



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

[www.axmedis.org](http://www.axmedis.org)

IST-2-511299

# **AXMEDIS overview**


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**20 November 2007**

**Avenue de la Joyeuse Entrée, 1 – 1040 Brussels  
Confindustria, Organized by AFI  
v1.0**

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## **Contingency**





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- **Difficulties of the SMEs**
  - ◆ enter and/or remain in the market of content production and distribution
- **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 acceptance**
  - ◆ Legal and technical capabilities
  - ◆ Lack of interoperability, openness
  - ◆ Flexibility in the business and transaction models
  - ◆ Differences in the European market and in the world
- **Etc.....**


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## Objectives

- **AXMEDIS is an IST EC Integrated Project**
  - ◆ under the DG INFSO, Luxembourg
  - ◆ >14 Meuro of costs, 8.1 Meuro of funding
  - ◆ started in September 2004
- **Main Objectives**
  - ◆ reduction of costs for content production, management and distribution considering activities of B2B and B2C
  - ◆ exploiting new models, methods and tools for content production, protection and distribution
  - ◆ Content more
    - ➔ interactive: .....cross media, multimedia
    - ➔ interoperable: ....device, DRM, formats
  - ◆ Create the AXMEDIS Framework for all





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## Objectives

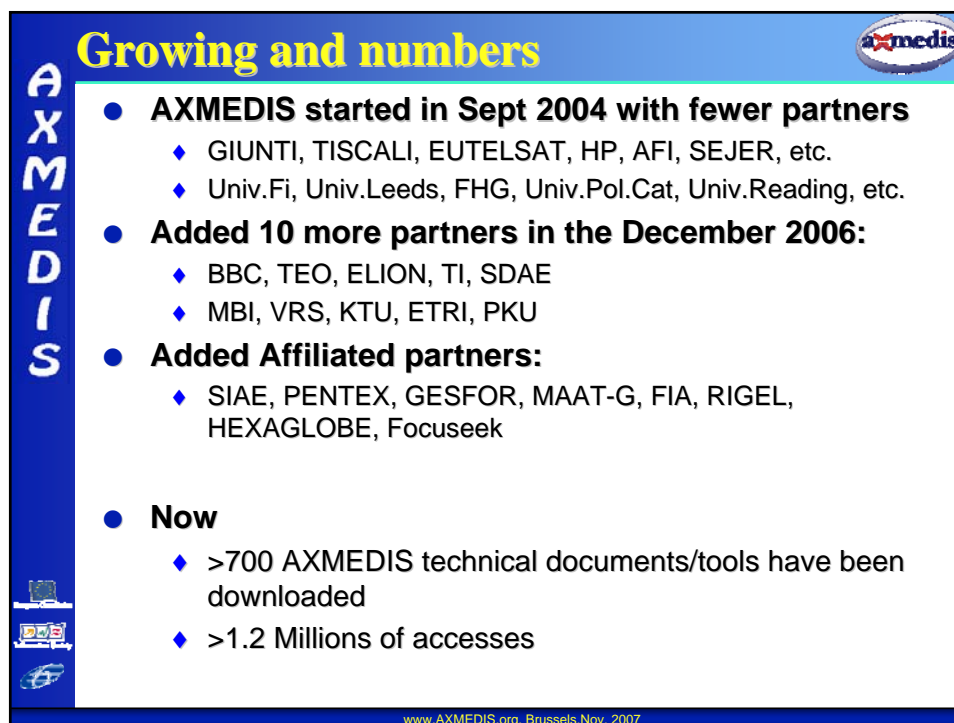
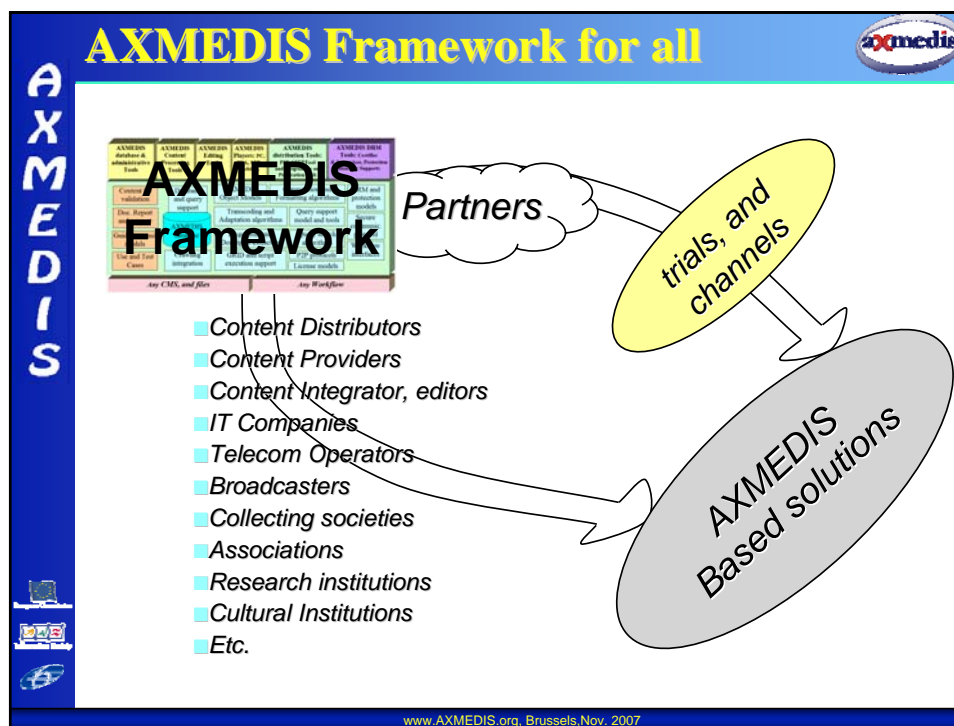



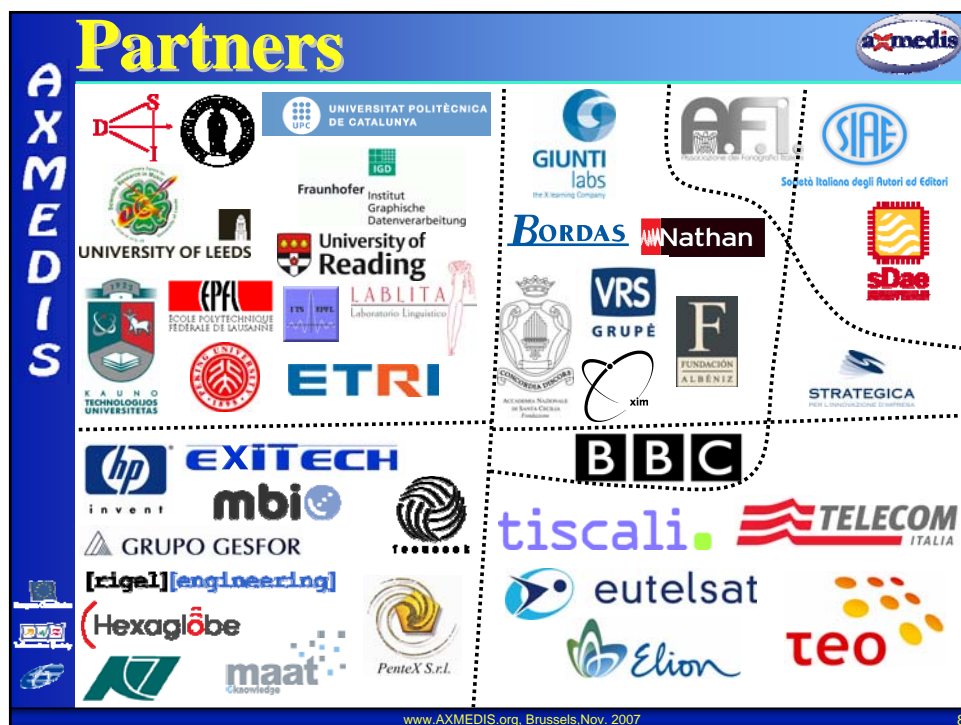
- **Perform research on enabling technologies**
  - ◆ Innovative forms of content for the business and final users
    - ➔ Cross media *interactive* content model
    - ➔ interoperability among different content and devices
  - ◆ Harmonization of B2B and B2C areas
    - ➔ Flexibility in business and transaction models
    - ➔ Secure/legal P2P content sharing for both B2B and B2C
    - ➔ Support of domains in the content management
  - ◆ Massive production of content with GRID technologies
- **Create a unified European platform for content production and distribution, developing the AXMEDIS framework, AXFW**
  - ◆ Improve standards
  - ◆ Development of the AXFW
  - ◆ Make the AXFW open, expansible and accessible to all
  - ◆ Open the Affiliation Programme to access at the AXFW
  - ◆ Set up of trials and demonstrators

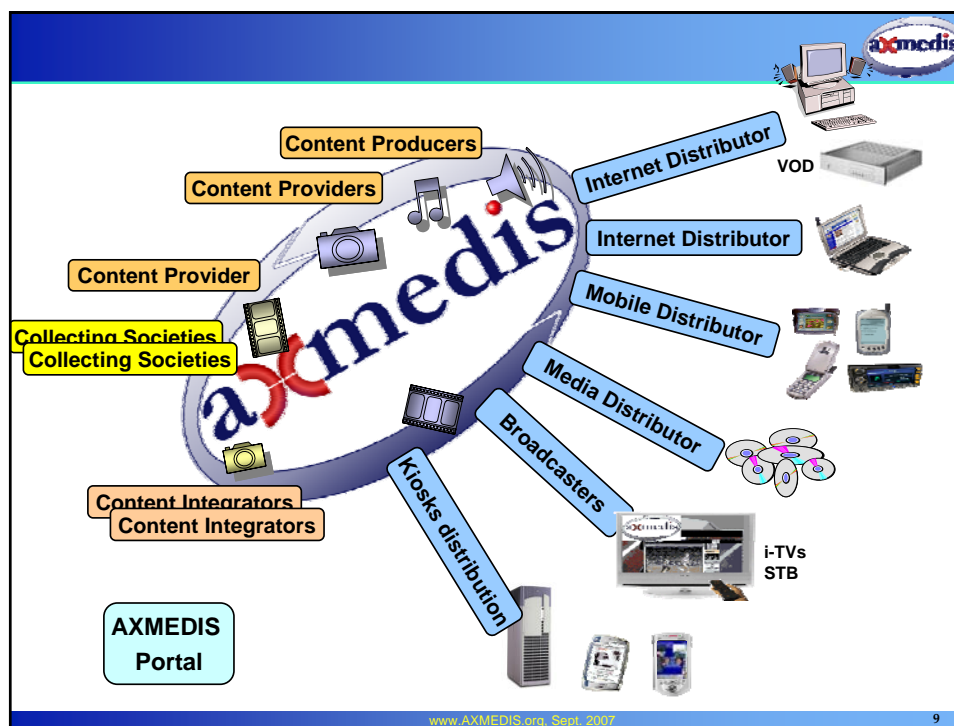


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## Technical Objectives

- **Enhance the interactivity and content forms**
  - ◆ cross media and simple resources
- **Enabling interoperability among different**
  - ◆ distribution channels (TV, PDA, mobile, kiosks, broadcasting,...)
  - ◆ DRMs (digital rights management) models (e.g., MPEG-21, OMA, Windows DRM, etc.),
    - make possible translations among license formats
- **Harmonize B2B and B2C**
  - ◆ Enforce flexibility in business and transaction models
  - ◆ Insertion of DRM into B2B, integration of B2B and B2C
  - ◆ Facilitate the passage from Contract to Digital Licenses and viceversa
  - ◆ Insertion of DRM domain management for Business and final users
- **Enabling the production and processing**
  - ◆ at low costs and in a scalable manner with GRID technology
- **Enabling secure/legal P2P content sharing for both**
  - ◆ B2B and B2C
- **Reuse and improve standards, remaining open and expansible**
  - ◆ Adoption and extension of MPEG-21 and OMA

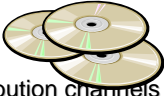
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## Cross Media Content

- **Examples are:**
  - ◆ Interactive training material
  - ◆ documents with hyperlinks
  - ◆ interactive content in which the user may navigate
- **Examples of cross media content are also 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 proposed a Innovations**
  - ◆ more interactivity
  - ◆ different media inside
  - ◆ flexibility in creating content packages
  - ◆ multilanguage and multicultural supports
  - ◆ ...




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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
- **Packing 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



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## Interoperability among devices

**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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## 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

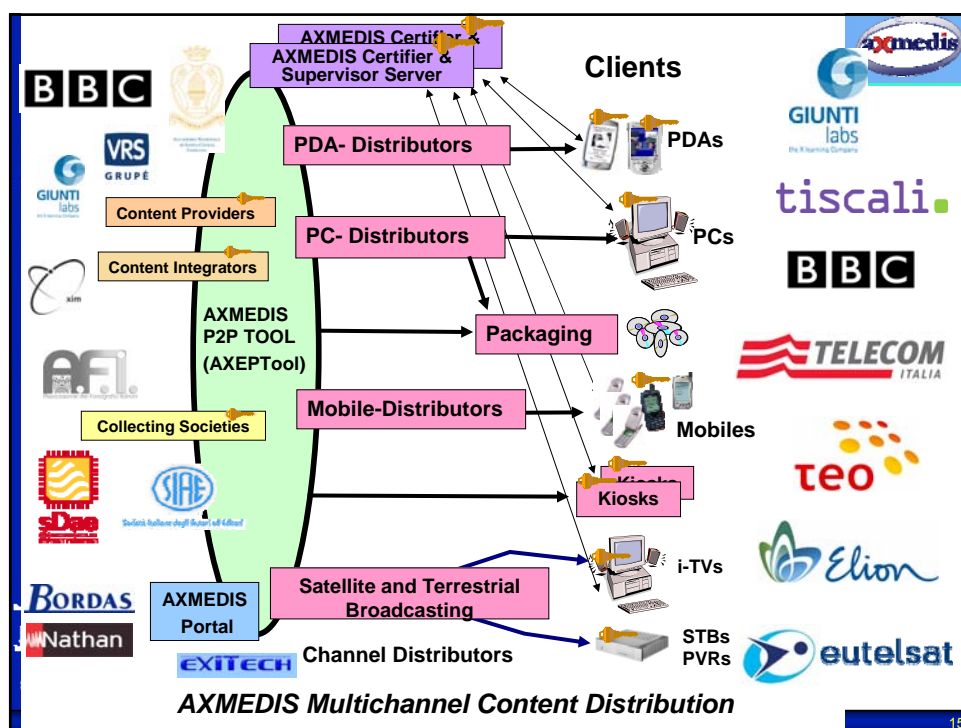
Streaming

VOD

P2P

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## AXMEDIS DRM Aspects

- 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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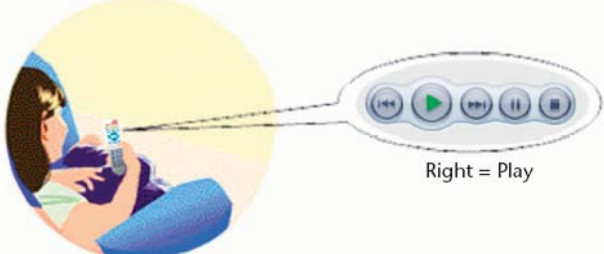
## An example of REL statement



Condition = November 2003



Resource = Ocean Wilds

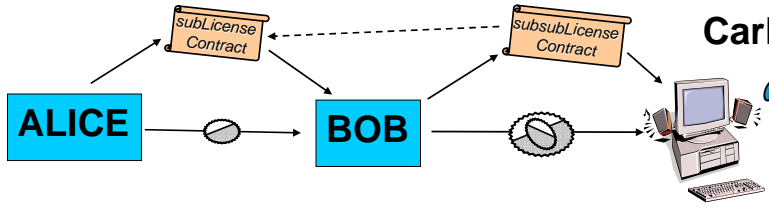



Right = Play

- 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

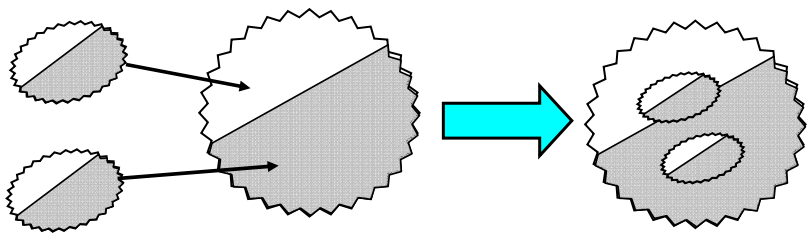
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## Cross media content and composition



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



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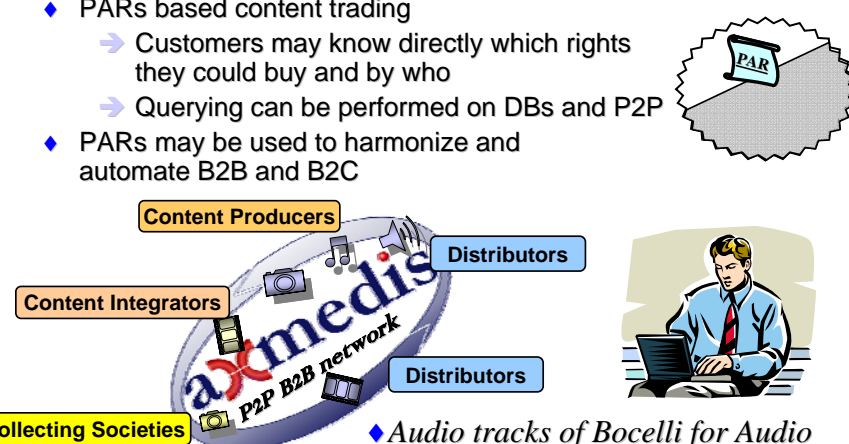
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## Make easier the B2B market of digital content



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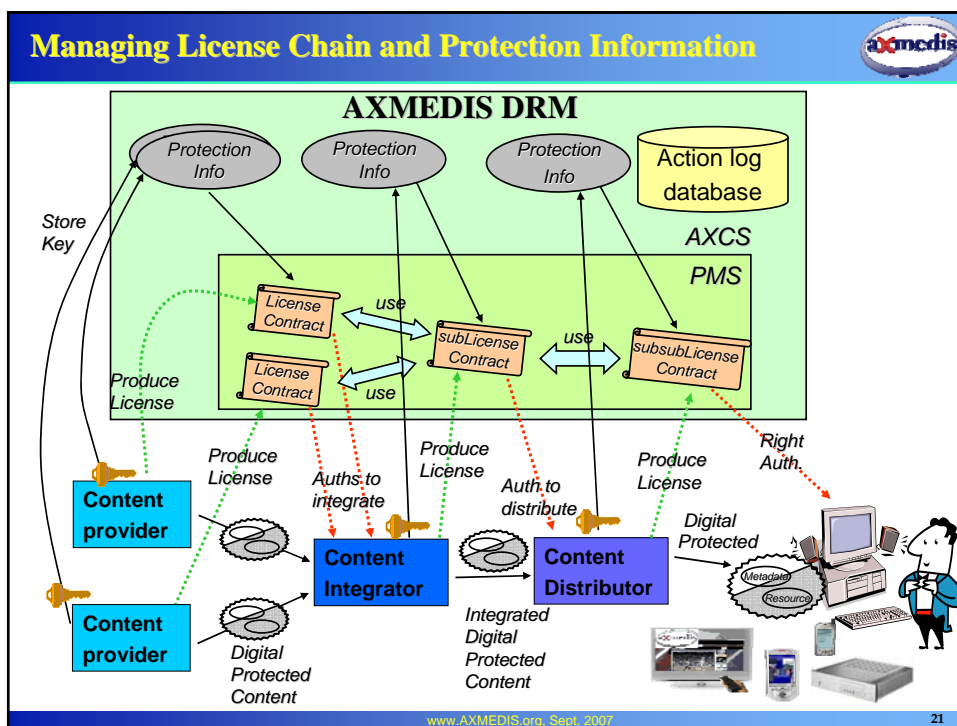
- **REL and Composition enforce flexibility and openness in business transactions**
- **PAR: Potentially Available Rights into AXMEDIS objects**
  - ◆ PARs based content trading
    - ➔ Customers may know directly which rights they could buy and by who
    - ➔ Querying can be performed on DBs and P2P
  - ◆ PARs may be used to harmonize and automate B2B and B2C



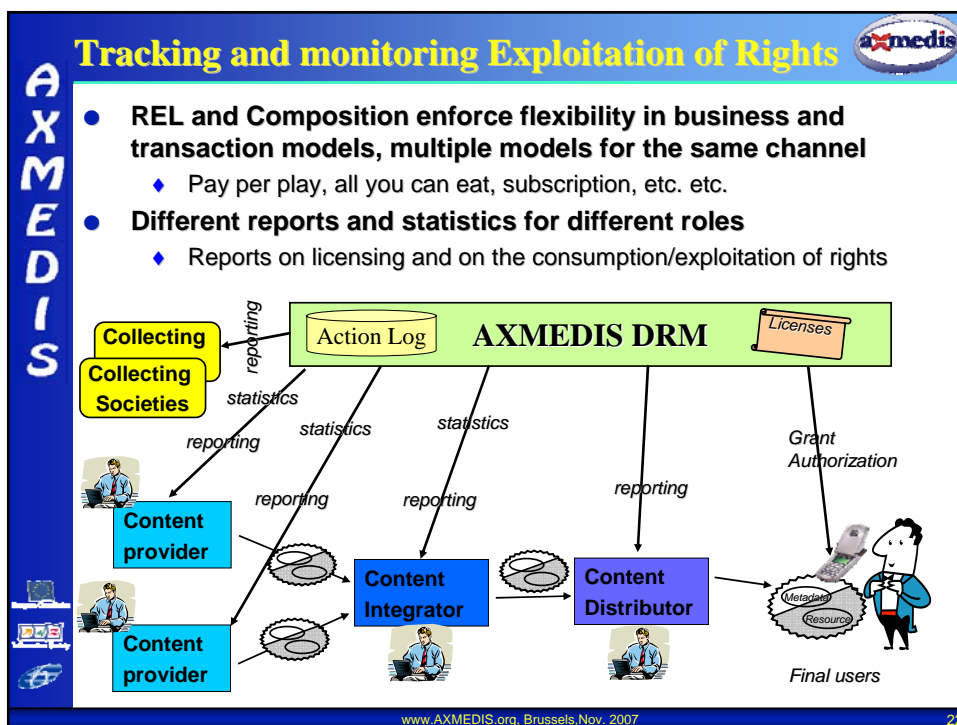
◆ Audio tracks of Bocelli for Audio broadcasting for June 2008 in Gernany?

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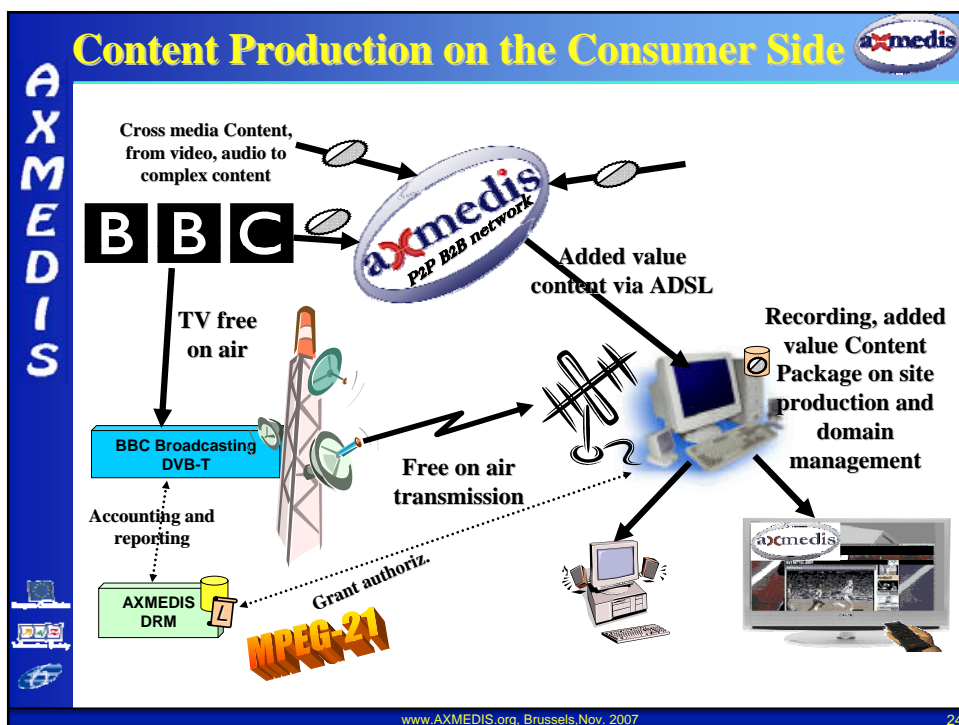
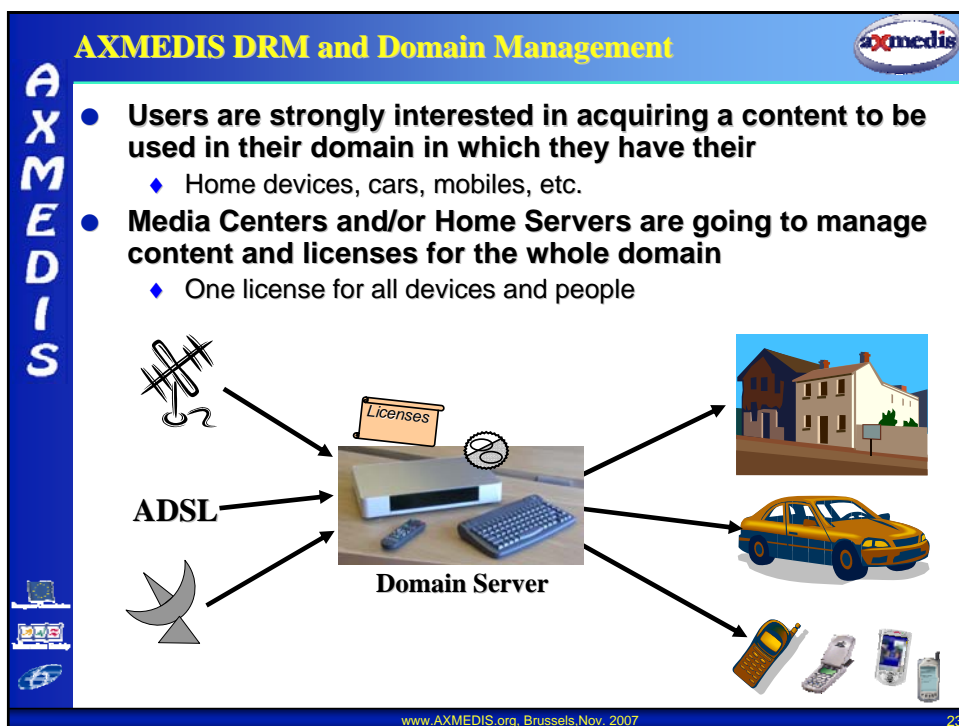
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## DRM Interoperable .....


- **DRM, Digital Rights Management**
  - ◆ Digital management of rights
- **Proprietary DRM solutions are**
  - ◆ based on *proprietary* formats for content and licenses, protection information, control messages, and reporting, etc.
- **DRM Interoperable (e.g., DMP, OMA)**
  - ◆ based on a **UNIQUE** Standard format for content and licenses, protection information, control messages, and reporting, etc.
    - ➔ Extensions are not accepted if not decided by the standard body
    - ➔ Standards are becoming obsolete in short time, patent pending is blocking the market
- **DRM Interoperable “a la AXMEDIS”**
  - ◆ based on **SEVERAL** standard formats (now MPEG-21 e OMA) e/o *proprietary* for content and licenses, protection information, control messages, and reporting, etc.
  - ◆ Interoperable on the B2B and B2C areas
  - ◆ It can be extended to accept other *solutions* for example MS Windows DRM, i-Tune, or more, etc.

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## Enabling massive content production and processing

- **AXMEDIS GRID language and tools for**
  - ◆ Automated Content Ingestion and Gathering
  - ◆ Automated Content Query and Retrieval
  - ◆ Automated Content Load and Storage: databases and files
  - ◆ Automated Content and Metadata Processing, enrichment
  - ◆ Automated Content and Data processing
  - ◆ Automated Content Filtering and Repurposing
  - ◆ Automated Content Composition, Formatting
  - ◆ Automated Content Protection and Licensing
  - ◆ Automated Content Publication/Download on/from:
    - ➔ Any channel including P2P Network
  - ◆ Automated Content Distribution
  - ◆ Automated Profiles management and processing
  - ◆ Automated Production of Content on Demand






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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.**

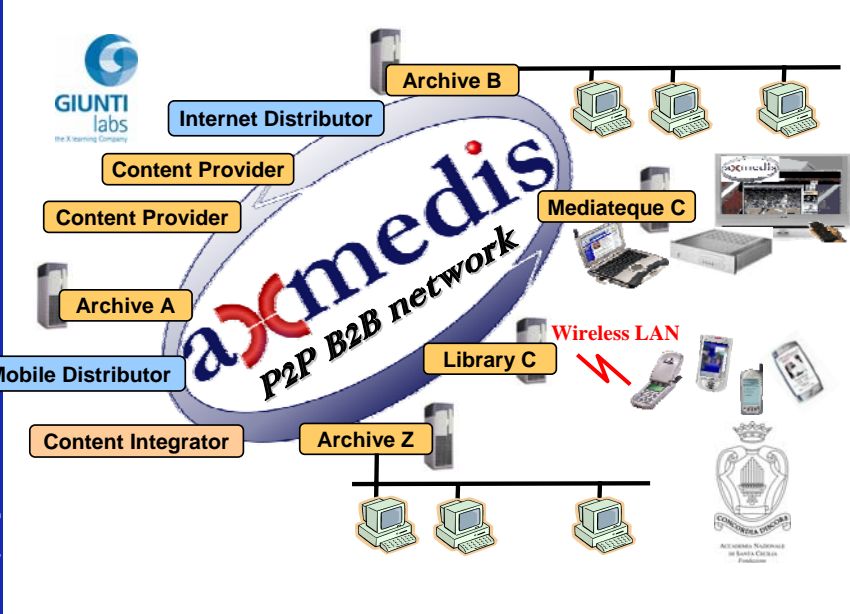
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## Content Sharing among Content Archives



The diagram illustrates the axmedis P2P B2B network. At the center is a large blue oval with the text "axmedis P2P B2B network". Surrounding this central hub are several entities connected by lines:

- GIUNTI labs** (the X-learning Company) is connected to the top left.
- Internet Distributor** is connected to the top left.
- Content Provider** (two instances) are connected to the top left.
- Archive A** is connected to the top left.
- Mobile Distributor** is connected to the bottom left.
- Content Integrator** is connected to the bottom left.
- Archive B** is connected to the top right.
- Mediateque C** is connected to the top right.
- Library C** is connected to the bottom right.
- Archive Z** is connected to the bottom right.

Additional elements include:


- Icons of desktop computers and laptops connected to the network.
- A red double-headed arrow labeled "Wireless LAN" connecting Library C and Archive Z.
- A logo for "COMPTON ITALIA" at the bottom right.













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## AXMEDIS Multichannel Distribution

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- 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  


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## Examples of USERS production and distribution

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- Content production tools for final users, SIAE trial
 

  
Società Italiana degli Autori ed Editori

  - ◆ Set up a service for final users' content collection and distribution with/without DRM
- Content Enrichment with AXMEDIS: **VARIAZIONI**e-ContentPlus
  - ◆ More than 10 partners + communities
  - ◆ [www.variazioni.org](http://www.variazioni.org)
  - ◆ Partners from Spain, Lithuania, Belgium, Portugal, Italy, Finland, Portugal
    - ➔ Koninklijk Conservatorium Brussel, Erasmushogeschool Brussel (EHB)- Belgium

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## Content Enrichment and social network

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# VARIAZIONI

- **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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## Can be a very important solution to


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- **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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## Comments


- **Thanks to the collaboration of content providers, associations, collecting soc, industries, research centers, etc.**
- **Results:**
  - ◆ 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 activity of B2B and B2C
  - ◆ making simples the composition and trading of content
- **Possible support the pana-europea license and as a tool for European Collecting Societies and associations**
  - ◆ B2B DRM, tracking and reporting, etc.

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## Affiliation Programme

- **The Affiliation is open to all, and it has has been performed by**
  - ◆ SIAE, PENTEX, GESFOR, MAAT-G, FIA, RIGEL, HEXAGLOBE, Focuseek
- **It allows to access to the AXFW to it for your business**
- **The AXFW contains:**
  - ◆ AXMEDIS tools ready to be used
  - ◆ Source code of all AXMEDIS tools
  - ◆ Technical reports and documentation
  - ◆ Mailing and discussion lists lists, wiki portal
  - ◆ Training reports and tutorials, videos, slides and docs
  - ◆ Access to the AXMEDIS workshops and training
  - ◆ Etc.



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