# Business *Not* As Usual: Civil-Military Interaction from an e-Business Perspective

**Dick Ooms**
Netherlands Defence Academy
and Tilburg University, The Netherlands
dm.ooms.02@nlda.nl

**Willem-Jan van den Heuvel**
European Research Institute for Service Science
Tilburg University, The Netherlands
w.j.a.m.vdnheuvel@uvt.nl

## ABSTRACT

In peace support operations, military and civil actors are often cooperating in international coalitions. In such operations, effective and efficient coordination and information sharing is a prerequisite for effective Civil-Military Interaction (CMI), but the literature shows that this still leaves much room for improvement. Most research in this area takes a behavioral-science approach. We argue that existing research could be complemented with a design-science approach, which is an Information Systems problem-solving paradigm with its roots in engineering. After developing a high level CMI information exchange model and identifying inhibitors for information exchange, this paper provides a comparison between CMI in peace support operations and the collaboration of commercial enterprises using the e-Business paradigm. Based on observed similarities, the paper argues that the enabling technology for e-Business could overcome current inhibitors for effective and efficient information exchange for CMI in peace support operations, and is complementary to other mechanisms for information exchange.

### Keywords

Peace support operations, Civil-Military Interaction, coordination, information sharing, e-Business paradigm

## INTRODUCTION

In the post-Cold War era, military forces are increasingly being deployed for peace support operations. Typical missions in such operations range from stabilization to reconstruction, peace building, and conflict prevention. In such operations they often participate in international coalitions consisting of a wide range of civil and military actors such as Non-Governmental Organizations (NGOs), International Organizations (IOs) and local organizations (Eriksson, 2000; Rietjens, 2006; Studer, 2001). Effective Civil-Military Interaction (CMI) in such operations requires effective and efficient coordination and information sharing. However, the research literature shows that there is still much room for improvement (Eriksson, 2000; Mockaitis, 2004; Rietjens, Verlaan, Brocades Zaalberg and De Boer, 2008). As Eriksson puts it, "the partnership between the civil and military elements of peace support operations has generally not been a very happy one" (Eriksson, 2000: 1). Apart from cultural differences, CMI suffers as well from organizational and technical inefficiencies.

### Purpose and Scope

This paper presents a new approach to the improvement of the mechanisms for coordination and information sharing for CMI. With some exceptions (e.g. Ingmarsson, Eriksson and Hallberg, 2009), most existing research in this domain is taking a behavioral-science approach (Eriksson, 2000; Mockaitis, 2004; Rietjens, 2006). We propose a design-science approach, which is an Information Systems problem-solving paradigm with its roots in engineering (Hevner, March, Park and Ram, 2004). In the past decade, e-Business has revolutionized the way commercial enterprises conduct business with each other, using service-oriented computing as enabling technology (Dubray, cited in Papazoglou and Ribbers, 2006). Using a design-science approach, we investigate to what extent the enabling technology of the e-Business paradigm can be applied to coordination and information-sharing mechanisms in support of CMI. This should improve the efficiency of information

exchange: automatic message exchanges between information systems could replace many inefficient meetings, telephone conversations, and e-mails.

A few notes about the scope of our research. Taking a technical approach does not imply we do not have an eye for cultural and other non-technical determinants of information sharing (Van den Heuvel, 2010). Although we do not intend to conduct specific research into these aspects, the design-science approach takes full account of the results of behavioral science research, including cultural aspects (Hevner *et al.*, 2004). Security is an important determinant of information sharing, especially in an international context, and has both technical and non-technical aspects (Van den Heuvel, 2010). As its complexity in the context of CMI would warrant a separate study, we include security only partly in the scope of this research. We will further narrow down the scope later in this paper, using our information exchange model.

### Paper Structure

This paper is structured as follows. Following this introduction and in line with our design-science approach, we first conduct an investigation of our problem space, by providing the requirements for cooperation and information exchange for CMI, and the associated inhibitors as described in the literature. We then investigate the knowledge base for our research, by discussing the similarities between CMI in peace support operations and cooperation between commercial enterprises using the e-Business paradigm. This provides the rationale for taking e-Business enabling technology as our technology of choice. As we expect different information exchange mechanisms to suit different information exchange requirements, we subsequently compare our technology of choice with other available mechanisms. Finally, we conclude that these mechanisms are complementary, and we outline our intended further research.

## INFORMATION EXCHANGE REQUIREMENTS AND INHIBITORS

The CMI literature (*inter alia* Eriksson, 2000; Mockaitis, 2004; Rietjens *et al.*, 2008) provides many examples of requirements for coordination between civil and military actors in peace support operations, and the related Information Exchange Requirements (IERs). To obtain an overview of IERs for CMI, we propose a high-level CMI Information Exchange Model as shown in figure 1. The four segments of the model indicate information classes with related information sources, as discussed below. The seven numbered arrows indicate associated categories of IERs (hereafter referred to as I1…7). The dotted line indicates the scope of our research, as discussed below.

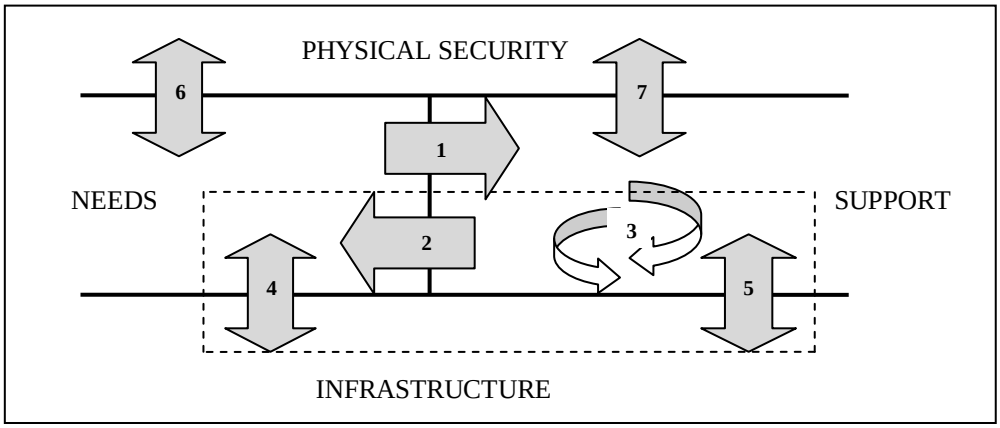


**Figure 1. CMI Information Exchange Model**

NEEDS: peace support operations are ideally needs-driven (Rietjens, 2006). Support recipients (local organizations and local population) are the primary information sources. Information about needs is to be exchanged with actors providing support capacity. This information exchange constitutes IERs category 1 (I1), depicted as arrow 1.

SUPPORT: employment of a wide range of possible support (e.g. food supply, medical, education, security sector reform, etc.) should be tailored to the needs as identified. Support actors (NGO's, IO's, local actors, military etc.) are the primary sources of information about support capability (availability, capacity, sustainability, intentions etc.). This information is to be exchanged with support recipients (I2, arrow 2) and among support actors (I3, arrows 3) for coordination purposes.

INFRASTRUCTURE: a range of infrastructure facilities such as transport, electricity and water supply, and Information and Communication Technology (ICT) (telephone, Internet) is required for the local population and to allow the provision of support. Infrastructure information sources include local authorities responsible for infrastructure, and infrastructure support actors (international and local), including the military. Information about specific infrastructure needs and about (non-)availability of infrastructure is to be exchanged with the infrastructure users: both the local population and support actors (I4 and I5, respectively).

PHYSICAL SECURITY: physical security is a prerequisite for the provision of support. It is widely agreed that the main role of the military in peace support operations is to provide security (Eriksson, 2000; Rietjens, 2006). The military collects all information on security and disseminates security information to both the local population and support actors (I6 and I7, respectively). However, the arrows point two ways; the "users of security" can also be providers of security-related information.

Using this CMI Information Exchange Model, we define our scope as the information exchange between support actors, including the military (the dotted line in figure 1), thus excluding the elicitation of needs (I1) and the exchange of security-related information (I6, I7) from the scope of our research.

### Inhibitors

The CMI literature (*inter alia* Eriksson, 2000; Mockaitis, 2004; Rietjens *et al.*, 2008) also provides many examples of inhibitors, i.e. factors obstructing the required exchange of information in CMI. The importance of identifying and addressing these inhibitors is twofold: first, any new approach to improving CMI information exchange should contribute to their mitigation; second, these inhibitors collectively create an environment very different from what enterprises doing e-Business are used to. They could create hurdles for the effective employment of e-Business enabling technology. Hence, these inhibitors form the rationale of our research.

We propose to cluster inhibitors in categories, arranged along a scale, ranging from those of a more technical nature, through organizational-related, to culture-related inhibitors. Although a scale suggests a linear distribution, reality is more complicated, as these aspects are highly interrelated, compounding the problems. An initial listing of categories, labeled X1…10 is proposed in table 1 below. Mapping these onto our CMI Information Exchange Model is difficult, since most inhibitors affect many or all categories of IERs.

| | | |
|---|---|---|
| X1 | ICT infrastructure | Local ICT infrastructure is often unreliable and with limited capacity. Mobile users have intermittent access and limited bandwidth |
| X2 | Technical interoperability | Hidden problems become apparent when civil and military information systems are connected to exchange information |
| X3 | Unstructured databases | Due to diverse and unstructured databases in use, information becomes difficult to retrieve and working methods are inefficient |
| X4 | Short rotations, insufficient handovers | Military rotations of 6 months are too short to build relations and trust. Much information and expertise gets lost in short handovers |
| X5 | Manual information collection | Much information is gathered by meetings, telephone calls and e-mails, which is inefficient and hampered by unreliable ICT infrastructure |
| X6 | Overlap in information gathering | Information is insufficiently shared, which leads to inefficiency, same information is being gathered by different organizations |
| X7 | Security issues | The military tends to over-classify information; what is made available is often outdated; civil sensitive information is not made available to the military |
| X8 | Semantic interoperability | Semantic interoperability problems due to cultural differences and unfamiliarity with each other, due to the temporary nature of coalitions |
| X9 | Cultural differences | Civil organizations have different organization and coordination mechanisms, different goals, and related timeframes than the military |
| X10 | Lack of trust | Distrust among civil actors about military intentions regarding non-military tasks, being not impartial, and in support of military mission |

**Table 1. Information Exchange Inhibitors**

In the following sections we will examine the suitability of different information exchange mechanisms to support the identified IERs and to overcome the inhibitors, by making specific references (I1…7, X1…10).

## e-BUSINESS AND CMI

Being a commercial paradigm, e-Business refers to information exchanges related to buying and selling, but also to the collaboration between business partners, distributors and suppliers (Papazoglou and Ribbers, 2006). As e-Business is about collaboration between different organizations, it can be compared to CMI in peace support operations. To illustrate the analogy using the CMI information exchange model introduced in the previous section, in figure 1 substitute "Customers" for Needs and "Commercial Enterprises" for Support. Business Process Integration (BPI) is a *conditio sine qua non* for e-Business. BPI is about a collaborative business process, defined as "a process that is implicit in the behavior and interaction between multiple business entities described as having different roles" (Papazoglou and Ribbers, 2006: 309). Individual process actors can be loosely coupled, thus maintaining their autonomy, but would still benefit from agreeing on common message standards (X2, 9; I3).

### Advantages and Challenges

BPI uses the automatic exchange of standardized messages, as governed by the collaborative business process. This could partially replace the plethora of e-mails and telephone calls currently required in CMI (Rietjens *et al.*, 2008) (X5, 6; I1, 2, 3, 5, 7). This will save time for tasks that really need human execution, such as face-to-face contact to build trust (X9, 10). Message exchange in BPI is typically "asynchronous"; it does not require an existing connection at the time of transmission. Message-Oriented Middleware (MOM) can support this asynchronous messaging with various technical features, such as "persistent messaging", ensuring message delivery under the limited and unreliable ICT infrastructure conditions typical of peace support operations (X1).

The Extensible Markup Language (XML) is a software language widely in use on the Internet for the exchange of documents. It is widely used for e-Business as a dynamic trading language that enables diverse applications to exchange information. XML is very flexible by allowing its users to define "document types" with specific format. Service-Oriented Architecture (SOA) (Papazoglou, 2008) is a concept supporting e-Business, defining interaction as an exchange of XML-messages between requestors and providers. Using "software services" (X5), providers, e.g. CMI actors, could publish their characteristics, including non-functional characteristics like availability, reliability and security profile (I7; X7). Software services are loosely coupled software modules, which are self-describing and communicate over the Internet using standardized XML messages. Published services are available in a public services registry, to be found by requestors, e.g. interested other CMI actors or a coordinating body like UNOCHA. Requestors select partners for collaboration by binding to their published services. This publish-find-bind mechanism, typical for a SOA, could probably assist in collaboration between CMI actors (X3, 4). Loosely coupled software services in a SOA support loosely coupled actors in a peace support operation (X9, 10). Whether additional technical developments are required for its use in CMI requires further research. Existing interoperability problems, due to cultural differences, will increase once BPI is adopted for CMI. BPI requires "semantic interoperability", which relates to the understanding of information and processes being shared between information systems of different CMI actors. This problem should be addressed both at the data and the process level (X8). Research is required into semantic interoperability problems and their solution.

## ALTERNATIVES: WEBSITES, PORTALS, SOCIAL MEDIA, MOBILE DEVICES

In the past decade, specialized portals and websites to support information exchange for peace support operations have been developed by *inter alia* the UN, Host Nations and NATO. These websites provide generic but up-to-date information about local needs, the support being provided, the security situation and the infrastructure (I1, 2, 4, 5, 6, 7; X5, 6). Their public nature and accessibility serves to bridge cultural differences and trust issues (X9, 10), and their use of international ICT standards serves to overcome technical interoperability issues (X2). However, they seem less suited for the exchange of specific information between support actors for coordination purposes (I3), for tailored information for a specific purpose (I5) or sensitive information for specific users (I7), and are still vulnerable to unreliable ICT infrastructure (X1). The use of websites to support information exchange for peace support operations seems complementary to the potential use of e-Business enabling technologies.

A more recent development on the Internet is the widespread use of mobile devices and social media. Initially developed for inter-personal information exchange, the suitability of social media to support information exchange for peace support operations is being investigated. Based on results of initial research (Hagar, 2012; Reuter, Marx and Pipek, 2011), its potential main application for peace support operations is expected to be for two-way communication between support organizations (including the military and individual field workers) and local population which could be used for information exchange regarding local needs, infrastructure and

security issues. This would support the use of individuals as information source (I4, 5, 6, 7). As with websites, the use of international ICT standards and an unreliable ICT infrastructure are both the strength and the weakness of social media (X1, 2).

## CONCLUSIONS, FURTHER RESEARCH

The interaction between civil and military actors in peace support operations shows similarities with commercial enterprises doing e-Business. These civil and military actors are also partners in business, albeit not in "business as usual". Based on these similarities, it appears that e-Business enabling technologies could be applied for CMI information exchange in peace support operations. This technology would have to overcome current inhibitors for effective and efficient information exchange for CMI, and seems complementary to other available mechanisms such as websites and social media. The contribution of this research to the field consists of taking a new, more technically-oriented approach, by developing a high-level CMI Information Exchange Model and identifying associated information exchange inhibitors, to investigate the feasibility of e-Business enabling technology to overcome the inhibitors identified. However, the preliminary conclusions have been drawn from limited literature research and should still be validated.

Based on this conclusion we intend to conduct further research as follows. We will develop a more detailed CMI process model that should be validated using case studies. A CMI information architecture will be developed, showing the relations between the process model, the information requirements, and (potential and existing) technical solutions. This would allow a gap analysis to be conducted to identify domain-specific shortfalls in existing e-Business technology. Prototype improvements should subsequently be developed and validated.

## ACKNOWLEDGMENTS

I would like to thank Tim Grant and Bas Rietjens, both from the Netherlands Defence Academy; Tim for his guidance in writing this paper and Bas, as subject matter expert, for introducing me in the world of civil and military actors in peace support operations.

## REFERENCES

1. Eriksson, P. (2000) Civil-Military Co-ordination in Peace Support Operations – An Impossible Necessity? *The Journal of Humanitarian Assistance*, posted 16 September 2000.
2. Hagar, C. (Ed.) (2012) Crisis Information Management, communication and technologies, Chandos Publishing, Oxford.
3. Hevner, A. R., March, S. T., Park, J. and Ram, S. (2004) Design Science in Information Systems Research, *MIS Quarterly*, 28, 1, 75-105.
4. Ingmarsson, M., Eriksson, H. and Hallberg, N. (2009) Exploring Development of Service-Oriented C2 Systems for Emergency Response, *Proceedings of the 6th International ISCRAM Conference*, Gothenburg.
5. Mockaitis, T. R. (2004) Civil-military cooperation in peace operations: the case of Kosovo, Strategic Studies Institute, U.S. Army War College, Carlisle, PA.
6. Papazoglou, M. P. and Ribbers, P. M. A. (2006) e-Business organizational and technical foundations, John Wiley & Sons Ltd, Chichester.
7. Papazoglou, M. P. (2008) Web Services: Principles and Technology, Pearson Education Limited, Harlow.
8. Rietjens, S. J. H. (2006) Civil-military cooperation in response to a complex emergency: Just another drill? PhD thesis, University of Twente, Enschede.
9. Rietjens, S. J. H., Verlaan, K., Brocades Zaalberg, T. W. and De Boer, S. J. (2008) Inter-organisational communication in civil-military cooperation during complex emergencies: a case study in Afghanistan, Overseas Development Institute, Blackwell Publishing, Oxford.
10. Reuter, C., Marx, A. and Pipek, V. (2011) Social Software as an Infrastructure for Crisis Management – a Case Study about Current Practice and Potential Usage, *Proceedings of the 8th International ISCRAM Conference*, Lisbon.
11. Studer, M. (2001) The ICRC and civil-military relations in armed conflict, *IRRC*, 83, 842, 367-391.
12. Van den Heuvel, G. G. A. (2010) Share to win: Unraveling information sharing in dynamic coalitions, *Proceedings of the 2010 European Conference on Information Systems*, Pretoria, paper 0309.