

Putting the science back in C2: What do the buzzwords really mean?



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Overview



- **Why the buzzwords?**
- **An easy example – EBO**
- **A harder example – Sensemaking**
- **The hardest example – NCW**
- **What good are buzzwords?**
- **The way ahead.**



Into the Lion's Den!



- **Not here to attack buzzwords**

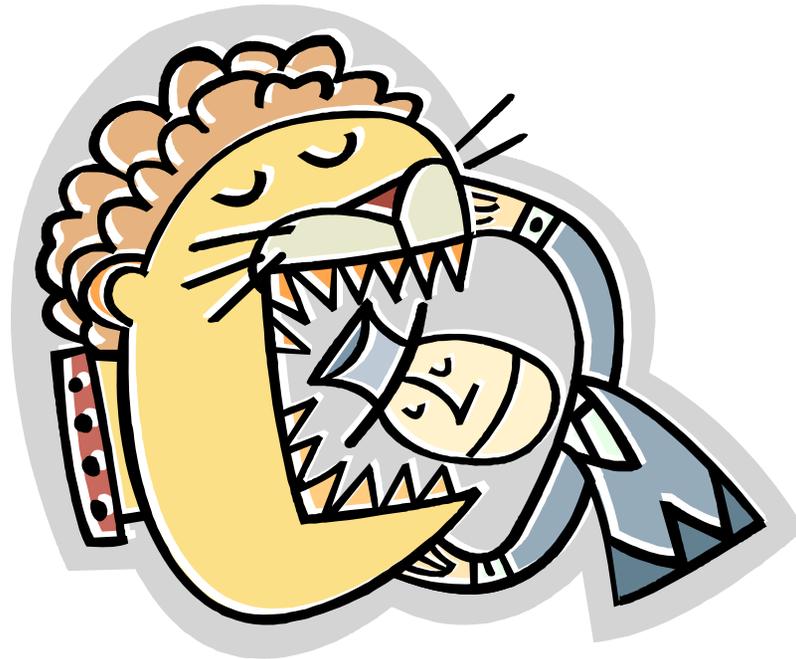




Into the Lion's Den!



- But to generate discussion





Buzzworthy annoyances



- **Where this all got started**
 - “Cognitive Science”
 - “Cognitive enough?”
 - Statistical conundrums
- **Bottom line: Must understand definitions**
 - At all levels of the research food chain



What is a Buzzword?



Merriam-Webster Online dictionary (www.m-w.com)

Buzzword:

- 1 : an important-sounding usually technical word or phrase often of little meaning used chiefly to impress laymen**
- 2 : a voguish word or phrase -- called also *buzz phrase***



What is a Buzzword?



Wikipedia (www.wikipedia.com):

Buzzwords:

- 1) Define new concepts**
- 2) Are intentionally vague so no one can question them**
- 3) Are intentionally vague so as to give rise to new ideas and concepts by forcing discussion of their meaning**



What is an experiment?



- **Hypothesis testing versus demonstration experiments**
 - **What is the difference**
 - **Pros and cons of each**
 - **What is our approach**
 - **Is it a continuous cycle of hypothesis to demonstration and back again?**



Effects-Based Operations (EBO)



- **Smith (2002) - “Effects-based operations are coordinated sets of actions directed at shaping the behavior of friends, foes, and neutrals in peace, crisis, and war.”**
- **Three examples of “EBO experiments”**



Effects-Based Operations (EBO)



- **Example 1**
 - **Is EBO better than non-EBO?**
 - **Potential outcomes**
 - **Both groups same plan same outcome**
 - **Both groups different plan same outcome**
 - **Can planning be done without EBO?**
 - **If so, how does one do/measure it?**



Effects-Based Operations (EBO)



- **Example 2**
 - **How do we develop a process to enhance EBO?**
 - **Assume EBO works**
 - **Develop a way to enhance the decision making process**
 - **Well designed visualizations?**
 - **Mayhorn, Wogalter, and Bell (2004)**
 - **Homeland security safety symbols**



Effects-Based Operations (EBO)



- **Example 3**
 - **Simulate operations and effects with intelligent agents**
 - **Current video games getting “smarter”**
 - e.g., 1st person shooters in which the bad guys run away
 - **If one can create and believe the fidelity**
 - **Could simulate and analyze results**
 - **How would we get there?**
 - **Simulate historical campaigns with known outcomes (both expected and surprising)**



Sensemaking



- **Russell, Stefik, Pirolli, & Card (1993) - “...the process of searching for a representation and encoding data in that representation to answer task-specific questions.”**
- **Alberts, Garstka, Hayes, & Signori (2001) - “(the way in which)...they (organizations) relate their understanding of the situation to their mental models of how it can evolve over time, their ability to control that development, and the values that drive their choices of action.”**
 - **Generating alternative actions intended to control selected aspects of the situation.**
 - **Identifying the criteria by which those alternatives are to be compared.**
 - **Conducting the assessment of alternatives.**



Sensemaking



- **Leedom (2002) several conceptual models**
 - **Run the gamut from a simple idea of the data fitting a story to complex ideas taking into account story, awareness, action, information, etc. in a variety of feed-forward and feed-backward loops**
- **Common thread in all is that they all involve definitions and words that have been used in the fields of cognitive psychology, decision making, artificial intelligence, and cognitive science**
- **Attempting to discredit the word sensemaking would be tantamount to discrediting hundreds of years of research on the human**



Sensemaking



- **No way to control the representations, schemas, mental models, etc. that humans create when problem solving**
 - **It would be impossible to test, for example, planning and execution with and without sensemaking.**
- **The problem (as in EBO) is that we are attempting to understand if a task can be done with or without sensemaking.**
 - **But human cognition and problem solving is always about sensemaking**
 - **One does not go through their daily life trying to “not” understand the world**



Sensemaking



- **But can you test it?**
 - **Yes by evaluating your widget, program, etc. against the standard of the day**
- **How do you know if it enhanced sensemaking?**
 - **Is learning/training faster?**
 - **Is memory better? (e.g., prospective memory)**
 - **Is decision making better? (e.g., expected value judgments)**
 - **Is perception better? (e.g., minimization of attentional capture, change blindness, etc.)**



Network-Centric Warfare (NCW)



- **Alberts (2002):**
 - **A robustly networked force improves information sharing.**
 - **Information sharing and collaboration enhance the quality of information and shared situation awareness.**
 - **Shared situation awareness enables self-synchronization.**
 - **These, in turn dramatically increase mission effectiveness.**
- **Arguments against can be seen elsewhere...so...**



Network-Centric Warfare (NCW)



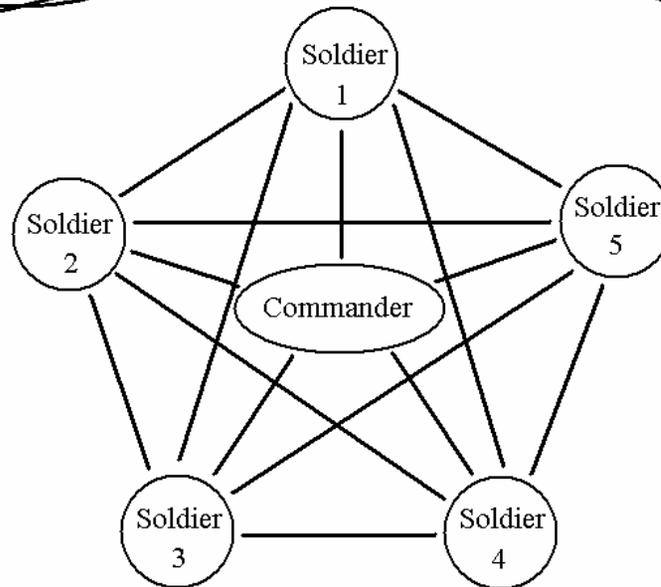
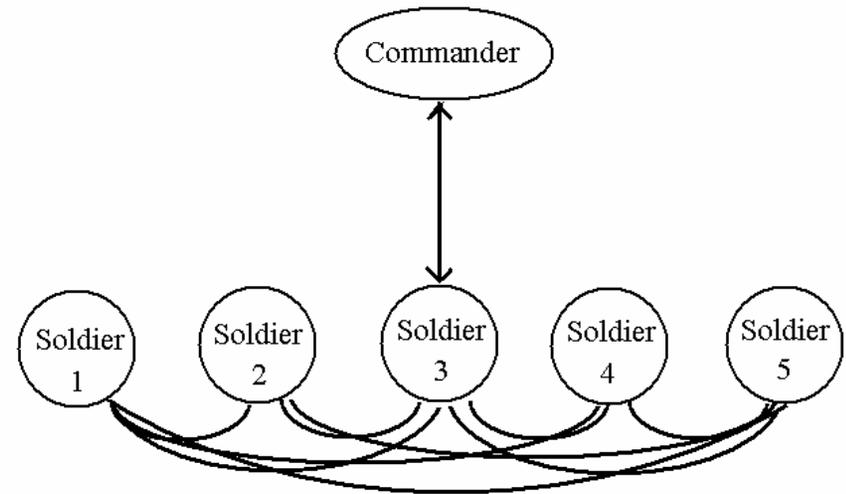
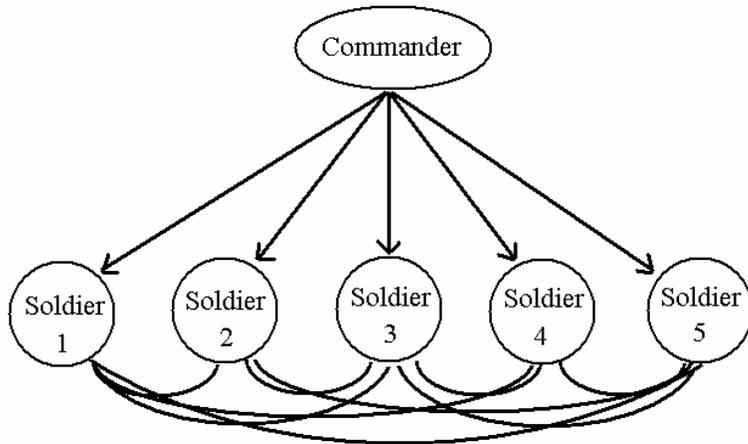
- **Can we test these tenants?**
 - **A robustly networked force improves information sharing. (Yes)**
 - **Information sharing and collaboration enhance the quality of information and shared situation awareness. (Yes)**
 - **Shared situation awareness enables self-synchronization. (Yes)**
 - **These, in turn dramatically increase mission effectiveness. (Well...more of a conclusion)**
- **So how?**



Network-Centric Warfare (NCW)



- **Three groups same goal, different communications and connectivity**

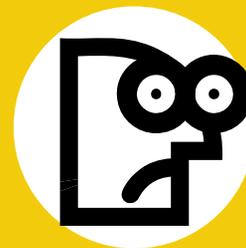
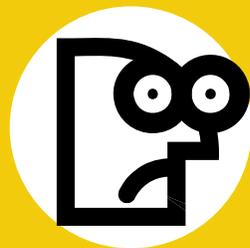




Conclusions



- **So...buzzwords may not be that bad if:**
 - **The definition is known and understood**
 - **The ideas can be tested**
 - **Those using the words understand the above**
- **Are they needed?**
 - **Perhaps**
- **Useful?**
 - **Again perhaps**
- **Will we ever be rid of them?**
 - **No**
- **Is that a bad thing?**



It's QUESTION TIME !!

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