FORCEnet Study – Overview of the Human Element Group's Findings: Implications for NCW

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▶ **FORCEnet – An Integrated Perspective**

- **Challenges, Transformation**

- **Recommendations**

- **Bottom Line – Design Principles**

Three Key Themes:

- *Equip the Man – don't Man the Equipment*

- *Humans decide – Machines calculate*

- *Moving from the Human – IN – the Loop to*
  - *The Human – AS – the Loop*

Human Capabilities Packages

GIG

FORCEnet

Warriors

Mission Capabilities Packages

- **FORCEnet – An Integrated Perspective**

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What Makes FORCEnet Transformational

- **Flexible combination of forces permitting adaptive action**
  - New mixes of capabilities to meet novel challenges
  - Effects-based means of deterrence, prevention, crisis response
  - Rapid linking and re-linking of people, platforms, systems, technologies, processes in dynamic capabilities packages
- **Mobilized knowledge via networked collaboration**
  - Mobilization of knowledge and expertise from across a nation / coalition to provide timely relevant support to decision makers
  - Virtual and distributed collaboration to foster self synchronization
  - Melded human and technology systems
  - Dynamic, shared situation awareness
  - Context Management through understanding and ability to evaluate options and guide outcomes
- **Properly empowered warriors to leverage resourcefulness and initiative across all echelons and functional areas**
  - Active command functions, but with minimal "mother may I?" loops
  - Clear, commonly understood commander's intent, including operational purpose/mission, desired effects, risk considerations, and boundaries for tactical behavior
  - Educated and trained individuals capable of relevant tactical accomplishments and operational impact

Transformational Capabilities

- **EBO are complex, non-linear in nature**
  - Linear relationships are insufficient to meet evolving operational requirements
  - Computers provide rapid processing capabilities, but have limited ability to deal with ambiguity
- **Recognition that FORCEnet is a network of thinking humans connected by technological and other means**
  - People and technology are one and inseparable – to carry out network centric operations as applied to effects based operations (EBO)
- **Human judgment, intuition, and adaptability provide advantages in complex, uncertain environments**
  - Critical underpinnings of a successful FORCEnet
    - Individual thinking and learning
    - Organizational structures and shared awareness
    - Adaptive use of technology to augment functions

Humans decide, machines calculate

Transformational Capabilities

Transformational Design Principles

- **Robustness and flexibility should be the prime focus in all FORCEnet systems and organizational development**
- **Situation Awareness is not a picture, it is a cognitive state**
- **Tools are needed that provide models as a common frame of reference to determine what metrics are relevant at a particular time**
- **Human nodes are irrelevant in NCW, if they are not connected and working towards a common purpose**
- **Organizational structures in NCW must be dynamic in response to broader context and changing circumstances**
- ***The Human Capability Package*** **(HCP) is the combination of these elements applied in specific, mission-focused circumstances**

Concept:
Human Capabilities Packages (HCP)

Key Aspects Linking Perspectives and Process:

- **Individual-Cognitive** - addressing issues associated with perception, comprehension, insights, and proficiency

- **Group-Collaborative** - addressing issues associated with organizational structures, types of relationships, cultural dynamics, communications and trust

- **Systems-Integrative** - producing "human-computer warfighter synergy" to achieve augmented cognition with blurred physical/virtual distinctions

HCP Objective - semi-autonomous manipulation of operational state to achieve effects.

Process \ Perspective	Cognitive	Collaborative	Integrative
Individual	★		+
Group	+	★	+
Systems	+	+	★

★ = Primary Relationships,   + = Secondary Relationships

- **FORCEnet – An Integrated Perspective**

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▶ **Recommendations**

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Enabling the Human Element: General Recommendations

- **Develop doctrine to enable *informal* organization functions in distributed, virtual environments**
    - Clear, unambiguous commander's intent, TTPs, ROE and tactical/organizational behaviors
    - Formal organizational structure as operational underpinning
    - Develop policies for effective cross-functional organizational relationships
    - Let the warriors determine and evolve the needed organizational structure
    - Allow and incorporate emergent, ad hoc and disintegrative informal organizational functions
    - Empower a range of leadership options and new leadership approaches
    - Articulate new innovation requirements and support rapid, "innovation-on-the-fly"

Enabling the Human Element: General Recommendations

- **Develop, provide and *expect* flexible tools and environments**
  - **Do not specify the blend of process, technology, organization**
  - **Allow humans to engage in effects-oriented collaboration using novel means that they choose**
  - **Consider utility of "Bloatware"**
  - **Drive accountability for acquisition and support to the user level to ensure prioritization in resource constrained environments.**

- **Link the Sea Warrior effort to Sea Trial and Sea Enterprise in a higher order, co-evolutionary development process**
  - **Ensure that people are able to be trained on new systems from the outset**
  - **Warfighters must provide feedback from Exercises/Experiments to the SYSCOMs and acquisition agencies**

Enabling the Human Element: General Recommendations

- **Integrate FORCEnet operators, developers, program managers to:**
    - Cooperate with and engage in other relevant research programs
    - Explore human and IT integration with new organization processes
    - Establish and coordinate a naval initiative for performance-based education and training for FORCEnet/Sea Power 21
    - Establish focused naval-government-industry-foundation partnerships aggressively to pursue this naval initiative
    - Aggressively test and evaluate the enhanced new human-oriented proposals

- **Develop a comprehensive FORCEnet Human Resource Strategy through Sea Warrior and Sea Enterprise**
    - Integrate recruitment, selection, assignment, education, training, and career development
    - Evolve the existing selection process to meet new FORCEnet challenges
    - Attract individuals with ability to accommodate complex interactions, and develop a range of relationships
    - Develop individuals with a natural inclination and capability to acquire new skills and thought processes
    - Educate and provide career development for FORCEnet personnel through joint assignments
    - Develop new personnel incentive structures

- **FORCEnet – An Integrated Perspective**

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- **Recommendations**

▶ **Bottom Line – Design Principles**

"Equip the man – don't man the equipment"

- Equip the man with more than technology – empowered sense-making and decision making, flexible organizational structures, new paradigms regarding complexity and distributed collaboration
- Co-evolve the human, organizational, and technological elements in an *intertwined, co-evolutionary development process*
- Design for robustness and adaptability, rethink optimization criteria
- Identify leveraging points among others doing similar things including other Services, Agencies, Academe, Industry
- Enable both formal and informal organization structures to emerge, function and disperse in the most appropriate form needed for a given situation or stage in the operation
- Evolve a common lexicon that reflects a blended joint/ interagency culture and FORCEnet-style behavior and values

Bottom Line – Design Principles

Humans decide – Machines calculate

- Maximize the use of machines for fast, complex calculations in order to free up people for making higher order decisions
- Articulate a commonly understood trade space among technology, people, doctrine, training and education
- Prepare the man – via equipment, education, TTP,…etc. – with the ability rapidly to generate and share *knowledge* from the increasingly available data and information
- Ensure consideration of complexity, properties of distributed networks, and the propagation of second order effects

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