

EFFECTIVE INFORMATION EXPLOITATION: A CHALLENGE FOR MILITARY AND BUSINESS ORGANISATIONS

Dr Carole Deighton

*Air Affairs (UK) Ltd
1 Market Street
Yeovil,
Somerset, BA20 1HR*

Information Exploitation is the sharing and use of information to support situation awareness, decision-making, planning and co-ordination to achieve particular business or military objectives. This paper outlines the types of competencies, which are associated with effective Information Exploitation (IX) and factors influencing effective IX within a consortium.

Introduction

Increasingly, UK Prime Contractors are being encouraged to collaborate with Small Medium Enterprises and Academia to form consortia to conduct research that will address key capability or knowledge gaps. The MOD's Defence Technology Centres and collaborative Research Programmes are current examples. Within the Military context, joint and coalition operations to achieve specific effects (e.g. peacekeeping, warfighting) are well documented by the media.

Both business and military teams may need to be formed at short notice with individual team members operating from various locations both within the UK and Nationally. Advances in communication systems have provided the technological infrastructure to enable dispersed teams to be networked within both civilian and military organisations. Within the military domain meeting the specific objectives of Networked Enabled Capable working at the 2007, 2015 and 2025 epochs represents a key challenge not only for the technologists but also for those concerned with effective Human Factors Integration (HFI).

The ability of the individual, team and organisation to work effectively within a consortium should not be assumed. Effective Information Exploitation (IX) and Information Management (IM) are fundamental to the success of a consortium – this term is used in the remainder of this paper to cover coalition and joint operations. IX and IM functions are enabled by People, Technology and Processes. In the first part of this paper the focus is on People; understanding the types of IX competencies that are required to work effectively within a consortium. In the second part of the paper, factors influencing the deployment of IX competencies within a consortium are highlighted. Recommendations for meeting the challenges presented by consortium working are outlined in the final section of this paper.

Information Exploitation Competencies

Defining Competencies

Various descriptions of the term 'competence' exist and typically refer to either a task-based or a person-based requirement. An ability based on the conduct of work tasks is usually termed 'competence' (plural competences). For example, the ability to 'send information' might require data entry (keyboard) skills and knowledge of protocols for sending secure information.

An ability based on a person's behaviour is usually referred to as a 'competency' (plural competencies). In this definition, competencies are observable behaviours that individuals demonstrate when undertaking job-relevant tasks effectively within a given organisation context. For example, 'shares information to gain commitment and trust from others'. Person-based competencies are not task or context specific and help to assess how people combine and use knowledge, skills, motives etc. when conducting work related tasks.

Competencies structured hierarchically within a Competence Framework form an essential input to an Organisation's Competence Management System (CMS) that in turn informs recruitment, selection, and training and development requirements.

Scope of the IX Competency Framework

IX is the sharing and use of information to support situation awareness, planning, decision-making and co-ordination to achieve particular objectives. In a study conducted on behalf of the UK MOD, (Deighton *et al*, 2005) focussed on an identification of those competencies associated with the sharing and use of information and situation awareness. It was argued that these two components are central to effective IX and are enablers to collaborative decision making and planning processes. Accordingly, the scope of the IX Competency Framework was defined as those competencies enabling the sharing and use of information and situation awareness.

Description of the IX Competency Framework

The Prototype IX Competence Framework developed by Deighton *et al*, (op cit), comprised 85 descriptions of effective teamwork competencies/behaviours, grouped into 14 competence areas, which were grouped into six competence clusters. The content of the Competency Framework was developed following a critical review of the literature on effective teamwork behaviours, existing team competency questionnaires and frameworks; unclassified future military policy documentation; and in consultation with Subject Matter Experts from UK Tri-service collective training facilities. A summary of the competency clusters and areas is provided at Table 1.

Factors influencing Information Exploitation

Assuming that personnel are suitably trained in the competencies associated with effective IX then what else could inhibit effective IX? Technology is an obvious influencing factor, where the provision of too much information and information overload is likely to inhibit information sharing. Two other important factors: organisational maturity and adhoc team working are discussed in the following sections.

Organisational Maturity

An important factor, which to the author's knowledge has not been investigated, is the impact of differences in the maturity of organisations comprising a consortium on IX and ultimately the achievement of business and military objectives.

Five levels of maturity are summarised in the Software Engineering Institute's Capability Maturity Model (CMMI) along with a description of the types of processes and practices, which are implemented at each level. For example, Integrated Project Management, Integrated Teaming, Measurement and Analysis (Chrissis, *et al*, 2004). At the lowest level of maturity (level 1) an organisation achieves its objectives as a result of the heroic efforts of its workforce at a cost of high stress, burn out and little planning or control. At the next level of maturity (level 2), the organisation emphasises project management, but does not have a company wide approach; different projects employ different processes. A team operating in a company at level 3 follows standard company processes and uses standard toolsets, both tailored to suit specific projects. There is an emphasis on organisational learning and feedback. Subsequent levels of maturity are characterised by the organisation's use of quantitative measures to support fact-based decision making (level 4) and the emphasis on innovation and continual improvement (level 5).

The capability to share information between projects within organisations, which is evident at level 3, suggests that this level of maturity and above is most appropriate given the requirements of consortium working. Does this mean that organisations at level 1 and 2 should not be invited to join a consortium? What is the ideal composition of a consortium in terms of maturity? If the ideal is not possible, then what interventions are required to enable effective IX? The development of enabling roles is one type of intervention; however, work to determine the specific requirements of this role is required.

Adhoc Team Working

An adhoc team is a 'new team', which has been formed for a specific reason. The team may have short-term objectives, a high staff turnover, differ in 'ways of working' and if multinational involve different cultures, languages etc. Adhoc teams may be formed to support peacekeeping operations and emergency/disaster management. In business, the bid team brought together to address a requirement involving a range of technical skills is a good example of an ad hoc team.

Through a simple mapping exercise Deighton *et al*, (op cit) highlighted those IX competency clusters and areas, which might be inhibited by adhoc, team working. Findings indicated that one of the major challenges to effective performance in IX is in establishing the interpersonal relations especially shared vision, evolving learning and mutual trust (refer Table 1). Once again, the question of what can be done to enable these competency areas to be established quickly needs to be asked. An examination of the competencies and behaviours associated with these areas provides a valid starting point. For example, consider the competency 'demonstrates an understanding of the general knowledge, skills, abilities, preferences, experiences, and tendencies of others within the consortium' (Evolving Learning). Within a bid team this competency may be facilitated by providing the bid manager with an appreciation of the types of issues that are typically addressed and approaches used by relevant disciplines (e.g. software and systems engineering, Human Factors Engineering, Training, Reliability, Safety).

Summary and Conclusions

In this paper, IX was defined as the sharing and use of information to support situation awareness, decision-making, planning and co-ordination to achieve military and business objectives. The clusters and areas comprising a prototype version of an IX Competency Framework were identified and it was noted that a set of competencies and behaviours had also been identified but not reported fully. It was argued that the ability of individuals and teams to exercise IX competencies should not be assumed and that the importance of these competencies will increase given advances in networked enabled working in both the civilian and military sectors.

The potential influence of the maturity of the organisation and in particular, the differences in maturity levels of organisations comprising a consortium on IX was discussed. In addition, the affect of adhoc team working on the competency areas: mutual trust, shared vision and evolving learning was highlighted.

Effective Information Exploitation is a major challenge to both military and business organisations. Understanding what enables and inhibits IX is critical and developing practical interventions is a research priority.

Table 1. Extract from the IX Competency Framework

Description of Clusters and Areas	
1	Interpersonal Relations
1.1	Collective Orientation - Shows the capacity to take others behaviours into account and a commitment to the consortium. <i>For example assists other consortium members in times of difficulty.</i>
1.2	Conflict Resolution - Proactively resolves problems within the consortium. Demonstrates a willingness to challenge inappropriate behaviour. <i>For example, demonstrates a willingness to resolve technical and cultural differences arising.</i>
1.3	Mutual Trust – Shows trust and confidence in the integrity and loyalty of the consortium membership. <i>For example, displays a willingness to trust the performance of others without excessive and time-consuming checks.</i>
1.4	Shared Vision – demonstrates an understanding of and support for the direction, goals and vision of the consortium. <i>For example, demonstrates the ability to interpret and articulate other’s views to ensure a common understanding.</i>
2	Adaptability
2.1	Task Adaptation – adapts resourcing and processes in collaboration with other relevant consortium members given specific task objectives. <i>For example, works collaboratively to ensure that the consortium can learn rapidly about new domains or environments.</i>
2.2	Team Adaptation – adapts team structure and ways of working (norms) in collaboration with other relevant consortium members given specific task objectives. <i>For example, where required encourages collaborative working both horizontally within and between traditional staff functions and vertically across the levels of command.</i>
3	Performance Monitoring and Feedback

Description of Clusters and Areas			
3.1	Evolving Learning – Demonstrates a general understanding of the knowledge, skills and abilities of the consortium and encourages the sharing and development of relevant expertise. <i>For example, demonstrates follow-through on lessons learned.</i>	3.2	Mutual Performance Monitoring and Feedback – Monitors the performance of the consortium using objective measures, provides constructive feedback and acts on feedback received. <i>For example, gives due recognition to the contributions of others.</i>
4 Co-ordination			
4.1	Task Organisation – Ensures that the tasks and workflow within and between the consortium’s teams are organised and synchronised. <i>For example, regularly reviews the validity of activities in relation to the overall objective of the consortium.</i>	4.2	Time and Activity Pacing – Ensures that tasks are conducted in the correct sequence and that resources are used efficiently. <i>For example, collaborates appropriately to ensure that the sequencing of tasks is optimal.</i>
5 Problem Solving			
5.1	Problem Assessment – Gathers information related to a problem, task or issue in consultation with other relevant members of the consortium when appropriate. <i>For example, displays a willingness to share information with other people and teams within the consortium.</i>	5.2	Implementation – Selects and implements a solution to a problem, task or issue within an agreed time. <i>For example, collaborates with relevant personnel to act decisively to implement the chosen solution.</i>
6 Communication			
6.1	Passing Information – Expresses relevant information clearly and accurately to consortium members using appropriate communication processes. <i>For example, information is expressed accurately with the appropriate degree of persistence.</i>	6.2	Receiving Information – Confirms receipt and understanding of task information and seeks clarification when required. <i>For example, uses appropriate techniques (e.g. backbriefs) to ensure that relevant members of the consortium have understood critical requirements.</i>

References

- Chrissis, M.B., Konrad, M., Shrum, S. 2004, *CMMI: Guidelines for Process Integration and Product Improvement, sixth Edition*, (Pearson Education Inc.)
- Deighton, C.D.B., Livingstone, H., and Luther, R. 2005, Information Exploitation Competencies Study. Air Affairs (UK) Ltd Main Contract Report.