Network Centric Warfare in the U.S. Navy’s Fifth Fleet

Network-Supported Operational Level Command and Control in Operation Enduring Freedom

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Outline

• Environment
• Theory
• Investigation
• Findings
• Other Lessons
• Implications
• Questions
Environment

Who: U.S. Navy’s Commander Task Force Fifty (CTF-50) aboard the USS Carl Vinson (CVN 70)
   – Carrier Group Three (CARGRU3)
   – Air Wing Eleven (CVW11)
   – Destroyer Squadron Nine (DESRON9)
Environment


- CARL VINSON Departs
- Terror Attacks
- Armed Recon
- Move to Close Air Support
- Kabul Falls
- Qandahar Falls
- Mazar-e Sharif Falls
- Northern Alliance Offensive Begins
- Tora Bora
- CARL VINSON Departs North Arabian Sea
- CARL VINSON Arrives in North Arabian Sea
- War Begins
- Kabul Falls
- Homecoming
- CARL VINSON Departs
- Port Visits
- CARL VINSON Arrives
- CARL VINSON Departs

6/16/2004
NCW Case Studies
EN ROUTE NORTHERN ARABIAN GULF FOR OPERATION SOUTHERN WATCH / MARITIME INTERDICTION OPERATIONS VS IRAQ
59 Coalition Ships (6 Aircraft Carriers in RED)

USS Carl Vinson
USS Antietam
USS Ingraham
USS O’Kane
USS Sacramento
USS Key West
USS Olympia
USS Peleliu
USS Comstock
USS Dubuque
USS John Young
USS Russell
USS T. Roosevelt
USS Leyte Gulf
USS Peterson
USS Detroit
USS Hartford
USS Bataan
USS Shreveport
USS Whidbey Island

JDS Hamana
JDS Kirisame
JDS Kurama
JDS Towada

FS Courbet
FS Var

JDS Hamana
ITS Garibaldi
ITS Aviere
ITS Zeffiro
ITS Etna

HMAS Sydney
HMAS Anzac
HMAS Kanimbla
HMAS Adelaide

HMCS Iroquois
HMCS Charlottetown
HMCS Halifax
HMCS Preserver
Missions

- Air to Ground Strike
- Anti-Air Warfare
- Tomahawk Land Attack Missile (TLAM) Strikes
- Anti-Submarine Warfare
- Protection of Shipping
- Maritime Interdiction Operations
Maritime Interdiction Operations (MIO)

- Multi-national maritime interception forces implementing sanctions against Iraq
- An average of 200 queries, 100 boardings, and 10 divers per month
Munitions

LASER-GUIDED BOMB

GPS-GUIDED BOMB (JDAM)

TOMAHAWK LAND-ATTACK MISSILE (TLAM)
Scale of Operations

24,905 FLIGHT HOURS

8,688 TOTAL SORTIES

2009 BOMBS Dropped

2,020,000 POUNDS OF ORDNANCE
Distributed Forces

- MIO
- FUJAIRAH: 370 NM FROM FUJAIRAH
- BAHRAIN: 800 NM FROM BAHRAIN
- OPAREA
The Bottom Line

- Quality of Organic Information
- Quality of Networking
  - Degree of Information "Shareability"
  - Degree of Shared Info
- Quality of Individual Info
- Quality of Interactions
- Degree of Decision/Synchronization
  - Degree of Actions/Entities Synchronized
  - Degree of Effectiveness
The Bottom Line

Network Centric Operations (NCO) in CTF-50
- Increased information accessibility (Shareability)
- Greater breadth/depth of information dissemination (Degree of shared information)
- Improved quality of interaction
- Greater quality of individual awareness
- Greater degree of shared awareness
The Bottom Line

• Other Findings (Social & Cognitive Domains)
  – NCW technology acceptance lessons
  – Establishing trust and collaboration in NCO
  – Cultural & organizational change for facilitating NCO success
Theory

• Decision-Making Theory
• Network Centric Warfare
• Technology Adoption
  – Technology Adoption Model
  – Technology Transition Model
Making Decisions?

People build mental models of the world and how it works
Making Decisions?

Decision-makers try to “recognize” a situation and match it to their mental model
Making Decisions?

Decision-makers try to “recognize” a situation and match it to their mental model
Taking a Step Back

• What are we really trying to do?
• Why are these things important?
• How do we make them happen?
A potential course of action must conform to three “images” – Beach & Mitchell
Requirements for Decision Support

• Current Situation - What is Happening?
• History - What has Happened?
• Plans – OPORDs, FRAGOs, etc
• Goals – Commander’s Intent
• Principles – Rules of Engagement
• Also…
  – Accurate Information
  – Timely Information
  – Shared Information
Boyd’s Decision-Action Cycle

Advantage can be gained through faster tempo
NCW Theory

• Network Centric Warfare theory expands on this by providing a means to the end
NCW Tenets

• A robustly networked force improves information sharing
• Information sharing enhances the quality of information and shared situation awareness
• Shared situation awareness enables collaboration and self-synchronization, and enhances sustainability and speed of command
• These, in turn, dramatically increase mission effectiveness
Shared Awareness

...requires complete, accurate, relevant and timely information shared over a robust network
Collaboration

Concerted Action Requires Concerted Thought
MIO Collaboration

- Creates an Information Advantage
  - working concurrently with shared information
- Exploits an Information Advantage to create a Tactical Advantage

Video of boarded ship transmitted from helo to frigate

Simultaneous chat discussion about boarding
Technology Adoption Theory

• Identify what influences people in using new NCW systems
Technology Acceptance Model

External Variables (X) -> Perceived Usefulness (U) -> Behavioral Intentions’ (BI) -> Actual System Use (AU)

Perceived Ease of Use (E) -> Perceived Usefulness (U)
Technology Transition Model
Simplified Tech Transition Model

- High Perceived Net Value
- Low Perceived Net Value

- High Perceived Complexity
- Low Perceived Complexity

- Assured Adoption
- Easy Adoption
- Medium Adoption
- Difficult Adoption
- No Adoption

- Email
- CommandNet
- Word Processor
- PowerPoint
- SAP
Problem Formulation

How did CTF-50 use of Network Centric Warfare capabilities to enable:
- Self-synchronization
- Speed of command
- Mission effectiveness
Variables of Interest

Effectiveness & Efficiency

• Speed of command
• Breadth/Depth of information dissemination
• Individual awareness
• Shared awareness
Variables of Interest

Social Domain

• Technology acceptance
• Cultural & Organizational change
NCW Framework

Force

Quality of Organic Information

Quality of Networking

Degree of Information "Shareability"

Quality of Individual Info

Quality of Shared Info

Degree of Shared Sensemaking

Quality of Interactions

Degree of Decision/Synchronization

Degree of Actions/Entities Synchronized

Degree of Effectiveness
Procedure

1. Identify actors (ships, squadrons, staffs & individuals)
2. Gather qualitative data – interviews
3. Fit the data to framework
4. Gather supporting and triangulating data
5. Write the story
6. Develop conclusions, recommendations and implications
CTF-50’s Tools

- Knowledge Web (KWeb)
- CommandNet
- Chat
How did it work?

• Tailored information flow
  – Voice nets for imminent threat and orders
  – Secure chat for time-sensitive information to Tactical Action Officers (TAOs)
  – Web-based “CommandNet” logs for critical events
  – Web pages for analytical details and further information
  – Chat rooms for supporting administration
Video Wall
2x4 Matrix of Projector Cubes

K-Desks (3)
2x3 Matrix of LCDs
Helicopter delivery of medical supplies has been suspended until further notice in the area west of Mt. Mayon.
Knowledge Web (KWeb)

• Web-Based Information Portal
Typical KWeb Summary Page

Intel

Last Update 11/25/01 09:49 a

Intel SITREP
Indications and Warning Log
Collections/Systems

INN DELHI DDG

Alerts & Impacts

- Atta's Post-War Plans
- Anti-Taliban Primer
- Kandahar Situation
- Arabs Flee Afghan in Disguise
- Small Boat Interdiction
- Messages of Interest
- Current OPINTEL

Related Info & Links

- USS CARL VINSON CVIC Homepage
- BF 50 BDA
- Return to Intel Brief
- Return to Sample KWEB

To comment on this web page, please contact:
mailto
Sample Underlying Content Page

OPINTEL
Pakistan

GEOPOL
Naval Activity
MARPAT Activity
Air Activity
Air Defense Activity
Emitter Activity
Ground Activity
Terrorist Activity

Page Maintained By Supplementary Plot (SUPPLOT) Knowledge Manager (SKM)
- e-mail: SKM@ccq3.navy.mil
- Chat name: CVIN_RDBM
- J-dial: 6220

- PK Protest Page
- JICPAC Pakistan PTMIG page
- Pakistan Recent Nuclear Activity as of 28JUL
- Tactical Activity Log
- PK Plotsheets
- Pakistan INTEL BRIEF
- Pakistan's Intelligence and Security Services
- Afghanistan Page
- PK AOB.jpg
Evolution of Data to Information to Knowledge: METOC Example

**Data:** Typical Text-based weather product

**Information:** raw and semi-processed data represented graphically

**Knowledge:** weather data and info translated into usable, understandable Knowledge of immediate value to planners and pilots
Degraded TACAIR conditions due to low level cloud cover and fog.

**Red:** Recommend GPS only

**Yellow:** Recommend mixed GPS and LGB loads.

**Clear:** No LGB restrictions!

**Brown:** GPS only

**Tan:** Mixed Loads

AFGHANISTAN TACAIR IMPACTS FORECAST VALID 12Z TO 00Z

- Marginal impacts to TACAIR
- Restricting impacts to TACAIR
- LASER SR VIS (LASER LOCK INCONSISTENT)
- LASER SR VIS (LASER LOCK UNLIKELY)
# Battle Damage Assessment Spreadsheet

<table>
<thead>
<tr>
<th>DATE (MISSEP)</th>
<th>FACILITY NAME (Fires, imagery)</th>
<th>BHA (WSY)</th>
<th>BDA (Post-strike imagery)</th>
<th>WEAPON</th>
<th>ACFT</th>
<th>PKG</th>
<th>DMP1 DESCRIPTION</th>
<th>DMP1</th>
<th>BE NUMBER</th>
<th>PILOTS' COMMENTS/MS2</th>
<th>MSN NUM</th>
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<tr>
<td>11/25/01</td>
<td>12P</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>CAS 3</td>
<td>COMPOUND</td>
<td>CMPND</td>
<td>12P</td>
<td>MES gun fight, missile shot</td>
<td></td>
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<tr>
<td>11/17/01</td>
<td>10G</td>
<td>HIT</td>
<td>Pending</td>
<td>BomB1</td>
<td>Fighter1</td>
<td>SCR 2</td>
<td>VEHICLE</td>
<td>VEH</td>
<td>10G</td>
<td>No luck for guys that get out of vehicle and</td>
<td>2543</td>
</tr>
<tr>
<td>11/17/01</td>
<td>17P</td>
<td>HIT</td>
<td>Pending</td>
<td>BomB1</td>
<td>Fighter1</td>
<td>SCR 2</td>
<td>VEHICLE</td>
<td>TRUCK</td>
<td>17P</td>
<td>TROOPS in BLDG</td>
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<td>17P</td>
<td>HIT</td>
<td>Pending</td>
<td>BomB3</td>
<td>Fighter2</td>
<td>SCR 2</td>
<td>VEHICLE</td>
<td>BARRACKS</td>
<td>16P</td>
<td>Entire area lit up</td>
<td></td>
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<tr>
<td>11/12/01</td>
<td>17L</td>
<td>HIT</td>
<td>Pending</td>
<td>BomB5</td>
<td>Fighter1</td>
<td>SCR 2</td>
<td>VEHICLE</td>
<td>VEH</td>
<td>17L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11/10/01</td>
<td>16P</td>
<td>HIT</td>
<td>Pending</td>
<td>BomB5</td>
<td>Fighter1</td>
<td>SCR 2</td>
<td>VEHICLE</td>
<td>VEH</td>
<td>16P</td>
<td></td>
<td></td>
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<tr>
<td>11/8/01</td>
<td>QANDAHAR MOTOR TRANS FAC</td>
<td>HIT</td>
<td>DESTROYED</td>
<td>BomB4</td>
<td>Fighter1</td>
<td>SCR 2</td>
<td>POL STORAGE</td>
<td>AOM499</td>
<td>0442CA0395</td>
<td>Continuing explosion</td>
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<td>11/6/01</td>
<td>KESHEN YAPA PAIN DSA</td>
<td>HIT</td>
<td>Pending</td>
<td>BomB1</td>
<td>Fighter1</td>
<td>FAC 4</td>
<td>VEHICLE</td>
<td>VEH</td>
<td>0337ST0008</td>
<td>2705</td>
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<td>11/5/01</td>
<td>13O</td>
<td>HIT</td>
<td>Pending</td>
<td>BomB1</td>
<td>Fighter1</td>
<td>FAC 2</td>
<td>TROOPS</td>
<td>TROOPS</td>
<td>13O</td>
<td>2703</td>
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<td>11/4/01</td>
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<td>HIT</td>
<td>Pending</td>
<td>BomB1</td>
<td>Fighter1</td>
<td>SCR 4</td>
<td>VEHICLE</td>
<td>VEH</td>
<td>12O</td>
<td>2605</td>
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<tr>
<td>10/23/01</td>
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<td>Pending</td>
<td>BomB1</td>
<td>Fighter1</td>
<td>SCR 3</td>
<td>VEHICLE</td>
<td>VEH</td>
<td>17L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10/27/01</td>
<td>HOSEYN KUT ARMY BKS</td>
<td>HIT</td>
<td>PROB DESTROYED</td>
<td>BomB5x2</td>
<td>Fighter1</td>
<td>FAC 7</td>
<td>BUILDING</td>
<td>BLDG</td>
<td>0434-00160</td>
<td>2703</td>
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<td>10/7/01</td>
<td>FARAH EW RADAR FAC</td>
<td>HIT</td>
<td>DESTROYED</td>
<td>BomB1</td>
<td>Fighter1</td>
<td>B</td>
<td>CTR OF SPT BLDG</td>
<td>AOG475</td>
<td>0420CA0085</td>
<td>Hit one MIG-21</td>
<td></td>
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<tr>
<td>10/7/01</td>
<td>HERAT AFLD</td>
<td>HIT</td>
<td>DESTROYED</td>
<td>BomB1</td>
<td>Fighter1</td>
<td>B</td>
<td>CTR RWY</td>
<td>A200306</td>
<td>0430-08400</td>
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</tbody>
</table>
CommandNet

- Collaborative Logging Tool
CommandNet Entry Screen

- Entry Area
- Classification
- Select Priority
- Select Category
- Hyperlink
CommandNet Usage

- USS Carl Vinson 13,880 Log entries
  - Battle Watch (4026)
  - Maritime Intercept Operation (MIO) Surge (1513)
  - Network Centric Feedback (28)

- Sea Surveillance Coordinator (SCC) Watch Log (47)
- Submarine Watch (559)
- Tactical Flag Command Center (TFCC) Watch Supervisors Log (986)
- Warfare CDR SITREP (6730)
Sources of Data

Interviews

Archival Data

– CD-ROM of KWeb Site
– CommandNet Logs
– Unclassified Post Deployment Brief
– Published U.S. Naval Institute Proceedings Paper

• “Network-Centric Intelligence Works!” - CAPT McKrell
• “Knowledge Web plays big in transformation” - LCDR Majeranowski
Sources of Data

Interviews

1. Commander CTF–50 – Rear Admiral, USS Carl Vinson
2. Commanding Officer of Cruiser (CG) - USS Antietam - AEGIS Anti-Air Warfare (AAW) - MIO operations in North Arabian Gulf
3. Commanding Officer – Frigates - FFG - USS Ingraham - MIO operations in North Arabian Gulf
4. Commander Carrier Group - 3
   1. COMCARGRU3-N6 - CAPT (O6) – Command, Control, Communications, Computer
   2. COMCARGRU3-N2 - CAPT (O6) – Intelligence
   3. COMCARGRU3-COS - CAPT (O6) - Chief of Staff
   4. COMCARGRU3-N3D – CAPT (O6) – Deputy Operations
   5. Assistant Battle Watch Captain & Tomahawk Land Attack Missiles (TLAMs) Officer - LCDR (O4)
   6. Battle Watch Captain & Air Operations Officer – CDR (O5)
Interviews

- **Duration:** 14APR03-06MAY03
- **Time:** 60-75 minutes
- **Location:** Officer’s Office
- **Props:** 4 slide Pre-Interview Brief
  - Who we are, how we got here, model, what we need
- **Interviewers:** Lead & Scribe
- **Format:**
  - NCW capabilities enable self-synchronization, speed of command & mission effectiveness
    - “End to End” story of how
    - Verifiable evidence
  - Tell us about
    - the dramatic success you had
    - a typical day using NCW capabilities
    - what you noticed that was different with NCW
Pre-interview Brief

Supplied to each subject prior to meeting with researchers
Who we are...

- Center for the Management of Information University of Arizona
  - Research Center established in 1985
    - Develop collaborative technology in the field and laboratory
    - Technology transfer GroupSystems.com
    - DoD Sponsorship – DoD/OFT, Air Force, Army, Naval Forces
- Navy Focus
  - 1995 DARPA Funding
  - Applied Research Experience
    - Fleet commands
    - Carl Vinson, Constellation, Lincoln, Chosin, Belleau Wood
    - Exercises
      » RIMPAC 98, 00; FBE A, B, E, J; Kernel Blitz, JTFEX –XX
      » Global 2001
    - CommandNet development and implementation
    - Network Centric Innovation Center
    - C3F Commander Conferences
    - TACTRAGRUPAC – NCW Commanders Course –MAY03
    - ForceNet Campaign Plan
How we got here…

- Thousands of hours of time at sea observing and living collaboration technology and concepts
- Developed and implemented CommandNet collaborative logging tool
- CommandNet Brief
  - Battlespace Information Conference
    - Network Centric Warfare: Leveraging The Power of The Network To Enhance Your Warfighting Capability – Brussels
- Office of Force Transformation
  - John Garstka
What we need...

• An “End to End” story of how NCW capabilities enable self-synchronization, speed of command & mission effectiveness

• Verifiable evidence of NCW capabilities enabling self-synchronization, speed of command, and mission effectiveness
  – Types of evidence – Indirect and Direct
    • Outcome evaluations
    • Observational studies
    • Systematic Reviews – Archival data
    • Experiments

• A case study illustrates NCW concepts and increases understanding
What we got…

- Force
  - Quality of Organic Information
  - Quality of Networking
    - Degree of Information "Shareability"
  - Quality of Individual Info
  - Degree of Shared Info
    - Degree of Shared Sensemaking
      - Shared Awareness
      - Shared Understanding
      - Shared Decisions
  - Quality of Interactions
    - Degree of Decision/Synchronization
      - Degree of Actions/Entities Synchronized
      - Degree of Effectiveness
Speed of Command

- “In my heart I know we improved speed of command…” RADM Zelibor

- Updates posted continuously – faster than old methods
  - The chat is better because it gives history, you can watch things unfold in near real time.
    - In the old days you had an OS3 writing while someone was talking at mach 3 on the radio. They would miss a lot.

- Morning briefs last 30-45 minutes
  - Usually 1 to 2 hours
  - Post brief meetings were ad hoc that dealt with future plans and how to improve situations
Speed of Command

• CARGRU3 was inside of the Third Fleet decision loop before we even sailed.
  – Intelligence gathering was the key.
  – We were acting on pictures and nuggets rather than 100 page documents.

• Increased speed of command allowed for “slack.”
  – Increased time for rest & relaxation – e.g. Battle group staff playing cards vs. typical “You can sleep when you’re dead” attitude
  – Measurable benefits to the staff
Speed of Command

RADM Zelibor, Commander Task Force Fifty
Information Accessibility (Shareability)

• Before
  – Normal operations are built around operational summaries and intentions messages. Every night they would send out their daily intentions. You went thru all of those and the operational task structure
  – People carried big tabbed notebooks of their info, ops officer's notebook, 3-4 guys would just spend their time updating notebooks

• With NCW Tools
  – With KWeb you don't have to read thru everything to get info
  – “I didn't read a single intentions message” - Cruiser Commander
  – More time to plan tactics and strategy
Information Accessibility

CAPT Fitzpatrick, Deputy Operations
Hierarchical Information Flow
Old Information Flow

- Air Wing Eleven
  - Squadrons
  - Destroyers

- Destroyer Squadron Nine
  - Cruisers
  - Destroyers

- Task Force Ships
  - US Battle Groups
  - Coalition Ships

- USS Carl Vinson
  - Ship's Company
Information Dissemination

• Before
  – Intel briefs every day, walking around with classified stuff, record messages, daily intelligence summary in message format
  – This meant that intelligence team spends night before getting brief together, day old stuff. 0800 brief is 1-2 days old in some cases. Once a day snapshot that is a kludge of old, new data. Don't have the people to do it twice a day.

• With NCW Tools
  – Inestimable value to having an assistant J2 that can do other things besides create a brief
  – Fixed it so that dynamic web pages could be edited every 5 minutes in word.
Breadth/Depth of Info Dissemination

With NCW Tools

• Watch standers had greater situation awareness
  – “The difference was night and day, what I saw was the level of knowledge of the watch standers increase.”

• CommandNet logs open to the world

• Information posted once, eliminating redundant effort
  – ...ad hoc meetings were much easier because of all of the info easily at hand.

• Predictability – users knew where to go and didn’t waste effort
Breadth/Depth of Info Dissemination

With NCW Tools

• If we didn't update, we got calls from around the globe…when the data was timely the phone calls stopped.

• FBI had pulled “stuff”

• N2 heard complaints when COMCARGRU3 was leaving - “Who will keep this up when you leave?“
Shared Awareness

Before

- When I was on southern watch as a department head with a squadron all I had was the Air Tasking Order. The squadron is looking only at what they need to do not the big picture.

With NCW Tools

- Battle Watch Captain knew the flight schedule, logistics flight, vertical replenishments, where Pakistani forces would be. I had a picture in my mind what was happening.
Shared Awareness

CAPT Fitzpatrick, Deputy Operations
Self-Synchronization

• Search and Rescue
  – USAF B-1B bailout over Indian Ocean
  – I look at one log that has the coordinates of the bailout.
  – Surface ship heading north towards the bailout area didn't have the same communication ability.
  – I pulled the lat/long and gave it to the surface ship and he said thank you.
  – It was fast and efficient rescue. The network centric capabilities saved time and allowed the search and rescue team to act faster.
Technology Acceptance

• Commitment from high-level champion
  – When everybody in the battle group knows the leadership used the web for information it works

• Difficult with some warfare commanders
  – Resistance to change
  – Screen real-estate limited KWeb implementation
  – Bandwidth limited use on Cruisers and Destroyers

• "Chat was awesome. Chat is like getting 20 new radios and being able to work all at once."
  – There were times, however, when the subordinates moved too quickly and agreed to things on chat that they couldn't perform. Had to back them off. Need to delegated chat authority.

• Floodgates opened after “posters” got credit for information
Problem: The theories didn’t explain it all

• What was different about CTF-50 that made this successful when so many others had failed?
  – Situation?
  – People?
  – Technology?
  – Training?
  – Leadership?

• Back to the drawing board…
Insights on Social Domain

• People develop trust and understanding through living and working together

• As groups grow larger and distribute it is harder to maintain trust and understanding (i.e. I completely trust my platoon, I trust the Marine Corps a lot, I’m less trustful of the Navy, etc)

• To overcome the lack of social bonding, and the associated trust and understanding, the military has settled on a division of responsibility (e.g. each unit has a bounded area of responsibility)
Insights on Social Domain

... But NCW demands that boundaries are lowered

• Units should know the goals of the operation and be free to act

• But, distributed units cannot rely on usual social & contextual information to build trust and understanding

• To make up for a lack of richness, communication must be explicit – I can’t move my chess piece and expect you to notice, I have to tell you about each move I make

• Updates must be accurate and timely to foster trust and understanding
Theory

• Decision-Making Theory
• Network Centric Warfare
• Technology Adoption
  – Technology Adoption Model
  – Technology Transition Model
• Human Communication
  – Social Context
  – Trust and Affinity
  – Channel Expansion
In communication literature there are two classifications of information.

Command Information is explicit. It is what is intentionally expressed or transmitted.

Contextual Information is tacit. It is the non-verbal, backchannel, status and social messages.
Communication Needs

Command Information

Command Information is explicit. It is what is intentionally expressed or transmitted.

Contextual Information

Contextual Information is tacit. It is the non-verbal, backchannel, status and social messages.

People use both of these types of information in making decisions.
Social and Information Domains

These can be informally mapped to the Information and Social Domains of NCW
They provide the situation awareness needed by the warfighter to make decisions in the Cognitive Domain.
NCW systems struggle to carry Contextual (social domain) Information
Information Domain Adjusts

…so in response communication must become more explicit to fill the void. Command Information must increase to make up for lost body language, water cooler chat and just being together.
Communication Richness

Communication ranges from simple transmitted messages to complex face-to-face interactions.
Channel Expansion Theory

• As users gain experience with a communication medium they are able to use it more effectively and efficiently
Communication is more than wire diagrams of sender, receiver & message
Communication Channels

• Situation awareness affects communication needs
  – Maintenance of high situation awareness requires only simple asynchronous “I” updates
  – Improving poor situation awareness requires complex synchronous communication

• Communication needs, in turn, affect communication complexity
  – Simple communication can be done through lean channels (chat)
  – Complex communication needs rich channels (VTC)
Complexity Requirements

Communication complexity should meet SA Requirements
Cultural & Organizational change

• "A smarter more informed boss makes life a whole lot easier."
  – "I probably had 10 times more information than if we didn't have this technology. It took me some time, but I read every web page. I'd get up in the morning and read webpages. I was cued by yellow and reds, then would go into those issues. By the end, I had the web pages memorized."

• Trust issues (Rumor control)
  – Trust was established because the commander said "this is how we are going to do business." More trusted than the email / chat buzz that flies around on the outside

• Delegation & empowerment – Petty officers allowed to post independently, without review

• In six months of cruise, we never built a single PowerPoint Intelligence brief
Cultural & Organizational change

• Issues with information shareability “transparency”
  – Another battle group officer wanted to control what his admiral saw and hated instant update KWeb
  – A USAF general stated the CTF-50 Commander was crazy as he would be micro managed to death by the "bosses." The CTF-50 Commander found the exact opposite.

• Delegation – leaders must be disciplined to avoid micromanagement

• Knowing 80% is better than 0%
  – “It doesn't have to be perfect”

• "I've always maintained that the hardest part of this isn’t the technology, its the culture“ - RADM Zelibor
Social Domain Insights & Recommendations

- Systems that provide value up and down the chain of command get used
- **Recommendation:** Field systems that benefit more than just the boss (CommandNet languishes while millions are spent on gold-plated systems)
- Frequency of Use is key to both adoption of tools and establishing communities of trust
- **Recommendation:** Select systems that require regular interaction from contributors and consumers
- Cheap and Simple Tools can be very effective if a common structure is enforced
- **Recommendation:** Put less emphasis on searching for “holy grail” systems and field simple ones now
Social Domain Insights & Recommendations

- NCW shouldn’t create more work
- Recommendation: Emphasize the desired communication channels
- Waiting for perfection has costs
- Recommendation: Take calculated risks – a best guess today is often better than a perfect answer next week
- Engaged people will innovate
- Recommendation: Let people experiment – experienced users expand communication channels and derive more value
CTF-50 NCW Payoffs

- Better quality of information
- More timely distribution
- Broader dissemination of information
- Deeper understanding throughout the force
- Greater efficiencies
- Effective delegation
- Better decisions
- Increased speed of command
A More Effective Staff

RADM Zelibor, Commander Task Force Fifty
Questions