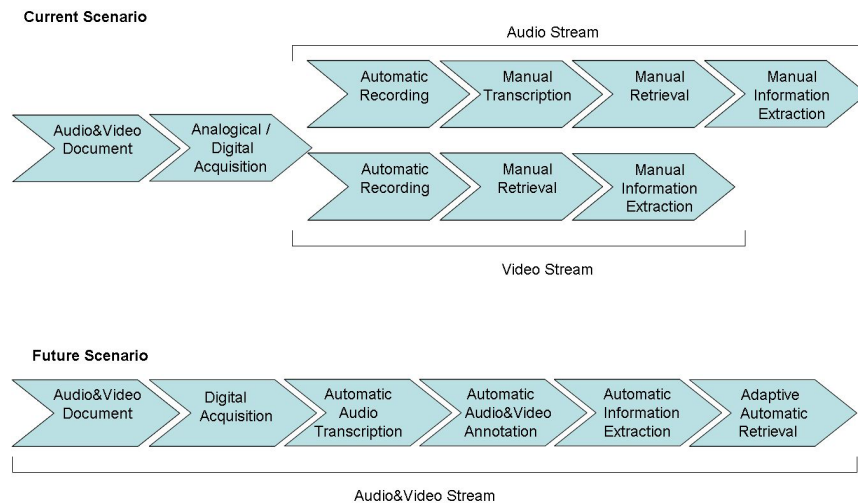# JUMAS Annual Report

http://www.jumasproject.eu/

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 up to now have been:

1) User requirements collection and JUMAS system design. The survey involved magistrates, judicial clerks and ICT managers in Italy and in Poland.
2) Set-up and first tuning for the Automatic Speech Recognition and Video Analysis engines to the judicial domain.
3) R&D activities about Automatic Speech Recognition on audio recordings from criminal trials
4) Multimedia and semantic information retrieval.
5) Analysis of video recordings from criminal trials.

The collected audio and video materials allowed an in depth analysis of the improvements to infrastructure and algorithms. The upgrades to audio-video infrastructure in the courtrooms have been implemented and a possible integration with judicial ICT infrastructure is in progress. The JUMAS project has been presented to judicial stakeholders in two major events: ICT4JUSTICE (Thessaloniki, Greece) and SIDIP (Naples, Italy) conferences, gaining a wide interest.
In 2009 JUMAS will be tested in the courtrooms.

JUMAS work areas in 2008 have been split in four main research tracks:
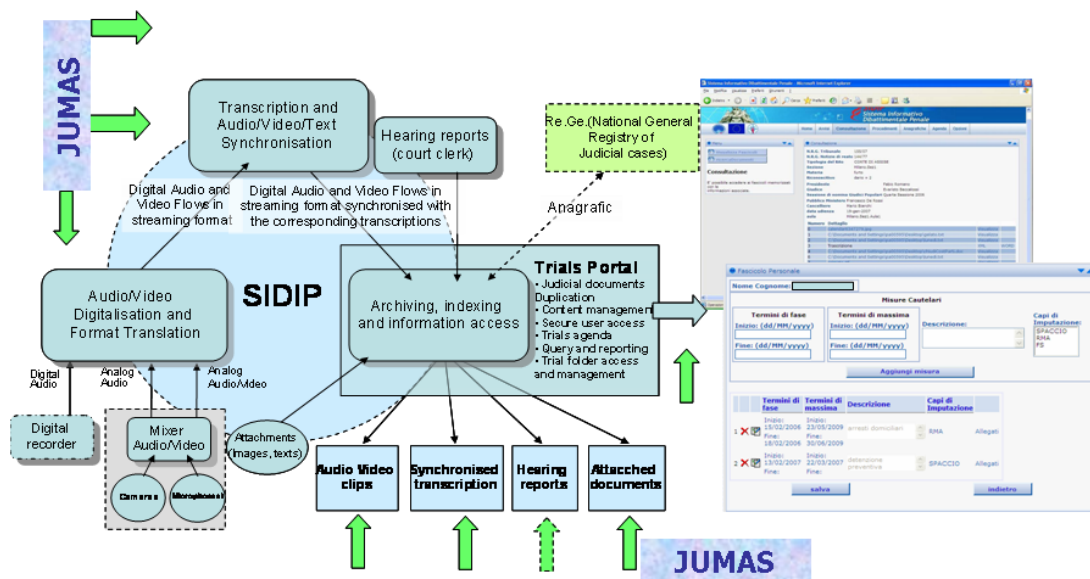
a) **Audio analysis**
   a. Automatic Speech recognition in criminal trials. Many different aspects have been faced, such as natural speech, dialects, people not speaking correctly the country language, judicial dictionary, thanks to the support of the Judicial Authorities. The main target is to improve the transcription process.
   b. Deception states, with the purpose to recognise them and enrich the semantics of the audio segments.
b) **Video analysis**. Definition of:
   a. Scene and event analysis in video recordings, to detect relevant events in the courtrooms and possible pattern of interest for judicial actors
   b. Video Analysis of depositions, in order to extract possible context and emotional states of the person in the video, giving relevant information for subsequent information retrieval.
c) **Multimedia Information Retrieval**. The relevant requirements of judicial actors have been focused and a first set of activities (ontology development, scene analysis, emotional state annotation, multimedia summarisation) have been started.
d) **Courtroom management system**. The demonstrator architecture has been designed and the JUMAS modules will be integrated into the courtroom management system (SIDIP in Italy, see figure, and e-Court in Poland).

User Involvement, Promotion and Awareness

The Ministry of Justice of Italy 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) and SIDIP (Structural funds in Italy) projects, achieving relevant synergies both at National and European level. Two major events have been organised:

- ICT4JUSTICE international conference in Thessaloniki (Greece) on October 24th 2008 (**www.ICT4JUSTICE.org**), attended by representatives from several Ministries of

Justice, DG Justice, Eurojust, the European Agency for Reconstruction and other relevant European Organisations and Institutions.

- SIDIP-JWEB-JUMAS conference in Napoli (Italy) on November 14th 2008, attended by about 200 judicial actors, including Court Presidents, Prosecutor Office Presidents and ICT managers from the Italian Ministry of Justice.

The judicial users expressed a very strong interest in JUMAS activities. The project activities have been presented to Interspeech 2008 and other national events in Italy and Poland.

Future Work or Exploitation Prospects, as appropriate (ca. 150 words)

In 2009 a first prototype set of Automation Speech Recognition Engine, Video Analysis and Multimedia Information Retrieval targeted to the judicial domain will be released and the JUMAS modules will be integrated with the courtroom management systems. The first tests will be performed in the Courts of Napoli (Italy) and in Wroclaw (Poland).
The judicial actors expressed a very strong interest in the possibilities offered by JUMAS to enhance the transcription process and to provide advance information retrieval capabilities on the multimedia contents (audio, video, text) of the judicial folders
The synergies between JUMAS and other projects in the judicial domain will be continuously exploited also in 2009, in order to reach the wider possible public in the judicial domain.