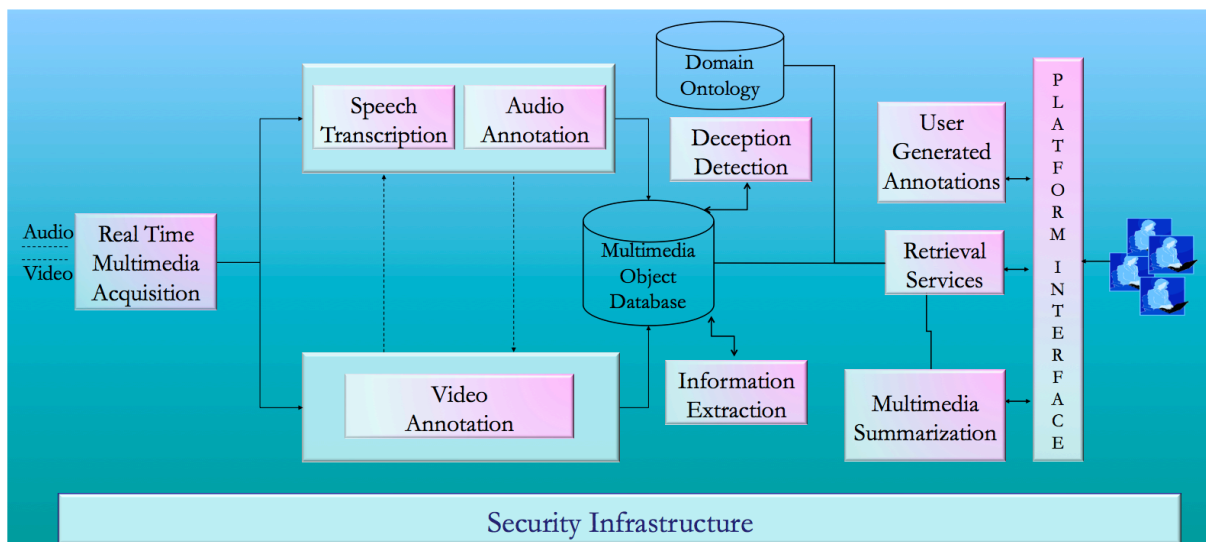


JUMAS project addresses the need to supply to the users effective tools for managing multimedia libraries, such as criminal trial proceedings. New models and techniques for extracting and representing the embedded semantics derived from multiple data sources will be developed. JUMAS will automate the transcription process and provide effective information retrieval tools on multimedia libraries through the collection, enrichment and sharing of multimedia documents annotated with embedded semantic. JUMAS is tailored at managing those situations where recordings from multiple cameras and audio sources in assemblies in which people debates and event sequences need to be semantically reconstructed for future consultations.

The prototype of JUMAS will be tested in the criminal trials in Italy and Poland.



Summary of Activities

The **JUMAS** project started in February 2008, and the main activities in the second project year (2009) have been:

- 1) Continuous refinement of user requirements with magistrates, judicial clerks and ICT managers in Italy and in Poland.
- 2) Definition of the baseline for the Automatic Speech Recognition and related prototype of Automatic Speech Recognition engines and first prototype Video Analysis engines related to the judicial domain.
- 3) First prototype of template filling, multimedia summarisation, user generated annotation modules.
- 4) R&D activities on deception recognition and emotional state recognition.
- 5) Definition of the semantic information retrieval module and integration libraries
- 6) Analysis of audio and video recordings from criminal trials.
- 7) Definition of JUMAS platform

The collected audio and video judicial materials allowed to implement improvements to infrastructure and to enhance processing algorithms. The upgrades to audio-video infrastructure in the courtrooms have been implemented and integration with judicial ICT infrastructure is in progress.

The JUMAS project has been presented to one judicial major events: ICT4JUSTICE 2009 (Skopje, FYR Macedonia) conference, gaining a wide interest, and to several international conferences.

JUMAS activities in 2009 have been split according to the four main research tracks:

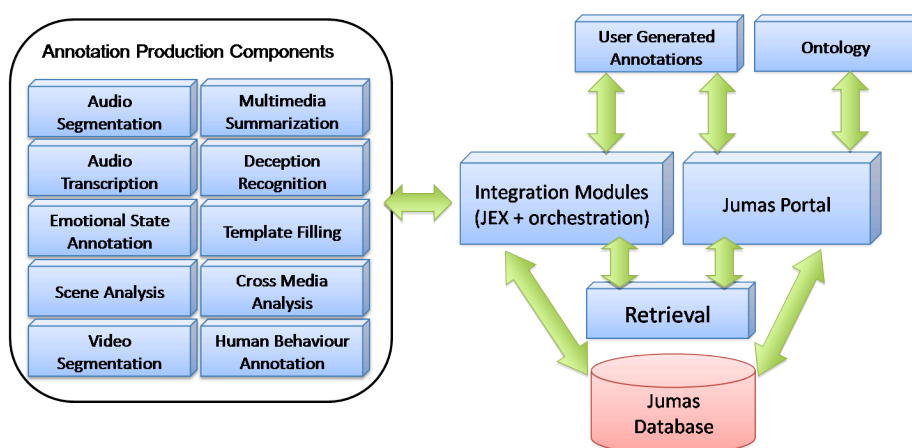
1. Audio analysis

- a) Automatic Speech recognition in criminal trials. Many different aspects have been faced, such as natural speech, dialects, people not speaking correctly the country language, judicial dictionary, thanks to the support of the Judicial Authorities. The main target is to improve the transcription process.
- b) Deception states, with the purpose to recognise them and enrich the semantics of the audio segments.

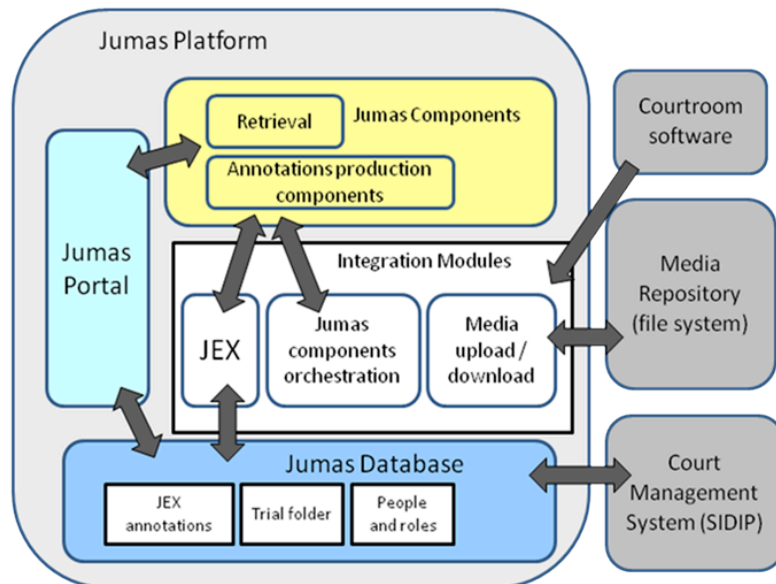
2. Video analysis:

- a) Scene and event analysis modules in video recordings, to detect relevant events in the courtrooms and possible pattern of interest for judicial actors have been implemented and tested.
- b) Video Analysis of depositions, with extraction of contexts, gestures and emotional states of the person in the video, giving relevant information for subsequent information retrieval and for emotional state recognition, has been implemented and tested.

3. **Multimedia Information Retrieval.** Ontology infrastructure, user generated annotation, multimedia summarisation, template filling, scene analysis, user generated annotation have been implemented with JUMAS Exchange format (JEX), integrating different annotations sources and retrieval components (see next figure).



4. **JUMAS demonstrator** architecture (next figure) has been defined, and integration activities started. JUMAS platform will work as an interoperable plug-in of different courtroom management system in Italy and Poland.



In 2010 JUMAS platform will be deployed in real environment. Semantic modules, emotion and deception recognition modules, video analysis and automatic speech recognition engines will be validated by the Judicial users (Italian and Polish Ministry of Justice)

User Involvement, Promotion and Awareness

The Italian Ministry of Justice and the Circuit Court of Wroclaw (Poland) promoted awareness about JUMAS inside their organisations, with relevant results. Dissemination activities have been clustered with the ones of J-WEB (IST program) project, achieving relevant synergies both at European level, with the support of DG JLS. One major event has been organised:

- ICT4JUSTICE international conference in Skopje (FYR Macedonia) on September 24th 2009, supported also by FYR Macedonia Government, attended by representatives from several Ministries of Justice, OLAF, Regional Cooperation Council and other relevant European Organisations and Institutions.

The judicial users expressed a very strong interest in JUMAS activities and outcomes, with possible short term exploitation of audio and video libraries.

The project activities have been presented to several international conferences. JUMAS experience will also constitute one of the basis for the upcoming new legislation in Poland for audio and video recordings in justice, foreseen in mid 2010.

Future Work.

In 2010 the Automation Speech Recognition Engine, Emotion Recognition, Deception Recognition, Video Analysis and Multimedia Information Retrieval modules will be integrated into the JUMAS platform and deployed for demonstration with the Court of Naples (Italy) and the Court of Wroclaw. Validation with judicial stakeholders will take place in the second part of 2010.

Particular attention will be devoted for dissemination and exploitation to judicial stakeholders, in Italy and Poland, with specific references to ongoing progresses of ICT infrastructures and foreseen legislation updates in the field of audio video usage in the judicial domain.

Exploitation strategy and plans will be set-up and possible synergies with other projects will be continuously exploited, to start to create a larger exploitation potential.

Further Information

Project website at www.jumasproject.eu and ICT4JUSTICE conference website at www.ict4justice.org.

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