EUREKA PROJECT E!2597 - EUROCARE ECH:TOPICC

1. General description

Project	E! 2597 - EUROCARE ECH:TOPICC	**Status**	Announced - 26-JUN-2003

Title   **Endangered Cultural Heritage: Tools For Preservation, Investigation And Copyright Clearance**

Class	Sub-Umbrella	**Technological area**	Information technology
Start date	02-JAN-2003	**End date**	02-AUG-2005
Duration	31 months	**Total cost**	1.26 Meuro

Partner sought   Yes

Summary   Develop Software Tools For Digital Acquisition, Archiving, Interactive Delivery Of Endangered Cultural Heritage Database Entries, Managing Internet-Integrated Multimedia Database And Electronic Copyright Trading Environment.

Budget and duration

Phase	Budget(Meuro)	Duration (Months)
Definition phase	0.16	3
Implementation phase	1.1	28
Total	**1.26**	**31**

Member contribution

Member	Contribution	Position	Since
Lithuania	**19.40%**	**Contact Member**	**27-SEP-2002**
Canada	19.00%	Participating Member	26-JUN-2003
Czech Republic	5.70%	Participating Member	26-JUN-2003
Spain	12.00%	Participating Member	26-JUN-2003
Latvia	1.40%	Participating Member	26-JUN-2003
Greece	26.90%	Participating Member	26-JUN-2003
Germany	15.60%	Interested	28-MAR-2002

Participants

Company	Country	Type	Role
Institute Of Mathematics And Informatics The Unesco Chair In Informatics For The Humanities	**Lithuania**	**Research Institute**	**Main**
Cultural And Educational Technology Institute	Greece	Research Institute	Partner
The Library Of The Lithuanian Academy Of Sciences	Lithuania	Research Institute	Partner
University Of Toronto/Multimedia Laboratory Edward S. Rogers Dept. Of Electrical & Computer Engineering	Canada	University	Partner

Participants

Company	Country	Type	Role
National Library Of The Czech Republic	Czech Republic	SME	Partner
Narcea Producciones Multimedia S.L.	Spain	SME	Partner
Itel, Informatics & Telematics Ltd R & D Unit	Greece	SME	Partner
Video Studio Of Rezeknes Augstskola	Latvia	SME	Partner
'Kolnasata' Fr.Trasuns' Museum	Latvia	Governm./Nat. Admin.	Partner
Business Systems International S.A.	Greece	SME	Partner
Public Company Visoriai Information Technologies Park	Lithuania	SME	Partner

2. Project outline

Project description

In our rapidly developing technological environment, people are coming to rely more and more on databases and networks to access information. To meet this demand, cultural heritage institutions particularly have to rethink traditional approaches to managing and disseminating information about their collections. They have to think about the sustainability of their collections. Digital technologies have added new means to preserve of cultural heritage - safeguarding it in digital space. Multimedia technologies open the door to new multimedia business, and an electronic system of multimedia rights clearance (MMRC) is necessary.

Project aims:

(i) To develop new generation of tools - software for filling and searching Internet-integrated multimedia data base (MDB) and copyrights trading environment in one-step marketing and management of multimedia products and rights capable of operating on European basis.

(ii) To create an MMRC value chain that links object creation, marketing, customer and access management, distribution and use.

(iii) To create an MDB prototype using as entries multimedia musical heritage items (MMHI), based on early European musical heritage data (images of musical manuscripts, audio-video music records, related pictures, texts).

The prototype will demonstrate MDB operability on digital acquisition and archiving, transfer and presentation of unique multimedia items as well as prove the benefits of interactive delivery. This is in accordance with the INFO 2000 program initiated by the EUROPEAN COMMISSION to stimulate the multimedia content industry to exploit new business opportunities and establish a European platform for information clearing and exploitation, for the transition 'from scribe to screen' in cultural heritage and for the latest EU program - eContent action to provide a bridge between companies in the digital content area and potential investors.

The main project goal is to create consolidated approach and MDB on a transregional, European basis - can be reached by setting up the framework bridging together content owners-providers (libraries, cultural institutions), know-how partners (advanced multimedia technology institutions) and producers. Research work in advanced databases management, data mining and IT methods is necessary in order to process a huge amount of digital information, representing the highest-quality pictures, sounds and video records, and to create a fully explorable digital archive connected to Internet. The interactive delivery of results also require innovative solutions and research.

Definition Phase Activities:

Target areas to be developed:

(a) the digital acquisition of MMHI - fragile/endangered image/audiovisual material,

(b) an Internet-integrated MDB warehousing system,

(c) state-of-the-art interactive delivery of multimedia

content,
(d) the highlighting of industrial structures, especially SMEs, capable of co-operating between content owners, scholars, multimedia producers, service providers, and end-users.

Project Implementation Phase Activities:

(i) To investigate and design innovative solutions in multimedial data presentations including: data compression techniques, the content and metadata integration research issue, advanced data mining;

(ii) To research issues on digital MMHI acquisition, image/audiovisual signal processing;

(iii) To research issues on archiving, transfer and presentation of acquired MMHI;

(iv) To create database architecture and design database applications - to create a software for Internet-integrated MDB filling and running on server;

(v) MDB warehousing: to develop standards for acquisition and electronic delivery of MMHI and their metadata system;

(vi) To collect information on MMHI (old musical manuscripts stored in project' partners countries) and make local rights clearance for their digitisation;

(vii) To create a prototype of MDB, filling it with digital MMHI (manuscript images, musical audio, video, texts, illustrations) and metadata;

(viii) To develop an interactive annotation-based metadata extraction system;

(ix) To create MMRC - multimedia rights clearance and trading environment as an electronic system capable of operating on a European basis;

(x) To create means for a flexible two-way delivery of accumulated multilingual cross-cultural e-content: generation of response files (on-fly technology) and interactive CD-ROM (on-demand technology).

Results and Economic Benefits:

1. Innovative solutions in Internet-integrated MDB filling online and personalised delivery of requested data online and offline will result in reduced delivery costs of production and ensure multimedia market competitiveness.

2. Promotion of information exchange between scientists and industry in all participating countries will develop market for high-technology products.

3. Software and experience in creating a prototype MDB on MMHI based on early European music and making it accessible as a total unit for researchers and other users produce the original software and digital collection entries as marketable products.

4. Knowledge, undiscoverable by other methods achieved by data mining of the MDB created, will foster the development of new research and industry areas.

5. Safeguarded as digital copies fragile and perishable cultural values become accessible in digital space and serve as a resource for the sustainability of the original collections.

6. Multimedia rights clearance and trading environment as an electronic MMRC system capable of operating on a European basis will simplify and speed up the rights clearance process and reduce localization costs for new products.

7. Dissemination of knowledge obtained both online (DB running on Internet server and delivering responses) and offline (publishing CD-ROMs-on-demand) will reduce delivery costs and create new jobs.

8. A network of organisations created to collect and digitise MMHI will advance the preservation other cultural values in digital space, their spread in the international market, cooperation between industry and content owners. It can be used in the future as a production distribution network.

Keywords: multimedia database, signal processing, cultural heritage.

Technological development envisaged

Work with an endangered cultural heritage in multimedia environment is unique. Not only are advances facilitating new methods for creating, preserving and sharing information, but also they are also dramatically increasing the inter-relatedness among activities previously perceived as separate. Issues of digital acquisition, image and audio/video processing, archiving and multi-medial presentation of collections are very complicated, wide in scope and require research in many fields.

This project aims to develop and enhance the following technologies:

(1) multimedia tools,

(2) databases for hypermedia,

(3) the integration of multimedia-Internet-offline tools.

Detailed Description:

The development of software for Internet-integrated MDB (from text to sound and images) management and interactive delivery involves:

- A creation of original software for filling MDB online with MMHI;

- Managing MDB and running it on an Internet server for an output delivery online;

- Research in advanced data bases mining and knowledge discovery;

- Research of innovative methods for processing a huge amount of digital information, representing the highest-quality pictures, sound and video records, details given in Sections (A) - (E) below;

- Creating websites as one of multilingual information and distribution channels, representing early music and its context by means of interesting pictures, descriptions, and examples of music.

(A) Acquisition and MMHI processing issues:

- Acquiring a digital copy of an image requires, among other things: providing proper illumination, choosing the digitising device according to object characteristics, preparing the object for the information acquisition process;

- Correction of artefacts introduced in the process of image acquisition can be divided into: correction of geometric distortions from object surface distortion and picture channel imperfections, colour calibration and initial image processing;

- Comparison of direct and indirect method of image acquisition quality and development of compensation procedures for errors specific to the indirect method;

- Image and audio signal analysis for feature extraction;

- Analysis of the best encryption and watermarking tools for efficient protection of digital objects, the best available protection of music-sheets distribution over the

Internet.

(B) Issues of archiving, transfer and presentation of acquired MMHI include:

- Storage of information acquired: choice of image file format, media, and problems of data migration and conversion to new standards with special emphasis on automation of those processes;

- Determination of objective quality coefficients which requires establishing a standard for compressed MMHI quality assessment;

- Choice of the optimal compression method;

- Creation of data indexing system and metadata structures related to MMHI acquired.

(C) Image quality enhancement. Experience gained in area of image quality enhancement can lead to further studies of algorithms efficiency in document image quality enhancement. This issue has great importance because properly conducted initial filtering enhances visual value of image and makes analysis and feature extraction much easier. Moreover, proper artefact correction in the image greatly improves results of lossy compression of information contained.

(D) Creating MDB warehousing and copyright trading environment for one-step marketing and management of multimedia products and rights capable of operating on European basis. The technology for implementing the warehouse both in terms of hardware, software, identifier and watermarking standards necessary for its physical operation and the operation of the rights clearance has to be applied. Issues such as pricing structure have to be addressed relating to differential pricing according to the user (commercial, educational or private individual, regional variations).

(E) Developing methods of automatic compilation and generation of personalized interactive CD-ROMs in an attractive form. This is a completely new area. Innovation is needed, but full automation of the process cannot be expected.

Note under Relationship to other EU Programmes:

The project has clearly expressed relevance to the EU strategic goals in IST and is related to the following programmes: CULTURE 2000, first 5th Framework - KA III and E-CONTENTS.

Markets application and exploitation

Marketability of created products in short:

(i) ensures a wide international market by featuring significant European content,

(ii) provides employment opportunities for youth to digitaize cultural holdings and related resources for use in MDB and display on the WWW,

(iii) covers the needs of users where networks are narrowband or too expensive,

(iv) saves the end-user time and effort when licensing.

Proof of these assertions is given below.

European countries are rich in contents (words and pictures, sounds and images), but the European market needs new products, services and distribution channels to exploit this wealth in the burgeoning market for electronic publishing, interactive media, the Internet and WWW. The

transition from conventional print media and linear structures to interactive media demands more than powerful computers and software tools alone. A new order of production skills and business models is required to produce attractive, viable products for this dynamic new market. Many people do not yet appreciate the commercial and personal potential of these new media and methods. In particular, many small and medium-sized enterprises (SMEs) do not perceive the value of multimedia computers and networked communications. This is reflection both of the lack of practical information and of useful and cost-effective products and services. This project will foster a close cooperation between content owners or providers, scholars, multimedia producers, service providers (marketing, distribution channels) and end-users. The cooperative trans-national network, mainly of industry, will be developed as a result of the ECH:TOPICC project and will create pan-European multimedia business nodes. Cultural heritage institutions will have a chance to maintain their collections: a high-quality digital copies of multimedia objects or licenses can be sold to publishers, the musical industry, collectors of cultural values while the original collections safeguarded better. In this way, multimedia technologies open the door to new multimedia business.

Economic exploitation of communication channels resources is one of the important features of this project: CD-ROM-on-demand technology saves networking costs and provides a product of the highest quality exactly to the interested user. Currently not all European homes have broadband access to the Internet, and this service will improve accessibility. Each partner will issue online and offline products, taking advantage of the international market, and adapt them to a local user, developing and adding a local-language version.

This project has clearly relevant to EU strategic goals in IST:

(1) Clearly reflects convergence of technologies and media;
(2) Fosters IST integration and convergence by forging alliances between digital content providers, advanced technologies owners and a wide array of users;
(3) Empowers citizens through better access to culture and science and develops information society through individual learning;
(4) Creates European added value from impact that is greater than a sum of national impacts; the investigation of MDB leads to otherwise unattainable knowledge, inferences drawn from it are based on a massive amount of data accumulated through this project;
(5) Provides employment opportunities mainly for youth to digitise cultural holdings and related resources;
(6) Enhances the value of multilingual and cross-cultural information as the common heritage of European nations.

Deliverables: The digital European MMHI archive based on early European music established using the latest technologies, with a projected life of at least 10 years, ready to be replicated and to evolve following the technology development. Evolving multilingual multimedia applications based on the content of the digital archive developed:

(i) Online service for legal acquisition of image/text/ sound digital record;
(ii) personalized multilingual interactive CD-ROM-on-demand

service;
(iii) common English web portal and web sites in the local
languages of project partners.
Target Audience: general audience (particularly for musical
education, self-development, life-long education, music
lovers), business (publishers, musical industry managers,
holders of rights, intermediate and final users of rights)
scholars researching manuscripts, musicologists, educators,
amateurs and collectors' societies.
International Market: A huge demand for multimedia contents
is emerging: the European multimedia industry, from small
sized developer's teams that still have to be discovered
for the market up to big, renowned enterprises. ECH:TOPICC
results will be available in English and in the languages
of participating countries. The provision of multilingual
and cross-cultural information guarantees a wide
international market. Each partner country will have the
opportunity to localize and publish CD-ROMs-on-demand,
therefore postal costs will be minimal.
Follow-Up Actions: Presentations of multimedia digital
collections to general audiences, workshops for specialists
interested in this topic, organization of 'Forgotten Music'
concerts. A natural extension of this project is to include
more and more European countries. MDB software can be used
for any other topic as well, such clearly foreseen MDB
market application topics are: digital archives of folklore
collections, that were recorded on old-fashioned devices,
virtual museum collections physically located worldwide butbrought together in cyberspace.

Project codes

BSI
LB	communication media
LBQ.B	audiovisual materials
LD	communication processes
LHC.D	information exchange
LIG	information handling
LKL	signal processing
MG	data media
MJD	data handling
MJG.JM	data bases

NACE
2215	Other publishing
2233	Reproduction of computer media
7230	Data processing
7240	Data base activities
7260	Other computer related activities
73	Research and development
80	Education
925	Library, archives, museums and other cultural activities
9251	Library and archives activities

3. Main participant

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Organisation type **Participant role**	Research Institute Main

Contribution to project

Main responsibility: creating a specialised database and making its prototype by collecting digitised MMHI from the project partners' countries, ensuring online accessibility and the personalised online/offline delivery of results. The organisational impact encompasses setting up the framework bridging together content providers (libraries, cultural institutions) and know-how partners (advanced multimedia technology institutions). The research work in advanced data bases mining and IT methods for processing a huge amount of digital information, representing the highest-quality pictures, sounds and video records to create a fully accessible Internet-integrated MDB and running on a server is planned. The exploitation of the results achieved by filling the prototype MDB on early European music, running it on the Internet server delivering generated on-fly responses to queries. Development of a service for those users who want to purchase a product of the highest quality that is, issuing personalized interactive CD-ROMs-on-demand. Two roles of the main participant can be distinguished: conceptual and implementation, both described briefly below. Conceptual Role (1) Setting up the framework bringing together different countries and institutions; (2) The conceptual design of digital media communication system, creating the plan of implementation and structure of digital archive and MDB; (3) Monitoring and coordinating the partners' work; (4) Organising evaluation of the accumulated materials and project results; (5) Writing the interim and final project reports. Implementation Role - Creation of original software for filling MDB online with MMHI - multimedia entities; - Functional/syntax specifications of public interfaces; - Managing, administering MDB and running it on a server for delivery online; - Research work in advanced data bases mining and knowledge discovery.

Expertise

The key direction is investigation and adaptation of new information processing technologies for the needs of the humanities. Educational activities: Creating contents and tools for education of specialists to use advanced information processing technologies: preparing and delivering the postgraduate/undergraduate courses in informatics for the humanities, the intensive digital publishing courses. The main teaching modules are: Basic Design Components, Planning CD-ROM or Web Projects, Creating Graphics, Processing Multimedia Used on the Internet, Animation, Using and Editing Audio, Scanning, Editing Resources: Software/Hardware, Marketing Multimedia Product, Evaluation of Multimedia Product Quality, Basics of Copyright, Rights Management, The Basics of Digital Signal Processing, Digital Audio Recording and

Editing, Developing Multimedia Presentation. Research areas: Recognition of Random Processes. Participation in two National Programmes: Lithuanian Language in an Information Society and Native Language Development, encompassing: - Recognition of audio signals, speech processing; - Digital remastering and preservation of old audio records; - Language engineering natural language processing and speech processing; - Speech features extraction; - Creating a database of Old Lithuanian Texts; - Creating digital archive of Lithuanian folklore records; - Frequency Dictionary and Lithuanian Terminological Data Bank; - Computerized translation of Lithuanian language into the languages of the EU countries. More information online: http://www.unesco.mii.lt

4. Partner

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Organisation type	Research Institute
Participant role	Partner

Contribution to project

Primary issues in multimedia databases for cultural heritage preservation, presentation and dissemination are: - Data Compression: Due to the huge amount of information involved in such a multimedia database development project, the need for compression of the digital content is imperative. Data compression of special kinds of images involves research and the development of new algorithms designed to fit the special image characteristics. - Data Management: Intelligent content-based interlinkage is essential for a modern multimedia database, in order to provide the best possible access to the stored/ digitized cultural heritage data. Such a database should be user-friendly, easy to access and update and compliant with Internet and CD-ROM production. - Data Watermarking: Public availability of cultural heritage data gave rise to the need for copyright protection. Much scientific research has been done in the area, especially for the needs of digital museums or publicly available cultural libraries. Our Institute can contribute to the project in all these areas, since these are subjects of our scientific research and development. Specifically, - for data compression, we are currently working on the new compression standard, JPEG2000, and we are developing our own client-server JPEG2000 applications. JPEG2000 seems to be the most promising coding standard for cultural heritage multimedia database applications that can be delivered through the internet, due to its flexible codestream organisation and up to lossless progressive transmission. At the same time, we are investigating algorithms for Document Image Compression (DIC). Specialised perceptually lossless DIC seems to be the most appropriate research area for the purposes of this project. - for data management, we are developing internet powered multimedia databases for cultural heritage preservation and dissemination, and have experience in producing CD-ROM multimedia database applications. So we are able to provide multimedia database design and implementation. - for data watermarking, we are interested in investigating the latest algorithms for image and video watermarking both for lossy and lossless compression, and might provide a review of the most appropriate of the existing algorithms for the registration of cultural heritage data.

Expertise

The aim of the CULTURAL AND EDUCATION TECHNOLOGY INSTITUTE (CETI) is the strengthening of research and technological activities and the application of new technologies in the sectors of humanitarian science and culture and education. Among others, the Institute is concentrating on the application of information technology in the area of Education such as Distance Learning (tele-education) and Education-on-Demand. CETI has experience in: - Image coding/ compression - Image transmission over IP - Image databases - Internet programming and CD-ROM production. Previous relevant CETI projects: - 'Study of satellite broadband networks LEO/ MEO for cellular multimedia telecommunication systems', funded by the General Secretariat of Research and Technology (PENED 1999 programme). The objective of this research project was the broadcasting of multimedia data through low orbit, broadband satellite networks (LEO).

4. Partner

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Organisation type	Research Institute
Participant role	Partner

Contribution to project

* Registration of all old (12-18th century) musical manuscripts in the LIBRARY OF THE LITHUANIAN ACADEMY OF SCIENCES; * Selection of the musical manuscripts for this project; * Preparation of selected manuscripts to digitisation (cleaning, simplest restoration); * Further preparation of selected manuscripts to digitisation; * Digitisation process of prepared manuscripts; * Search for additional materials (illustrations, texts, studies of musicologists); * Filling of Multimedia Data Base (MDB) with archival description for digitised manuscripts and additional materials; * Further creation of archival descriptions, testing and evaluating; * Editing of valid archival descriptions.

Expertise

Established together with the LITHUANIAN ACADEMY OF SCIENCES on January 16, 1941. The new library received the building and the holdings of the former STATE VRUBLEVSKIAI LIBRARY, which was founded by the lawyer T. Vrublevskis and was one of the largest Vilnius libraries of the time. During a post-war period, the library was providing the scholars of the scientific institutes with the information and bibliographic material

according to the problems solved in the Academy. On January 1, 2000 the holdings of the library comprised 3,699,397 volumes and 245,161 manuscripts. The LIBRARY OF THE LITHUANIAN ACADEMY OF SCIENCES is the State universal research library continuously adding foreign and local research titles to its holdings. The holdings of the Manuscript Department cover documents, divided up into 353 fonds. The oldest documents are dated 11th century. The majority of these date from the 16th to the 20th centuries and written in Latin, old Byelorussian, Polish, Russian and the German language, and, from the end of 16th century, in Lithuanian also. Part of holdings is reflected in printed and electronic catalogues; the majority of the holdings is reflected in card catalogues but the subject-information catalogue is not complete. The majority of documents originate from the historical territory of the GRAND DUCHY OF LITHUANIA. They elucidate the past of the present LITHUANIA, partly BYELORUSSIA, Northern POLAND, East PRUSSIA and the Klaipeda district. The most valuable groups of documents are the parchment collection (1421 units, 12-19th centuries), stocks of church institutions (i.e. the archive of the Vilnius Cathedral Capitula and a part of Archbishop's archive, 1387 - middle of the 20th century), the archive of the Evangelist-Reformer Synod of Lithuania (16-20th centuries), the archive of a vanishing community of Karaites, living in LITHUANIA, part of the archive of the family of Sapiega, a noble family of the GRAND PRINCIPALITY OF LITHUANIA some fragments of the manor archives of Lithuania (15-20th centuries), archives of Lithuanian national organisations, editorial offices of newspapers, which were functioning during the occupation of Vilnius district, collections of Russian church manuscripts and other books (11-19th centuries), books of songs, collections of works by Lithuanian artists, archives of the professors of the old VILNIUS UNIVERSITY, diverse collections of documents about the political, economical and cultural life of LITHUANIA and its capital Vilnius. In the Manuscript Department the archives of famous scholars, academicians of LITHUANIA and the majority of historians, writers, architects, etc. of LITHUANIA, are preserved.

4. Partner

Company	**University Of Toronto/Multimedia Laboratory Edward S. Rogers Dept. Of Electrical & Computer Engineering** Kings College Road, 10 M5s 3g4 Toronto Canada Tel +1 416 946 5605 Fax +1 416 978 4425 www.dsp.toronto.edu
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Organisation type	University
Participant role	Partner

Contribution to project

(I) Data Compression Methodologies for Heritage Information: Visual information such as still images and video signals require a large amount of memory to store and a large bandwidth to transmit. The main problem with today's technology is the low data bandwidth available to individual multimedia users. Our research will focus on the investigation of perceptually lossless image/ video compression schemes needed to support predetermined quality of service for transmission over dedicated communication links, wireless or otherwise. Perceptually lossless compression deals with compression schemes in which degradation in the image quality is not visible to human observers. Such compression schemes make extensive use of the human visual system (HVS) properties. Based on these properties, new algorithms and methodologies for

perceptually lossless compression will be developed. (II) Content Representation and Indexing: As information is playing an increasingly dominant role in emerging technologies, methodologies for indexing and retrieval of data in large repositories will become of paramount importance. The main objective here is to develop techniques to both extract information from visual data as well as represent the extracted information in a way that the corresponding data can be queried later in an efficient and cost-effective manner. Unlike alphanumeric data, multimedia information does not have a semantic structure. Thus, conventional information management systems cannot be directly used to manage multimedia data. Instead, to meet the challenging tasks in indexing heritage information, there is a need for new, sophisticated, model-based schemes to produce a high-level description of the data. Our research will focus on the development of object models based on level vision features. The objects will be used to identify high level structure, and to monitor semantic changes in the visual repository resulting in intelligent processing of the archived data. (III) Authentication and Copy Protection of the Information: The wide-spread processing, exchange and use of visual information between individuals and organizations through mass distribution infrastructures such as the Internet creates a pressing need to protect digital information against illegal duplication and unlawful tampering, especially when cultural heritage information is considered. Furthermore, there is a necessity for mechanisms that identify and trace any illegal duplication of content. Our research will address these new security issues through the use of novel advanced multimedia processing and communication theory strategies. We propose using a content-based approach that embeds discreet security codes in visual data. Content-based protection is transparent to application and users, and can be implemented without modifying existing communication protocols. The approach will be compatible with well-known compression standards.

Expertise

K.N. Plataniotis is currently an Assistant Professor with the Edward S. Rogers Department of Electrical and Computer Engineering at the UNIVERSITY OF TORONTO. He is the Bell Canada Junior Chairholder in Multimedia and an Associate of the NORTEL INSTITUTE FOR TELECOMMUNICATIONS. From August 1997 to June 1999 he was an Assistant Professor with the School of Computer Science at RYERSON POLYTECHNIC UNIVERSITY. While at Ryerson, Prof. Plataniotis served as a lecturer in 12 courses to industry and Continuing Education programs. He co-authored, with A.N. Venetsanopoulos, a book on 'Color Image Processing & Applications', Springer Verlag, August 2000, ISBN 3-540-66953-1. He is a contributor to three books, and has published more than 100 papers in refereed journals and conference proceedings in the areas of adaptive systems, image processing and multimedia communications. Prof. Plataniotis is a member of the IEEE Technical Committee on Neural Networks for Signal processing, and the Technical Co-Chair of the Canadian Conference on Electrical and Computer Engineering, CCECE 2001, May 13-16, 2001, Toronto, Ontario. Members of the team: A.N. Venetsanopoulos. The Multimedia Laboratory at the Edward S. Rogers Sr. Department Of Electrical And Computer Engineering, UNIVERSITY OF TORONTO, Toronto, CANADA, is led by an international leader, Prof. A.N. Venetsanopoulos. He is Director of the Digital Signal and Image Processing Laboratory, a Full Professor at the Department of Electrical and Computer Engineering, UNIVERSITY OF TORONTO and the inaugural Chair holder of the Bell Canada Multimedia Chair at the UNIVERSITY OF TORONTO. In October 1996 he was awarded the 'Excellence in Innovation Award' of the INFORMATION TECHNOLOGY RESEARCH CENTRE of Ontario and ROYAL BANK, for 'innovative work in colour image processing and its industrial applications'. He was elected as a Fellow of the INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE) 'for contributions to digital signal and image processing', he is also a Fellow of the ENGINEERING INSTITUTE OF CANADA (EIC), 'for contributions to electrical engineering', and was awarded an Honorary Doctorate from the NATIONAL TECHNICAL UNIVERSITY OF ATHENS, in October 1994. In November 2000 he became Recipient of the 'Millennium Medal of IEEE'. In April 2001 he became a Fellow of the CANADIAN ACADEMY OF ENGINEERING. Between July 2001 and June 2006 he will be the Dean of the Faculty of Applied Science and Engineering of the UNIVERSITY OF TORONTO. He has served as lecturer in 138 short courses to industry and continuing education programs and as Consultant to numerous organizations; he is a contributor to twenty nine (29) books, a co-author of Nonlinear Filters in Image Processing: Principles Applications (ISBN-0-7923-9049-0), and Artificial Neural Networks: Learning Algorithms, Performance Evaluation and Applications (ISBN-0-7923-9297-3), Fuzzy Reasoning in Information Decision and Control systems (ISBN-0-7293-2643-1).

4. Partner

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Organisation type	SME
Participant role	Partner

Contribution to project

The NATIONAL LIBRARY OF THE CZECH REPUBLIC will contribute to the project through: - Works on the electronic format of the digital document, which represents music manuscripts. It will be an XML DTD based on former work performed in the national digitization programmes and on latest standards or de facto standards such as MASTER DTD for the bibliographic part of the format or standards for description of digital still images. - Digitization of selected manuscripts of interest to the partners from the holdings of the NATIONAL LIBRARY OF THE CZECH REPUBLIC. - Provision of Internet access to the national Digital Library via standards agreed in the project; this library will make accessible a greater number of digitized originals. - Possible adaptation of the available database machine for work on the bibliographic records in the agreed XML format to allow for fast searches in manuscript records.

Expertise

The NATIONAL LIBRARY OF THE CZECH REPUBLIC and its digitization partner, AIP BEROUN LTD, published the first pilot digitization CD-ROM of the UNESCO Memory of the World programme in 1993. In 1996, they launched the first routine digitization. The NATIONAL LIBRARY OF THE CZECH REPUBLIC co-ordinates today two national digitization programmes: Memoriae Mundi Series Bohemica (digitization of manuscripts and old printed books) and Kramerius (preservation microfilming and digitization of microfilm) - before the end of 2001, the two national programmes produced around 1,000,000 digitized pages. The digitization centre of the former programme has three cameras and the centre for the latter programme two microfilm scanners; all of them installed in the NATIONAL LIBRARY. Adolf Knoll is a member of the UNESCO Memory of the World Sub-Committee on Technology, which in 1999 approved the NATIONAL LIBRARY metadata format and digitization approach as one of its basic recommendations to be followed by other institutions. Together with Stanislav Psohlavec, director of AIP BEROUN, they have great expertise in imaging technology (scanning, calibration, fixation of originals, microclimate control during digitization) as well as in metadata handling and long-term storage of digital document and digital carriers. The NATIONAL LIBRARY is also about to launch a routine exploitation of the internet digital library, thereby providing access to all documents published in the two national programmes such as old manuscripts, old printed books, rare books, old maps, old periodicals, etc.

4. Partner

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	Tel Fax
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Organisation type	SME
Participant role	Partner

Contribution to project

Our main contributions to the project may be summarised as follows: - To design and develop a dynamical web interface that will allow access to the digital contents of the ECH:TOPICC Project. - To develop a web interface to facilitate the search and retrieval of multimedia content. - To develop a web interface that will allow participants in the project to upload multimedia rich material to databases via the Internet. - To develop a web interface that will allow multiparty remote exchange of information among the project participants. - To share our knowledge on encoding and streaming of rich media content for its distribution trough the Internet. - To serve as an intermediary between members of the project and Spanish institutions and organisations interested in the digitalisation of Spanish cultural heritage. Moreover, NARCEA PRODUCCIONES MULTIMEDIA S.L. will do its best to promote collaboration among all partners in order to establish a more permanent relationship that could result in the development of other multimedia and multicultural projects.

Expertise

Our main field of expertise is the design and development of rich media, data driven web interfaces. Our main tools for design are vector graphics software, Flash, and DHTML. In particular, Flash, our main development tool, allows the integration of multimedia content (audio, video, animated graphics, etc.) with remote databases through scripting in PERL or PHP and its internal programming capabilities. For the last two years we have been developing sophisticated e-learning environments that are accessible to the general public through the Internet. In developing this websites we have acquired an advanced knowledge of the following topics and tools: - Vectorial design: Flash - Client side programming: DHTML, JavaScript, ActionScript - Server side programming: C++, PERL - Databases: MySQL, Oracle, etc. - CGIs: PERL, PHP - Streaming techniques: Flash, Quicktime, Windows Media, etc. - Digital video: MPEG, MPEG2, Sorenson, etc. - XML. Besides these technical capabilities in the field of web design and development, NARCEA PRODUCCIONES MULTIMEDIA is composed of a multidisciplinary team of people enjoying very different backgrounds. Among its members, it includes experts in Education, Fine Arts, Humanities and, of course, Computers. We firmly believe that all of this makes NARCEA PRODUCCIONES MULTIMEDIA S.L. an ideal partner for a cultural and technological initiative such as the ECH:TOPIC Project.

4. Partner

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	Technical Manager / Head Of R & D Unit

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Organisation type	SME
Participant role	Partner

Contribution to project

Task 1: Contribution to the formulation of the overall architecture taking into account functional, information and communication requirements. Task 2: Contribution to the development of databases which consolidate the multimedia content. Task 3: Integration of metadata for the system database, based on the design and implementation of a specific structure for metadata management. Task 4: Development of generic XML-based modules for preparation of content formulation suitable for multimodal delivery. Task 5: Development of modules for delivery of multimedia content via IP networks. Task 6: Development of modules for delivery of multimedia content to users on the move, following a mobile device and mobile network infrastructure agnostic approach. The focus will be on 2.5-3G mobile technologies. Task 7: Contribution to the development of user interfaces for the presentation of content in various user contexts and environments (home, office, car, nomadic).

Expertise

- Component-based architecture, engineering and design of complex telematics systems, using J2EE and EJB. - Distributed databases and content management. - Intelligent and mobile agents for Business Process Automation and Content Management. - Provision of services to mobile users, based on GSM (UMTS and GPRS are current research areas of the company), WAP, etc. - Provision of Integrated Network Services (heterogeneous infrastructures, service management, user customised services, etc) and ASP (Application Service Provider). - e-solutions (B2C (e-shops), B2B (Business-to-Business)(business processes)).

4. Partner

Company	**Video Studio Of Rezeknes Augstskola**
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Contact	**Mr. Maris Justs**
	Director

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Fax

Organisation type SME
Participant role Partner

Contribution to project

- Creation of a multimedia digital database for cultural heritage preservation. - Elaboration of advanced database management, data mining and IT methods. - Creation of the content, design, format and production of the CD-ROM. - Formatting of digital text, picture and sound files, creation of the MDB-based web page and virtual museum, design of updates for the next issues of CD-ROM. - Provision of visual, video/ audio data gathering methods and appliances during expeditions to the inhabitants/ peculiar objects of the region (songs, costumes, religious traditions, landscape). - Large holdings of video and audio materials in analogue/ digital format considering Sakstagala parish and Latgale. - Devices, apparatuses and experience for digital video production. - Digitalization of image /audio sound material. - HTML applications and web design.

Expertise

- Practice and skills in multimedia digital database management for cultural heritage preservation. - Elaboration of advanced database management, data mining and IT methods. - Experience in design, formatting and production of the CD-ROM. - Formatting of digital text, picture and sound files. - Devices, appliances and experience in digital video production. - Experience in digitalization of image/ audio sound material, production of video material. - Long-term work in Latvian TV on 'Oluti', dedicated to acquisition and preservation of cultural heritage of Latgale (including the Sakstagala region). - Expertise in religious and cultural traditions. - HTML applications and web design.

4. Partner

Company **'Kolnasata' Fr.Trasuns' Museum**
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Tel +371 4 657 271
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Contact **Mrs. Valentina Bruzgule**
Director

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Fax

Organisation type Governm./Nat. Admin.
Participant role Partner

Contribution to project

- Museum holdings (manuscripts, sound records, video, books, photos, etc.) on the Sakstagala region and

Fr.Trasuns' museum. - Organisation of expeditions and gathering of cultural visual/ audio material (from old/ interesting inhabitants of the region and peculiar sites). - Preparation of PC files/ entries for further processing and consumption at the virtual museum, web page and CD-ROM. - Marketing and distribution of the CD-ROM. - Preparation of school tests and topical presentations for online and e-learning.

Expertise

Keen knowledge and experience in gathering, storage and processing of cultural heritage materials. Holdings and evaluations of old, fragile and endangered cultural materials concerning the Sakstagala region, Latgale and cultural activist Fr.Trasuns. Knowledge of cultural data marketing needs of schools in the Sakstagala region.

4. Partner

Company	**Business Systems International S.A.** 17 Noembriou, 130 155 62 Athens Greece Tel +30 10 651 18 26 Fax +30 10 651 29 04 www.bsi.gr/eng
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Organisation type	SME
Participant role	Partner

Contribution to project

Our company can contribute to the project in the following areas: - Testing of the final product as well as of all resulting product modules. - Checking the effectiveness of archiving, transfer and presentation of the acquired multimedia musical heritage items. - Issue the online and offline resulting products, taking advantage of our company's expertise in the Greek software market. - Adapt the project results to the Greek user.

Expertise

The company is the biggest specialised vendor & developer in Scanners and Digital Document Imaging Software & Hardware products in the Balkan region. We develop and distribute a very wide range of imaging software, document management software and Optical Character Recognition (OCR) software, scanners, digital cameras and digital storage devices. Our products target both the retail and the b2b market. BSI has developed several document management and recognition software: - eDocPlus: An innovative document management software, which enables you to store and organise your documents and photos easily and without wasting time. With eDocPlus you can handle any type of document that exists in your computer, including pictures, graphics and anything that is created through Windows applications by creating an

advanced super fast SQL based paperless office. - eDocPlus Office CS: A very useful and powerful multi-user document image management software. It is based on an advanced Client/ Server Architecture and has full capabilities of setting user access rights. All the documents filed in eDocPlus Office CS, thanks to its integrated SQL type database, can be searched and retrieved very fast with an unlimited combination of search criteria. - eDoc CardMan: A simple-to-use business card scanning software where all your business card information is organised in a very user-friendly database. It reads and recognises all the business card information (from several countries) and updates the fields of the business cards database. - eDoc NetScan: An innovative software package that allows you to a share a scanner among many PCs connected in an ethernet local area network. It provides a very friendly multi-user environment with several extra functions (distributes scanned images, documents and messages among users, emails the scanned documents). BSI has experience in: - Document management systems - Typewritten and handwritten character recognition - Document segmentation & area classification - Document Indexing & classification.

4. Partner

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Organisation type	SME
Participant role	Partner

Contribution to project

- Marketing and disseminating the idea of digital archive for cultural heritage; - Publishing information, advertising, organizing public presentations; - Creating website representing early music and its context by means of interesting pictures, descriptions, examples of music, old instruments; - Demonstrating the results achieved by creating and publishing an interactive CD-ROM or series of them on collected early European musical manuscripts, illustrated with audiovisual records, texts and high-resolution pictures, animations, virtual reality, video records; - Implementing a multimedia rights clearance system, licensing and trading intellectual property rights; - Maintaining an interactive CD-ROM-on-demand service.

Expertise

The organisation runs projects and courses in informatics for the humanities and does marketing and promotion of Information Technology (IT). Key research activities are: digital preservation of Lithuanian cultural heritage, propagation of advanced IT in the humanities, education and training courses, creation of cultural web sites, interactive CD-ROMs, electronic and traditional publishing, IT support for government and business administration. Analysis, consultation and participation in software development projects, operating feasibility studies concerning the representation of various commercial activities. Consultation, analysis, marketing, engineering, partial and complex IT support in the field of information activity. Conception, design

and production of computer presentations and information materials, CD-ROMs, databases and information systems, programming.