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Abstract:

This report contains the final summary of the whole MUSICNETWORK project. It summaries the experience and the major achievements, results and facts that have characterised the MUSICNETWORK project evolution in line with the Annex 1 and with the satisfactory of all partners.

Keyword List:

Interactive multimedia music, music notation, music imaging, music accessibility, music library, music archive, music protection, music distribution, symbolic music representation, MPEG SMR.

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1 Executive Summary and Report Scope

The main objective of the MUSICNETWORK is to create a community to bring the European Music industries and content providers into the interactive multimedia era, with a special attention to SME. There is currently a large gap between academy and industry and many products in the marketplace fail to exploit the potential of new multimedia technologies. The MUSICNETWORK helps complex research solutions to reach the marketplace by seeking agreements between the different actors and formats.

This is been achieved by bringing together research institutions, industries, small and medium sized enterprises (SMEs), and experts to build the required momentum to study and define multimedia music modelling and coding for the new age.

During his three years of life the MUSICNETWORK has:

1. created a collaborative environment for music content providers and corporate users to access research results and technological solutions easier,
2. created a community that have produced several new research and development and industrial projects in the area of music and multimedia such as: IMAESTRO, AXMEDIS, VIMUS, etc. and relevant activities such as the action of MPEG SMR standardisation.
3. provided training, technology transfer and access to expertise in the multimedia music field, providing a widely understandable and easily accessible market and technology watch ,
4. involved research institutes and standardisation bodies (e.g., Mpeg7, W3C, Mpeg21, etc.) to consider problems of music coding for integrating multimedia and distribution aspects, preserving the owner rights,
5. increased the competitiveness of content providers and distributors working in multimedia music delivery,
6. increased awareness and confidence by building consensus among content owners and providers towards the new solutions, technologies and music models, thereby removing the problems that currently limit the digitising of music archives,
7. prepared the VIth Framework technology needs and developments for digital music,
8. stimulated the exploitation of new functionalities that may open new markets for new ways of music distribution: such as e-publishing, e-book, virtual libraries, mobile entertainment, m-commerce, etc.

The most important milestones and expected results achieved during the project are:

1. the definition of user requirements regarding the MUSICNETWORK and its services to the music industry and content providers;
2. the definition and implementation of a large community of participants aimed at defining integrated solutions to bring music into the multimedia interactive age;
3. the implementation of a WWW site to provide services and information to music industries and end-users of the network;
4. an increased awareness and consensus towards the new technologies for music coding and distribution.
5. continuous technical support of communities related to music libraries, multimedia music, music notation, music distribution, music protection, music digitisation, etc.
6. a series of reports about new models of music coding and guidelines regarding the adoption of current standards for the same target.
7. the definition of integrated models and guidelines to consider the different aspects addressed by the working groups.
8. the assessment of the MUSICNETWORK by experts and specific defined metrics which are typically used in technology transfer activities.
9. dissemination of results and the definition of a suitable exploitation plan.

As reported in the Annex I, details of these activities are reported in specific documents. This document reports only a short summary of activities performed during the MUSICNETWORK Project.

According with the aim of the exploitation plan and MUSICNETWORK project, the MUSICNETWORK community has created an association with the aim of continuing the work starter by the MUSCINETWORK with a sustainable activity.

2 Introduction and general objectives

The MUSICNETWORK has been funded by the European Commission to help bringing music into the interactive multimedia era. It represents a Centre/Network of Excellence where music content providers, cultural institutions, industry, and research institutions work together drawing on the assets and mutual interests to exploit the potentials of multimedia music content along with the technologies, tools, products, formats and models.

There is currently a large gap between technology and content providers and many products in the marketplace fail to exploit the potential of new multimedia technologies, MUSICNETWORK helps research solutions to reach the marketplace by seeking agreements among different actors and formats. This could be achieved by bringing together research institutions, industries, small / medium sized enterprises, and experts to build the required momentum to study and define multimedia music modelling and coding for the new age. MUSICNETWORK activities, actions and services are provided through its www site: www.interactivemusicnetwork.org

The central focus of the MUSICNETWORK was the creation of a community bringing the European Music industries and content providers into the interactive multimedia era. This has been possible by the joint effort of content providers, institutions, research centres, industries and experts pursuing a common objective: studying the various aspects of music coding, protecting and distribution to improve present standards and therefore foster future wider exploitations of music related content, tools and applications.

A special care in this activity has been devoted to the SME and to grant effective technology transfer from Research institution to SME thus:

- increasing the competitiveness of content providers and distributors working in multimedia music areas: production, management, delivery, protection, etc.
- stimulating the exploitation of new functionalities that may open new markets for new ways of music distribution: such as e-publishing, e-book, virtual libraries, mobile entertainment, and m-commerce.
- increasing awareness and confidence by building consensus among content owners and providers towards the new solutions, technologies and music models, thereby removing the problems that currently limit the exploitation of multimedia music archives.

What became apparent was the need to identify suitable models and solutions to integrate and make available the knowledge coming from music publishers, digital libraries, universities, standardization bodies, research institutions, music associations, end-users, music schools, information technology companies, commercial distribution and e-distribution, and industry. MUSICNETWORK project implemented concrete actions for integrating these types of knowledge and bringing music into the interactive media era (see Fig.1). To this end, a set of activities were implemented to understand better the requirements; to assess research and technology; to integrate available technologies; and to push them into the direction leading to the proposed objectives.



Fig 1 – The MUSICNETWORK activities (copyrighted by MUSICNETWORK)

This activity has accelerated the process of development and adoption of applications in the area of Multimedia Music and also in the area of digitisation and conversion of archives and digital collections by both removing technical problems and creating awareness about the capabilities offered by present technologies and solutions.

2.1 The MUSICNETWORK'S Activities and the Services Provided

MUSICNETWORK has so far proved to be a quite unique case and not only in Europe, proposing an integrated and unified model and a language for music notation, together with its related multimedia and protection aspects, while still considering standardisation of solutions and formats.

MUSICNETWORK offers a unique set of services to the community:

- **Innovation and stimulation:**
 - o Stimulating new services and multimedia functionalities exploitation;
 - o Opening new markets for distribution, e-publishing, advertising, entertainment, ODL, edutainment, infotainment, with mobile and pervasive systems;
 - o Suggesting models and formats for interactive multimedia music coding, distribution and protection;
 - o Suggesting guidelines for the adoption of present standards in connection with standardisation bodies such as MPEG;
- **Knowledge and information:**
 - o Giving a clear view of present market and technology state of the art, best practice and trends;
 - o Providing access to a large database of state of the art, requirements, technologies and solutions;
 - o Providing information and support on EC activities in multimedia music area;
 - o Offering training on the latest technologies, standards and solutions;
- **Visibility and accessibility:**
 - o Offering wider visibility for research and technology innovations;
 - o Offering free access for everyone to all kinds of information;
 - o Creating an environment where partners identification according to skills is viable and simple;
- **Consulting and Standardisation management:**
 - o Collecting problems and suggesting solutions for problems concerning multimedia music and innovative technologies;
 - o Mediating the work of companies and research centres with the work of standardization bodies;
 - o Identification of requirements;
 - o Production of call for technologies in the standard bodies.

The above technical objectives are addressed thanks to a set of activities aimed at creating a collaborative environment where content providers and corporate users may access research results and technological solutions so as to make the technology transfer easier, nominally:

- Co-ordinating a set of expert working groups on the most important topics; producing guidelines, state of the art reports... in order to cope with problems met in bringing music coding, distribution and protection into the interactive multimedia age.
- Recently managing an Ad Hoc Group in MPEG on Symbolic Music Representation, SMR, <http://www.interactivemusicnetwork.org/mpeg-ahg/>.
- Organizing a set of workshops and conferences, inviting experts and decision makers to highlight and solve technical and business problems.
- Organising workshops open to everybody, often co-located with other conferences¹.
- Maintaining a portal for supporting all the above mentioned services.

2.2 The Working Groups of the MUSCINETWORK

As already stated MUSICNETWORK addresses several aspects of music, involving a large group of participants belonging to different states and having different cultures and technology skills. Most of the results produced by the project, therefore, have also a strong value for non-European countries and the

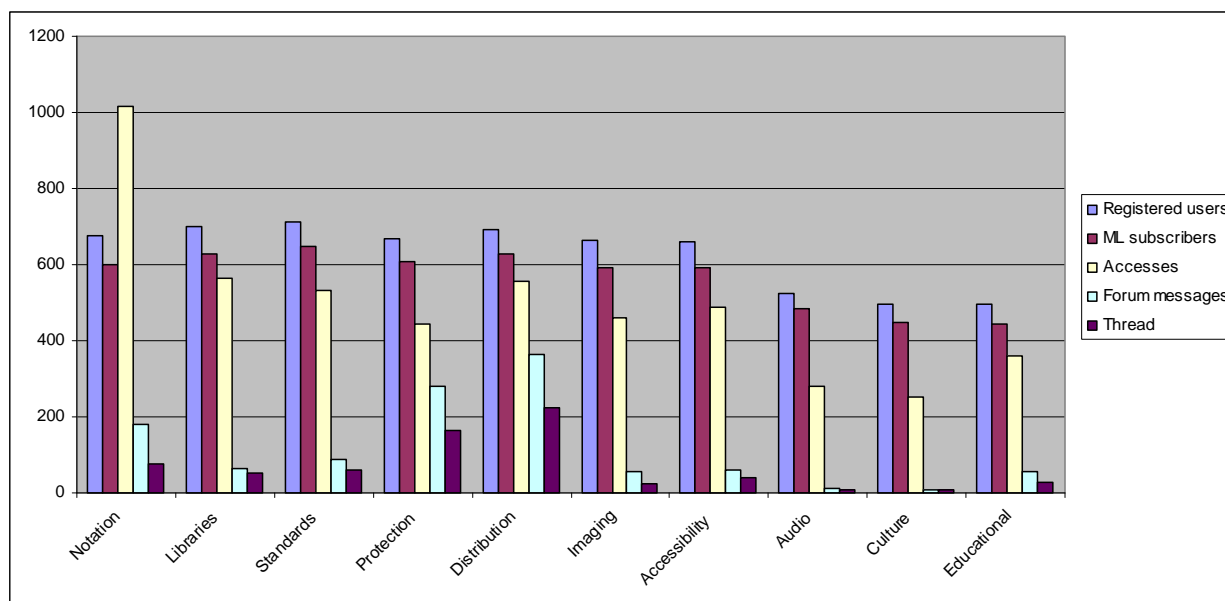
¹ WEDELMUSIC2003, MPEG meeting March 2004, WEDEMUSIC2004, IAML, IAMIC, etc.
MUSICNETWORK Project

inclusion of participants from non-EU states has always been encouraged. Several different working groups have been established and interested parties have been involved in the work.

- *Music Notation.* This group examines each and every aspect of coding music notation, including modern music notation, format conversion, lyric modelling (multilingual aspects), fonts, and defining standards for music symbols, standardisation into MPEG and other bodies.
- *Music Libraries.* This group has a cross-domain perspective including museums, archives, industry catalogues and other collections. It deals with metadata, information and content based retrieval, digital libraries, technological, legal and standardization developments, sharing documents and content.
- *Music in Multimedia Standards.* This working group examines multimedia standards for music coding, including audio and video coding (mpeg7, mpeg21 etc), portable internet formats, synchronization, media integration and other standardization aspects, with MPEG and other bodies.
- *Music Distribution.* This group examines the distribution of coded music including streaming, Internet, distribution models (B2B, B2C, P2P, etc.), mobile systems, WEB-TV, Mobile, and transaction models (on-line, off-line, kiosks, virtual shops).
- *Music Protection.* This group is devoted to issues related with the protection of coded music, such as encryption, fingerprint, watermark, Digital Rights Management, profiling functionalities, active and passive protection, and other security issues.
- *Music Accessibility.* This working group examines music coding for print impaired people (visually impaired, dyslexic, etc), and studies accessibility issues, user interfaces, computer assisted software and devices and the provision of music in alternative formats.
- *Music Imaging.* This working group focuses on issues relating to imaging and processing of music sheets, printed music scores and handwritten manuscripts, including music image acquisition, acquisition of music with different types of page support, digitising ancient music, coding for images, optical restoration and preservation, and optical music recognition (OMR).
- *Music audio.* This working group is focused on audio processing aspects such as: conversion from audio to music notation, query by content, beat tracking, audio shrinking and stretching, audio recognition and comparison for personalization, etc.
- *Music education.* This group analyses and works on educational aspects of music with the support of the information technology and pedagogical aspects. In particular it deals with the aspects of: cooperative work on music notation, performances, virtual conductor, virtual orchestra, playing instruments by using internet support, e-learning, distance teaching, courseware tools, assessing music performances, self learning, software tools for music education, etc.
- *Music culture.* This working group addresses the cultural aspects of music and musicology. This permits to consider music in the related historical period, while considering also the interpretation aspects related to that musical context.

3 Consumptive Activities of the Working Groups

The activities of the Working groups reflect the requests of the participants as depicted in the following graph.



Among the WG that on Music Notation seems to have a little bit more work. In any cases, the traffic on the WGs is not high. Most of the subscribers are in the MUSICNETWORK only to get new information and not to contribute or discuss.

3.1 WG-Notation and WG-Standard (DSI, IRCAM)

In this section it is summarised what has been done in the WG on Music Notation.

- Over 320 documents posted on the web pages, some of these are in the top ten.
- 115 posts in 110 threads on the forum
- 17 events listed in the web pages
- 50 projects mentioned in the web pages
- 9 relevant research groups mentioned in the web pages
- 9 experts mentioned
- 80 bibliographical entries listed in the web pages
- 25 WEB pages of the WG, including those of the MPEG AHG on Music Notation
- **Dissemination**
 - The dissemination has been done in several manners. At conference, and meetings, and distributing emails for stimulating the contribution and the joining, and with direct emails.
 - EC concertation meetings
 - WEDELMUSIC2002 Conference, December 2002, Darmstadt (FHGIGD, DSI, UNIVLEEDS, IRCAM , etc.), Exposition and conference, flyer distribution, presentation
 - ICMAI, September 2002, presentation of a Paper and Poster
 - IST November 2002, Copenhagen, flyer distribution
 - Tempo Reale Workshop, Florence, TR, December 2003, flyer distribution, presentation
 - IBC 2002, September 2002, Amsterdam, fair, flyer distribution
 - MPEG Meetings In Norway, July 2003
 - EVA 2003, Florence, March, presentation and flyer distribution
 - European Music Navigator Open e-commerce Symposium 2003, March, presentation and flyer distribution
 - IBC 2003, Amsterdam, September fair, flyer distribution
 - MAXIS 2003, UK, April, announce and flyer distribution
 - IAMIC Conference, Rome 2003, June, Announce and flyer distribution
 - JIM in Montbeliard, 2003
 - EVA London 2003, UK, Accessibility, flyer distribution and a paper

- IST Event 2003 Milano, October 2003
- IAML Annual Conference 2003, July 2003 Tallinn
- AIIA meeting and conference, workshop on cultural heritage, Pisa, September 2003
- WEDELMUSIC 2003 conference, September 2003
- 68th MPEG Meeting, Brisbane, Australia, October 2003.
- 69th MPEG Meeting, Munich, Germany, March 2004
- IAML Annual conference, Oslo, August 2004
- WEDELMUSIC 2004 conference, September 2004
- Florence World Vision, November 2004
- 70th MPEG Meeting, Palma de Mallorca, Spain, October 2004
- 71th MPEG Meeting in Hong Kong, China, January 2005
- IFLA 2003
- AICA, Benevento, September 2004
- ISMIR 2004, October 2004, Barcelona, Spain
- EVA Florence 2005, March 2005, flyer distribution
- Frankfurt Musik Messe, April 2005, flyer distribution
- eLearning Conference, May 2005, Bruxelles
- 72nd MPEG meeting April 2005, Busan (Korea)
- **Contribution**
 - Contribution to the PULMAN guidelines
 - Contribution of MPEG document of MUSICNETWORK for Trondheim (NO) MPEG Meeting.
 - Contribution on MPEG document of MUSICNETWORK for Brisbane (AU) MPEG Meeting
 - Contribution on MPEG document of MUSICNETWORK for Waikoloa (HI) MPEG Meeting
 - Contribution on MPEG document of MUSICNETWORK for München (DE) MPEG Meeting
 - Contribution on MPEG document of MUSICNETWORK for Redmond (WA) MPEG Meeting
 - Contribution on MPEG document of MUSICNETWORK for Palma de Mallorca (ES) MPEG Meeting
 - Contribution on MPEG document of MUSICNETWORK for Hong Kong (CN) MPEG Meeting
 - Contribution on MPEG document of MUSICNETWORK for Busan (KR) MPEG Meeting
- **Production of Articles and reports**
 - ICMAI 2002 article
 - A short article on the Cultivate newsletter
 - EVA 2003 Article
 - A long article in the German IAML Newsletter “Forum Musikbibliotheken”, February 2003
 - A short announce in an article on ACM Transaction on Human Computer Interaction
 - Announces in three chapters that will be pressed in Computer Music Books.
 - Several short messages in relevant www sites: ministry, EC, news, etc.
 - AIIA meeting and conference, workshop on cultural heritage, Pisa, September 2003
 - AICA, Benevento, September 2004
 - New version of the MUSICNETWORK flyer
 - Florence World Vision, November 2004
 - Interview with Italian newspaper (La Repubblica, February 2005)
- **Organisation**
 - 1st MUSICNETWORK Workshop, December 2002, Darmstadt (all partners). The documents, presentation, minutes of the discussions, etc. Have been posted in the WWW site of the MUSICNETWORK and made available for all.
 - Rome, Italy, October 2002, a short seminar, presentation, flyer distribution
 - MIDEM, January 2003, with a Panel, flyer distribution, presentation in a Panel
 - MusikMesse, March 2003, Frankfurt, Fair, a stand, presentation and flyer distribution
 - Meeting in Milan, September 2002, Major publishers: Ricordi, Nuova Carish, Rugginenti, Suvini, Sonzogno, Curci, corso magenta
 - 2nd MUSICNETWORK Open Workshop, September presentation and flyer distribution
 - MPEG, Music Notation Ad Hoc Group Organisation
 - Music Notation Workshop at the Open Workshop of MUSICNETWORK, September 2003
 - Workshop on Music Notation Resonance, October 2003.

- 3rd MUSICNETWORK Open Workshop, March 2004, Munich, Germany
- 4th MUSICNETWORK Open Workshop, Barcellonja (Spain), September 2004
- Workshop of MUSICNETWORK MPEG AHG on SMR, Palma de Mallorca (Spain), October 2004
- Workshop of MUSICNETWORK MPEG AHG on SMR: Assessment for Symbolic Music Representation Proposals Paris (France), February 2005...
- 5th MUSICNETWORK Open Workshop, July 2005, Vienna (Austria)

3.2 WG-Imaging(UNIVLEEDS)

- Over 30 documents posted on the web pages
- 55 posts in 23 threads on the forum
- 8 events listed in the web pages
- Many related projects listed in the web pages
- 6 relevant research groups listed in the web pages (with abstracts and links)
- Over 200 relevant bibliographical entries listed in the web pages
- 8 number of expert mentioned with further links
- 10 web pages
- Several presentations and moderations at internal project meetings
- Development of the MUSICNETWORK Working Group Imaging (WG-Imaging), including regular presentations of the working group and the project for national (UK) research/funding councils (AHRB/RPSRC), conferences, commercial/industrials meetings etc.
- Dissemination and presentations at a wide range of conferences and relevant events, including
 - EVA Harvard 2002 (Harvard, USA)
 - WEDELMUSIC International Conferences 2002, 2003, 2004
 - EVA London 2003, 2004, 2005 (London, UK)
 - ICDAR 2003 (Edinburgh, UK)
 - RESONNANCES 2003 (Paris, France)
 - Music Tech Education Conferences 2003, 2004 (Leeds, UK)
 - Musikmesse 2003 (Frankfurt, Germany)
 - EuroMold, 3 – 6 December 2003 (Frankfurt, Germany)
 - ACS (International Trade Fair for Computer Systems in the AEC Industry), 19 – 21 Nov 2003 (Frankfurt, Germany)
 - International Conference on Digital Technologies & Performing Arts, 2003 (Doncaster, UK)
 - International Conference on New Interfaces for Musical Expression, Hamamatsu, Japan, 3–5 June 2004 (UNIVLEEDS)
 - 5th International Conference on Music Information Retrieval Audiovisual Institute, Universitat Pompeu Fabra, Barcelona, Spain, 10–14 October 2004 (UNIVLEEDS)
 - McGill University, invited lecture, Canada, 29–30 Oct 2004 (UNIVLEEDS)
 - International Computer Music Conference (ICMC), Miami, USA, 1–6 Nov 2004 (UNIVLEEDS)
 - Live Algorithms for Music workshops, 13-14 December 2004, Goldsmiths College, UK (UNIVLEEDS)
 - ICMC 2005 (Barcelona, Spain, to be performed)
 - IST2004: The Hague, The Netherlands (DSI, IRC, COMVERSE, UNIVLEEDS, etc.)
 - AISB 2004 Convention: Motion, Emotion and Cognition (Leeds, UK)
 - MPEG and SMR meetings (October 2004 Palma de Mallorca, Spain; March 2004, Munich, Germany)
 - Gesture Controlled Audio Systems, Oslo University, 2–3 Dec 2004 (UNIVLEEDS)
 - London 3D Imaging Technology Conference & Applications Workshops, 15-18 February 2005, New Computer Engineering Building, University College London, London (UNIVLEEDS)
 - International Conference on Multimedia, Image Processing and Computer Vision (IADAT-micv2005), Madrid, Spain, 30 March – 1 April 2005 (UNIVLEEDS)
 - LAM Research Workshop, Goldsmiths College, 11 April 2005 (UNIVLEEDS, to be performed)

- AISB Convention (Artificial Intelligence and the Simulation of Behaviour), 12-15 April 2005, University of Hertfordshire, UK (UNIVLEEDS, to be performed)
- International Workshop on Gesture in Human-Computer Interaction and Simulation, 18-20 May 2005, University of Bretagne Sud, Vannes, France (UNIVLEEDS, to be performed)
- EVA London, UK, 2005 (UNIVLEEDS, to be performed)
- and other ICSRiM & UNIVLEEDS related events such as:
 - Visiting scholars
 - Local councils (including the Mayor of Leeds)
 - National councils and related networks
 - UK Digital Music Research Network events
 - EPSRC Interdisciplinary network workshops and meeting, 2005
 - UK National Science Week workshops 2004 and 2005
 - British Education fair 2003, Kuala Lumpur, Malaysia
 - Arts Council England (meetings and visits)
 - ICSRiM research meetings and symposiums
 - The Sounds of the Guitar: A Global Crossroads, November 26th and 27th, 2004, University of Leeds, UK,
- Production of Articles and reports
 - Contributions to the PULMAN final report 2003 (Music and Non-Print Material Section)
 - Various articles as presented in MUSICNETWORK Open Workshops
 - Articles as presented in the above mentioned dissemination activities
 - Book chapter on Optical Music Recognition
 - An article on OMR in a Special issue of the Journal of New Music Research (to appear)
- Cooperation
 - Expert workshop, Fraunhofer IGD, Rostock, Germany, 25–27 March 2004 (UNIVLEEDS)
 - and with relevant organisations, such as
 - MusicXML
 - PULMAN, MINERVA,
 - Music Imaging Ltd
 - Capella
 - major publishers including
 - Associated Board,
 - Boosey & Hawkes,
 - Peter Editions
 - optical music recognition (OMR) software companies including:
 - SharpEye
 - Capella
 - and others
- Organisation
 - Participation in other MUSICNETWORK working groups, including WG-Education, WG-Standards, WG-Accessibility, WG-Notation and others
 - Hosted the MUSICNETWORK supported first Symposium on Gesture Interfaces for Multimedia Systems, 29 March 2004, ICSRiM – University of Leeds, UK
 - Hosted the Second MUSICNETWORK Open Workshop, ICSRiM - University of Leeds, UK, 2003-08-12
 - Hosted the MUSICNETWORK supported MAXIS 2003: International Festival and Symposium of Sound and Experimental Music, 10—13 April 2003, ICSRiM – University of Leeds, UK

3.3 WG-Library (MICA)

- 69 documents posted on the web pages. Bernhard Guenther's paper on Music Library standards "Music Representation for Music Libraries" is leading the list of the most downloaded documents.
- 63 posts in 52 threads on the forum
- 9 events listed in the web pages
- 26 other projects listed in the web pages (with abstracts and links)
- 26 relevant research groups listed in the web pages (with abstracts and links)

- 81 standards and technologies listed in the web pages (with abstracts and links)
- 18 bibliographical entries listed in the web pages
- 6 other important online resources listed in the web pages (with abstracts and links)
- Several presentations and moderations at internal project meetings
- Presentations and articles for numerous conferences, events and publications
 - IST Event Copenhagen 2002,
 - EAS European Music Education Congress Wien 2003,
 - IAMIC Annual Conference Rome 2003,
 - IAML Annual Conference Tallinn 2003 plenary session,
 - IAML Annual Conference Tallinn 2003 Orchestra and Broadcasting Branch session,
 - “Forum Musikbibliotheken” 2003/1
 - IAML Austria Meeting October 2003
 - IAML / IASA Congress Oslo August 2004
 - MIDEM 2005
 -
- Cooperations
 - with several branches of IAML - International Association of Music Libraries, Archives and Documentation Centers (survey on digital technologies in music libraries, starting summer 2003)
- Participation in other MUSICNETWORK working groups, optimizing synergies with WG-Libraries
- Contributions to
 - PULMAN final report 2003 (Music and Non-Print Material Section)
- Organisation
 - Preparations for a joint MUSICNETWORK /IAML/IASA session during the IAML Annual Conference Oslo 2004
- Involvement of experts and advisors volunteering for the Working Group, e.g.:
 - Ole Bisbjerg, Head of Danish State and University Library Aarhus Music Department
 - Michel Fingerhut, Head of IRCAM Paris Mediatheque
 - Thomas Lebnitz, Head of Musiksammlung Oesterreichische Nationalbibliothek
 - Jutta Lambrecht, Head of WDR Schall- und Notenarchiv
 - John H. Roberts, University of California, Berkeley, President of IAML
 - Federica Riva, Conservatorio di musica 'Arrigo Boito' Parma
 - Tim Crawford, City University, London

3.4 WG-Accessibility(FNB)

- 1 experts mentioned
- 16 bibliographical entries listed in the web pages
- 7 WEB pages of the WG
- Production of Articles, presentations and reports
 - EVA London, 2003
 - DAISY General Conference, Amsterdam
 - IFLA Section Libraries for the Blind Pre-conference, Marburg
 - AAATE Dublin
 - Braille Music Conference, Madrid
 - Organised sound Journal article(in print)
 - Paper Presentation and Poster Presentation Elpub Electronic publishing conference 2005(forthcoming)
 - Paper and Presentation Open Source Systems conference Genova(forthcoming)
 - Several papers and networking sessions ICCHP 2004 Paris
 - Position paper for CEN/ISS MMI-DC workshop on metadata for accessibility
 - Submission to CVHI Granada
 - Book Chapter “Designing accessible software for music applications”(forthcoming)
 - Position papers for MPEG on accessibility
- Participation:

- Frankfurt MusikMesse
- Network Session Chair: “Providing and maintaining accessible music solutions” IST 2004 Conference, Den Haag

Participation in other MUSICNETWORK working groups (Notation, Standards, Libraries, Imaging and Education), optimising synergies with WG-Accessibility . This included attendance of at MPEG meetings to support the activities of the Ad-Hoc group for Symbolic Music representation.

- Contributions to
 - PULMAN final report 2003 (Music and Non-Print Material Section)
- The WG Accessibility is encouraging the participation of members at many international conferences ,and has arranged to give papers, demonstrations etc throughout the duration of the Music Network. Forthcoming conferences include: International Federation of Library Associations (IFLA); International Association of Music Libraries (IAML); International Conference on Music & Artificial Intelligence (ICMAI); Conference on Assistive Technologies for Vision & Hearing Impairment (CVHI); European Bureau of Library, Information and Documentation Associations (EBLIDA); European Association of Information Services (EUSIDIC); International Council for Education of People with Visual Impairment (ICEVI); International Conference on Technology and Persons with Disabilities (CSUN); World Blind Union (WBU)

3.5 WG-Distribution (RIGEL)

- 120 documents posted on the WG-Distribution document repository:
 - 20 downloaded more than 100 times (out of a total 200 documents downloaded more than 100 times for the whole MUSICNETWORK)
 - 3 documents downloaded more than 1000 times (out of a total of 25 documents downloaded more than 1000 times for the entire MUSICNETWORK)
- 363 posts in 220 threads on the forum
- 13 events listed in the web pages
- 29 other projects listed in the web pages (with abstracts and links)
- 11 relevant research groups listed in the web pages (with abstracts and links)
- 16 standards and technologies listed in the web pages (with abstracts and links) considering also 9 technologies described and evaluated in the technology surveys documents available.
- Preparation of surveys, scientific papers and technology reports:
 - A technology survey document (available at the WG-Distribution website) where main technologies for secure digital music delivery and DRM are described and evaluated.
 - A technology report on Apple iTunes new music distribution service (prepared in collaboration with WG-Protection), scoring a total of about 10 thousands successful downloads, and becoming the “best seller” of all the documents either produced as result of the MUSICNETWORK activities or even simply uploaded into the MUSICNETWORK repositories.
 - (in collaboration with WG-Protection) of a technology report on Buy.com music distribution service.
 - Analysis of the “Sheet Music Publisher” Scenario, addressing the requirements and needs of a typical player in the distribution value chain: an on-line publisher of sheet music. Requirements are considered for a correct and efficient production, exchange and distribution of sheet music and by products, enforcing IPR and copyrights. Collected requirements and needs are then compared with the developing MPEG21 framework identifying major challenges and critical success factors.
 - Preparation of a scientific paper submitted and accepted at the WEDELMUSIC 2004 International Conference, containing the main results from the “Sheet Music Publisher” Scenario analysis. Michel Girer, Bernhard Günther, Martin Schmucker, Francesco Spadoni, “MPEG-21 and Music Notation Applications”, International Conference on Web Delivering of Music Scores, Barcelona (E), September 13-14, 2004. Abstract available at: <http://csdl.computer.org/comp/proceedings/wedelmusic/2004/2157/00/21570028abs.htm>,
 - Preparation of a report on Distribution of Coded Music, containing the outcome of different initiatives undertaken and the results achieved by the WG Distribution, in terms of analysis of the market, technologies, products and services, emerging business models, existing problems and potential solutions. The work put good effort in highlighting the importance of the needs of end-users and consumers of music when considering the major problems as well

as the new behaviours and possibilities originated by the availability of music in digital format. Available at:

http://www.interactivemusicnetwork.org/documenti/view_document.php?file_id=1135

■ Dissemination

- Contacts with business partners to promote the work and objectives of the MUSICNETWORK
- MUSICNETWORK Flyers and brochure distribution
- Contribution to preparation of subsequent versions of the flyer,
- Contacted companies, organisation and institutions potentially interested in the MUSICNETWORK activities

■ Collaborations

- A promising collaboration has been established with the MUSICNETWORK 's Protection WG, since a lot of hot topics and aspects (DRM, Distribution Technologies, Business Models, users acceptance) are common to the two WGs,
- Results about analysis and studies for the "Sheet Music Publisher" Scenario have been referenced and published at the Digital Media Project (DMP) site by Leonardo Chiariglione <http://www.dmpf.org/open/dmp0248.zip>

■ Participation:

- MUSICNETWORK First Open Workshop in Darmstadt, December 2002
- Frankfurt MusikMesse, March 2003
- MUSICNETWORK Second Open Workshop in Leeds, 9-12 September 2003
- IST 2003 and SMAU, Milan, October 2003
- MUSICNETWORK Third Open Workshop in Munich, 13-14 March 2004 (co-located with the MPEG meeting),
- Review Meeting MUSICNETWORK, EUFO, Luxembourg, 30 June 2004.
- WEDELMUSIC 2004 international conference, 13-14 September 2004
- MUSICNETWORK Fourth Open Workshop in Barcelona, 14-15 September 2004

■ Organisation

- Contribution to the organisation of the first and second Open Workshop
- Contribution to the organisation of the third and forth Open Workshop

3.6 WG-Protection (FHGIGD)

- over 50 documents posted on the web pages
- approximately over 200 posts on the forum on the WG protection and several more on other WGs
- 22 events listed in the web pages
- 11 other projects listed in the web pages (with abstracts and links)
- 19 relevant research groups listed in the web pages (with abstracts and links)

■ Preparation

- (in collaboration with WG-Distribution) of a technology report on Apple iTunes new music distribution service.
- (in collaboration with WG- Distribution) of a technology report on Buy.com music distribution service.

■ Dissemination

- Promotion of MUSICNETWORK to partners and other organisations
- Distribution of flyers
- Directly contacting companies, organisation and institutions that might be interested in MUSICNETWORK
- Presentations at workshops and conference, e.g. IST Conference 2004 in Den Haag, Wedelmusic Conference, Barcelona 2004, or CAST-Forum February, 2005 (together with WG Libraries).

■ Collaborations

- Due to common areas a collaboration with the WG Distribution was initiated
- Together with WG Libraries investigation of future distribution platforms.

■ Participation and Contribution to :

- MUSICNETWORK First Open Workshop in Darmstadt, December 2002
- Frankfurt MusikMesse, March 2003

- EMN conference 2003, Vienna (presentation about content protection and DRM)
 - MUSICNETWORK Second Open Workshop in Leeds, September 2003-09-12
 - MUSICNETWORK Third Open Workshop in Munich, 2004
 - MUSICNETWORK Fourth Open Workshop in Barcelona, 2004
 - MUSICNETWORK MPEG Meeting, Munich, September, 2004
 - MUSICNETWORK MPEG Meeting, Paris, February, 2005
 - Organisation
 - Local arrangement of the first Open Workshop in Darmstadt
- Contribution to the organisation of the first and second Open Workshop

In the forum we contributed the discussion by answering questions where necessary and relevant. Several news have been distributed. We also tried to start discussions by raising relevant questions. However there is a low activity concerning the participants: 163 threads with 282 posts results in a mean depth of two, This hardens the assumption that the participants within the WG Protection consider MUSICNETWORK as an information source, which is also confirmed by the fact that our news were recently distributed on other mailing lists.

3.7 WG-Education (ILABS)

The work group on education (WG-Education) has a transversal role, it intends to foster exchange of points of view, results, doubts, needs, information on all topics related to education. Is open to participants coming from all other groups and has provided so far a review of the current situation, key emergent themes, technologies and information about main contributors and events in the areas referencing:

- 352 Total access: (Italy: 225 - Europe: 113 - Rest of world: 14)
- 91 Documents loaded
- 14 leaning platforms
- 18 major content providers and educational ISP
- 136 major project in the field
- 23 educational portals and e-commerce site
- 6 music on-line courses
- 17 national policies and educational sources links
- 40 references to other music related educational links and tools
- 3 references to accessible educational tool
- 110 references to other relevant and interesting sources
- 56 Messages posted:
- 22 events mentioned in the web pages

Moreover the WG responsables have taken care of promoting both WG and project activities through:

- Presentation of WG-Education activities
 - IAMIC 2003
 - EAS 2003 via paper print out distribution
 - SEN-IST-NET, E-MUSE, WEBKIT, FLIC, VISIRE project partners and also to our R&D and commercial partners
- Participation in other MUSICNETWORK working groups providing documents and posting news into the forum
- Provided documents have been categorised and ordered according to content, sources and relevance

4 Integration of results

Multimedia music content owners and distributors, such as publishers, archives, libraries, conservatories, music shops, music information technology and commercial companies are extremely interested in exploiting new methods for providing content in a fast and simple way with new interactive multimedia functionalities. However, they are afraid of losing their content or money by selecting non standard, unstable and unsafe formats. Most multimedia music content owners and distributors are converting their archives of music scores from paper to images and symbolic notation to survive in the market. Typically, they also have differently organised archives where several other related digital objects are collected: images, documents, lyric and videos. This material is not organised and quite rarely managed by an integrated Digital Asset Management database and tools for their integrated inspection.

In the era of Internet, the market of multimedia music content and of its applications is strongly dependent on the Internet evolution market. The most relevant exploitation of digital content and tools will be via Internet, e-commerce and m-commerce mechanisms.

4.1.1 MUSICNETWORK working groups and activities

Multimedia music presents several aspects: coding of symbolic music notation, coding of image sequences of music scores, multilingual lyric that can be mounted on symbolic notation of music according to the specific indexing, images related to music notation symbols or lyric, video related/synchronised to music notation symbols or image scores or documents or lyric text, audio files related and synchronised with music in symbolic format and images of music scores, protection aspects of audio and/or video and/or music scores such as watermarking or fingerprint, verbal description of videos and documents and scores for blind people, etc. To bring music coding into new multimedia interactive applications is a complex task which requires for its definition, understanding and solution the integration of the knowledge of several aspects. 7 areas of work have been identified, where several different competencies have to be used/integrated in order to produce models and solutions to be shared by a large part of users.

The working groups that have been identified are:

- **WG-MN:** coding music notation
- **WG-ML:** music coding for libraries,
- **WG-MMS:** multimedia standards for music coding
- **WG-DCM:** distribution of coded music,
- **WG-PROT:** protection of coded music,
- **WG-MPIP:** music coding for print impaired people,
- **WG-CIMS:** coding images of music sheets.

The working groups are also addressing transversal problems and applications, such as the copyrights aspects, the educational aspects of music, legal problems, etc. The integration activity of the Working group work is the tool to construct a complete view of the mentioned transversal aspects.

The main aspects that every WG has considered are the following:

- ρ **State of the art and Standard review:** identification of the state of the art in the specific area of the working group; identification and monitoring of the standards, standard the facto widely recognised in the specific area of the working group: collection of information and documents related to these standards; identification and monitoring of technical leading partners of the sector, in terms of market and technical solutions; assignment of a responsible for each standard (some of them are naturally present in the consortium since they are or have been involved in standard bodies) from the working group participants; verification of standards against the needs expressed by the requirements and test cases.
- ρ **Market Monitoring and Analysis:** Monitoring the market size of tools and activities related to the working groups. Monitoring the technology and the market of leading partners evolution. Monitoring the user type for the functionalities and formats. Monitoring the political and legal aspects related to the formats and tools. Monitoring the legal aspects related to the exploitation of content. Monitoring the behaviour of music content providers in regard of the aspects. Monitoring and analysing the end-user profile and the usage context for the technology.

- ρ **Technology Watch and Contribution to Standards:** The monitoring of the technology used by leading partners of the sector. Monitoring security aspects related to the adoption of content with technology of the working group. Assessment of the current technology for the new media and distribution mechanisms. Definition of mechanisms and key aspects for assessing technology. Description of the main functionalities of each category of tools related to the working group area. Survey of solutions and technologies adopted in the working group area. The production of reports with comments regarding the applicability of standards in specific music coding area managed by the working group. Contribution with specific guidelines to the most related bodies of standards, such as Mpeg7 and Mpeg 21.
- ρ **Model Definition and guidelines production:** Social and cultural analysis of user needs and of working group technologies. Description of the detailed user needs which can be related to aspects of the working group. Production of consumptive technology report of working group. Production of reports/guidelines regarding the most important technical solutions identified. Strategies and guidelines for achieving best practices, including practices in the field of education; Strategies and guidelines for improving interoperability and exchanges between systems;

The results produced by each group need to be integrated to produce a uniform analysis and possibly seamless solutions. The next step is to stimulate the identification of integrated solutions and models.

4.2 Results of Integration

On the basis of the analysed activities and feedbacks from participants, each Working Group proposed suitable models and solutions. The obtained results and the developed models, and the knowledge extracted, are now being integrated. The integration proceeded at three main levels:

- Performing collaboration and joint initiatives involving two or more Working Groups,
- introducing a uniform integrated model integrating all aspects of music and multimedia,
- defining an integrated set of products and services for the MUSICNETWORK,
- building a self-sustainable MUSICNETWORK association to continue to pursue the MUSICNETWORK objectives after the end of this project.

4.3 WGs joint initiatives

The following paragraphs contain information concerning activities, initiatives and works jointly performed by two or more Working Groups of the MUSICNETWORK, in order to integrate the results obtained separately and to stimulate cross-fertilisation among different thematic areas and market sectors.

4.3.1 Music Notation and Imaging Working Groups

OMR (optical music recognition) tools are applications dealing with aspects related to the Notation WG (music notation models and formats) and to the Imaging WG (image recognition techniques, etc.), for this reason some activities are joined between the two working groups.

The joint activities performed as of March 2004 dealing with OMR tools were:

- The definition of a "Quick-Test" for OMR software. The "Quick-Test" consists of a three-page dataset and encompasses the most frequently found Common Western Music Notation symbols. It is designed to be used as a first evaluation of OMR tools to find out the capabilities of the software. The "Quick-Test" dataset can be downloaded from the documents section of the Imaging WG on the MUSICNETWORK website. The first results have been published on the last Deliverable of WG imaging and made public for all on the www site.
- The definition of OMR tools evaluation metrics, a set of evaluation categories (based on music notation symbols and their relationships, and their importance using specific weights) and some evaluation indexes for the global estimation of the performance. The first results have been published on the last Deliverable of WG imaging and made public for all on the www site.
- The preparation of a questionnaire to find evaluation categories weights to estimate the performance of OMR tools. The questionnaires were distributed at the 2nd MUSICNETWORK workshop to experts. The questionnaires collected were 17 from OMR experts, Notation experts, music editors users, engravers,

and music library experts. The results of the evaluation of questionnaires is reported in the MUSICNETWORK deliverable - Coding Images of Music Sheets - DE4.7.1.

- A first assessment of three OMR tools (SmartScore, SharpEye2 and O³MR) was performed using a data-set of 7 images covering the basic and more advanced music notation symbols (triplets, small notes, ornaments, etc.), the results of the assessment are reported in the deliverable DE 4.7.1.

4.3.2 Music Notation and Standards Working Groups

4.3.2.1 Summary of the activities performed

Works on integration between Notation and Standards working groups have been started very early, when it becomes clear for these working groups that a joint activity in MPEG was needed.

The purpose of this joint activity was aimed to integrate Music Notation in MPEG. The activity started in May 2003 (month 10), with the joint elaboration of a proposal for the MPEG meeting in July 2003, in Trondheim. The MPEG group has agreed on the setting of a Ad Hoc Group, which is, in MPEG parlance, a specific group aimed to study a particular topic, in that particular case the Music Notation and its possible integration in MPEG. A mailing list (a reflector in MPEG parlance) has been settled up, as well as a web site.

During the whole process, a number of intermediate documents have been produced: user's scenarios, intermediate reports, requirements. All these documents are available on the Web site.

A request for Expressions of Interest has been produced, in order to show interest of music community.

Expression of Interest have been received, from the academic world as well as from industries.

From the academic world, Expressions of Interest have been received from institutions like Libraries or research institutions. From industries, Expressions of Interest have been received from companies dealing with audio processing (automatic generation of scores from audio), or dealing with optical recognition of music scores, or even dealing with e-learning and education.

Finally, a workshop dedicated to a common elaboration of requirements for Music Notation in MPEG 4 has been organized in collocation with the 68th MPEG meeting in Munich, March 2004.

4.3.2.2 OFFICIAL INPUT MPEG ISO DOCUMENTS provoked by the MUSICNETWORK

- Paolo Nesi, DSI, University of Firenze, Italy, Giorgio Zoia, EPFL, Switzerland, Jerome Barthelemy, IRCAM, France, Pierfrancesco Bellini, DSI, University of Firenze, Italy, David Fuschi, ILABS, GIUNTI, Italy, David Crombie, FNB, The Netherlands, Francesco Spadoni, RIGEL, Italy, Kia Ng, University of Leeds, UK, Martin Schmucker, FHGIGD, Germany; **“Proposal for Music Notation Modeling and its Integration within MPEG-4 and MPEG-7”**, MUSICNETWORK IST Network and related working groups (DSI, IRCAM, EPFL), Throndenheime, Norway, July 2003.
- Paolo Nesi (DSI, University of Firenze), Giorgio Zoia (EPFL), Pierfrancesco Bellini (DSI, University of Firenze), Jerome Barthelemy (IRCAM). **“Music Notation Application Requirements and MPEG Technology”**, AHG on Music Notation Requirements, Brisbane, Australia, October 2003.
- Paolo Nesi (DSI, University of Firenze), Pierfrancesco Bellini (DSI, University of Firenze), Giorgio Zoia (EPFL), Jerome Barthelemy (IRCAM), **“Music Notation Functionality and Interface to MPEG”**, AHG on Music Notation Requirements, Waikoloa, USA, December 2003.
- Paolo Nesi (DSI, University of Firenze), Pierfrancesco Bellini (DSI, University of Firenze), Giorgio Zoia (EPFL), Jerome Barthelemy (IRCAM), **“Music Notation Technical Requirements”**, AHG on Music Notation Requirements, Waikoloa, USA, December 2003.
- Jerome Barthelemy, Benoit Meudic, Marc Texier, **“Proposal for Music Instrumentation and WeightedScales Descriptors and Descriptor Scheme”**, as a result of the workshop on Music Libraries.
- Giorgio Zoia (EPFL), James Ingram, **“A new Application Scenario for Music Notation in MPEG”**. This document presented the “synthetic opera” application scenario, introducing new requirements in terms of interaction with other media, including visual SNHC, and in terms of content protection (MPEG-4 IPMP/IPMPX). AHG on Music Notation Requirements / MUSICNETWORK, Munich, Germany, March 2004.

- **MPEG2004, ISO/IEC JTC1/SC29/WG11**, Paolo Nesi (DSI, University of Firenze), Pierfrancesco Bellini (DSI, University of Firenze), Giorgio Zoia (EPFL), Jerome Barthelemy (IRCAM), **“Music Notation Technical Requirements and Integration in MPEG-4”**, AHG on Music Notation Requirements / MUSICNETWORK, Munich, Germany, March 2004.
- **MPEG2004, ISO/IEC JTC1/SC29/WG11**, Paolo Nesi (DSI, University of Firenze), Pierfrancesco Bellini (DSI, University of Firenze), Giorgio Zoia (EPFL), Jerome Barthelemy (IRCAM) **“Proceedings of AHG on Music Notation Requirements / MUSICNETWORK”**. This document includes all together most of the contributions by different experts; it includes further examples of music notation related applications and examples of music notation xml formats and tools. Munich, Germany, March 2004.
- James Ingram, **“Position Paper about the SMR Draft Call for Proposals”**, Containing some comments on document M11083 provided by James Ingram. AHG on Symbolic Music Representation, Redmond, Washington state, USA, July 2004,
- Paolo Nesi (DSI, University of Firenze), Pierfrancesco Bellini (DSI, University of Firenze), Jerome Barthelemy (IRCAM), James Ingram, David Crombie, **“Draft Evaluation Criteria for Assessing SMR Proposals”**, AHG on Symbolic Music Representation, Redmond, Washington state, USA, July 2004,
- Paolo Nesi (DSI, University of Firenze), Pierfrancesco Bellini (DSI, University of Firenze), Jerome Barthelemy (IRCAM), James Ingram, David Crombie, Neil McKenzie, **“Examples of Matching SMR aspects and available technologies”**, AHG on Symbolic Music Representation, Redmond, Washington state, USA, July 2004,
- G. Zoia, Jerome Barthelemy, Pierfrancesco Bellini, Paolo Nesi and Mikael Bourges Sevenier (Mindego inc.), **“Graphic functionality in MPEG-4 and Symbolic Music Representation”**, AHG on Symbolic Music Representation, Redmond, Washington state, USA, July 2004,
- Paolo Nesi, Giorgio Zoia, James Ingram, Pierfrancesco Bellini, **“Study on Draft Cfp on Symbolic Music Representation”**, AHG on Symbolic Music Representation, Redmond, Washington state, USA, July 2004,
- Michael Good, **“Response to Draft Call for Proposals N6457”**, containing comments on the last version of the Draft Call for Technology on SMR, from Michael Good, Recordare, US; AHG on Symbolic Music Representation, Redmond, Washington state, USA, July 2004,
- David Crombie, Roger Lenoir, Neil McKenzie, **“Accessible Information in MPEG”**, Palma de Mallorca, Spain, October 2004
- Paolo Nesi, Giorgio Zoia, James Ingram, Pierfrancesco Bellini, Jerome Barthelemy, M. Campanai, Kia Ng, Giuseppe Nicotra, David Crombie, **“Proposed SMR Evaluation Model and Procedure”**, AHG on Symbolic Music Representation / MUSICNETWORK, Palma de Mallorca, Spain, October 2004, accessible at: <http://www.interactivemusicnetwork.org/mpeg-ahg/Proposed-SMR-Evaluation-Procedure-v1-0.doc>
- Jerome Barthelemy, Gregoire Carpentier, **“Proposal for a Core Experiment of WeightedScalesDS”**, Palma de Mallorca, Spain, October 2004.
- Giorgio Zoia, Pierfrancesco Bellini, Paolo Nesi, Jerome Barthelemy, **“MPEG-4 and SMR: report on available functionality for graphics”**, AHG on Symbolic Music Representation / MUSICNETWORK, Palma de Mallorca, Spain, October 2004,
- David Crombie, Roger Lenoir, Neil McKenzie: **“Proposed Technology for accessible SMR decoders”**, Hong Kong, Cina, January 2005.
- Maurizio Campanai, Pierfrancesco Bellini: **“WEDELMUSIC as SMR proposal”**, Hong Kong, Cina, January 2005.
- G. Bertoni: **“Proposal for Braille Music Symbolic Representation”**, Hong Kong, Cina, January 2005.
- Tillmann Weyde, Hartmut Ring: **“Proposal for Symbolic Music Representation Format”**, Hong Kong, Cina, January 2005.
- Hyoung-Joong Kim, Yong-Soo Choi, Yong-Ju Cho: **“SMR on the Korean Symbolic Music Representation”**, Hong Kong, Cina, January 2005.

4.3.2.3 OFFICIAL PUBLIC and OUTPUT MPEG ISO DOCUMENTS provoked by the MUSICNETWORK

All the content that has been used to create the following documents are accessible as single or multiple pages attached to the MPEG AHG main web page:

<http://www.interactivemusicnetwork.org/mpeg-ahg/index.html>

- **MPEG2003, ISO/IEC JTC1/SC29/WG11**, Paolo Nesi (DSI, University of Firenze), Giorgio Zoia (EPFL), Pierfrancesco Bellini (DSI, University of Firenze), Jerome Barthelemy (IRCAM), “**Application Requirements of Multimedia and Music Notation**”, AHG on Music Notation Requirements / MUSICNETWORK, Brisbane, Australia, October 2003. (ISO public Document ISO/IEC JTC 1/SC 29/WG 11 N6049)
- **MPEG2003, ISO/IEC JTC1/SC29/WG11**, Giorgio Zoia (EPFL), Paolo Nesi, Pierfrancesco Bellini (DSI, University of Firenze), Jerome Barthelemy (IRCAM), “**Application Scenarios for Music Notation integrated in MPEG**”, AHG on Music Notation Requirements / MUSICNETWORK, December 2003, Waikoloa, Hawaii, USA, (ISO public Document as ISO/IEC JTC 1/SC 29/WG 11 N6149).
- **MPEG2004, ISO/IEC JTC1/SC29/WG11**, “**Workplan for Core Experiment on Music Instrumentation and Weighted Scale Type**”, March 2004, Munich, Germany.
- **MPEG2004, ISO/IEC JTC1/SC29/WG11**, “**Draft Call for Proposals for Symbolic Music Representation**”, AHG on Music Notation Requirements / MUSICNETWORK, March 2004, Munich, Germany, (ISO public Document as ISO/IEC JTC 1/SC 29/WG 11 N6457).
- **MPEG2004, ISO/IEC JTC1/SC29/WG11**, “**Call for Proposals on Symbolic Music Representation**”, Audio Subgroup, Public document, Redmond, USA, July 2004. (ISO public Document ISO/IEC JTC 1/SC 29/WG 11 N6689) accessible at: <http://www.interactivemusicnetwork.org/mpeg-ahg/w6689.zip>
- **MPEG2004, ISO/IEC JTC1/SC29/WG11**, “**DRAFT SMR Evaluation Procedure**”, Audio Subgroup, Public document, Redmond, USA, July 2004. (ISO public Document ISO/IEC JTC 1/SC 29/WG 11 N6690) accessible at: <http://www.interactivemusicnetwork.org/mpeg-ahg/w6690%20%28DRAFT%20SMR%20Evaluation%20Procedure%29.doc>
- **MPEG2004, ISO/IEC JTC1/SC29/WG11**, “**SMR Evaluation Model and Procedure**”, Audio Subgroup, Public document, Palma de Mallorca, Spain, October 2004. (ISO public Document ISO/IEC JTC 1/SC 29/WG 11 N6812) accessible at: <http://www.interactivemusicnetwork.org/mpeg-ahg/>
- **MPEG2005, ISO/IEC JTC1/SC29/WG11**, **Workplan for the Evaluation of Responses to the CFP on SMR**, Hong Kong, January, Cina, (ISO Document ISO/IEC JTC 1/SC 29/WG 11)
- **Mandate of the MPEG AHG on SMR**, Hong Kong, January, Cina, (ISO Document ISO/IEC JTC 1/SC 29/WG 11)
- **MPEG2005, ISO/IEC JTC1/SC29/WG11**, **Audio Subgroup, Report on Symbolic Music Representation RM0 Selection**, April 2005, Busan, Korea (ISO Document ISO/IEC JTC 1/SC 29/WG 11)
- **MPEG2005, ISO/IEC JTC1/SC29/WG11**, **Audio Subgroup, Workplan for Symbolic Music Representation**, April 2005, Busan, Korea (ISO Document ISO/IEC JTC 1/SC 29/WG 11)
- **Mandate of the MPEG AHG on SMR**, April 2005, Busan, Korea (ISO Document ISO/IEC JTC 1/SC 29/WG 11)

4.3.2.4 Chronological report of the activities performed

Joint activities performed for the integration of Notation and Standards WGs results can be summarised in chronological order according to the following points:

- **May-July 2003**: elaboration of a proposal (an input document) on the integration of Music Notation into the MPEG framework for the 65th MPEG meeting.
- **July 2003**: participation to the 65th MPEG meeting (Trondheim, NO) which established the Ad-Hoc group on Music Notation Requirements.
- **August-October 2003**: discussions on the reflector and preparation of input document on Music Notation Application Requirements for the 66th MPEG meeting.

- **October 2003:** participation to the 66th MPEG meeting (Brisbane, AU) in which was decided to continue the work on requirements.
- **November-December 2003:** discussions on the reflector and preparation of two input documents on Music Notation Application Requirements and integration of Music Notation into the MPEG framework for the 67th MPEG meeting.
- **December 2003:** participation to the 67th MPEG meeting (Hawaii, USA) in which was decided to continue the work on requirements and on application scenarios.
- **January-March 2004:** discussions on the reflector and preparation of a input document on Music Notation Application Requirements and integration of Music Notation into the MPEG framework for the 68th MPEG meeting.
- **March 2004:** organization of the 3rd MUSICNETWORK workshop/Ad-hoc Group meeting co-located with the 68th MPEG meeting, in the AHG meeting the requirements were refined and discussed with the Music Notation and MPEG experts. In the meeting it was decided to change the AHG name to “Symbolic Music Representation” because the term “Music Notation” was felt too restrictive.
- **March 2004:** participation to the 68th MPEG meeting (Munich, DE) in which a draft call for proposal for Symbolic Music Representation was produced.
- **March 2004:** integration of results of workshop on Music Libraries and MPEG in documents produced by AHG on music notation.
- **April-July 2004:** discussions on the reflector and preparation of three input documents into the MPEG framework for the 69th MPEG meeting in Redmond USA. These documents have been presented by P. Nesi.
- **July 2004:** MPEG meeting in Seattle, US, July 2004, Meeting of MPEG AHG on Symbolic Music Representation. At the meeting, the document containing the requirement has been transformed as the official CALL for PROPOSAL on Symbolic Music Representation.
- **August-October 2004:** the work of this period can be divided in different phases; 1) work done through the reflector generated approximately 120 emails that were exchanged among the subscribers of the *mn-mpeg* email reflector (with about the half of the subscribers from the industry); the informal call for weight tables to be used in evaluation received 21 answers.
- **August 2004:** MUSICNETWORK organises a Special Session at the Joint IAML - IASA Congress Oslo, August 8-13, 2004
- **September 2004:** organization of the 4th Open workshop in Barcelona. In that meeting the “Assessment model for SMR” and “Examples on matching technology” related to MPEG have been discussed.
- **October-November 2004:** Presentation of the SMR (requirements and Call for Proposal) at the ICMC conference in Miami (International Computer Music Conference, with more than 300 attendees usually), US, November 2004, presentation performed by Kia Ng, UNIVLEEDS.
- **October 2004:** MUSICNETWORK workshop on SMR: “Model Assessment for Symbolic Music Representation”, co-located with the 70th MPEG meeting in Palma de Mallorca
- **October 2004:** meeting of MUSICNETWORK MPEG AHG on SMR with IEEE-IMS (27 October Milan, Italy) to investigate the possibility of an agreement and/or liaison between the Musicnetwork + MPEG AHG and the IEEE PAR 1599 Group (see section 6.12 for details).
- **January 2005:** participation to the 71th MPEG meeting in Hong Kong, China.
- **February 2005:** Workshop on the Assessment of Symbolic Music Representation in Paris. The meeting has been organised in IRCAM premises. The assessment of the quality of the Symbolic Music Representation models has been performed on the basis of the assessment model.
- **April 2005:** participation to the 72th MPEG Meeting in Busan, Korea
- **July 2005:** organization of a meeting of the MUSICNETWORK MPEG AHG on SMR during the 5th MUSICNETWORK Open Workshop in Vienna (Austria) on “Integration of Music in Multimedia Applications”
- **July 2005:** participation to the 73th MPEG Meeting in Poznań, Poland,

4.3.2.5 Some figures about the activities of the MPEG Ad-hoc group, from 08/2003 to 10/2004

- 625 mails exchanged by about 80 persons very active;
- 127 experts persons registered to the AHG reflector
- about 50% of companies
- 18 Expressions Of Interest (EOIs) have been received
- hundreds of people joining the AHG MPEG meetings

4.3.3 Standards and Libraries Working Groups

4.3.3.1 Summary of the activities performed

Works on integration between Libraries and Standards working groups have been started in December 2003, with the preparation of a workshop held in Munich in March 2004 in parallel with the 68th MPEG meeting. The purpose of the workshop was to try to exchange the point of views from different communities: the MPEG community, and the Librarians community. To this aim, a call for proposals was launched, calling for new experiments and applications in domains related to music description, cataloguing, searching, and exchange of information. At the same time, librarians were invited to present libraries current practices, standards, and needs.

During the workshop, a document was produced in common in order to analyse potential common works of MPEG and Music Libraries experts. Particularly, the document makes a SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis of possible relationships between the Music Libraries world and the MPEG community. The document lists possible future Proposals and Contributions to MPEG-7, and recommends the elaboration of guidelines. The document is available on the MUSICNETWORK web site.

As both communities traditionally are hardly connected to each other so far, even if MPEG-7 claims to be a very broad metadata platform, the task demanded high integration efforts. Here the Working Group design of the MUSICNETWORK has proven to be quite helpful. The workshop succeeded in bringing very different stakeholders together and creating a very productive atmosphere to identify the different approaches and perspectives, as well as showing possible directions for further developments.

4.3.3.2 Brief summary of the SWOT analysis for MPEG-7 and library integration

The following analysis has been done for assessing the impact and rationales to proceed in the direction of stimulating the MUSICNETWORK work into the direction of MPEG7. Most of this work has been done in the Munich meeting and as a consequence of the meeting, in March 2004.

Strenghts

- New possibilities of music representation/description
- Share and build up knowledge about how to develop metadata in an interoperable way
- Interoperability beyond (partners of) a specific project
- Relation to automatic extraction of information/metadata
- Agreements on cataloguing/classification issues (e.g. by profiling -> instrumentation)
- Framework for using and improving standards for applications instead of starting from scratch
- Paves the way for standardized benchmarking for intelligent applications involving multimedia metadata and search/retrieval (better possibilities to compare results)
- Toolbox approach allows for sub-setting of standards for particular applications

Weaknesses

- Missing symbolic representation, or at least missing bi-/multi-directional connection between symbolic representation and realisation (no cross-reference to scores, thus no possibility to connect MPEG-7 metadata to the score)
- Score-based similarity search etc. still more reliable than audio-based similarity search
- Over-/underspecified descriptors (e.g. „author“ leaves out most roles of persons involved in the creation of a multi-faceted music object, such as arranger, conductor etc.)

- What's bridging the gap between low-level and high-level descriptors in order to obtain a useable kind of information about music?
- Automated metadata generation will not be able to replace manual cataloguing and classification for quite a while
- Complexity/size of the standard makes validation hard (10000 lines of XML code needed for the validation of 10 lines); need for XML scheme subsets
- IP status of MPEG-7: unclear licensing conditions for the use of MPEG-7 in applications

Opportunities

- New services for end users/library patrons, e.g. browsing through an opera or a music video
- Additional features based on automated classification rather than on manual classification
- Multimedia as a way (e.g. for libraries) to bring heterogeneous formats and kinds of information together (e-learning, publications, ...)
- Accessing fragmentary content: splitting a single item into different chunks e.g. for music analysis
- Description as a proxy of the „original“ data (legally easier P2P distribution of metadata instead of the „original“ data?)
- MPEG-7 is bound to play a major role in the Semantic Web; use cases should be developed

Threats

- Missing interest from information management technology providers and users to move towards MPEG
- Difficulties in finding the initial user base
- IP problems with (automatically generated) metadata as derivative works

Documents produced:

- Participation to report of the Music Notation AHG activities (MPEG document m10466)
- Workshop report
- Submission of a document to the 68th MPEG meeting, Munich (MPEG document m10568)
- Core Experiments to be held in MPEG (w6454 , WG11 document, approved by MPEG).

4.3.3.3 Joint Libraries / Standards Activities, figures:

- 30 Experts attending the workshop
- 9 presentations made (available on the MUSICNETWORK web site)
- 1 proposal elaborated, accepted by MPEG.

4.3.4 Music Notation and Education Working Groups

The WG on Music notation and that on Music Education have already collaborated since the beginning when the construction of the WG on music education has been set up.

The collaboration has been concretised in the production of content in the deliverables and in the WWW pages. The integration among these two groups is quite natural and supported by the activities on Music Education via Music notation such as on projects like:

- WEDELMUSIC
- IMUTUS and
- MUSC14ALL that have not reached the funding yet was very positively assessed and evaluated.

On this line in a past open Workshop a collaboration section has been organised in which some products for music education via music notation have been assessed:

- FINALE
- WEDELMUSIC
- Etc.

Further results of such cooperation have been the dissemination activities performed by WG-education in respect of the project in all contexts where WG-education representatives (chair included) have been invited both at national and international level.

4.3.5 Music Accessibility and Education Working Groups

At present WG-education has been contacted by CEN-ISSS-APLR to start with IMS a joint initiative for the possible definition of a new set of metadata for learning objects. The new set of metadata should be focused on accessibility and related issues. Informal request for exchange of contribution has been made. Some results of such cooperation are reflected in the proposed structure for the related metadata and in the related foreseen developments.

Possible further cooperation are under exam in order to launch a joint proposal for further initiatives in the field of accessibility with a specific focus on support tools and technologies (exploiting nowadays state of the art technology developed for other field or purposes).

Invitation to take part to the: Metadata for Accessibility Workshop on the 30th April in Brussels has been received. CEN/ISSS WS/MMI-DC organizes this event in conjunction with CEN/ISSS WS/LT APLR (Accessibility Properties for Learning Resources) project (<http://www.cenorm.be/sh/mmi-dc>). WG-Education and WG-Accessibility presented a paper to this event even though it was not possible to directly attend.

Through the discussion lists, the accessibility work group has advised on the other groups, ensuring that the specifications and guidelines of the Accessibility WG are incorporated and reused, within the other developing work and standards.

The accessibility WG have also monitored and contributed to the Ad hoc MPEG discussion list (now the SMR ad hoc MPEG list). Specific deliverables of work related to the Accessibility WG are outlined below:

- As a result of the Conference in Madrid (June 2003), Arca and Veia Progetti have started an open discussion list (www.resonare.org). This list exists to discuss the various standards available and in use for Braille music. The list highlights the problems that are inherent to the current use cases and also how the use of Braille music could redefine improvement to the format. The list is moderated by Bettye Krolick and helped promoting the debate held at the International Conference on Braille Music that took place in Zurich, Switzerland, Sept. 23-25, 2004
- As part of ICCHP 2004(7-9 July 2004, Université Pierre et Marie Curie, Paris, France) a STS (Special thematic Session) took place on “making music accessible”(http://projects.fnb.nl/am/sts.html). The Special Thematic Session on Making Music Accessible focus on new approaches to this area, with a particular interest in:
 - initiatives which provide enhanced access to music
 - innovative use of existing and new technologies
 - incorporation of recognised international standards and guidelines
 - multimedia music authoring environments
 - new distribution channels

4.3.6 Music Accessibility, Notation and Standard Working Groups

The music Accessibility group has produced a glossary on music notation in partial collaboration with the music notation WG, which in the past has also provided a list of symbols and connection with several other glossaries.

Recently the WG on accessibility started a work of revision of the requirements identified in the MPEG activities of WG Notation and WG Standard to verify their suitability for supporting Braille and Spoken Music.

4.3.7 Protection and Distribution Working Groups

The main joint initiatives performed by the two working groups involved in protection and on-line distribution of music resulted in technical documents, surveys and analysis as well as the organisation of workshop, as summarised in the following paragraphs:

- Technical report analysing Apple iTunes Music Store and its success factors. Besides the technical aspects, user and customer aspects as well as content aspects are considered. Furthermore, iTunes Music Store's impact to online music distribution services is analysed and a short outlook to future music online distribution is given. The document is currently available at the MUSICNETWORK document repository at: http://www.interactiveMUSICNETWORK.org/documenti/view_document.php?file_id=430

- Technical report analysing BuyMusic.com on-line music distribution service. The report is available at: http://www.interactiveMUSICNETWORK.org/documenti/view_document.php?file_id=599
- Working draft defining the main evaluation criteria and metrics to compare on-line music distribution services (like Apple iTunes Music Stores and BuyMusic.com) and related enabling technologies. At: http://www.interactiveMUSICNETWORK.org/documenti/view_document.php?file_id=600
- Position paper to be presented at the 3rd MUSICNETWORK Workshop in Munich (13th and 14th March 2004) summarizing the music notation requirements on the digital distribution of content. The motivation is a revision of MPEG-21 according to the needs of music related content distribution. Although MPEG-21 was designed content type independently, a revision is reasonable. We don't not expect to detect any necessity for significant changes of MPEG-21. However, MPEG-21 also contains media related information, e.g. the rights expression languages (REL) and the rights data dictionary (RDD),
- Organisation of a workshop on Protection and distribution and MPEG21, at the 3rd MUSICNETWORK Open Workshop in Munich (13th and 14th March 2004). More information available at: http://www.interactiveMUSICNETWORK.org/events/Third_OpenWorkshop_2004/MUSICNETWORK_OW-March-2004-Description-v1-4-clean.htm.
- Presentations, position papers and materials from the organised events and sessions,
- Contributions to MPEG documents on issues related to distribution and protection of multimedia content.
- Preparation of a scientific paper submitted and accepted at the WEDELMUSIC 2004 International Conference, containing the main results from the "Sheet Music Publisher" Scenario analysis. Michel Girer, Bernhard Günther, Martin Schmucker, Francesco Spadoni, "MPEG-21 and Music Notation Applications", International Conference on Web Delivering of Music Scores, Barcelona (E), September 13-14, 2004. Abstract available at: <http://csdl.computer.org/comp/proceedings/wedelmusic/2004/2157/00/21570028abs.htm>.
- Analysis of the "Sheet Music Publisher" Scenario, addressing the requirements and needs of a typical player in the distribution value chain: an on-line publisher of sheet music. Requirements are considered for a correct and efficient production, exchange and distribution of sheet music and by products, enforcing IPR and copyrights. Collected requirements and needs are then compared with the developing MPEG21 framework identifying major challenges and critical success factors.
- Definition of Use Cases and Requirements collection for MPEG-21 support to on-line publishing and distribution of IPR-protected sheet music", in collaboration with Michel Girer, Notissimo/Listesso. The results of this activities, and the Requirements in particular, have been appreciated and requested by Leonardo Chiariglione's DMP (Digital Media Project). have been referenced and published at the DMP web site, <http://www.dmpf.org/open/dmp0248.zip>
- Preparation of a report on Distribution of Coded Music, containing the outcome of different initiatives undertaken and the results achieved by the WG Distribution, in terms of analysis of the market, technologies, products and services, emerging business models, existing problems and potential solutions. The work put good effort in highlighting the importance of the needs of end-users and consumers of music when considering the major problems as well as the new behaviours and possibilities originated by the availability of music in digital format. Available at: http://www.interactivemusicnetwork.org/documenti/view_document.php?file_id=1135,
- The joint effort of the Working Groups Protection and Distribution produced good results in terms of quality and quantity of the activities performed within the Distribution section of the MUSICNETWORK web portal: 120 documents posted on the WG-Distribution document repository, 20 of which downloaded more than 100 times (out of a total 200 documents downloaded more than 100 times for the whole MUSICNETWORK), 3 documents downloaded more than 1000 times (out of a total of 25 documents downloaded more than 1000 times for the entire MUSICNETWORK), 363 posts in 220 threads on the forum (as of March 2005).

4.4 Integration of business services

MUSICNETWORK has so far proved to be a quite unique case and not only in Europe, proposing an integrated and unified model and a language for music notation, together with its related multimedia and protection aspects, while still considering standardisation of solutions and formats.

MUSICNETWORK offers a unique set of services to the community:

- **Innovation and stimulation:**
 - o Stimulating new services and multimedia functionalities exploitation;
 - o Opening new markets for distribution, e-publishing, advertising, entertainment, ODL, edutainment, infotainment, with mobile and pervasive systems;
 - o Suggesting models and formats for interactive multimedia music coding, distribution and protection;
 - o Suggesting guidelines for the adoption of present standards in connection with standardisation bodies such as MPEG;
- **Knowledge and information:**
 - o Giving a clear view of present market and technology state of the art, best practice and trends;
 - o Providing access to a large database of state of the art, requirements, technologies and solutions;
 - o Providing information and support on EC activities in multimedia music area;
 - o Offering training on the latest technologies, standards and solutions;
- **Visibility and accessibility:**
 - o Offering wider visibility for research and technology innovations;
 - o Offering free access for everyone to all kinds of information;
 - o Creating an environment where partners identification according to skills is viable and simple;
- **Consulting and Standardisation management:**
 - o Collecting problems and suggesting solutions for problems concerning multimedia music and innovative technologies;
 - o Mediating the work of companies and research centres with the work of standardization bodies;
 - o Identification of requirements;
 - o Production of call for technologies in the standard bodies.

The above technical objectives are addressed thanks to a set of activities aimed at creating a collaborative environment where content providers and corporate users may access research results and technological solutions so as to make the technology transfer easier, nominally:

- Co-ordinating a set of expert working groups on the most important topics; producing guidelines, state of the art reports... in order to cope with problems met in bringing music coding, distribution and protection into the interactive multimedia age.
- Recently managing an Ad Hoc Group in MPEG on Symbolic Music Representation, SMR, <http://www.interactivemusicnetwork.org/mpeg-ahg/>.
- Organizing a set of workshops and conferences, inviting experts and decision makers to highlight and solve technical and business problems.
- Organising workshops open to everybody, often co-located with other conferences².
- Maintaining a portal for supporting all the above mentioned services.

Integration of results from the different working groups should provide also a uniform set of concrete products and services that the MUSICNETWORK can offer now and sale in its future to its users and new potential customers.

4.4.1 Products and services

The first problem is the identification of services and products that the MUSICNETWORK could be able to deliver to its participants. In addition, services and products are also related to the business model that we would like to implement.

² WEDELMUSIC2003, MPEG meeting March 2004, WEDEMUSIC2004, IAML, IAMIC, etc.
MUSICNETWORK Project

Contacts and networking

- Creation of a database of contacts and for information service. This is possible exploiting the huge amount of registered people and companies.
- A service can be one to provide the searching engine for experts. It is very hard to find companies interested in paying for that service since Internet can be used for the same purpose for free.

Consultancy

- Presently the MUSICNETWORK does not provide development solutions, we only analyze them and we coordinate the research in the area to cope with them. This is an indirect service for who is presenting us the problems. This is regarded as an obstacle as highlighted by people asking for solutions at the Frankfurter Musikmesse. Concerning the protection issues most of the contacts at the Messe were technical questions to get technical answer. Presently the consortium is not enough reactive to this type of activities and thus seems that the consultancy is not really viable according to the skill and the attitudes of the present partners and people involved. We should try to transform the request in contracts for partners and participants that are involved in the music network and/or for those that have the skill and are in the MUSICNETWORK to look for collaboration. This could have some value.
- consumers are looking for answers and have many questions. But there are many (subscription) models for information provision and if we can convincingly offer interesting content (from whatever perspective, be it research, market info, technical info) then it should be part of the business model.
- “people asking for solutions”, HINT for the content of the MN offer to a large group (tech consumer =66%) of potential customers. That is, one of the most important service can be “providing solutions for the digital music business”, surveying the market and technology offer, evaluating them and selling them, as consultancy, to customers. In this case we should investigate partnerships with the most important technology providers. A careful evaluation of real possibilities is needed of course.
- MUSICNETWORK could still act as a very specialized provider and helping tech consumers to find their way within the currently thousands of different offers and solutions.
- Consultancy for solving a problem, is a service. Partners are very strong in this domain and could provide valuable consultancy to the market sector. Clients may include libraries, relevant education sector. If we will decide in favour of consultancy we have to consider a framework including consulting layer, company law etc to ensure we are protected, e.g. indemnity, which has to be defined in some agreement.

Directories, eMarketplace, information exchange

- Exchanging of ideas and collaboration
- Exchanging information:
 - forum,
 - mailing lists,
 - Workshops and meetings
- we have to involve market key actors and convince them that it is worth the effort to share part of their knowledge This is presently working by means of the MUSICNETWORK workshops that permit to collect information coming from institutions and industries.

Information digest (from MUSICNETWORK to customers)

- Information (on latest technologies, research activities, standards, ...)
- But: A lot of information is available on the Internet for free (newsgroups, academic and industry websites) so people will hardly pay just for it. Also adding value to information is difficult as value depends on the usage itself.
- People pay for specific, high professional, precise, updated, revised and certified information available in an efficient way (quickly, one-stop-shop). This can be the real value added, something that will make them, as well as other customer groups, wanting to pay for an information service. Boston's MIT provide a information service on new technologies (in general) comprising a periodic “new technologies review” newsletter. We can do something similar (apart from the brand) focusing on the eMusic business. As a second step, we should think if and how MUSICNETWORK can provide such “digest” service. On this basis MUSICNETWORK can produce an “news” magazine/newsletter, rather on hard copies than on email, which will provide the news in eMusic

field. A small fee for subscription would be required, with the “collateral” benefit of giving MUSICNETWORK a more formal shape of organization. This magazine/newsletter can include apart from news, several articles and views of experts.

- One problem is the production of content and articles that can be sold, so having interesting and valuable content. This capability is in the hand of the project partners. In this direction, we are trying to realize a couple of books on the aspects of the MUSICNETWORK .
- “Information digest” service should be part of the business model. It can be the first (in time) subscription service for the MUSICNETWORK , since it is the closest to what we are providing at the moment. In addition, such service can be a good vehicle for other services, like “consultancy” or “providing 3rd-party solutions”.
- smaller companies are probably interested in a technical survey. But the question is will they find MUSICNETWORK when they are using search engines or links.
- Latest development and research efforts done at universities and research institutions are an appealing topic for companies that are looking for new developments. At the same time for R&D units (especially of universities) it can be interesting to see who is looking for what so we can also think of establishing a sort of “marketplace” where to post announcements of new developments, results.

Dissemination and promotion:

- Via our mailing list of participants
- direct announce of new products to our participants, as a forum
- promotion of products to our workshops and to associations, we should restrict the field: educational, publishers, etc.
- organizing and promoting research and development of the partners and participants at MUSICNETWORK workshops. This offer has a value in terms of visibility for who is buying the service. The registration at the conference have been keep free presently. In the next meeting the registration should become a small fee just to make clear that the service has a price and a costs for the partners and to verify if the attendees are motivated to come.
- Lists of selected (probably those that have received the seal):
 - companies, web pages for advertising, etc..
 - experts, web pages
 - products, web pages, workshops
 - tutorial, web pages, workshops
 - success stories, web pages
 - reports, web pages, workshops
 - etc.

Standards (notation, Web Services, MPEGx, ...)

- The MUSICNETWORK can become the reference body for creating and maintaining standards in the area of Computer Music. On this view and line, the WGs on Music Notation and Multimedia Music Standard are joining their effort for creating a standardized version of Music Notation integrated into MPEG. To this end, the first contact with MPEG has been established and a specific AHG has been created. <http://www.dsi.unifi.it/~nesi/mpeg/ahg-mn-65-66.html>

Publishing and selling of books, guides, surveys

- Reports can be created on demand trying to guess the market and realizing them only if the sold is profitable with respect to their cost:
 - Publication of the index with a summary and a price, index, list of figures, etc., numbers are facts and they are reasons to get the document in most cases. Word based documents are not really valuable for the market since there is a lot of them around the world for free
 - Collections of the orders
 - Verify if the report can be realized in time, otherwise it can be delayed or canceled
 - The document can be committed to experts since the beginning
 - The collection of data is needed
- Reports on hot topics (free of charger or with a price, etc..)
 - Technology review
 - Tutorials

- State of the art analysis
- Market analysis
- Critical Assessment of products, certification of products
- A good starting point e.g. for WG imaging will be selling the collected music sheets as a reference material for OMR software evaluation (if we have the permission of the publishers). This is something which we considered as added-value.
- Possible good examples of documents and books that can be distribution from money can be:
 - Conference proceedings of the conference presently they are free of charge and thus they are freely distributed.
 - Tutorials, MPEG4, Music Notation, archive management for archives, etc.
 - Reports on: OMR, Watermarking, business models, etc.
 - Test cases collections, e.g. test cases for OMR
 - Review material and tools for making it (small market)
 - Report and guidelines on standard music notation, music score digitization, music sheet digitization, etc.
 - On this line, several documents have been produced and distributed for free:
 - Comparison of music notation languages
 - Comparison of CMS for music
 - Comparison of DRM
 - Analysis of I-Tunes
 - Etc.
- Publishing and distributing CD roms with all the collected information, etc. with an internal browser, etc.

The main strength of the MUSICNETWORK with regards to products and services offered can be summarised by the following points:

- being managed by an experienced and differentiated pool of companies and organisations;
- as a consequence of the above point, having a wide and significant core set of skills and competencies in the most different fields related to digital music;
- running a (more or less) collaborative community of skilled people, which can be involved in the value chain at different levels:
 - as potential users to gather feedbacks and reactions to new products and services,
 - as sources for market analysis for new products and services,
 - as potential suppliers of services themselves (as suggested by Michel in a previous point), as potential customers of services and products sold by or through the MUSICNETWORK

The following table lists potential services and products ordered from the most probable to the less probable and difficult:

MN Services and Products	Description
Information digest (from MN to MN's customers)	News, market announcements, events related to the digital music business, case studies, technology surveys . It must be specific, high professional, precise, updated, revised and certified information available in an efficient way (quickly, one-stop-shop).
Dissemination and Promotion	To have promotion, dissemination of products, events, activities, solutions, best practices, companies, conference organization, etc.
Publishing and selling of books, guides, surveys	Production and distribution of documents that could be sold on demand or on the summary (and built only if profitable). The production of the document could be even performed by others
Sealing	Analysis of software products and guidelines, or tutorials to assign them a MUSICNETWORK seal.
Directories, eMarketplace, information exchange	A service for third party consultants and technology providers to get to their customers (and viceversa) more efficiently , to have promotion, dissemination and greater visibility
Contacts and networking	Offering participants/customers the possibility to gather new contacts and
Standards (notation, Web Services, MPEGx, ...)	Participation to various standardisation activities can generate a revenue stream in case of successful adoption. A market to explore is the definition, developement, providing, certification of Web Services standards for the eMusic market
Consultancy	Consultancy on technology and business organisation, provided directly from MN members

5 Analysis of MUSICNETWORK participants

Since the beginning of the registration of participants to the MUSICNETWORK (October 2002), the registration form of the MUSICNETWORK has requested the new participants to give us some voluntary information. This information besides the name, surname, affiliation and email consists of:

- Company Name
- State
- Personal or Company Subscription (to know if the participant was making the registration for personal use or in charge of the company or institution)
- The role in the company
- Expertise Keywords
- Major Interest about the Music Network
- Working Groups Selected

In April 2003 we also allowed the new registered participants to select an affiliation type selecting one or more of the following 16 different types:

1. Research groups, private or public, university or institution
2. Professional
3. Content producer
4. Information Technology providers, industry
5. Educational institutions: conservatory, music school
6. Archive, library
7. Associations for content
8. End user, music lover, etc.
9. Student
10. Music information centre
11. Content Distributor
12. Industrial activity
13. Industrial association
14. Broadcaster: radio and TV
15. Standardization body
16. Legal bodies

At the end of each year of work, on the basis of collected data from several sources (WEB monitoring, registration, questionnaires at the workshops, etc.), we have produced an analysis and reasoning about

- the profile of the participants,
- the expectation of participant from the MUSICNETWORK
- their potential contribution, etc.

On the basis of that data analysis, it is possible to have a clear idea about the potentiality of sustainability of the MUSICNETWORK and the services and products that could effectively make the MUSICNETWORK a stable service for the community. The trend and the evolution of these data is also a very important information since it describes the effect of the work performed by the MUSICNETWORK partners and thus the effective results obtained by the MUSICNETWORK project.

5.1 Participant Profile Analysis

The profile of the participants has been extracted from several information among those reported above. Data have been collected along the project and for the last time in last week of March 2005.

5.1.1 Role in the company

A first classification can be produced by the information about the role in the company. On the 941 participants only the 64% have given an answer to this question. In addition, 422 on the 941 have exposed their affiliation while the other has stated NONE. This means that only the 45% of the participants have filled the field about their company. Among those that have NONE (not exposed the affiliation name), about the 24% have a general provider email. This percentage is similar to that of the participants that have filled

the field but the aspects are not related since the distribution of NONE is complete non correlated with the distribution of the answers to this question.

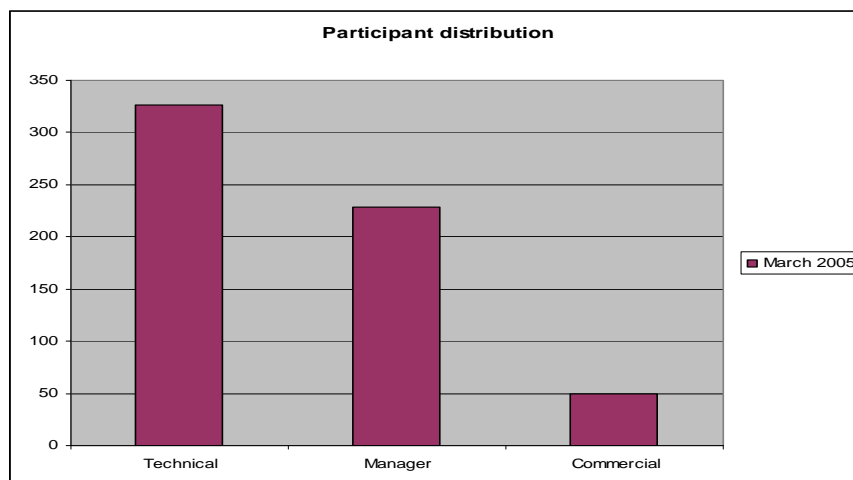
Probably the 24% of the 45%, that is the 11% of the participants are people without affiliation, such as students, retired people or professionals. Particularly, registered participant as students are 67 (that is the 7%).

The following graphic reports the percentage of participants' role. The role is a field that has been requested to be filled in the form. The first fact that can be deduced is that the participants have a strong technical 54% majority. On the other hand, the management aspect is not negligible with a 38%. The commercial role is practically absent.

The Percentage of participant that have permitted the exposition of their company name is a 36%.

ROLE	Number (Oct 2003)		Number (Aug 2004)		Number (March 2005)	
Management	142	38%	212	37%	228	38%
Technical	204	54%	289	53%	326	54%
Commercial	32	8%	46	7%	49	8%
Total	378		547		603	

Even if the number of participants is increased during the three years of MUSICNETWORK life, the distribution of roles is exactly remained the same.



The classification in management and commercial has been kept since most of the companies make this distinction. For people working in management typically a high level profile is intended, while commercial people are involved in the marketing and distribution chain. Managers are supposed to be people responsible for decisions.

It would be interesting to examine how many registered managers do belong to the marketing / commercial side of the company. Probably some persons have preferred to stress their “management” role rather than their “commercial”. This can be also seen as a factor to be taken into account if the commercial aspect is relevant but the “role” or “position” is even more important for the registered users.

In any case, the distinction can be weak and subjective. We obviously are more interested in addressing technicians and management people rather than the commercial/marketing side of the company. It should also be noted that potential customers of our current shaped consortium are the technically and management oriented people. Technical work on the content that we could provide while managers are those that decide to take the affiliation to the MUSICNETWORK or not. Several reasons for this can be identified: Management people always push the technical staff to do the ‘research/technical’ work of their company in

projects, therefore the technical staff will decide whether our network is worth mentioning to or useful for the management. Therefore, we are more technically oriented than management-oriented. On the contrary, we should have a balance from these two categories.

We have also to consider that we have two kinds of customers, those that provide and those that need technology. On both sides we have manager people and technical people. Therefore, the above distinction is too simple to derive easy conclusions.

In both categories, we can find industrial and research people, content and distributors, etc. This first classification is just to have an idea of our participants' thoughts and how they reflect themselves. Products or services that we are going to provide have to be tuned on the basis of more subtle information. This first classification is not enough to define the services and/or the products, or to decide that the MUSICNETWORK has to produce products or provide services.

The MUSICNETWORK is perceived as being a 'research-related' project and point of service, largely because of its EU funding. In this case, the first target customers are researchers and technologists who can champion our work within their companies/organisations.

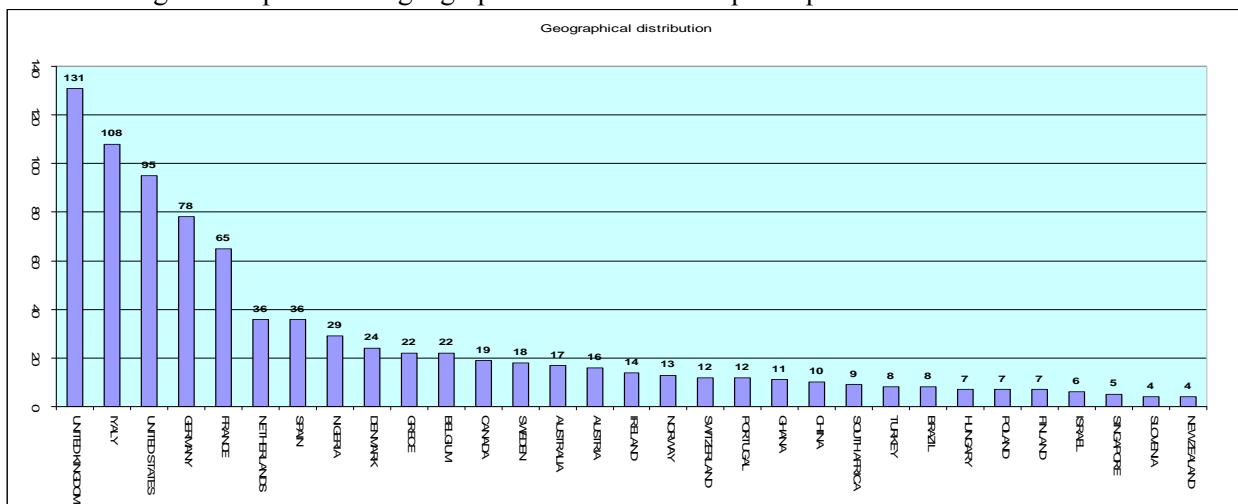
About the publishers (sheet music publishers, or multimedia publishers, or labels in general), the distinction between technicians and managers is not obvious, because there are very few technicians on their organizations. For music scores publisher the business is very ancient and traditional, while for multimedia publishers or labels the profile is more active and renovated. If some of the publishers would like to join MUSICNETWORK, probably the managers are concerned.

5.1.2 Geographical Distribution

The geographical distribution of participant is reported in the following graphic, in which the evolution along the years is reported. The figure reports the number of participants per country along the project duration.

Please note that, by considering the evolution with respect to its previous versions of the same distribution, the number of participants from UK is growing faster with respect to that of the other states. While at the beginning Italy was the most dominant participant, recently MUSICNETWORK is also acknowledged outside Europe, such as US, China, Brasil, etc. For the values of the 2005, the Europeans are the 70% of the participants, while the US and Canada cover the 12%.

The following table represent the geographical distribution of participant in march 2005.



5.1.3 Affiliation type

The participants can select one or more of the above mentioned Affiliation Types in the registration process. This possibility has been provided only since April 2003, while the data reported in the table are those referred to March 2005 (for the evolution of data some graphs are reported). Obviously people are generally not willing to provide personal information to web sites.

In March 2005, on the 941 participants 565 have provided their detailed affiliation type. Since it was possible to set more than one selection a total of 1336 selection were provided, with an average of 2.65 selections per person.

The distribution of the affiliation types for the 2005 is reported in the following graphic. The possible keywords to be selected were a mix of detailed and general keywords.

From the analysis, it is possible to identify the most important groups: research, content producers, IT providers, education and archives. They might be relevant for our future business model. On the other hand, as planned in this report and analysis of the interests of these groups to pay for the MUSICNETWORK services has to be done.

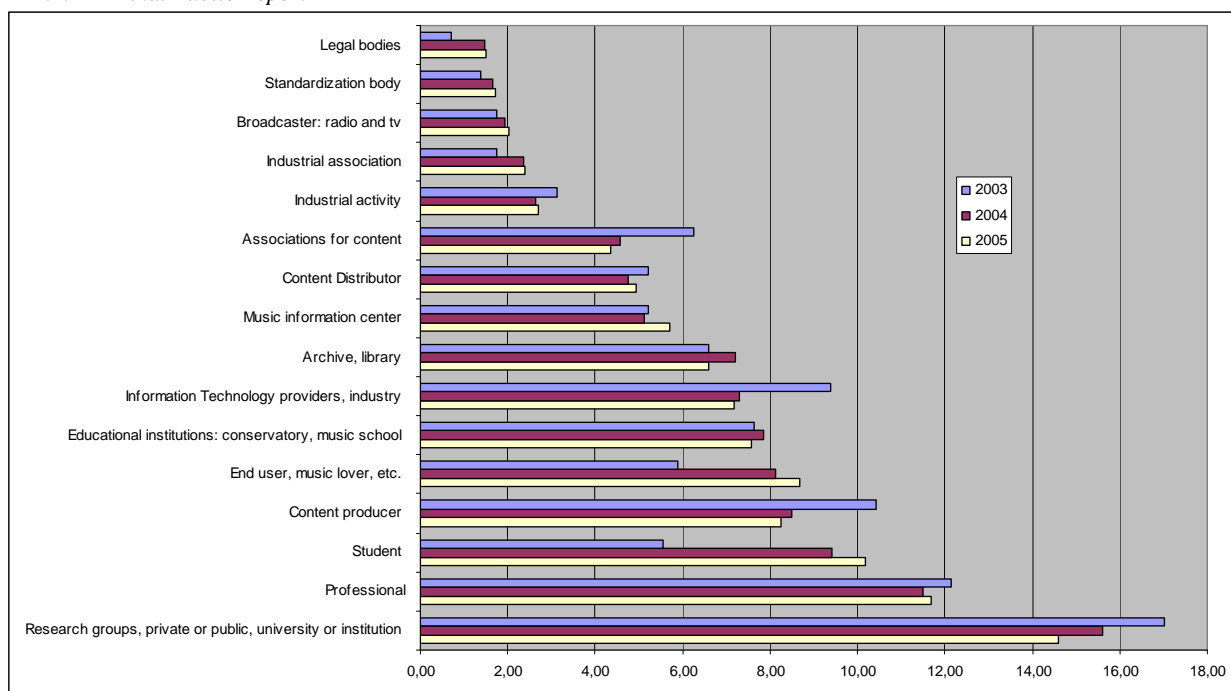
Affiliation type	number	%
Research groups, private or public, university or institution	195	14,60
Professional	156	11,68
Content producer	136	10,18
Information Technology providers, industry	110	8,23
Educational institutions: conservatory, music school	116	8,68
Archive, library	101	7,56
Associations for content	96	7,19
End user, music lover, etc.	88	6,59
Student	76	5,69
Music information center	66	4,94
Content Distributor	58	4,34
Industrial activity	36	2,69
Industrial association	32	2,40
Broadcaster: radio and tv	27	2,02
Standardization body	23	1,72
Legal bodies	20	1,50
TOTAL	1336	100,00%

It should be noted that users with an affiliation that is relevant in terms of potential will to acquire service from the MUSICNETWORK accounts for 32,99% while those that may be interesting but probably will not represent the core users for the system we have an other 30,56% for a total of 63,54%. This means that if the registered users (especially managers) are willing to acquire our services there is almost a third of registered users that could be the lead to project support after the initial phase supported by the European Commission.

The graph below is related to the evolution of above table is reported in the following with all the categories and the values registered in the 2003, 2004 and 2005. The graph reports the absolute values while a similar graph for the percentage is reported in the sequel. As it can be noted, the MUSICNETWORK as attracted a lot of professionals in the area, and they are mainly technicians. Please note that in this content, the professional has a large meaning in the sense that its definition includes also people that work in their single man company as a consultant, mainly.

From the graph, it is also true that the MUSICNETWORK participation has maintained it Academic profile.

The following table reports the affiliation type trend in percentage.



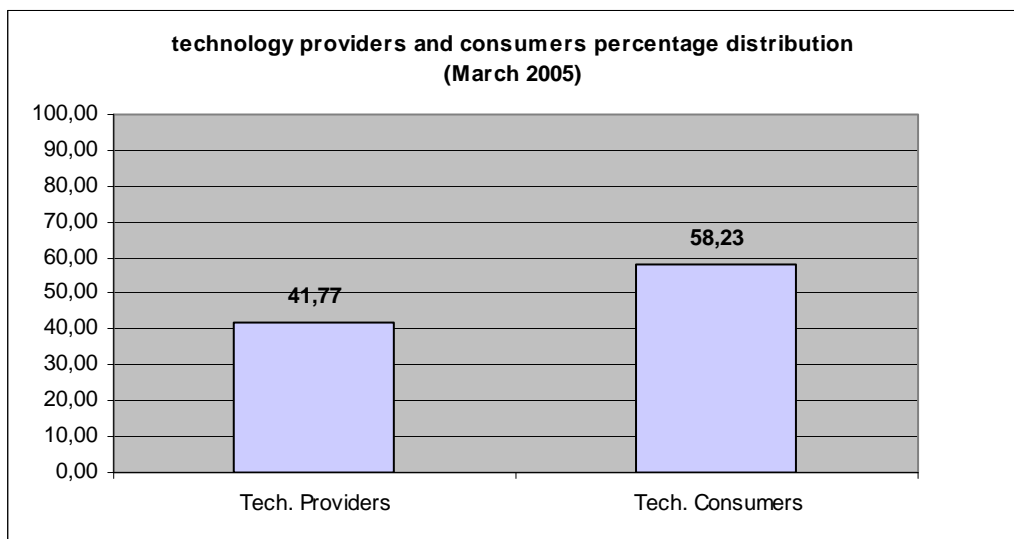
MUSICNETWORK continuously increased the number of participants. As requested in the review, MUSICNETWORK spent more effort in addressing end-customers and commercial players. These endeavors were successful: It can be noted that, according to the aim of the MUSICNETWORK, in the second and third year of the project the effort has been mainly directed in attracting less Academic but more industries and final users. This is confirmed by the following graphs in which the delta from 2004 to 2005 and that from the 2003 and 2005 are reported.

From the analysis of the above data, the whole set of data can be reclassified in those that are registered to the MUSICNETWORK to play the role of technology provider and those that are act within MUSICNETWORK as technology consumers. In this case, the professional have been counted on both sides.

	2003		2004		2005	
	Number	%	Number	%	Number	%
Technology Providers	131	45,49	466	42,56	558	41,77
Technology Consumers	157	54,51	629	57,44	778	58,23
Total	288		1095		1336	100,00

It is interesting to see that we have more technology consumers than providers in the participants and during 3 years this trend was growing. A first conclusion would be that consumers are interested about technology information and on technology itself. This is more evident from the analysis reported in the next section This section reports what they are looking for and which service from the MUSICNETWORK they consider valuable.

The following graph reports the percentage distribution of technology providers and consumers in the participant.



5.2 What the Participants are looking for

The participants of the MUSICNETWORK look for specific aspects and services on the MUSICNETWORK and from the MUSICNETWORK itself. The analysis of their motivations to make the registration on the MUSICNETWORK have been analysed on the basis of the statements that they have written during the registration.

Only the 48% of the participants have explicitly written their motivations in the registration questionnaire. Great part of the motivations were simple list of keywords and simple statements, for a total of 745 of them (for the whole project duration). In this section the analysis of those statements is reported.

The provided needs have been classified in two categories:

- Needs of Technological Information and
- Needs of other services.

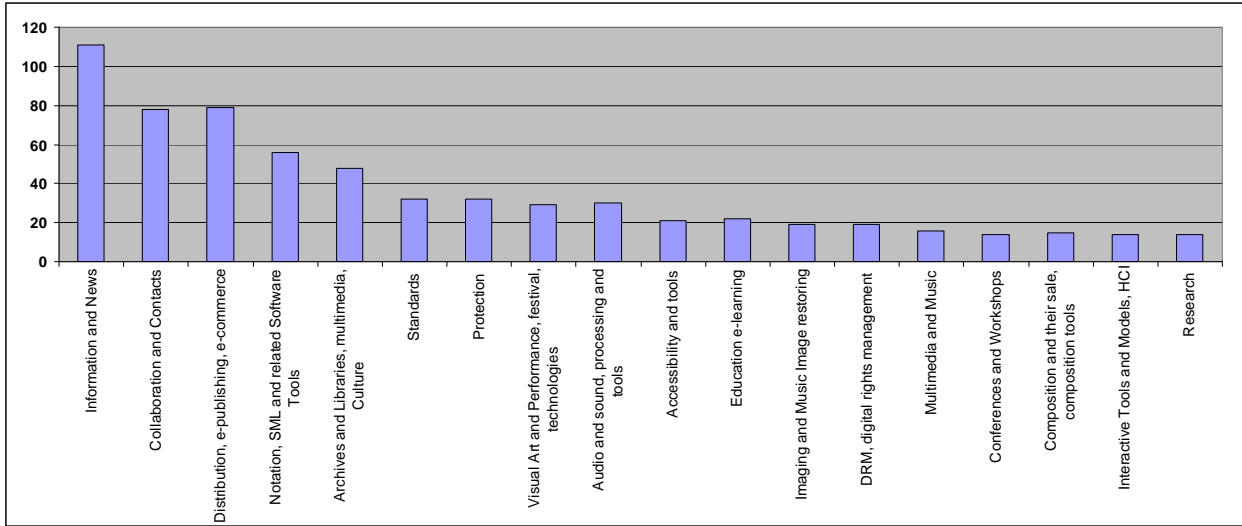
It is obvious that both of them are services and thus the providing of technological details is a service. In the next table, a classification is performed ordering them on the basis of the number of requests. The analysis of the requested services can give an idea about how the technical information can be provided and can be requested to have from the participants.

From these numbers it is evident that the most relevant service required is to get information about technical and innovative aspects and technologies. All the other services together cover only the 30%. In addition, the Need of Technological Information can be satisfied with products such as reports, deliverables, conference proceedings, review, etc. They have to be at the state of the art and interesting as argument to be attractive.

description	Number of requests August 2003		Number of requests August 2004		Number of requests March 2005	
Technical Information Needs	296	74%	460	69%	517	70%
Other Service Needs	103	25%	210	31%	221	30%
Total	399		670		738	

Distribution of the requested needs of the MUSICNETWORK participants has not changed much along the project duration, thus the values are referred to the whole data up to March 2005.

This distribution of the requested needs is reported in the next graph. Separate tables for the two groups identified above are reported in the next subsections a more detailed analysis.

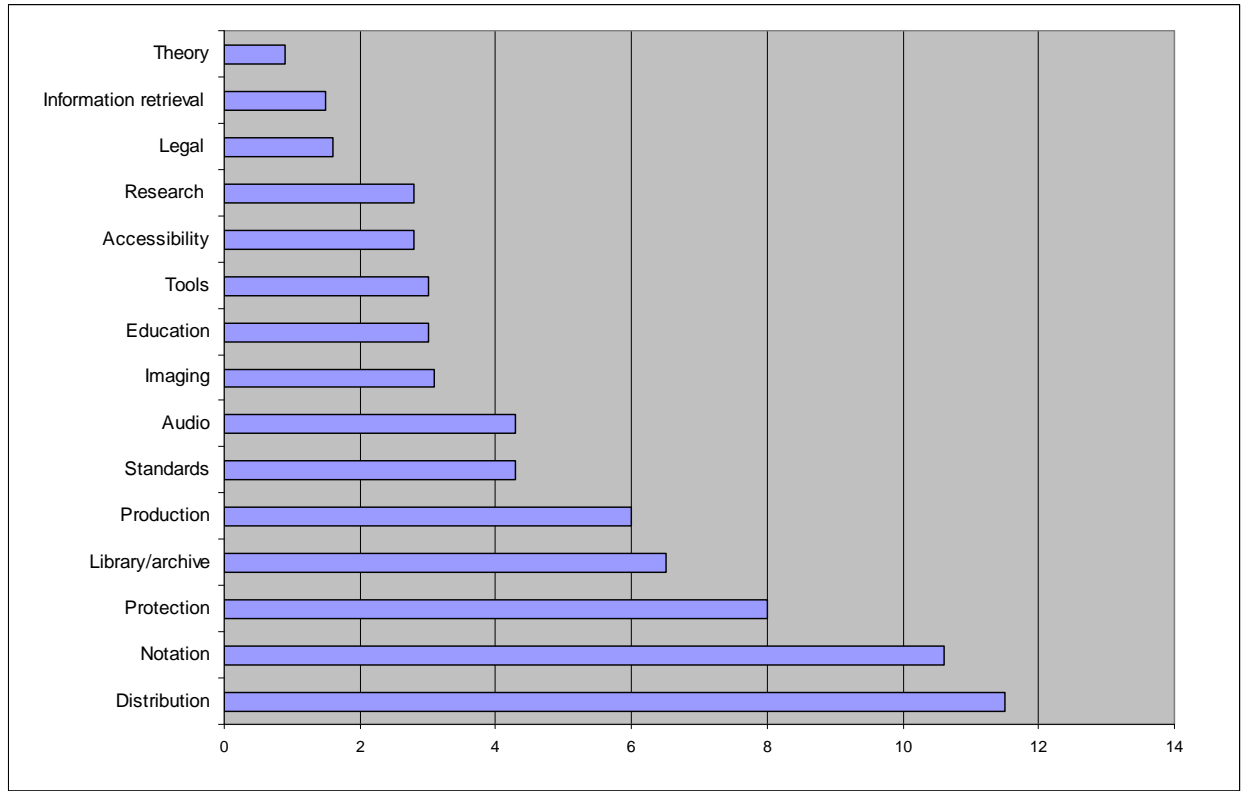


5.2.1 Which Technology Topics they are looking for

The topics of the Technical Information which are looked from the participants are listed in the following table. Please remember that these data come from the declaration of the participants, and thus are needs, while in the sequel an analysis of the effective response of the MUSICNETWORK to these needs is reported.

The topics described in the table have been classified according to 16 categories as reported in the graph after the table. It is evident that the needs of information regarding “distribution” aspect are still the most relevant one. For distribution, it is intended all the technologies for distributing content via Internet. This is the most requested topic. Behind this there is probably the distribution of notation (marginally), audio, educational content, and content in general are most interested for our participants.

In general, also protection and copyrights should be fused into the distribution. In that case, the distribution has obviously a dominant relevance for the MUSICNETWORK participants. From this figure, some WG of the MUSICNETWORK appear to be less relevant than others: culture, education, accessibility, imaging, etc. This is quite natural since their related market is smaller. The following figure reports the percentage of interest.



From this report and analysis, the Audio WG is important. Presently those aspects have not been addressed in deep since most of the activity has been focussed on symbolic music and its impact on several activities. The audio processing is a very complex area and should need an additional work for its management. In any case, we need to address that topic since it is one of the most requested from the participants.

5.2.2 Which Other Services they are looking for in addition to get Technical Information

The participants look also for other services. As stated before the participants of the MUSICNETWORK (221 requests) have manifested the needs of services, 221 over the 524 mentions of technologies. The details about the type of requested services are reported in the following table.

Description of Other Services Requested	Number	%	category
Information and News on Technology, the future	111	50	Information
Collaboration and Contacts for technical aspects	78	35	Collaboration
Conferences and Workshops	14	6,3	Conferences
Market and Commercial contacts	10	4,5	Market
Dissemination diffusion of results, and models	8	3,6	Dissemination
total	221		

The first item in the table is a generic statement for claiming that the participants are looking for some technical information and exchange. This in effect should be added to the 524 requests and in many cases is a simple remark.

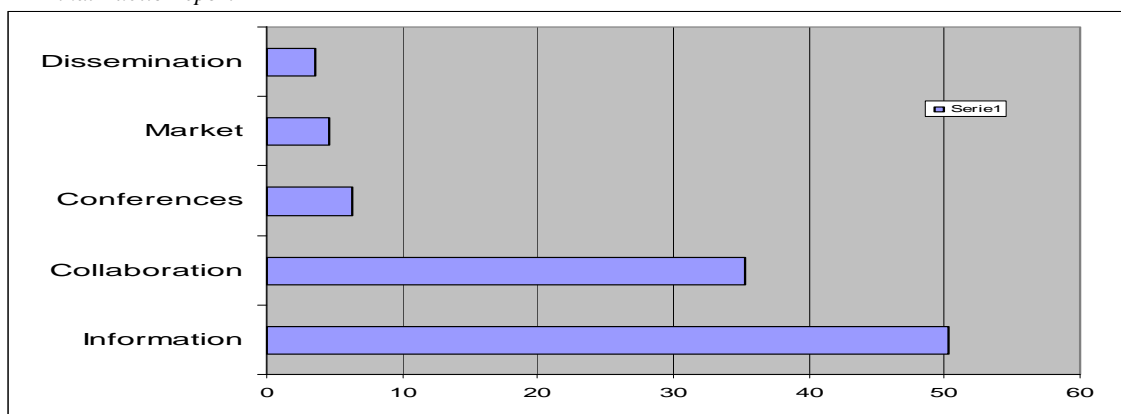
The following item in the lists is referred to requests to realise collaborative activities and to find other partners. The collaborations are looked for creating projects and for getting experts.

A second very important fact is that there is an explicit request about Conferences and Events. On the other hand, the percentages are very low since the whole request for services is around 15 %. The corresponding request for the conferences is about 2%. The organisation of conferences is a method to attract technical content that can be posted on the web site and provided to the participants. An additional way could be to make some call for content or some call for expert forcing the contributors to provide updated documents about their activities and projects, and this can be a way to maintain updated the information on the MUSICNETWORK.

Please note that commercial aspects and founding are only marginally mentioned and requested. The MUSICNETWORK has created in these years a set of services to satisfy these needs:

- Forums for creating discussions, marginally used
- Documents for getting information, very strongly used
- Conference and workshop organisation, quite interesting but not satisfactory.
- WEB pages of the companies indexed into the WWW site, marginally used, only 20 on 200 companies have created their WWW page. It is very simple to create a www page, but there are looking for one way information, only download only of information and not provide any.
- Newsletter, we have distributed a large number of newsletters. One per month and several means of communication.
- Web pages with updated information, very interesting for participants

The next graph reports the distribution of required other services.



Considering the expectations of the customers for the specific services over the request of technical information, we can make the consideration depicted in the next table. Probably the main focus is on information exchange (from the technical side mainly), partners and contacts, consultancy and dissemination.

	informati on exchange	partner / contacts	consultanc y	dissemin ation	legal issue s
information exchange and recovering	X				
collaborations in research projects, networking	X	X			
collaborative possibilities and communication, finding partners	X	X			
contact with people, experts, research and industry	X	X			
conferences, workshops, seminars, tutorials	X		X		
dissemination of their activities				X	
exchange information, thoughts and ideas	X				
finding contacts with industry		X			
collaboration for development		X			
information about cross Europe activities and projects	X	X			
legal affairs, aspects and foundations					X

A further analysis is needed to see who are those that are looking for the most relevant services. They can be researchers, technology providers or technology consumers. In order to satisfy these two categories the actions to be performed could be significantly different.

The analysis about those that are looking for collaborations, exchanges and contact has produced the data reported in the following table. The number of them is only 26 over hundreds of other requests, close to the 5%. This means that they mentioned the word collaboration, exchanges and/or contact more than one time in their statements.

Request	Total	University and centres	Industry	Assoc., library, studios, educational	managers	Technicians
Collaboration	60	19	11	13	19	17
Percentage	100	31,7	18,3	21,7	31,7	28,3

It is evident that the request of collaboration comes from both parties in more or less the same amount. This is a very interesting results, which means that we are really attracting both parties with the same efficiency. Please note that only 2 out of 19 managers come from industries and the other 17 come from Associations, libraries, studios and educational institutions.

The only less represented part is industry which is currently not looking for collaboration. In most cases, industrial partners look for founding, new market opportunity, and in other network the commercialisation of their products. Probably, the MUSICNETWORK is less interesting since it does not

- found projects;
- provide access to founding, or it does that only indirectly via the technical innovation;
- give them the possibility of accessing to a new market or to commercial activities, or it does that only indirectly via the technical innovation;
- enlarge for them the market, or it does that only indirectly via the technical innovation;

The fact, that the answer to above needs is indirect via the technological innovation is hard to understand and accept for the computer music industry that is in most cases looking for immediate answers and results. In fact, the computer music industry is mainly comprised of SMEs that do not make any medium and long term plan but only try to survive on the market.

Another important issue is the current economic situation. Active participation in networks like the MUSICNETWORK requires personal efforts and therefore produce costs whose return of invest is too long termed for industrial organisations. Hence, they do not spend any type of resource for active participation but act as a distant observer. The sequence of Workshops of the MUSICNETWORK has tried to change this point of view giving more space to the industry and leaving them more space. Also the connection with MPEG for the SMR standardisation is a way to create a real new market. Presently this activity is obtaining a great success in terms of penetration interest in the computer music industry, and we are only at it beginning.

5.3 The analysis of the Downloaded Documents and main web pages

In order to verify if the needs are effectively satisfied or at least aligned to what the participant do in the MUSICNETWORK, an analysis of the downloaded documents from the Working Group Areas.

The analysis of the log of the documents that have been downloaded from the WWW site of the MUSICNETWORK can give additional information about when the participants are looking for and why they are registered on the MUSICNETWORK.

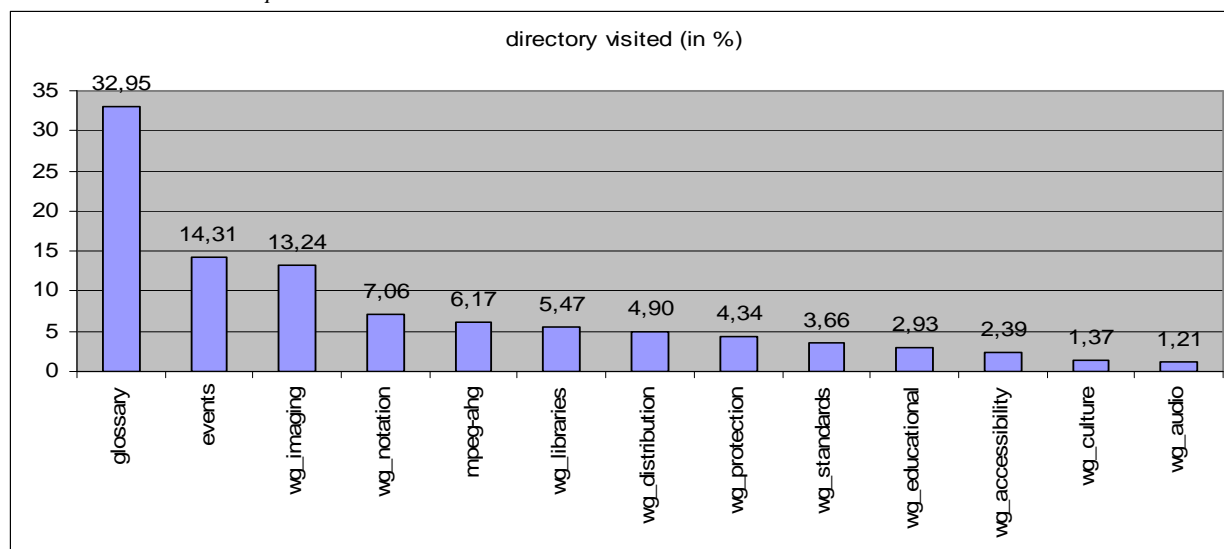
The total number of downloaded files since the beginning of the project up to the 25/03/2005 is 146.936.

This number is even more impressive as the number of available uploaded documents presently is 978 (25/03/2005).

The distribution of the downloads per WG is reported in the following table.

An interesting result is the 20,6% download that has been done from the Imaging Working Group with 37 documents. The highest interest has been found in the documents available from the imaging, notation and library WGs. The average per document depends on the number of documents published by every WG. It passes from 51 request per document for the notation group to the 532 requests per document for the distribution group. This measure is related to the needs of documents and thus to the interest of people in downloading document in that sector.

By analyzing the number of accesses in the MUSICNETWORK areas and web pages we can see the users' interest distribution.



Please, consider that Glossary, Events and MPEG-AHG are pages presents in the www site only since 2004.

In total grouping the activities for topics we have the results reported in the following table that can give an idea of what the MUSICNETWORK participants are looking for.

TOPIC of INTEREST	Sub Areas	% for topic
Music Notation (symbolic and imaging)	Notation	52,87
	Imaging	
	MPEG-AHG	
	Glossary	
Distribution and protection	Distribution	11,02
	Protection	
Library	Library	6,54
Standard	Standard	3,82
Education and Culture	Educational	4,48
	Culture	
Accessibility	Accessibility	2,45
Audio	Audio	1,00
Overview		1,41
Events		16,40
Total		100

5.3.1 Access to the MUSICNETWORK WEB portal

The general analysis of traffic has been performed by using an external tool. The data produced by that tool are reported in this section.

According to that analysis the total number of accesses at the WWW site is very impressive: 1.460.046, among them a lot of accesses are due to the download of simple images or other gadgets in the html pages and thus they have not been considered. The remaining number of accesses is effectively about 10 times the number of accesses to the first page of the MUSICNETWORK.

The following table reports the general statistics analysis about the MUSICNETWORK. We can see a sort of liner increment in all activities reported, which reflects the growing interest of the registered participants in MUSICNETWORK and the growing of traffic.

Activity count description	05.12.2002	10.02.2002	at 2.5.2003	07.07.2003	15.12.2003	30.03.2004	15/06/2004	25/05/2005
<i>Number of visitors on the WWW portal first page</i>	2640	4742	6543	8215	11807	16067	19873	44001
<i>Number of Downloads, monitored</i>	120	1232	2665	3208	22000	30000	58340	146046
<i>Number of effective accesses (DOC+pages)</i>	2760	5974	9208	11423	33807	46067	78213	449686
<i>Number of registered users:</i>	311	421	504	567	661	730	799	941
<i>Web pages (registered institutions):</i>	120	151	181	202	217	233	246	258
<i>Number of uploaded documents:</i>	23	136	173	196	428	539	574	971
<i>Newsletter subscribers:</i>	303	400	467	521	593	651	713	825
<i>Countries:</i>	49	51	55	58	62	64	64	78

6 The analysis of all potential products and services

The first activity of this section is the identification and analysis of the potential services and products that the MUSICNETWORK could be able to deliver to its participants and customers. In addition, services and products are also related to the business model that could be implemented.

Consultancy or Mediation for Consultancy

- “people asking for solutions”, hint for the content of the MUSICNETWORK offer to a large group (tech consumer =66%) of potential customers. That is, one of the most important service can be “*providing solutions for the digital music business*”, surveying the market and technology offer, evaluating them and selling them, as consultancy, to customers.
- Consultancy for solving a problem is a service. Partners are very strong in this domain and could provide valuable consultancy to the market sector. Customers may include libraries, relevant education sector. If we will decide in favour of consultancy we have to consider a framework including consulting layer, company law etc to ensure we are protected, e.g. indemnity, which has to be defined in some agreement.
- Presently the MUSICNETWORK does not provide development solutions, we only analyse them and we coordinate the research in the area to cope with them. This is an indirect service for anyone who is presenting us the problems.
- This is regarded as an obstacle as highlighted by people asking for solutions at the Frankfurter Musik Messe. For example, concerning the protection issues most of the contacts at the Messe were technical questions to get technical answer. Presently the MUSICNETWORK is not reactive enough to this type of activities and thus it seems that the consultancy is not really viable according to the skill and the attitudes of the present MUSICNETWORK and people involved. MUSICNETWORK should try to transform the requests in contracts for partners and participants that are involved in the music network and/or for those that have the skill and are in the MUSICNETWORK to look for collaboration, and in effect this will transform the MUSICNETWORK as a mediator. The mediation has a value for the MUSICNETWORK participants that may be involved in the contract, we can call them MUSICNETWORK Associated Members, MAM.
- If the MUSICNETWORK will play the role of consultancy it will be in conflict with many SMEs that play the same role and that presently are interested in the MUSICNETWORK to improve their visibility, thus they could have interest to become **MUSICNETWORK Associated Members, MAM**.
- A package with a fixed number of free hours or tokens for consultancy and information access can be defined. The expert can be sent directly to the customer to listening the problem and providing information and starting solving the problem or providing general information and links to do it. The MUSICNETWORK will be committed to produce a report in which the problems are analysed in the context of the market and technological state of the art, and suggestions and solutions are given.

Contacts providing

The MUSICNETWORK has now a large database of about 900 registered experts and customers. Plus a database of about other 3000 addresses is in the hands of the major partners of the MUSICNETWORK.

- Creation of a database of contacts and for information service. This is possible exploiting the large number of registered people and companies.
- A service can be one to provide the searching engine for experts. It is very hard to find companies interested in paying for that service since Internet can be used for the same purpose for free.
- The same activity can be performed by the simple browsing on public web pages.
- This large database can be a way to attract companies and institutions that are interested to make adverting and promoting their activity, for example with banners or with the simple distribution of content in the newsletter.
- The same list of contacts can be accessible in the form of mailing list to the MUSICNETWORK Associated Members, MAM.

Directories, eMarketplace, information exchange

- Exchanging of ideas and collaboration
- Exchanging information:
 - forum,
 - mailing lists,

- Workshops and meetings
- This is presently working by means of the MUSICNETWORK workshops that permit to collect information coming from institutions and industries.

Dissemination and promotion:

- Via our mailing list of participants
- direct announce of new products to our participants, as a forum
- promotion of products to our workshops and to associations, we should restrict the field: educational, publishers, libraries, etc.
- MUSICNETWORK could still act as a very specialized provider and helping tech consumers to find their way within the currently thousands of different offers and solutions.
- organising and promoting research and development of the partners and participants at MUSICNETWORK workshops. This offer has a value in terms of visibility for who is buying the service. The registrations at the conference have been kept free presently. In the next meetings, the registration should become a small fee just to make clear that the service has a price and a cost for the partners and to verify if the attendees are motivated to come.
- Lists of selected (probably those that have received the seal or qualification):
 - companies, web pages for advertising, etc..
 - experts, web pages
 - products, web pages, workshops
 - tutorial, web pages, workshops
 - success stories, web pages
 - reports, web pages, workshops
 - etc.

Information digest (from MUSICNETWORK to participants or public)

- Information (on latest technologies, research activities, standards, ...)
- A lot of information is available on the Internet for free (newsgroups, academic and industry websites). Also adding value to this information is difficult as value depends on the usage itself. On the other hand, from the statistic analysis the information provided by the MUSICNETWORK is requested and cannot be found in other places.
- People pay for specific, high professional, precise, updated, revised and certified information available in an efficient way (quickly, one-stop-shop). This can be the real value added, something that will make them, as well as other customer groups, wanting to pay for an information service. Boston's MIT provide a information service on new technologies (in general) comprising a periodic "new technologies review" newsletter. We can do something similar (apart from the brand) focusing on the eMusic business. As a second step, we should think if and how MUSICNETWORK can provide such "digest" service. On this basis MUSICNETWORK can produce a "news" magazine/newsletter, rather on hard copies than on email, which will provide the news in eMusic field. A small fee for subscription would be required, with the "collateral" benefit of giving MUSICNETWORK a more formal shape of organization. This magazine/newsletter can include apart from news, several articles and views of experts.
- One problem is the production of content and articles that can be sold, so having interesting and valuable content. This capability is in the hand of the project partners or future MAM. In this direction, we are trying to realize a couple of books on the aspects of the MUSICNETWORK. The books should be edited by the MUSICNETWORK instead of pushing them in the hands of some publisher.
- "Information digest" service should be part of the business model. It can be the first (in time) subscription service for the MUSICNETWORK, since it is the closest to what we are providing at the moment. In addition, such service can be a good vehicle for other services, like "consultancy" or "providing 3rd-party solutions".
- smaller companies are probably interested in a technical survey. But the question is will they find MUSICNETWORK when they are using search engines or links.
- Latest development and research efforts done at universities and research institutions are an appealing topic for companies that are looking for new developments. At the same time for R&D units (especially of universities) it can be interesting to see who is looking for what so we can also think of establishing a sort of "marketplace" where to post announcements of new developments, results.

- The information digest can be self maintained finding the way to stimulate the posting of new articles and documents on the MUSICNETWORK. This can be performed by promising visibility and/or by providing them some revenue or share.

Standards (notation, Web Services, MPEGx, ...)

- The MUSICNETWORK can become the reference body for creating and maintaining standards in the area of Computer Music. On this view and line, the WGs on Music Notation and Multimedia Music Standard are joining their effort for creating a standardized version of Music Notation integrated into MPEG. To this end, the first contact with MPEG has been established and a specific AHG has been created. <http://www.dsi.unifi.it/~nesi/mpeg/ahg-mn-65-66.html>
- Recently the ISO MPEG SMR has evaluated the proposed technologies for symbolic music representation with the aim of selecting the most promising to become the reference model zero of the MPEG SMR standard. The first committee draft, FCD, will be produced for the July 2005.
- Companies and institutions can be interested to support the MUSICNETWORK to maintain updated information and low level tools regarding the MPEG SMR. In addition, the role of MUSICNETWORK can be to promote the MPEG SMR to other companies to enlarge its diffusion. The MAM can be interested in this service as medium to long term activity.

Publishing and selling of books, guides, surveys

- Reports can be created on demand trying to guess the market and realizing them only if the sold is profitable with respect to their cost:
 - Publications of the indexes with a summary and a price, index, list of figures, etc., numbers are facts and they are reasons to get the document in most cases. Word based documents are not really valuable for the market since there is a lot of them around the world for free
 - Collections of the orders
 - Verify if the report can be realized in time, otherwise it can be delayed or canceled
 - The document can be committed to experts since the beginning
 - The collection of data is needed
- Reports on hot topics (free of charge or with a price, etc.)
 - Technology review
 - Tutorials
 - State of the art analysis
 - Market analysis
 - Critical Assessment of products, certification of products
- A good starting point e.g. for WG imaging will be selling the collected music sheets as a reference material for OMR software evaluation (if we have the permission of the publishers). This is something which we considered as added-value.
- Possible good examples of documents and books that can be distribution from money can be:
 - Conference proceedings of the conference presently they are free of charge and thus they are freely distributed.
 - Tutorials, MPEG4, Music Notation, archive management for archives, etc.
 - Reports on: OMR, Watermarking, business models, etc.
 - Test cases collections e.g. test cases for OMR, etc.
 - Review material and tools for making it (small market)
 - Report and guidelines on standard music notation, music score digitisation, music sheet digitization, etc.
 - On this line, several documents have been produced and distributed for free:
 - Comparison of music notation languages
 - Comparison of CMS for music
 - Comparison of DRM
 - Comparison of Music notation
 - Comparison of OMR systems and tools
 - Analysis of I-Tunes
 - Etc.
- Publishing and distributing CD ROMs with all the collected information, etc. with an internal browser, etc.

6.1 The general model of SWOT analysis

The MUSICNETWORK Business model potentials have been considered for the SWOT analysis by using the following schema

<p>Strengths:</p> <ul style="list-style-type: none"> • What are your advantages? • What do you do well? • What relevant resources do you have? • What do other people see as your strengths? <p>Suggestion: Consider this from your own point of view and from the point of view of the people you deal with. Don't be modest - be realistic. If you are having any difficulty with this, try writing down a list of your characteristics. Some of these will hopefully be strengths! In looking at your strengths, think about them in relation to your competitors - for example, if all your competitors provide high quality products, then a high quality production process is not a strength in the market, it is a necessity.</p>	<p>Weaknesses:</p> <ul style="list-style-type: none"> • What could you improve? • What do you do badly? • What should you avoid? <p>Suggestion: consider this from an internal and external basis - do other people seem to perceive weaknesses that you do not see? Are your competitors doing any better than you? It is best to be realistic now, and face any unpleasant truths as soon as possible.</p>
<p>Opportunities:</p> <ul style="list-style-type: none"> • Where are the good opportunities facing you? • What are the interesting trends you are aware of? <p>Useful opportunities can come from such things as:</p> <ul style="list-style-type: none"> • Changes in technology and markets on both a broad and narrow scale • Changes in government policy related to your field • Changes in social patterns, population profiles, lifestyle changes, etc. • Local Events <p>Suggestion: A useful approach to looking at opportunities is to look at your strengths and ask yourself whether these open up any opportunities. Alternatively, look at your weaknesses and ask yourself whether you could open up opportunities by eliminating them.</p>	<p>Threats:</p> <ul style="list-style-type: none"> • What obstacles do you face? • What is your competition doing? • Are the required specifications for your job, products or services changing? • Is changing technology threatening your position? • Do you have bad debt or cash-flow problems? • Could any of your weaknesses seriously threaten your business? <p>Suggestion: Carrying out this analysis will often be illuminating - both in terms of pointing out what needs to be done, and in putting problems into perspective. You can also apply SWOT analysis to your competitors.</p>

The first version of the SWOT analysis in this preliminary business plan has produced the following tables that reports the possible services and products in the priority order from the most probable to the less probable and difficult.

The general SWOT for the MUSICNETWORK potentiality is:

<p>Strengths:</p> <ul style="list-style-type: none"> • Huge pool of knowledge • Still growing network • Well-Known for the standardization activities • Large number of accesses, • good penetration, strongly visible • Good reports/deliverables • Forum as exchange platform • Partners very active and well-known in their area are a very good reputation for the MUSICNETWORK • differentiated pool of companies and organisations • collaborative community of skilled people, which can be involved in the value chain at different levels: <ul style="list-style-type: none"> ○ as potential users to gather feedbacks and reactions to new products and services, ○ as sources for market analysis for new products and services, ○ as potential suppliers of services themselves, as potential customers of services and products sold by or through the MUSICNETWORK • 	<p>Weaknesses:</p> <ul style="list-style-type: none"> • Registered people are not active. This indicates that they are mainly interested in information “consumptions”. They are unlikely to contribute either actively nor monetary. • The benefit especially for small organizations is visible enough. • Main activity are information digest and standardization push in ISO MPEG.
<p>Opportunities:</p> <p>Standardization needs more awareness and participation from different organizations. MUSICNETWORK can offer help in standardization questions for SMEs.</p> <p>There is still no distribution solution considering the interests of rights owner and consumers.</p> <p>Internet distribution will grow and this has to be acknowledged by SMEs.</p> <p>Governments deserve information on users’ interests (in addition to lobbying organizations)</p>	<p>Threats:</p> <p>MUSICNETWORK might not be capable to clearly stress its potentials and possibilities for potential customers.</p> <p>If no significant-added value can be offered to SMEs, participants will leave MUSICNETWORK.</p> <p>Organisations are only interested in free information. They potentially only pay for (software) solutions.</p> <p>Threat that MUSICNETWORK would become another news blogger about music</p>

MN Services and Products	Description	SWOT			
		Strengths	Weaknesses	Opportunities	Threats
Information digest (from MN to MN's customers)	News, market announcements, events related to the digital music business, case studies, technology surveys. It must be specific, high professional, precise, updated, revised and certified information available in an efficient way (quickly, one-stop-shop).	We have the skilled people for producing good content, we have the skill to succeed in this action	High costs and risks for the production and sale of valuable content	no similar service for eMusic, high demand	Authors of good documents and reports are single people, thus the MN seems to be a stand alone company that exploit the skill of single experts. In this case, why we have to become an European Group.
Dissemination and Promotion	To have promotion, dissemination of products, events, activities, solutions, best practices, companies, conference organization, etc.	Large experience Quite easy-to-reach targets: universities, schools, association of performers or composers, large number of accesses	An increment of the number of contacts is needed especially in the area of large companies and public non profit organizations	There is a limited request of this kind of activity, while it can be strongly useful for the production of content and thus for the information distribution and sale	High competition, conflict of interest inside and outside the network
Publishing and selling of books, guides, surveys	Production and distribution of documents that could be sold on demand or on the summary (and built only if profitable). The production of the document could be even performed by others	wide core set of competencies, lot of material produced, analysed, collected	High costs and risks for the production and sale of valuable documents	Presence of the skill and of the demand of these kind of documents	High competition, conflict of interest
Sealing and qualification	Analysis of software products and guidelines, or tutorials to assign them a MUSICNETWORK seal.	Competence presence for performing the work.	Large work for identifying metrics. Acquisition of the consensus to be considered a valuable seal	OMR and Music Notation could be the first activities. Also DRM for assessing the protection level	Low competition at high level. High competition at low level at which product comparison is performed by magazines.
Directories, eMarketplace, information exchange	A service for third party consultants and technology providers to get to their customers (and viceversa) more efficiently, to have promotion, dissemination and greater visibility	We have a large experience in this activity and we have a huge number of qualified contacts and experts	The number of contacts with large companies should be increased	high demand, no similar service for eMusic, wide community already existing	difficult to control ongoing 3rd-party transactions/relationships?
Contacts and networking	Offering participants/customers the possibility to gather new contacts	We have a lot of contacts and a lot of strong resources in terms of skill.	WE have to improve our service for creating contacts. We should avoid to become too end-user oriented (but they need services)	highest demand, wide community already existing	hard to convince people to pay. This type of service is already available on other sites, more visibility to the whole MN, less to the single partner
Standards (notation, Web Services, MPEGx, ...)	Participation to various standardisation activities can generate a revenue stream in case of successful adoption. A market to explore is the definition, development, providing, certification of Web Services standards for the eMusic market	High profit and long terms duration income can be obtained	Relevant investment, for a long duration is needed	Good moment for our entrance in the MPEG and for the stability of the XML and for the needs of the educational market	We need the support of the industry in the area of music notation. Presently it is quite low. See for instance MIDI.org
Consultancy	Consultancy on technology and business organisation, provided directly from MN members	wide core set of know-how and competencies	organisation needed (EEIG?), MN should grow in visibility	high demand	high competition, conflict of interest

6.2 Products and Services analysis

According to the above SWOT analysis the most important products and services have been analysed to better understand the target customers, possible business, competitors and partnership. They are reported in order of their relevance and immediate exploitability.

MN Services and Products	Main Competitors	Possible partnerships
Information digest (from MN to MN's customers)	ScreenDigest and several similar companies that have large and stable contacts with large companies. See pres.net	Several experts, or large companies to produce the information, universities
Dissemination and Promotion	other product distributor and research institutions	large research institutions and technology providers
Publishing and selling of books, guides, surveys	technology providers that promote their products as the unique absolute solution	ScreenDigest, MIDEM, MILIA, etc.
Sealing and qualification	Magazines and associations. Some of them perform this kind of activity. For example the music education association TIME assess the educational software for music education.	Possible associations such as IAML, IAMIC, etc. that could delegate MN to become their technical counterpart.
Directories, eMarketplace, information exchange	several portals and the same associations. This could be a service in conflict with the previous	Associations without this service, big groups, large companies, NPO
Contacts and networking	several institutions and portals, the same Internet	Idealist, EC, Content Village, EMO, several associations
Standards (notation, Web Services, MPEGx, ...)	MIDI.ORG, MUSICXML, etc.	MIDI.ORG, MUSICXML, MPEG, SIBELIUS, CODA, etc.
Consultancy and/or mediation	Some of the partners, several companies, large consultancy with more power of development, etc. We should stay at a different level, as monitoring or supervising.	With associations of category.

According to the above discussion and the statistics analysis the most probable services/products are:

MN Services and Products	Possible Business Models	Target customers	How to sustain
Information digest (from MN to MN's customers)	On demand, and/or Annual fee, or Free of charge (in combination with other pay services)	all (with differentiated content offer), associated participants and general public	The MN can ask with call for papers and contribution to provide content for the WEB and for the conference, that in a second phase is ported on the web. This information will be accessible only to MAM
Dissemination and Promotion	Activity based model, conference registration, promotion campaign	technology providers, product distributors composers, small publishers, journals, experts	Continuing in exploiting and growing the mailing lists and using the MN participants mailing lists on the portal
Promotion of products	Giving more visibility, free for public and MN associated	All, general public and MAM	Call for product review and description, service accessible only for companies that are MAM
Promotion of experts	Giving more visibility, free for public and MN associated	All, general public and MAM	Call for articles for web and conferences, only for experts that are MAM
Publishing and selling of books, guides, surveys	Royalty based, and/or Annual fee, also on demand	technology consumers, NPO, libraries, publishers, etc.	The MN can ask with call for book topics and these can be promoted on the web to see if they are of interest. MAM will have special discount to get this information
Sealing and qualification	Receive an annual subscription to the register and receiving information about the analysis that produce the sealing. Receiving a payment for analyzing a given product. This is weaker.	Industry for computer music software builder, All, general public and MAM	This can be performed in conjunction with some review or comparison model or with some standardisation model or aim. For example: SMR compliant, OMR best tool, etc. This service is only accessible for companies that are MAMs.
Directories, eMarketplace, information exchange	Annual fee plus a fixed percentage on each successful transaction	Technology providers, consultants and their customers,	Directly as an additional service of the web portal. This service is only accessible for companies that are MAMs.
Contacts and networking	Annual fee, or Free of charge (in combination with other pay services)	All, general public and MAM	Directly as an additional service of the web portal. This service is only accessible for companies that are MAMs.

Standards (notation, Web Services, MPEGx, ...)	Royalty based, or Annual fee, the support can be included in the registration (following MPEG, creating documents, maintaining the standard, translating doc in several languages, etc.)	Mainly technology providers that have to be supported by a standard to increase their distribution, see for instance the Music Notation, mainly MAM	Monitoring and working on ISO MPEG SMR group, hosting their web pages, collecting the content, test cases, etc. This service is only accessible for companies that are MAMs.
Consultancy and/or mediation	On demand, specific contracts, a fixed number of consultancy hours could be included in the industry registration if the fee is reasonable high	Mainly technology consumer, but also technology developer without a research unit. They are mainly SMEs. Also NPO and libraries can be interested.	MUSICNETWORK Associated Members, MAM, have to provide their skill and competence at disposal of the MUSICNETWORK in change of their subscription at the highest level.

The above balance of content production and publication will allow to create a virtuous mechanism for maintaining updated the information on the WEB portal and thus to maintain high the attention of the general public to the activities of the MUSICNETWORK.

In summary the MUSICNETWORK participants have:

- **First interest in getting new and fresh technical information/documents**
 - produced by the WG
 - Produced by others for the Open Workshops
 - Results and evolution of the MPEG SMR process
- **Secondary interest in**
 - Participating at the meeting (those create content for the former requests and interest)
 - Receiving newsletters
- **Main technical interest in:**
 - notation, standardization, protection, distribution, library, imaging, etc.
 - Specific technologies in each sector

Review documents, comparisons, guidelines, work on standards

7 Dissemination Activity

7.1 Events in which an activity of Dissemination has been performed

7.1.1 Activity performed in the 2002, starting from July-August

- EVA London 2002, July 2002. (UNIVLEEDS) flyer distribution
- WEDELMUSIC2002 Conference, December 2002, Darmstadt, Germany (FHGIGD, DSI, UNIVLEEDS, IRCAM, etc.), Exposition and conference, flyer distribution, presentation. The First Open Workshop of the MUSICNETWORK has been collocated with this conference.
- Global Venture Forum Osaka, 23rd to 25th October 2002 (CRL), flyer distribution
- ICMAI, September 2002, II International Conference, on Music and Artificial Intelligence, University of Edinburgh, Scotland, Faculty of Music & Division of Informatics, 12-14 September, (FNB and DSI edited document), presentation of a Poster.
- ISMIR October 2002, Paris (IRCAM), flyer distribution
- IFLA2002: IFLA 2002 – (International Federation of Library Associations and Institutions), 68th IFLA General Conference and Council & Library International Exhibition 2002, Libraries for Life: Democracy, Diversity, Delivery, 18-24 August, Glasgow – Exhibition & Conference, A special supplement on this event has been published in the latest issue of eCulture (volume 3 issue 3), <http://www.ifla.org/IV/ifla68/index.htm> Distribution of Flyers by FNB
- Resonance 2002, October, Paris (IRCAM) , flyer distribution
- Rome, Italy, October 2002, a short seminar (DSI), presentation, flyer distribution, organised by the University of Roma La Sapienza.
- IST November 2002, Copenhagen, Denmark, (DSI, MICA) , flyer Distribution
- Tempo Reale Workshop, Florence, TR, December 2002 (DSI) , flyer distribution, presentation
- IBC 2002, September 2002, Amsterdam, (DSI, FNB), fair, flyer distribution
- ICMC 2002, flyer distribution (UNIVLEEDS)
- IEEE ICME, International Conference on Multimedia and Expo, EPFL, Losanne, Switzerland, August, 2002, (DSI)
- UK EPSRC Digital Music Network Launch Day (UNIVLEEDS), Dec 2002, announcement and flyers.
- MPEG 2002 meetings (IRCAM), flyer distribution
- Concertation Meeting of the EC, 18 November 2002, Luxemburg. Flyer distribution and presentation of MUSICNETWORK.
- Meeting in Milan, September 2002, Major publishers: Ricordi, Nuova Carish, Rugginenti, Suvini, Sonzogno, Curci, corso Magenta, Milan, Italy (DSI).

7.1.2 Activity performed in the 2003, flyer distribution

- MAXIS 2003, UK, April, announce and flyer distribution (UNIVLEEDS, DSI).
- IFLA2003: IFLA 69th meeting General Conference, August 2003 Berlin, offer from the EC to have a station in the EC stand of the IFLA meeting. This offer has been refused by the MUSICNETWORK after the experience of FNB at the same conference in the previous year. The conference has not produced a relevant follow up. In addition, FNB and MICA will be present at IFLA and the distribution flyers will be performed in any case by means of FNB and MICA.
- IBC2003, September 2003, Amsterdam, (DSI, FNB), fair, flyer distribution.
- Event requested for the semester of Italian presidency of the EC, October 2003. An event managed by the MUSICNETWORK has been requested. The event has not been assigned.
- ISMIR 2003 (IRCAM).
- ICMC 2003, International Computer Music Conference, (UNIVLEEDS).
- CEBIT 2003 (FHGIGD).

7.1.3 Activity performed in the 2003, flyer distribution and formal presentation

- Concertation meeting of the EC, January 27-28 2003, Luxemburg. Flyer distribution, presentation of
- Music Evolution and innovative needs and of the MUSICNETWORK

- AIIA 2003: Ottavo Congresso Nazionale dell'Associazione Italiana per l'Intelligenza Artificiale, 23-26 Settembre 2003, Polo didattico "L. Fibonacci", Università di Pisa, Pisa, Italy.
- MIDEM2003, January 2003, Canne, France, with a Panel (DSI, MICA) , flyer distribution, presentation of a talk in a Panel by P. Nesi.
- EVA Florence 2003, Florence, Italy, March (DSI), presentation and flyer distribution.
- EMN2003: European Music Navigator Open e-commerce Symposium 2003, Austria, March, (MICA) presentation and flyer distribution.
- DAISY 2003 conference: presentation of the MUSICNETWORK by FNB, Amsterdam, mainly WG on Accessibility.
- Tempo Reale Workshop, Florence, TR, 2003 (DSI), flyer distribution, presentation.
- EAS 2003, Congress of Europaeische Arbeitsgemeinschaft Schulmusik, "WeiterBildung - Life long learning", May 8-11, 2003 Vienna, International Music Congress Vienna, May 2003 (MICA), presentation and flyer distribution.
- IAMIC2003 Conference, July, Rome. The MUSICNETWORK has been presented at the IAMIC conference with a sequence of slides. The presentation has been given by DSI and GIUNTI-ILABS
- EVA London 2003, UK, Accessibility, flyer distribution and a paper (UNIVLEEDS, FNB, DSI).
- WEDELMUSIC2003, September 2003, Leeds, UK, co-located with second MUSICNETWORK open workshop, see in the following.
- Music and Braille 2003, Madrid, 2003. Organised by ARCA with the collaboration of FNB for the work on standardisation on Music Coding in Braille. Distribution of Flyers and presentation of the MUSICNETWORK with slides.
- Resonance 2003, France, October (IRCAM), distribution of flyers, organization of a workshop
- MINERVA2003 meeting, November 2003, presentation of the MUSICNETWORK activity.
- IST2003: A special workshop has been submitted and refused by the IST committee. Dissemination via flyers has been done by ARCA. The MUSICNETWORK has been mentioned in the panel related to Visual Impaired for the work performed in the WG on Accessibility.
- IAML Annual Conference Tallinn 2003, July, (Council Session, Plenary Session, Broadcasting and Orchestra Libraries Branch Session, Program Committee Session, Copyright Committee Session), Presentations and consensus-building: MICA and FNB.
- MPEG 2003 meetings in Norway and Brisbane, (DSI, IRCAM), flyer distribution.
- FET Brain Storming Brussels in the November 2003. Some representatives of the MUSICNETWORK have been invited: DSI, IRCAM, UNIVLEEDS.
- Concertation meeting of the EC on Community memory: June 2003, Luxemburg, presentation of MUSICNETWORK and area evolution with slides, flyer distribution , DSI

7.1.4 Activity performed in the 2004, flyer distribution

- MILIA 2004, Canne, France, Distribution of flyers MICA.
- ISMIR 2204, October 2004, Barcelona, Spain
- Florence World Vision, November 2004
- IST2004: The Hague, The Netherlands (DSI, IRC, COMVERSE, UNIVLEEDS, etc.)
- AISB 2004 Convention: Motion, Emotion and Cognition (Leeds, UK)
- MPEG and SMR meetings (October 2004 Palma de Mallorca, Spain; March 2004, Munich, Germany)
- Gesture Controlled Audio Systems, Oslo University, 2–3 Dec 2004 (UNIVLEEDS)
- International Conference on New Interfaces for Musical Expression, Hamamatsu, Japan, 3–5 June 2004 (UNIVLEEDS)
- 5th International Conference on Music Information Retrieval Audiovisual Institute, Universitat Pompeu Fabra, Barcelona, Spain, 10–14 October 2004 (UNIVLEEDS)
- McGill University, invited lecture, Canada, 29–30 Oct 2004 (UNIVLEEDS)
- International Computer Music Conference (ICMC), Miami, USA, 1–6 Nov 2004 (UNIVLEEDS)
- Live Algorithms for Music workshops, 13-14 December 2004, Goldsmiths College, UK (UNIVLEEDS)
- ICCHP 2004 Paris (FNB)

7.1.5 Activity performed in the 2004, flyer distribution and formal presentation

- AICA, Benevento, September 2004
- 69th MPEG Meeting, Munich, Germany, March 2004

- IAML Annual conference, Oslo, August 2004
- WEDELMUSIC 2004 conference, September 2004
- 70th MPEG Meeting, Palma de Mallorca, Spain, October 2004

7.1.6 Activity performed in the 2005, flyer distribution

- EVA Florence 2005, March 2005, flyer distribution
- Frankfurt Musik Messe, April 2005, flyer distribution
- European Research and Innovation Exhibition, 3-5 June 2005, Paris (France)
- London 3D Imaging Technology Conference & Applications Workshops, 15-18 February 2005, New Computer Engineering Building, University College London, London (UNIVLEEDS)
- International Conference on Multimedia, Image Processing and Computer Vision (IADAT-micv2005), Madrid, Spain, 30 March – 1 April 2005 (UNIVLEEDS)
- LAM Research Workshop, Goldsmiths College, 11 April 2005 (UNIVLEEDS, to be performed)
- AISB Convention (Artificial Intelligence and the Simulation of Behaviour), 12-15 April 2005, University of Hertfordshire, UK (UNIVLEEDS)
- International Workshop on Gesture in Human-Computer Interaction and Simulation, 18-20 May 2005, University of Bretagne Sud, Vannes, France (UNIVLEEDS)
- EVA London, UK, 2005 (UNIVLEEDS)
- Digi-Arts UNESCO conference in ST. Petersburg (MICA)
- IAMIC conference, New York, September 2005 (MICA)
- IMC, Los Angeles, October 2005 (MICA)

7.1.7 Activity performed in the 2005, flyer distribution and formal presentation

- 71th MPEG Meeting in Hong Kong, China, January 2005
- Workshop of MUSICNETWORK MPEG AHG on SMR Assessment of Symbolic Music
- Representation Proposals, 24th 25th February 2005, Paris (France)
- 72nd MPEG meeting April 2005, Busan (Korea)
- eLearning Conference, May 2005, Brussels. The MUSICNETWORK is been present as exhibitor with a stand.

7.2 Specific Activity in collaboration with the EC and towards Networks & Projects

The activities performed in collaboration of the EC have been those reported in the following lists. The list reports all the events at which the MUSICNETWORK has been invited. In all these occasions the representative of the MUSICNETWORK has provided a presentation:

- Concertation Meeting of the EC, 18 November 2002, Luxemburg. Flyer distribution and presentation of MUSICNETWORK, DSI
- Concertation meeting of the EC, January 27-28 2003, Luxemburg. Flyer distribution, presentation of Music Evolution and innovative needs and of the MUSICNETWORK, DSI
- Concertation meeting of the EC on Community memory: June 2003, Luxemburg, presentation of MUSICNETWORK and area evolution with slides, flyer distribution, DSI
- FET Brain Storming, Brussels in November 2003. Some representatives of the MUSICNETWORK have been invited: DSI, IRCAM, UNIVLEEDS.

The activities performed towards other EC Network and Projects have been:

- PULMAN: cross posting of messages, contribution to the writing of PULMAN guidelines for the music digitization
- MINERVA: cross posting, presentation of the MUSICNETWORK activity, contribution of the MUSICNETWORK as experts of digitization
- FIGARONET: cross posting, aspects on digital right management
- Cultivate: <http://www.cultivate-int.org>, mention of the MUSICNETWORK activities several times in the DIGICULT column
- ECULTURENET: Europe's digital culture for research, education and for all its citizens <http://www.eculturenet.org/>, mention of the MUSICNETWORK activities.
- IMUTUS: EC FP5 project on music education, cross posting
- OPENDRAMA: EC FP5 project on music education, cross posting, presentation of OPENDRAMA results on MUSICNETWORK open workshop.

- CALIMERA, CA of the FP6: first contact with their coordinator
- DIGICULT: <http://www.cordis.lu/ist/ka3/digicult/publications.htm>, some publication of
- MUSICNETWORK activity and posting on MUSICNETWORK of their activity.
- WEDELMUSIC FP5 project, web delivering of music scores
- CUIDADO FP5 project. Content-based Unified Interfaces and Descriptors for Audio/Music Databases Available Online
- AMICITIA FP5 project (Asset Management Integration of Cultural heritage In The Interexchange between Archives): Contact with the project partners, review of their Digital Right Management model, results are contained in the document on DRM published on the www site of the MUSICNETWORK, see the WG on Protection.

7.3 Specific Activities towards Institutions and other lists

National and international authorities, associations, other mailing lists and standard bodies have been contacted. Presently some result has been obtained with:

- AFI: Italian association of Phonographic Industry, audio (DSI).
- AIF: Industrial Association of Florence. They are strongly interested and are collaborating through the Maggio Fiorentino to the community of the MUSICNETWORK, (DSI).
- CSUN: International Conference on Technology and Persons with Disabilities (FNB)
 - CVHI: Conference on Assistive Technologies for Vision & Hearing Impairment (FNB)
- EBLIDA: European Bureau of Library, Information and Documentation Associations (FNB)
- EUSIDIC: European Association of Information Services (FNB)
- IAMIC: International Association of Music Information Centers, they have invited DSI and Giunti-ILABS to talk at the IAMIC annual conference 2003 in Rome.
- IAML: The International Association of Music Libraries, Archives and Documentation Centres has invited MICA to give several MUSICNETWORK presentations at the annual conference 2003; IAML and MICA are negotiating a joint MUSICNETWORK session at the IAML/IASA conference 2004.
- ICEVI: International Council for Education of People with Visual Impairment (FNB)
- ICMAI: International Conference on Music & Artificial Intelligence (FNB)
- IFLA: International Federation of Library Associations (FNB)
- ISO/IEC JTC1 WG34, we have been informed about the status of SMDL model, IRCAM, DSI.
- MINERVA, we are involved in their activities regarding digitisation guidelines, DSI
- MPEG, we have been invited to present a contribution at the MPEG meeting in Norway, DSI, IRCAM.
- Musicentrepreneurs.com, we have been involved and we are cross referencing their activities (FHGIGD).
- RIPM: an organisation that work on collecting the music repertoire, cross posting. They were contacted with the aim of convincing them to manage the Working Group on Music Culture.
- WBU: World Blind Union (FNB)
- PHOList: a very large and specialized private mailing list on computer music, music culture, etc., cross posting.
- MUSIK Messe, organizers of the Frankfurt Musik Messe, Cross posting
- PULMAN, we have contributed to the production of their technical guidelines for digitisation. In particular our contributions have been focused on music digitisation. Evidence of this cooperation has been given also in their final report.
- EMC: European Music Council (Regional Group of the IMC/UNESCO), http://www.european-music-council.org/bulletin_eu.html “One of the interesting new projects to emerge from the 8th call is MUSICNETWORK, a network of excellence on music interests across Europe”

Standards bodies:

- ISO, we have been looking much forward to cooperate in respect of SMDL model, but have been informed that SMDL has been cancelled from their activities.
- MPEG, we have been invited to present a contribution at the MPEG meeting in Norway. We attended the meeting in Brisbane for managing the AHG on music Notation and we have also attended the meeting in Munich. The MUSICNETWORK MPEG AHG on Symbolic Music Representation has attracted a large number of industries (including the relevant ones). For further details, please see the SMR documentations.

- DMP (Digital Media Project, www.Chiariglione.org): partners of MUSICNETWORK have started to collaborate with the DMP in the September 2003. Some of the requirements related to the music in libraries and in the DRM have been revised by MUSICNETWORK (mainly DSI).

In addition, an event managed by the MUSICNETWORK has been requested for the semester of Italian presidency of the EC, October 2003. The event has not been assigned.

7.4 NewsLetter

The Newsletter consists of an important and effective means of dissemination for MUSICNETWORK and since February of 2003 it is being produced and distributed on monthly basis. It is designed and edited entirely in HTML format providing in such a way useful web links for more convenience and interactivity. Apart from the MUSICNETWORK registrants' list, the newsletter is also distributed to ten more mailing lists that wish to receive relevant news from our network.

The newsletter is trying to be consistent therefore it follows a specific structure and outline, which however is flexible to be reshaped in cases where it is necessary.

In every newsletter an outline of the discussions and of the threads in the forum is given together with useful links for articles or documents that have been uploaded during that month. It provides the end-user the opportunity to have in a one-page long document the skeleton of all discussions in the forum. In addition news about upcoming events and conferences related with MUSICNETWORK are also given in a special section of the newsletter, while in it MUSICNETWORK informs its registrants about events that it organizes or supports. Every decision taken by the MUSICNETWORK committee or relevant news is also reported in the newsletters, which are the most regular and one of the most important means of communication with all the subscribers and users. The newsletter aims to give the end-users apart from information, the spirit of a community, which can be the only basis of a good and fruitful function of MUSICNETWORK.

In the case of the needs of advertising some major event of the MUSICNETWORK a special version of the newsletter has been delivered.

The list and the archive of all Newsletters are visible on the WWW site for all the participants.

8 Economic, political, and social aspects

The main economic, political and social factors that effects the business strategies are:

- There are several European and national measures to stimulate the diffusion of multimedia solutions (for example, e-content (in the digitisation of documents and archive field), e-culture, digicult, etc). Most of these activities are instruments that permit the acquisition of new tools and the set up of new process to pass at the digital world. This is obviously an accelerator that will stimulate the market and thus also the acceptance of MUSICNETWORK.
- In the Cultural area, the money are typically recovered from foundations and donations. The present structure of no-profit organisations of public utility (e.g., ONLUS), like the MUSICNETWORK International Association, permits them to survive making some business. For who funds ONLUS, the Italian law permits a series of financial benefits. This involves public and private foundations (banks, public institutions, etc.) to promote this kind of associations.
- The B2B transaction model is dominating the e-market. In this case, the experience and the real numbers have demonstrated that a cost saving of about 10-25% is obtained performing the transactions via B2B instead of via traditional media and mechanisms. This involves the market to search new solutions and to search new organizations like MUSINETWORK to have information on the market's trend.
- At international trade level, Europe needs to keep its capacity to support its content industry whether film, music or publishing. The WTO is well placed to ensure the enforcement of international norms developed at the World Intellectual Property Organisation (WIPO). It will be crucial to protect copyright in the face of piracy and unlimited copying. International cooperation is also necessary to tackle issues such as jurisdiction of courts, choice of law and recognition of judgments governing on-line dealings. This will provide legal security to copyright owners, on-line traders and consumers. The role of WIPO is essential to eliminate "copyright heaven". The WIPO Copyright Treaties of 1996 represent a good step in the right direction but remain incomplete as providing a still limited scope of exclusive rights to performers and producers, for instance. A broad range of new digital services are not covered by the WIPO treaties. The entry into cyberspace will be positive only if it is not the source of new exclusions

and cultural “homogenisation”. The development of culture is directly linked to the level and quality of intellectual property protection. The cultural dimension must be crucial for the development of the information society and electronic commerce. Digital networks need original and diversified content and the development of content requires a legal environment conducive to creativity and investment in creativity. We need to protect and reward our authors, composers, performers, publishers and producers for their specific contributions. To assist the industry make the necessary adaptation, financial support mechanisms could be tailored to meet the needs of the music sector.

- The music market is dominated by five large companies (The Majors) that hold the 75 to 80% of the global music market. The Majors are concerned by piracy but also by the power of Internet to drive price down at US level in more expensive markets, such as Western Europe and Asia. Due to the global nature of Internet it is essential to harmonise regulations internationally. In the field of copyright and neighbouring rights, international harmonisation is well under way with the adoption at the World Intellectual Property Organisation (WIPO) of International copyright Treaties. Whilst these instruments do not solve all the issues, they provide a useful framework for future national or regional legislative efforts in this field.
- MUSICNETWORK has several impacts on the social objectives of the EC. The main points are the integration of SMR into MPEG-4, the possibility to have contacts with European ministries and institutions, possibility of respecting the copyrights and at the same time allowing the secure distribution of multimedia music, the possibility to create a network of excellence at world level.
- Increasing culture in all aspects of music and multimedia, (since the distribution of music and multimedia music) is easier by using MUSICNETWORK’ knowledge. Presently, the lack of a secure model for distributing music has demonstrated actual technology solutions are inadequate. Numerous research studies show that digital music piracy has a negative impact on legitimate sales of music (see: IFPI Digital Music Report 2005). Music Industries, Publishers, Theatres, Libraries and Music Archives have very huge archives that are currently un-exploited. With the MUSICNETWORK’ solutions images and old music scores, audio records, modern music notation and documents can be joined and presented to valorising cultural heritage.
- Opening the path for new services and functionalities for the citizens and for the intermediate users such as multimedia libraries, music schools, cultural institutions, etc.. With MUSICNETWORK results, it is possible to have full access to the information at different levels for music industries, consumers, multimedia libraries, music schools, institutions, etc.
- Valorising the cultural heritage of music that Europe provides. With MUSICNETWORK results, it is possible to distribute the European music and multimedia music in the world without the risk of copyright infringement. This increases the profits for music distributors, publishers and authors. Some of these a SME.

For these reasons, MUSICNETWORK may have a strong socio-economic impact for the implementation of general services that could provide new features and will satisfy the requirements of music market. It has also relevant cultural aspects since the adoption of interactive and multimedia solutions for studying and teaching music may be a tools for attracting more students and thus for increasing the cultural level.

9 Exploitation aspects

9.1 Exploitation objectives

The main objectives of the project exploitation are:

- To make the MUSICNETWORK self-sustainable
- To identify the market segment
- To enlarge the MUSICNETWORK community (participants list) in order to make the sustainability easier
- To maintain the high level of proficiency of the partners of MUSICNETWORK
- To grow and extend the market identified during the MUSICNETWORK project, to further penetrate and support the growth of the sector
- To satisfy the exploitation objectives to the single partners in the measure in which they are in line with those of the MUSICNETWORK .
- To continue to support the building of the sector with creditable standards and technologies

9.2 Evidence of Market orientation

The main orientation of the market is on obtaining information as a free service for the community. This type of service is typically provided by associations and by large institutions that see these services as a sort of a promotion/advertising vehicle. In addition, the information (typically business information) is bought by the companies to make financial forecast and business plans. This kind of activity is typically well paid by large industries. Companies are reluctant to spend money on technical information, even if it seems from the Previous Statistic analysis that companies are spending a lot of time in navigating and downloading MUSICNETWORK pages and documents. On the other hand, SMEs and thus also those that access to the MUSICNETWORK are used to have access to technical information for free or from technology providers that offer them new technology with all the documentation required.

With the development of the self publishing and more generally speaking with the tools provided by Internet, more and more people want to act by themselves but need advice, consulting, technical information, and tools, etc. They have to be aware of the newest software tools and technologies; and they probably need as well services or products. These comments are perfectly in lines with what has been resulted from the statistic analysis from which:

- 58,27% needs information on music notation, standards, imaging, glossary, etc.
- 11,02% needs information on distribution and protection of music

Now with about 300.000 hits per year, that is about 50.000 hits per month, the MUSICNETWORK is strongly interested as a vehicle for:

- advertising, and
- promotion

9.3 Evidence of customer acceptance

According to the statistics analysis we can assume to have the evidence that our customers have accepted the role of MUSICNETWORK regarding the diffusion of technical information and thus they are probably ready to pay for some specific services of the MUSICNETWORK.

According to the first part of this document, the largest part of the participants use the MUSICNETWORK to get fresh news about technology which is recently spread on other mailings lists. The potential customers of the MUSICNETWORK services are not only the MUSICNETWORK registered participants. This is evident by the fact that the portal has received about 450.000 visits from more than 8700 different organisations, and only 940 registered participants. In the following, for MUSICNETWORK participants we intent all those that are accessing to the MUSICNETWORK services.

MUSICNETWORK participants are

- Strongly interested in obtaining technical information which can be considered both products and/or services
- both private and institutions and both categories are interested on the same type of information and services,

- both industries and academic, but at least the 65% are technology consumers, thus publishers, music information centers, ministry, SMEs, etc.
- only in a small part interested in getting contacts and partnership-networking. Similar services already exist, and sometimes for free (see for instance the partnership building services of the EU commission).
- in large part interested to make them more visible to others, thus these experts are strongly motivated in providing new contributions to be posted on the MUSICNETWORK as articles and news.
- interested in using the MUSICNETWORK portal as vehicle for advertising and promoting, since we have now 50000 hits per month.

The MUSICNETWORK participants and customers are interested in the provided information since it is:

- accessible
- precise and correct, and at the state of the art.
- complete and exhaustive, and at the state of the art.
- Etc.

Presently, MUSICNETWORK participants should be ready to pay for that service since nobody else can provide the same information and service in Europe and the world.

The potential target groups of MUSICNETWORK participants are:

- 1) content providers (including composers) are willing to distribute music for making business,
- 2) technical-oriented people from industries who seek for a fast solution to a problem or even for just a guideline how to find it,
- 3) people who are interested in innovation coming from research institutions (libraries, ministry, archive, etc.) and/or from Academia (i.e., Universities, EU project coordinators on music, etc),
- 4) promoters for promoting products and events on the portal since it is visited by a huge number of computer music experts, this is value for promoting conferences, journals, products, events, experts, etc .
- 5) people or institutions for promoting their visibility via MUSICNETWORK towards other participants. They are typically: ministry, libraries, technology providers, or consultancies, etc.

Most of the potential customers of the MUSICNETWORK are not asking for a constant help, but just occasionally, for a sporadic occurrence of a problem or for a period. In those occasions, they look for information and found it in the MUSICNETWORK portal and services. This is especially true for 1), 2), and 3).

For 4) and 5), the issue is different they look for a stable point in which they like to promote their activity. This will allow us to increase the quantity of content/information provided exploiting their needs, and thus giving to them the possibility of posting on the MUSICNETWORK their promotional information.

10 Finally

According with the aim of the exploitation plan and MUSICNETWORK project, the MUSICNETWORK community has created an association with the aim of continuing the work started by the MUSICNETWORK with a sustainable activity.

11 Contact detail

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