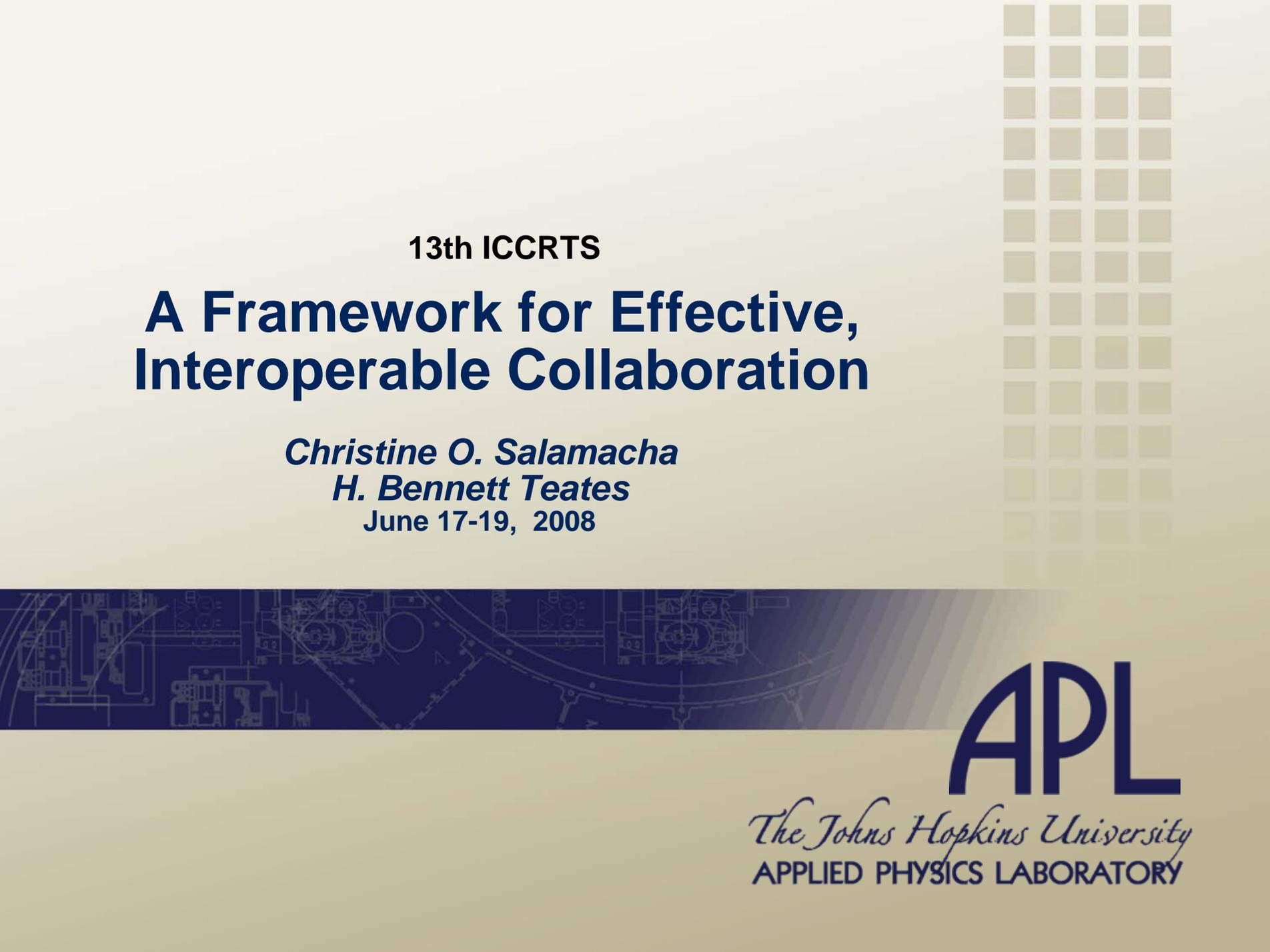


13th ICCRTS

A Framework for Effective, Interoperable Collaboration

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APL

The Johns Hopkins University
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Outline

Need for Collaboration in Command and Control

Categories of the Collaborative Information Environment

Framework for Effective, Interoperable Collaboration

Recommendations

Outline

- ➔ **The Need for Collaboration in Command and Control**
Categories of the Collaborative Information Environment
Framework for Effective, Interoperable Collaboration
Recommendations

The Need for Collaboration in C2

- **Network Centric Warfare Identifies several key tenets:**
 - **Robustly Networked Force Improves Information Sharing**
 - **Information Sharing Enables Collaboration**
 - **Collaboration Enhances Information quality**
 - **Collaboration Enhances Shared Situation Awareness**
 - **Shared Situation Awareness Enables Better and Faster Decisions.**

Decision Making is the Essence of C2

Outline

The Need for Collaboration in Command and Control

➔ Categories of the Collaborative Information Environment

Three Categories for Collaborative Information Environment

Summary

The Collaborative Information Environment (CIE)

- **Three Major Categories and Their Associated Factors**
 - **People**
 - **Activities**
 - **Supporting Capabilities**

The Collaborative Information Environment (CIE)

- **People Factors**

 - Stages of Team Maturity** (Vern Johnson)

 - Social Aspects of Group Decision-Making** (DeSanctis and Gallup)

 - The Team and Mission/Task Domains** (Noble, Buck, and Yeargin)

Observations:

Social Cohesion (commitment to each other) and Mission Cohesion (commitment to the mission) are essential for successful performance.

Current discussion of virtual C2 tends to ignore the people aspect of distributed collaboration. Instead it tends to focus on the supporting technologies.

The Collaborative Information Environment (CIE)

- **Activity Factors**

- **Seven types of cognitive functions** (Nobel, et al)
- **Macro-cognition** (Leskey)
- **Mapping Process to tools** (Wroblewski and Warner)
- **Joint TTPs to capture workflow and effective use of tools** (Jensen)

Observations:

Collaboration patterns help overcome activity inertia

Collaboration TTPs help map activities to supporting capabilities (tools)

The Collaborative Information Environment (CIE)

- **Supporting Capability Factors**
 - **Group Decision Support System (GDSS) Shells**
 - **Presence Awareness**
 - **Permission Management and Access Control**
 - **Directory Services**
 - **Mediation Services**
 - **Visualization for common understanding**

Observations

Web-browser based access to common workspaces support mobile, distributed teams best

A collection of common tools makes learning and use easier

Tool interoperability and use of “common data” or data mediation are needed

User Defined Operational Pictures (UDOPs) can not deviate too far from the Common Operational Picture

Outline

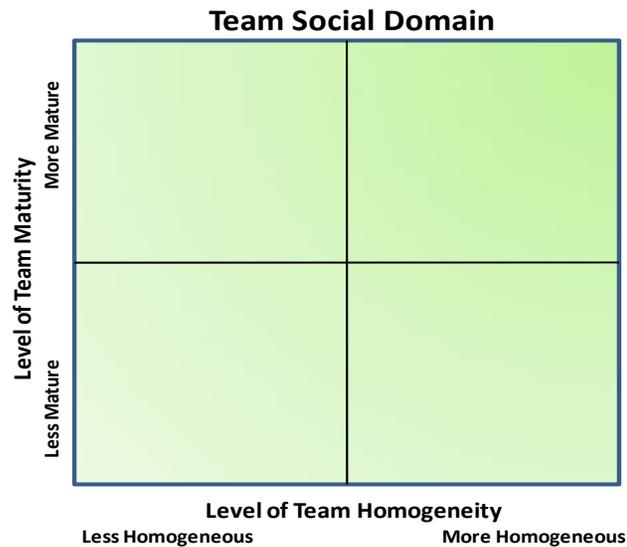
The Need for Collaboration in Command and Control

The Collaborative Environment

➔ Framework for Effective, Interoperable Collaboration

Recommendations

Framework for Effective, Interoperable Collaboration

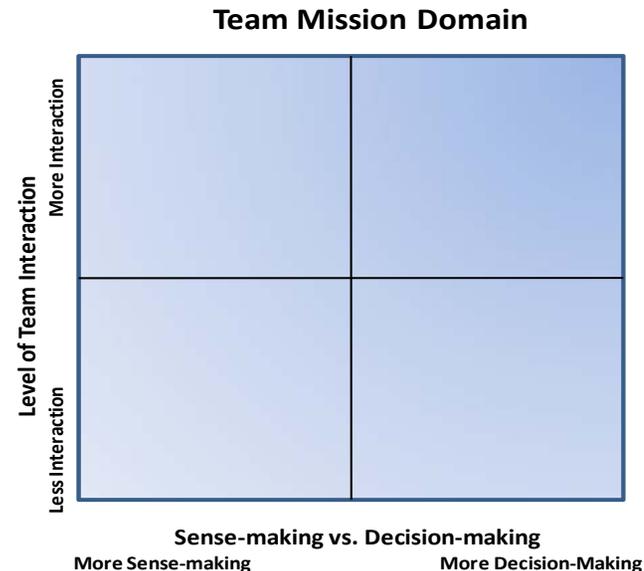


Team Maturity is a measure of the familiarity within the team as a whole.

Team Homogeneity is a measure of the commonness exhibited in the team. (e.g., due to common previous experience, affiliation with common organization, personality traits of individuals in team).

Team Interaction is a measure of interaction required for the activity or process (i.e. measure of team vs. individual activity).

Sense-making vs. Decision-making is a measure of the core objective of the process or activity.



Outline

The Need for Collaboration in Command and Control

The Collaborative Environment (Three categories)

Framework for Effective, Interoperable Collaboration

➔ Recommendations

Recommendations

- **People Factors:**
 - Need unambiguous presence information that spans collaboration tools
 - Need team roster and contact information
 - Need profile information for individual team members
 - Social networking information (team member associates and colleagues)
- **Activity Factors:**
 - Need to have collaboration process templates for each contingency to help team focus on mission
 - Supporting tools need to be automatically mapped to collaboration process templates
- **Supporting Capability Factors:**
 - Need to have tools that can interoperate
 - UDOPS must maintain COP relevance
 - Collaboration tools need to be allocated to the Team Social Domain and the Team Mission Domain

A test bed for net-centric, distributed collaboration information environment experimentation and validation is needed.