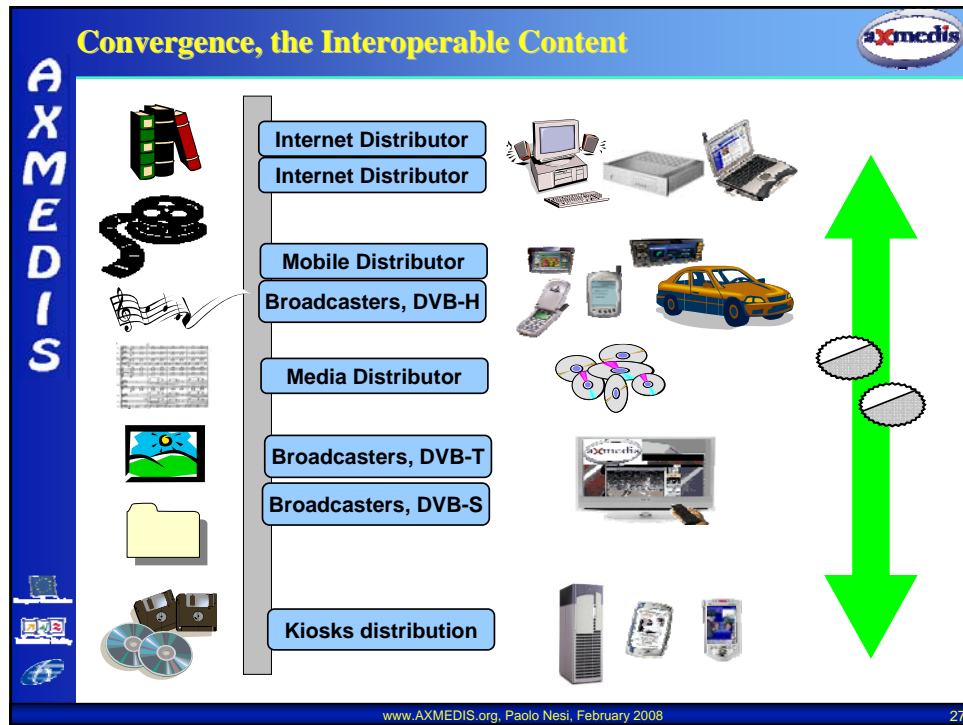
User's Trends



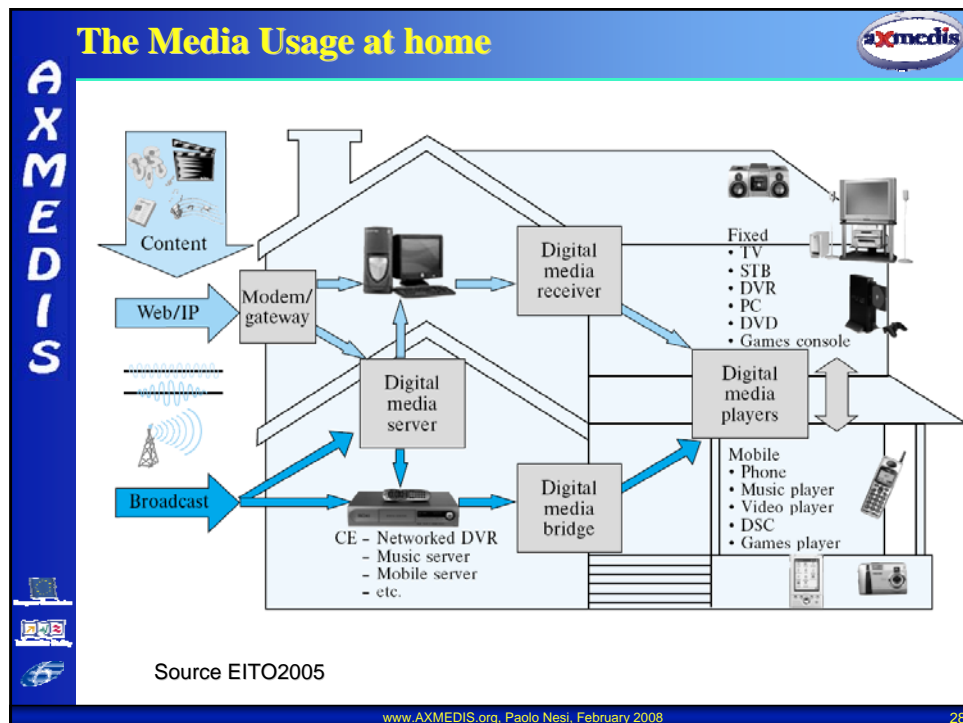
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- **Users are gradually abandoning the traditional TV**
- **We can see that they**
 - ◆ Spend more time on PC/games console
 - ◆ Spend more money and time on i-TV
 - Cultural/educational, infotainment programs
 - Thematic information
 - ◆ Are more attracted by new content models and usages
 - ◆ Are more attracted by new devices
 - ◆ Are interested in personal content publishing and sharing
 - YouTube, Video Google, etc.,
 - ◆ Are interested in Personal TV, personal realities,
 - ◆ Are interested in interactive and interoperable content
 - ◆ Are interested in home media centers and content management,
 - ◆ Etc,

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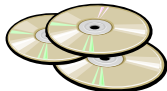



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Not enough interactivity and interoperability



- **Cross Media Content examples are:**
 - ◆ Interactive training material
 - ◆ documents with hyperlinks
 - ◆ interactive content in which the user may navigate
- **DVDs, WEB pages, eBooks, etc.**
 - ◆ mainly audio visual or textual
 - ◆ allow the inclusions of Simple Games (only DVD)
 - ◆ mainly for physical distribution (e.g., DVD)
 - ◆ eBooks and WEB pages are only digital distribution
 - ◆ low or absent interoperability among devices and distribution channels
- **AXMEDIS Innovations**
 - ◆ more interactivity and interoperability among devices/players
 - Content moving among devices and player
 - The same content on difference devices
 - different media inside
 - ◆ flexibility in creating content packages
 - ◆ ...




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Traditional value chain Issues, state of the art



- **The protection is performed just before distribution**
 - ◆ By the distributor or
 - ◆ By a specialized third party company as a service
- **The B2B areas are (production, integration, etc.):**
 - ◆ Considered trusted
 - ◆ Based on paper contracts
 - ◆ Contracts are produced on the basis of a limited and not standard terminology, so that they are not easy interpreted and transported on other media, or channels, etc.
- **Producers and integrators have no control about what is done on the content in the last phase of distribution:**
 - ◆ authors and producers cannot verify, they may ask
 - ◆ integrators cannot verify, they may ask at the business partners
 - ◆ Etc.
- **The distributors:**
 - ◆ control the selling of content, mainly with conditional access systems
 - ◆ do not control/verify the exploitation of each single rights



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Aim of Digital Rights Management



- To prevent the non-authorized rights exploitation by who has not acquired the rights
- To allow accessing at the digital content functionalities in a controlled manner
 - ◆ To who has been **authenticated/certified**
 - ◆ To do what (are the rights) is defined in a **License**
 - ◆ **Verifying/Control/Supervise** if the above conditions and others are respected
 - ◆ By using technologies to **protect content** (e.g., encryption, fingerprint, watermark, etc.)
- To **Verifying/Control** if the allowed rights are respected
- There are some **Cons**, since the user is constrained:
 - ◆ Registration of users
 - ◆ Authentication of users and/or tools/terminal/devices
 - ◆ Control of users
- ***It has to be supported by a set of additional technical solutions***




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Market solutions viz AXMEDIS




Business Models	Larger number of Business Models
B2B DRM	B2B, B2C, B2B2C DRM solution
Proprietary / Standard DRM and model	Standard DRM: MPEG-21, OMA, etc.
Non interoperable DRM	Allowed Interoperable DRM: MPEG-21, OMA, etc.
Fixed/Flexible Protection Model	Any Protection Model, key, algorithms, etc.
Separation among Content and license	Separation among Content and license
Signed Content Header	Signed Content AXINFO, any Metadata
Channel distribution	Multichannel with the same license
Players and Devices	Players and Devices: PC MS-Windows, PDA Windows Mobile, STB, Linux OS, Apple MAC, Mobiles
License Proprietary: number of rights	Licenses MPEG-21 REL: Expandable dictionary, Any type of rights, Licenses OMA
Authentication of Player	Authentication of device, user, domain, etc.
Revocation per Player	Revocation per device, user, etc,
Revocation per license	Revocation per license
digital resources that can be included and protected	Any digital format, of any type
Media content	Single audio, video, image, doc, and Cross media: SMIL, HTML, SVG, MPEG-4,...
Customizable Tools	Customizable Tools: servers and player clients



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B2B Rights Management

- **Advantages of B2B DRM**
 - ◆ Automation of contract-based deals
 - ◆ Assessing the Usage in the B2B
 - ◆ Reducing costs of B2B promotion
 - ◆ Allowing integration and composition of protected content
 - ◆ Allowing content production on demand, no contracts signatures, immediate DRM processing
 - ◆ Try and buy, try and use for business
 - ◆ Free try for Business users
 - ◆ Increasing the control, decreasing the risk
- **P2P distribution**
 - ◆ sharing of content
 - ◆ lower costs to access content
 - ◆ Lower costs to promote/distribute content
 - ◆ Increment of accessible content

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Summary of Major Challenges

- **Reduction of production, protection and distribution costs**
- **Content production/protection on demand**
- **Automating the B2B area, DRM and distribution**
 - ◆ Production, protection and distribution phases
 - ◆ Expanding DRM to B2B
 - ◆ Reducing costs of B2B distribution
- **Real Time content Processing**
 - ◆ Reducing production and distribution costs
 - ◆ Flexible Content Distribution
 - ◆ Content production, protection, distribution on demand
 - ◆ Adaptation and transcoding
 - ◆ Accelerating B2B processing
- **Increasing security: rights usage and control on**
 - ◆ Harmonization of B2B and B2C
 - ◆ Increasing security and interoperability
 - ◆ Increasing control of rights exploitation
 - ◆ Allowing the set up of a large number of business models
- **Any other question/issue ??**



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 - ◆ Content Model and hierarchy
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AXMEDIS Content Elements

A X M E D I S


- **Content Packaging for protection and distribution**
 - ◆ Streaming (so called real-time) and/or downloading
 - ◆ Sharing on P2P, etc..
 - ◆ portable on physical supports, etc. (scalable)
 - ◆ binary and/or XML, etc.
- **Real Cross Media**
 - ◆ Multimedia hierarchies of digital resources such as models based on:
 - HTML, SMIL, SCORM/IMS, WEDELMUSIC, MPEG-4, etc.
 - With internal and external links and relationships: *for example one HTML page may be build by using several images and audio files.*
 - ◆ **Integration of docs, audio, video, images, via spatial rendering and synchronization, providing interactivity**
- **The Content Package in the hands of the final user to be used may need of the following information**
 - ◆ Metadata.....
 - ◆ Digital Resources.....
 - ◆ Protection Information.....
 - ◆ License.....


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AXMEDIS Metadata



- **Metadata:**
 - ◆ Identification of information,
 - unique ID (AXOID), UUID,
 - distributor ID, UUID,
 - other codes such as: ISRC, ISBN, etc.
 - Producer ID and Information, etc.
 - Author Information, etc.
 - ◆ Classification information also for indexing:
 - Dublin core, etc.
 - ◆ PAR: Potentially Available Rights 
 - ◆ Descriptors: for indexing, MPEG-7, technical and conceptual, etc.
 - ◆ References to Owner, to Distributor, etc.
 - ◆ Fingerprint
 - ◆ Historical and versioning aspects
 - ◆ Etc.
- **Some of them are grouped in AXMEDIS format in the so called AXMEDIS Information, AXINFO**
- **One Metadata set for each resource or group, ITEM**






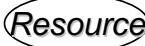


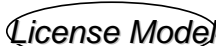

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AXMEDIS Content Elements

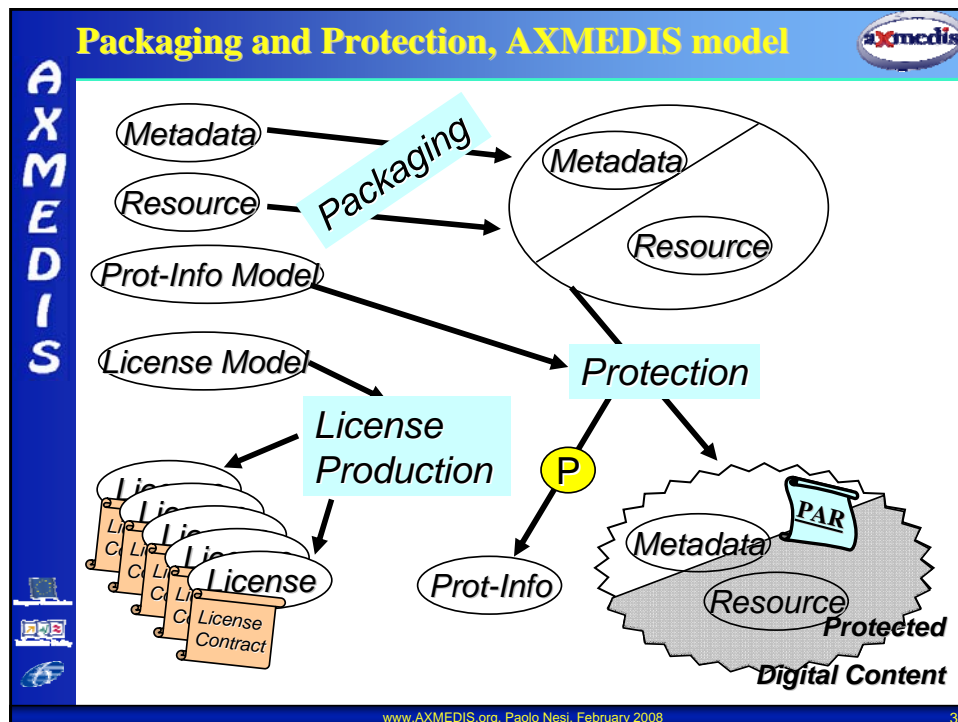


- **Digital Resources:** 
 - ◆ Any digital information: images, docs, txt, video, game, application, xml files, audio, animation, etc.
 - ◆ Hierarchy of digital resources, nesting levels
 - ◆ Internal and external links: e.g., HTML navigation, SMIL references, MPEG-4 paths..
- **Protection Information:**  → 
 - ◆ What has to be done to access (unprotect) a given information/resource
 - ◆ Protection Tools used, their parameters, etc.
- **License:**  → 
 - ◆ Which rights are provided, who is the recipient, what are the conditions, etc.

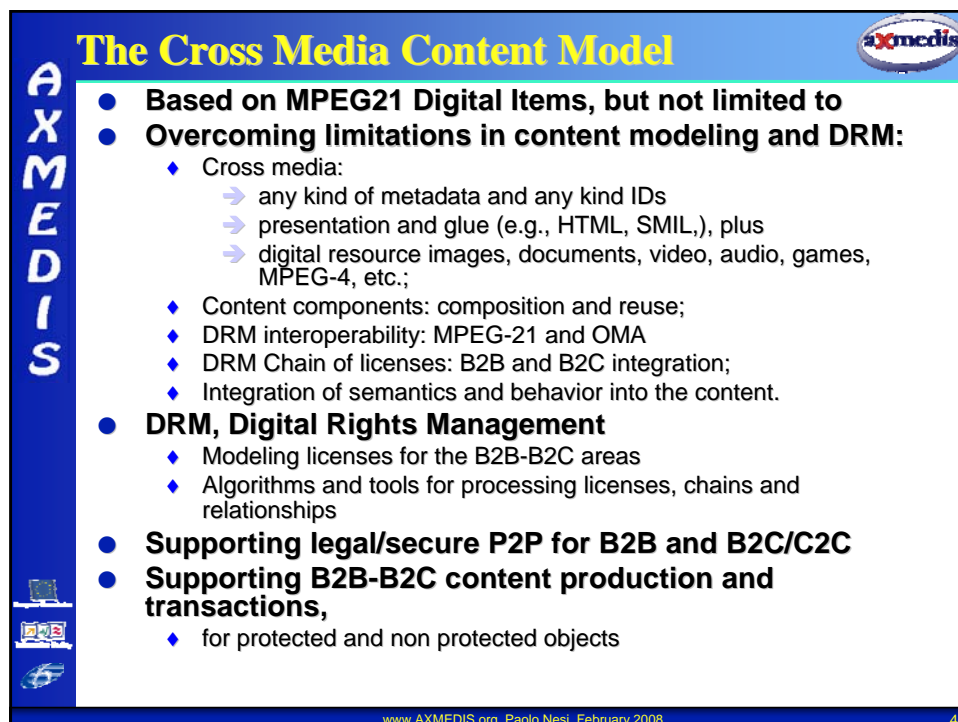


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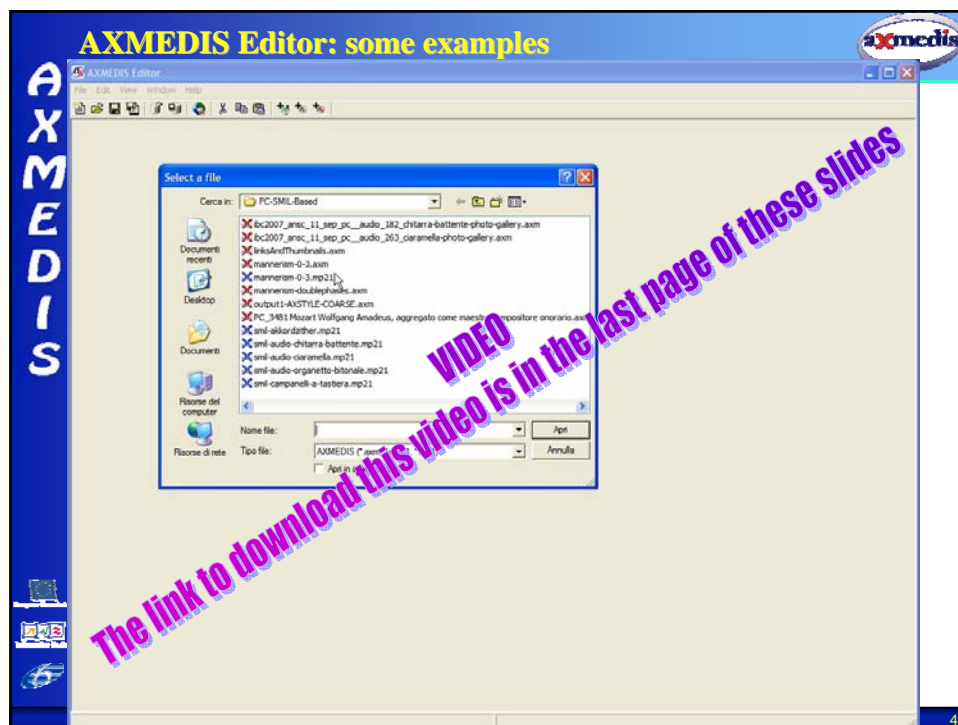
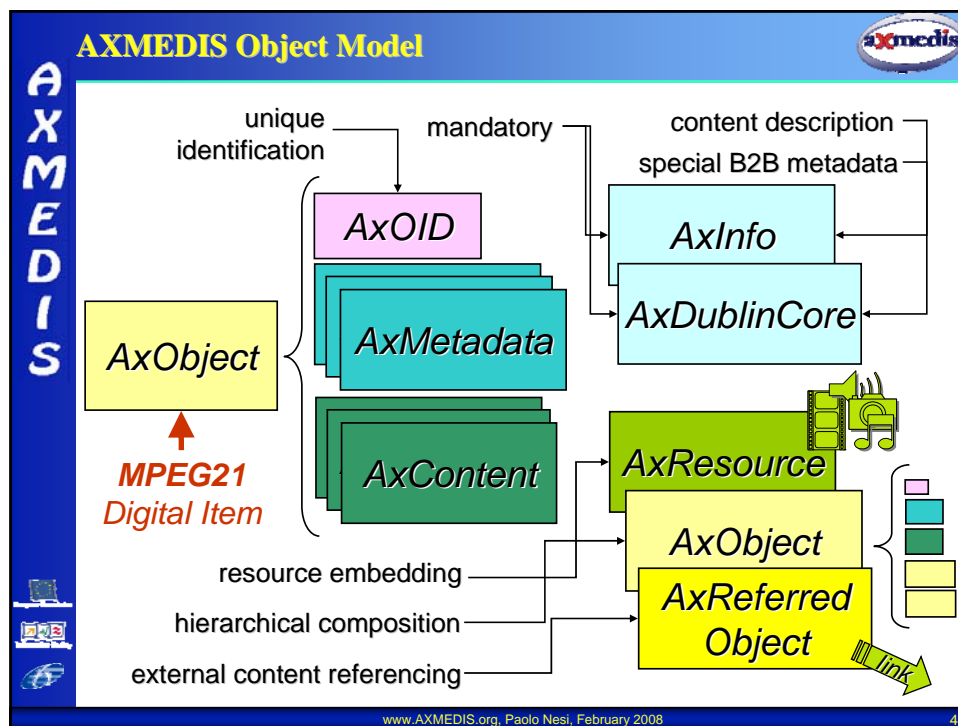
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VIDEO


The link to download this video is in the last page of these slides

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AXMEDIS Digital Rights Management

- To allow accessing at the digital content functionalities in a controlled manner
 - ◆ To who has been registered the first time and continuously: **authenticated and certified**
 - ◆ To do what is defined in a **license** (to allow exploiting the rights)
 - ◆ By using technologies to **protect content** (e.g., encryption, fingerprint, watermark, etc.)
 - ◆ **Verifying/Control/Supervise** if the above conditions and others are respected



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Managing License and Protection Information

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- **Once obtained the content a license is needed to exploit the right you have acquired,**
 - ◆ or at least you need a server that verify that you are authorized to exploit some right and provide you the Authorization
- **Once you are Authorized to exploit the rights you may get a reference to**
 - ◆ the Protection Information to Unprotect the specific object segment and/or digital resources
- **License and Protection Information are typically located in external and remotely located Servers**
 - ◆ but may be cached on the terminal device if allowed by the license issuer
- **During all these phases the AXMEDIS Certifier and Supervisor verify integrity and certificate**

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AXMEDIS DRM Aspects


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- **Formal definition of Licenses as MPEG-21 REL**
 - ◆ Facilitate the passage from Contract to Digital Licenses and viceversa
- **Support and make easier the B2B market of digital content, and cross media content**
 - ◆ Content composition and DRM management
 - ◆ Tracking and monitoring the exploitation of rights
 - ◆ Reduction of costs for B2B trading of content
 - ◆ Enforce flexibility in business and transaction models
 - ◆ Harmonize and automating B2B and B2C
 - ◆ Management of domains
- **Enable interoperability among different**
 - ◆ distribution channels and devices with their DRM
 - ➔ TV, PDA, mobile, kiosks, broadcasting,...
 - ◆ DRMs models: MPEG-21 and OMA, other can be added
- **Enabling**
 - ◆ Content production on the consumer side
 - ◆ secure/legal P2P content sharing for both B2B and B2C


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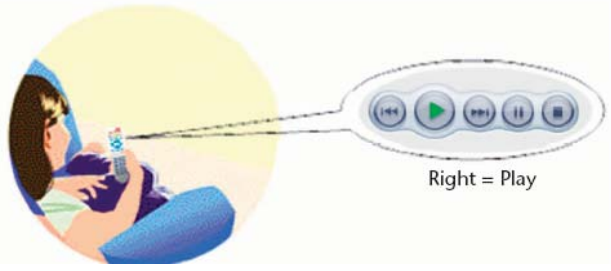
An example of REL statement



Condition = November 2003



Resource = Ocean Wilds

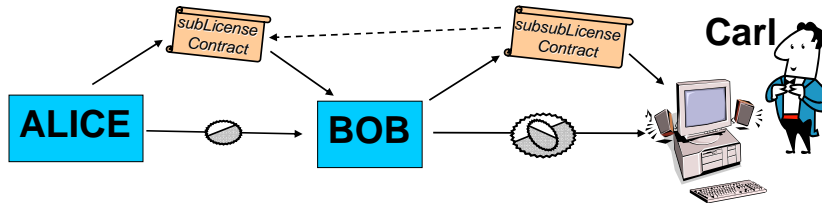



Right = Play

- Rosy can Play 3 times the Ocean Wilds in November 2003.

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Managing License Chain, B2B and B2C






Carl

- **Alice states** "Bob has the right to issue a license to anyone to print the book in Italy"
- **Bob states** "Carl has the right to print the book in Italy"
- To solve the SubSubLicense for Carl all the connected Licenses are needed
- Licenses have to be accessible on Processing Engine
- Alice can revoke the license to Bob

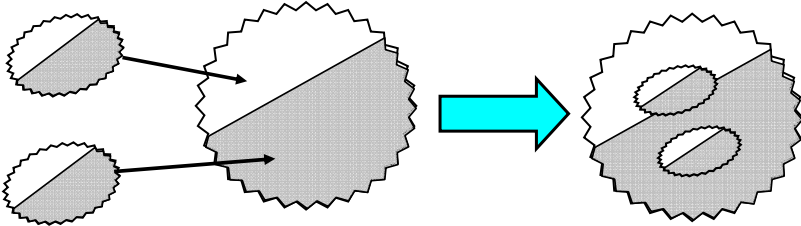
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Cross media content and composition

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- **AXMEDIS objects can be used as components for creating other added values AXMEDIS objects**
 - ◆ Allowing the production added value object for composition or integration of protected content
 - Who is composing can add its own protection and licensing
 - ◆ Allowing the Rights Management Of Composition, in the digital world similarly at what is performed in the physical world
 - ◆ The shares along the value chain are de facto formalized




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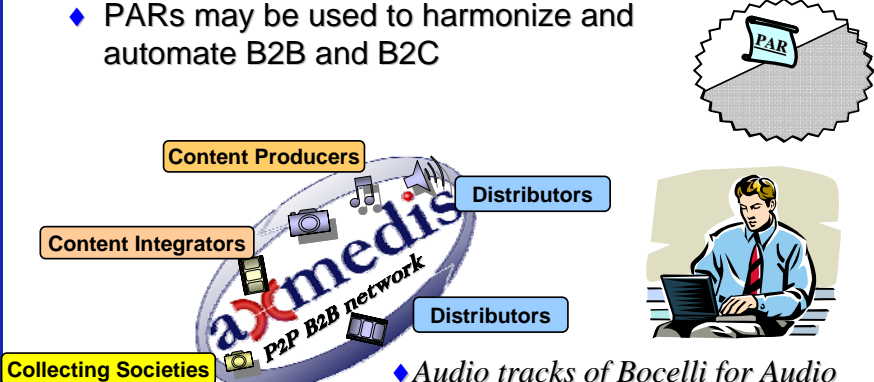
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Make easier the B2B market of digital content

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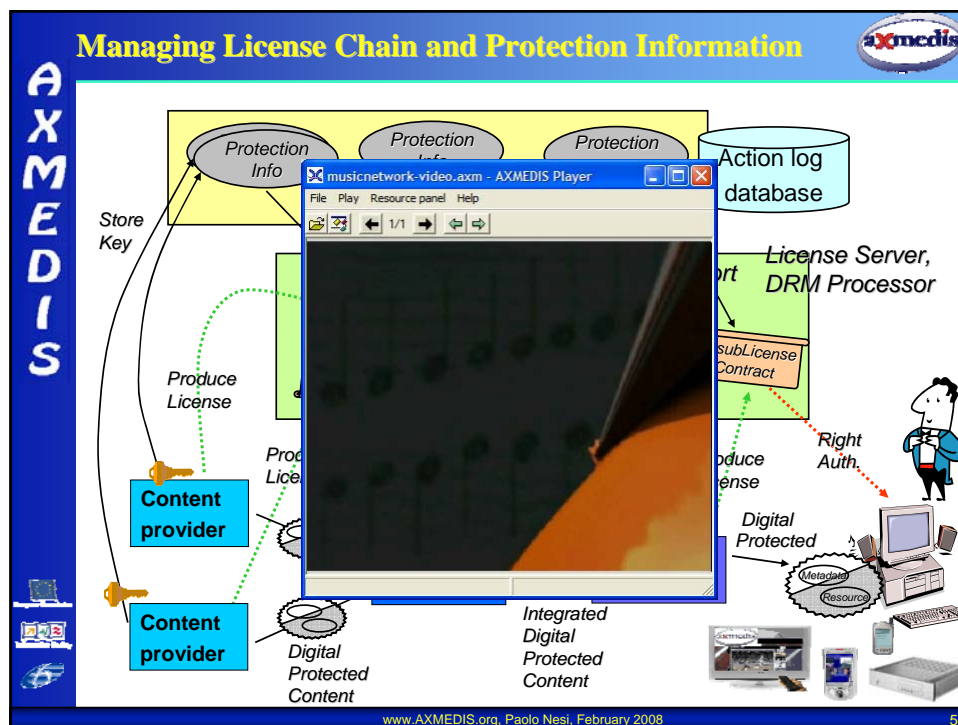
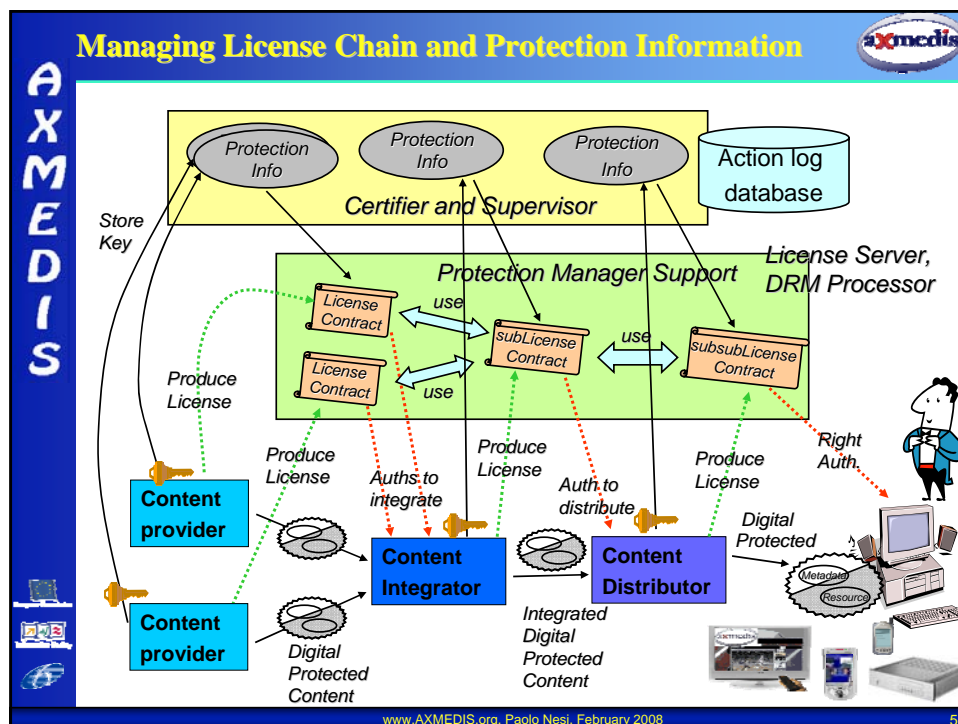
- **PAR: Potentially Available Rights into AXMEDIS objects**
- **The PAR can be used to make queries**
 - ◆ PARs based content trading, Customers may know directly which rights they could buy and by who
 - ◆ PARs may be used to harmonize and automate B2B and B2C

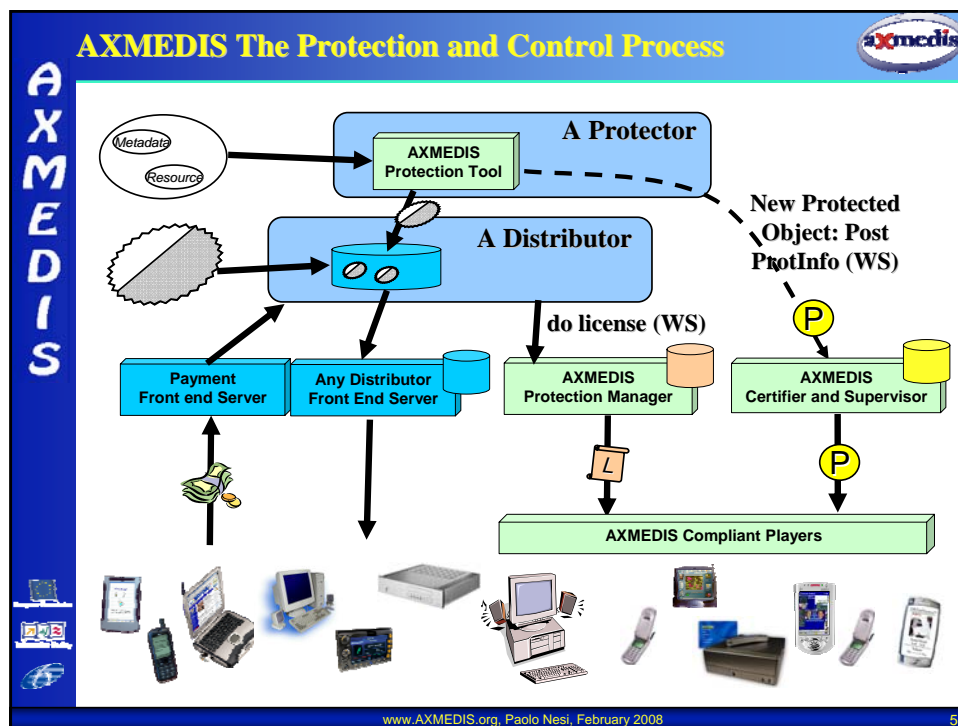


◆ *Audio tracks of Bocelli for Audio broadcasting for June 2008 in Gemany?*

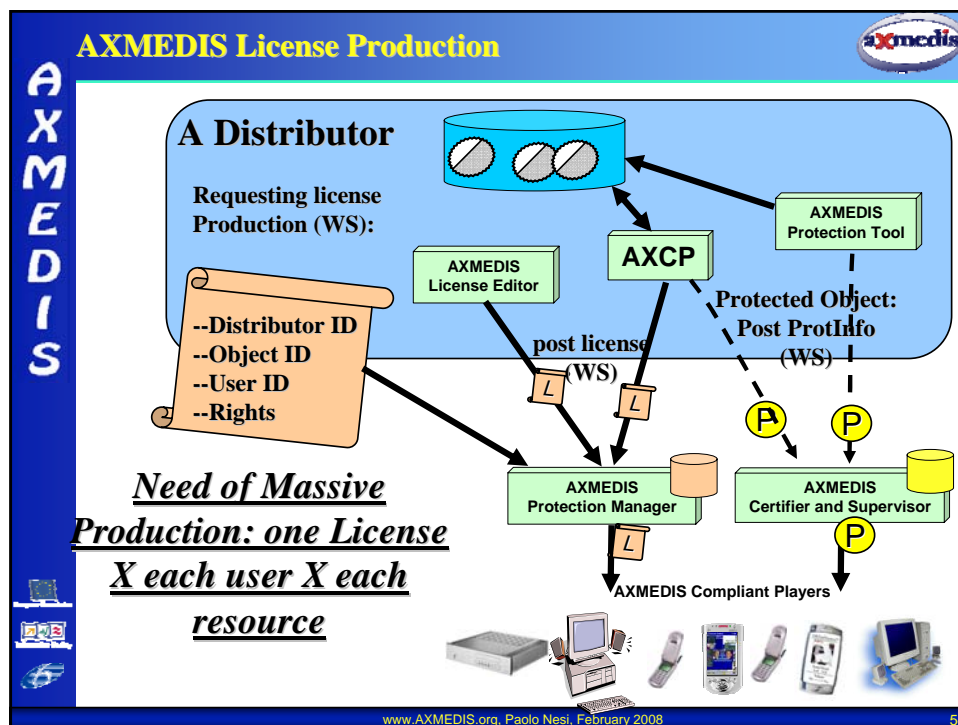
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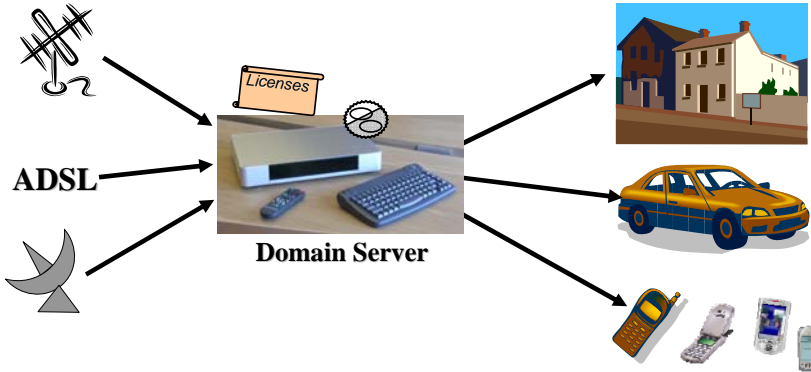
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DRM and Domain Management

AXMEDIS

- **Users are strongly interested in acquiring a content to be used in their domain in which they have their**
 - ♦ Home devices, cars, mobiles, etc.
- **Media Centers and/or Home Servers are going to manage content and licenses for the whole domain**
 - ♦ One license for all devices and people





Domain Server


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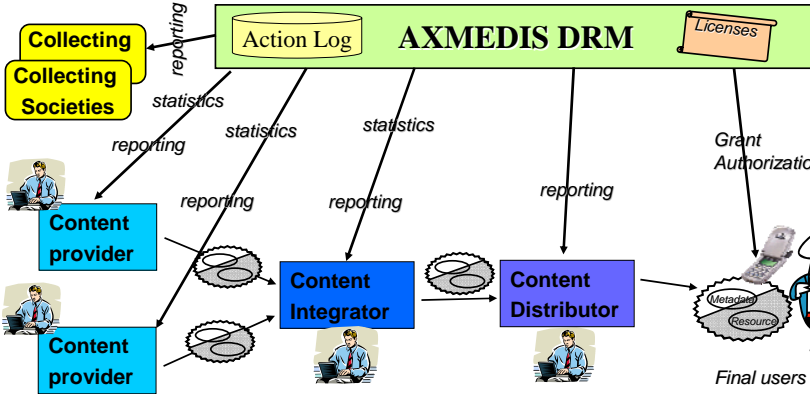
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Tracking and monitoring Exploitation of Rights

AXMEDIS

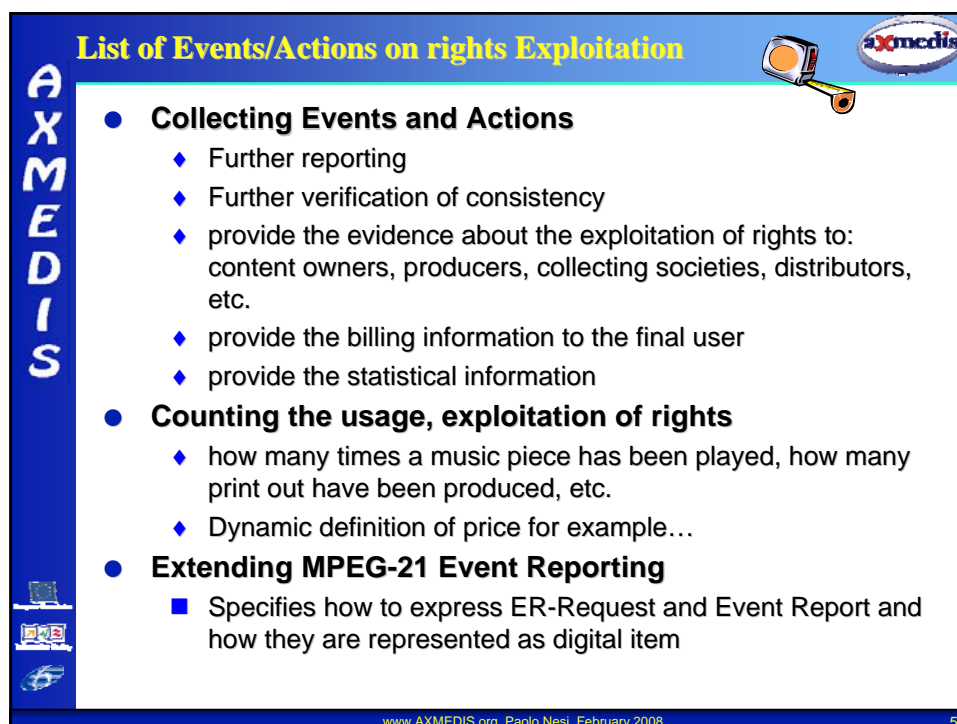
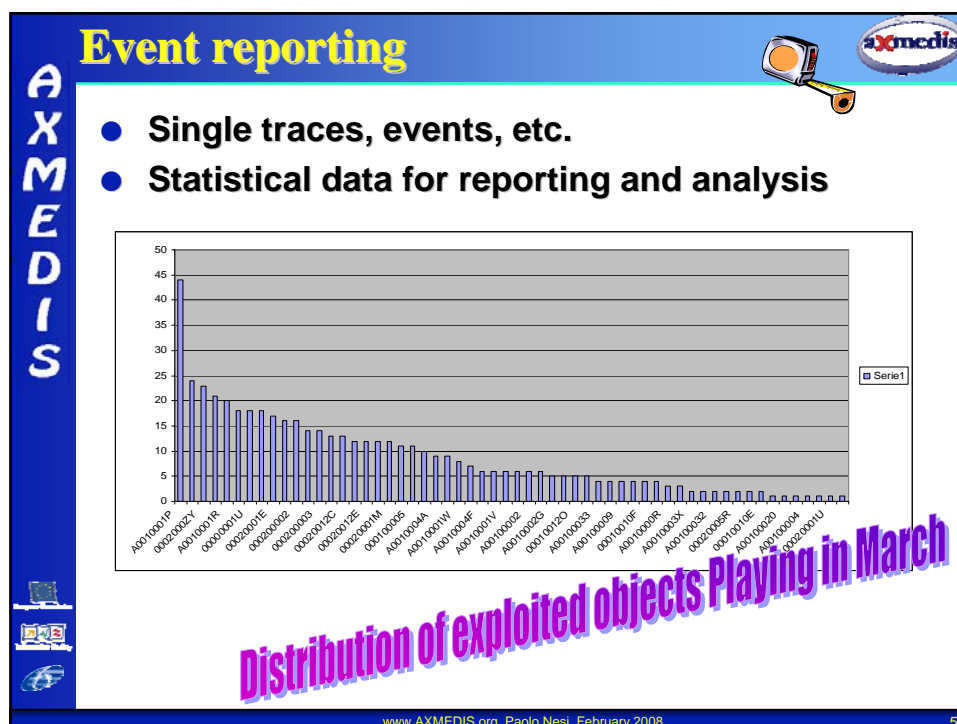
- **Different reports and statistics for different roles**
 - ♦ Reports on licensing and on the consumption/exploitation of rights
- **REL and Composition enforce flexibility in business and transaction models, multiple models for the same channel**
 - ♦ Pay per play, all you can eat, subscription, etc. etc.





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Table of Content

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- AXMEDIS Content Packaging
- AXMEDIS Content Protection and Tracking
- **AXMEDIS Content Production and Processing**
 - ◆ AXMEDIS Editors, Authoring
 - ◆ AXMEDIS players
 - ◆ Automated AXMEDIS Content Processing and Production
 - ◆ Multichannel Back-Office Management
- AXMEDIS Application Scenarios
- Conclusions and references








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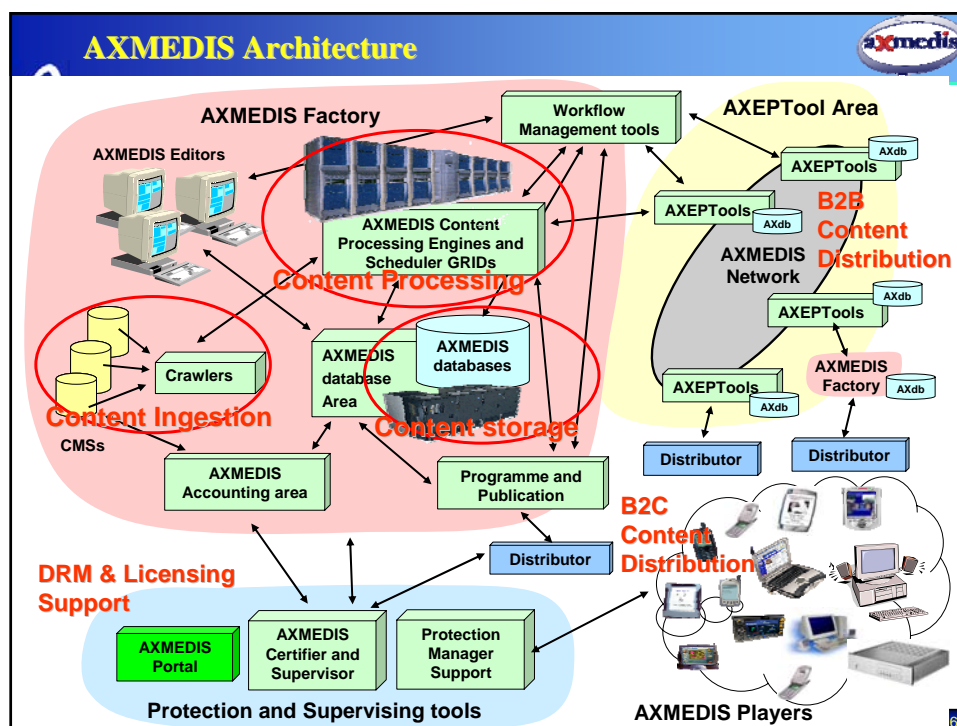


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Major Tools

- **Players for cross media content:**
 - ◆ PC, PDA, STB, mobiles, etc.
- **Tools for DRM and protection**
- **Content Production tools**
 - ◆ Authoring tools for cross media content: AXMEDIS Editor
 - ➔ for content, protection and licenses
 - ◆ Automated production tools for content, protection packages and licenses: AXCP, Workflow
 - ◆ CMS: search and retrieval, automated connection with your own and/or third parties CMSs
- **Content Distribution**
 - ◆ P2P tools for B2B and C2C in a controlled and safe/legal manner: AXEPTool, AXMEDIA
 - ◆ User and tool Registration portals
 - ◆ Certification authority, AXCA
 - ◆ License Server and Certifier and Vericator, PMS/AXCS
 - ◆ Scheduling: Program and publication, Workflow, etc.
 - ◆ Distribution Portal
 - ◆ Content acquisition portal for end user production

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AXMEDIS Cross Media Content

Any content inside a package:

- Video, Audio, Documents, Images, games, animations, WEB pages, tools, etc.
- compliant and extend MPEG-21

AXMEDIS content that can


- create content for other devices, etc.
- satisfy social activity, user annotations, user content production, etc.
- be digitally streamed on TV (DVB-T/DVB-S/DVB-H with the same level of interactivity
- be protected with the needed flexibility
- be distributed on different terminals/devices and via different channels.
- be customized for culture and language

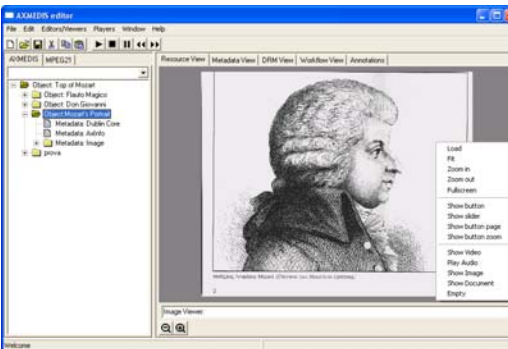
The screenshots show various content packages, including text documents, images, and video content, demonstrating the versatility of AXMEDIS content.

AXMEDIS Authoring Editor

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- **The AXMEDIS Editor is an application allowing**
 - ◆ manual production of AXMEDIS objects
 - ◆ inspection of automatically produced objects
 - ◆ finishing AXMEDIS objects pre-produced automatically
- **It integrates many Editors & Viewers to handle all the aspects of the AXMEDIS Objects production**
 - ◆ Resource
 - ◆ OBJ Composition
 - ◆ Metadata
 - ◆ DRM/Licenses
 - ◆ Protection
 - ◆ Presentation
 - ◆ Behavior
 - ◆ Etc....






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AXMEDIS Tools

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- **AXMEDIS/MPEG-21 Model plus a set of players**
 - ◆ Audio and video players: almost any format
 - ◆ Document viewers: PDF, HTML, etc.
 - ◆ Image viewers: any format
 - ◆ Cross media: MPEG-4, SMIL player, HTML, etc...
 - ◆ Etc.
- **AXMEDIS Metadata support**
 - ◆ AXInfo, Dublin Core, etc.
 - ◆ Any descriptors, etc.
- **Possible integration AXMEDIS AXOM core module in any player**
 - ◆ The access to the AXMEDIS Framework allows you to create in short time your customized AXMEDIS compatible player in many platforms based on AXOM:
 - ➔ Windows
 - ➔ Linux
 - ➔ PDA, Windows Mobile 5
 - ➔ Etc.



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Interoperability among devices

AXMEDIS

The user likes interoperability among devices, e.g., getting

- ◆ a video for the TV and reproducing it on mobiles, PC, etc.
- ◆ an MP3 audio track and using as ringtone in the phone, reproducing it on the car stereo, or in the living room, passing to a friend.
- ◆ a guide in a museum for his mobile, using there, and passing and playing it at home on the TV set
- ◆ Etc.....

AXMEDIS interoperability satisfies these demands among a large set of devices:

- ◆ PC, STB/PVR/HDR, PDA, Mobiles, etc.
- ◆ You can buy once to use on all

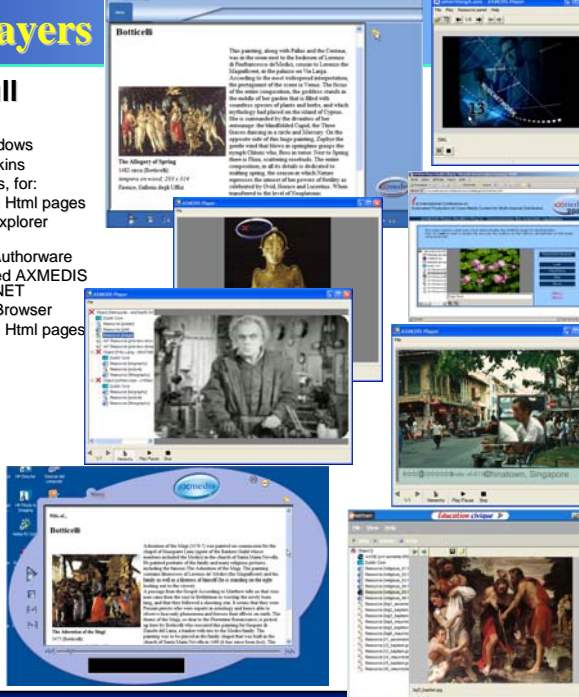


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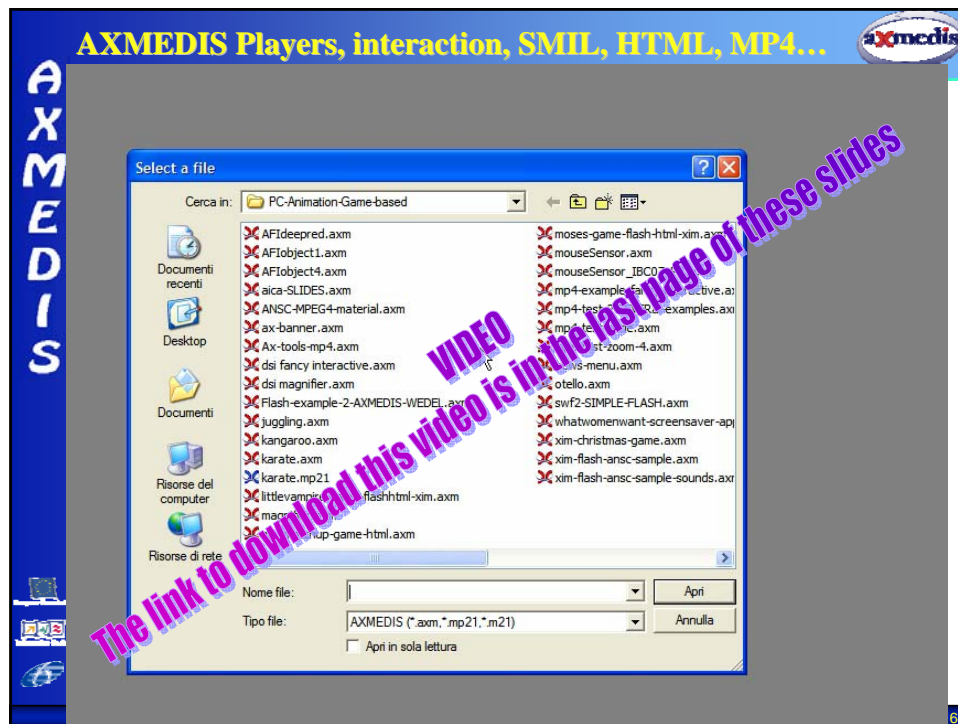
Interoperable Players

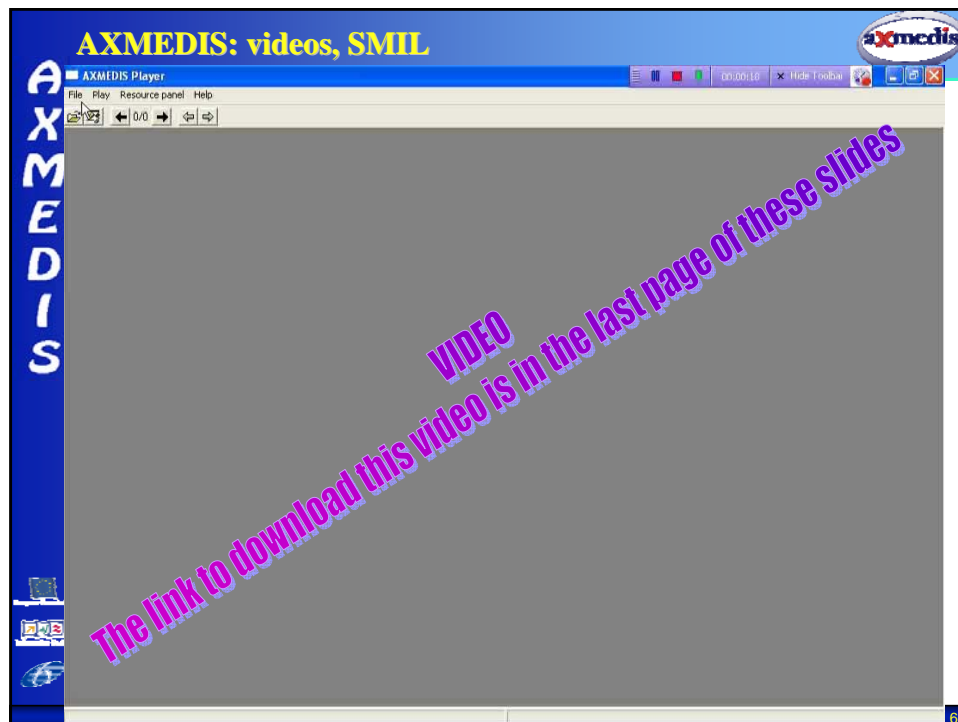
AXMEDIS

- ◆ **PC players with full functionalities**
 - ◆ Stand Alone Player for Windows
 - ◆ Version with Replaceable skins
 - ◆ Active X Player for Windows, for:
 - Integrating player in Html pages
 - Microsoft Internet Explorer Browser
 - Macromedia tools Authorware
 - Realising customised AXMEDIS Players based on .NET
 - ◆ Plug in for Mozilla Internet Browser
 - Integrating player in Html pages
 - Two different skins
- ◆ **PDA player:**
 - ◆ MPEG-4, SMIL, HTML
- ◆ **STB player:**
 - ◆ for IPTV
 - ◆ for DVB-S
 - ◆ MPEG-2, MPEG-4
- ◆ **Mobile player:**
 - ◆ A pure Java player will be ready for Feb 2008
 - ◆ SMIL support with Audio Visual, MMAPi of Java



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PDA and mobiles players



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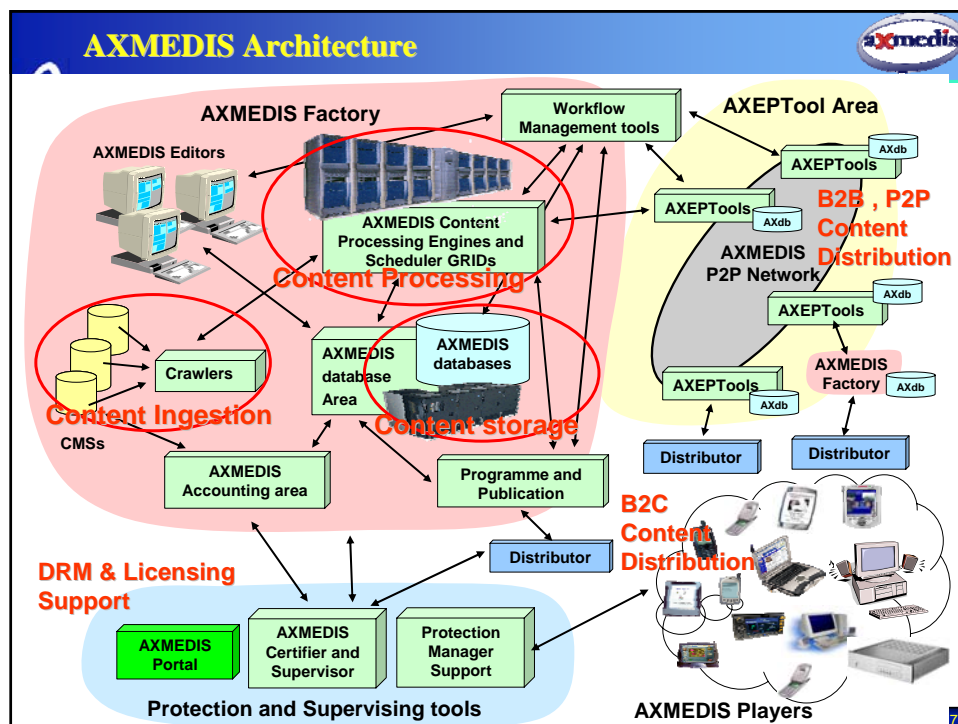
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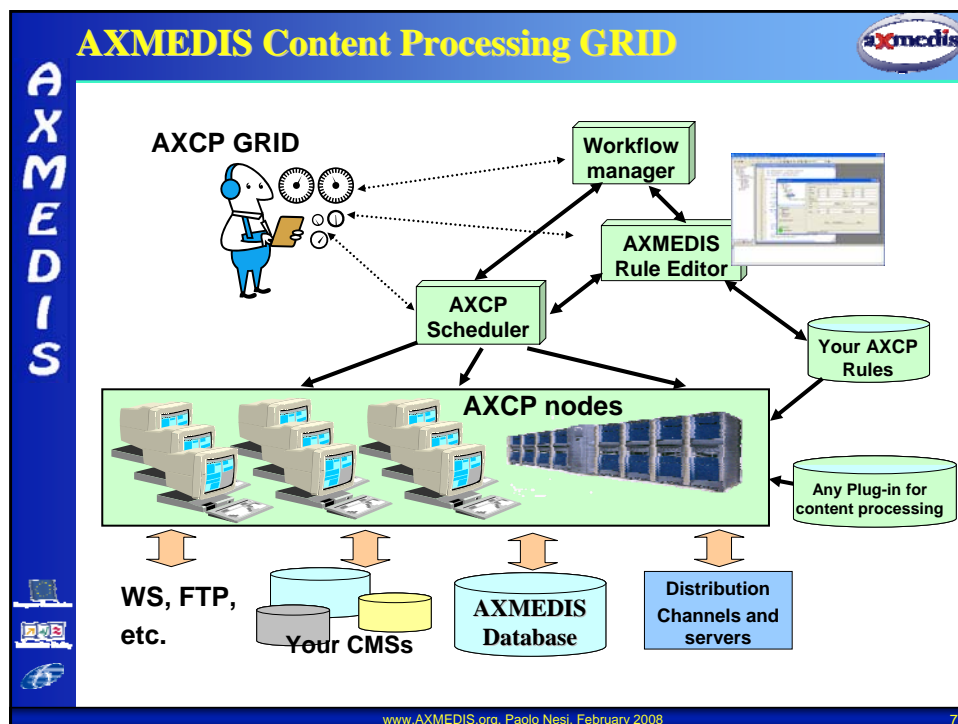


Content Processing Applications

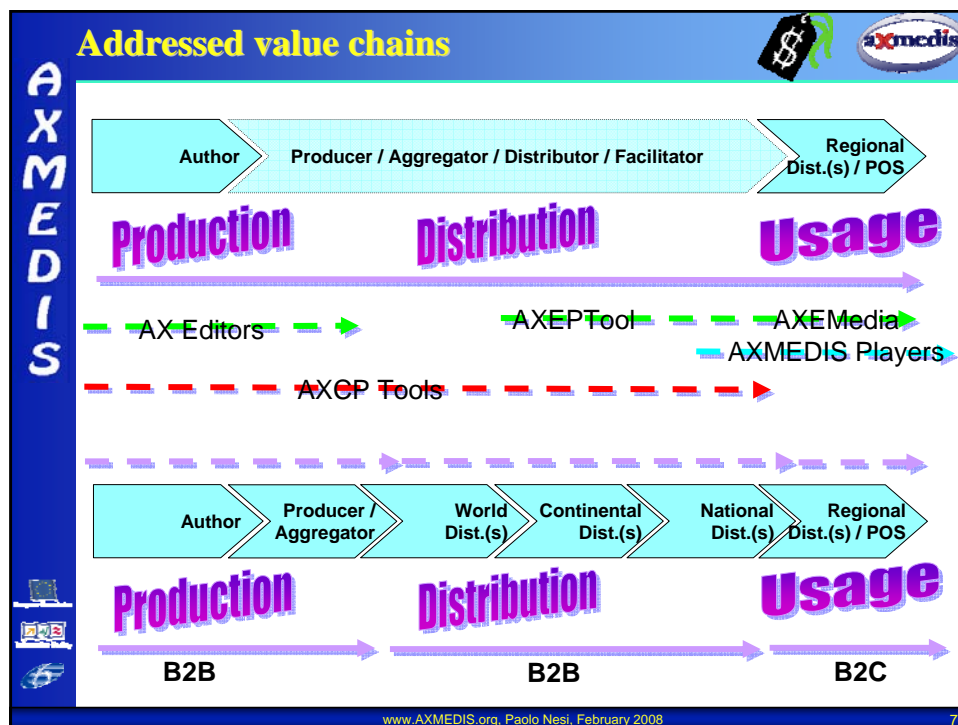
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- **AXMEDIS allows you to reduce costs and increase efficiency of your content management.**
- **Automating back office content production/protection and distribution**
 - ◆ Open and secure architecture for content production, processing, protection and enrichment, based on a scalable GRID model
 - ◆ Maximum flexibility with
 - AXMEDIS content processing GRID Language
 - Uses plugins for content adaptation/transcoding for multi-channel production, fingerprinting, processing profiles, etc.
- **AXCP GRID solution allows automated management of:**
 - ◆ content, metadata and licensing information, etc.,
- **AXCP tools can be integrated and controlled by your applications and/or workflow management systems.**

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- AXMEDIS Content Production and Processing
- **AXMEDIS Application Scenarios**
 - ◆ Application Scenarios
 - ◆ Content Sharing and/or Distribution
 - ◆ AXMEDIS Trials and Demonstrators
- Conclusions and references

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Applicative Areas

- Multi-channel production and distribution: broadcasting, IP/Internet, WEB sites, P2P, mobile, PDA, IPTV, interactive TV and channels, etc.
- Multi-channel experience for customers
- Video on Demand (VOD), and production on demand solutions
- Control of P2P content sharing and distribution, involving your customers in distribution (super-distribution)
- Involve customers and final users in content production and social networking
- interoperable DRM (MPEG-21, OMA, etc.)
- different business models and/or transactions on the same distribution channels: pay per play, monthly rate, preview, renting, advertising, etc.
- interactivity with cross media models
- advertising (customized and/or real time personalized advertising)
- Production and distribution of content with unprotected preview and the rest protected
- Etc.


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Applications and scenarios



- **In most of the cases there is:**
 - ◆ Usage of the AXMEDIS Editors and Players
 - ◆ Massive usage of the AXCP GRID for managing back office issues, defining specific scripts for:
 - ➔ Automated content production and adaptation (MPEG-21, OMA, etc.)
 - ➔ Automated creation of licenses (MPEG-21, OMA, etc.)
 - ➔ Automated regeneration of new versions of the objects
 - ➔ Automated object acquisition and posting on DataBases
 - ◆ Support of the AXMEDIS PMS and AXCS for the DRM aspects
 - ◆ Support of the CAMART and All for collecting reporting data
 - ◆ Usage of the AXMEDIS Editors and Players
 - ◆ Front ends for selling and distributing of the Distributors involved so that to maintain their plate and relationships with their customers
- **In some cases there is the usage of:**
 - ◆ The P2P tools, for B2B and B2C2C
 - ◆ Some specific tools for content posting on the databases
 - ◆ Some specific player tools for final users
 - ◆ Some specific tools for Home and Factory Domain Management
 - ◆ Workflow support




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Enabling secure/legal P2P

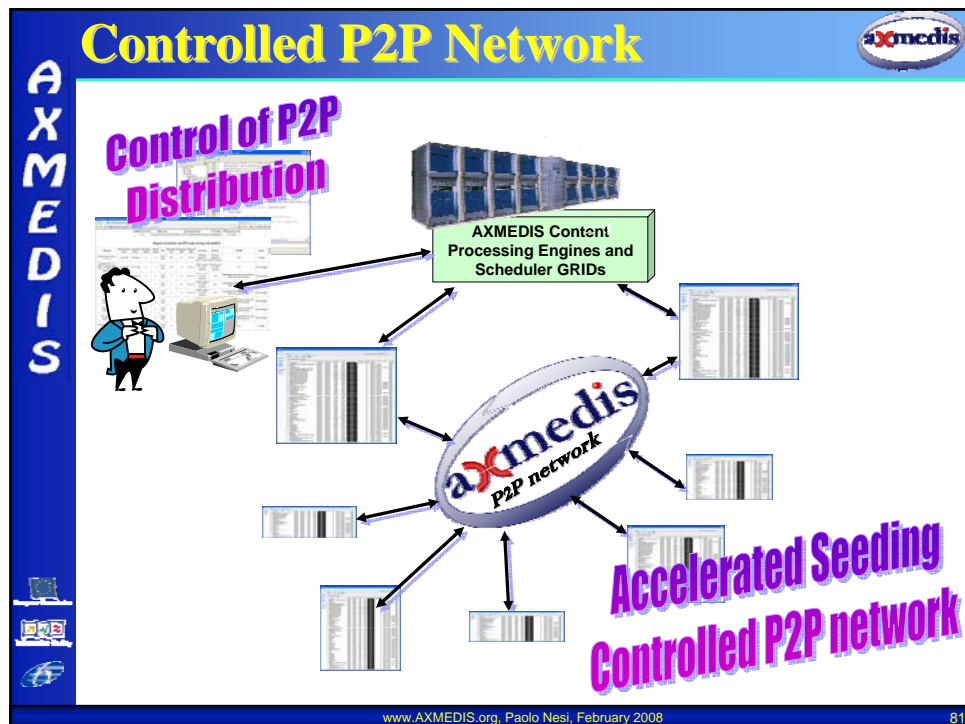


- **P2P network set up for content distribution**
 - ◆ BitTorrent Technology with Query and Catalogue
 - ◆ Protected content, legal P2P set up
 - ◆ P2P Client Tools
 - ◆ Automated B2B content distribution/publication via P2P, fast seeding,
 - ◆ Automated and efficient control of P2P networks
 - ◆ CONSUMER content distribution and sharing
- **Content Sharing among, producers, integrators, archives and libraries, etc.**



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AXMEDIS P2P Tools

- **AXMEDIS P2P tools for content sharing respecting IPR**
 - ◆ Content Distribution and P2P file sharing based on BitTorrent
 - ◆ DRM support, supervision and control
 - ◆ Certified metadata, etc.
- **AXEPTool**
 - ◆ Only for B2B
 - ◆ Technical queries and information:
 - ➔ Features, descriptors, duration, formats, license information, distribution model, etc.
 - ◆ Automated loading and publication via the AXCP tools
 - ◆ Control and certification of metadata
- **AXMEDIA tool:**
 - ◆ Only for C2C and B2C
 - ◆ Simple queries on simple user focussed metadata
 - ◆ Simple management of files on the file system
 - ◆ Control and certification of metadata

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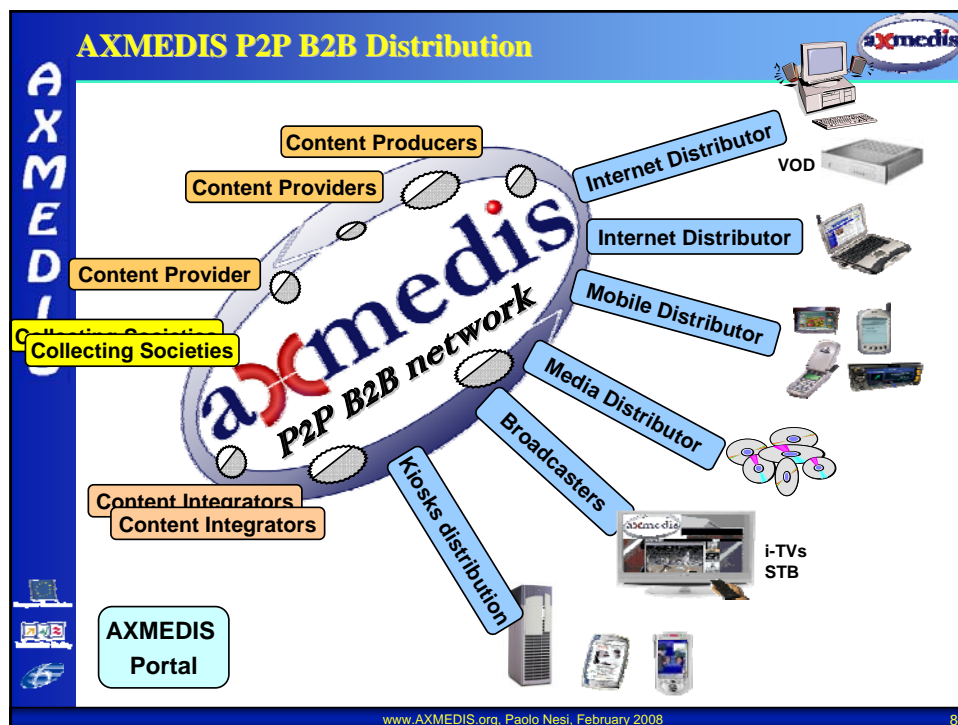
AXMEDIS P2P for B2B: AXEPTTool

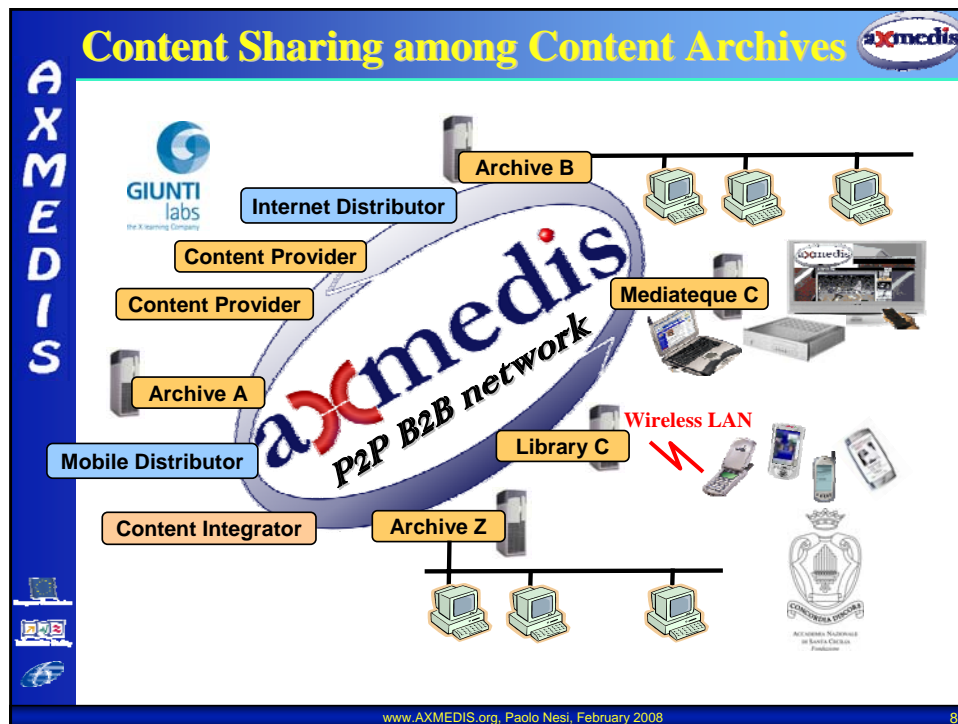
AXMEDIS

AXEPTTool

Enhanced BitTorrent Technology with AXEPTTool P2P B2B tool

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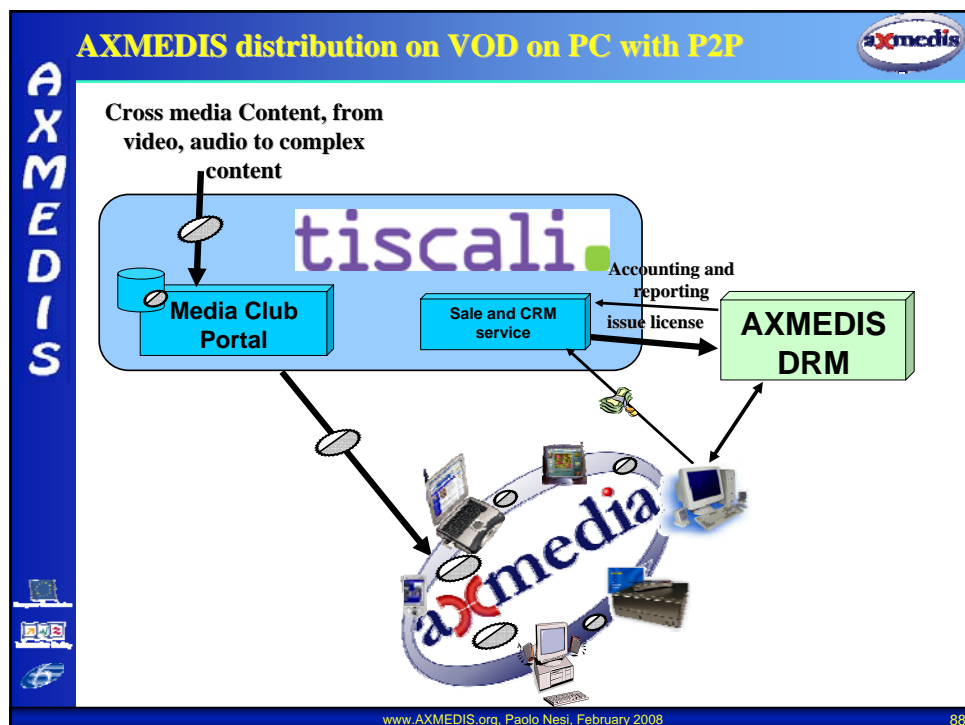
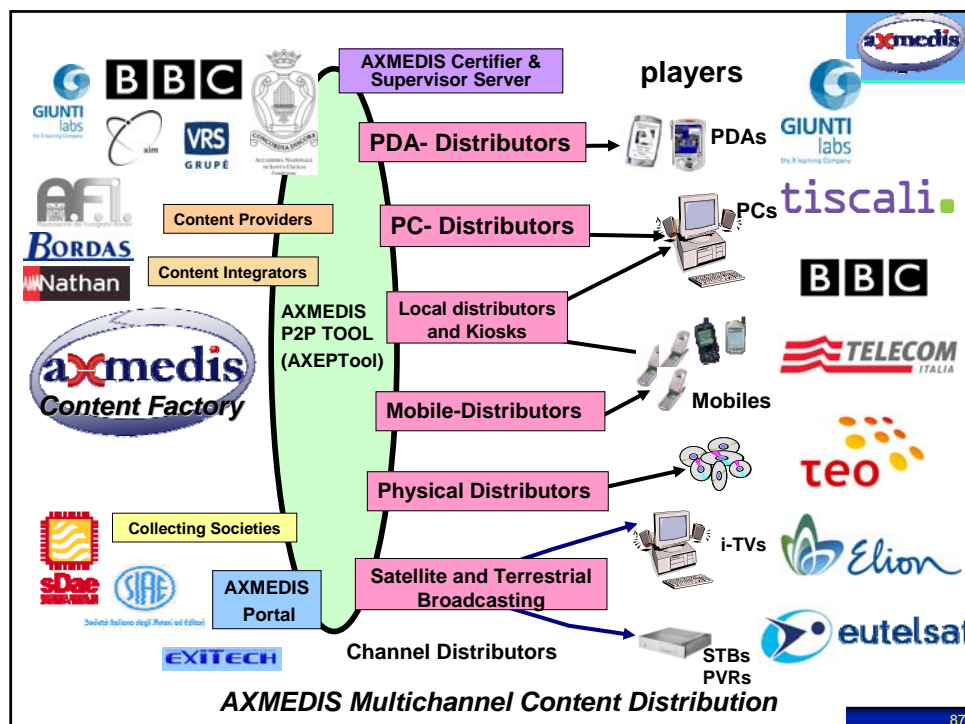




AXMEDIS Multichannel Distribution

- **PCs via Internet+P2P, AXMEDIS P2P and PC player:** TISCALI Media Club, DSI
- **PCs via Internet, AXMEDIS PC player:**
 - ♦ ELION, VRS
- **PCs via Satellite data broadcast, AXMEDIS PC player:**
 - ♦ EUTELSAT, UNIVLEEDS
- **PDA via Kiosks, AXMEDIS PDA player:**
 - ♦ ILABS + ANSC Kiosks, TISCALI, DSI
- **STBs and PVRs:**
 - ♦ AXMEDIS STB: IPTV, Internet VOD: TEO, VRS
 - ♦ AXMEDIS STB/PVRs via Satellite data broadcast: EUTELSAT, MBI
- **Mobiles:**
 - ♦ AXMEDIS mobile player: ILABS, TISCALI, DSI
 - ♦ OMA player: Telecom Italia (TI), DSI
- **PCs via Internet+P2P, AXMEDIS P2P and PC player:**
 - ♦ free air DVB-T + home domains/media center
 - ♦ BBC, SDAE, ETRI, UPC

The slide number 86 is in the bottom right corner.





TISCALI Distribution with AXMEDIS Technology

AXMEDIS

- **B2C distribution**
- **AXMEDIS objects with**
 - ◆ Video and Audio Files, with MD, images and also MPEG-4
- **The AXMEDIS Objects may be**
 - ◆ Downloaded from the TISCALI media club or P2P AXMEDIA
 - ◆ shared among consumers with AXMEDIA Tool a P2P tool
 - ◆ Visualized and played on AXMEDIS players free accessible
- **The users**
 - ◆ have to perform the registration on TISCALI
 - ◆ by a license to use the content
 - ◆ may use any AXMEDIS player
 - ◆ Mainly on PCs and Media Centers. PVRs
- **License allows**
 - ◆ Content sharing on AXMEDIA
 - ◆ Content play
 - ◆ Content Adaptation...
 - ◆ Content Migration on other P2P channels...
 - ◆ Content Migration on any other AXMEDIS terminal

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TISCALI Media Club, Distribution Portal

AXMEDIS

mediacubmanager

Search Axmedis media

Search for: CONTAINS brief

☒ right EQUAL play

☐ territory EQUAL

☐ exercise limit EQUAL

☐ validity interval LESS EQUAL

2 records found

title	type	creator	date	import status
Ariete	NULL	NULL	12/09/2007	

Statistics

Search: from: 2007-06-16 media id:

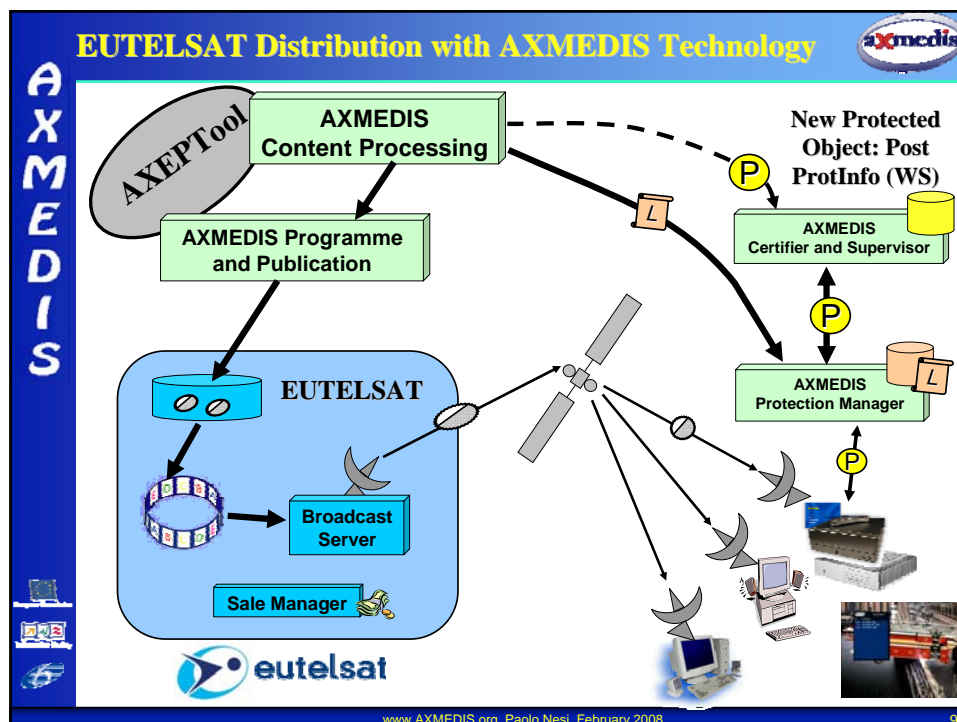
creator: domain: work identification:

1844 records found

media id	creator	operation	execution	regi
URN:AXMEDIS:00002:OBJ:00909E67-1D09-3708-8467-11519307131B	URN:AXMEDIS:00002:BUS:DO990006-8E93-3EC0-ABC4-882122A0654C	mxplay	2007-10-16 10:50:02	2007-10-16 10:49
URN:AXMEDIS:00002:OBJ:7362A059-8461-31A1-8B51-D8073ED1E3F3	URN:AXMEDIS:00002:USR:7C98E82E-6040-3ED9-8476-9C2000DEE42D	mxplay	2007-10-16 09:24:19	2007-09-24 09:24
URN:AXMEDIS:00002:OBJ:9A295BCC-340D-3029-026A-44EF6C709B51	URN:AXMEDIS:00002:BUS:DO990006-8E93-3EC0-ABC4-882122A0654C	mxplay	2007-10-16 08:43:19	2007-08-43 08:43
URN:AXMEDIS:00002:OBJ:8905BACD-8887-375D-BC5B-878F152AAF67	URN:AXMEDIS:00002:BUS:DED45C52-802F-3AC2-895B-8F1007C784A4	mxplay	2007-10-15 17:38:14	2007-10-15 17:37

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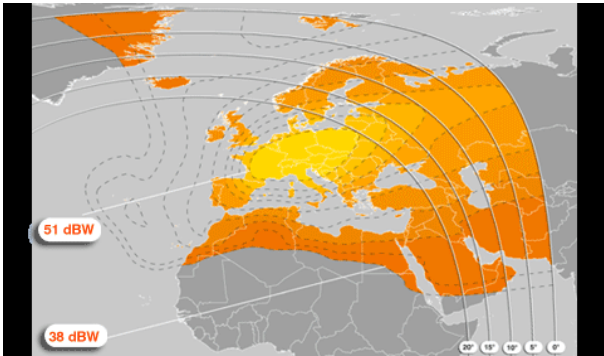


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EUTELSAT Distribution with AXMEDIS Technology

AXMEDIS Service on ATLANTIC BIRD™ 1:

- 12.5° West, covering Europe and Americas
- Frequency: 11.428GHz
- Symbol rate: 30000KSym/s
- Polarization: Horizontal



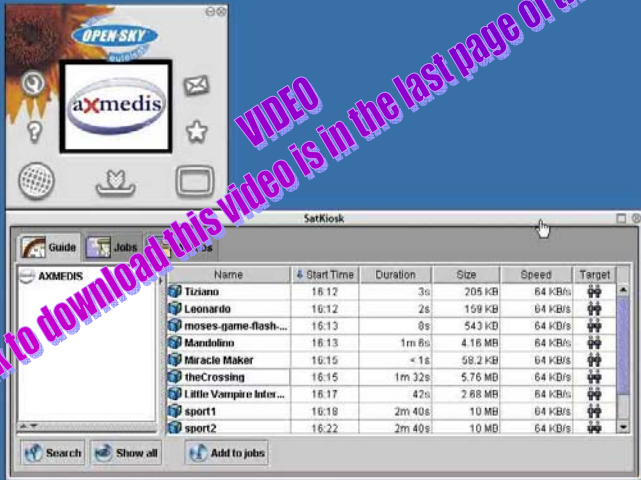
<http://www.eutelsat.com/satellites/125e.html>

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VIDEO on EUTELSAT distribution

VIDEO


The link to download this video is in the last page of these slides




Name	Start Time	Duration	Size	Speed	Target
Tiziano	16:12	3s	205 KB	64 KB/s	64
Leonardo	16:12	2s	159 KB	64 KB/s	64
moses-game-flash...	16:13	0s	543 KB	64 KB/s	64
Mandolino	16:13	1m 8s	4.18 MB	64 KB/s	64
Miracle Maker	16:15	< 1s	58.2 KB	64 KB/s	64
theCrossing	16:15	1m 32s	5.76 MB	64 KB/s	64
Little Vampire Inter...	16:17	42s	2.88 MB	64 KB/s	64
sport1	16:18	2m 40s	10 MB	64 KB/s	64
sport2	16:22	2m 40s	10 MB	64 KB/s	64


AXMEDIS

EUTELSAT Distribution with AXMEDIS technology





- **B2B and B2C distribution**
- **AXMEDIS objects with**
 - ◆ Any kind of content,...
 - ◆ Video, images, document, audio, animations, etc.
- **The AXMEDIS Objects may be**
 - ◆ Visualized and played on AXMEDIS players free downloaded
 - ◆ Received on Kiosks
 - ◆ Received and player on STB of MBI
- **The users have to perform the registration of**
 - ◆ themselves on an AXMEDIS portal or via the STB ID/PIN
 - ◆ any AXMEDIS player tool they would use
 - ◆ Mainly on PC for TV and/or STB and/or Kiosks
- **License allows**
 - ◆ Content play
 - ◆ Content Adaptation...
 - ◆ Content Migration on any other AXMEDIS terminal, in some cases





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AXMEDIS

ILABS Distribution with AXMEDIS technology



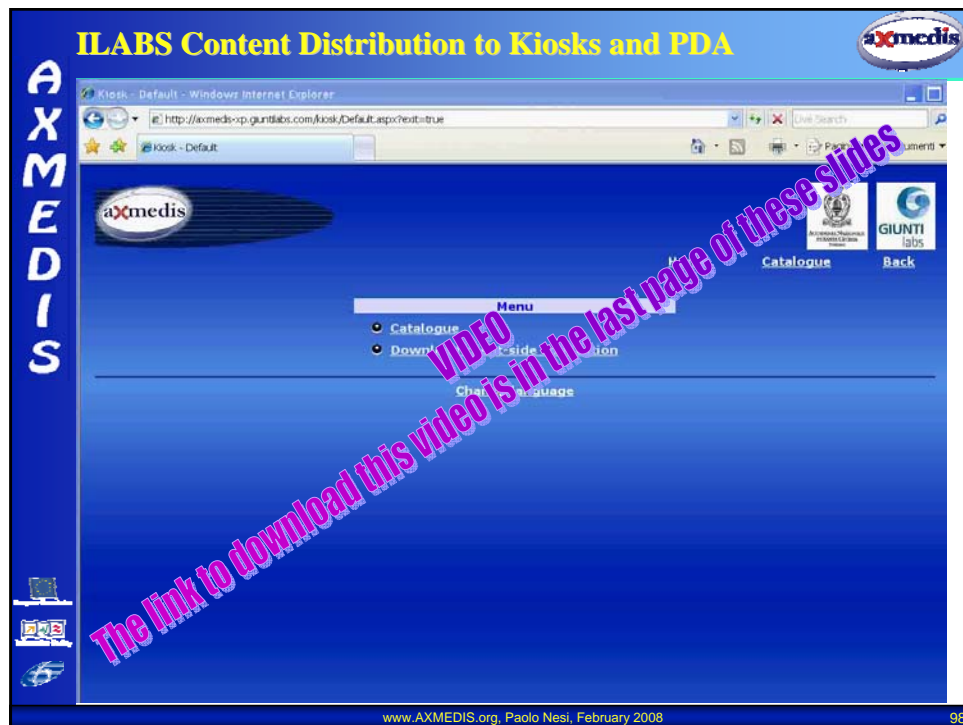


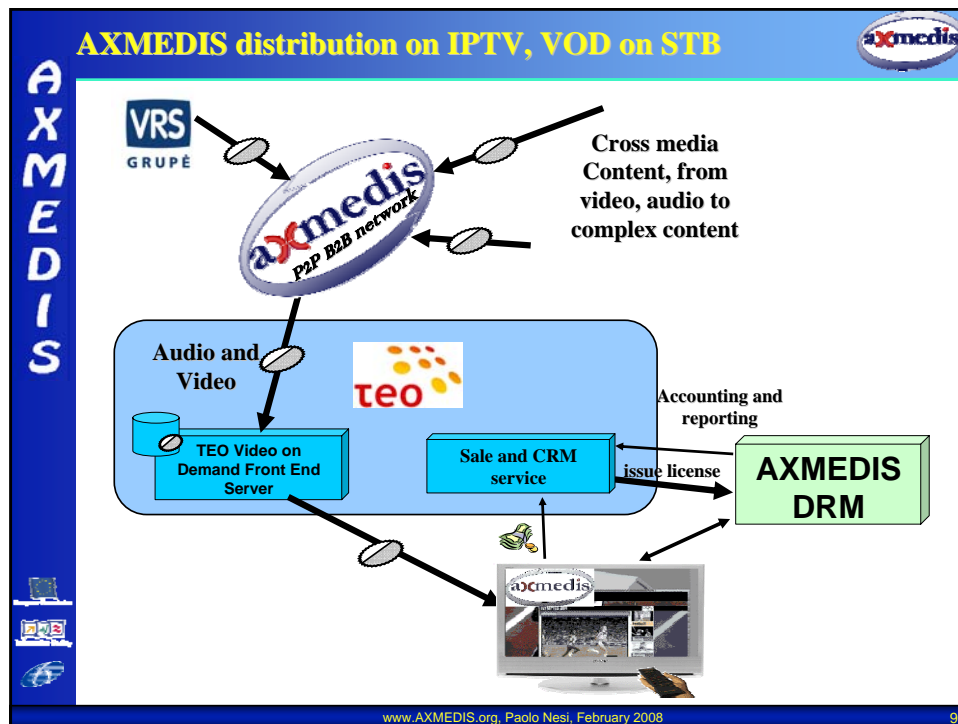
- **B2B and B2C distribution**
- **AXMEDIS objects with**
 - ◆ Educational and cultural content,...
 - ◆ Video, images, document, audio, animations, etc.
- **The AXMEDIS Objects may be**
 - ◆ Produced on demand on the basis of phone profile, POD
 - ◆ Visualized and played on AXMEDIS players free downloaded
- **The users have to perform the registration of**
 - ◆ themselves on ILABS portal and/or an AXMEDIS portal
 - ◆ any AXMEDIS player tool they would use
 - ◆ Mainly on PC-Kiosks, PDA and/or mobiles
- **License allows**
 - ◆ Content play
 - ◆ Content Adaptation...
 - ◆ Content Migration on any other AXMEDIS terminal, in some cases

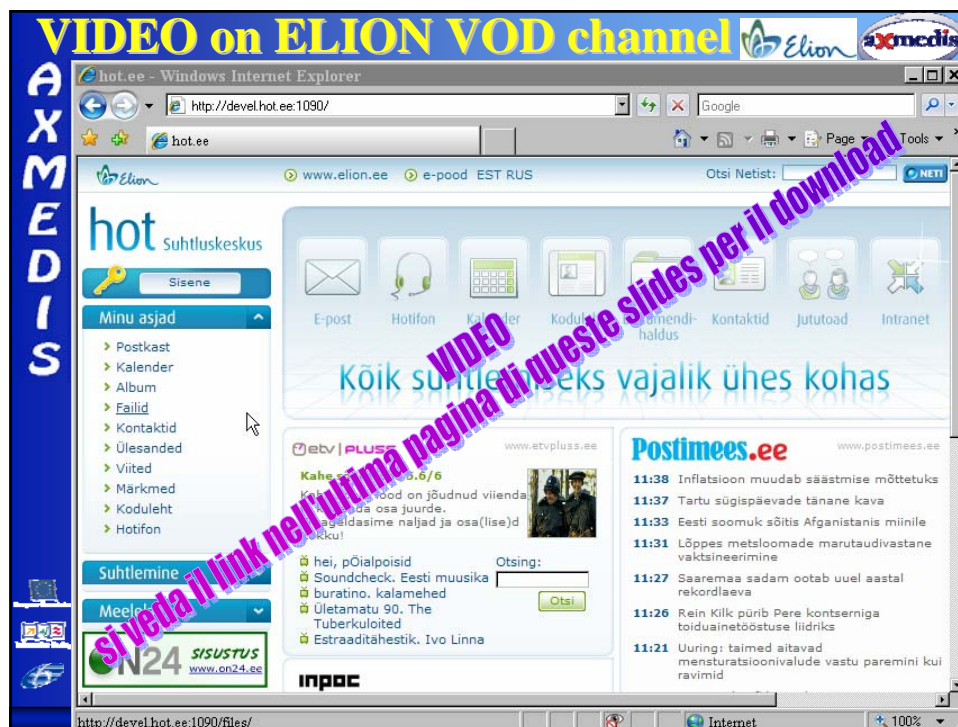
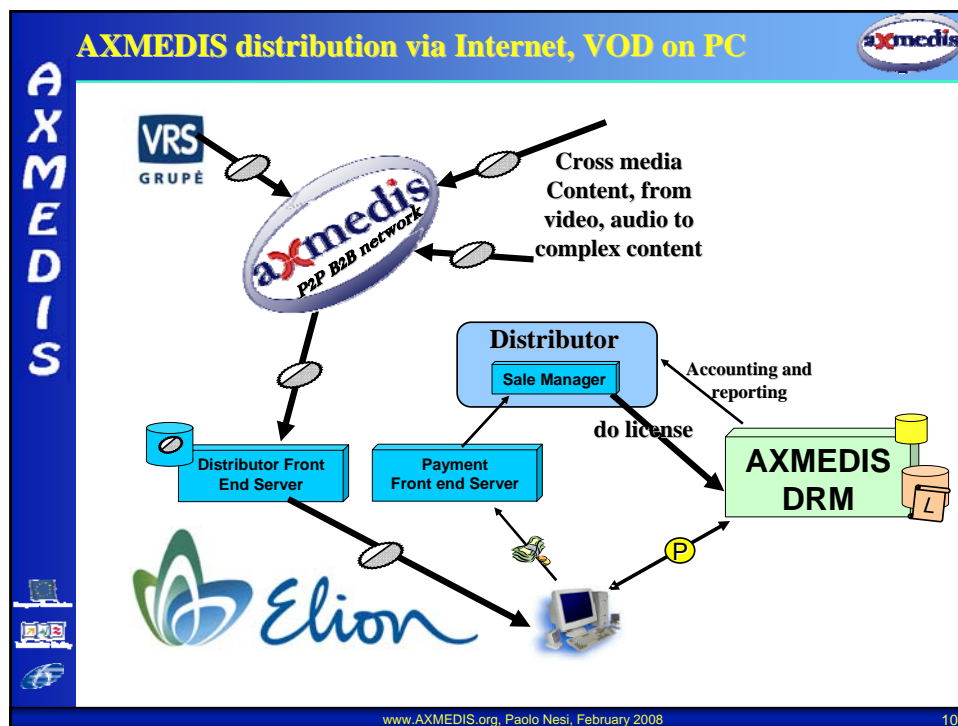


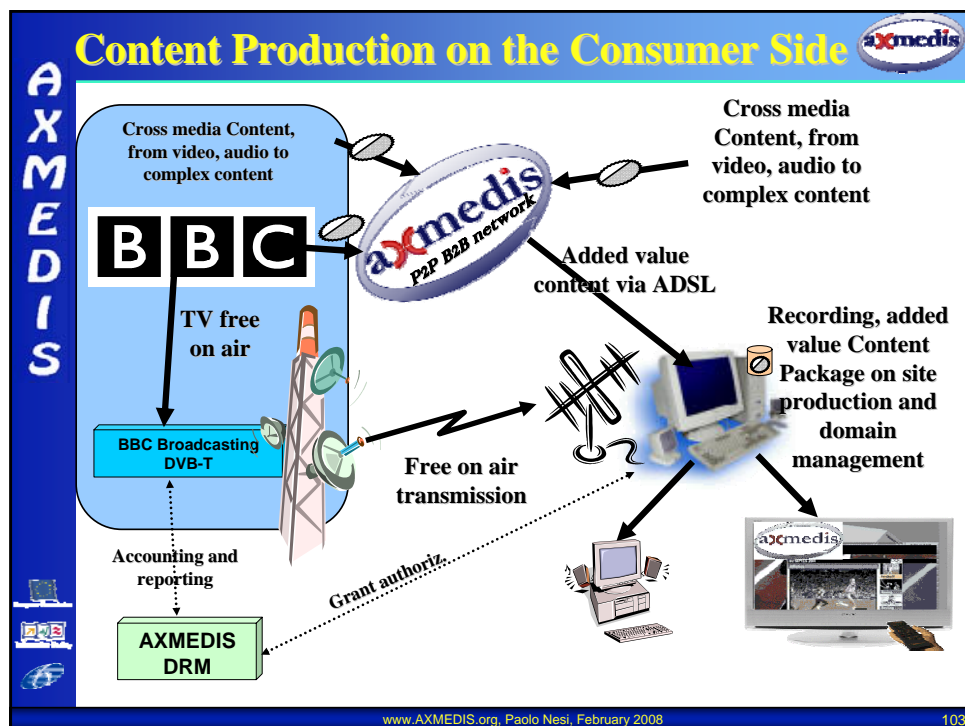
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VIDEO on BBC content production

The screenshot displays the AX4HOME Demonstrator interface, showing a TV schedule for BBC One, BBC Two, and CBBC. The interface includes a search bar, a list of programs, and a detailed view of the selected program.

AX4HOME Demonstrator 1.00am (Wed 10 Oct 2007) --> 12.59am (Thu 11 Oct 2007)

© BBC Research (British Broadcasting Corporation)

Time	BBC One	BBC Two	CBBC
1.30pm	BBC London News The latest stories from the BBC London newsroom. [S] 10 minutes	Class TV: Science Clips [Age 9-11] Interdependence and Adaptation: How plants and animals adapt to each other and their environments. [S] 10 minutes	Class TV: Primary Geography [Age 9-11] World Environmental Changes - Berlin: Series of programmes exploring the ways in which human beings shape and influence the environments in which they live. [S] 15 minutes
1.45pm		Animal Park The animals of Longleat as you've never	Lilly the Witch Lilly in the Wild West: Lilly wants to prove to Leon that there were too many girl sheriffs back in the Wild West. [S] 20 minutes
2.00pm			

Transferring data from www.bbc.co.uk/ax4home

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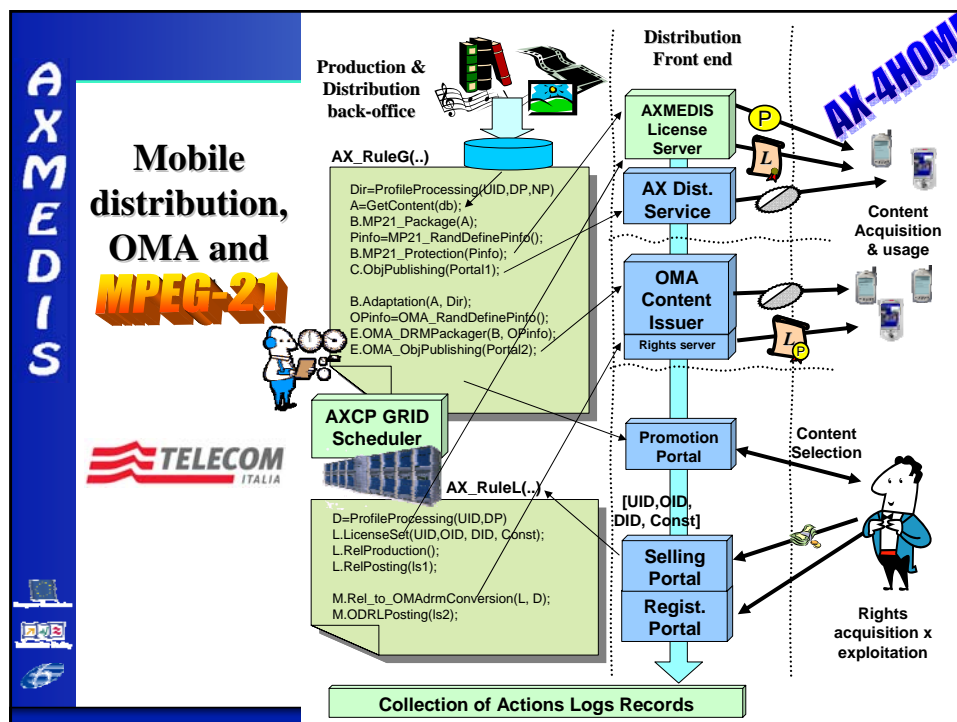
AXMEDIS

Interoperability among channels

- **Channels are the distribution methods for content:**
 - ◆ Streaming, e.g., DVB-T, S, H
 - ◆ Downloading, WEB
- **Channels are grounded on different communication standards,**
 - ◆ MPEG, HTTP, RTSP, DVB, etc.
 - ◆ Content and devices are strongly related to the supported input channel
- **AXMEDIS content is independent on the communication channel**
 - ◆ Content can be automatically produced for multiple channels at the same time
 - ◆ Content received from one channel can be passed to a different one

 	DVB-T P2P Internet UMTS GPRS DVB-S Downloading Streaming VOD P2P
--	---

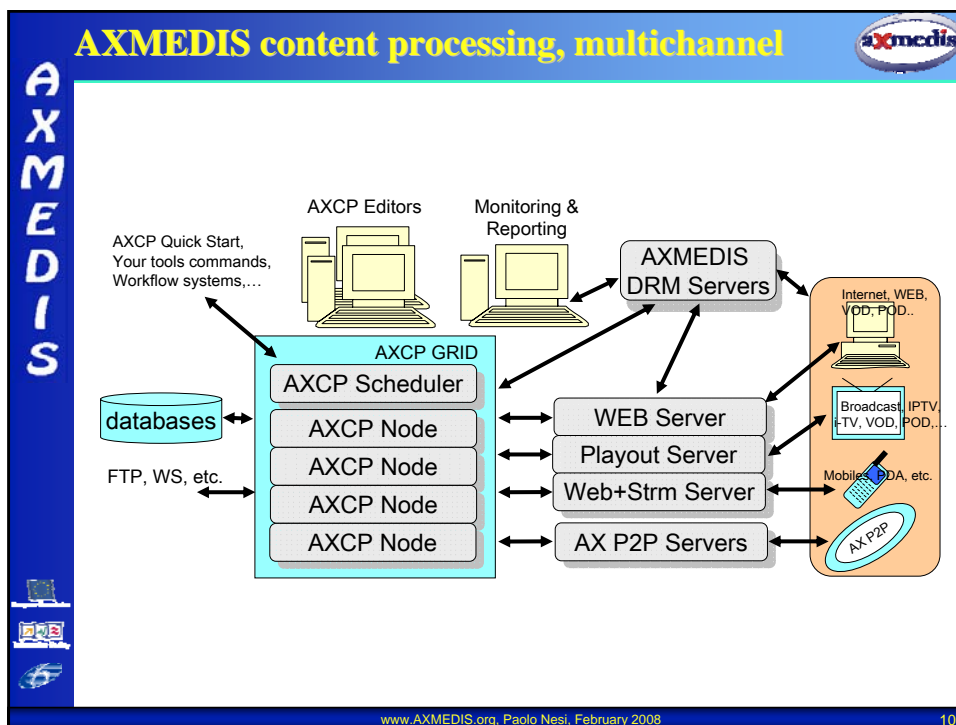
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Telecom Italia, OMA & MPEG-21 distribution

The screenshot shows the AXMEDIS software interface. The top window displays 'AXMEDIS Automated PRODUCTION' with the Telecom Italia logo. Below it, a browser window shows the AXMEDIS Home Page with options to 'View list of Axmedis contents', 'Load a new content', and 'Load a new license'. To the right, a mobile phone is shown displaying the AXMEDIS website, with a small device connected to it via a cable.

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USERS production and distribution

AXMEDIS

- **Content production tools for final users, SIAE trial**
- **Set up a service for final users', producers**
 - ◆ content acquisition and collection from the final user would,
 - ➔ Definition of the DRM rules from the final users
 - ◆ automated content production, protection and adaptation
 - ◆ automated license creation
 - ◆ License production on demand, different models
 - ◆ Content distribution via distribution portal with/without DRM
 - ◆ Automated counting of consumed rights




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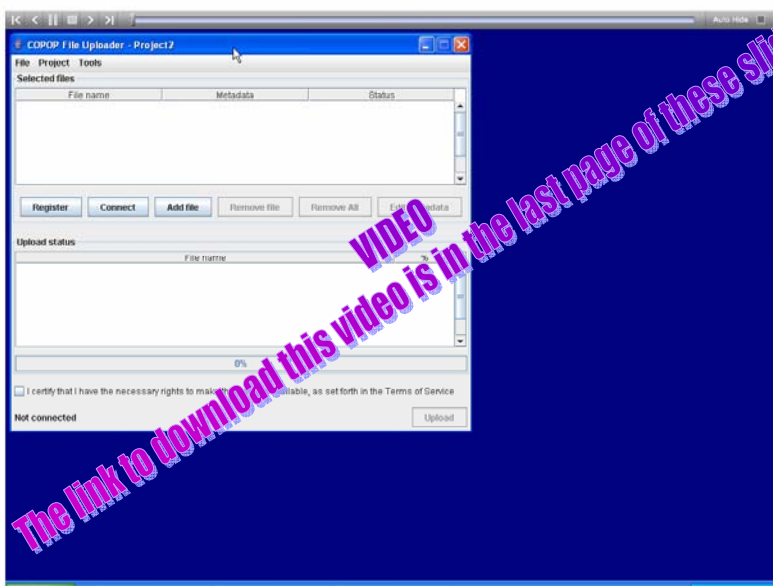
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Fase 1: file upload with COPOP client

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VIDEO
 The link to download this video is in the last page of these slides

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Content Enrichment with final users

- **Content Enrichment with AXMEDIS**
- **VARIAZIONI e-ContentPlus**
- www.variazioni.org
- **Content**
 - ◆ enrichment, several forms
 - ◆ produced and reproduced on demand at each enrichment
 - ◆ production with DRM
 - ◆ distribution from VARIAZIONI portal and from AXMEDIS P2P
- **> than 10 partners + communities**
 - ◆ Partners from Spain, Lithuania, Belgium, Portugal, Italy, Finland, Portugal



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Content Enrichment and social network

- **audiovisual**
 - ◆ Master classes of famous magisters (Harmos)
 - ◆ Concerts
 - ◆ Conferences
 - ◆ Special Events...
- **audio**
 - ◆ Concerts
 - ◆ Lessons
 - ◆ Rehearsals of concerts
 - ◆ Popular Songs...
- **historic documents**
 - ◆ Programs of concerts
 - ◆ Letters
 - ◆ Scores
 - ◆ Images
 - ◆ Articles
 - ◆ Pedagogical Material









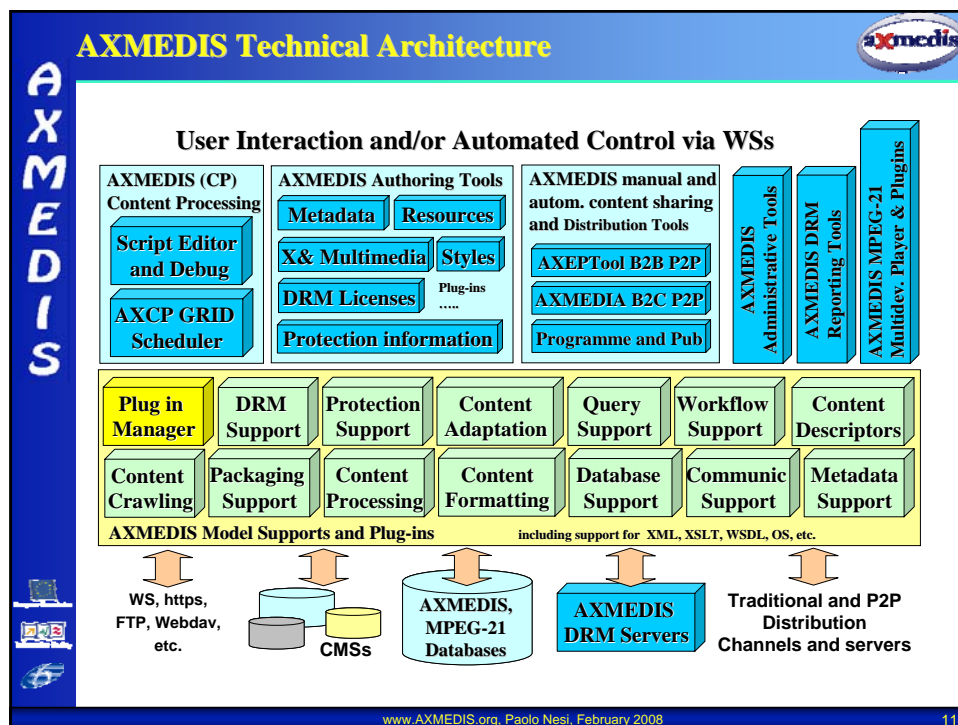
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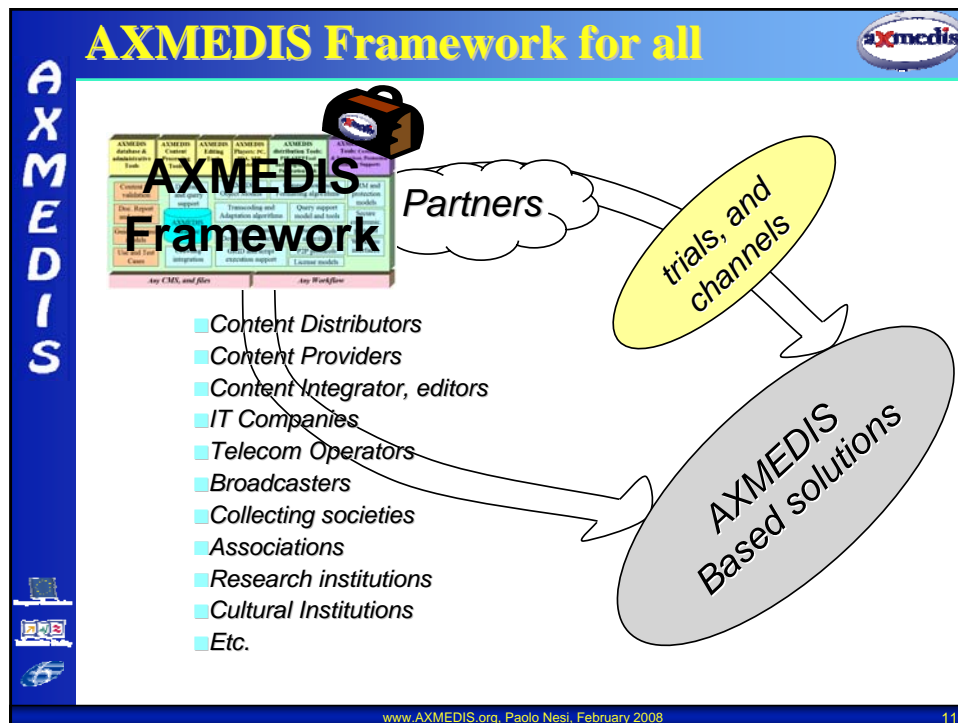
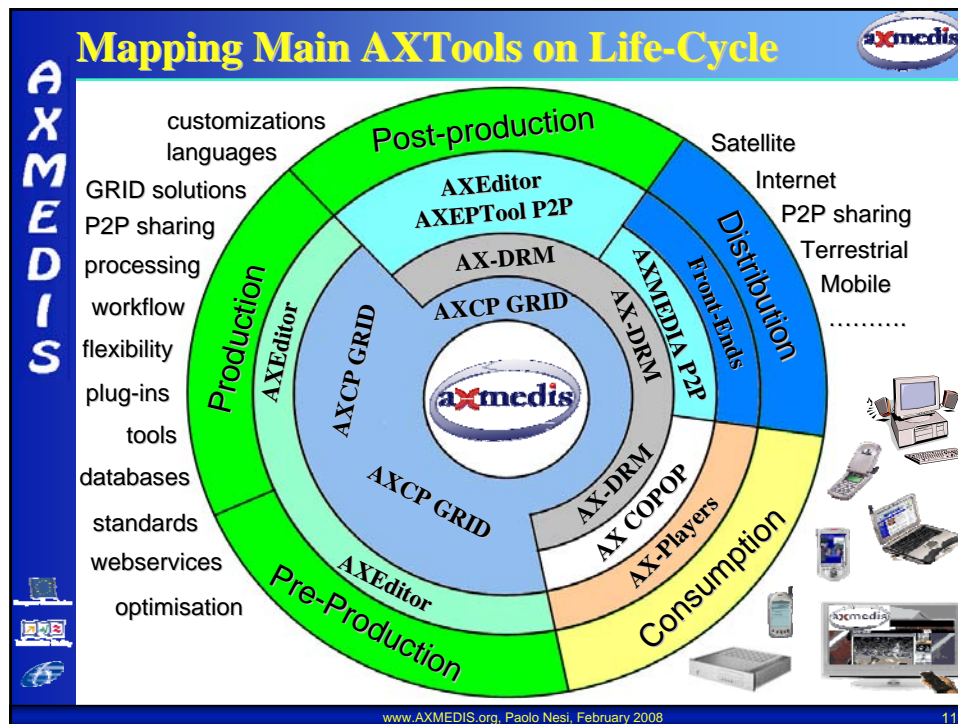
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Table of Content

- Preface
- What is AXMEDIS
- Market Analysis and Opportunities
- State of the Art, Limitations, Needs
- AXMEDIS Content Protection and Tracking
- AXMEDIS Content Production and Packaging
- Examples of AXMEDIS Applications
- **Conclusions and references**

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Can be a very important solution to

- **support the distribution of Cross media content**
 - ◆ More interactivity and capabilities for the consumers
 - ◆ Interoperability among devices/content for the consumers
 - ◆ Interoperability among DRM for the consumers and along the value chain
- **make easier the B2B market of digital content, and of cross media content**
 - ◆ Composition and DRM management
 - ◆ Tracking and monitoring the exploitation of rights
 - ◆ Simpler B2B Content Trading, costs reduction
 - ◆ High flexibility in business and transaction models
- **make easier for SMEs to access/survive in the digital content market**
 - ◆ Proposed and getting content
 - ◆ Set up distribution and other business solutions for content




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AUTOMATING the BACKOFFICE

- **Lower costs of and enabling**
 - ◆ content gathering, transcoding/monitoring platform, production of content on demand with AXCP
 - ◆ integrate cross media content and automatically managing rights for complex multimedia products
 - ◆ production, B2B distribution, promotion via P2P B2B
- **New forms of content and unexploited content:**
 - ◆ Making business with cross media content, integrating HTML, SMIL, document, video, etc., no possible up to now
 - ◆ Exploiting the content "long tail"
- **Interoperability, convergence of media**
 - ◆ interoperability of content and DRM, Multi-channel distribution
 - ◆ access to the same content on several platforms, devices and locations
 - ◆ greater level of security, control of content usage in all channels B2B2C
- **DRM, creation new business models**
 - ◆ different business models on the same channel may be used
 - ◆ adapting the distribution channel to the users needs and would
 - ◆ Access to detailed reporting on the exploited rights
- **Distribute content with**
 - ◆ Any B2C: Internet, STB, broadcasting, Mobile, kiosks, pda, etc.
 - ◆ P2P to Consumers with the support of DRM




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AXMEDIS

- **A unique framework for all**
 - ◆ Cross Media Content and tools
 - ◆ Backoffice Automation
 - ◆ Standards
 - ◆ Open platforms
 - ◆ Interoperability on content
 - ◆ Interoperability on devices/players
 - ◆ Interoperability on DRM
- **The added value to your business!**



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Affiliation to the AXMEDIS


- The benefits of the affiliation include the possibility of using the AXMEDIS technology and tools (customize them from source code), for your business without limitations
- You can become affiliated with AXMEDIS.
The affiliation provides access to
 - ◆ a large amount of information and knowledge
 - ◆ full source code AXMEDIS Framework TOOLS
 - ◆ AXMEDIS tools ready to be used
 - ◆ Technical reports and documentation
 - ◆ Mailing and discussion lists, wiki portal
 - ◆ Training reports and tutorials, videos, slides and docs
 - ◆ Access to the AXMEDIS workshops and training
- The affiliation can be performed via the affiliation agreement
 - ◆ information can be recovered from the DVD and on the portal
- The affiliation has a small annual fee that
 - ◆ can be covered in money or by value, offering contributions to the AXMEDIS Framework for the community.
 - ◆ Is free of charge for no profit institutions



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Click on these links to download the videos


- **slide 42: editor-new5b.wmv**
 - ◆ http://www.axmedis.org/documenti/view_documenti.php?doc_id=3643
- **slide 67: play5-N.wmv**
 - ◆ http://www.axmedis.org/documenti/view_documenti.php?doc_id=3645
- **slide 68: play5-VIDEO-NESI.wmv**
 - ◆ http://www.axmedis.org/documenti/view_documenti.php?doc_id=3671
- **slide 69: new-xim-ansc-objects-with-audio.wmv**
 - ◆ http://www.axmedis.org/documenti/view_documenti.php?doc_id=3669
- **slide 71: pda-player-medium.wmv**
 - ◆ http://www.axmedis.org/documenti/view_documenti.php?doc_id=3668
- **slide 94: sat-dist-with-audio.wmv**
 - ◆ http://www.axmedis.org/documenti/view_documenti.php?doc_id=3667
- **slide 100: AXELTEO-TEO-STB-demo.wmv**
 - ◆ http://www.axmedis.org/documenti/view_documenti.php?doc_id=3670
- **Slide 102: ELION-enduser-nesi.wmv**
 - ◆ http://www.axmedis.org/documenti/view_documenti.php?doc_id=3649
- **slide 104: bbc-user4.wmv**
 - ◆ http://www.axmedis.org/documenti/view_documenti.php?doc_id=3672
- **slide 110: siae-presentation-short-July2007-new-nov07.wmv**
 - ◆ http://www.axmedis.org/documenti/view_documenti.php?doc_id=3651

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Technical Notes

- **AXMEDIS for all**
 - ◆ http://www.axmedis.org/documenti/view_documenti.php?doc_id=3108
- **AXMEDIS Object model**
 - ◆ http://www.axmedis.org/documenti/view_documenti.php?doc_id=3634
- **AXMEDIS Automated Content processing**
 - ◆ http://www.axmedis.org/documenti/view_documenti.php?doc_id=3624
- **AXMEDIS P2P**
 - ◆ http://www.axmedis.org/documenti/view_documenti.php?doc_id=3612
- **AXMEDIS DRM**
 - ◆ http://www.axmedis.org/documenti/view_documenti.php?doc_id=3616
- **AXDRM how to use on a portal**
 - ◆ http://www.axmedis.org/documenti/view_documenti.php?doc_id=3616
- **Video on demand and STB, TEO show case**
 - ◆ http://www.axmedis.org/documenti/view_documenti.php?doc_id=3738
- **Content on demand on Internet, ELION show case**
 - ◆ http://www.axmedis.org/documenti/view_documenti.php?doc_id=3745


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Technical Notes

- **Please stay tuned other technical notes are coming on:**
 - ◆ Satellite distribution, EUTELSAT OPENSky show case
 - ◆ Content recording and production at home, BBC show case
 - ◆ Content production and distribution for PDA, ILABS show case
 - ◆ Content distribution from server and via P2P, TISCALI show case
 - ◆
 - ◆



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Contact Information


- ***If you like to know more about the AXMEDIS framework and other AXMEDIS technologies and functionalities please do not hesitate to contact the project coordinator***
- ***Prof. Paolo Nesi, Ph.D.***


*DISIT-DSI, Department of Systems and Informatics
Distributed Systems and Internet Technology Lab
University of Florence
Via S. Marta 3, 50139 Firenze, Italy
Email: nesi@dsi.unifi.it
Web: <http://www.AXMEDIS.org>*



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**Automating Production of Cross Media Content
for Multi-channel Distribution**

www.axmedis.org IST-2-511299

AXMEDIS Overview on Content Production

*David Fuschi, Paolo Nesi,
Pierfrancesco Bellini,
Ivan Bruno, Lorenzo Sutton*

<http://www.axmedis.org/>
version 1.6
February 2008, User Group Meeting

www.AXMEDIS.org, Paolo Nesi, February 2008

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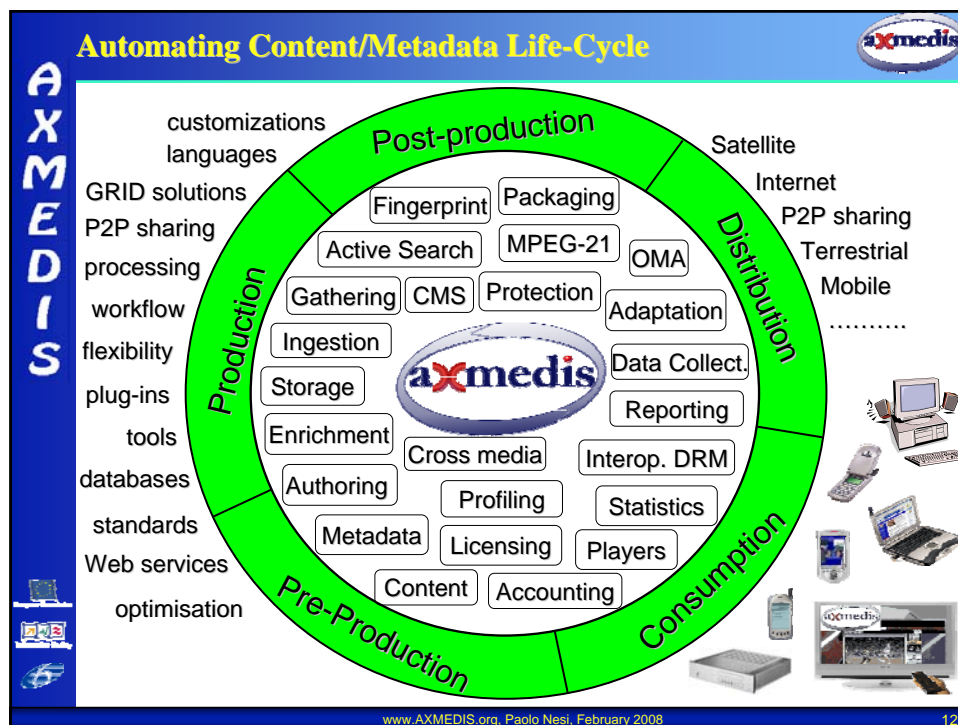
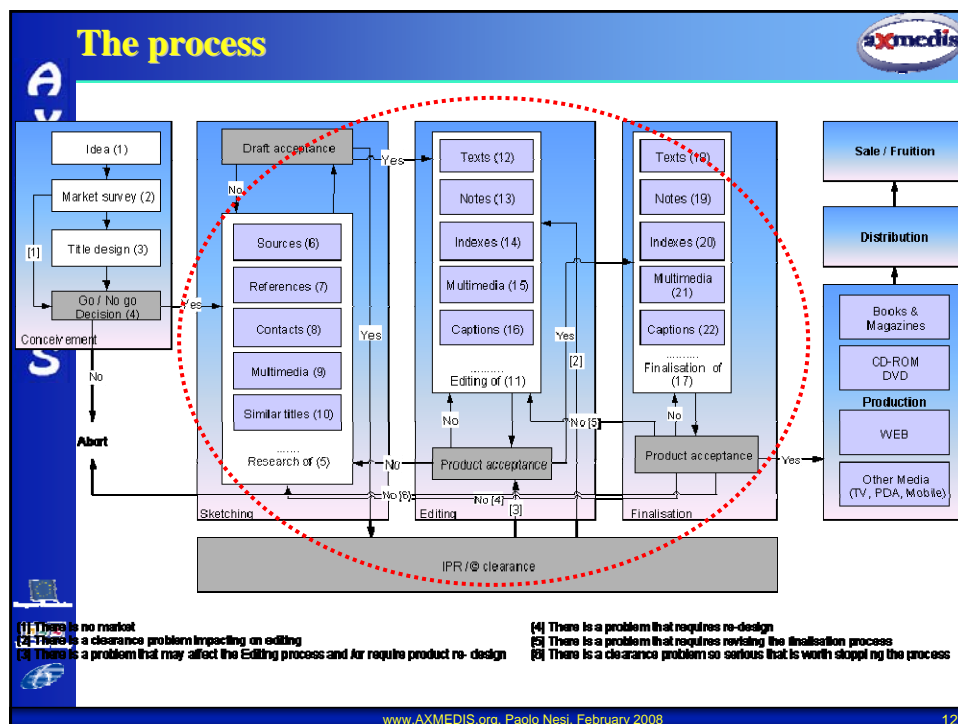
Table of Content

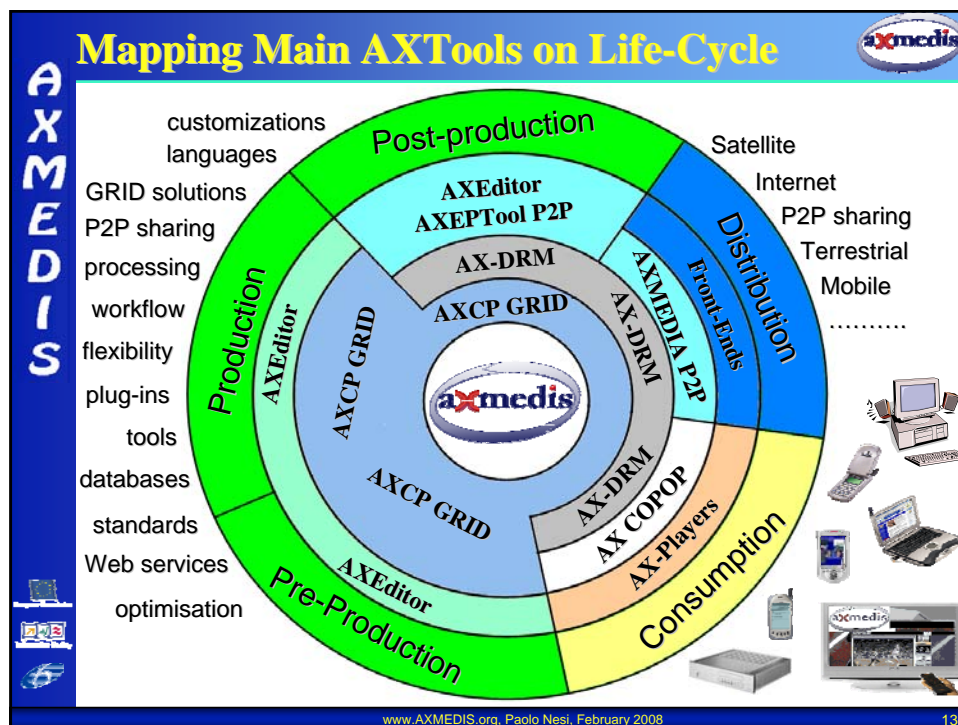
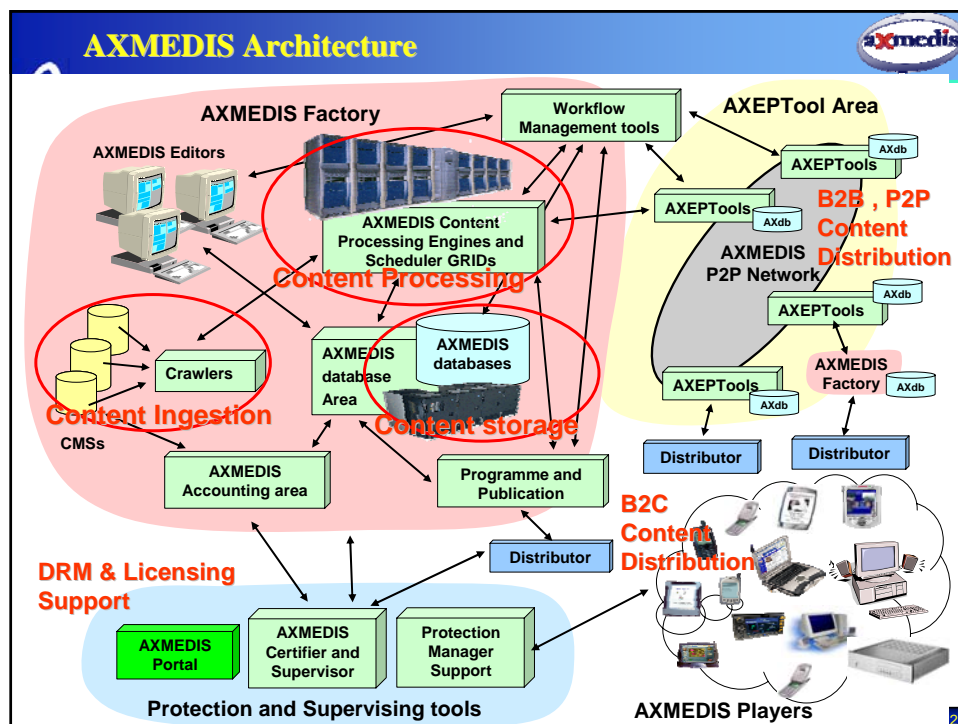
AXMEDIS

- **Introduction on content production in AXMEDIS** ←
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- **AXMEDIS Editor / Database query**
- **AXMEDIS Automated Content Processing**
 - ◆ Crawling, accessing CMS
 - ◆ Adapting, transcoding, processing....
 - ◆ Protecting, licensing, DRM,
- **Massive execution on GRID**
- **AXMEDIS Publishing Tools**
 - ◆ Distribution via Servers and/or P2P


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Please download AXMEDIS Tools

- **AXMEDIS PC player:**
 - ◆ http://www.axmedis.org/documenti/view_documenti.php?doc_id=3715
- **AXMEDIS PC player with SKIN**
 - ◆ http://www.axmedis.org/documenti/view_documenti.php?doc_id=3716
- **AXMEDIS PC player, Active X and .Net**
 - ◆ http://www.axmedis.org/documenti/view_documenti.php?doc_id=3717
- **AXMEDIS PC player for EUTELSAT OPENSKEY:**
 - ◆ http://www.axmedis.org/documenti/view_documenti.php?doc_id=3767
- **AXMEDIS Editor:**
 - ◆ http://www.axmedis.org/documenti/view_documenti.php?doc_id=3720
- **AXMEDIS content production tools (includes the above AXMEDIS Editor):**
 - ◆ http://www.axmedis.org/documenti/view_documenti.php?doc_id=3722
- **PDA player:**
 - ◆ http://www.axmedis.org/documenti/view_documenti.php?doc_id=3627
- **PDA content:**
 - ◆ http://www.axmedis.org/documenti/view_documenti.php?doc_id=3748
- **P2P Client tool AXEPTool:**
 - ◆ http://www.axmedis.org/documenti/view_documenti.php?doc_id=3739

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AXMEDIS







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- **Introduction on content production in AXMEDIS**
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AXMEDIS Model

- **AXMEDIS Objects**
 - ◆ MPEG21 Digital Item with a specific structure
 - ◆ Can be protected
 - ◆ Has several kinds of metadata
 - ◆ Any metadata and descriptor can be included
 - ◆ Any ID can be included: AXOID, ISBN, ISRC, ISAN...
 - ◆ 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

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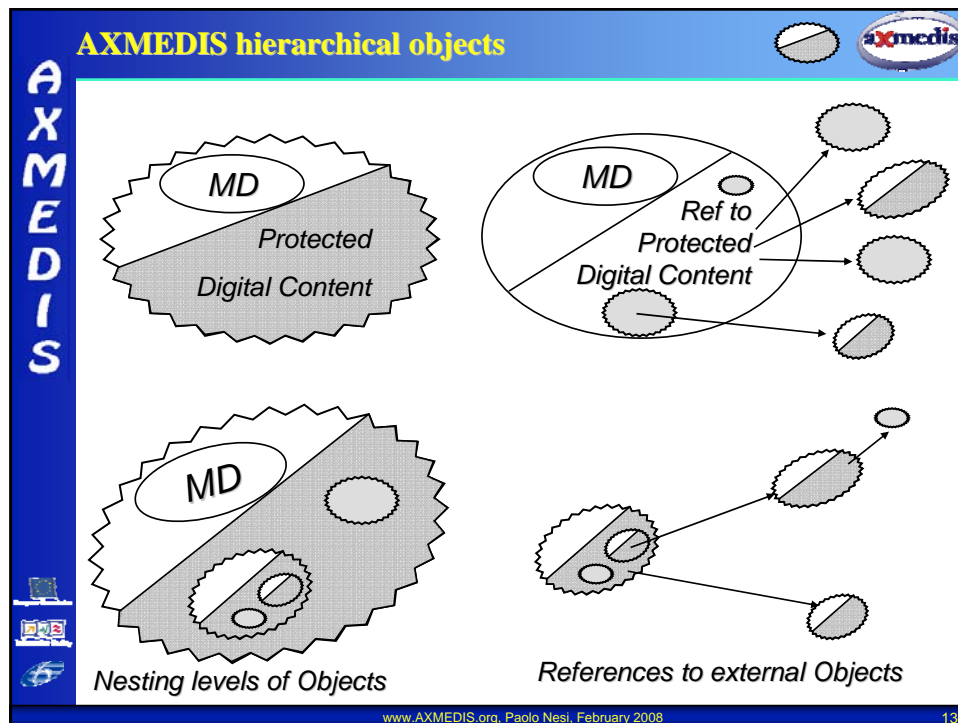
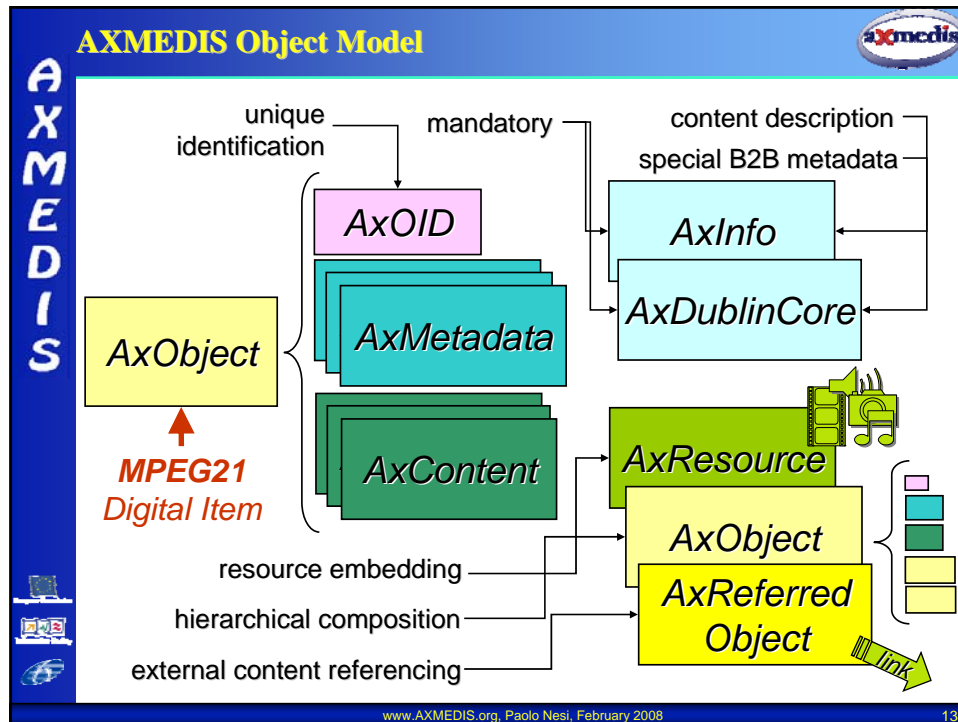
AXMEDIS



AXMEDIS Singularities


- **Structure**
 - ◆ Hierarchical with one level for resources
 - ◆ Hierarchical with more levels for embedded AXMEDIS objects
- **Protection**
 - ◆ AXMEDIS Objects can be protected
 - ◆ DRM with MPEG-21 REL
- **Metadata**
 - ◆ AXMEDIS Objects have metadata not their components
 - ◆ AXMEDIS Objects metadata are always accessible

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Metadata - AxInfo



- The **AxInfo** contains **B2B** and **AXMEDIS** specific metadata
 - ◆ 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
 - ◆ Workflow information
 - ◆ Fingerprints algorithms used
 - ◆ Internal Potential Available Rights (the rights owned)
 - ◆ Potential Available Rights (the rights on sell)
 - ◆ Metadata certification and status




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Metadata – Dublin Core




- **Dublin Core Metadata** are a standard set of metadata usable for multimedia cataloguing
- **15 basic elements**
 - ◆ title, creator, contributor, description, coverage, format, date, identifier, language, publisher, rights, source, subject, type, relation
- **Other elements and derived elements**
 - ◆ abstract, audience, available, conformsTo, dateAccepted, ...
- **Any other descriptor can be included**
- **See Technical note on AXMEDIS Object model**
- http://www.axmedis.org/documenti/view_documenti.php?doc_id=3634




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The Cross Media Content Model




- **simple files:**
 - ◆ audio, video, images, documents, animations, games, etc.;
 - ◆ any combinations of cross media with presentation formalized in HTML, SMIL, MPEG-4, Flash, XML, etc.;
 - ◆ hypermedia with internal and external links;
 - ◆ menus, collections, lists, etc.
- **reference to external files and/or other AXMEDIS objects as URLs and links;**
- **content with a large variety of information associated to single resources and/or content collections.**
 - ◆ any metadata, classification information, Dublin Core, etc.;
 - ◆ any descriptors such as fingerprint, technical information, MPEG-7, XML, etc.;
 - ◆ any identifications: AXOID, UUID, ISBN, ISMN, ISRC, ISAN, etc.

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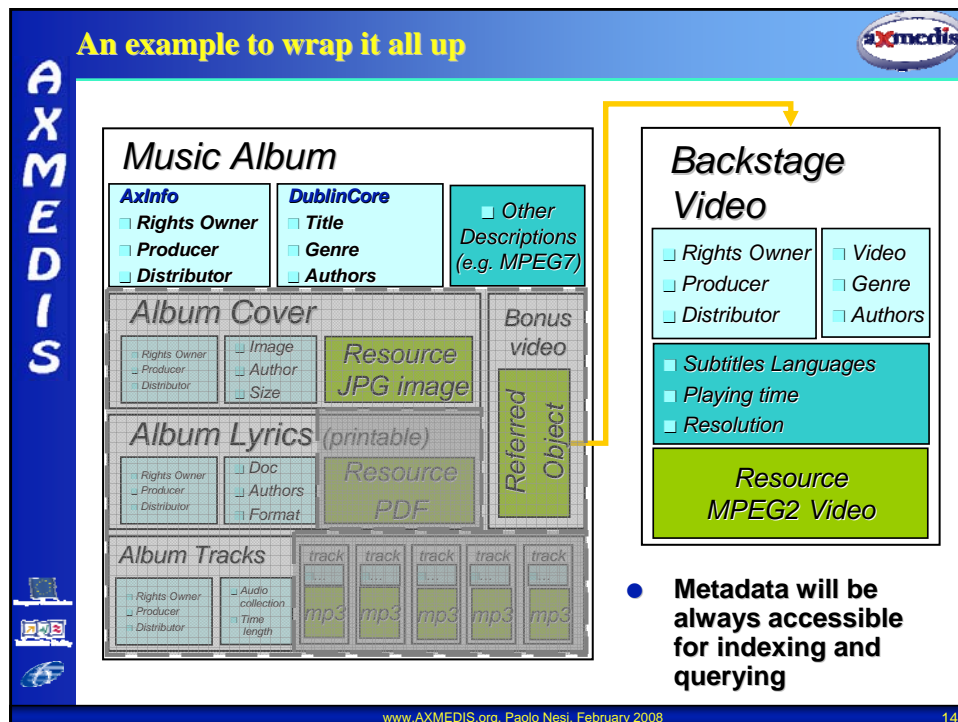
The Cross Media Content Model



- **collections as lists or hierarchically organized files, collections/packages, AXMEDIS objects (nesting levels)**
 - ◆ on which users may navigate, make queries on the basis of metadata of single components or files;
 - ◆ with HTML and/or SMIL as presentation layers to provide interactivity to users, etc.;
 - ◆ with files and internal nested packages protected in different manners with different algorithms, or selectively non-protected;
- **AXMethods JavaScript to add narrative capabilities and semantics, and in general to make more intelligent and interactive the content package behavior.**

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AXMEDIS


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 - ◆ Distribution via Servers and/or P2P

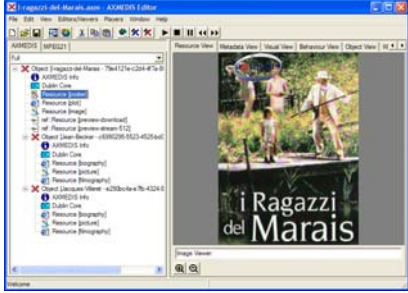
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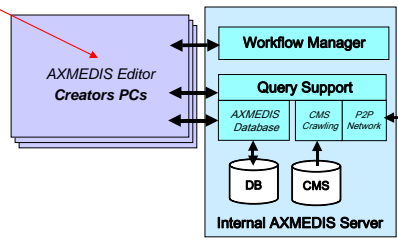
AXMEDIS Editor

AXMEDIS



- **The AXMEDIS Editor is an application allowing**
 - ◆ manual production of AXMEDIS objects
 - ◆ Inspection/change of automatically produced objects
 - ◆ finishing AXMEDIS objects pre-produced automatically
 - ◆ Protection of AXMEDIS objects
 - ◆ Storing AXMEDIS objects into the AXMEDIS database
 - ◆ Query and load AXMEDIS objects from the database






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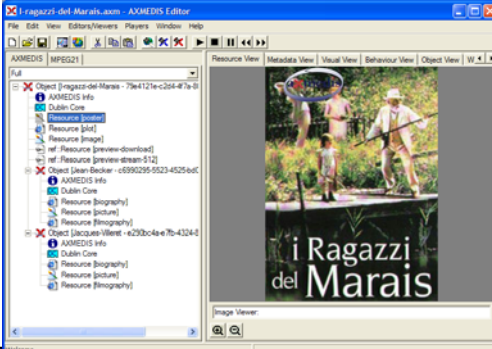
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AXMEDIS Editor

AXMEDIS

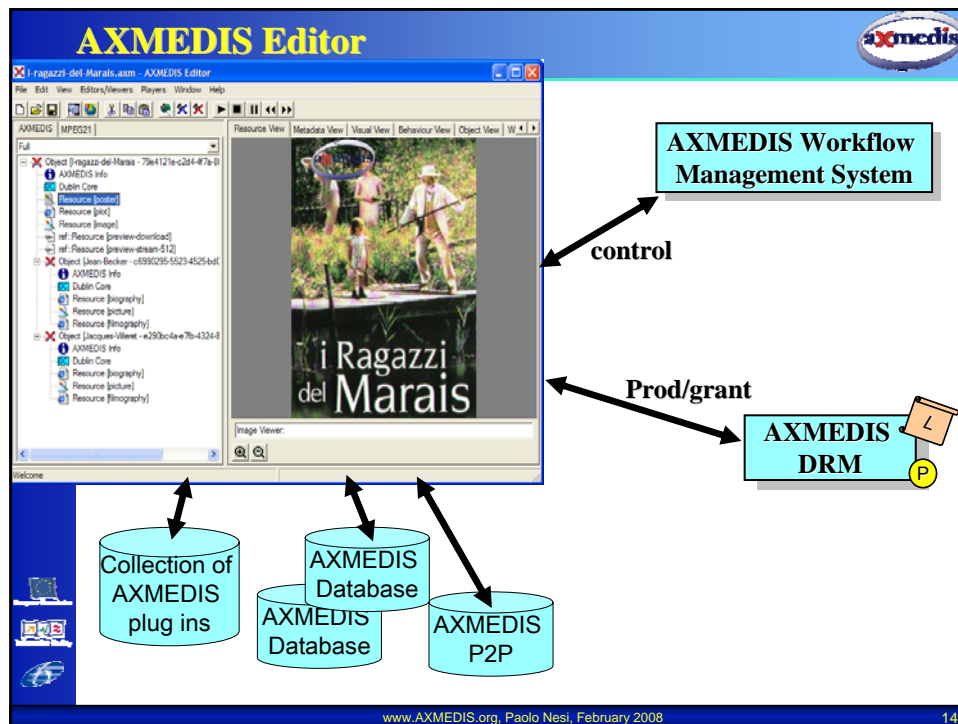


- **Metadata editor, Metadata mapper:**
AXINFO, DC ++
- **Resource player/viewer:**
Images, video, audio, doc, HTML, SMIL, MPEG-4
- **visual editor:**
SMIL, synchronization, presentation
- **Behavior editor,**
AXmethods: Business logic, extended JavaScript,a huge range of functionalities
- **DRM Editor:**
license editor, production of licenses
- **Protection editor:**
how to protect the object, DES, AES, etc..
- **Workflow:**
content production status, flags, etc.
- **In the short future:**
Scenarios Editor to design links of SMILs, etc.



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Example on the Editor usage, in the room

- **Creation of an object via drag and drop resources into the AXMEDIS Editor**
 - ◆ single resources can be player immediately
 - ◆ SMIL/HTML may have INTERNAL references to call
 - ➔ resources, other SMIL/HTML files, external hyperlinks
 - ➔ activation of AXMETHODS
 - ◆ FLASH may have INTERNAL references to activate AXMETHODS
- **AXmethods may**
 - ◆ put in execution/play resources, presentations
 - ◆ communicate with files and channels
 - ◆ get information from database
 - ◆ create other objects and/or internal resource
 - ◆ enrich/analyze/query the AXMEDIS object itself
 - ◆ etc..

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Example on the Editor usage, in the room




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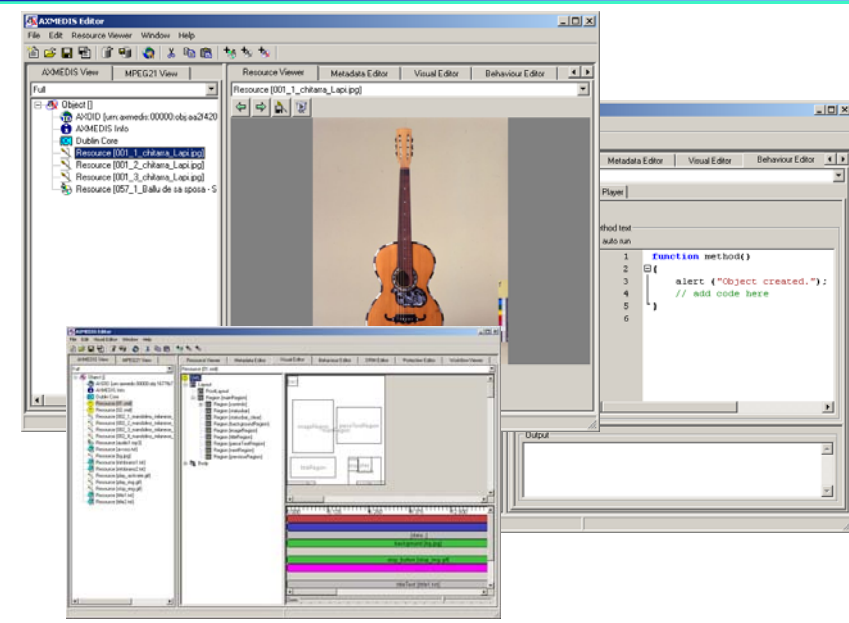
- **Usage of a produced objects:**
 - ◆ SMIL objects with videos on secrete camera
 - ◆ SMIL object with video of XIM
- **Production of**
 - ◆ objects with HTML and SMIL
 - ◆ objects with nested AXMEDIS objects
- **Show of the usage of the:**
 - ◆ Query support to access at the AXMEDIS database
 - ◆ Metadata editor
 - ◆ Resources player
 - ◆ Visual editor: SMIL
 - ◆ Protection information editor
 - ◆ Behavioral editor for AXMethods
 - ◆ etc.

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Some Snapshots from the examples shown




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Table of Content



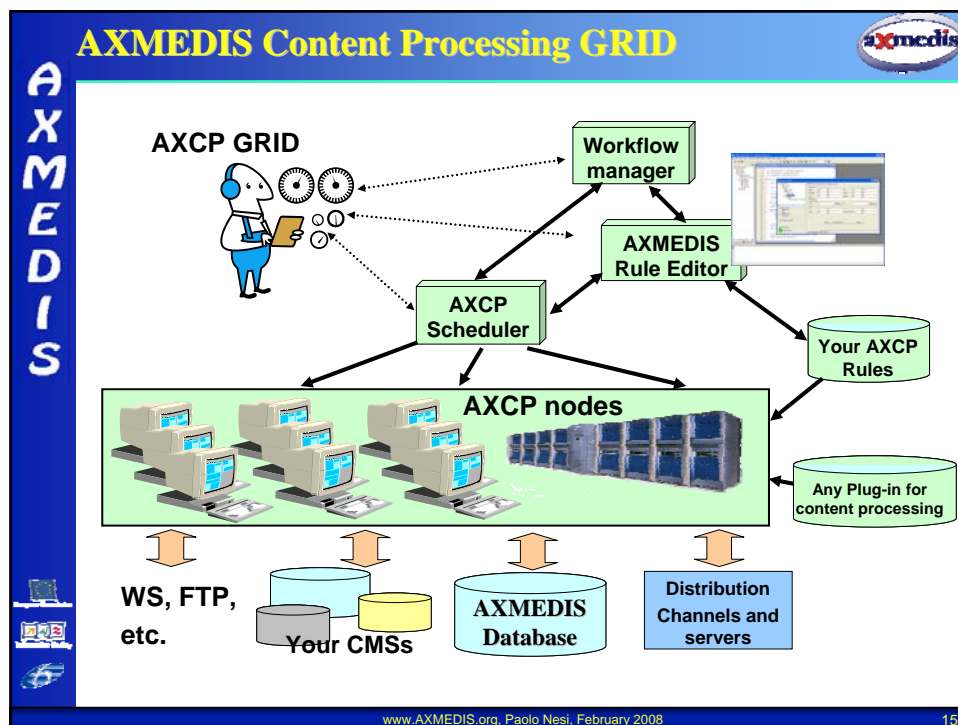
A
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S



Content Processing Applications


- **AXMEDIS allows you to reduce costs and increase efficiency of your content management.**
- **Automating back office content production/protection and distribution**
 - ◆ Open and secure architecture for content production, processing, protection and enrichment, based on a scalable GRID model
 - ◆ Maximum flexibility with
 - ➔ AXMEDIS content processing GRID Language
 - ➔ Uses plugins for content adaptation/transcoding for multi-channel production, fingerprinting, processing profiles, etc.
- **AXCP GRID solution allows automated management of:**
 - ◆ content, metadata and licensing information, etc.,
- **AXCP tools can be integrated and controlled by your applications and/or workflow management systems.**

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AXMEDIS CP GRID tools


- **AXCP Rules can be:**
 - ◆ activated for content processing on any AXCP Node as well as on a single computer
 - ◆ used/parameterized to produce content on demand or to be integrated in your content factory
 - ◆ activated from your Workflow Management System or from any other application
 - ◆ activated by changes in remote objects and queries in the local database and on the P2P network.
- **AXCP Nodes allow to be controlled by an AXCP Scheduler. The stand alone version of the AXCP Node can be used for executing AXCP Rules for ad-hoc processing and activation without demanding their allocation and scheduling to the AXCP Scheduler.**

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AXMEDIS CP GRID tools


- **AXCP Scheduler to allocate and manage AXCP Rules on Nodes:**
 - ◆ scheduling and balancing jobs/processes on AXCP Nodes
 - ◆ activating jobs as sporadic and periodic tasks
 - ◆ monitoring progress of production processes and their status, etc.
- **AXCP Rule Editor allows you to produce, debug, test and validate AXCP Rules to execute them on AXCP Nodes**
- **AXCP Quick Start allows you to activate Rules in simple manner by passing them parameters;**

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Table of Content


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- Introduction on content production in AXMEDIS
- AXMEDIS Model, AXOM
- AXMEDIS Editor / Database query
- **AXMEDIS Automated Content Processing**
 - ◆ Crawling, accessing CMS
 - ◆ Adapting, transcoding, processing....
 - ◆ Protecting, licensing, DRM,
- Massive execution on GRID
- AXMEDIS Publishing Tools
 - ◆ Distribution via Servers and/or P2P

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AXCP functionalities 1/2



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- **Firing and control activities for AXCP rules**
- **Content and metadata access, ingestion and gathering, management and retrieval, mapping, metadata models and processing**
- **Content Processing for audio videos, document, images, and any files**
 - ◆ Text/Document processing, adaptation and transcoding
 - ◆ Audio / Video / Image Processing, adaptation and transcoding
 - ◆ Digital File Fingerprint and recognition
 - ◆ Extraction of Descriptors ...
- **Content Composition Presentation and Interactive models**
- **Multimedia and cross media adaptation/processing**
- **General Information Processing**






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AXCP functionalities 2/2

- Communication Capabilities
- Workflow management Production Process
- Content Packages, Media Containers and DRM
- Content Formatting
- Profiling and their management
- Content Adaptation Process
- Content Protection and DRM, Licensing and DRM
- Content Publication and Distribution
- Distribution and control of P2P network


● For each item in the AXCP technical note there is a list for supported formats and protocols:

● http://www.axmedis.org/documenti/view_documento.php?doc_id=3624




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Extraction of descriptors from content

- Each file characterized by a numerical model describing its content according to different dimensions of perception
- Models can be used to compute similarity between files
- Application:
 - ◆ classification
 - ◆ recommendation
 - ◆ Playlist generation
 - ◆ Clustering of collections



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Examples shown in live during the meeting

- **Automated**
 - ◆ production of interactive content (SMIL and HTML based) with several resources, audio, video, images, docs, MPEG-4, etc.
 - ◆ production/adaptation for PC and PDA
 - ◆ load/save of AXMEDIS objects from/to AXMEDIS database
 - ◆ protection of content
 - ◆ production of licenses according to business models
- **Tools used**
 - ◆ AXMEDIS Editor for producing AXMEDIS objects and revising them
 - ◆ AXMEDIS players for PC, PDA for showing them
 - ◆ AXCP Editor for producing the AXCP Rules
 - ◆ AXCP Scheduler and nodes for executing scripts
 - ◆ AXDRM for protecting content and DRM

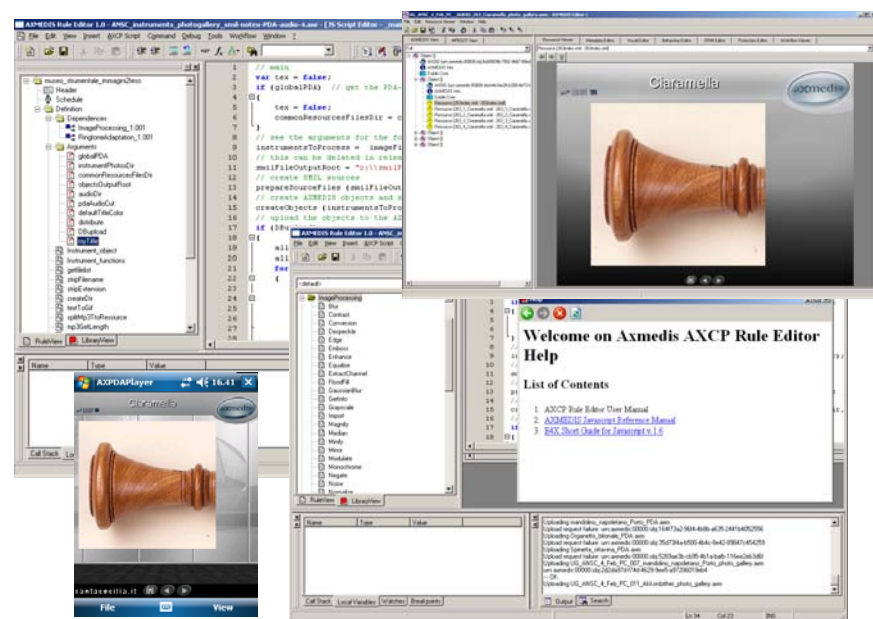
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Some Snapshots from the examples shown



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Table of Content	
●	Introduction on content production in AXMEDIS
●	AXMEDIS Model, AXOM
●	AXMEDIS Editor / Database query
●	AXMEDIS Automated Content Processing <ul style="list-style-type: none"> ◆ Crawling, accessing CMS ◆ Adapting, transcoding, processing.... ◆ Protecting, licensing, DRM,
●	Massive execution on GRID
●	AXMEDIS Publishing Tools <ul style="list-style-type: none"> ◆ Distribution via Servers and/or P2P

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Key Issue: dynamic and real time	
●	Devices and content delivery formats are not static <ul style="list-style-type: none"> ◆ Emerging devices and formats ◆ Dynamic market in terms of possibilities and content types and formats
●	Required: Flexible Software Tools <ul style="list-style-type: none"> ◆ Support of numerous content types and formats ◆ Support of different devices
●	On-demand distribution: <ul style="list-style-type: none"> ◆ Production on the basis of requests and profiling (user device, network, etc.), etc. ◆ Request depending adaptation and processing

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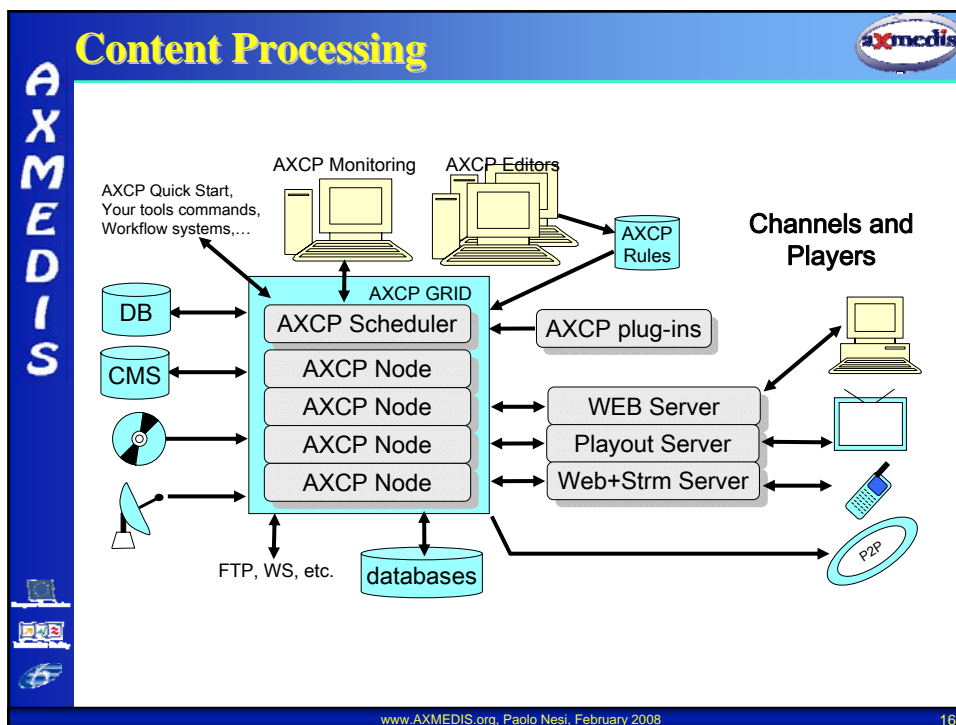
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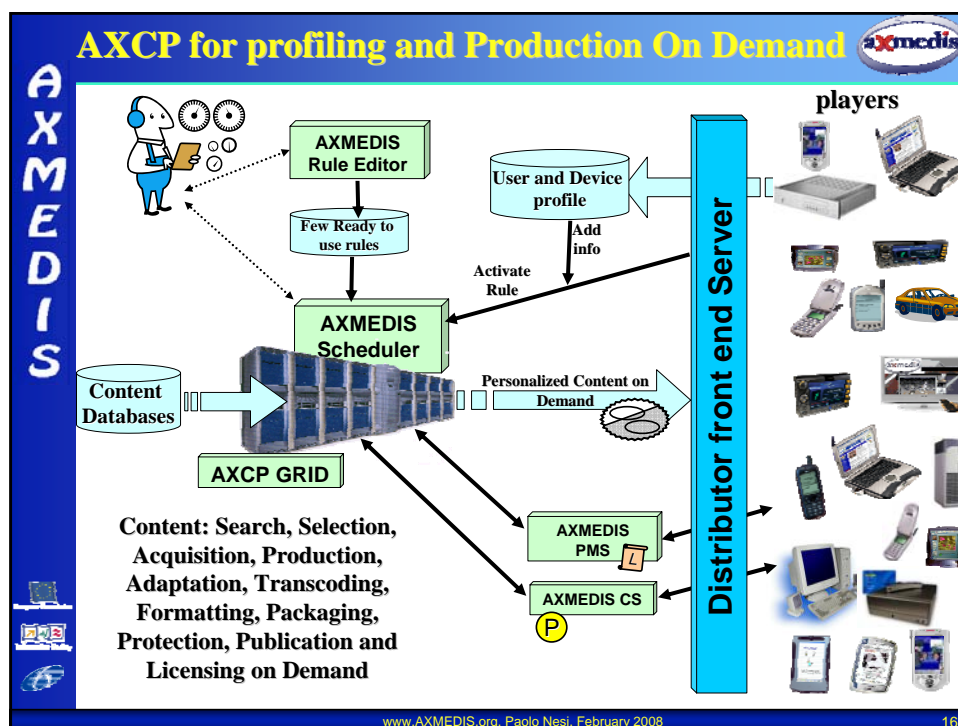
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Key Issue: dynamic and real time

- **Multi-channel distribution**
 - ◆ Differing receiving devices
 - ◆ Differing distribution modalities
 - ◆ Multiple interoperable DRMs, license chain processing
- **Content monitoring**
 - ◆ Broadcast channels and networks,
 - ◆ Peer-To-Peer networks, Websites, etc.

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Examples shown in live during the meeting

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- **Automated**
 - ◆ Activation of AXCP Rules on an instance of the AXCP GRID
 - ◆ Production, adaptation, protection of content
 - ◆ publication on distribution servers and on AXMEDIS P2P according to business models
 - ◆ Licensing and DRM
- **Tools**
 - ◆ AXCP for executing Rules
 - ◆ AXCP Quick Starter for immediate and simple activation of AXCP rules
 - ◆ AXP2P for publication of AXMEDIS objects. You can access to them by joining the P2P network
 - ◆ AXDRM for protecting content and DRM
- See the last slide to get the links at the tools to be downloaded.
- You can test some of the AXMEDIS show cases from: <http://www.axmedis.org/com>

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Some Snapshots from the examples shown

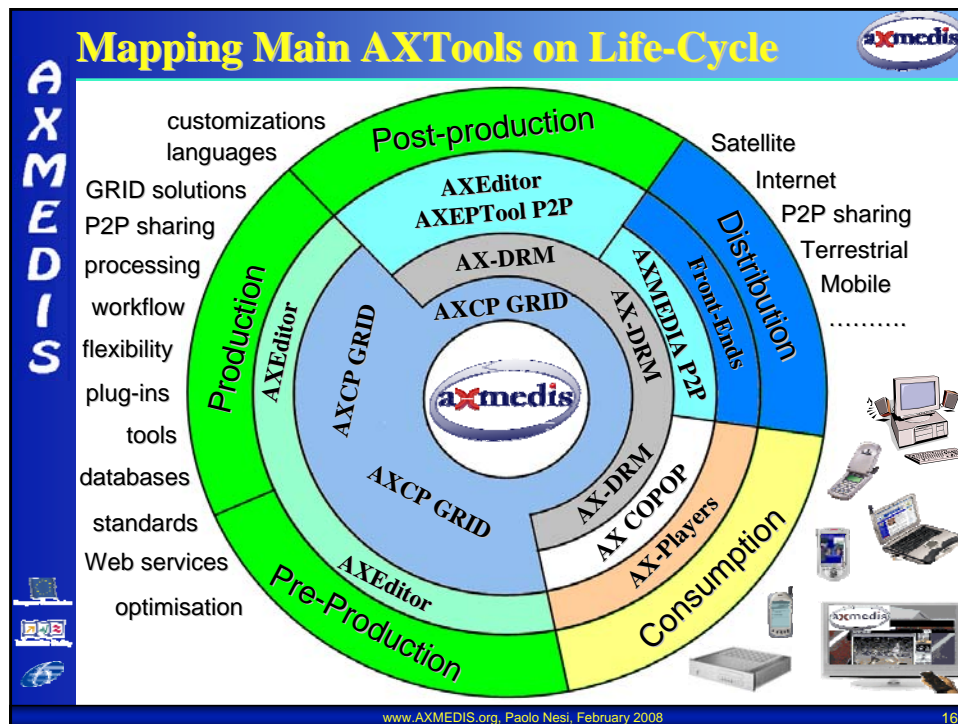
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Snapshots of the GRID at work

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Contact Information

AXMEDIS

- ***If you like to know more about the AXMEDIS framework and other AXMEDIS technologies and functionalities please do not hesitate to contact the project coordinator***
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