

**Informedia Experience-in-Demand  
DARPA ITO Annual Project Summary  
July 2000**

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**Objective:**

The Informedia Experience-on-Demand (EoD) project is developing tools, techniques, and systems that allow users to capture complete records of personal experience and to share them in collaborative settings. The project is also developing techniques for managing vast quantities of multimedia data and for searching, summarizing, and visualizing content from multiple perspectives. Indexed and summarized experience will enable "remembering" analogous past events and "projecting" future, simulated ones. Potential users range from rescue workers carrying personal EoD systems in operational situations to crisis managers coordinating operations remotely. EoD capabilities will significantly improve situation awareness and analysis, both as events unfold and in retrospective review.

**Approach:**

This work builds on the Informedia Digital Video Library (IDVL) project, which has successfully applied speech- and image-understanding and natural-language processing to create rich, indexed, searchable multimedia information resources automatically. EoD technology will extend the basic DVL concept, advancing into new information spaces by supporting

collaboration and summarization of multiple, simultaneous information generators, integrated across people, time, and space.

Personal EoD units will record audio, video, GPS, and other sensor data, all of which can be augmented by manually added annotations. Each unit will operate as a portable, interoperable, Informedia system, allowing both its immediate operator and remote EoD systems to search for and retrieve information. Individual EoD units will capture and manage information from their unique points of view and make this information available to their peers throughout the EoD environment.

The EoD environment will synthesize data from contributing units into a "collective experience" -- a global perspective of ongoing and archived personal experiences. The environment can thus integrate multiple, local perspectives and provide additional details for larger-scale decisions and superior event coverage for realtime collaboration.

### **TIDES option:**

This research effort addresses several challenges related to significantly improving the effectiveness of collaborative teams working with material in multiple languages. The integration of translangual capability into teamwork support tools can:

1. improve overall translangual capability and
2. improve the quality of team interaction and product while working with translangual material.

With respect to (1), the research emphasis is on multilingual content threading and multi-document summarization.

### **Recent Accomplishments:**

- Automatically generated maps that cover the locations spanned by a query's result set of relevant video segments. Dynamically summarized the video events recorded by different EoD units occurring in the same spatial region by overlaying the respective routes traversed onto a single interactive map display. Selecting a particular video segment will thus highlight one specific route of an EoD collection unit on the display; conversely, selecting one route from those presented will recall the corresponding video segment.
- Conducted field trials using multiple participants, each wearing EoD data collection equipment, exploring the same area at the same time. Existing digital wireless communications infrastructure was used to transmit EoD video, audio, and GPS data back to a base processing station in near real-time.
- Incorporated historic and archived video footage into the EoD system. This footage was geocoded and merged with recent EoD-collected data to provide contrasting pre-existing views of the same location, as might be useful in a disaster or battlefield situation.
- Devised and built a mechanism for detecting bodies in video. The method uses motion information to identify possible locations of joints, and then determines the globally optimal body configuration. Body detection can successfully track one or more individuals in relatively complicated video.

**TIDES option:**

- Initial scale-up studies of structural differencing for shared file systems. This resulted in a new architectural approach to asynchronous collaborative systems, which has been subsequently pursued in a separately funded project.
- Developed a prototype object-oriented GUI for integrated translangual information retrieval, gisting machine translation, and summarization, to allow experimentation with different styles of user interaction in a cross-language information management workstation. This also provided educational opportunities for two graduate students in GUI design.

**Current Plan:****EoD:**

- Project end date was 6/26/00.

**TIDES option:**

- Create parallel corpora that cover widely disparate language pairs and some low-density languages with relatively high accuracy in the next year. The parallel corpora created should improve the quality of dynamically updated multi-lingual corpus-based thesauri and context-relevant profiles.

**Technology Transition:**

- Collaborated with the local public television station, WQED, to develop a library of realtime recorded EoD experience data integrated with historical and archived footage from their stock.
- In discussion with General Motors concerning their interest in using EoD technology onboard in their automobiles to provide an intelligent, interactive “tourguide” upon request.

**Comments / Questions:**

Responding to the government’s desire to have EoD participate in the PI meeting and demonstrations currently scheduled for the latter part of September 2000, a no-cost extension until September 2000 has been requested and granted.

The TIDES program utilized an otherwise unfunded option line on this project’s contract to fund the work of other researchers, herein reported and annotated as “TIDES option”.