

## Enabling Access to Sound Archives through Integration, Enrichment and Retrieval



Project No: 033902

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### Executive Summary

#### Introduction

Many digital sound archives suffer from tremendous problems concerning access. Sound materials are often held separately from other materials and media where they cannot easily be listened to or browsed with no method for searching content. Existing systems which attempt to deal with these issues are often library or content specific, of limited functionality, or difficult to use.

EASAIER will provide a unique, friendly interactive experience utilizing state-of-the-art technologies to increase the effectiveness of sound archive access. It is being designed with libraries, museums, broadcast archives, and music schools and archives in mind but will also provide a number of specialized tools which may be used by anyone interested in accessing archived materials; amateur or professional.

The EASAIER system will enable enhanced access to sound archives by providing multiple methods of retrieval, integration with other media archives, content enrichment and enhanced access tools. It offers methods of searching content based on audio features, musical features, or speech content. EASAIER also supports cross-media retrieval, enabling access to other media apart from audio. It implements advances in machine learning, music and speech processing.



This first year of the project has focused on developing the platform for the system, compiling and assessing existing resources from the project partners, and creating new features which will be used in the EASAIER system. This has been achieved with great success and has far exceeded expectations for this period. Within the first year, the framework and architecture for EASAIER has

been established, user-needs defined and evaluation test methods established, the search and retrieval framework and ontology has been set up, several access features have been designed and developed to prototype level, and a draft user interface and front end has been demonstrated.

EASAIER has also been actively promoted through the publication and presentation of papers at various international conferences. These have included the 122<sup>Nd</sup> AES Convention where the time signature detection code is currently being ported to C++ for use in EASAIER several international and the WASPAA 2007 where a paper on time signature detection and ornamentation transcription was presented. All are detailed in the appendix to the Activity report. EASAIER also had a stand at the IST Event held in Helsinki Finland in November 2006.

Dissemination activities will be stepping up as the project progresses and further demonstrational prototypes are made available. This will primarily take place through the expert user's groups lead by the Royal Scottish Academy of Music and Drama. These user groups will be able to test the system on their respective archives. Currently there are officially five expert users signed up to sit on the panel; the British Library, National Library of Scotland, Irish Traditional Music Archives, INA (Institute National de L'Audiovisuel), and Caledonian University's Spoken Word project. RSAMD is also in discussion with other potential archives throughout Europe which will help to expand the potential user base for the EASAIER system in the future.

## The Partners

EASAIER has brought together a consortium consisting of 3 commercial companies and 4 academic institutions with five European countries represented. The Coordinator for EASAIER is Dr. Joshua Reiss of Queen Mary University of London, UK. Partners in the consortium are:

- Queen Mary University of London – London, UK (Coordinator)
- Dublin Institute of Technology – Dublin Ireland

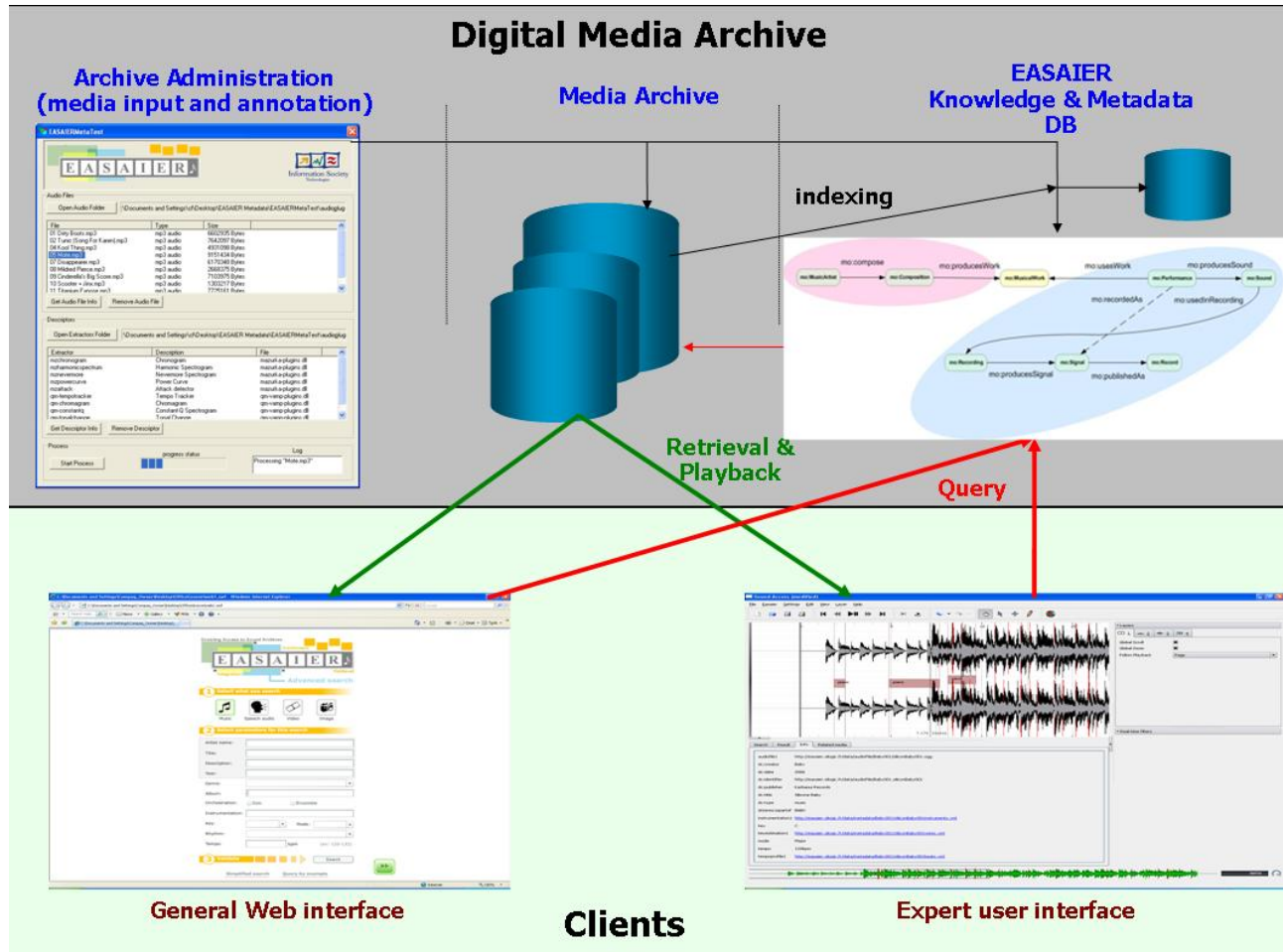
- The Royal Scottish Academy of Music and Drama – Glasgow, Scotland UK
- Alkalmazott Logikai Laboratorium Kutató Fejlesztő Szervezet – Budapest, Hungary
- Leopold-Franzens-Universität Innsbruck – Innsbruck Austria
- SILOGIC S.A. – Toulouse, France
- NICE Systems Ltd. – Raanana, Israel

## **EASAIER objectives:**

1. Improve and implement the separation and representation of sound objects from audio signals through-
  - *Establishing a common set of metadata and provide a mapping for various existing ontologies*
  - *Developing and improving segmentation and source separation techniques*
  - *Developing sound object recognition tools which aim to identify the sources of the sounds in archived recordings*
2. Allow processing of content in order to provide online interactive tools for end-users and enrich the browsing experience by developing advanced tools such as-
  - *Time-stretching to allow a user to slow down or speed up recordings without modifying the pitch*
  - *Transcription which would allow a piece of music to be converted into a standard score notation.*
  - *Synchronisation and alignment of multimedia such as audio and video*
3. Provide multiple online retrieval systems, allowing for searching of content and metadata using multiple different techniques and modalities allowing for-
  - *Speech retrieval*
  - *Music retrieval*
  - *Cross-media retrieval*
4. Provide organizational tools allowing users and archivists to gather related archive materials into tailored collections such as-
  - *Cross-archive access*
  - *Description extraction*
  - *Visualizing and navigating sound archives*
  - *Developing tools that learn categories for audio description*
5. Measure the effectiveness of the developed access system and explore its potential impact by-
  - *Evaluating the system from a variety of perspectives such as uptake, usage, presentation, value and effectiveness*
  - *Benchmarking the effectiveness using both objective and subjective measures*
  - *Establishing synergies with existing and related research projects which will provide an important link for the EASAIER project to the wider community and ensure that project achievements are placed in the broader context of audio video archiving and cultural heritage.*

These objectives are addressed in a series of eight workpackages with each workpackage being led by one of the project partners.

## General EASAIER Architecture



## Project objectives and major achievements during the first reporting period 1 May 2006-30 April 2007

The Project has achieved all milestones and deliverables for this period and has advanced further than expected by producing working demos in all technical workpackages. In Workpackage 2 the ontology has advanced to proof of concept; Workpackage 3 has created the speech segmentation user interface which can perform vocal queries and a music retrieval system has been devised; Workpackage 4 has implemented a speaker recognition application and can build a voiceprint from a way which can recognize speaker and playback; Workpackage six has

developed a preliminary EASAIER front end. Enriched access tools have also been developed to demonstration standard in workpackage 6. These include real-time sound source separation, pitch scale modification with synchronized video and a restoration EQ module.

EASIAER was also pleased to be accepted to have a stand at the 2006 IST Conference in Helsinki, Finland. It was a tremendous opportunity to network with other EU projects and generated further interest for future collaboration.

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