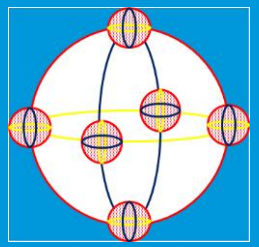
WHAT ARE THE REAL RISKS OF KNOWING AND NOT KNOWING – LEADING KNOWLEDGE IN CYBER

Presented by Mrs Anne Bader



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FACULTY OF
ENGINEERING &
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19th ICCRTS: C2 Agility: Lessons Learned from Research and Operations

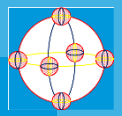
Simon Reay Atkinson, Professor, Dr., Complex Systems, Sydney University, Captain RANR
Amanda Goodger, University of Cambridge PhD Researcher, Director In-Lode™
Steve Lesher, Deputy Chief J6,USCENTCOM
Nicholas Caldwell, Dr., Lecturer in Information Technology, University Campus Suffolk
Jodi Steel, Dr., Director of NICTA's Security and Environment Business Team
Dale Shoupe, Professor, Maxwell USAF, Air Education and Training Command , Air War College

Presented by Mrs Anne Bader

Agenda

1. Thank You to ICCRTS and Dr David Alberts
2. Introduction of Authors and Presenter (Mrs Anne Bader)
   - The Auld Alliance – US; AS; UK
     - USMC; Royal Australian Navy; USAAF (order in age)
     - Communications and ICT Agencies / Schools / Commands (CENTCOM)
     - Universities – Cambridge; Sydney; Suffolk, Air War College
3. Why – the Problem set.
4. A New Synthesis
5. Leadership and Management
6. Coping or Failing
7. A Call to Arms

The Problem Set



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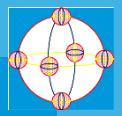
Problem Set

‘Every Country has the Government it deserves’

(Attributed to de Maistre (1753-1821))

- We are at a time of step change;
  - If liberty, freedom, and democracy are to survive, then the redesign and renewal of the way we aggregate our organizations and institutions and apply their knowledge and information in the future will be vital.
- Government is an emergent property alongside strategy, design, engineering, industry and adaptation:
  - Designs of our organizations and institutions and how we explore and (not only) exploit their knowledge and information bounds are imperatives for how we create the industry (in its wider setting) necessary for productivity, adaptability, and resilience.
- This paper presents current thinking on management and information trends, including:
  - Organizational knowledge profiles;
  - Leadership and Management structures as they may be applied in the future.
- Running through our paper is a view that ‘we owe it to young and future generations and returning (often injured and wounded soldiers, sailors, marines and airmen) to restore our City beacons and allow them once more to shine forth; illuminating dark recesses by providing hope and inspiration to all people’.

A New Synthesis



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Synthetic Ecology

- We need increasingly to consider our *entangled* Synthetic Ecology as:
  - 'A system (being or entity) that adapts, over time, by combining, through design and by natural processes, two or more dynamically interacting networks, including organisms, the communities they make up, and the non-living (physical and technological) mechanical components of their environment' (Reay Atkinson et al, 2014a).
- This may therefore be the end of the ICT / computer age and the beginning of the *Synthetical Age* where we need to start designing and building afresh – and 'putting humanity back in the loop'.
  - What will our universities, engineers, lawyers, medics, soldiers, armed forces, navies, armies look like in the 21st Century?
  - These are the questions we need to start asking.

Uncertainty and Instability

- Frequently we are presented with situations where decisions need to be taken and yet when there is *uncertainty* as to how best to proceed. In other words, there is more than one solution and we are dealing, potentially, with a complex problem.
- *Uncertainty* applies to probabilities, as in a Risk Register and to physical measurements that are already made, or to *known-unknowns*, *unknown-knowns* and *unknown-unknowns*. Specifically, *Uncertainty* may:
  - ‘arise in partially observable, opaque, stochastic environments / non-ergodic (complex) ecologies, overly prescribed, ruled or controlled regimes as well as due to lack of assurance, *instability*, ignorance and / or lack of caring and shared awareness; including indolence.
- *Instability* can create *Uncertainty* and *Uncertainty* can create *Instability* but they are not the same thing. *Instability* is considered as:
  - ‘the quality or state of being *unstable* and / or the tendency to behave in an *unpredictable*, changeable, *uncertain*, or erratic manner’.

The Gold Standard of the Future Organisation

- We consider that *engagement* incorporates response and that *mitigation* and *preparedness* are elements of *Recovery* and *Prevention*.
- We suggest that the ability to *Prevent,* Engage (when are where we have to) & *Recover* is indicative of our *Resilience*, where we see:
  - ‘Resilience to be the *ability* of an *ecology* or *system* to *adapt*, transform, redesign, *renew*, and *recover* in a timely response to events’ (after Bryant, 2012).

New Rope for Old Money

- On the **Management of Knowledge**, based on the Three Needs Model (3NM), ‘need-to-know’; ‘need to share’ and ‘need to use’
  - ‘A cross-disciplinary *organic* enterprise connecting and *synthesizing* social, cultural, communication and technical processes – including trust, obligation, commitment, and accountability – to facilitate creative learning and adaptation and leverage information capture and knowledge exchange (ICKE) by connecting communities who-need to-know with those who-need-to-share with those who-need-to-use’.
- On **Information Capture and Knowledge Exchange (ICKE)** (pronounced ‘Ike’ after President Eisenhower who knew a thing about complexity…) and based upon Soviet concepts for Razvédka Bóyem:
  - ‘The active gathering and capture of information (and data) for testing (abducting, deducting and inducting) and *synthesizing* through social exchange’

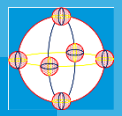
Two Predominant Coupled Systems

- We consider that there are two predominant, coupled systems at play within contemporary organizations, one to do with collaborative social influence (CSI) in which the social drives the IT (SIT) e.g., in a design department and the other to do with coordination, rule and control (CRC) in which the IT drives the social (ITS), e.g., Just in Time manufacturing:
  - '**CRC / ITS** systems seek to program (as opposed to programme) the relationship between technical processes and humans by digitizing performance fidelity and coding for repeatable *risk free* procedures in computer-control (cyber) spaces so that data and communication do not [temporally] contradict each other '.
- By contrast:
  - '**CSI / SIT** systems stress the reciprocal interrelationship between humans and computers to foster improved shared awareness for agilely shaping the social programmes of work, in such a way that humanity and ICT [control] programs do not contradict each other '.

Das Cyber

- We consider that **Cyber** comprises two sub-systems: **‘**Coordination Rule and Control (CRC)’ and ‘Collaboration and Social Influence (CSI)’.
- These system attributes provide the necessary and “requisite variety” to enable both *control*, ‘in time’, and *influence*, ‘over time’. In this regard, Cyber may consist of two poles:
  - ‘A technologically bounded, largely immeasurable, strongly scientific, stochastic *coordination*, *rule* and *control* space; comprising virtual-media and the display of data dealing with the *real* communication of *facts*; and the *conceptualization* of alternative possibilities, themselves capable of generating hard physical and soft more *social* effects and *collaboratively influencing* them’

Leadership and Management



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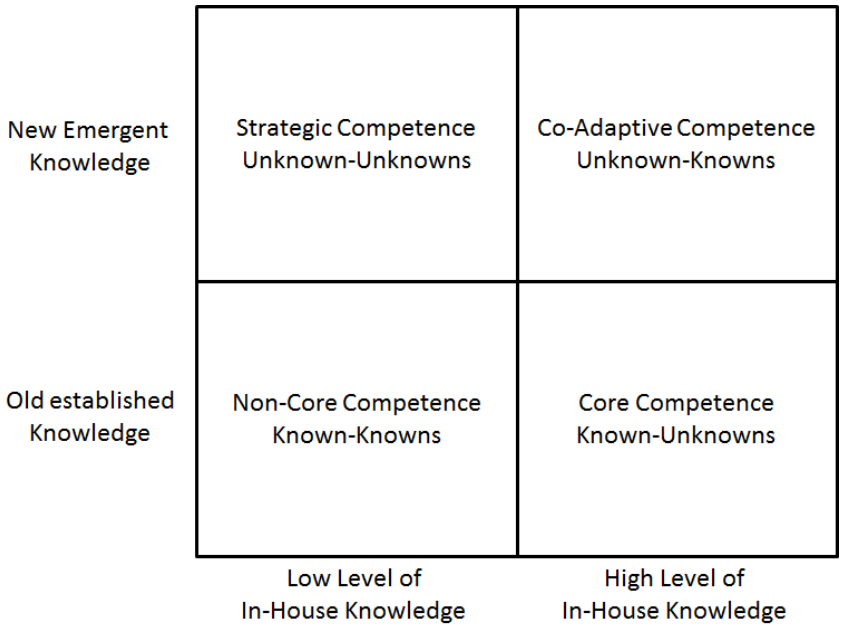
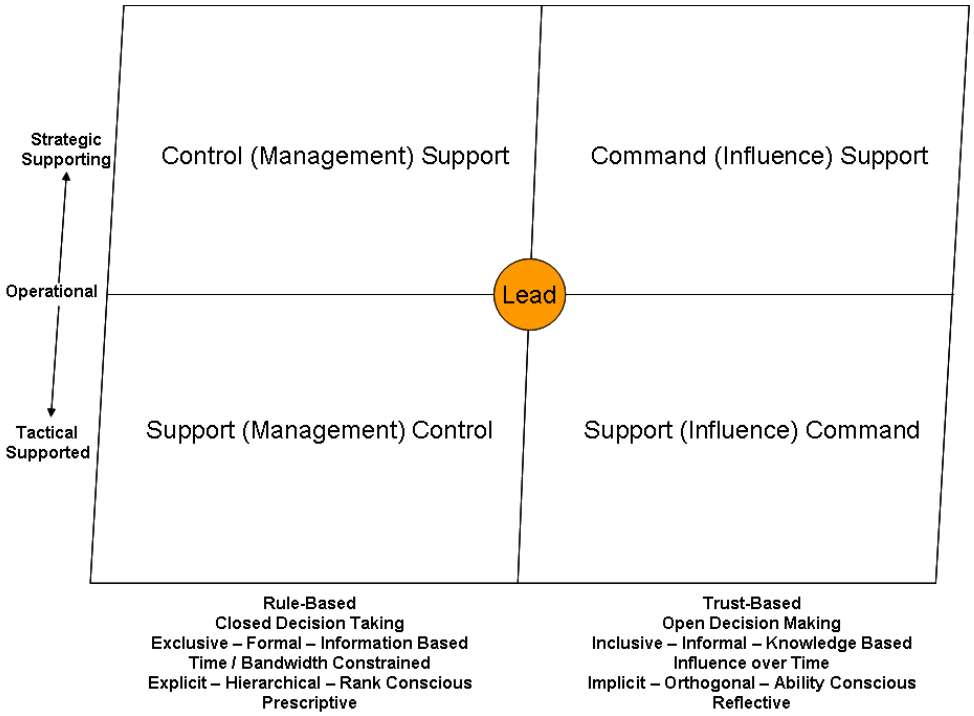
Institutional Knowledge

- Combining the Milton model into a structural knowledge matrix, it is possible to 'situate' institutional knowledge.
  - An effective institution capable of learning – and continuing to learn – needs to occupy the strategic, unknown-unknowns (its research and thinking capacities) and co-adaptive, unknown-knowns (its design and adaptation capacities) competencies and to 'guard what it knows' (e.g., for a Navy to build, crew and fight warships).
  - That same institution needs to retain certain core knowledge (known-unknowns) but can choose to transfer elements of its non-core business (known-knowns) to an external agency (e.g., management of pay rolls).
  - Effective (as opposed to just efficient) institutions also retain 'in-being' the reflective capacity – capable of identifying and exploiting 'new and evolving knowledge'. '



Organizational Knowledge Matrix after Milton and Rumsfeld

Leadership and Management



Non Orthogonal (connected) Command (Influence) and Control Quadrants Merging work by Alberts & Hayes, [58] and Reay Atkinson & Moffat [13]

- Drawing on work by Alberts & Hayes and Reay Atkinson & Moffat we differentiate between *fidelity*, in terms of 'removing noise from an info/techno-socio system' (see Atlan & Cohen, [59]) and *agility*, in terms of a socio-techno system's 'reflective capacity', to suggest:
  - 'Management & Control may be a function of rules, time, bandwidth and fidelity, whereas Command & Leadership may be a function of influence, trust, collaboration and agility' [60].
    - **Note**: that while the word 'command' is often associated with strict rules and control mechanisms, it is being used here in the military sense, where it is roughly synonymous with leadership.

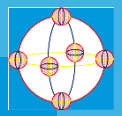
Organizational / Institutional Health

‘Specialist (Technical / Engineering) Leadership is likely to be trust and influence based, exercising a reflective, conceptual and implicitly ability conscious, open, inclusive and informal, decision making / taking style’

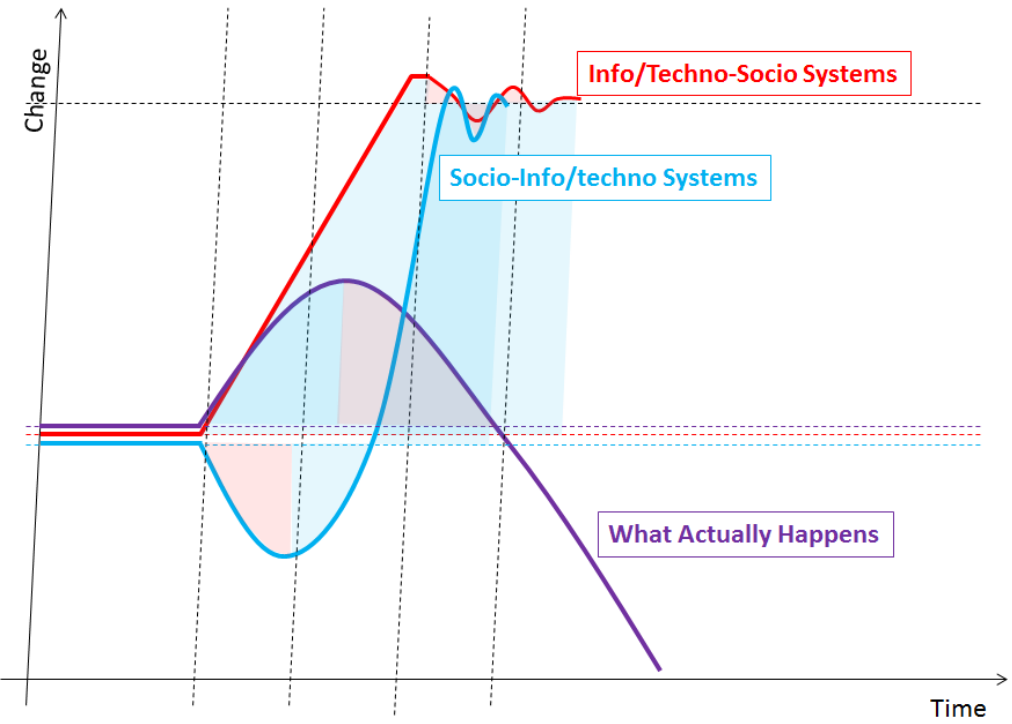
- After He & Wong, successful organizations are constantly balancing between the *exploitative* (delivered *in time* by management & control) and the *explorative* (delivered *over time* through command & leadership).
- The balancing between management & control (the exploitative) and command & leadership (the explorative) to keep an organization *in kilter* is known also as *ambidexterity*.
- This suggests that the ability to *dynamically balance* between the *exploitative* and the *explorative* is indicative of a systems ability to *problem solve* and, hence, of its health.
- Organizations and Institutions that cannot problem solve are *unhealthy places to be* and to which people do not want to belong…

Where are the Liberal Democracies at this stage – where are You?

Coping or Failing



The 10 Year Rule

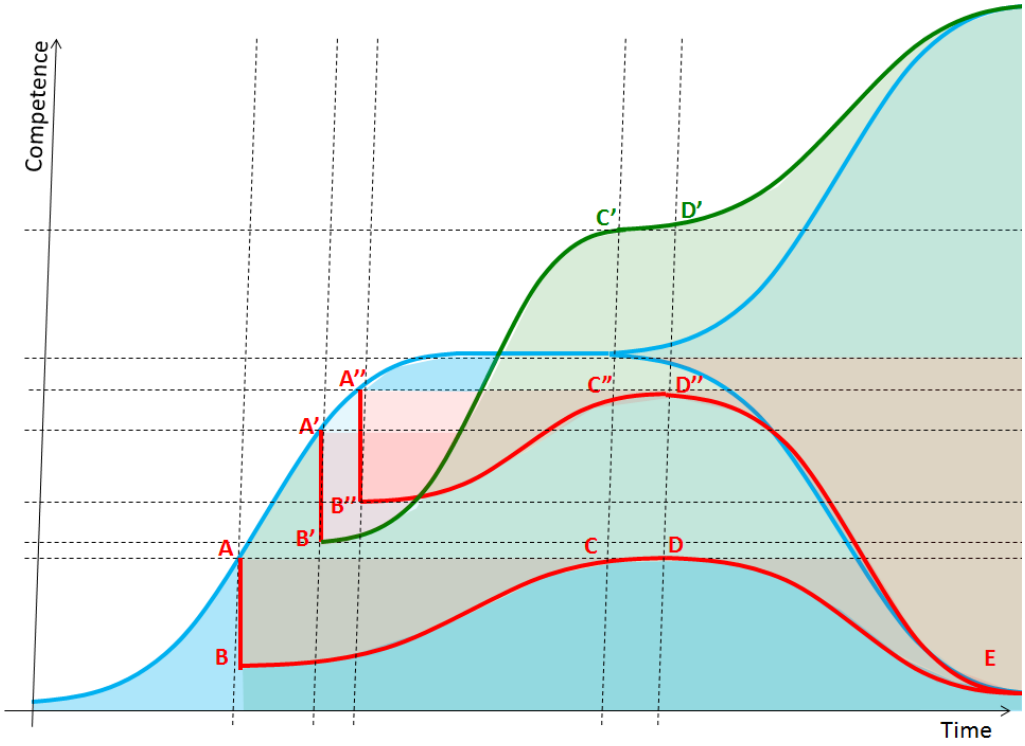


Change Dynamics ITS System versus SIT System and what actually happens when wrongly applied

- A traditional view of Change Management is shown by the ‘step change’ applied to a ITS control type system.
- Change creates an instantaneous (linear, over time) response from the system until it reaches the required change state. At this point there is some *hunting* as the system settles to its new state and awaits future demands.
- What happens when this model is applied to a SIT system, is that the system responds as directed to meet set targets. Over time, because of lack of investment and the recognition that change is costly to any organization (there are often very good individual and collective reasons not to change) performance actually falls off.

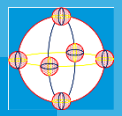
Resilient Organizations

- ‘If an individual suffered a ‘shock’ early in their tour (A) then there is an immediate loss of competency A-B but, more significantly, that individual would never recover to a level of competency higher (MI) than they were when the shock occurred by the end of their tour, B-C/D’.
- ‘If the individual suffered a shock A’’ later in their tour the same shock occurred, A”-B”, and although the individual would not recover to a level above that when the shock occurred, the overall loss in competency and MI was much reduced (A”-C”/D”).
- ‘If the individual was part of a close knit collaborative (shared aware) networked team with high MI, then although the individual may suffer the same shock than when working alone / as an individual, A’-B’, just as the shock was mitigated and shared, so the individual and team learned. Consequently, the final competency level (C’-D’) was improved. The organization had become more **Resilient**



Managing Shock and Collaboration, Over Time

A Call to Arms



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Strategic Failure

- Foreman introduced the concept of *Quatrage*, recognizing that rather than triage, given the number of seriously injured service personnel (mostly young men) returning from Iraq and Afghanistan who would not have survived in previous conflicts – and that *Triage* had broken down.
  - These numbers in the United States, United Kingdom and Australia as well as other Allies such as Canada, Denmark and the Netherlands now run into their thousands. This does not represent the subsequent waves of sufferers from PTSD yet to come.
- Many of our institutions have failed, see UK House of Common's Public Administration Select Committee report regarding the failure of the UK at the strategic level.
- This strategic failure is not confined to the UK and but also extends to the political, sûréte and economic departments and institutions of state that serve them.

Belonging

- Our People want to belong and to contribute.
  - We have a significant number of injured service personnel returning from the wars.
  - We have a responsibility to them and also to our young people to enable them to thrive *successfully*, *happily* and *healthily* in the knowledge enterprise economies (KEEs) of the 21st Century.
- This will be our greatest sûréte – providing *resilience* against future shocks and existential tyrannies.
  - Concepts such as the UK Veterans Information Communication Technology Occupational Recovery (VICTOR) enterprise that seeks to employ injured service personnel in operational centers to civil solve problems (handling the disruptions caused by ash clouds, for example), over time, may be just such an innovative example.

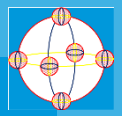
A Step Change

- Designs for public service institutions such as the civil/ public service are in desperate need of overhaul, witness the Global Financial Crisis but also the *affordability* bubbles bursting in higher education and in health.
  - New designs are called for that will be affordable (politically, militarily and economically) and sustainable into the future.
  - For defense and sûréte, this means us all (politicians, business folk, financiers, bankers, industrialists, public and civil servants, soldiers, sailors, marines, airmen, academics, and researchers) thinking again with more of a strategic and adaptive than a static peacetime mentality.
- The dis-association and disaggregation of people from IT and the desire for more and more Cyber-IT to control the social (ITS) will need reconsidering. In simple terms, we have spent the last thirty years taking people out of the system – and so increasing the likelihood of shocks by reducing *resilience* – and need now to start putting our people (from all walks of lives and backgrounds) back in the driving seat (SIT).
- Key to the Knowledge Enterprise Economies (KEEs) of the 21st Century, will be how we lead and manage our people in the future – and, as we have argued at both the Universities of Sydney and Cambridge and amongst ourselves, how we 'design humanity back into the loop' and so rebuild our *enlightening* 'cities upon the hill'.

Let Us Not Despair

Let us not despair but rather design our cities afresh, constructed upon great hills, and inhabited by peoples humbly aware of their humanity and responsibilities; trusted to build our institutions and organizations afresh upon rocks stronger than oceans, wind-swept, God-blessed, and teeming with people of all kinds living in harmony and peace, cities with free ports humming healthily and happily with commerce and creativity.

Questions



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