3.1   Publishable summary

Project description

iMP research focuses on architecture, workflow and applications for intelligent metadata   driven processing and distribution of digital movies and entertainment. The goal is to enable a 'Virtual Film Factory' in which creative professionals can work together to create and customise programmes from Petabyte scale digital repositories, using semantic technologies to organise data and drive its processing. By separating metadata from essence, controlling all the image and sound processing operations from the metadata layer, the underlying data library can being maintained unchanged while enabling a new generation of more flexible applications. This will radically reduce the amount of data created: new versions, grades, or language releases only result in additional metadata, not new data files. The system will support a more automated workflow for content distribution from postproduction to the assembly, distribution and playout of multiple variations of programmes in different formats and locations.

Summary of activities

The major achievements of the project so far, grouped by focus, are:

- **Metadatabase and Middleware**
  - Virtual Film Factory v1
  - Test content for final postproduction, customisation and distribution trials
  - Prototype of Intelligent Storage, and Middleware v2
- **Tools and Technology**
  - Bespoke Content Delivery Systems
  - Prototype software agents for distribution, brokerage and customisation
  - Final version of robust and intuitive audible applications
  - Graphic pre-visualisation tool – 3D interface for post-production
  - Combined pre- visualisation tool for of graphic and audiovisual content
- **Semantic media management and distribution**
  - Second version of the iMP ontology
  - Revised metadata tools
  - Post-Production Semantic Assistant

The iMP project begun the 1st January 2009, and has now approached the end of its second year. The current results of the project are excellent, and the project is on track to complete all of its objectives. Advanced prototypes and demonstrators have been developed on schedule, and as the final 6 months of the project commences, the work will be refocused on the integration and evaluation of the prototypes as part of the 'Virtual Film Factory'.

The different work areas within the project are the following:

Imp Metadatabase

The metadatabase constitutes the core of the new infrastructure development for the virtual film factory. Without it, the data management of the content flowing into and out of the virtual film factory would be too cumbersome, too slow and too complex. The

creative aim of the virtual film factory is to assist and encourage the interactive creation of iterations and versions which enable a superior creative outcome. That creative aim is simply not attainable within a framework based on conventional filesystem structures. The first step towards a workable prototype of the virtual film factory is therefore a workable prototype of the underlying metadatabase. Thus, the prototype database from partner FilmLight was installed in the working Post-Production environment on the premises of partner Lapospo, on the first of October.
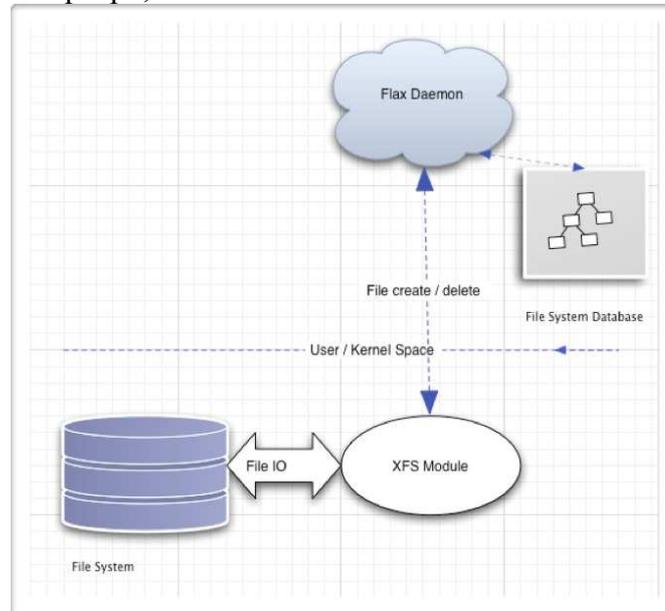

Figure 1: Metadatabase filesystem overview. The upper half of the diagram shows how the 'public' face of the filesystem metadatabase (the standard file system interface) interacts with the lower level systems that maintain associated metadata with files stored in a standard file system.

Importantly, the metadatabase comes with a comprehensive API which allows 3rd parties (for example, other partners within the project) to develop custom plugins for the metadatabase.

Novel semantic, visual and audio applications

In close collaboration with Filmlight and Lapospo, the academic partners of the project (Universitat Pompeu Fabra - UPF, Barcelona Media -BM, and the National University of Ireland Galway - NUIG) have developed a series of novel applications that improve the post-production workflow:

- Semantic post-production assistant – by monitoring the actual work carried out in a professional post-production work environment, NUIG have created a 'Post-production assistant', using semantic data to guide the post-production user through the process, suggesting next steps and, crucially, pointing out where errors or deviations have been made from the standard process.
- Novel Visual Applications – the increase and ease of access to metadata has allowed UPF to create a series of novel visual applications that allow users to more quickly visualise and access crucial data.
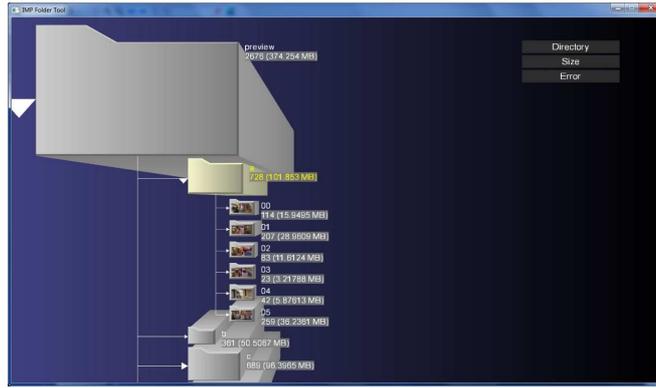
Figure 2: Screenshot of how metadata can be represented in 3D to demonstrate different aspects of the directory contents at a glance

- Novel Audio Applications – BM has been developing a series of 3D audio applications, focusing on 22.1 sound for professional cinemas. This is particularly difficult for current digital cinema distribution as the current standards only allow 5.1 speaker setups. BM has worked closely with Filmlight and Datasat Digital to incorporate 3D audio setup and metadata into a functioning distribution system.

Satellite Distribution Prototype

Datasat Digital has created and tested a prototype system for distribution of digital cinema content The scenario included the whole distribution chain, using DCI content produced by Lapospo, and the transfer from their servers, through the 'demonstration' equipment built to represent a satellite connection, to several sites. Files were also successfully transferred from the site receivers into the Theatre Management System (TMS), ingested and finally played out through a Screen Management System (SMS) in an auditorium. Both 2D and 3D content was used for the trial and the 'Show' included older local TMS content as well as the new transferred features.
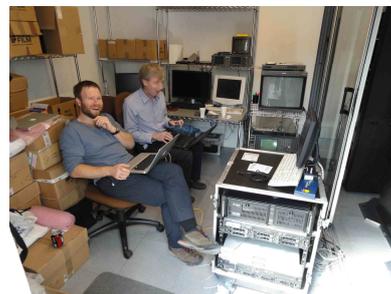

SMS Play out

TMS Server

Rx 2

Rx 3   Pre realisation confidence

IP encapsulator

XD Host Satellite server

Figure 3: Lapospo satellite distribution

The equipment used at Lapospo represents the file transfer equipment from the interface of the Distributor to the site screen. Each portion of a file delivery system was represented as well as the Internet interface for 'Ordering' and 'Issue tracking'. New files were entered into the system and the whole ordering, delivery, site ingest and play out processes were followed.

System configuration changes were necessary to allow the Lapospo local area network to interface to the UMS system and the system SMS to play out the content to the projector. Each process in the chain will be observed to confirm that the operation is as expected.

Market Prospects

Media in general and filmmaking in particular is a fashion-led business, where if one high profile director produces a certain look, or uses a particular effect, this influences others. iMP regularly tracks and reports on emerging research outside the project that may be relevant, both within the ICT and Intelligent Content Technology communities and beyond. Exploitation Planning builds on the market awareness data and applied it to construct a coherent approach to the exploitation of project results.

Recent Market Analysis from Filmlight suggests that the company will be able to achieve much commercial impact from this project. Apart from the financial revenues, it will show that Filmlight are looking at a 'broader' base in post-production, and are not 'just' a grading system manufacturer. Filmlight have a good track record in getting high profile in media, and it is possible that such grading systems could be entered into the Academy Awards 'Technical' Oscars, awarded by AMPAS annually. Note that in last year's awards, Filmlight won four 'Oscars'.

The digital distribution broadcast market is in its infancy, there are no proven models or incumbents, DDS code is agnostic to all types of files and is capable of interfacing to many platforms. Thus DDS marketing efforts will continue to keep track of market trends and identify potential customers in not only digital cinema but other media related fields.

Lapospo's view is that there is a coherence in the evolution of postproduction in the last 30 years, from which follows that innovation through the integration of filebased workflows. Intelligent processing and collaborative environments is the next milestone in media production. In the '90s it was the boost of FX companies on a shot based concept. The first decade of the 21st century was the time for the Digital Intermediate and filebased workflows with the scope of a complete film. Now, it seems that the 2010-2020 decade is geared towards the postproduction HUB: a file based working environment that pulls together post production, production, IT services, communications and management systems.

User Involvement, Promotion and Awareness

As part of the dissemination and training aspects of iMP, in June a public workshop, attended by over 30 people, was held in Barcelona. The goal of this public workshop half way through the life of the project was to bring together professional and academics from within and outside the project in order to discuss and debate about how the intelligent use of metadata has been changing the process of production, postproduction

and distribution of audiovisual material. The public debate helped evaluate the goals and initial achievements of the project at its current stage, should help in the dissemination of the results of this and other projects exploring the intelligent use of metadata for digital media.

More information on all these aspects can be found at http://www.imp-project.eu