DATA & INFORMATION FUSION
DEFENCE TECHNOLOGY CENTRE

MIMEX

Multivariant Information Management & Exploitation

A toolkit that provides military users, at all levels, with enhanced situational understanding through the collection, analysis and presentation of relevant information from semantically heterogeneous and physically disparate information sources.

Project Highlights

- **Exploitation of Heterogeneous Information:** exploitation of unstructured text, audio, video, images.
- **Enterprise Services:** flexible integration of new technology components; adaptability to diverse task contexts.
- **User-Centred Design:** human factors interventions to support cognitive processing.
- **Semantically-Enabled Capabilities:** ontologies to support information integration, retrieval, and reasoning.
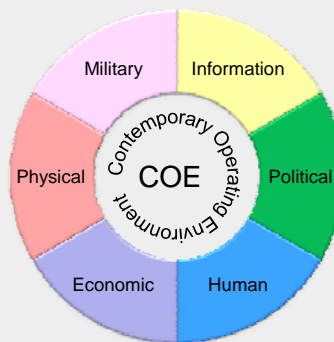
Key Achievements

- Semantic Tagging Engine
- Information Harvesters
- Resource Indexer
- Speech Processing Capability
- Domain Ontologies
- RDF Knowledge Store
- Ontology-Driven Visualizations
- Domain Scenario
- Empirical Evaluation of the Effect of User Interface Manipulations on Cognitive Processing
- CWID 2007 Demonstration

Project Keywords

Entity Extraction • Decision Support • Human Factors • Ontologies • Enterprise Services • Natural Language Processing • User-Centred Design • Situation Awareness • Information Integration • Cultural Awareness • Data Visualization • Semantic Web

Demonstration Context

In the Contemporary Operating Environment (COE) it is estimated that 75% of all the information relevant to military decision-makers is available from open sources. MIMEX will develop technologies to support the exploitation of these information sources using a combination of advanced natural language processing, speech recognition and semantic search capabilities. MIMEX will also support enterprise-level information integration across the multiple dimensions of the COE to better support situation awareness and decision superiority.

MIMEX capabilities will be demonstrated within a specific operational context, namely Stability and Support Operations. This operational context involves the integration of multiple forms of heterogeneous information, much of it open source. Stability and Support Operations require high-levels of both situation and cultural awareness, and they reflect much of the reality of contemporary military engagements.

Technical Approach

Content Acquisition

- develop speech processing capabilities to support the exploitation of video and audio resources.
- develop entity extraction capability.
- develop screen scrapers to harvest information from institutional web sites.

Information Retrieval

- support manual and automatic modes of semantic annotation and document tagging.
- develop indexing mechanism for rapid search and retrieval.
- develop information retrieval utilities.

Information Integration & Analysis

- develop semantic integration solution to support information integration & exchange capabilities.
- develop data analysis and information visualization components.
- improve information quality assessments.

Cognitive Processing

- encourage appropriate cognitive processing of task-relevant information.
- minimise the disruptive effects of interruptions on human performance by manipulating information access.
- facilitate user learning by instructional manipulations.