Improving Civil-Military Information Sharing in Peace Support Operations using a Service-Oriented Approach

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Presentation Structure

• Peace Support Operations (PSO)

• Communications obstacles in PSO

• Research Approach

• The Service-Oriented Computing paradigm

• Parallels

• Operational Process Modelling
Peace Support Operations
Peace Support Operations
Peace Support Operations

- military actor
- local population
Peace Support Operations

Information exchange required to:

• increase trust & understanding

• prevent interference

• improve safety

• prevent duplication of effort (scarce resources)

• learn from each other (don’t reinvent the wheel)

• allow coordination of activities
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Communications Obstacles (1)

Research (Rietjens et al, 2008 and others) describes following communications obstacles in PSO:

• “principles gap”: humanitarian organisations not wanting to be associated with military actors

• information overload: many different civil organisations (IO’s, NGO’s) involved (in Kabul, Afghanistan more than 650 organisations!)

• unstructured information: large amounts of unstructured information prevent analysis and processing
Communications Obstacles (2)

• **no institutional memory:**
civil partners become frustrated with lack of institutional memory of military partners, due to rotations and lack of information structure

• **heterogeneity in methods and approaches:**
different working methods of civil organisations, diversity of approaches and interpretations between nationalities, military rotations, units, staff members

• **no reliable communications:**
face-to-face contact necessary, but lack of time to share information in the field
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Research approach

• Information systems discipline: confluence of people, organisations & artifacts (*Hevner et al, 2004*)

• Two paradigms: behavioral science & design science

• Most research on PSO information sharing is behavioral science

• Should be complemented with design science research (technical approach to problem solving)

• Technology and behavior are inseparable: results of behavioral research to be taken into account
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Webservice: a self-describing, self-contained software module available via a network, such as the Internet, which completes tasks, solves problems, or conducts transactions on behalf of a user or application (Papazoglou, 2008)

Webservices:
• are loosely coupled software modules
• semantically encapsulate discrete functionality
• can be accessed programmatically
• can be dynamically found and included in applications
• are described in a standard description language
• are distributed over the Internet
The Service-Oriented Computing paradigm (2)

Service provider

Service description

Service registry

Service client

service

publish

bind

find
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Observation:
The wide range of different organisations, loosely cooperating in PSO, each making its specific contribution, resembles the cooperation of different software services, loosely coupled, to support a business process.

Initial research question:
Could information exchange between civil and military partners in PSO be improved by applying the principles and technologies of Service-Oriented Computing?
SOC might solve observed communication obstacles:

- **bridging the “principles gap”:** loose coupling of services, representing organisations, could provide necessary separation

- **preventing information overload:** keeping track of capabilities, availability, activities and selection of partners could be supported / automated using service orchestration technology

- **providing structured information:** publication of services description in standardised language could ease & automate information handling
Parallels (3)

• *providing institutional memory*: Public registry of services descriptions allows for easy reference

• *reducing heterogeneity*: agreement on the use of web services as standardised way to promulgate information on organisation, capabilities, availability etc could reduce heterogeneity

• *alleviate limited communication capabilities*: use of services technology allows more efficient use of scarce communication facilities than unstructured telephone use and e-mailing
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Operational Process Modelling (1)

Architecture products:

1. C4I principles
2. C4I standards & technologies
3. Operational Process Model
4. Operational Services Model
Operational Process Modelling (2)

Previous work on C4I architecture for NL Armed Forces:

• used Boyd’s (1996) OODA loop as modified by Grant (2005): Rationally Reconstructed OODA model (OODA-RR) for Internal Process View

• included Naturalistic Decision Making Process (Klein, 1998): repository of prototype situations as “knowledge representations”

• initially modelled Joint Air Defence process

Research question: OODA-approach only applicable to C2 processes or to all operational processes incl PSO?
Operational Process Modelling (3)
Operational Process Modelling (4)
Operational Process Modelling (5): JAD process OODA-RR flow diagram
Any questions?