Contingency

- **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.....**
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

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
AXMEDIS Framework for all

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.

Growing and numbers

- AXMEDIS started in Sept 2004 with fewer partners
  - GIUNTI, TISCALI, EUTELSAT, HP, AFI, SEJER, etc.
  - Univ.Fi, Univ.Leeds, FHG, Univ.Pol.Cat, 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

- Now
  - >700 AXMEDIS technical documents/tools have been downloaded
  - >1.2 Millions of accesses
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
  - 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
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
  - …

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
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

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
AXMEDIS DRM Aspects

- **Formal definition of Licenses as MPEG-21 REL**
  - Facilitate the passage from Contract to Digital Licenses and vice versa

- **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
An example of REL statement

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

Managing License Chain, B2B and B2C

- 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
**Cross media content and composition**

- 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

**Make easier the B2B market of digital content**

- 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 Gemany?
Managing License Chain and Protection Information

- AXMEDIS DRM
  - Protection Info
  - Protection Info
  - Action log database
  - AXCS
  - PMS

- License Contract
- Produce License
- Use
- Auth to integrate
- Auth to distribute
- Produce License
- Right Auth.
- Digital Protected
- Content
- Licenses
- Authorization

Content provider
Content provider
Content Integrator
Content Distributor

Tracking and monitoring 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.
- Different reports and statistics for different roles
  - Reports on licensing and on the consumption/exploitation of rights
AXMEDIS DRM and Domain Management

- 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

Content Production on the Consumer Side

- Cross media Content, from video, audio to complex content
- BBC Broadcasting
  - TV free on air
  - BBC Broadcasting DVB-T
- Accounting and reporting
- AXMEDIS DRM
- Added value content via ADSL
- Recording, added value Content Package on site production and domain management
- Free on air transmission
- Grant authorization
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.

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
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.

Content Sharing among Content Archives
**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

**Examples of USERs production and distribution**

- Content production tools for final users, SIAE trial
  - 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
  - Partners from Spain, Lithuania, Belgium, Portugal, Italy, Finland, Portugal
    - Koninklijk Conservatorium Brussel, Erasmushogeschool Brussel (EHB)- Belgium
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

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
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.

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.
Contact Information

- **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