Implementing Network-Centric Command And Control

**10th International Command and Control Research and Technology Symposium
The Future of C2**

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The Goal

"By making possible a faster, clearer reading of the situation and a more effective distribution of resources, a superior command system may serve as a force multiplier and compensate for weaknesses in other fields…"

- Martin van Creveld, 1985

Background

- The field of Command, Control, Communications and Computers (C4) is moving so quickly that the interaction between user pull and technology push is becoming exceptionally dynamic.

- Advancements in C4, sensors, information, information systems and precision-strike technologies, as well as the implementation of new, broad, ubiquitous networks, are creating a significant change in the military information environment.

Our Premise

- It will be some time before U.S. military forces can achieve a truly interoperable command and control capability because significant impediments relating to:

  - *culture,*
  - *structures*,
  - *processes, and*
  - *products*

  must first be addressed.

Network Centric Warfare Report

- As described in the Network Centric Warfare Report to Congress, a fighting force that can conduct network centric operations can be described as having the following attributes and capabilities:
  - **Physical Domain**: All elements of the force are robustly networked achieving secure and seamless connectivity.
  - **Information Domain**: The force has the capability to collect, share, access and protect information. The force can collaborate in the information domain.
  - **Cognitive Domain**: The force has the capability to develop and share high quality situational awareness and have a shared knowledge of the commanders' intent.

Sharing

- All of these domains require a ***shared*** networking environment, ***shared*** information and knowledge, ***shared*** situation awareness and understanding of commander's intent. By definition, ***shared*** implies:
  - The use of something <u>along with others</u>.
  - <u>Letting someone use something</u>.
  - Having <u>similar feeling or experience</u>.
  - <u>Taking responsibility together</u>.

I.e., Sharing is a Social concept!

The Social Domain

- Besides the physical, information and cognitive, domains the **social domain** (the domain of sharing & interaction) is also needed.

- **Social Domain**: The social domain implies the **cultural** impact that can create the kind of understanding that will promote *shared* interaction and proceedings congruent to the commander's intent.

- C2 processes and the interactions between and among individuals and entities that fundamentally define organization and doctrine exist in the social domain.

Information Age C2 Process
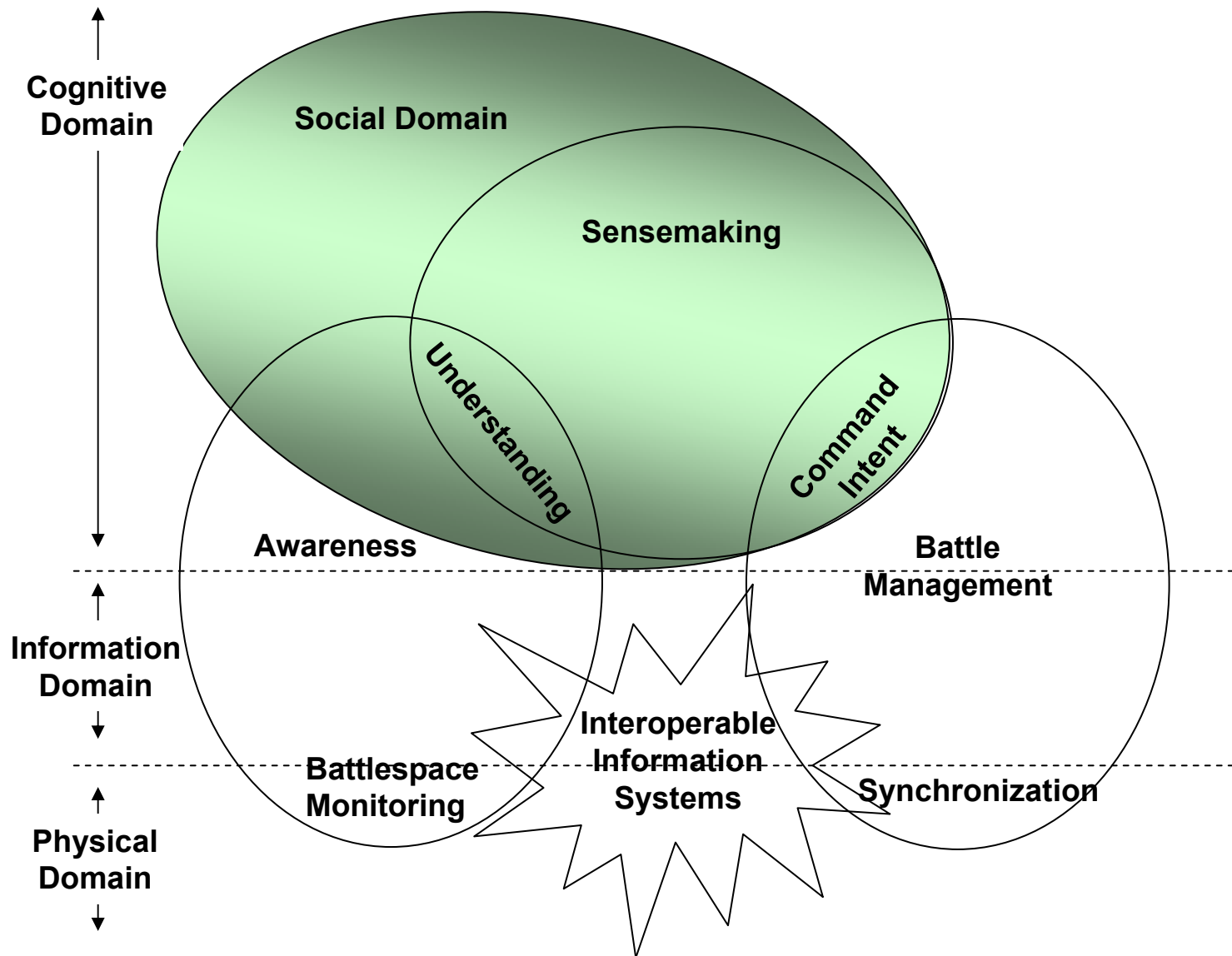
Interoperability

- To have an effective and robustly networked force, there is a need to have an enterprise-wide, integrated C2 system.

- Such a force can only be achieved if there is high interoperability among mission participants, data elements and the systems that support them.

  – Interoperability ensures the ability of systems and forces to interact effectively with other systems and forces.

  – Forces that are interoperable are able to operate in a net-centric environment.
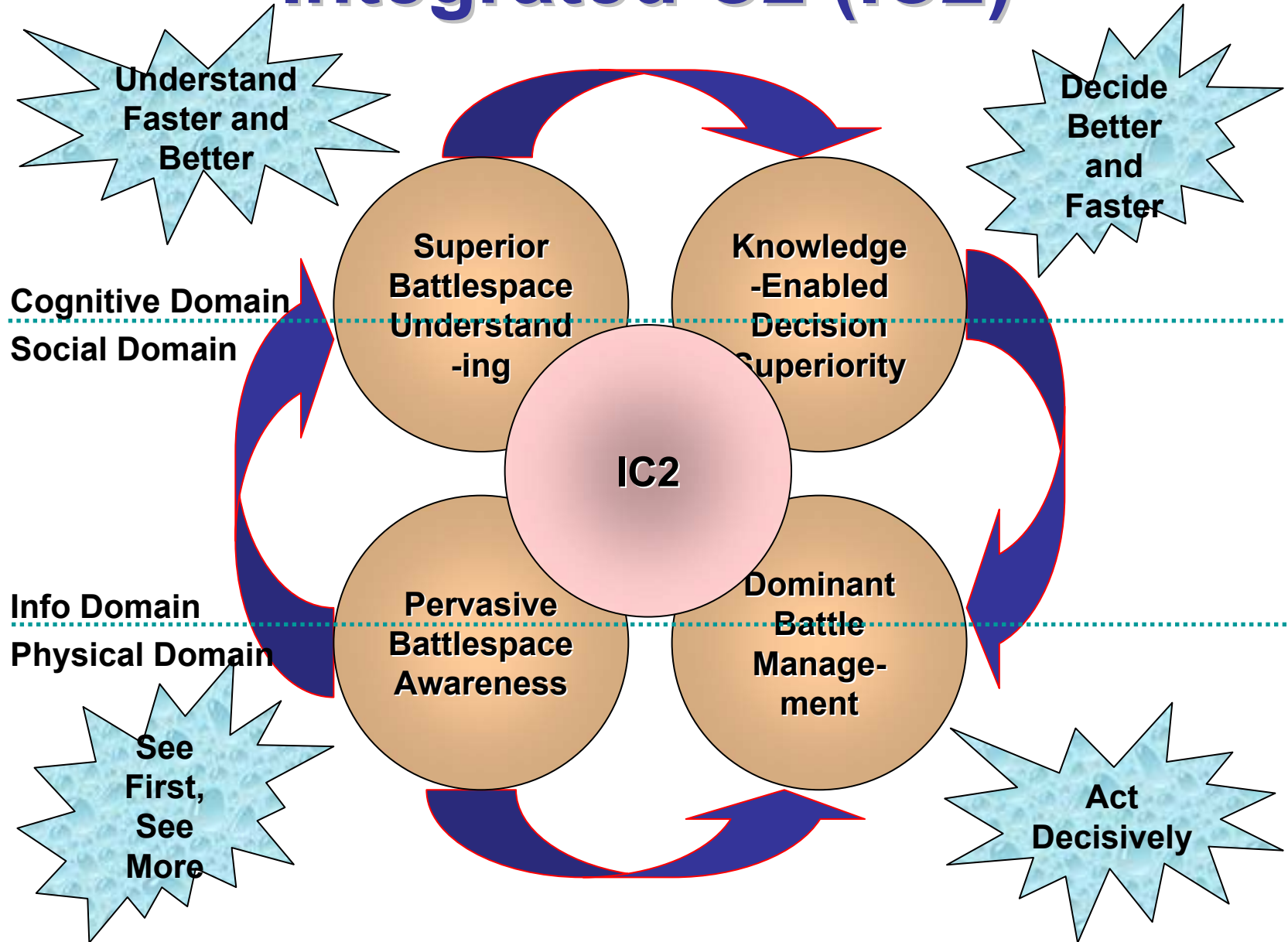
Shared Awareness

- Interoperability in the social domain allows actions to be dynamically self-synchronized (the ability for commanders to support one another without detailed prior coordination due to shared awareness, in other words, *trust*).

- The social domain implies the **cultural** impact that can create the kind of understanding that will promote interaction and actions congruent to the commander's intent.

Integrated C2 (IC2)

- Command and control is as much about the technology and the **processes** that enable it, as it is about the commanders and their staffs who use the technology and processes.

- *Integrated* refers to the need to fight as an synchronized, harmonized, multi-dimensional force.

Integrated C2 (IC2)

Understand Faster and Better

Decide Better and Faster

Cognitive Domain

Social Domain

Superior Battlespace Understand-ing

Knowledge-Enabled Decision Superiority

IC2

Info Domain

Physical Domain

Pervasive Battlespace Awareness

Dominant Battle Manage-ment

See First, See More

Act Decisively

Key Ingredients

- The following are considered key to achieving IC2:

  - *Culture*   – *Structure*
  - *People*   – *Process*
  - *Trust*   – *Products*
  - *Time*   – *Organization*

Culture

- The *capacity to change* is as much about looking at fundamentally different strategic "options" as it is changing the *mindsets of people* to "dare" to look at radical changes and to experiment.

- The **military *culture*** is an important consideration if evolutionary, and in some cases revolutionary, operational concepts are to be tested objectively and evaluated fairly.

People

- Culture, by definition, is "… *people* with shared beliefs and practices …."

- The importance of people is often cited in reports of change and to really enable transformation and harness the power of IC2, the need for a common purpose cannot be ignored if we intend to accelerate the change.

Trust

- ***Trust*** is believing. It alleviates having to confirm or verify, and eliminates the requirement to know first hand that something has been successfully accomplished.

- ***Trust*** is a learned quality derived from faith in the system and those who are part of it, and is based on mutual understanding, commitment, conviction and dedication.

Time

- The excitement surrounding a technologically enabled transformation could quickly fade if progress is not *time*ly.

- Policy must clearly define roles and responsibilities, and commanders must set priorities such that work objectives are defined at manageable levels to fit within existing time constraints.

Structure

- Sun Tzu observed that *"… just as water retains no constant shape, so in warfare there are no constant conditions …."* emphasizing the need to have continuous adaptation and superior battlespace awareness and understanding.

- This fluidity, however, strains C2 **structures** & resources and significantly increases the complexity of policy development.

Process

- Well defined and tested *processes* are necessary to support the structure and the full spectrum of joint operations envisioned by the Goldwater Nichols legislation.

- Joint forces, able to "plug" quickly into an integrated battlespace structured around interoperable communications, standards, doctrine, tactics and procedures, benefit from greater adaptability and a superior sense of battlespace awareness.

Products / Deliverables

- **Visible *deliverables*** become important, both politically and operationally, to sustain the transformation journey towards IC2.

- ***Products*** that are based on an integrated C2 architecture will give the services a quantum leap in capabilities when combined with battlespace awareness and precision strike.

Organization

- Within DoD there are currently multiple ***organizations*** with varying levels of responsibility for C2 functions, processes, procedures, policies and operational concepts. In addition, each of these organizations sponsors a number of C2 or C2-related initiatives and there does not seem to be any central coordination that will ultimately ensure an enterprise-wide IC2 environment.

  Even if these were all perfectly coordinated, the construct is

  extremely difficult to work within.

Authority / Responsibility

- Some entity must accept the *responsibility for* and be empowered with the *authority to*:

  - integrate / coordinate C2 architectures and programs across DoD,

  - assist with the development of and endorse C2 policies and directives,

  - represent the C2 community at large within the Integrated C2 enterprise-wide governance structure.

Governance

- There must be ***governance*** to support and enforce the development a *culture* of *trust* within and among *people* and *organizations*, to adhere to *time*-frames and to develop the *structures*, *processes* and *products*, that will deliver the full range of Integrated C2.

- ***Policy, guidance*** and ***governance*** are the glue that will help to coordinate and hold the key components together.

Conclusion

To achieve the next big leap in capability,
IC2 cannot be the dream of just a few
while remaining distant and vague to the rest.

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