



Automating Production of Cross Media Content for Multi-channel Distribution

www.AXMEDIS.org

DE3.1.2.2.1

Specification of General Aspects of AXMEDIS framework, first update of DE3.1.2 part A

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1 Executive Summary and Report Scope

The full AXMEDIS specification document has been decomposed in the following parts:

DE number	Deliverable title	responsible
DE3.1.2.2.1	Specification of General Aspects of AXMEDIS framework, first update of DE3.1.2 part A AXMEDIS-DE3-1-2-2-1-Spec-of-AX-Gen-Asp-of-AXMEDIS-framework-upA-v1-0.doc	DSI
DE3.1.2.2.2	Specification of AXMEDIS Command Manager, first update of DE3.1.2 part B AXMEDIS- DE3-1-2-2-2-Spec-of-AX-Cmd-Man-upB-v1-0.doc	DSI
DE3.1.2.2.3	Specification of AXMEDIS Object Manager and Protection Processor, first update of DE3.1.2 part B AXMEDIS-DE3-1-2-2-3-Spec-of-AXOM-and-ProtProc-upB-v1-0.doc	DSI
DE3.1.2.2.4	Specification of AXMEDIS Editors and Viewers, first update of DE3.1.2 part B AXMEDIS-DE3-1-2-2-4-Spec-of-AX-Editors-and-Viewers-upB-v1-0.doc	DSI
DE3.1.2.2.5	Specification of External AXMEDIS Editors/Viewers and Players, first update of DE3.1.2 part B AXMEDIS-DE3-1-2-2-5-Spec-of-External-Editors-Viewers-Players-upB-v1-0.doc	EPFL
DE3.1.2.2.6	Specification of AXMEDIS Content Processing, first update of DE3.1.2 part C AXMEDIS-DE3-1-2-2-6-Spec-of-AX-Content-Processing-upC-v1-0.doc	DSI
DE3.1.2.2.7	Specification of AXMEDIS External Processing Algorithms AXMEDIS-DE3-1-2-2-7-Spec-of-AX-External-Processing-Algorithms-v1-0.doc	FHGIGD
DE3.1.2.2.8	Specification of AXMEDIS CMS Crawling Capabilities, first update of part of DE3.1.2 AXMEDIS-DE3-1-2-2-8-Spec-of-AX-CMS-Crawling-Capab-v1-0.doc	DSI
DE3.1.2.2.9	Specification of AXMEDIS database and query support, first update of part of DE3.1.2 AXMEDIS-DE3-1-2-2-9-Spec-of-AX-database-and-query-support-v1-0.doc	EXITECH
DE3.1.2.2.10	Specification of AXMEDIS P2P tools, AXEPTool and AXMEDIS, first update of part of DE3.1.2 AXMEDIS-DE3-1-2-2-10-Spec-of-AXEPTool-and-AXMEDIA-tools-v1-0.doc	CRS4
DE3.1.2.2.11	Specification of AXMEDIS Programme and Publication tools, first update of part of DE3.1.2 AXMEDIS-DE3-1-2-2-11-Spec-of-AX-Progr-and-Pub-tool-v1-0.doc	UNIVLEEDS
DE3.1.2.2.12	Specification of AXMEDIS Workflow Tools, first update of part of DE3.1.2 AXMEDIS-DE3-1-2-2-12-Spec-of-AX-Workflow-Tools-v1-0.doc	IRC
DE3.1.2.2.13	Specification of AXMEDIS Certifier and Supervisor and networks of AXCS, first update of part of DE3.1.2 AXMEDIS-DE3-1-2-2-13-Spec-of-AXCS-and-networks-v1-0.doc	DSI
DE3.1.2.2.14	Specification of AXMEDIS Protection Support, first update of part of DE3.1.2 AXMEDIS-DE3-1-2-2-14-Spec-of-AX-Protection-Support-v1-0.doc	FUPF
DE3.1.2.2.15	Specification of AXMEDIS accounting and reporting, first update of part of DE3.1.2 AXMEDIS-DE3-1-2-2-15-Spec-of-AX-Accounting-and-Reporting-v1-0.doc	EXITECH

1.1 This document concerns

This Document reports the general aspects of the AXMEDIS framework specification. It includes:

- Specification guidelines
- AXMEDIS Framework overview
- AXMEDIS plan and evolution table with the planned evolution of the AXMEDIS framework components from March 2006 to March 2007, in relationships to the specification structure.
- Schema and guidelines for the AXMEDIS Framework Specification Document

2 Specification Guidelines

The whole AXMEDIS system has been decomposed in subsystems and tools. The decomposition has been performed on the basis of structural aspects, the diagrams are reported in the UML file in vision. Please see the last version on the Specification folder on the web portal.

The specification of each tools, component and/or module has to be performed by providing the following information and adopting the UML methodology and tools/diagrams this will allow to talk a unique language for all now in the specification phase and in terms of documentation of companies accessing to take-up actions:

- General description of the functionalities and relationships with other tools and components.
- References to the other tools and components that have to interact with the entity.
- Structural decomposition of larger modules or subsystems that still needs to be decomposed to identify the entities that are modeled in terms of classes. These are recognizable being single programs, DLL, plug-in, packages, etc.
- Class diagram with details regarding specialization, interfaces, decomposition and references
 - Description of classes with their major attributes and methods, with their type and signature
 - If some class/object has some evolving state please provide a state diagram with the description of the states and transitions.
- Object diagrams (component diagrams of UML) to show what happen among objects when these are instantiated from classes, to highlight the production of lists, and the general structure of objects in the memory.
- Sequence diagram and/or collaboration diagram (among processes) of UML for selected parts to the explanation of the entity behavior and their relationships with other entities or processes
- Description of protocols, if any, at level of communication packets and all the higher levels
- Description of relevant algorithms for the functional part of your methods/services by using: textual description highlighting the motivation and the needs in AXMEDIS, description in terms of flow chart or activity diagrams of UML or pseudocode or directly in programming language, and if rational a mathematical formulation of the algorithm or of its math parts. For each non specified algorithm since it is not know yet please provide
 - metrics for its evaluation
 - reference value of these metrics
 - an example of the results
 - test cases have to be put in a different deliverable
 - etc.:
- Description of the API provided, if any, in terms of functions/procedures, functionalities, parameters, types of parameters, behaviour, and internal behaviour. In addition, a sample procedure and detailed sequence diagram of what can be done to exploit the module in other processes. The API has to be described by using UML VISIO, IDL (interface description language).
- Description of the interoperability specification aspects related to the adoption of the software module in different operating systems and to be integrated in different contexts,
 - conditional compilations,

- different behaviors in different context,
- profiling,
- configuration aspects,
- etc.
- Formal description of any textual format file, all content formats and confirmation formats have to be XML and have to be provided in terms of Schema, where each field has to be fully specified in terms of type and semantics of each possible value, giving the dynamics (e.g., $-255 + 256$), type (e.g., string, float, integer, unsigned integer), etc. Some examples have to be provided.
- Formal description of any Binary format file, please provide EBNF description, with dictionary etc., where each field has to be fully specified in terms of type and semantics of each possible value. Some examples have to be provided.
- Formal description of any language, rule based or functional or mix, by using EBNF description with dictionary and semantic description. Some examples have to be provided.
- Description of the high level communication interfaces such as COM, ACTIVEX, and support for plug-ins, etc., by providing: functions/procedures, functionalities, parameters, types of parameters, behavior, and internal behavior. In addition, a sample procedure and detailed sequence diagram of what can be done to exploit the module in other processes.
- Description of the User Interface, if any:
 - Visual Shape and design of the main frame
 - Menu with major and minor items and related associated functionalities.
 - Contextual menu
 - Main functionalities provided from the user interface
 - Visual Shape and design of the major dialog boxes.
 - Usage of tool bars, scrollbars, and any gadget or widget, etc.
 - Description of main activities of the users in terms of Use Cases, see the other deliverable
 - For usability aspects please consult ACIT partner
- In designing/specifying the tools/modules please take into account the following general aspects:
 - Configuration management
 - Please verify if some your components can be produced customizing a component produced by other partners or can be used by other partners in other tools
 - Interoperability on different platforms,
 - Print capability of the information manipulated
 - Protection aspects (registration, certification, operation control, access to certifier, DRM, etc.), please consult protection experts
 - Help to support the users,
 - Multilingual support of the user interface and of the help
 - Undo support that could be obtained with controlling all commands
 - workflow and cooperative work support to be integrated with the Workflow tools that will be selected for AXMEDIS, etc.
 - insert an About for citing, copyright, AXMEDIS projects and EC in a proper manner, as will be defined later.
 - Refer to used standards providing references and documents for the other partners. These documents will be made accessible to all via WEB.
 - Declare any library and tools that you are going to use and the license level/type/cost for that tools/libraries, etc. According to the CA you have to be very carefully in using:
 - PEK, it has to be authorized
 - Libraries that may enforce some constraints in the exploitability or portability
 - Any used element/library, etc. has to be approved
 - Any non approved element cannot be used.
 - Etc.
 - Installation capability, it has to be installable in a very easy manner
 - Manual support for technical and user point of views

- Please remember that if the tool/module belongs to the AXMEDIS Framework as defined in the CA, it has to be provided in source code to be included into CVS connected to the AXMEDIS portal.

3 AXMEDIS Framework overview

AXMEDIS is an ambitious Integrated Project of Research and Development partially funded by the European Commission in IST FP6 and including about 20 partners such as University of Florence, HP, EPFL, FHGIGD, ACIT, AFI, TISCALI, University Pompeo Fabra, University of Leeds, CPR, EXITECH, XIM, University of Reading, etc. The duty of AXMEDIS is to work on research activities, develop new tools and products and trial them as effective demonstrators.



AXMEDIS goals

AXMEDIS is creating and developing the AXMEDIS Framework, an open solution exploiting a set of new technologies and tools, which can be used by your solutions and applications for:

- reduction of costs and increasing efficiency for content production, protection, management and distribution; better pricing and value-for-money for industry products and services, containing costs to set up sustainable business ventures in the digital cross media content:
 - integrating your Content Management Systems, CMSs, with the distribution systems by automating the communication and update of content and information between the two systems;
 - automating content gathering and ingestion processes from local or remote CMSs and file systems;
 - automating composition, allowing parallel processing, exploiting GRID technology, and optimization techniques for content ingestion, production, protection and formatting;
 - managing the workflow at level of the content factory and among different content factories sharing the same content production objectives;
 - automating the whole process allowing content production on demand;
- support for the whole value chain: composition, packaging, integration, aggregation, synchronization, formatting, adaptation, transcoding, indexing, integration in the same objects protected and non protected components, definition of relationships with other resources, metadata integration and remapping/transcoding, protection, license production and verification;
- convergence of the media, interoperability of content supporting the multichannel distribution, support content distribution:
 - on different channels such as satellite data broadcast, Internet, cellular network, wireless, traditional supports as DVDs, internet, mobiles networks, local and wireless networks;
 - including Peer-to-Peer (P2P) in both B2B (Business-to-Business) and B2C (Business-to-Consumer) levels;

- on different devices such as PC, PDA, i-TV, STB, etc.;
- with different transaction models on the same channels and content with flexibility in the business and transaction models;
- adoption of new methods and tools for innovative, flexible and interoperable Digital Rights Management (DRM), including
 - exploitation of MPEG-21 REL (Right Expression Language) and overcoming its limitations with specific extensions,
 - supporting different business and transactions models and their integration,
 - supporting the integration/interoperation of different DRM models such as MPEG-21 REL and ODRL OMA (Open Mobile Alliance);
- harmonization of B2B and B2C areas for DRM, bringing the DRM model in the B2B area, supporting production and protection models in the whole value chain;
- increment of content accessibility with a P2P platform at B2B level, which can integrate content management systems and workflows.

AXMEDIS implements the AXMEDIS Framework for all, and especially for small and large industries sharing a common interest in the exploitation of new technologies and solutions. The AXMEDIS Framework can be used to setup and built 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 customize your applications and processes according to your needs.

The AXMEDIS digital content and content components is an **open format** capable of integrating any kind of cross media format (video, images, animations, games, learning objects, multimedia, audiovisual, document, audio, etc.) in any digital format, any kind of metadata including identification, classification, categorization, indexing, descriptors, annotation, relationships and play activities and protection aspects.

The AXMEDIS format permits the combination of content components and their secure distribution in respect of the copyright laws, 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 low level formats). AXMEDIS is open to any DRM model and solution.

Within the AXMEDIS content any type of cross media content can be included from simple multimedia files to games or software components, for leisure and entertainment, infotainment, and also for managing protected governmental content, healthcare information, business of value information, etc.

This document describes the **AXMEDIS open architecture and framework**. It is open since:

- all the AXMEDIS specification is public and its specific use is royalty free. Any company or third party can use the document to create an AXMEDIS compatible solution;
- all the source code of AXMEDIS Framework is accessible by getting affiliated with AXMEDIS. The affiliation fee is low and affordable for all;
- the affiliation to AXMEDIS can be obtained also providing work or results to the community. So that you can have the access to the AXMEDIS Framework in change of your contribution in improving and extending it;
- the AXMEDIS plug-in technology is public, and the source code for creating new plug-in is public without needs to be affiliated;
- in AXMEDIS the focus is on interoperability and openness of content model, including multichannel distribution;
- in AXMEDIS the focus is on interoperability of DRM model, including multichannel distribution.

More technical information on AXMEDIS architecture and framework and about how to access at the AXMEDIS framework getting affiliated to AXMEDIS are available on <http://www.axmedis.org> .

3.1 Business to Business areas

In order to ease the collaboration among the business area, AXMEDIS is providing a wide set of tools and especially the AXEPTool, a P2P tool for B2B distribution of content. AXMEDIS supports DRM and Reporting of the use of the content. This tool gathers the information related to the exploitation of rights along the value chain and by the final user and reports it back to the concerned actors. These utilities are very useful to provide the evidence of the exploited rights in a transparent manner to collecting societies or other business partners.

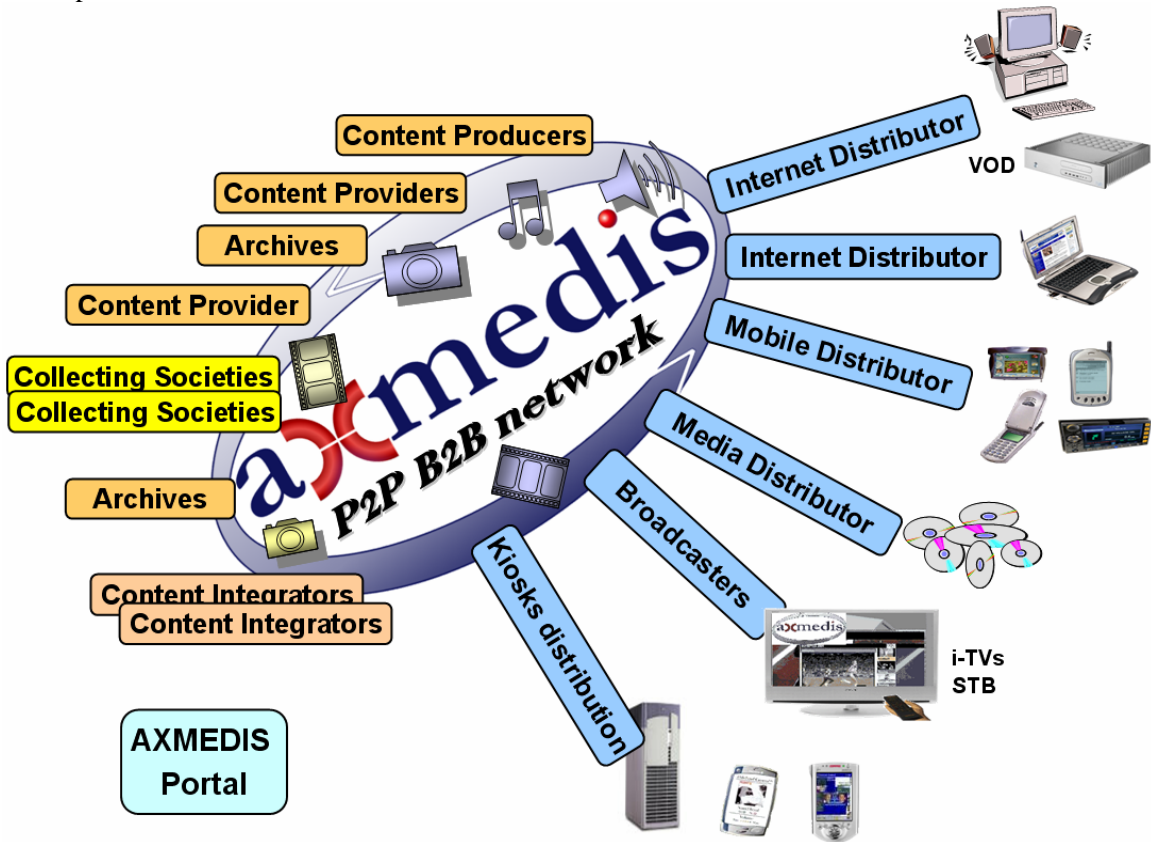


Fig.2 -- AXMEDIS Business to Business area with some distributors

The distribution side may present one or more single distribution paths for each type of content. In AXMEDIS, the content distributors can continue their preferred mechanisms for reaching the final users. The possible Channel Distributors have a large variety of capabilities, they are both of pull and push, and may include off-line and on-line connection from the client to the distributor.

3.2 AXMEDIS General Architecture

In Figure 3, a more detailed version of AXMEDIS architecture is reported. The diagram includes all the major areas of the AXMEDIS framework and architecture. The following description for each major component is mainly related to the flow of the content from its acquisition to distribution.

The major AXMEDIS areas are the:

- **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 harmonize 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 Area** 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. Among connected AXMEDIS Factories, it is also possible to make distributed queries 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 content distribution and publication towards external web services for example those of front end distribution servers.
- **AXMEDIS Player** for content playing and execution on several different platforms, to built specific and customized 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 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.

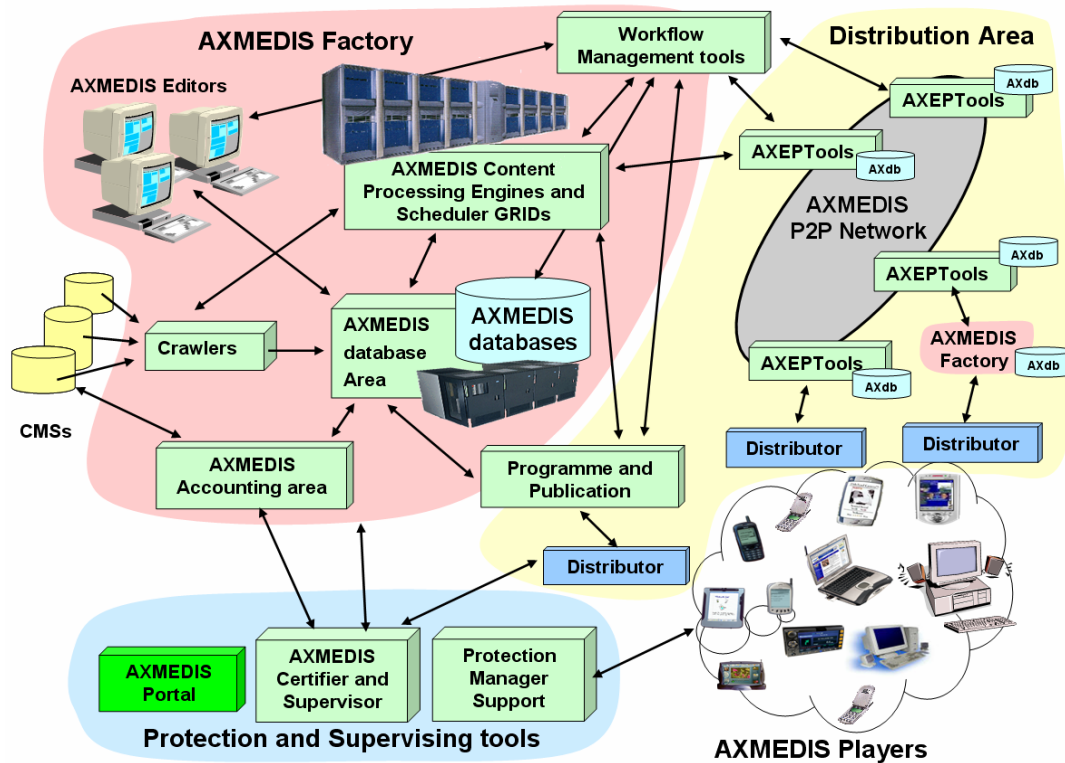


Fig.3 – AXMEDIS Architecture

3.3 AXMEDIS Factory

A content factory can be built on the basis of AXMEDIS tools in a scalable and flexible manner. Also tuning for example, GRID size, database size and type, number of authoring tools, number and types of tools/algorithms and libraries for processing content, licenses, integration support based on Workflow or not, etc. This allows setting up a large range of configurations to satisfy the needs of small and large content producers, integrators, and distributors.

The **AXMEDIS Database Area** includes the AXMEDIS/MPEG-21 database model, supporting the storage and access to AXMEDIS content via a large set of metadata for each object grouped in what it is called AXInfo, and that can be customized with your needs. The database also includes produced licenses for the objects, history of performed actions on content, potentially available rights for each digital resource, models of contracts, etc. The AXInfo includes Dublin core plus descriptors and many other metadata for managing protection, lifecycle, etc. Any descriptors and metadata can be added in a flexible manner. Thus, different AXMEDIS factories may be based on different AXInfo and metadata, while automatic adapters can be defined and activated. The database area is based on a scalable database, a powerful AXMEDIS Database manager, and an effective **AXMEDIS Query Support** endowed of an easy to use user interface. The User may perform queries to search for objects and content located in the CMSs, in the local AXMEDIS database and in the virtual database comprised of the AXMEDIS content accessible/published via the P2P network of AXEPTools in the AXMEDIS B2B Network.

The **AXMEDIS Content Processing Area** (AXCP Area) is based on a GRID solution for automating all the activities to be performed for the production, and processing of content. The major tools are the **AXCP GRID Node (Engine) and AXCP Scheduler**, which are respectively the single node (computer) of the GRID and the organizer of processes on the GRID Nodes. They implement a scalable solution to process from smaller collections to huge amount of content per day, per minute. The processing algorithms can be specified in terms of script code (in Spider Monkey) allowing the manipulation of complex AXMEDIS data types and simple digital resources and content in general, and for the direct access to the AXMEDIS database and processing queries with the help of the AXMEDIS Query Support. The solution allows the writing of any kind of content processing algorithms, to activate them automatically on some query result, and these can be put in execution as independent processes on a scalable GRID for massive production and processing of digital resources in respect of the DRM.

The available data types, operators and accessible algorithms allow manipulation of any digital resources in a large number of formats. Algorithms can be defined for massive content composition (packaging, combination, etc.) and content layout formatting (synchronization, image and screen layout, from image sequence to video, etc.), content adaptation (change in resolution, subsampling, change in format, etc.), transcoding, coding, decoding, fingerprint extraction, estimation of descriptors, license adaptation and transcoding, license production and verification, etc.;

The users of the **AXMEDIS Content Processing Area** can code in terms of Java Script rules any kind of processing procedures and algorithms to manipulate/produce:

- Any digital resource:
 - such as images (more than 150 different formats), audio (more than 50 formats), video (more than 50 formats), documents (TXT, PS, HTML, PDF, RTF, DOC, etc.), multimedia (more than 20 formats including MPEG-4, HTML, LOM, etc.);
 - for their transcoding, adaptation, feature and descriptor extraction, recognition, certification, etc.;
 - with functionalities of many well know and powerful processing libraries such as: FFMPEG lib, LibSNDFile, TreTagger, DocFrac, GhostScript, XPDF, HTMLDOC, ImageMagik, MP4Box, Xerces, XALAN, CCPP, etc. (if you are interested in adding more libraries please contact AXMEDIS people);
- Packages and their composition and formatting

- AXMEDIS objects with AXInfo Metadata and indexing,
- MPEG-21 Objects,
- including digital resources, metadata (e.g., Dublin Core, etc.),
- protection information, etc.
- Protected objects and resources, managing protection information:
 - by using MPEG-21 IPMP model, and format
 - using algorithms such as encryption/decryption, scramble, compression, key production, different sizes for keys, etc.
- Licenses on the basis of the business models chosen:
 - stating grants, conditions, etc.,
 - verifying license consistency with respect to the potentially available rights, with the license in production, etc.,
 - by using formalism of MPEG-21 REL, and with OMA ODRL – MPEG-21 REL transcoding
- Automatic content and information access
 - database accesses (ODBC, etc.) with direct facilities;
 - database access by means of crawling facilities to access to a larger set of possible database models. They may contain digital content, resources, files, metadata, administrative and licensing information, etc., and can be physically located in several different computer systems and based on several different database models: ODBC, MySQL, ORACLE, MS-SQL, Tamino Lobster XML, etc., or files systems. The access to this information is performed by means of Focuseek Crawler;
 - file system and operating system access;
 - http and ftp accesses;
 - AXMEDIS database access with query support, actualization of selections, active queries, etc.
- Device capabilities format and processing facilities, to take into account for adaptation and/or processing;
- User Profile format and processing facilities, to take into account for adaptation and/or processing;
- WSDL facilities for the activation of WEB services dynamically on the basis of their definition;
- XML facilities for the application of styles and general processing;
- SMIL facilities for the application of templates and styles and processing;
- etc.

The algorithms and procedures used in the AXCP Area can be expanded by using the AXMEDIS Plug In technology that allows customizing and easily expanding the processing capabilities of the AXMEDIS GRID. Algorithms for the extraction of fingerprint, descriptors, adaptation, content processing, DRM adaptation, metadata adaptation, are built as pluggable algorithms. ***Any other library, model and format and related algorithms for their manipulation can be plugged in the AXCP in a very easy manner.***

The AXMEDIS **Workflow Management tools** include a set of micro tools and interfaces which are pervasively connected to all the AXMEDIS tools and plug-ins to allow interfacing the whole content factory to Workflow tools such as Open Flow and BizTalk. The control is performed to define AXMEDIS factory workflow policies and to manage inter-factory workflows policies.

The **AXMEDIS Editor** is the authoring tool for manually producing AXMEDIS objects when needed and for supporting the designer to create the scripts for the AXCP that could be considered macros of the AXMEDIS Editor. It is based on the AXMEDIS Object Model, called AXOM and based on MPEG-21, and all the modules and tools to manipulate and create AXMEDIS objects and related information and digital resources such as:

- resource hierarchy viewer and editor;
- visual and behavioral viewer and editor to show/manipulate visual and temporal aspects of related digital resources according to SMIL;
- metadata editor and viewer, to manipulate and view general XML metadata and specific AXInfo metadata;

- DRM viewer and editor to create and verify the licenses;
- Protection Information viewer and editor to specify, apply and browse protection aspects on the basis of the MPEG-21 IPMP format with extension of AXMEDIS;
- set of plug-ins to use algorithms for content processing as those mentioned and used in the AXCP Area mentioned above;
- set of plug-ins to allow the integration of AXMEDIS Editor within other editing and viewing applications such as: Video Editors, Image Editors, etc.;
- an interface to connect the AXMEDIS Editor with other external powerful editor tools;
- an interface with workflow (OpenFlow and BizTalk);
- set of internal viewers and players for digital resources such as document, images, video, MPEG-4, and audio resources, etc., for more than 250 different file formats.

The **AXMEDIS Accounting Area** includes a set of tools which allows content producers, distributors or collecting societies to collect administrative information and reports about their content in order to gathering information about the list of rights that have been exploited on their AXMEDIS objects by the final users and by the business users. This information is collected into the AXMEDIS database for further analysis. The acquisition of accounting information is performed by collecting it from the AXMEDIS Certifier and Supervisor, AXCS. The local database and the AXCS provide support to make queries to obtaining statistics data on content usage in the area, in the channel, for a type of content, for a period, etc. A specific tool allows extracting data from the AXMEDIS Database to migrate them towards the administrative side of the CMS, such as high level administrative information to prepare the bill at the content users, distributors, etc., to interface with customer relationships services.

3.4 AXMEDIS Distribution Area and Players

The AXMEDIS tools for the distribution area allow automating the content publication and acquisition in the business area establishing also interconnection among different AXMEDIS Factories by means of the so called AXEPTools (AXMEDIS P2P Tool for B2B distribution) which is a secure and legal P2P tool. The tools in this area also allow scheduling content distribution and publication towards external web services for example those of front end distribution servers.

Each **AXEPTool** includes an instance of the AXMEDIS Database that allows making distinction from content in the AXMEDIS Factory and content published to be distributed and shared with other business partners. It also allows searching for content among business partners connected on the AXMEDIS Network. Typically the network allows sharing content among producers, integrators, distributors, publishers, archives, etc. Among the interconnected AXEPTools it is possible to make distributed queries to search for content, and to automatically publish and acquire/update content from/to the business partners, etc. The Potentially Available Rights and the contact information are the instruments to start the negotiation of content acquisition. This mechanism makes the B2B content distribution faster, simpler and more secure. Each transaction and trial is monitored by the AXEPTool and by the AXCS. During queries, the content and the technical metadata are certified thus avoiding trivial problems of many P2P architectures.

The **AXMEDIS Programme and Publication tool, AXP&P**, includes a set of tools which allow interconnecting AXMEDIS Databases content to the distribution channels for producing programs to public content on the distribution channel, and to transfer the related to content on the channel. It also allows the management of requests for content production/adaptation on demand. The production of content programs is capable of scheduling the production/adaptation of content depending on the distribution profile, production time costs and on delivering time. These tools also provide a front end in terms of web services to delivering content ready for the distribution.

The **Distributors** represent any kind of content distribution services (see Fig.3): Internet, satellite and terrestrial broadcast, mobile, towards: PC, STB, I-TV, mobiles, PDAs, etc.

Distributors may be also interested in having in their plant some components of the AXMEDIS factory such as an instance of the AXMEDIS Database to make queries, license editor to produce licenses, AXCP for

content adaptation and/or to protect content in massive manner, for content production on demand, etc. In order cases, they can delegate these actions to other parties or to external web services. Some examples about the usage of AXMEDIS tools to set up solutions for content distribution are reported in the following. In some cases, the Distributors may be interested in establishing a connection with the AXMEDIS Certifier and Supervisor for obtaining reports about the rights exploitation or for getting statistical information.

Some Distributors may be interested in exploiting AXMEDIS technology to set up a legal P2P service for content distribution. This solution can be realized by using the so called **AXMEDIA** tools. It is a P2P tool for distributing and sharing AXMEDIS content among end users, the distributor may insert AXMEDIS content in the network of peers and this may freely navigate among them but with the supervision and control of AXMEDIS protection and monitoring models.

The **AXMEDIS players** are based on the AXMEDIS object model and manager called AXOM (AXMEDIS Object Manager). They are capable of reading and playing/executing AXMEDIS objects according to the business models chosen and the license associated with the user/device. AXMEDIS player are available mainly for PC (as independent tools, as plug in for Internet Explorer and Mozilla browsers) and PDA with Pocket PC 2003. The AXOM module can be integrated in any other content processing tool in order to manipulate AXMEDIS and/or MPEG-21 objects.

AXMEDIS framework provides tool kits and libraries to create a large number of different players on different platforms, leaving free the customization of the user interface, skin, and much more; mainly MS-Windows, MAC and Linux, for PC, PDA and may be for mobiles and Set Top Boxes.

3.5 AXMEDIS Protection and Supervising Tools

AXMEDIS Protection and Supervision Tools provide support for registering and certifying users, providing unique IDs for the AXMEDIS objects, authenticating of devices and tools, processing licenses, managing black lists, continuous monitoring of the user activities on the AXMEDIS content on AXMEDIS players and tools on the basis of licenses, and collecting and reporting the information about content usage and rights exploitation, etc. The tools of this area are described in the following.

The **AXMEDIS Certifier and Supervisor, AXCS**, is the responsible of user registration, for device and tools authentication and certification, and for the registration and tracking of the activities performed on AXMEDIS objects on any AXMEDIS compliant tool. The AXCSs provide protection information and share with the AXMEDIS Protection Manager Supports (PMS) the responsibility of managing the protection for distribution channels and domains. The AXCS also manages black lists of users, devices and tools to restrict their activities when irregularities are detected.

The **AXMEDIS User Registration portal** is a service that can be used by content Distributors to make the registration of AXMEDIS final users (if they do not prefer to automatically register all their users). In any case, the User has to make a registration on AXMEDIS to obtain a certificate that could allow him/her to install tools and to cope with the related AXMEDIS licenses. Some Distributors may prefer to use a direct Web Service to automatically register their users in for AXMEDIS. Both solutions can be used.

The **AXMEDIS Object Registrator** is a service to produce and assign a unique object ID to AXMEDIS objects. In the process, the most important metadata may be provided as well by allowing establishing relationship from standard and/or proprietary identification codes with those used in AXMEDIS. It is a service accessible by all tools capable of creating new AXMEDIS objects for any AXMEDIS Factory (such as: AXMEDIS Editor, AXCP GRID Node) and it is a WEB service directly connected to the AXMEDIS Certifier and Supervisor.

The **AXMEDIS Protection Manager Support, PMS**, collects the licenses and has the duty of processing chains of licenses on the basis of the requests received from AXMEDIS players, and all other AXMEDIS tools that include an AXOM to manipulate objects. The PMS allows the management of licenses and the sharing of these along other PMSs by means of a network of AXCSs. Each PMS can be associated with one *AXMEDIS Project*

or more different distribution channels or can be geographically distributed, e.g., to cover a geographic area. The definition of licenses and the management of information into PMS and AXCS allow to set up of a large variety of different distribution and transactions models, from client server to P2P, from satellite data broadcast toward i-TV to content distribution to cellular phones. The PMS is also provided in versions that allow managing Domains (the so called PMS Domain) such as those that can be set up for managing licenses for a school, a house, or a company, etc. Each PMS Server allows to receive the posting of new licenses by means of a Web Service, this can be used for automating their production from the Distributor Front End Sale server. In alternative, the **AXMEDIS DRM Editor** (license editor) can be used.

The **AXMEDIS Portal** includes services for all the AXMEDIS users including those that support AXMEDIS and contribute to the construction and improvement of the AXMEDIS framework. It provides a set of service including the database of AXMEDIS documentation, the deployment of the AXMEDIS framework, the management of the mailing lists, etc. It allows providing updated tools and information to AXMEDIS partners. On AXMEDIS portal, you can get the list of AXMEDIS compliant tools, devices, registered companies, test cases, documentation, libraries, etc. In addition, you can find from the AXMEDIS Portal references to the AXMEDIS services that allow the authentication, certification and continuous monitoring and control of any AXMEDIS tools.

3.6 AXMEDIS Framework

The AXMEDIS Framework is the set of information and tools that is at the basis of the above mentioned applications and solutions. In the next Figure, the simplified version of the AXMEDIS Framework structure is reported. It contains all the necessary tools to set up a large set of services and solutions in the area of content production, protection and distribution. The AXMEDIS Framework is an infrastructure on which several other models for content modeling, protection, production, DRM and distribution can be built in a very simple manner reusing the components and functionalities provided.

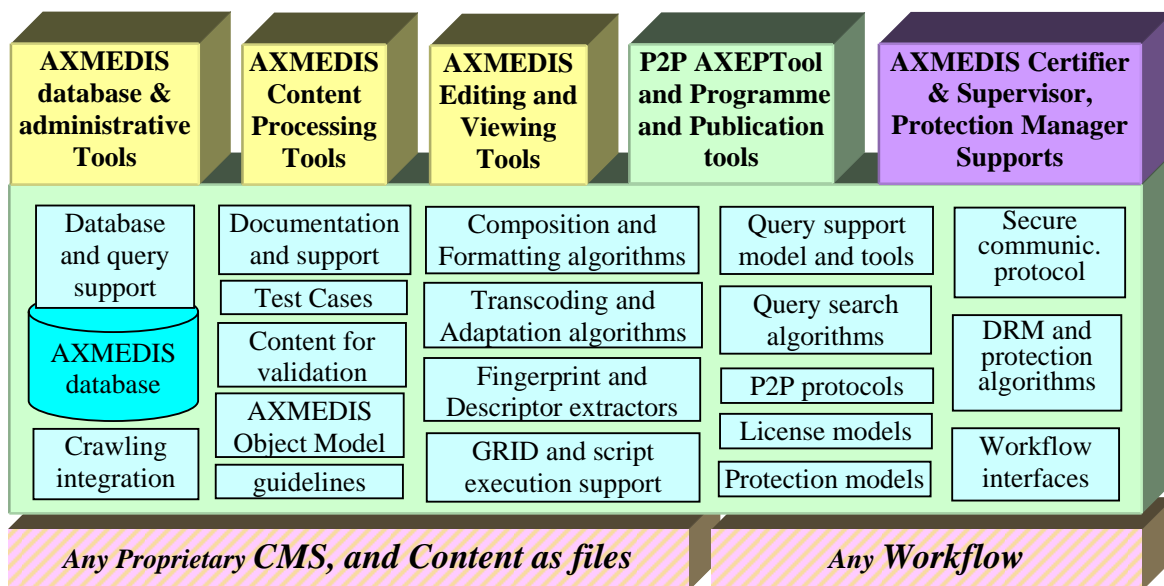


Fig.4 -- AXMEDIS Framework structure, a simplified view

The general infrastructure gives a common ground on the base of which other content based applications and tools can be built. In addition, to the modules and tools described before, the most relevant parts of the **AXMEDIS Framework** are:

- Requirements and their revisions,

- test cases and uses cases and their revisions,
- content for validations, both single resources and metadata and demonstrative AXMEDIS objects,
- general documentation of AXMEDIS tools and supports, including the:
 - whole specification of the AXMEDIS framework and the
 - detailed technical documentation of the source code,
- CVS tree with source codes of the several modules of the AXMEDIS framework,
- examples of AXCP scripts modeling algorithms for content compositions and formatting, for transcoding and adaptation, for extraction of fingerprint and descriptors, content processing, license manipulation and verification, license adaptation, etc., for many different formats of digital resources and for any categories of them: audio, video, document, multimedia, images, animations, text, metadata, etc.,
- examples and models of licenses,
- example and models for protection information,
- examples of workflow usage and programming for controlling AXMEDIS Factories,
- examples of queries and selections for accessing to the database,
- tutorials on content:
 - general aspects and state of the art,
 - content production,
 - content protection,
 - on AXMEDIS tools,
 - on distribution tools,
 - on general AXMEDIS aspects, etc.,
- guidelines for source code production for contributing to the AXMEDIS framework,
- guidelines on content production and distribution,
- guidelines for the production of AXMEDIS Plug-ins for AXCP and AXMEDIS Editors,
- guidelines for the production of licenses on the basis of contracts,
- ready to use/install AXMEDIS tools such as: AXMEDIS Players, AXEPTool, AXMEDIA tool, AXMEDIS Editors, AXMEDIS Programme and Publication tools, AXMEDIS Content Processing Tools, AXCS, AXMEDIS PMS.

3.7 Accessing to the AXMEDIS Framework

The present status of the AXMEDIS Framework can be obtained from its coordinator or partners. Demonstrations of the AXMEDIS tools and of the whole AXMEDIS Framework are provided at AXMEDIS conferences and in other occasions listed on the AXMEDIS Portal. The AXMEDIS Framework can be accessed by all affiliated partners. The Affiliation to AXMEDIS is performed by subscribing an Affiliation Agreement with an AXMEDIS Contractor. The Affiliation Agreement and the list of Contractors are accessible on the AXMEDIS portal.

There are many **reasons to get affiliated to AXMEDIS**, which can be summarized as follow:

- Obtaining access to an *open platform* that can be customized for your production., protection and distribution needs;
- *Reduction of costs* for content gathering, processing, production, protection and distribution;
- Adopting a standard model (MPEG-21) for content and licenses modeling and thus for inserting DRM in your business;
- Establishing contacts with other business partners interested in exploiting similar technology;
- Acquiring a greater control about content usage;
- Creating customized players;
- Exploiting and trial of new business models;
- Exploiting capabilities of secure legal P2P distribution;
- Setting up and create a customized distribution channel interoperable with others;
- Setting up some new service (empowering your present solution) on the basis of AXMEDIS technology;
- Setting up of one-stop service for content protection and DRM set up;
- Allowing reporting to your business customers which rights are exploited on their content;

- Allowing the management of rights reporting for multimedia products;
- Allowing using a solution that can be safer and more flexible with respect to state of the art;
- Saving money in accessing at innovative technologies for content production and distribution, integrated environment;
- Accessing to strongly innovative technology to trial it;
- Contributing to the AXMEDIS Framework is allowing you to continuing accessing to the framework reducing the costs for its accessibility.

Research institutions and technology providers are interested in getting affiliated with AXMEDIS to:

- make visible, promote, produced algorithms and tools that can be used for content processing and modeling and that can be in some how integrated into the AXFW. These tools may be provided as demonstrators with limited capabilities;
- exploit the AXMEDIS Framework to make business with it for the reasons reported in the above list;
- add new content models and new DRM models and make them interoperable with MPEG-21 and others already in place on AXMEDIS;
- test new algorithms and tools with respect to the state of the art solutions, in a very easy and cheap manner;
- access at low cost a framework by means of which several different configurations and solutions may be built to cover the needs of the value chain actors and tested with low effort;
- access at tools based on MPEG-21 standard;
- collaborate with very relevant and well known research institution and companies of the areas;
- etc.

The present **status of the AXMEDIS Framework** can be obtained from its coordinator. Demonstrations of the AXMEDIS tools and of the whole AXMEDIS Framework are provided at AXMEDIS conferences and in other occasions listed on the AXMEDIS Portal. The AXMEDIS Framework can be accessed by Affiliated Partners. The Affiliation to AXMEDIS may be performed by subscribing an Affiliation Agreement with an AXMEDIS Contractor.

The AXMEDIS 2006 conference will be held in Leeds in December 2006. The Call For Papers is open until April 2006. <http://www.axmedis.org/axmedis2006/>

3.8 References

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- P. Bellini, P. Nesi, D. Rogai, A. Vallotti, “MPEG-21 REL Authorization Algorithm, C implementation, with RDD support”, Technical Report, DSI-DISIT, Department of Systems and Informatics, University of Florence, May 2004.

AXMEDIS Tutorials

- [General Tutorial and Overview http://www.axmedis.org/documenti/view_documenti.php?doc_id=1582](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1582)
- [Content Production Tutorial http://www.axmedis.org/documenti/view_documenti.php?doc_id=1559](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1559)
- [Content Distribution Tutorial http://www.axmedis.org/documenti/view_documenti.php?doc_id=1555](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1555)

Basic knowledge reports (an updated version will be available soon)

- [User requirements](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1062) http://www.axmedis.org/documenti/view_documenti.php?doc_id=1062
- [Use Cases](http://www.axmedis.org/documenti/view_documenti.php?doc_id=774) http://www.axmedis.org/documenti/view_documenti.php?doc_id=774
- [Test Case](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1395) http://www.axmedis.org/documenti/view_documenti.php?doc_id=1395

AXMEDIS Framework Specification (an updated version will be available soon)

- AXMEDIS Framework [General aspects, Editor and Model](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1379) http://www.axmedis.org/documenti/view_documenti.php?doc_id=1379
- AXMEDIS [Viewers and Players](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1380) http://www.axmedis.org/documenti/view_documenti.php?doc_id=1380
- AXMEDIS Content Processing tools http://www.axmedis.org/documenti/view_documenti.php?doc_id=1381
- Estimation of [Fingerprints and Descriptors](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1382) http://www.axmedis.org/documenti/view_documenti.php?doc_id=1382
- AXMEDIS [Database modeling and content Gathering](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1383) http://www.axmedis.org/documenti/view_documenti.php?doc_id=1383
- P2P tools, [AXEPTools and Programme and Publication](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1384) http://www.axmedis.org/documenti/view_documenti.php?doc_id=1384
- AXMEDIS [Workflow](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1385) aspects http://www.axmedis.org/documenti/view_documenti.php?doc_id=1385
- [Protection aspects and rights Accounting aspects](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1386) http://www.axmedis.org/documenti/view_documenti.php?doc_id=1386
- Applications of Content [Distribution and AXMEDIS Portal](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1387) http://www.axmedis.org/documenti/view_documenti.php?doc_id=1387
- [Definitions Terms tables links](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1388) http://www.axmedis.org/documenti/view_documenti.php?doc_id=1388

AXMEDIS reports on basic enabling technologies

- [Content Model and Managing, MPEG-21, authoring, etc.](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1423) http://www.axmedis.org/documenti/view_documenti.php?doc_id=1423
- [Content indexing and querying](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1422) http://www.axmedis.org/documenti/view_documenti.php?doc_id=1422
- [Content processing, Composition and formatting, workflow](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1479) http://www.axmedis.org/documenti/view_documenti.php?doc_id=1479
- [Content Protection and Supervision](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1429) http://www.axmedis.org/documenti/view_documenti.php?doc_id=1429
- [Content Sharing and Distribution via P2P](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1419) http://www.axmedis.org/documenti/view_documenti.php?doc_id=1419
- [Content Distribution via Internet](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1470) http://www.axmedis.org/documenti/view_documenti.php?doc_id=1470
- [Content Distribution via Mobile](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1452) http://www.axmedis.org/documenti/view_documenti.php?doc_id=1452
- [Content Distribution via Satellite data broadcast](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1448) http://www.axmedis.org/documenti/view_documenti.php?doc_id=1448
- [Usability issues](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1467) http://www.axmedis.org/documenti/view_documenti.php?doc_id=1467
- AXMEDIS vs [DMP MPEG21 Analysis](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1063) http://www.axmedis.org/documenti/view_documenti.php?doc_id=1063
- AXMEDIS [Framework Infrastructure](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1391), guidelines and some tools http://www.axmedis.org/documenti/view_documenti.php?doc_id=1391
- AXMEDIS [Framework Validation](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1392) and integration http://www.axmedis.org/documenti/view_documenti.php?doc_id=1392

Content Modeling and Test Cases

- [Content Aspect Specification](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1389) http://www.axmedis.org/documenti/view_documenti.php?doc_id=1389
- [Content Aspect Specification Appendix](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1670) http://www.axmedis.org/documenti/view_documenti.php?doc_id=1670
- [Content for Test Cases and Validation](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1393) http://www.axmedis.org/documenti/view_documenti.php?doc_id=1393
- [Content Selection Guidelines](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1390) http://www.axmedis.org/documenti/view_documenti.php?doc_id=1390
- [Multilingual Guidelines and Technical Solutions](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1427) http://www.axmedis.org/documenti/view_documenti.php?doc_id=1427

- [AXMEDIS Editorial Format Guidelines and basic examples](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1394)
http://www.axmedis.org/documenti/view_documenti.php?doc_id=1394

Brochures and press cutting

- [AXMEDIS Short Presentation ENG](http://www.axmedis.org/documenti/view_documenti.php?doc_id=231)
http://www.axmedis.org/documenti/view_documenti.php?doc_id=231
- [AXMEDIS Short Presentation ITA](http://www.axmedis.org/documenti/view_documenti.php?doc_id=236)
http://www.axmedis.org/documenti/view_documenti.php?doc_id=236
- [AXMEDIS Long Presentation ENG](http://www.axmedis.org/documenti/view_documenti.php?doc_id=230)
http://www.axmedis.org/documenti/view_documenti.php?doc_id=230
- [AXMEDIS Long Presentation ITA](http://www.axmedis.org/documenti/view_documenti.php?doc_id=234)
http://www.axmedis.org/documenti/view_documenti.php?doc_id=234
- [AXMEDIS Flyer](http://www.axmedis.org/documenti/view_documenti.php?doc_id=1163) http://www.axmedis.org/documenti/view_documenti.php?doc_id=1163
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http://www.axmedis.org/documenti/view_documenti.php?doc_id=1669

4 AXMEDIS plan and evolution table

Percentage of completion are referred to the completion of the specification features, taking into account the requirements and use cases.

AXMEDIS framework detailed plan and evolution									
		type	Partner		M23	M25	M28	M31	
				March 2006	July 2006	Sept 2006	Dec 2006	Marc 2007	
DE3.1.2.2.2	Command Manager	type	DSI	90,00%	100,00%	100,00%	100,00%	100,00%	
	AXMEDIS Command Manager	Module	DSI	90,00%	100,00%	100,00%	100,00%	100,00%	
DE3.1.2.2.3	Object Manager and Protection Processor			71,50%	77,21%	88,03%	97,27%	100,00%	
	MPEG-21 Object Model	Module	DSI	90,00%	100,00%	100,00%	100,00%	100,00%	
	MPEG-21 loader	Module	DSI	100,00%	100,00%	100,00%	100,00%	100,00%	
	MPEG-21 saver	Module	DSI	100,00%	100,00%	100,00%	100,00%	100,00%	
	AXMEDIS Object Model	Module	DSI	85,00%	100,00%	100,00%	100,00%	100,00%	
	AXMEDIS Object Preprocessor	Module	EPFL						
	resolving references (MIT License)			175,00%	90,00%	100,00%	100,00%	100,00%	
	XML to BIN and viceversa for MPEG-21			50,00%	50,00%	100,00%	100,00%	100,00%	
	AXMEDIS Protection Processor	Module	DSI	75,00%	85,00%	90,00%	95,00%	100,00%	
	Encryption/Decryption Support	Module	FUPF	85,00%	90,00%	90,00%	95,00%	100,00%	

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EncryptionDecryption (data, KeyAX, Algorithm)	Module	FUPF	85,00%	90,00%	90,00%	95,00%	100,00%
OPEN SSL Library	Library	FUPF	100,00%	100,00%	100,00%	100,00%	100,00%
Compress/uncompress Support	Module	DSI	10,00%	10,00%	25,00%	75,00%	100,00%
compress	Library	DSI	10,00%	10,00%	25,00%	75,00%	100,00%
uncompress	Library	DSI	10,00%	10,00%	25,00%	75,00%	100,00%
Scramble/Descramble Support	Module	EPFL					
Cryptlib Library	Module	EPFL	75,00%	90,00%	100,00%	100,00%	100,00%
MPEG-21 DIBO	Module	EPFL	0,00%	30,00%	70,00%	100,00%	100,00%
MPEG-21 DIM	Module	EPFL	0,00%	30,00%	70,00%	100,00%	100,00%
MPEG-21 DIA processing	Module	EPFL	0,00%	30,00%	70,00%	100,00%	100,00%
MPEG-21 DIA	Format	EPFL	0,00%	30,00%	70,00%	100,00%	100,00%
AXMEDIS Data Model	Format	DSI					
MPEG-21 DI and IPMP	Format	DSI	80,00%	100,00%	100,00%	100,00%	100,00%
ObjectCreator Management	Format/Module	DSI	100,00%	100,00%	100,00%	100,00%	100,00%
Owner Management	Format/Module	DSI	100,00%	100,00%	100,00%	100,00%	100,00%
Distributor Management	Format/Module	DSI	100,00%	100,00%	100,00%	100,00%	100,00%
Object Status	Format/Module	DSI	100,00%	100,00%	100,00%	100,00%	100,00%
PromoOf Management	Format/Module	DSI	100,00%	100,00%	100,00%	100,00%	100,00%
Workflow Status	Format/Module	DSI	100,00%	100,00%	100,00%	100,00%	100,00%
Fingerprints Management	Format/Module	DSI	100,00%	100,00%	100,00%	100,00%	100,00%
Internal Potential Available Rights Management	Format/Module	DSI	100,00%	100,00%	100,00%	100,00%	100,00%
Potential Available Rights Management	Format/Module	DSI	100,00%	100,00%	100,00%	100,00%	100,00%
Additional Metadata Management	Format/Module	DSI	100,00%	100,00%	100,00%	100,00%	100,00%
Object History Management	Format/Module	DSI	1,00%	50,00%			
AXMEDIS Tool Fingerprint	Format/Module	DSI					
Device Fingerprint	Format/Module	DSI	75,00%	75,00%	90,00%	100,00%	100,00%
Software Fingerprint	Format/Module	DSI	75,00%	75,00%	90,00%	100,00%	100,00%
AXMEDIS Protection Info	Format/Module	DSI	75,00%	90,00%	100,00%	100,00%	100,00%
Protection Tool description	Format	DSI	75,00%	90,00%	100,00%	100,00%	100,00%

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DE3.1.2.2.4	Editors and Viewers	type	DSI	68,79%	82,41%	96,25%	97,96%	99,63%
	AXMEDIS Editor and Viewer	Tool	DSI	80,00%	90,00%	100,00%	100,00%	100,00%
	Hierachy Editor and Viewer	Module	DSI	80,00%	100,00%	100,00%	100,00%	100,00%
	DRM Editor and Viewer	Module	FUPF	85,00%	85,00%	90,00%	95,00%	100,00%
	DRM Editor and Viewer Tool	Tool	FUPF	85,00%	85,00%	90,00%	95,00%	100,00%
	Protection Editor and Viewer	Module	FHGIGD	60,00%	70,00%	80,00%	90,00%	100,00%
	Visual Editor and Viewer (SMIL editor)	Module	EPFL	70,00%	90,00%	100,00%	100,00%	100,00%
	Behaviour and Functional Editor and Viewer	Module	EPFL	60,00%	90,00%	100,00%	100,00%	100,00%
	Object Editor and Viewer	Module	EPFL	20,00%	50,00%			
	Metadata Editor and Viewer	Module	UNIVLEEDS	70,00%	80,00%	85,00%	90,00%	95,00%
	Metadata Mapper Editor and Viewer	Tool	UNIVLEEDS	40,00%	60,00%	75,00%	85,00%	95,00%
	Workflow Editor and Viewer	Module	DSI	100,00%	100,00%	100,00%		
	AXMEDIS Content Tool Error Manager	Module	DSI	0,00%	25,00%	75,00%	90,00%	100,00%
	AXMEDIS Editor Configuration Manager	Module	DSI	90,00%	90,00%	100,00%	100,00%	100,00%
	AXMEDIS Editor Plug-in Manager	Module	DSI	95,00%	95,00%	100,00%	100,00%	100,00%
	AXOM Content Processing	Module	DSI	75,00%	75,00%	100,00%	100,00%	100,00%
	AXOM Command and Reporting	Module	DSI	75,00%	75,00%	100,00%	100,00%	100,00%
	Internal Audio Player	Module	DSI	90,00%	100,00%	100,00%	100,00%	100,00%
	Internal Image Viewer	Module	DSI	90,00%	100,00%	100,00%	100,00%	100,00%
	Internal Video Player	Module	DSI	90,00%	100,00%	100,00%	100,00%	100,00%
	Internal MPEG-4 Player	Module	EPFL	75,00%	90,00%	100,00%	100,00%	100,00%
	Enforcement of IPMPX into MPEG4 player	Module	EPFL	75,00%	90,00%	100,00%	100,00%	100,00%
	Integration of MP4 IPMPX with MP21 IPMP	Module	EPFL	75,00%	90,00%	100,00%	100,00%	100,00%
	MPEG-4 Player Tool	Tool	EPFL	75,00%	90,00%	100,00%	100,00%	100,00%
	Internal SMIL Player (Ambulant derived)	Module	EPFL	60,00%	80,00%	100,00%	100,00%	100,00%
	Internal Document Viewer	Module	DSI	90,00%	100,00%	100,00%	100,00%	100,00%

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Error Coding	Format	DSI	0,00%	50,00%	100,00%	100,00%	100,00%
Error Log	Format	DSI	0,00%	50,00%	100,00%	100,00%	100,00%
Configuration Format	Format	DSI	100,00%	100,00%	100,00%	100,00%	100,00%
Plug-in description	Format	DSI	90,00%	90,00%	100,00%	100,00%	100,00%
Client Side Filtering	Module	CRS4	5,00%	5,00%	5,00%	5,00%	5,00%
Managing EUTELSAT Cache	Module	CRS4	0,00%	0,00%	0,00%	0,00%	0,00%
Simulation of Push/Pull balance and filtering	Module	CRS4	5,00%	5,00%	5,00%	5,00%	5,00%
User Preference/filtering set up and management	Tool	CRS4	5,00%	5,00%	5,00%	5,00%	5,00%
User Preferences Profile Format	Format	CRS4	5,00%	5,00%	5,00%	5,00%	5,00%

DE3.1.2.2.5	External Editors/Viewers and Players	type	EPFL	34,55%	63,18%	95,56%	97,78%	100,00%
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External Editor/Viewer Activation Manager	Module	DSI	0,00%	25,00%			100,00%
AXMEDIS ActiveX Control	Tool	DSI	70,00%	90,00%	100,00%	100,00%	100,00%
AXMEDIS Plug-in into Mozilla	Module	SEJER	80,00%	85,00%	90,00%	95,00%	100,00%
AXMEDIS Mozilla Player	Tool	SEJER	80,00%	85,00%	90,00%	95,00%	100,00%
AXMEDIS Plug-in into multimedia Players	Module	DSI/EPFL	0,00%	0,00%	90,00%	95,00%	100,00%
AXMEDIS PC Player	Tool	DSI	60,00%	90,00%	100,00%	100,00%	100,00%
AXMEDIS PDA Player (with MPEG4 player)	Tool	EPFL	0,00%	70,00%	100,00%	100,00%	100,00%
AXMEDIS Mobile Player	Tool	DSI	0,00%	25,00%			100,00%
AXMEDIS Mobile Player	Tool	EPFL	0,00%	70,00%	100,00%	100,00%	100,00%
AXMEDIS Tablet PC Player for School Bag on Mozilla	Tool	SEJER	80,00%	85,00%	90,00%	95,00%	100,00%
AXMEDIS STB Model	Tool	MBI					

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	External Player Control and Interaction	Protocol	DSI	10,00%	70,00%	100,00%	100,00%	100,00%
DE3.1.2.2.6	Content Processing	type	DSI	54,11%	75,38%	84,34%	95,30%	100,00%
	AXCP Rule Model	Module	DSI	80,00%	85,00%	90,00%	95,00%	100,00%
	AXCP Rule Loader and Saver	Module	DSI	95,00%	95,00%	98,00%	100,00%	100,00%
	AXCP Rule Editor and Debugger	Tool	DSI	90,00%	90,00%	95,00%	95,00%	100,00%
	AXCP Rule Engine, GRID Node	Tool	DSI	75,00%	80,00%	90,00%	95,00%	100,00%
	AXCP Rule Engine, stand alone node	Tool	DSI	75,00%	80,00%	90,00%	95,00%	100,00%
	AXCP Rule Scheduler	Tool	DSI	75,00%	80,00%	90,00%	95,00%	100,00%
	AXMEDIS Selection Editor and Viewer	Module	DSI	70,00%	80,00%	90,00%	95,00%	100,00%
	Formatting Engine	Module	DSI	10,00%	65,00%	75,00%	90,00%	100,00%
	Template Editor and Selector	Tool	DSI	0,00%	30,00%	45,00%	75,00%	100,00%
	Style Editor, Selector and Optimizer	Tool	DSI	0,00%	30,00%	45,00%	75,00%	100,00%
	Style Optimiser	Module	DSI	10,00%	50,00%	65,00%	85,00%	100,00%
	DATA Types and Functions for JavaScript	Module	DSI					
	JS_AXOM: AXMEDIS Data Model	Module	DSI					
	JSXObject (include AXOID request)	Module	DSI	85,00%	90,00%	95,00%	98,00%	100,00%
	JSxInfo	Module	DSI	85,00%	90,00%	95,00%	98,00%	100,00%
	JSxResource	Module	DSI	85,00%	90,00%	95,00%	98,00%	100,00%
	JS_XML (for metadata or any other)	Module	DSI					
	generic XML metadata formats	Module	DSI	100,00%	100,00%	100,00%	100,00%	100,00%
	JS_AXCPPlugin for AXMEDIS_CONTENT_PROCESSING Plugins	Module	DSI					
	JSxCPPlugin	Module	DSI	100,00%	100,00%	100,00%	100,00%	100,00%
	JS_Connection classes	Module	DSI					
	JShttpConnection	Module	DSI	100,00%	100,00%	100,00%	100,00%	100,00%
	JSftpConnection	Module	DSI	100,00%	100,00%	100,00%	100,00%	100,00%

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JSodbcConnection	Module	DSI	100,00%	100,00%	100,00%	100,00%	100,00%
JSWebServiceConnection	Module	DSI	100,00%	100,00%	100,00%	100,00%	100,00%
JS_ZipArchiver classe	Module	DSI					
JSzipArchiver	Module	DSI	100,00%	100,00%	100,00%	100,00%	100,00%
JS_DUBLIN_CORE	Module	DSI					
set and get attributes	Module	DSI	100,00%	100,00%	100,00%	100,00%	100,00%
JS_Selection	Module	DSI					
database query	Module	DSI	70,00%	80,00%	90,00%	95,00%	100,00%
database selections	Module	DSI	70,00%	80,00%	90,00%	95,00%	100,00%
AXSBJIS - AXMEDIS searchbox javascript bridge	Module	DSI/Focuseek					
AXSearchbox	Module	DSI/Focuseek	100,00%	100,00%	100,00%	100,00%	100,00%
Document	Module	DSI/Focuseek	100,00%	100,00%	100,00%	100,00%	100,00%
MetadataValue	Module	DSI/Focuseek	100,00%	100,00%	100,00%	100,00%	100,00%
QueryParser	Module	DSI/Focuseek	100,00%	100,00%	100,00%	100,00%	100,00%
QueryInfo	Module	DSI/Focuseek	100,00%	100,00%	100,00%	100,00%	100,00%
QueryView	Module	DSI/Focuseek	100,00%	100,00%	100,00%	100,00%	100,00%
QuerySort	Module	DSI/Focuseek	100,00%	100,00%	100,00%	100,00%	100,00%
QueryAtomType	Module	DSI/Focuseek	100,00%	100,00%	100,00%	100,00%	100,00%
QueryAtom	Module	DSI/Focuseek	100,00%	100,00%	100,00%	100,00%	100,00%
QuerySliceWeight	Module	DSI/Focuseek	100,00%	100,00%	100,00%	100,00%	100,00%
QuerySpec	Module	DSI/Focuseek	100,00%	100,00%	100,00%	100,00%	100,00%
QueryResult	Module	DSI/Focuseek	100,00%	100,00%	100,00%	100,00%	100,00%
JS_Protection	Module	FHGIGD					
JS_ProtectionInfo	Module	FHGIGD	0%	50,00%	80,00%	100,00%	100,00%
JS_ProtectionStamp	Module	FHGIGD	0%	50,00%	80,00%	100,00%	100,00%
JS_PostingProtectionInfo (on AXCS)	Module	FHGIGD	0%	50,00%	80,00%	100,00%	100,00%
JS_DRM	Module	FHGIGD					
JS_License – class that models a License	Module	FHGIGD	80%	90,00%	95,00%	100,00%	100,00%
JS_Issuer	Module	FHGIGD	80%	90,00%	95,00%	100,00%	100,00%
JS_GrantGroup	Module	FHGIGD	80%	90,00%	95,00%	100,00%	100,00%
JS_Grant	Module	FHGIGD	80%	90,00%	95,00%	100,00%	100,00%
JS_Right	Module	FHGIGD	80%	90,00%	95,00%	100,00%	100,00%
JS_Principal	Module	FHGIGD	80%	90,00%	95,00%	100,00%	100,00%
JS_Resource	Module	FHGIGD	80%	90,00%	95,00%	100,00%	100,00%

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JS_Condition	Module	FHGIGD	80%	90,00%	95,00%	100,00%	100,00%
JS_PAR – class that models a PAR	Module	FHGIGD	10%	50,00%	80,00%	100,00%	100,00%
JS_LicensePostingOnPMS	Module	FHGIGD	80%	90,00%	95,00%	100,00%	100,00%
JS_LicenseRightVerificatiion	Module	FHGIGD	10%	30,00%	50,00%	90,00%	100,00%
JS_LicenseODRLTranslation	Module	FHGIGD	10%	30,00%	50,00%	90,00%	100,00%
JS_Publisher	Module	DSI					
moving Objects from AXDB to AXEPTool out DB	Module	DSI	60,00%	100,00%	100,00%	100,00%	100,00%
removing Objects from the AXEPTool out DB	Module	DSI	0,00%	100,00%	100,00%	100,00%	100,00%
get list of Object IDs into the AXEPTool out DB	Module	DSI	0,00%	100,00%	100,00%	100,00%	100,00%
JS_Downloader	Module	DSI					
activate Download of Objects from the P2P Network	Module	DSI	60,00%	100,00%	100,00%	100,00%	100,00%
monitor the Download status ???	Module	DSI	0,00%	100,00%	100,00%	100,00%	100,00%
Get list of Object IDs into the AXEPTool in DB	Module	DSI	0,00%	100,00%	100,00%	100,00%	100,00%
JS_Loader	Module	DSI					
moving Objects from the AXEPTool in DB to the AXDB with metadata mapping	Module	DSI	0,00%	100,00%	100,00%	100,00%	100,00%
removing Objects from the AXEPTool in DB	Module	DSI	0,00%	100,00%	100,00%	100,00%	100,00%
JS_Functions	Module	DSI					
Statistics	Module	DSI	0,00%	30,00%	50,00%	80,00%	100,00%
Combinatorial	Module	DSI	0,00%	30,00%	50,00%	80,00%	100,00%
Sets Management	Module	DSI	0,00%	30,00%	50,00%	80,00%	100,00%
Start and Stop external processes	Module	DSI	0,00%	20,00%	50,00%	70,00%	100,00%
File System Access	Module	DSI	50,00%	70,00%	80,00%	90,00%	100,00%
Controlling System Exploitation	Module	DSI	0,00%	20,00%	50,00%	70,00%	100,00%
JS_UserProfile	Module	IRC					
get and set profile attribute	Module	IRC	60,00%	75,00%	90,00%	95,00%	100,00%
JS_DeviceProfile (mobile, CCPP)	Module	IRC					
get and set profile attribute	Module	IRC	60,00%	75,00%	90,00%	95,00%	100,00%
JS_ContextProfile	Module	IRC					
get and set profile attribute	Module	IRC	60,00%	75,00%	90,00%	95,00%	100,00%

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JS_AXToolProfile	Module	DSI						
JS_AXToolFingerprint (estimation and processing)	Module	DSI	0,00%	30,00%	50,00%	80,00%	100,00%	
JS_AXToolFingerprintLoading (from and XML File)	Module	DSI	0,00%	30,00%	50,00%	80,00%	100,00%	
JS_FORMATTING	Module	DSI						
JS_Template	Module	DSI	0,00%	30,00%	50,00%	95,00%	100,00%	
JS_Style	Module	DSI	0,00%	30,00%	50,00%	95,00%	100,00%	
JS_Format	Module	DSI	0,00%	30,00%	50,00%	95,00%	100,00%	
JS_Optimisation (based on GA)	Module	DSI	0,00%	30,00%	50,00%	95,00%	100,00%	
JS_MetadataMapper	Module	UNIVLEEDS						
JS_MappingMetadata (based on XSLT)	Module	UNIVLEEDS	0,00%	30,00%	50,00%	95,00%	100,00%	
JS_MetadataMap (loading and saving)	Module	UNIVLEEDS	0,00%	30,00%	50,00%	95,00%	100,00%	
AXCP Rule Format	Format	DSI	80,00%	85,00%	90,00%	95,00%	100,00%	
AXCP Executor Profile	Format	DSI	60,00%	70,00%	80,00%	95,00%	100,00%	
AXCP GRID - Rule Engine	Protocol	DSI	60,00%	70,00%	80,00%	95,00%	100,00%	
DE3.1.2.2.7	External Processing Algorithms	type	FHGIGD	56,76%	66,32%	76,03%	88,09%	93,85%
Adaptation Tools and algorithms for Document formats	Plug ins	DIPITA						
their own	Plug in	DIPITA	45,00%	60,00%	65,00%	90,00%	100,00%	
DOCFRAC	Plug in	DIPITA	0,00%	50,00%	60,00%	80,00%	90,00%	
GNU Ghostscript	Plug in	DIPITA	0,00%	50,00%	60,00%	80,00%	90,00%	
XPDF	Plug in	DIPITA	60,00%	75,00%	75,00%	90,00%	95,00%	
HTMLDOC	Plug in	DIPITA	60,00%	75,00%	75,00%	90,00%	95,00%	
Adaptation Tools and algorithms for Video formats	Plug ins	FHGIGD						
FFMPEG	Plug in	FHGIGD	60,00%	75,00%	75,00%	90,00%	95,00%	
Adaptation Tools and algorithms for Image formats	Plug ins	DSI						
Image Magik	Plug in	DSI	100,00%	100,00%	100,00%	100,00%	100,00%	

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Adaptation Tools and algorithms for Audio formats	Plug ins	EPFL						
FFMPEG	Plug in	EPFL	80,00%	100,00%	100,00%	100,00%	100,00%	100,00%
LIBSNDFILE	Plug in	EPFL	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%
SoundTouch	Plug in	EPFL	0,00%	0,00%	0,00%	100,00%	100,00%	100,00%
Adaptation Tools and algorithms for Multimedia formats	Plug ins	EPFL						
GPAC	Plug in	EPFL	70,00%	90,00%	100,00%	100,00%	100,00%	100,00%
SMIL to BIF	Plug in	EPFL	0,00%	0,00%	100,00%	100,00%	100,00%	100,00%
Adaptation Tools and algorithms for Metadata/AXInfo	Module	UNIVLEEDS						
Adapting AXInfo, Dublin Core, etc. (via XSLT)	Module	UNIVLEEDS	20,00%	40,00%	70,00%	80,00%	95,00%	95,00%
Loading Metadata Maps	Module	UNIVLEEDS	80,00%	85,00%	90,00%	95,00%	95,00%	95,00%
Adaptation Tools and algorithms for DRM information	Module	FUPF						
DRMAdaptation	Module	FUPF	5,00%	10,00%	15,00%	20,00%	21,00%	21,00%
DRMChecker	Module	FUPF	5,00%	10,00%	15,00%	20,00%	21,00%	21,00%
Adaptation Tools and algorithms for RingTone formats	Plug ins	IRC						
TiMidity++	Plug ins	IRC	20,00%	40,00%	60,00%	80,00%	100,00%	100,00%
FFMPEG	Plug in	IRC	60,00%	75,00%	90,00%	95,00%	100,00%	100,00%
Metadata Map Format	Format	UNIVLEEDS	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%
Descriptor extractor as fingerprint for Text files	Plug ins	DIPITA						
Comparative frequency analysis: mono-term and multi-term keywords detection	Plug in	DIPITA	70,00%	80,00%	85,00%	90,00%	100,00%	100,00%
Descriptor extractor as fingerprint for Audio files	Plug ins	EPFL						
Segmentation of Audio (labeling)	Plug in	EPFL	80,00%	90,00%	95,00%	100,00%	100,00%	100,00%
Rithms, tonality, genre, tempo, etc.	Plug in	EPFL	180,00%	90,00%	95,00%	100,00%	100,00%	100,00%
other state of the art libraries	Plug in	EPFL	280,00%	90,00%	95,00%	100,00%	100,00%	100,00%
Descriptor extractor as fingerprint for Video Files	Plug ins	FHGIGD						

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	several contacts but not real code...	Plug in	FHGIGD	0,00%	40,00%	50,00%	70,00%	100,00%
	Descriptors Formats	Format	FHGIGD	0,00%	40,00%	50,00%	70,00%	100,00%
	Fingerprint Estimation for Text files	Plug ins	DIPITA					
	document integrity fingerprint	Plug in	DIPITA	10,00%	40,00%	50,00%	85,00%	100,00%
	Fingerprint Estimation for Audio files	Plug ins	FHGIGD					
	FHG one	Plug in	FHGIGD	80,00%	90,00%	95,00%	100,00%	100,00%
	Fingerprint Estimation for Video Files	Plug ins	FHGIGD					
	FHG one, frame similarity	Plug in	FHGIGD	70,00%	80,00%	90,00%	100,00%	100,00%
	Fingerprint Estimation for Metadata	Plug ins	FHGIGD					
	HASH function	Plug in	FHGIGD	40,00%	60,00%	80,00%	100,00%	100,00%
	Fingerprint Estimation for Generic Files	Plug ins	FHGIGD					
	AXMEDIS Objects	Plug in	FHGIGD	90,00%	95,00%	100,00%	100,00%	100,00%
	Single Resources	Plug in	FHGIGD	90,00%	95,00%	100,00%	100,00%	100,00%
	Fingerprint Formats	Format	FHGIGD	0,00%	40,00%	50,00%	70,00%	100,00%
	Watermarking Audio files	Plug ins	FHGIGD					
	Robert One	Plug in	FHGIGD	0,00%	100,00%	100,00%	100,00%	100,00%
	External Protection Libraries	Plug ins	EPFL					
	libcrypto (state of the art library)	Plug in	EPFL	75,00%	90,00%	100,00%	100,00%	100,00%
DE3.1.2.2.8	CMS Crawling Capabilities	type	DSI	97,50%	100,00%	100,00%	100,00%	100,00%
	Collector Indexer	Tool	DSI	100,00%	100,00%	100,00%	100,00%	100,00%
	Watch Manager	Tool	DSI	90,00%	100,00%	100,00%	100,00%	100,00%
	Administrative Tool	Tool	DSI	100,00%	100,00%	100,00%	100,00%	100,00%
	Fast Access Database Interface	Tool	DSI	100,00%	100,00%	100,00%	100,00%	100,00%
DE3.1.2.2.9	Database and Query Support	type	EXITECH	88,15%	94,71%	96,91%	98,38%	100,00%

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AXMEDIS Database Interface	Module	EXITECH	90,00%	95,00%	95,00%	95,00%	100,00%
AXMEDIS Database Web Service Interface	WS	EXITECH	90,00%	95,00%	95,00%	95,00%	100,00%
AXMEDIS Web Administrative Database Interface	Tool	EXITECH	80,00%	85,00%	95,00%	95,00%	100,00%
AXMEDIS Loader and Saver	WS	EXITECH	80,00%	90,00%	95,00%	95,00%	100,00%
Protection Models for AXMEDIS object Repository	Module	FUPF	87,00%	90,00%	95,00%	95,00%	100,00%
History of AXMEDIS Objects	Module	EXITECH	85,00%	90,00%	90,00%	95,00%	100,00%
AXMEDIS Query Support	WS	EXITECH	90,00%	95,00%	95,00%	95,00%	100,00%
User Selection Archive	WS	EXITECH	90,00%	95,00%	95,00%	95,00%	100,00%
Query User Interface	Tool	DSI	60,00%	95,00%	95,00%	95,00%	100,00%
Selection User Interface	Module	DSI	10,00%	95,00%	95,00%	95,00%	100,00%
Query Support for Production On Demand	Module	FHGIGD	70,00%	80,00%	90,00%	100,00%	100,00%
Query Support for Clients	Tool	FHGIGD	70,00%	80,00%	90,00%	100,00%	100,00%
AXDB-Core API	API	EXITECH	95,00%	95,00%	95,00%	95,00%	100,00%
AXDBMAPPING Format	Format	EXITECH	100,00%	100,00%	100,00%	100,00%	100,00%
AXMEDIS Query Format	Format	EXITECH	100,00%	100,00%	100,00%	100,00%	100,00%
AXMEDIS Query Result Format	Format	EXITECH	100,00%	100,00%	100,00%	100,00%	100,00%
AXMEDIS Selection Format	Format	EXITECH	100,00%	100,00%	100,00%	100,00%	100,00%
AXMEDIS Simple Query Format	Format	FHGIGD	80,00%	90,00%	95,00%	100,00%	100,00%
Distribution profile format	Format	FHGIGD	70,00%	80,00%	90,00%	100,00%	100,00%
Client Profile	Format	FHGIGD	70,00%	80,00%	90,00%	100,00%	100,00%
AXDB, AXMEDIS Database	Tables	EXITECH	100,00%	100,00%	100,00%	100,00%	100,00%
License and PAR Database	Tables	FUPF	80,00%	90,00%	100,00%	100,00%	100,00%
Saver WebService	Protocol	EXITECH	100,00%	100,00%	100,00%	100,00%	100,00%
CommitListener WebService	Protocol	EXITECH	100,00%	100,00%	100,00%	100,00%	100,00%
Loader WebService	Protocol	EXITECH	100,00%	100,00%	100,00%	100,00%	100,00%
checkoutListener Web Service	Protocol	EXITECH	100,00%	100,00%	100,00%	100,00%	100,00%

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	Descriptor_Support Web Service	Protocol	EXITECH	100,00%	100,00%	100,00%	100,00%	100,00%
	Publication_Support Web Service	Protocol	EXITECH	100,00%	100,00%	100,00%	100,00%	100,00%
	User_Support Web Service	Protocol	EXITECH	100,00%	100,00%	100,00%	100,00%	100,00%
	P2PHub_Support Web Service	Protocol	EXITECH	100,00%	100,00%	100,00%	100,00%	100,00%
	Query_Support Web Service	Protocol	EXITECH	100,00%	100,00%	100,00%	100,00%	100,00%
	Query Support Listener Web Service	Protocol	EXITECH	100,00%	100,00%	100,00%	100,00%	100,00%
	Selection Archive Web Service	Protocol	EXITECH	100,00%	100,00%	100,00%	100,00%	100,00%
	Actualize Listener	Protocol	EXITECH	100,00%	100,00%	100,00%	100,00%	100,00%
DE3.1.2.2.10	P2P tools, AXEPTool and AXMEDIA	type	AXMEDIS	33,33%	33,33%	70,00%	76,67%	100,00%
	AXEPTool-Core, Virtual Database	Module	CRS4	50,00%	50,00%	70,00%	80,00%	100,00%
	AXEPTool Query Support	Module	CRS4	50,00%	50,00%	70,00%	80,00%	100,00%
	AXEPTool Query Interface	Module	CRS4	10,00%	10,00%	70,00%	80,00%	100,00%
	AXEPTool Monitor	Module	CRS4	40,00%	40,00%	70,00%	80,00%	100,00%
	Publishing and Monitoring Objects	Module	CRS4	0,00%	0,00%	70,00%	80,00%	100,00%
	AXEPTool Monitor User Interface	Tool	CRS4	80,00%	80,00%	70,00%	80,00%	100,00%
	AXEPTool User Interface (configuration, and query)	Tool	CRS4	0,00%	0,00%	70,00%	70,00%	100,00%
	Protection Aspects on AXEPTool	some	DSI/FUPF	0,00%	0,00%	70,00%	70,00%	100,00%
	AXMEDIA User Interface (monitoring download, configuration)	Tool	CRS4	70,00%	70,00%	70,00%	70,00%	100,00%
	Protection Aspects on AXMEDIA	some	DSI/FUPF	0,00%	0,00%	70,00%	70,00%	100,00%
DE3.1.2.2.11	Programme and Publication Tools	type	UNIVLEEDS	80,00%	85,00%	88,00%	91,00%	95,00%
	P&P Model	Module	UNIVLEEDS	90,00%	95,00%	95,00%	95,00%	95,00%
	P&P Editor	Tool	UNIVLEEDS	75,00%	80,00%	85,00%	90,00%	95,00%
	P&P Engine	Tool	UNIVLEEDS	70,00%	75,00%	80,00%	85,00%	95,00%
	P&P Engine Monitor	Tool	UNIVLEEDS	75,00%	80,00%	85,00%	90,00%	95,00%

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P&P Rule Format		Format	UNIVLEEDS	90,00%	95,00%	95,00%	95,00%	95,00%
DE3.1.2.2.12	Workflow Tools	type	IRC	91,35%	84,81%	88,27%	92,12%	100,00%
Open Flow Support								
	Workflow Engine	Tool	IRC	95,00%	95,00%	95,00%	95,00%	100,00%
	Workflow User Interface	Tool	IRC	95,00%	95,00%	95,00%	95,00%	100,00%
	Workflow Request Adaptors	Module	IRC	95,00%	10,00%	50,00%	80,00%	100,00%
	Workflow Input Queue Adaptor	Module	HP	95,00%	10,00%	50,00%	80,00%	100,00%
	Workflow Request Gateways	Service	IRC	95,00%	95,00%	95,00%	95,00%	100,00%
	Workflow Response Gateways	Service	IRC	95,00%	95,00%	95,00%	95,00%	100,00%
	Workflow Plugins	Plug ins	IRC	95,00%	95,00%	95,00%	95,00%	100,00%
	Editor Plugin API	Plug in	IRC	95,00%	95,00%	95,00%	95,00%	100,00%
	Engine Plugin API	Plug in	IRC	95,00%	95,00%	95,00%	95,00%	100,00%
	Rule Editor Plugin API	Plug in	IRC	95,00%	95,00%	95,00%	95,00%	100,00%
	AXWFDB, AXMEDIS Workflow Database	Tables	IRC	95,00%	95,00%	95,00%	95,00%	100,00%
	Config.XML (workflow controlled devices locations and informations)	Format	IRC	95,00%	95,00%	95,00%	95,00%	100,00%
	AX_adataper.cfg (WebService URIs for plugins, adaptes and gateways)	Format	IRC	95,00%	95,00%	95,00%	95,00%	100,00%
	Generic Request from Workflow to Workflow Gateway Protocol	Protocol	IRC	95,00%	95,00%	95,00%	95,00%	100,00%
	Editor Channel	Protocol	IRC	95,00%	95,00%	95,00%	95,00%	100,00%
	Rule Editor Channel	Protocol	IRC	95,00%	95,00%	95,00%	95,00%	100,00%
	Engine Channel (AXCP Scheduler Channel)	Protocol	IRC	95,00%	95,00%	95,00%	95,00%	100,00%
	Database Channel	Protocol	IRC	95,00%	95,00%	95,00%	95,00%	100,00%
	Generic Response from Workflow Gateway to Workflow protocol	Protocol	IRC	95,00%	95,00%	95,00%	95,00%	100,00%
	Editor Channel	Protocol	IRC	95,00%	95,00%	95,00%	95,00%	100,00%

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	Rule Editor Channel	Protocol	IRC	95,00%	95,00%	95,00%	95,00%	100,00%
	Engine Channel (AXCP Scheduler Channel)	Protocol	IRC	95,00%	95,00%	95,00%	95,00%	100,00%
	Database Channel	Protocol	IRC	95,00%	95,00%	95,00%	95,00%	100,00%
	AXMEDIS Tool Activation/Commands from Workflow Protocol	Protocol	IRC	95,00%	95,00%	95,00%	95,00%	100,00%
	Reporting from AXMEDIS Tools to Workflow Protocol	Protocol	IRC	95,00%	95,00%	95,00%	95,00%	100,00%
	Biztalk Support	Module	IRC	0,00%	0,00%	10,00%	50,00%	100,00%
	Workflow Engine	Tool	IRC	0,00%	15,00%	50,00%	80,00%	100,00%
	Workflow Request Adaptors	Module	IRC	0,00%	15,00%	50,00%	80,00%	100,00%
	Workflow Input Queue Adaptor	Module	IRC	0,00%	15,00%	50,00%	80,00%	100,00%
	Workflow Plugins	Plug ins	IRC	0,00%	15,00%	50,00%	80,00%	100,00%
	Editor Plugin API	Plug in	IRC	0,00%	15,00%	50,00%	80,00%	100,00%
	Engine Plugin API	Plug in	IRC	0,00%	15,00%	50,00%	80,00%	100,00%
	Rule Editor Plugin API	Plug in	IRC	0,00%	15,00%	50,00%	80,00%	100,00%
	AXWFDB, AXMEDIS Workflow Database	Tables	IRC	0,00%	15,00%	50,00%	80,00%	100,00%
DE3.1.2.2.13	Certifier and Supervisor and networks of AXCSs/PMSs	type	DSI	82,56%	87,91%	91,05%	94,30%	100,00%
	AXMEDIS Certification and Verification, AXCv	WS	FUPF	90,00%	90,00%	95,00%	95,00%	100,00%
	AXMEDIS Certification and Verification, AXCv	Module	FUPF	90,00%	90,00%	95,00%	95,00%	100,00%
	AXMEDIS Supervisor, AXS	WS	FUPF	95,00%	95,00%	95,00%	95,00%	100,00%
	AXMEDIS Supervisor, AXS	Module	FUPF	95,00%	95,00%	95,00%	95,00%	100,00%
	storeListActionLog	Protocol	FUPF					
	AXCS Users Registration Web Service	WS	DSI	80,00%	85,00%	90,00%	95,00%	100,00%
	AXCS Objects Registration Web Service	WS	DSI	70,00%	75,00%	80,00%	90,00%	100,00%

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AXCS Reporting Web Service	WS	DSI	80,00%	85,00%	90,00%	95,00%	100,00%
AXCS Statistics Web Service	WS	DSI	80,00%	85,00%	90,00%	95,00%	100,00%
AXCS Database Interface	Module	DSI	60,00%	70,00%	80,00%	90,00%	
AXCS Tool-Offline Registration Web Application	Tool	DSI	0,00%	50,00%	75,00%	90,00%	100,00%
AXCS Manager User Interface	Tool	DSI	0,00%	25,00%	50,00%	75,00%	100,00%
AXCSs/PMSs: Data Request and Diffusion	Module	DSI	0,00%	10,00%	30,00%	50,00%	100,00%
AXMEDIS User Registration Portal	Tool	DSI	100,00%	100,00%	100,00%	100,00%	100,00%
AXCS-DB-Interface API	API	DSI	60,00%	70,00%	80,00%	90,00%	100,00%
Registration and certification database	Tables	DSI	100,00%	100,00%	100,00%	100,00%	100,00%
Objects ID database	Tables	DSI	100,00%	100,00%	100,00%	100,00%	100,00%
Accounting database	Tables	DSI	90,00%	95,00%	95,00%	95,00%	100,00%
User Registration database for user registration portal	Tables	DSI	100,00%	100,00%	100,00%	100,00%	100,00%
AXMEDIS prefixes format	Format	DSI	100,00%	100,00%	100,00%	100,00%	100,00%
AXMEDIS ID format	Format	DSI	100,00%	100,00%	100,00%	100,00%	100,00%
AXMEDIS Action Log Format	Format	DSI	90,00%	95,00%	95,00%	95,00%	100,00%
AXCS/PMS Data Diffusion Format	Format	DSI	0,00%	50,00%	50,00%	75,00%	100,00%
AxcvCAPkcs12.p12 file format	Format	FUPF	100,00%	100,00%	100,00%	100,00%	100,00%
axcvToolCertStore.p12 file format	Format	FUPF	100,00%	100,00%	100,00%	100,00%	100,00%
axcv.properties file format	Format	FUPF	100,00%	100,00%	100,00%	100,00%	100,00%
toolBase64PKCS12 output parameter format	Format	FUPF	90,00%	95,00%	100,00%	100,00%	100,00%
toolFingerprint input parameter format in AXCv certify method	Format	FUPF	100,00%	100,00%	100,00%	100,00%	100,00%
toolFingerprint input parameter format in AXCv reverify method	Format	FUPF	100,00%	100,00%	100,00%	100,00%	100,00%
toolFingerprintDigest input parameter format in AXCv verify method	Format	FUPF	100,00%	100,00%	100,00%	100,00%	100,00%
AXCSUserRegistration protocol	Protocol	DSI	100,00%	100,00%	100,00%	100,00%	100,00%
AXCSObjectRegistration Protocol	Protocol	DSI	90,00%	95,00%	95,00%	95,00%	100,00%

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	Object Metadata registration	Protocol	DSI	90,00%	95,00%	95,00%	95,00%	100,00%
	AXOID acquisition and registration	Protocol	DSI	100,00%	100,00%	100,00%	100,00%	100,00%
	AXCSReporting Protocol	Protocol	DSI	80,00%	85,00%	90,00%	95,00%	100,00%
	AXCSStatistics Protocol	Protocol	DSI	80,00%	85,00%	90,00%	95,00%	100,00%
	AXS protocols	Protocol	FUPF					
	storeSID	Protocol	FUPF	95,00%	95,00%	95,00%	95,00%	100,00%
	getProtectionInfo	Protocol	FUPF	95,00%	95,00%	95,00%	95,00%	100,00%
	saveProtectionInfo	Protocol	FUPF	95,00%	95,00%	95,00%	95,00%	100,00%
	AXCV protocols	Protocol	FUPF					
	Certify (with passing TFP etc.)	Protocol	FUPF	95,00%	95,00%	95,00%	95,00%	100,00%
	Verify (user, tools, etc...)	Protocol	FUPF	90,00%	95,00%	95,00%	95,00%	100,00%
	reVerify	Protocol	FUPF	90,00%	95,00%	95,00%	95,00%	100,00%
	verifyPMSActionLog	Protocol	FUPF	90,00%	95,00%	95,00%	95,00%	100,00%
	Asynchronous Tool Verification (Authentication, no action log only verif)	Protocol	FUPF	90,00%	95,00%	95,00%	95,00%	100,00%
DE3.1.2.2.14	Protection Support	type	FUPF	71,64%	75,84%	78,55%	81,54%	87,01%
	Protection Manager Support Server	Tool	FUPF	90,00%	95,00%	95,00%	95,00%	100,00%
	authorise	Module	FUPF	75,00%	85,00%	95,00%	95,00%	100,00%
	getLicense	Module	FUPF	95,00%	95,00%	95,00%	95,00%	100,00%
	sendLicense	Module	FUPF	95,00%	95,00%	95,00%	95,00%	100,00%
	InitLicenseEndUser	Module	FUPF	95,00%	95,00%	95,00%	95,00%	100,00%
	AddGrantEndUser	Module	FUPF	95,00%	95,00%	95,00%	95,00%	100,00%
	finaliseLicenseEndUser	Module	FUPF	95,00%	95,00%	95,00%	95,00%	100,00%
	InitLicenseDistributor	Module	FUPF	95,00%	95,00%	95,00%	95,00%	100,00%
	addGrantforDistributor	Module	FUPF	95,00%	95,00%	95,00%	95,00%	100,00%
	addGrantforEndUser	Module	FUPF	95,00%	95,00%	95,00%	95,00%	100,00%
	finaliseLicenseDistributor	Module	FUPF	95,00%	95,00%	95,00%	95,00%	100,00%
	verifyUser	Module	FUPF	95,00%	95,00%	95,00%	95,00%	100,00%
	certify	Module	FUPF	95,00%	95,00%	95,00%	95,00%	100,00%
	verify	Module	FUPF	90,00%	90,00%	90,00%	95,00%	100,00%
	reverify	Module	FUPF	90,00%	90,00%	90,00%	95,00%	100,00%
	ping	Module	FUPF	95,00%	95,00%	95,00%	95,00%	100,00%

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Protection Manager Support Client	Module	FUPF	85,00%	90,00%	90,00%	95,00%	95,00%
authorise	Module	FUPF	70,00%	75,00%	75,00%	95,00%	100,00%
getLicense	Module	FUPF	95,00%	95,00%	95,00%	95,00%	100,00%
sendLicense	Module	FUPF	95,00%	95,00%	95,00%	95,00%	100,00%
InitLicenseEndUser	Module	FUPF	95,00%	95,00%	95,00%	95,00%	100,00%
AddGrantEndUser	Module	FUPF	95,00%	95,00%	95,00%	95,00%	100,00%
finaliseLicenseEndUser	Module	FUPF	95,00%	95,00%	95,00%	95,00%	100,00%
InitLicenseDistributor	Module	FUPF	95,00%	95,00%	95,00%	95,00%	100,00%
addGrantforDistributor	Module	FUPF	95,00%	95,00%	95,00%	95,00%	100,00%
addGrantforEndUser	Module	FUPF	95,00%	95,00%	95,00%	95,00%	100,00%
finaliseLicenseDistributor	Module	FUPF	95,00%	95,00%	95,00%	95,00%	100,00%
verifyLicense	Module	FUPF	15,00%	30,00%	40,00%	50,00%	65,00%
verifyTemporalLicense	Module	FUPF	15,00%	30,00%	40,00%	50,00%	65,00%
registrationRequest	Module	FUPF	0,00%	10,00%	20,00%	30,00%	50,00%
unRegistrationRequest	Module	FUPF	0,00%	10,00%	20,00%	30,00%	50,00%
getDomainsRegistered	Module	FUPF	0,00%	10,00%	20,00%	30,00%	50,00%
insertActionLog	Module	FUPF	70,00%	75,00%	80,00%	85,00%	90,00%
retrieveActionLogs	Module	FUPF	70,00%	75,00%	80,00%	85,00%	90,00%
deleteCacheContent	Module	FUPF	95,00%	95,00%	95,00%	95,00%	95,00%
clearActionLogs	Module	FUPF	95,00%	95,00%	95,00%	95,00%	95,00%
getLastActionLog	Module	FUPF	95,00%	95,00%	95,00%	95,00%	95,00%
getLastFingerprint	Module	FUPF	25,00%	40,00%	50,00%	25,00%	25,00%
verifyUser	Module	FUPF	95,00%	95,00%	95,00%	95,00%	95,00%
certify	Module	FUPF	95,00%	95,00%	95,00%	95,00%	95,00%
verify	Module	FUPF	90,00%	90,00%	90,00%	90,00%	90,00%
reverify	Module	FUPF	90,00%	90,00%	90,00%	90,00%	90,00%
GetProtectionInfoLOCAL	Module	FUPF	70,00%	80,00%	80,00%	70,00%	70,00%
UpdateProtectionInfoLOCAL	Module	FUPF	70,00%	80,00%	80,00%	70,00%	70,00%
Protection Manager Support Domain Factory	Tool	FUPF	70,00%	75,00%	80,00%	85,00%	90,00%
Protection Manager Support Domain Home	Tool	FUPF	10,00%	10,00%	10,00%	10,00%	10,00%
License Manager (database)	Module	FUPF	75,00%	80,00%	80,00%	85,00%	90,00%
retrieveLicense	Module	FUPF	95,00%	95,00%	95,00%	95,00%	95,00%
deleteLicense	Module	FUPF	95,00%	95,00%	95,00%	95,00%	95,00%
storeLicense	Module	FUPF	95,00%	95,00%	95,00%	95,00%	95,00%

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retrieveLicenseModel	Module	FUPF	0,00%	25,00%	50,00%	60,00%	70,00%
deleteLicenseModel	Module	FUPF	0,00%	25,00%	50,00%	60,00%	70,00%
storeLicenseModel	Module	FUPF	0,00%	25,00%	50,00%	60,00%	70,00%
updateLicenseModel	Module	FUPF	0,00%	25,00%	50,00%	60,00%	70,00%
revokeLicense	Module	FUPF	0,00%	25,00%	50,00%	60,00%	70,00%
revokeAddLicense	Module	FUPF	0,00%	25,00%	50,00%	60,00%	70,00%
License Verificator	Module	FUPF					
verifyCreatedLicense	Module	FUPF	95,00%	95,00%	95,00%	95,00%	95,00%
verifyTemporalLicense	Module	FUPF	50,00%	65,00%	80,00%	85,00%	90,00%
License Generator	Module	FUPF					
InitLicenseEndUser	Module	FUPF	95,00%	95,00%	95,00%	95,00%	95,00%
AddGrantEndUser	Module	FUPF	95,00%	95,00%	95,00%	95,00%	95,00%
finaliseLicenseEndUser	Module	FUPF	95,00%	95,00%	95,00%	95,00%	95,00%
InitLicenseDistributor	Module	FUPF	95,00%	95,00%	95,00%	95,00%	95,00%
addGrantforDistributor	Module	FUPF	95,00%	95,00%	95,00%	95,00%	95,00%
addGrantforEndUser	Module	FUPF	95,00%	95,00%	95,00%	95,00%	95,00%
finaliseLicenseDistributor	Module	FUPF	95,00%	95,00%	95,00%	95,00%	95,00%
Authorisation support	Module	FUPF					
authorise (locally and connection to PMS Ser ver)	Module	FUPF	85,00%	90,00%	90,00%	90,00%	95,00%
RDD Server	Module	FUPF					
retrieveRightsGenealogy	Algorithm	FUPF	95,00%	95,00%	95,00%	95,00%	95,00%
getPARGenealogy	Algorithm	FUPF	95,00%	95,00%	95,00%	95,00%	95,00%
GetChildren	Module	FUPF	95,00%	95,00%	95,00%	95,00%	95,00%
GetParents	Module	FUPF	95,00%	95,00%	95,00%	95,00%	95,00%
Protection Info Manager (manage ProtInfo in/out Secure Cache)	Module	FUPF					
insertProtectionInfo	Module	FUPF	95,00%	95,00%	95,00%	95,00%	95,00%
retrieveProtectionInfo	Module	FUPF	95,00%	95,00%	95,00%	95,00%	95,00%
Key Generator	Module	FUPF					
generateRSAKey	Module	FUPF	95,00%	95,00%	95,00%	95,00%	95,00%
generateSymmetricKey	Module	FUPF	95,00%	95,00%	95,00%	95,00%	95,00%
generateDSAKey	Module	FUPF	95,00%	95,00%	95,00%	95,00%	95,00%
Domain Manager	Module	FUPF	10,00%	15,00%	15,00%	30,00%	50,00%
Domain Registration Manager	Module	FUPF	10,00%	15,00%	15,00%	30,00%	50,00%
Protection Support for Mobiles	Module	FUPF	10,00%	15,00%	15,00%	30,00%	50,00%
Rights Expression Translator	Module	FUPF	10,00%	15,00%	15,00%	30,00%	50,00%

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Secure cache manager for PMS Server	Module	FUPF						
deleteCacheContent	Module	FUPF	70,00%	80,00%	80,00%	85,00%	95,00%	
insertStatus	Module	FUPF	70,00%	80,00%	80,00%	85,00%	95,00%	
updateStatus	Module	FUPF	70,00%	80,00%	80,00%	85,00%	95,00%	
deleteStatus	Module	FUPF	70,00%	80,00%	80,00%	85,00%	95,00%	
retrieveStatus	Module	FUPF	70,00%	80,00%	80,00%	85,00%	95,00%	
insertLicense	Module	FUPF	70,00%	80,00%	80,00%	85,00%	95,00%	
deleteLicense	Module	FUPF	70,00%	80,00%	80,00%	85,00%	95,00%	
insertProtectionInfo	Module	FUPF	90,00%	90,00%	90,00%	90,00%	95,00%	
insertSystemDate	Module	FUPF	90,00%	90,00%	90,00%	90,00%	95,00%	
retrieveSystemDate	Module	FUPF	90,00%	90,00%	90,00%	90,00%	95,00%	
deleteSystemDate	Module	FUPF	90,00%	90,00%	90,00%	90,00%	95,00%	
insertDomain	Module	FUPF	90,00%	90,00%	90,00%	90,00%	95,00%	
retrieveDomain	Module	FUPF	90,00%	90,00%	90,00%	90,00%	95,00%	
deleteDomain	Module	FUPF	90,00%	90,00%	90,00%	90,00%	95,00%	
retrieveActionLogs	Module	FUPF	90,00%	90,00%	90,00%	90,00%	95,00%	
insertActionLog	Module	FUPF	90,00%	90,00%	90,00%	90,00%	95,00%	
retrieveStatusEx	Module	FUPF	90,00%	90,00%	90,00%	90,00%	95,00%	
retrieveStatusEx	Module	FUPF	90,00%	90,00%	90,00%	90,00%	95,00%	
Secure cache manager for PMS Client	Module	FUPF	80,00%	85,00%	85,00%	90,00%	95,00%	
A SQL file format (encrypted)	Module	FUPF						
Generation of Contracts from Licenses	Tool	FUPF	55,00%	60,00%	70,00%	90,00%	95,00%	
License Generation from Contract	Module	FUPF	55,00%	60,00%	70,00%	90,00%	95,00%	
Secure Communication Support (DEPRECATRED)	Module	FUPF						
AXCS Proxy (DEPRECATRED, included in the PMS client-Server)	Module	FUPF						
License Database, on PMS Server	Tables	FUPF						
Local cache info on PMS Server Domain	Tables	FUPF	80,00%	85,00%	85,00%	90,00%	95,00%	
Content consumption status on PMS Server	Tables	FUPF	80,00%	85,00%	85,00%	90,00%	95,00%	

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	License format (MPEG-21 REL based)	Format	FUPF	80,00%	85,00%	85,00%	90,00%	95,00%
	Posting License on PMS Protocol	Protocol	FUPF	10,00%	15,00%	20,00%	30,00%	40,00%
	License Creation	Protocol	FUPF	10,00%	15,00%	20,00%	30,00%	40,00%
	Authorisation (grant and)	Protocol	FUPF	10,00%	15,00%	20,00%	30,00%	40,00%
	Key generation	Protocol	FUPF	10,00%	15,00%	20,00%	30,00%	40,00%
DE3.1.2.2.15	Accounting and Reporting	type	EXITECH	81,25%	87,50%	92,50%	95,00%	100,00%
	Core Accounting Manager and Reporting Tools (CAMART)	Tool	EXITECH	85,00%	90,00%	95,00%	95,00%	100,00%
	Administrative Information Integrator (AII)	Tool	EXITECH	65,00%	75,00%	85,00%	95,00%	100,00%
	CAMART database	Table	EXITECH	85,00%	90,00%	95,00%	95,00%	100,00%
	AII Exchange Format	Format	EXITECH	90,00%	95,00%	95,00%	95,00%	100,00%

5 Schema and Guidelines for the AXMEDIS Framework Specification Document

The following sections are the schema for the rest of the specification documents belonging to the AXMEDIS specification set.

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6 This document concerns

The extended summary

6.1 List of Modules or Executable Tools Specified in this document

A module is a component that can be or it is reused in other cases or points of the AXMEDIS framework or of other AXMEDIS based solutions.

The modules/tools have to include effective components and/or tools and also testing components and tools.

Module/tool Name	Module/Tool Description and purpose, state also in which other AXMEDIS area is used	Standards exploited if any

6.2 List of Formats Specified in this document

A format can be (i) an XML content file for modeling some information, (ii) a file format for storing information, (iii) a format that is manipulated by the tools described in this document, etc...

Format Name	Format Description and purpose, state also in which other modules is used	Standards exploited if any

6.3 List of Databases Specified in this document

Database Name	database Description and purpose, state also in which other AXMEDIS area is using	Standards exploited if any

6.4 List of Protocols Specified in this document

A protocol is a communication modality among distinct processes that can be located or not on different computers.

Protocol Name	protocol Description and purpose, state also in which other modules is used	Who is the master and who is the slave	Standards exploited if any

7 General Use Cases and scenarios

<general description and list>

]

7.1 Use Case AAAA

<A GRAPH>

<AN EXPLANATION>

7.2 Use Case bbbb

<A GRAPH>

<AN EXPLANATION>

7.3 Use Case cccc

<A GRAPH>

<AN EXPLANATION>

7.4 Use Case dddd

<A GRAPH>

<AN EXPLANATION>

8 General architecture and relationships among the modules produced

The whole AXMEDIS system has been decomposed in subsystems and tools. The decomposition has been performed on the basis of structural aspects, the diagrams are reported in the UML file in vision. Please see the last version on the Specification folder on the web portal.

The specification of each tools, component and/or module has to be performed by providing the following information and adopting the UML methodology and tools/diagrams this will allow to talk a unique language for all now in the specification phase and in terms of documentation of companies accessing to take-up actions:

- *General description of the functionalities and relationships with other tools and components.*
- *References to the other tools and components that have to interact with the entity.*
- *Structural decomposition of larger modules or subsystems that still needs to be decomposed to identify the entities that are modeled in terms of classes. These are recognizable being single programs, DLL, plug-in, packages, etc.*
- *Class diagram with details regarding specialization, interfaces, decomposition and references*
 - *Description of classes with their major attributes and methods, with their type and signature*
 - *If some class/object has some evolving state please provide a state diagram with the description of the states and transitions.*
- *Object diagrams (component diagrams of UML) to show what happen among objects when these are instantiated from classes, to highlight the production of lists, and the general structure of objects in the memory.*
- *Sequence diagram and/or collaboration diagram (among processes) of UML for selected parts to the explanation of the entity behavior and their relationships with other entities or processes*

< some graphs in UML>

< some description>

9 Module or Executable Tool <.....>

Module/Tool Profile		
<name of the module>		
Responsible Name		
Responsible Partner		
Status (proposed/approved)		
Implemented/not implemented		
Status of the implementation		
Executable or Library/module (Support)		
Single Thread or Multithread		
Language of Development		
Platforms supported		
Reference to the AXFW location of the source code demonstrator	https://cvs.axmedis.org/repos/.....	
Reference to the AXFW location of the demonstrator executable tool for internal download	https://cvs.	
Reference to the AXFW location of the demonstrator executable tool for public download		
Address for accessing to WebServices if any, add accession information (user and Passwd) if any		
Test cases (present/absent)		
Test cases location	http://.....	
Usage of the AXMEDIS configuration manager (yes/no)		
Usage of the AXMEDIS Error Manager (yes/no)		
Major Problems not solved	-- --	
Major pending requirements	-- --	
Interfaces API with other tools, named as	Name of the communicating tools References to other major components needed	Communication model and format (protected or not, etc.)
Formats Used	Shared with	format name or reference to a section

- *Any used element/library, etc. has to be approved*
- *Any non approved element cannot be used.*
- *Etc.*
- *Please remember that if the tool/module belongs to the AXMEDIS Framework as defined in the CA, it has to be provided in source code to be included into CVS connected to the AXMEDIS portal.*

9.2 Module Design in terms of Classes

Class diagrams

Their relationships, etc....

9.3 User interface description

- *Description of the User Interface, if any:*
 - *Visual Shape and design of the main frame*
 - *Menu with major and minor items and related associated functionalities.*
 - *Contextual menu*
 - *Main functionalities provided from the user interface*
 - *Visual Shape and design of the major dialog boxes.*
 - *Usage of tool bars, scrollbars, and any gadget or widget, etc.*
 - *Description of main activities of the users in terms of Use Cases, see the other deliverable*
 - *For usability aspects please consult ACIT partner*

9.4 Technical and Installation information

- *Installation capability, it has to be installable in a very easy manner*
- *Manual support for technical and user point of views*

References to other major components needed	
Problems not solved	•
Configuration and execution context	

9.5 Draft User Manual

9.6 Examples of usage

9.7 Integration and compilation issues

- *Description of the interoperability specification aspects related to the adoption of the software module in different operating systems and to be integrated in different contexts,*
 - *conditional compilations,*
 - *different behaviors in different context,*
 - *profiling,*
 - *configuration aspects,*
 - *etc.*

9.8 Configuration Parameters

Config parameter	Possible values
	Xxxx : Yyyy : :

9.9 Errors reported and that may occur

Error code	Description and rationales

9.10 Formal description of algorithm <.....>

- *Description of relevant algorithms for the functional part of your methods/services by using: textual description highlighting the motivation and the needs in AXMEDIS, description in terms of flow chart or activity diagrams of UML or pseudocode or directly in programming language, and if rational a mathematical formulation of the algorithm or of its math parts. For each non specified algorithm since it is not know yet please provide*
 - *metrics for its evaluation*
 - *reference value of these metrics*
 - *an example of the results*
 - *test cases have to be put in a different deliverable*
 - *etc.:*

name	
Method	
Description	
Input parameters	
Output parameters	

name	
Method	
Description	
Input parameters	
Output	

parameters	
------------	--

10 Provided API named <.....>

- Description of the API provided, if any, in terms of functions/procedures, functionalities, parameters, types of parameters, behaviour, and internal behaviour. In addition, a sample procedure and detailed sequence diagram of what can be done to exploit the module in other processes. The API has to be described by using UML VISIO, IDL (interface description language).
- Description of the high level communication interfaces such as COM, ACTIVEX, and support for plug-ins, etc., by providing: functions/procedures, functionalities, parameters, types of parameters, behavior, and internal behavior. In addition, a sample procedure and detailed sequence diagram of what can be done to exploit the module in other processes.

For each API

Call name	
Method	
Description	
Input parameters	
Output parameters	
Request Sample Message	
Response Sample Message	

Call name	
Method	
Description	
Input parameters	
Output parameters	
Request Sample Message	
Response Sample Message	

11 Table description for database <.....>

Table description in formal manner, item name, type, etc.

12 Formal description of format <.....>

- *Formal description of any textual format file, all content formats and confirmation formats have to be XML and have to be provided in terms of Schema, where each field has to be fully specified in terms of type and semantics of each possible value, giving the dynamics (e.g., -255 + 256), type (e.g., string, float, integer, unsigned integer), etc. Some examples have to be provided.*
- *Formal description of any Binary format file, please provide EBNF description, with dictionary etc., where each field has to be fully specified in terms of type and semantics of each possible value. Some examples have to be provided.*
- *Formal description of any language, rule based or functional or mix, by using EBNF description with dictionary and semantic description. Some examples have to be provided.*

XML, etc.

13 Formal description of communication protocol <.....>

- *Description of protocols, if any, at level of communication packets and all the higher levels*
Sequence diagram
Activation diagram

For WSDL

Call name	
Method	
Description	
Input parameters	
Output parameters	
Request Sample Message	
Response Sample Message	

AND then WSDL

14 Bibliography (mandatory)

--- this section is mandatory in all deliverables ---

15 Glossary (mandatory)

--- this section is mandatory in all deliverables ---