Sensemaking Support Environment
“A Thinking Aid for All-Source Intelligence Analysis Work”

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Overview

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• Limitations and Shortcomings
• Sensemaking Support Environment (SSE) Goals
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Research Objectives

• Research study initially focusing on intelligence analysis in the context of asymmetric warfare
• Evaluate existing intelligence analysis work patterns, systems, and tools
• Identify all shortcomings & limitations of the domain
• Investigate possible properties of a “thinking aid” for support of work
• Build a “proof of concept” scenario to support hypothesis
• Propose a new analytic concept
Current Analytic Environment

- Various inconsistent working environments
  - Multiple platforms
  - Different software applications
- Intelligence Analysts (IA) review large amounts of textual data in order to provide assessments
  - 50 to 250 messages per day
  - Information may be out of context
- Ineffective use of technology
  - Message storage and archival techniques
Limitations and Shortcomings

• Inability to remember and recall critical information over long periods of time
• Ability to maintain context of information
• Inability to look at information from multiple perspectives
• No IA support for framing an issue

• Ability to create and display graphical representations of textual data
• Inability to “share” context in a collaborative manner
Sensemaking Support Environment (SSE) Goals

- Aid the IA in the framing process
- Perform automatic search for data items to aid IA along their line of thinking
- Assist the IA if she or he wishes to look at the problem from a new angle
- Support the IA when he or she may want to explore a different framing

- Keep IA in one central location where “thinking actions” take place
- Actively participate with the IA in the sensemaking process
- Aid data search automatically from any new viewpoints the IA may formulate
Scenario for concept demonstration

- Notional terrorist event involving Bosnia & Herzegovina
- 20 interrelated messages that would have arrived during a 1.5 year time frame
- Total of 900+ messages representing the “noise” factor
- Includes various 2nd & 3rd level-deep inference layers
- Illustrates the rate at which message relation can grow
SSE Concept Demonstration Software

• Computational language engine
  – Natural language parser & Linguistic analysis tool

• Multiple analytic views
  – Message view / concept map view / aggregate message view / personal workspace

• Sensemaking work learning engine
  – Automatic information population

• Dynamically controlling the system’s rate at which it processes intelligence traffic
  – Place a time-frame boundary around the problem
  – Bounded by logical “hops”
SSE Architecture

Interactive Views

- Highlighted Message View
- Conceptual Map View
- List of Related Messages
- User Specified Context Space

I/O Means

- Mouse
- Keyboard
- Visual Language

Message Inbox
Inbox
Model

Computational Language Engine
Sensemaking Work Learning Engine

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Highlighted Message View

- Original message feed
- Hyperlinked all recognized objects of importance
- People, Organizations, Places, Events, S&T Terms, Anomalies, Comments, Related Messages identified and extracted

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ZNY EEE E
O 182130Z JUN 10
FM DHS/FOB SARAJEVO
TO DIA/DAH
FM DIA/DAH
TO AIG 1825
AMB EMBASSY SARAJEVO
AMB EMBASSY TEBRAN
WHITE HOUSE SITUATION ROOM
TAGS: MMIL, STE, IR, BA
SIMULATED CLASSIFIED
SUBJ: MOIS STRATEGIC PLANNING SESSION
SOURCE: RED 108967///A COOPERATIVE SOURCE WITH ACCESS WHOSE REPORTING HAS BEEN ASSESSED AS VERY RELIABLE.
1. (S//C) ON 10 JUN, IRAN (IR) MINISTRY OF INTELLIGENCE AND SECURITY (MOIS) CHIEF IN SARAJEVO, ABDOL VAHED MUSAVI-LARI, MET WITH SEVERAL PEOPLE, INCLUDING AN UNIDENTIFIED MEMBER OF THE BOSNIAN PARLIAMENT AT THE ULICA KASIMA HADZIC 25 SAFE HOUSE. THE PURPOSE OF THE MEETING ALLEGEDLY WAS TO REVIEW MOIS ACTIVITIES IN BOSNIA AND HERZEGOVINA (BH) OVER THE PRECEDING 6 MONTHS AND TO SET MOIS PRIORITIES IN BH FOR THE SECOND HALF OF 2010.
2. (S//C) DURING THE MEETING, MUSAVI-LARI REPORTEDLY STATED THAT THEY SHOULD "TEACH THE INFIDELS A LESSON THEY WILL NOT SOON FORGET." NEITHER THE NATURE OF THE LESSON NOR THE IDENTITY OF THE INFIDELS COULD BE DETERMINED.
BT
NNNN
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• Conceptual map view of the same message feed
• Central theme based on event-based system
• Related messages linked accordingly
• Ungrouped objects
• Past analyses
• Anomalies
Related Message Network

- Aggregate of related messages displayed based on user defined boundaries on the time frame, node linkage trace
• Elements of a thought-process representing an individual hypothesis
• IA is able to frame an analysis
• IA can synthesize different pieces of evidence and thoughts

Terrorist attack taking place in BIH
• All items of importance representing another hypothesis
• The IA is able to explore alternative fames as well

ZNY EEEEE
O: 180700Z MAR 10
FM NSA/CSS
TO AIG 135INFO
AMEMBASSY TEHRAN
AMEMBASSY SARAJEVOTAGS: MMIS, MDEF, PREL, IR, BA
SIMULATED CLASSIFIED
SUBJ: BOSNIAN TRADE DELEGATION TOURS IRANIAN DEFENSE PLANTS (S/C)
1. (S//C) A BOSNIAN TRADE DELEGATION CONSISTING OF REPRESENTATIVES FROM 10 BOSNIAN AND HERZEGOVINIAN COMPANIES TOURED SEVERAL IRANIAN DEFENSE PLANTS DURING A 6 – 15 MAR 10 VISIT TO THE ISLAMIC REPUBLIC OF IRAN (IRI). THE DELEGATION, FUNDED BY THE PRIVATE "BOSNJACKI SAVJETODAVNI ODBOR" (BOSNIAN MUSLIM ADVISORY COMMITTEE - AN INDUSTRY ADVOCACY GROUP ASSOCIATED WITH THE IRI-BASED NON-GOVERNMENTAL ORGANIZATION IGASA (INTERNATIONAL ISLAMIC RELIEF ORGANIZATION), WAS LED BY MOMIR TOSIC, BOSNIAN MINISTER FOR FOREIGN TRADE AND ECONOMIC RELATIONS

   The delegation focused on increasing commercial ties and boosting annual trade over the $50 million mark. HASAN CENGIC, DELEGATION CHAIR AND MEMBER OF THE BIH HOUSE OF PEOPLES FOREIGN TRADE COMMITTEE WAS SCHEDULED TO MEET PRIVATELY WITH MOHAMMAD ALI YUNESI, IRI MINISTER OF INTELLIGENCE & SECURITY. THE PURPOSE OF THE MEETING WAS NOT DISCLOSED.
Summary

- Need an entirely new approach to a software working environment
- Induce IA to “think out loud” while staying focused on “sensemaking”
- SSE aids the IA in framing their analysis while exploring alternative frames

- Ensure the IA quickly gets re-grounded in the analysis when she or he comes back to the problem as new data arrives or after working other tasks
- Environment to assist in both the cognitive and physical processes involved in sensemaking
- Keep IA focused on problem-set by centralizing all work in one location
- Keeps the analysis alive in an organized way
- A System “aware” of IA work activities
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