Access to the AXMEDIS Framework

The AXMEDIS Framework is accessible to all including industries, large or small, who share the interest to exploit new technologies and solutions for automated content production and multi-channel distribution.
The AXMEDIS Framework can be used to setup and build a set of complete applications and services in the area of content production, protection and distribution. With the flexibility of AXMEDIS dynamic plug-in technology, you can customise your applications and processes according to your needs.

AXMEDIS Framework is Open:

- AXMEDIS focuses on interoperability and openness of content model and interoperability of DRM models, including multi-channel distribution;
- AXMEDIS specification is public and accesible from AXMEDIS portal. Its use is royalty free;
- source code of the AXMEDIS Framework is accessible by the AXMEDIS Affiliation programme. The affiliation fee is affordable for all. Alternatively affiliation can also be offered in return for contributions to improve and/or extend the AXMEDIS Framework;
- AXMEDIS plug-in technology is public. The specification and the source code for creating new plug-ins are public and accessible without the need to be affiliated. Any tool can be integrated into the AXMEDIS Content Processing GRID with this technology.
- AXMEDIS partners are open to your needs that may be useful to improve the capabilities of the AXMEDIS framework.

To take advantage of the AXMEDIS framework and technologies, you are invited to apply for the AXMEDIS Affiliation.

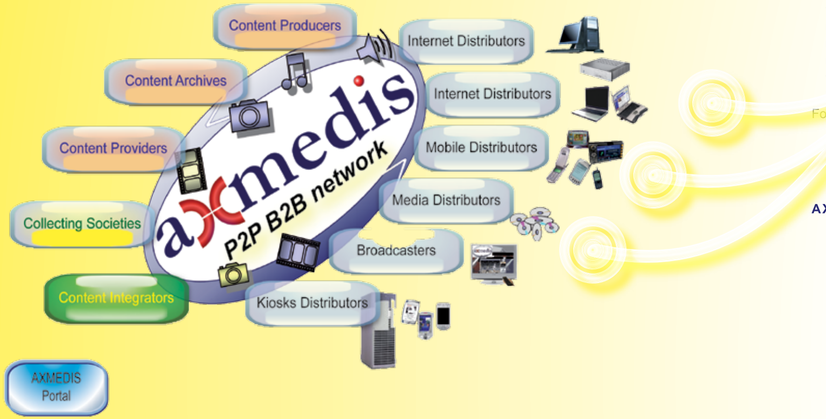
AXMEDIS Affiliation

With the AXMEDIS Affiliation, industrial participants can:

- access the AXMEDIS Framework which can be used to set up and enhance production, protection and distribution facilities/platforms in a simple and cheap manner;
- adopt standard models (e.g. MPEG-21) for content and licenses modelling and hence adding DRM in your content business;
- establish contacts with other business partners interested in exploiting similar technology;
- obtain greater control on the content usage;
- create customised AXMEDIS players for PC, PDA, etc.;
- exploit and trial innovative business models that can be enforced on a distribution channel with management of rights and obtain reports on exploited rights of the multimedia content distributed.

With the AXMEDIS Affiliation, Research institutions can:

- access the AXMEDIS Framework to build different solutions and applications to cover the needs of the value chain actors and tested with low effort;
- improve visibility, promote and produce algorithms and tools that can be used for content processing and modelling, and can be integrated into the framework;
- add new content models and new DRM models, make them interoperable with MPEG-21 and others already in place on the AXMEDIS Framework;
- test algorithms and tools with respect to the state of the art solutions, with ease;
- collaborate with other relevant research institutions and companies within the sector.



AXMEDIS B2B Distribution and Sharing

For latest information, developments, events and announcements, please visit the AXMEDIS web portal at **http://www.axmedis.org**.
If you have any queries or comments, please email **axmedisinfo@axmedis.org**.

AXMEDIS Partners include:
With the AXMEDIS Affiliation, Research institutions can:
Accademia Nazionale di Santa Cecilia Fondazione, Italy
Advance Concepts for Interactive Technology GmbH, Germany
AFI, Associazione dei Fonografici Italiani, Italy
BBC, British Broadcasting Corporation, UK
DSI, Department of Systems and Informatics, University of Florence, Italy
Dipartimento di Italianistica, Università degli studi di Firenze, Italy
EPFL, Ecole Polytechnique Federale de Lousanne, Switzerland
ETRI, Electronics and Telecommunications Research Institute, Korea
Elion Enterprises Ltd., Estonia
EUTELSAT S.A., France
EXITECH S.r.l., Italy
Focuseek, Italy
FHGIGD, Fraunhofer Institute for Computer Graphics, Germany
GIUNTI Interactive Labs S.r.l., Italy
HP, Hewlett Packard Italy S.r.l., Italy
Hexaglobe, France
Kaunas University of Technology, Lithuania
MBI S.r.l., Italy
Peking University, China
Rigel Engeneering, Italy
SEJER, Bordas and Nathan, France
SDAE, Sociedad Digital de Autores y Editores, Spain
SIAE, Società Italiana degli Autori ed Editori, Italy
Strategica S.r.l., Italy
Telecom Italia, Italy
TEO LT, Lithuania
TISCALI Services, Italy
UPC, Universitat Politecnica de Catalunya, Spain
University of Leeds, Interdisciplinary Centre for Scientific Research in Music, UK
University of Reading Informatics Research Centre, UK
VRS Grupė, Lithuania
XIM Ltd., UK
For the full list, please see the AXMEDIS portal.

axmedis

Automating Production of Cross Media Content for Multi-channel Distribution

www.axmedis.org

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Image courtesy of NASA and the Visible Earth, http://visibleearth.nasa.gov
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AXMEDIS Framework

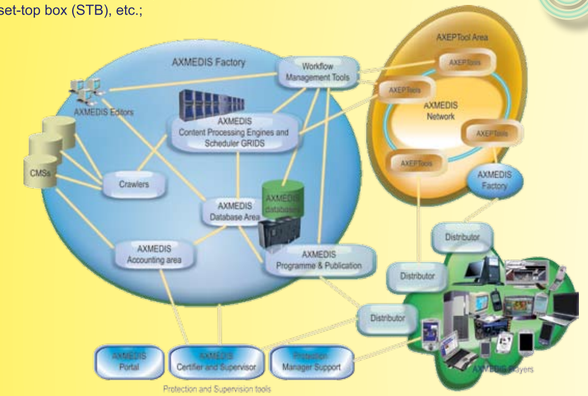
The AXMEDIS Framework is an open solution which builds on technologies and tools to:

- reduce costs and increase efficiency for content production, protection, management and distribution. It offers effective automation for:
  - integrating your Content Management Systems (CMSs) with distribution systems by automating the communication and maintenance of content and information between the two;
  - content gathering and ingestion processes from local and remote CMSs as well as file systems;
  - composition, supporting parallel processing, GRID technology, and optimisation techniques for content ingestion, production, protection and formatting;
  - managing the workflow processes at content-factory level and between content-factories with the support of OpenFlow and BizTalk Workflow Management systems;
  - the overall process allowing content production on demand.
- support the whole value chain, including composition, packaging, integration, aggregation, synchronisation, formatting, adaptation, transcoding, indexing. Additional features include the integration of both protected and non-protected components within an object, definition of relationships with other resources, metadata integration and remapping/transcoding, protection, license production and verification;
- allow the convergence of the media and interoperability of content to enable multi-channel distribution. The framework supports content distribution:
  - on different channels such as satellite data broadcast, Internet, cellular/mobile network, wireless and traditional media support such as CDs, DVDs;
  - via different communication technologies, particularly with Peer-to-Peer (P2P) for both B2B (Business-to-Business) and B2C (Business-to-Consumer) levels;
  - to different devices such as PC, PDA, interactive TV (i-TV), set-top box (STB), etc.;
  - with different transaction models on the same channels and content, and with flexibility.
  - adopt new methods and tools for flexible and interoperable
  - Digital Rights Management (DRM) in order to facilitate a smooth transition from paper contracts to digital licenses.
  - exploitation of MPEG-21 REL (Rights Expression Language) with specific extensions and enhancements;
  - support of different business and transaction models and their integration;
  - integration/interoperation of different DRM models such as MPEG-21 REL and ODRL OMA (Open Mobile Alliance).
- harmonise B2B and B2C areas for DRM, bringing the DRM model in the B2B area, supporting production and protection models in the whole value chain;
- increase content accessibility via the AXMEDIS P2P platform at B2B level, which can integrate content management systems and workflows.

AXMEDIS Content Model

AXMEDIS content model is designed to support all types of cross-media content; from simple multimedia files to software components such as games, for all kinds of applications, from personal to global scale usages including leisure, education, entertainment, infotainment as well as the management of protected content for government, healthcare, business, etc.

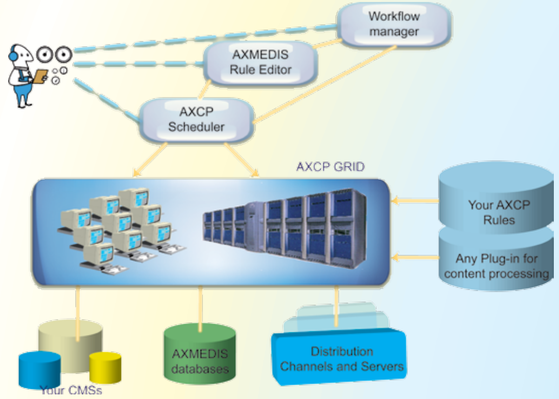
AXMEDIS is an open format which is capable of integrating any kind of cross-media format (e.g. video, images, animations, games, learning objects, multimedia, audiovisual, document, audio, etc.) in digital format with any kind of metadata including identification, classification, categorisation, indexing, descriptors, annotations, relationships and play activities, and protection aspects. The AXMEDIS format permits the combination of content components and their secure distribution in respect of their intellectual property rights, supporting a large variety of DRM rules and models according to concepts of interoperability among DRM models (mainly, but not only, based on MPEG-21, with both binary and XML formats). AXMEDIS is open to all DRM models and solutions.



AXMEDIS Architecture

Key Components

AXMEDIS Factory: for automatically collecting content from legacy CMSs, producing the content, programming and scheduling the production process, processing metadata, composing and formatting content, collecting content information from content usage, producing licenses to harmonise the production with workflow applications in the factory and among geographically distributed factories, etc. The AXMEDIS Factory is scalable in the sense that it can satisfy the needs of small and large content producers, integrators, and distributors. The factory is supported by tools for automating the production process and to perform manual editing;



AXMEDIS Distribution tools: for automating the content publication and acquisition in the business area allowing the interconnection of AXMEDIS Factories by means of the AXEPTools which is a secure and legal P2P tool. It is also possible to make distributed queries among connected AXMEDIS Factories to search for content and to automatically publish and acquire/update content from/to the business partners, etc. The tools in this area also allow scheduling of content distribution and publication towards external web services for example those of front end distribution servers;

AXMEDIS Players: for content playback and execution on several different platforms (PC, PDA, mobiles, AXMEDIS Mozilla Plug in, AXMEDIS Active X), to build specific and customised content players, for distributing and sharing content among final users by means of secure P2P tools such as AXMEDIA P2P tool;

AXMEDIS Protection and Supervising tools: for registering users, certificating users, authenticating devices and tools, monitoring all the activities performed on the AXMEDIS content on AXMEDIS players and tools, processing licenses, managing black lists, and collecting and reporting the information about content usage and rights exploitation, etc.

Content Processing

AXMEDIS framework and the AXMEDIS Content Processing (AXCP) based on GRID technology offers automated features and functionalities, supporting convenient scripting interface to enable automation and control with:

- Content Ingestion and Gathering:
  - from Content Management Systems (CMS such as ORACLE, XML databases, Tamino, MySQL, MSSQL, HP DMP, ODBC, etc.), file system, and protocols;
  - by processing resources and coupling them with metadata;
  - via Web Services, FTP, HTTP, WebDAV, SMB, Gopher, NNTP, and other models.
- Content Storage and Retrieval:
  - AXMEDIS database, MPEG-21 database;
  - other AXMEDIS content Factories by means of the AXEPTool.
- Content Processing:
  - digital resources adaptation, extraction of descriptors, transcoding, synchronisation, metadata processing, estimation of fingerprint, watermarking, indexing, content summarisation, etc.; for videos, images, documents, audio files, etc.;
  - metadata manipulation, mapping and adaptation: Dublin core, MPEG-7, etc.;
- Content Composition:
  - creation of content components or objects by a combination of raw assets such as text, images, audio, video, animation, metadata, descriptors, licenses, and other multimedia objects such as MPEG-4, HTML, SCORM, OMA, macromedia tool file, games, etc.;
  - creation of content as linear or hierarchical combination of content components.
- Content Formatting:
  - structuring and styling content elements by means of SMIL based templates and applying style-sheets to define the usage interface (format, layout) of the whole collection of content elements and the interested content usage paradigms. For example, karaoke, collection browsing, selection menus, slide presentation, background window with live video, animated text, graphics etc.;
  - optimising and defining style parameters for layout. For example automated best fit of images for a screen, optimising the amount of text in the page using Genetic Algorithms, best time fitting, etc.
- Content Protection:
  - protecting digital resources and objects with their complex structure;
  - creating Protection Information parameters, such as keys, or other features;
  - applying Protection Information model to content objects, segmenting digital resources, slicing objects, applying encryption, scrambling, compression, and many other algorithms;
  - posting specific protection information of a given AXMEDIS object to the AXMEDIS Certifier and Supervisor server;
  - tracking exploited rights and reporting actions performed to the content owner, distributors, collecting societies, etc.
- Content Licensing:
  - generating licenses from license models and additional information, storing licenses, and posting to license server automatically;
  - supporting transcoding/translating licenses (MPEG-21 REL, ODRL);
  - invoking verification algorithms about licenses and available rights to simulate the usage from the user site.
- Content Publication and Distribution:
  - supporting distribution towards multiple channels;
  - producing, monitoring and editing programmes and schedules.