**Technical Note
n.7001
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**Manage and
distribute your
contents with that of
your users**

Provide a unique tool for
accessing to the content,
selling it and getting user
generated content.

Video on Demand (VOD),
and production on
demand solutions

Interactivity with
Intelligent cross media
models

User generated content,
Involve customers
and final users in
content production and
social networking

Integrated interoperable
DRM

Exploiting different
business models and/or
transactions on the
same distribution
channels: pay per play,
monthly rate, preview,
renting, advertising, etc.

Adopt advertising
(customized and/or real
time personalised
advertising)

Control P2P content
sharing and distribution,
involving your customers
in distribution
(superdistribution)

Cross Media Finder

The market of digital content is rapidly changing. Users are becoming more interested in using interactive and intelligent content. The Cross Media Finder described in this document is a demonstrative portal of the AXMEDIS technology for the implementation of IP based portal for content distribution and collection of User Generated Content. The Innovation mainly consists in the AXMEDIS Content (MPEG-21) usage that can:

o present in a single digital object more powerful and participative entertainment experiences than present DVDs;

o provide enhanced interactivity such as making queries into the content elements, supporting and storing annotations, navigating and selecting content elements to be played, reacting to user commands and changes, etc.;

o present some autonomy of control, being proactive with the users providing and requesting information and data: for example to create touristic guides, to create traveling reports, coking books, brico-work manual, etc., asking to the user to augment the manual for further experiences and/or friends, etc.;

o include/describe/package any kinds of media and media collections: audio, video, games, documents, images, etc.;

o be exchanged and distributed among different devices/tools: PC, mobiles, smart-phones, STB/PVR, HDR, PDA, etc.;

o be accessed from several different interoperable distribution channels: Internet, P2P, wireless mobile, satellite and/or terrestrial networks, etc.;

o change/adapt its behavior according to the user profiles and experience, context, device capabilities, connection capabilities, etc.;

o be generated by final users, produced at home and/or shared in the network, in the respect of the user Intellectual Properties Rights (IPR), that means supported by some open versatile Digital Rights Management solution;

o be protected and managed with AXDRM that supports a large set of business models, for example: renting, pay per play, subscription, advertising, user generated content, etc.;

The Cross Media Finder portal shows how these issues can be integrated in a portal for cross media content on demand and may be integrating thematic social networking obtaining the integrated features reported at the end of this document.

The demonstrative portal can be tested on http://variazioni.axmedis.org/CrossMediaFinder. The access to the integrated version with P2P tools can be tested by installing the AXMEDIS P2P client via: http://www.axmedis.org/documenti/view_documenti.php?doc_id=3624

On the Cross Media Finder, the user starts connecting with the Portal by using (i) link or (ii) the AXMEDIS P2P client tool called AXEPTool (as depicted in the figure). The user can directly access to facilities for searching, downloading and publishing content. Observing and browsing the content already obtained, downloaded in the past. The AXEPTool is a P2P client tool of the AXMEDIS P2P controlled Network: http://www.axmedis.org/documenti/view_documenti.php?doc_id=3624

Via the Cross Media Finder AXEPTool the user can:
- access to cross media content as described in the following;
- make queries on cross media content selecting video, audio, documents, images, cross media or any, on the basis of extended metadata, or other categories;
- download the content from the server, client/server direct download;
- download the content from the P2P network;
- play content directly into the WEB page or from the downloaded files;
- browse the list of the most downloaded content;
- see the last recently uploaded content;
- see a preview for each content element with an icon or animated icon;
- see a set of metadata such as: title, description, format, type, genre, ranks, comments, etc., for each content element in preview or as a result of a query;
- see the extended metadata for each content;
- upload content on the Cross Media Finder to see them directly presented in the portal;
- publish files and/or cross media content on the P2P network;
- see statistics about download and upload of the P2P network;
- see the whole catalogue of the P2P network.

In order to play a cross media content, the user has to click on the visible and/or animated icons representing the content. The resulting action is the internal opening of a new web page into the AXEPTool. That page contains the AXMEDIS Active X player with the automatic loading of the selected content.

AXMEDIS Content Format, features and rationales

AXMEDIS content format supports from simple files to complex collections of multimedia for a large range of applications, from business to business to personal and/or global scale production, protection and distribution, with and without DRM. AXMEDIS format and solution can be used:

o for describing and/or packing and may be protected any kind of digital content, with standard, custom and extended metadata;
o for cultural heritage valorization and distribution, educational and infotainment content: lessons, coursewares;
o for content distribution: VOD, IPTV, WEBTV, etc.;
o for modeling content for PC, PDA, P2P, Kiosks and mobiles with interactive parts;
o as intelligent content having the possibility of defining the internal business model and actions on the content itself, dynamic modeling of content behavior;
o as interchange content format, wrapping any kind of files, including SMIL, HTML, FLASH, MXF, etc., for safer audio/visual sharing;
o for sharing content among B2B actors of the value chain, in protected and non protected versions;
o for leisure and entertainment content: video, TV, games, etc.;
o for distributing and protecting governmental, military, clinical information;
o for packaging, protecting and distributing newsML;
o for creating audio guides for PDA and mobiles
o for producing content with advertising (customized and/or real time personalized advertising inside the package or linked to outside);
o for producing and delivering personalized content inside the package or linked to outside;
o for managing personally produced content from final users and customers;
o to provide multichannel experience and distribution: different content on different channels at the same time for multichannel experience of the user.

The above mentioned scenarios and many others can be realized thanks to AXMEDIS technology and tools of: AXMEDIS content format, DRM, controlled P2P, and Content Processing, see Technical Notes http://www.axmedis.org/documenti/documenti.php

AXMEDIS Objects may contain:

o **elements/essences** which are:
   o simple files audio, video, images, documents, animations, games, etc.;
   o any combinations of cross media with presentation in HTML, SMIL, MPEG-4, XML, FLASH, NewsML, MXF elements, etc., hypermedia with internal and external links;
o **reference** to external files and/or other AXMEDIS objects as URIs and links;
   o menus, collections, lists, interactive elements on animations, etc.
o **metadata and descriptors** associated with single resources and/or collections:
   o metadata, classification information, Dublin Core, and any other XML metadata etc.;
   o descriptors such as fingerprint, technical information, MPEG-7, XML, etc.;
   o single and/or multiple identifications: AXOID, UUID, ISBN, ISMN, ISRC, ISAN, etc.
   o business descriptors such as the AXInfo, PAR (potentially available rights), etc.;
o **collections** as lists, hierarchy of files, nesting levels, menus, etc., on which users may
   o navigate, make queries on the basis of metadata of single components or files;
   o receive auto play, automated presentation, dynamic advertising, chained videos, special content, packaging audio visual with additional content, etc.;
   o access to content with different presentation algorithms, protected and/or selectively non-protected, with or without previews, and many other models.
   o perform annotations to content elements;
o **narrative and proactive capabilities:** behavior formalization and semantics to make intelligent and interactive the content package, allowing the final users to perform not only interaction, while
   o enrichment (addition of comments and data to object content);
   o transformations (migration of the same object to another device with some adaptation), extraction of ringtones, screens for mobiles, etc.;
   o queries inside the content collection;
   o questionnaires, quiz, exercises inside the content package;
   o recording additional content coming from P2P, Web, etc.;

o licensing its own content with specific wizard;
o evolving the content with its own action as above, so has to have at the next usage its own picture collection, brico-reporting experience, traveling experience report, messages for the family, etc.

AXMEDIS Player into Internet Explorer

The AXMEDIS player Active X for Internet Explorer presents the following features:

- play video/audio from HTTP link in progressive download;
    o stop, pause, restart, go end, go top, go full screen;
    o seeking position on the video/audio moving cursor;
    o show full metadata, show structure;
    o show progressive download bar;
- play cross media content in AXMEDIS/MPEG-21 format downloading them via HTTP;
    o MPEG-21, SMIL, HTML, FLASH, animation, image, audio, video, doc, MPEG-4,
    o show and navigate into the cross media content structure;
- execute intelligent AXMEDIS objects with AXMethods;
    o interactive Support, Content behavior, Internal content query, Collection of user action, Proactive with users, Extraction of resources, User monitoring
- AXMEDIS DRM Support:
    o Off Line DRM function, Licensing Links, Protection tools plugins, Attacks detection, Users may gen licenses, Domain support, REL Rights Supported
- Content acquisition: Download, Progressive download
- Technical details: easy to install via certified CAB, msi and/or exe, plug in technology to add features and protection tools, developed in C++;
- Open and customizable according to needs.

The AXMEDIS player is automatically downloaded and proposed for installation at the first opening of the WEB page containing the player. It is a certified tool and thus it is recognized to be a secure tool by any Internet Explorer without asking to the user to reduce its level of protection.
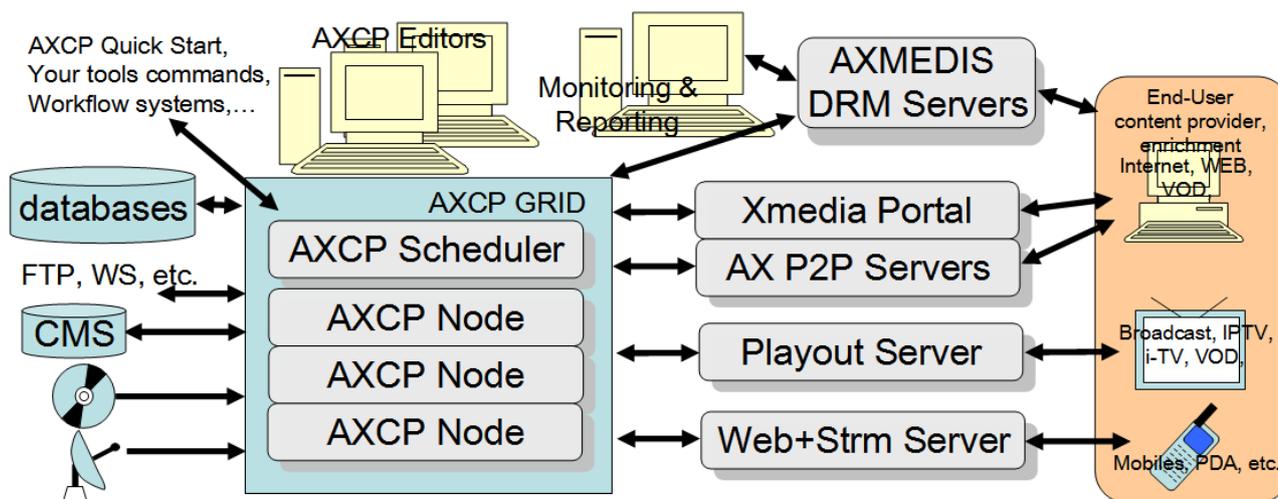

In the above figure, an example of cross media content is reported. The example reports a collection of short video of secret camera that the user may select clinking on the photogram. Once downloaded the same content is accessible as unique file from the disk.

Deploy Cross Media Finder

The Cross Media Finder can be customized according to specific needs, to be deployed

- **to work with generic files and/or with AXMEDIS/MPEG-21 content**. The users provided content files are automatically reformatted and adapted according to the distribution defined format by using AXCP. The production of AXMEDIS/MPEG-21 Objects and their templates can be performed with the AXMEDIS Editor/authoring. AXMEDIS provides also players for: MS Windows, Linux, Windows Mobile 5 and 6, and java mobiles, STB/PVR/HDR, Media Centers, PDA, and mobiles. They can be customized as GUI and functionalities. Examples of customizations are available: http://www.axmedis.org/documenti/view_documenti.php?doc_id=3634
- **as single WEB portal and/or integrated with P2P** network and client tool as described before; The P2P network is obtained with the AXMEDIS P2P, a BitTorrent enhanced solution for P2P: http://www.axmedis.org/documenti/view_documenti.php?doc_id=3612
- **with or without the support for collecting and adapting user generated content**. The processing of the user generated content is performed automatically with the AXMEDIS Content Processing tools, AXCP, that can be scaled up to managed large amount of content per day to automate your content production, protection and distribution as stated above and in more details into the technical note: http://www.axmedis.org/documenti/view_documenti.php?doc_id=3624
- **with or without the support for DRM**. Asolution to adopt MPEG-21 DRM with other DRM solutions, includes servers and licensing tools and allows DRM, detection of attacks, black list management, collection of actions logs containing traces about the rights exploitation, tools for administrative management, etc. http://www.axmedis.org/documenti/view_documenti.php?doc_id=3616

Integrated Social Networking Support

The users may become regular registered users by performing a subscription. During the registration the users have to fill a form to describe their profile. The profile includes some few personal data and their preferences on the cross media content.

On the basis of the user profile and of his/her actions on the portal, the portal is capable of:
- suggesting a list of potential friends;
- proposing a list of content to be acquired;
- suggesting the list of content closer to their preferences and profile;
- presenting to them specific advertising.

Only the registered users may:
- post his/her generated content on the portal to see it automatically transformed into content distributed on the cross media finder portal;
- see the list of his/her posted content with details about the ranks and views;
- create a list of friends;
- define the list of friends that may access to the posted content;

- see the preferred content of friends;
- see the posted content of friends;
- see the content which is closer to his/her profile;
- create the list of their preferred content elements;
- create play list of content;
- vote and comment played content, influencing the ranks;
- access to protected content reserved to them without paying;
- access to pay per play content according to the business models;
- see the list of the most played content by him/herself.

AXMEDIS Tools for your download

In the following, the links to download the most important AXMEDIS player are reported. It is also possible from the AXMEDIS portal to download additional AXMEDIS tools and content:

o PC players:
   o AXMEDIS stand alone PC player;
      http://www.axmedis.org/documenti/view_documenti.php?doc_id=3767
   o AXMEDIS Skin based PC player;
      http://www.axmedis.org/documenti/view_documenti.php?doc_id=3716
   o AXMEDIS Active X, for usage into HTML pages and simple VB and/or .NET applications and PC players. .NET Player; http://www.axmedis.org/documenti/view_documenti.php?doc_id=3717
o PDA Windows Mobile 5 and 6 player, supporting: SMIL, HTML, MPEG-4, video, audio, documents, images, etc.; http://www.axmedis.org/documenti/view_documenti.php?doc_id=3842
o Mobile player:
   http://www.axmedis.org/com/index.php?option=com_content&task=view&id=172&Itemid=91
o Production tools:
   http://www.axmedis.org/com/index.php?option=com_content&task=view&id=83&Itemid=55

References

AXMEDIS portal http://www.axmedis.org on which you can find:

- **AXMEDIS tools**:
   o production tools: editor and automated production, AXCP tools;
   o players for several platforms;
- **AXMEDIS objects and examples**
   o audio, video, images, collection, education, cross media, training objects, documents, etc.;
   o Interactive and smart objects;
- **AXMEDIS P2P network** that you can freely and easily join for trial;
- **AXMEDIS Technical Notes, white papers** on:
   o AXCP, Automated production tools;
   o AXMEDIS Model;
   o AXMEDIS P2P;
   o AXMEDIS DRM;
   o AXMEDIS DRM how to integrate and use
   o AXMEDIS DRM for dummies
   o VOD for PC and STB
   o Usage intelligent content with the show case of BBC
- **AXMEDIS show cases:** of: TISCALI, EUTELSAT, BBC, TEO, ELION, Giunti LABS, ANSC, Telecom Italia, VARIAZIONI, SIAE, etc.
   o examples and technical documentation about AXMEDIS distribution cases for : VOD, IPTV, mobile, PDA, STB, etc., download and streaming, etc.
- **AXMEDIS tutorials**:
   o videos, slides, and documents
   o example of AXCP rules

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