TELEMETA, Web project for handling academic research sound archives

Thomas Fillon[1] *, Guillaume Pelerin[1], and Joséphine Simonnot[2]

[1] PARISSON, http://www.parisson.com
{thomas.fillon,guillaume.pellerin}@parisson.com
[2] CREM, LESC, CNRS UMR 7186, M.A.E. - Université Paris Ouest
josephine.simonnot@mae.u-paris10.fr

Abstract. The abstract should summarize the contents of the paper and should contain at least 70 and at most 150 words. It should be written using the *abstract* environment.

Keywords: Sound archives, Ethnomusicology, Database, web platform, Metadata

1 Introduction

In social sciences like anthropology or linguistic, researchers have to work on multiple type of multimedia documents like photos, videos, sound recordings or databases. The need to easily access, visualize and annotate such materials can be problematic given their diverse formats, sources and given their chronological nature. This particular concern gets together some laboratories[1] involved in research on Ethnomusicoly from the french National Center on Scientific Research (CNRS).

Given those considerations, since 2007, the CREM laboratory and Parisson, a company specialized in the management of audio database, have been developing *Telemeta*, a innovative, collaborative and interdisciplinary web-based multimedia platform that fits the professional requirements from both sound archivists and researchers in ethnomusicology. Since 2008, a first prototype of this platform has been online[2].

Purpose of the demonstration

The demonstration aims at presenting the features offered by *Telemeta* as detailed in Section 2 in the context of ethnomusiclogical sound archives [5]. It

* This work was partially done inside the DIADEMS project funded by the national french agency ANR

[1] the Research Center on Ethnomusicology (CREM), the Musical Acoustics Laboratory (LAM, UMR 7190) and the sound archives of the Mediterranean House of Human Sciences (MMHS)

[2] Archives sonores du CNRS, Muse de l'Homme, http://archives.crem-cnrs.fr

focuses on the enhance and collaborative user-experience for accessing the audio items and associated metadata and on the possibility for the expert user to further enrich those metadata. Another goal of this demonstration is to present the integrated audio analysis tools described in Section 3

2 Telemeta

Telemeta is a free and open source web audio content management system which introduces useful and secure methods to backup, index, transcode, analyse and publish any digitalized audio file with its metadata. An overview of the Telemeta's web interface is illustrated in Figure 1

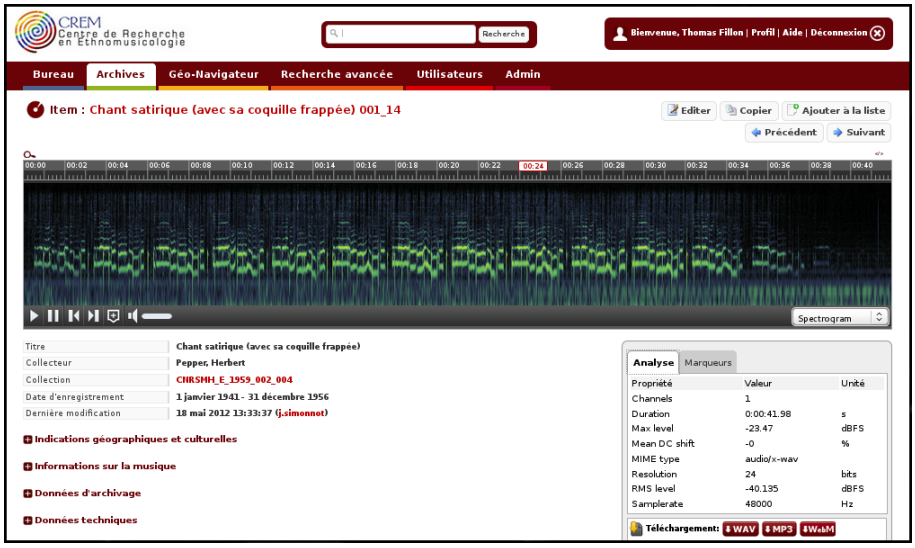

Fig. 1. Screenshot excerpt of the *Telemeta* web interface

Telemeta is dedicated to professionals who wants to easily organize, backup, archive and publish documented sound collections of audio files, CDs, digitalized vinyls and magnetic tapes over a strong database, in accordance with open web standards.

2.1 Features and Architecture

Telemeta architecture is flexible and can easily be adapted to particular database organization of a given sound archives. The compatibility with other systems is facilitated by the integration of the metadata standards protocols *Dublin Core* and *OAI-PMH* [2,4].

The main features of *Telemeta* are :

- Web platform :
  - *Pure HTML* web user interface including dynamical forms and smart workflows
  - High level *search engine*
  - *User management* with individual desk, lists, profiles and rights
  - RSS feed generators
  - XML serialized backup
  - Strong SQL or Oracle backend
  - *Multi-language support* (now english and french, german and spanish in development)
- Audio support :
  - *Secure archiving, editing and publishing of audio files* over internet.
  - Smart dynamical and skinnable *audio player*
  - *Multi-format support* : FLAC, OGG, MP3, WAV and more
  - *Playlist management* for all users with CSV data export
  - "On the fly" *audio analyzing, transcoding and metadata embedding* based on an easy plugin architecture
- Metadata :
  - Social cumulative indexing with *semantic ontologies* and *time-coded markers*
  - *Geo-Navigator* for audio geolocalization
  - DublinCore compatibility and OAI-PMH data provider

2.2 Metadata

Beside the audio data, an efficient and dynamic management of the associated metadata is also required. Consulting metadata provide both an exhaustive access to valuable information about the source of the data and to the related work of peer researchers. Dynamically handling metadata in a collaborative manner enable to optimize the continuous process of knowledge gathering and enrichment of the materials in the database.

One of the major challenge is thus the standardization of audio and metadata formats with the aim of long-term preservation and usage of the different materials.

Metadata provide two different kinds of information about the audio item : contextual information and annotations. Contextual information consists in :

- Geographic and cultural information (Location details, population/social group, ethnographic context)
- Musical informations (style, composition, interprets, ...)
- Archiving data (code and reference to the item)
- Technical data (media type and duration)
- Related media (any other material (images, video or text document associated with the audio item)

Annotation information provides additional comments or analysis done by some expert on the data. Annotations can consist in temporal information such as :

– segmentation in relevant class or label for ethnomusicological study (e.g. speech versus singing voice segment)
– time-coded makers for instantaneous comments

It should be notice that those annotations can be done either by an human expert or by some audio processing automatic analysis (see Section 3).

3 TimeSide

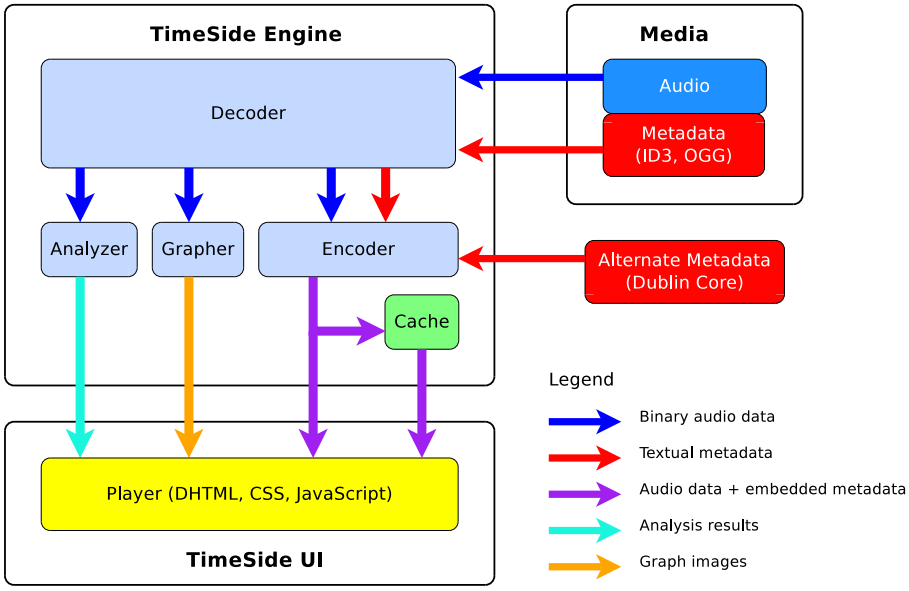

Fig. 2. TimeSide architecture

3.1 Audio management

Gstreamer, web player with enhance visualization (waveform, spectrogram)

3.2 Audio features extraction

Include reference audio feature tools : Aubio + Yaafe + Vamp [3,1] flexible architecture

4 Current development and perspectives

interdisciplinarity is further enhance by the Music Information Retrieval, Speech technology Diadems project

4.1 Audio analysis

Development of tools to offer new audio analysis tool to ethnomusicologis research studies + music similarity

4.2 Automatic segmentation and classification

- singing / talking voice segment
- ...

Acknowledgments. The authors would like to thanks all the people that have been involved in *Telemeta* specification and development or have provide appreciated thoughts during discussions.

References

1. Brossier, P.: Automatic annotation of musical audio for interactive systems. Ph.D. thesis, Centre for Digital music, Queen Mary University of London, UK (2006)
2. Dublin Core metadata initiative, `http://dublincore.org/`
3. Mathieu, B., Essid, S., Fillon, T., Prado, J., Richard, G.: Yaafe, an easy to use and efficient audio feature extraction software. In: Proc. of ISMIR 2010, Utrecht, Netherlands. pp. 441–446. International Society for Music Information Retrieval (2010), `http://ismir2010.ismir.net/proceedings/ismir2010-75.pdf`
4. Open archives initiative protocol for metadata harvesting, `http://www.openarchives.org/pmh/`
5. Archives sonores du CNRS - Muse de l'Homme, `http://archives.crem-cnrs.fr`