New services for the public in a technology-related approach: the AXMEDIS project inside a library

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Abstract

Multimedia libraries market is urging better pricing and value-for-money for their products and services. Key issues for a viable and sustainable business venture in the digital cross-media content include the containment of content sale prices and the accessibilities to the contents in order to allow better exploitations of the heritage of the library.

Currently, the library sector has not fully exploit new possibilities from the Information Technologies for their public services and management aspects Possible technology-enhanced solutions to containment of sale price challenge could be found by automating, accelerating and restructuring content managing and delivering processes, and providing solution for content protection.

The AXMEDIS project (Automating Production of Cross Media Content for Multi-channel Distribution) is supported by the European Commission to create an innovative technology framework for the automatic production and distribution of digital cross-media contents over a range different media channels with protection, including PC (on the internet), PDA, kiosk, mobile phones and i-TV (interactive-TV). AXMEDIS aims to meet the above mentioned challenges of the library and the market demand by:

- reducing costs for content management with the application of appropriate Artificial Intelligence techniques;

- reducing content production, distribution, protection and aggregation costs in order to increase exploitation and accessibility to the heritage of the library with novel and innovative technological framework;

- providing new methods and tools for the protect of the digital contents to preserve the copyright and to provide rightful royalty to the content owner with Digital Rights Management (DRM).

This paper presents a brief introduction to the AXMEDIS project and discusses the new functionalities and capabilities highlighting the applications and exploitations in the library context. For further details on the AXMEDIS project, see the project website at www.axmedis.org.

Introduction

The world of libraries compared to the archival and museums sectors is the pioneer in the introduction of the ICT: creating standards for cataloguing first, and, more recently, with the creation of digital collections.

Typical daily activities of a library consist of various services to the public and regular management tasks. All these activities can be optimised with further application and exploitation of the new possibilities and capabilities offered by the Information Technology. Generally, public services management activities are extremely time-consuming and labour intensive for both the librarian as well as the customer. Librarian spends time in processing the customer request, locating the objects requested by the customer, considering the object copyright, re-producing the objects (if legally possible), and finally delivering the objects. During this time, the customer has to wait for the process to be completed by the librarian.

In the evolving scenario of the digital content market, multimedia libraries are demanding for better pricing and better value-for-money for the products and services. Digitization is no more just an activity for preservation. Vital key issues for the setting up and management of a viable and sustainable business venture in the digital cross media content include the containment of sale prices and increased accessibilities to the contents in order to provide a better exploitation of the libraries' heritage.

Possible solutions to these challenges can be found by automating, accelerating and restructuring the management and delivering and distribution processes, together with the application of content protection solution. These approaches can enhance the management and delivery processes by offering faster and cheaper services, while at the same time providing new capabilities to support a safer and protected distribution and sharing of digital content.

AXMEDIS

The AXMEDIS initiative is funded by the European Commission to create and explore innovative technological framework for automatic production and distribution of cross-media contents over a number of different distribution channels (e.g. networked PC, PDA, kiosk, mobile phone, i-TV, etc) with DRM. In the context of the libraries market, AXMEDIS aims to offer innovative solutions and tools to:

- manage and distribute and share digital content, such as audio-visual materials (video/film), images, documents, and others, in a protected and verified manner, over many different distribution channels including Internet, mobiles devices, PDA, PC, i-TV, satellite and others;
- increase the visibility and accessibility of content with the realisation of tools for content sharing among content owners. This allows the content to reach distant markets with access to larger markets;
- offer additional and relevant sales channels that can simplify content distribution at a reasonable cost for end-users;

- increase both the safety and reliability with the protection models to ensure verifiable and protected delivery the objects to content producers and distributors;
- increase the accessibility of European audio-visual content;
- provide new international business opportunities to all the related SMEs in the areas of cross media content production, aggregation and distribution;
- allow end-users to gain access to the contents at a reduced costs. This will be realised by exploiting the AXMEDIS infrastructure which will open paths for new services for industrial content exploitation and for both public and corporate clients (archives, schools, libraries, etc). It will also create low cost distribution chains of digital material for entertainment, education, e-commerce, etc. At the same time, this will accelerate the process of digitisation of contents for archives with reduced production costs, and enhance the value of the cultural heritage by facilitating the exploitation of the archives in digital form.

The AXMEDIS project started in September 2004. The first results are expected by the end of this year, to be demonstrated at the annual AXMEDIS International Conference (see http://www.axmedis.org/axmedis2005) and the completed framework is scheduled for 2007. The present results are the identification of requirements and a large set of formal definition of scenarios for content production, protection and distribution considering B2B and B2C domains.

AXMEDIS Consortium and Potential Users

The AXMEDIS consortium consists of leading European digital content producers, integrators, aggregators, and distributors, together with information technology companies and research groups. The consortium has important resources and complementary skills which will have an effective impact upon the industry. It will also demonstrate the value of the project outcomes and the reliability and effectiveness of the project results to a wide range of potential users, including:

- archives, institutions, schools and content producers;
- associations of content producers;
- Publishers and digital content providers;
- Content integration and design, audio and video;
- Networks, broadcaster and their technology providers for i-TV, PC, etc.; Mobile distributor for GSM cells or UMTS, etc.;
- Content distributor operators and technicians towards PC on internet;

Technology-Enhanced New Services and New Possibilities

With the new possibilities resulted from the AXMEDIS framework, European Libraries will have the possibility to promote, manage and distribute their content on a global scale with less effort. The new technology-enhanced business model will be able to support the growth of the European content

industry and to enhance the accessibilities and increase the availability of a significantly increased quantity and quality of multimedia content globally.

There are many different ways in which AXMEDIS can promote and stimulate the library related market. For examples, on a B2C (Business-to-Customer) scenario, the library can make use of the AXMEDIS environment to support the sale of the contents from the library (self) to their own customer (B2C, case 1). In addition, the framework can also provide the sale of the contents from other library to their own customer (B2C, case 2). On a B2B (Business-to-Business) scenario, the AXMEDIS environment can be used to support the sale of the contents from their own library to another library (B2B, case 1), or to support the sale of the contents from their own library to another business user (B2B, case2).

With AXMEDIS, the new possibility will stimulate better value-for-money digital content due to effective and automated processing, production and delivery of the content using latest network technology to enable optimum interconnection and transactions between B2B and B2C, with DRM.

How AXMEDIS works

The AXMEDIS Framework manages objects. In this context, every object here is a digital container for some digital content. Depending on the ownership, each library has the right to produce licenses which are modelled as profiles for the use of the content (i.e., print, play, save, time limited use, etc., to control the access and proper usage). On the base of the profile, each library can issue licenses and establish relevant fees.

AXMEDIS is a complete framework for the normal processes required in the Library domain including, management, control, processing, distribution, transaction (selling and buying), etc. With AXMEDIS, the objects are stored in a database within the library (reachable through IP address), or in a Kiosk, and the process of digital contents transaction can be improved in several different contexts:
- in normal day-to-day operations;
- new possibility of complete/share collections (virtually), with access to digital contents from other libraries and, at the same time, widen the accessibilities and availabilities of the contents.

As mentioned in the above section, there are many different ways to promote and stimulate the library related market using the AXMEDIS framework, in different aspects including:
- B2C:
  - supporting the sell of content from a library to their own customer; or supporting the sell of content from another library to their own customer
- B2B:
  - Supporting the sell of content from a library to another library; or supporting the sell of content from other business final users

AXMEDIS for ANSC

The Multimedia Library of Accademia Nazionale di Santa Cecilia holds a huge collection of invaluable heritage contents, spanning from 1651 to the present day. The archive contains many different forms of content including documents, audio recordings, photographs and others. The musical library preserves many original manuscripts (particularly in the XVIIth-XXth Century) and printed editions. Within the summer 2005, 102.000 pages of the contents will be digitised.

For the ANSC case, one of the key benefits offer by the AXMEDIS framework is the functionalities and capabilities to process and manage combinations of contents. ANSC plans to explore usages involving:
- Raw objects, which contain just one or more digital items of the same type, like a bibliographic entity (a manuscript, libretto, printed edition, e-book…) and some cataloguing info about it.
- Complex objects, e.g.:
  - 2 different versions of the same libretto coming from 2 or more different libraries. In this case each library has its own licensing model.
  - A UNIMARC (or XML) file of a collection and digital samples of the content coming from 1 or more libraries.
  - Catalogue record + Manuscript + printed/critical edition.
  - Integrated collection of serials / periodicals with digitised articles.
  - And so on…

The combination is huge and wide ranging, even considering only book material, and this is why AXMEDIS is important in supporting cross-media to allow optimised processes for library related domain.

We can imagine different kind of library activities that at present are possible and additional ones that AXMEDIS can realise reducing cost and accelerating the process.

For example, on a B2C (Business-to-Customer) scenario, the library can make use of the AXMEDIS environment to support the sale of any digital reproduction, the merchandising of digital objects owned by the library to its own customer, a system of preview / requesting material service using, for instance, mobile phone provided to the customer in advance In other terms, customer can preview the catalogue and the digital resources of the library some time before coming and buying them for PC use. (B2C, see slide).

The framework can also provide the sale of the contents from other libraries to its own customer (B2C, see slide).

On a B2B (Business-to-Business) scenario, the AXMEDIS environment can be used to support the sale of the contents from its own library to another library (B2B, case 1), or to support the sale of the contents from their own library to another business user (B2B, see slide).

Since the Accademia has a Multimedia library, there is a wide range of available objects in different formats, including archival documents. As an example, a typical Accademia object can be an entire archival record of a weekly concert of the ANSC Orchestra, and the object could contain (see slide):

- The XML file of the record containing the data on the performers, programme, date, place, etc...;
- The pictures of the concert (e.g. in JPEG);
- The audio recording (e.g. in MP3). if available;
- The score (e.g. in JPEG or in any proprietary file format like Finale or Sibelius)
- Programme notes (e.g. in PDF)
- Press clippings (e.g. in PDF)
- Composers and performers biographies (e.g. in any textual format)
- Archival documentation related to the concert (e.g. in JPEG) for past concerts beyond 40 years (in Italy)

As you can see, there are some affinities between this way of aggregation and FRBR way of organizing contents.
Generally speaking, contents are aggregated on the basis of metadata, starting from Dublin Core schemas and beyond.

During our daily work this is the traditional process:

- A library staff receives a customer's request (let's suppose a manuscript)
- The library staff goes to the storage-room and locate the manuscript
- The library staff digitise the requested pages
- The library staff manage the licensing
- The library staff burns the CD with the digitised images of the manuscript
- The library staff delivers the CD to the customer
- Meanwhile the customer has to wait until the library staff completes all the above mentioned operations.

In the slide you can see which steps are affected by the application of AXMEDIS.
With AXMEDIS, the process from the request to delivery is optimised by means of different distribution channels, including PC (or kiosk), mobile, i-TV, PDA. With AXMEDIS, the customer can go through the whole process online and receives the contents requested in real time. The library staff has only to check the results of the process and does not need to manually perform all the time-consuming individual sub-tasks as described earlier. All the content-owner(s) of the digital resources within the requested object receive their revenues in accordant to the licence provided and contract with the libraries which produced the objects. The content distributor can receive a percentage of the income (as agreed) if the content is acquired through a distributor. All these activities are managed in a transparent manner and accessible independently

from the different partners of the value chain. Thus each value chain partner may access to the AXMEDIS certifier and supervisor to enquire and receive information on the consumption of any functionality of any object.

AXMEDIS Support

AXMEDIS can offer assistance and technical support to libraries interested in using the platform and adopting the AXMEDIS solutions. This support action will be provided through activities such as training, management, assessment and evaluation, dissemination and demonstration at conference and fairs, and affiliating them to AXMEDIS. Furthermore, the AXMEDIS consortium will grant the sum of 1 million Euro distributed by means an European competitive call to companies and research institutes interested in developing real solutions by exploiting AXMEDIS technologies.

Conclusion

We believe that the AXMEDIS solution will encourage not only the creation of new digital archives (based on international standards of cataloguing and descriptions (metadata)) but also stimulate the exploitation process for a wider range of digital media over many different distribution channels. AXMEDIS can introduce a new vision for the digitalisation process, encouraging the creation of digital archives for heritage preservation, as well as providing wider and better access to the important contents of the libraries such as books (in electronic form) and all other types of audio-visual materials. We hope that AXMEDIS can also encourage the creation of networks of libraries with the framework where it will be possible to buy and sell (free or otherwise) digital contents between all partners, significantly increase the points of entrance to the contents of the library, on a Business-to-Business model. Provide a model for cooperation preserving at the same time the licensing model of each library is one of the key benefits of AXMEDIS.

It is easy and beneficial for all to gain access to the AXMEDIS technologies. Over the course of the project, some didactic events will be organised to provide better understanding of the AXMEDIS technologies with further information about the potentialities of AXMEDIS. Business delegates can attend these events in order to participate in the project and bring AXMEDIS technologies to their company. Special training sessions and courses will be held for managers, content managers, content producers and integrators, and digital content distributors.

Workshops and courses will be organised in several venues in Europe. To provide better understanding of the new solutions, AXMEDIS is providing a forum for discussion with technologists and experts who are ready to assist with any AXMEDIS related queries. Further information, events and calls are available online at the project website, www.axmedis.org

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