

Draft Terms of Reference
Battlespace Knowledge Workshop
AIAA Technical Committee on Information and C2 Systems

A. Background

A.1. Tasking. The Department of Defense is embarked upon a journey to transform the Force for the 21st Century. The closely inter-related concepts of information and decision superiority are at the very core of this Information Age transformation. New information technologies have enabled a qualitative change in the information environment, allowing the development of high levels of battlespace knowledge and enabling new types of military operations. This can result in decision superiority, better decisions arrived at and implemented faster than an opponent can react. Decision superiority does not automatically result from information superiority. Organizational and doctrinal adaptation, relevant training and experience, and the proper command and control mechanisms and tools are equally necessary.

In recognition of the potential of new technologies and their applications, the ASD (C3I) requested that the AIAA Information and C2 Systems Technical Committee (AIAA I&C2 TC) conduct a workshop on the subject.

The sponsors of the workshop will be in the Office of the ASD (C3I) and the J-6.

A.2 Context. Many technologies underlying the creation and management of knowledge are being developed and used in the commercial sector. These technologies continue to be a driving force behind the restructuring of commercial organizations and processes, resulting in increased effectiveness and reduced operating costs. The term “knowledge”

has yet to be standardized, meaning somewhat different things to different people, and its interpretation often overlaps concepts associated with “information”.

For the purpose of focusing this Workshop on areas of greatest interest to ASD (C3I), “Battlespace Knowledge” will be used here to refer to concepts, processes, tools, and technologies that serve to improve our ability to

1. extract “knowledge” from “information” or “data”, thereby enabling new ways of doing business, reducing information overload, reducing cycle time, and increasing the quality of decisions;

2. disseminate this knowledge with those in the organization that need it to

create shared awareness; and, in doing so,

3. enable new organizing principles and approaches to management that can leverage our superior understanding to improve our military effectiveness on tactical battlefields.

The opportunities afforded by superior battlespace knowledge can be difficult to exploit. Commercial experience has shown that if initiatives are to be successful, there is a need to change not only technology, but also organizational culture and operational processes. In fact, reliance solely on technological change has led to widespread skepticism of claims for improved effectiveness and efficiency. This workshop will examine not only the opportunities for exploiting battlespace knowledge but also the possible impediments to exploitation, whether these are cultural, procedural or technological.

Another lesson from commercial experience is that no “cookbook” solution applies to any specific problem or industry. Developing and applying effective solutions to organizations is not a simple matter, and need to be tailored to specific applications. Commercial techniques and solutions cannot be applied in a straightforward manner to the military domain for many reasons, some of which are:

1. Operating environment. Both military and commercial operations are characterized by competition. However, military operations involve much more serious considerations of potential casualties and destruction. More subtly, military forces are not allowed to choose its operating environment (e.g., mission, timing, or adversary) with the same freedom as does commercial industry. This may require much broader (and possible more compromised) solutions for the military.

2. Change process. Commercial firms are in a continuous operating environment, and can experiment and rapidly learn lessons with new technologies. The military can experiment with new operational concepts, and has ongoing and planned warfighting experiments. However the military’s experiments are limited in terms of their realism and the scope of any individual experiment.

3. Spectrum of possibilities. Commercial firms have successfully exploited

knowledge management, but each firm takes a unique approach that works for its’ specific circumstances. Even within the same industry, different firms take different approaches. There is no clear lesson on what is useful for the military.

4. Systems-of-systems. While individual information technologies may perform effectively in isolation, ultimate effectiveness will depend on how they work together in a systems-of-systems architecture. The military needs to develop, predict and aim for objective architectures that are long range and achievable. To achieve this, the DoD needs a very flexible and adaptive acquisition system to adjust architectural plans as technologies develop and, just as importantly, as critical technologies are discarded or fail to be developed by the commercial sector.

B. Goals and Objectives

The goal of this Workshop is to develop a plan of action leading to enhanced battlespace knowledge. The Workshop is not expected to develop single point solutions to complex problems, but rather to identify realistic opportunities to enhance battlespace knowledge in DoD and to identify the actions that should be taken to ameliorate potential impediments to the successful implementation of those opportunities.

The Workshop objectives are 1) to develop a framework for understanding the potential contributions of battlespace knowledge to military operations; 2) to provide a baseline assessment of current state of battlespace knowledge; 3) to identify and assess the uses and applicability of commercially applied solutions to take advantage of increased knowledge; 4) to identify areas where DoD-unique needs exist that will not be satisfied by commercial efforts; and 5) to identify areas where DoD must conduct experiments and/or invest in R&D to understand and fulfill unsatisfied needs. Recommendations will address issues of culture, process, and technology.

C. Approach

This workshop will require extensive participation by representatives from the commercial and DoD sectors. To focus the efforts of workshop participants, working groups will be established to address specific high payoff issues of interest to DoD and which relate to commercial experiences with knowledge management. The following working groups will be formed to address the questions cited below. Each working group will be expected to orient products toward developing a better understanding of the role of knowledge management in the military; experiments that need to be conducted to increase understanding of required changes in culture, process and technology; and, recommended R&D efforts to improve capabilities.

1. Uses of Battlespace Knowledge. This working group will develop a framework for understanding how battlespace knowledge contributes to military force effectiveness. This framework will be used to assess current state of the practice. The working group will also project future needs based on future doctrinal concepts as outlined in Joint Vision 2020.

2. Global Operations. This working group will address the specific problem of globally distributed operations, focusing on how information and knowledge can be used to enhance effectiveness. This working group will address technical issues (e.g., creation and maintenance of globally distributed knowledge databases), cultural issues (e.g., use and acceptance of collaborative tools), and process (e.g., creation of knowledge processes). Applicable commercial experiences will be used when possible.

3. Time Critical Operations. This working group will address the specific problem of time critical operations, as exemplified by precision strike. This working group will address technical issues (e.g., real-time communications connectivity), cultural issues (e.g., rationalizing streamlined, quick reacting organizations within larger, slower reacting organizations focused on broad-based operations), and process (e.g., impact of streamlined decision making on organizations.)

4. Synthesis. This group will synthesize the products of the other working groups.

D. Location and Dates. The workshop will be conducted in the Washington, D.C. area in Winter 2001.