Integrating Disruptive Technologies in DoD…

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September 4, 2008

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Briefing Outline

• Disruptive or really… GLYUXSDELH?
• How to think about military innovation
• Current receptivity to innovative technology
• Disruptive system to legacy system--how?
• Challenges to technology integration
  – Concentrating on Service technology integration

Goal: Tech transition and diffusion
Military Innovation

• Three historical change mechanisms
  – External (civilian) mandate
  – Internal (service) adoption
  – Interservice rivalry

• Today’s environment – “the strategic hiatus”
  – Civilians (OSD, Congress, think-tanks) can only effect Service programs at the margins
  – Few internal Service engines for change
  – Goldwater-Nichols submerged interservice rivalry

All three indicators are pessimistic…
Current Political Situation

- **High degree of strategic uncertainty**
  - Geopolitics in flux, Iraq war uncertain, threats evolving rapidly
  - Technology advancing at a rapid rate
  - Worrisome budget trends, downturn likely

- **No clearly-defined national security strategy**
  - More reactive than proactive, priorities unclear
  - Threats diffuse, outside preference zones

- **“Lame Duck” administration(s)**
  - Services generally unresponsive to direction
  - New guys disoriented

Conducive to incremental tech
The Perceptual Chasm

- One of the greatest obstacles to technology integration: understanding military technology
  - Magic or con game?
  - Invisible technologies = impenetrable to laymen
- OSD’s “Future Warfare 20XX” project
  - Directed energy, biotech, nanotech, robotics
  - Major problems with baseline tech understanding
- Technologist // layman gap: huge & growing
  - Talking past one another all too common

Must employ a team approach with ”bridgers”
Institutional Integration Challenges

- The Services
- Congress
- Industry
- Think-tanks

They all have their issues, but…

Let’s concentrate on the Services…
The Services

• Toughest nut to crack—extremely deep, Byzantine organizational cultures, hard to pattern
  – Some are “monarchic,” some are “feudal”
  – They sit at fulcrum of the “iron triangle”

• The Services are most likely to welcome a new system or capability when it meets three “tests”
  – Solves an operational problem they prefer to solve
  – Sustains a familiar form of warfare
  – Sustains the dominant sub-cultures within the Service
Disruptive… to Legacy System

How does an disruptive weapon system “graduate” to become a legacy system?

Four indicators:

1. Integration into core mission areas
2. Dedicated (exclusive) units
3. Committed officer constituency
4. Follow-on systems

Army SD-1 Falconer UAV
The ICBM Model

• Development in 1950s spurred by V-2, nuclear proliferation, Sputnik
  – ICBMs operational in 1959
• Initially, SAC employed excess aviators (B-47 crews) as missile crews
• Also opened ICBM-only training pipeline
• ICBM-only cadre rose through ranks, advocated follow-on ICBM systems
• 1981—ICBM-only colonels assume wing command, now three four-stars

The “misfit” became a legacy system
The Diffusion of Precision

• Precision-guided bombs and military aviation
  – Over 28,000 expended in Vietnam; hit rates approached 50%
  – LGBs assessed as “spectacularly” successful
  – The Air Force did not fully embrace LGBs until after Desert Storm
  – Naval aviation lagged even farther behind

• Precision fires and Army field artillery
  – Laser-guided Copperhead 155 failed in 1980s
  – 2004: Army doctrine emphasized mass use of legacy rounds

• Almost 40 years after precision-guided munitions had been demonstrated in Southeast Asia, and over a decade after aviators fully adopted precision warfare, the Army finally woke up
  – First used Guided MLRS in 2005; Excalibur in 2007
The Threat of Precision

- Proliferation of guided rocket/ artillery/ mortar/ missile (G-RAMM) looming in the near future
  - Guided ground-ground indirect-fire rockets (e.g., GMLRS)
  - Guided artillery (e.g., Excalibur, Krasnopol)
  - Guided mortar (e.g., Strix, Merlin, Aquila, Fireball, PGMM)
  - Guided missiles (e.g., MANPADS, Kornet, cruise missiles)

- Requires new thinking about defensive systems
  - Directed energy—an obvious answer
  - SSLs developing rapidly in the laboratory
  - Service interest weak, diffused
  - Will only act when threat clear, enduring

Which Service(s) will prefer to solve this threat? Will they compete or defer?
Where are the Visionaries?

“The goal of modern strategy will be to achieve a decision with highly mobile, highly capable forces, before the masses have begun to move.” General Hans von Seeckt

“...sea craft of all kinds, up to and including the most modern battleships, can be destroyed easily by bombs dropped from aircraft—aircraft constitute a positive defense of our country against hostile invasion.” Maj Gen Billy Mitchell

“[I] don’t think it is even faintly realized— the immense impending revolution which the submarines will effect as offensive weapons of war. . . . The oil engine will govern all sea-fighting, and all sea-fighting is going to be governed by the submarine.” Admiral Sir Jackie Fisher

They’re always out there — you have to find them
Overcoming Service Barriers to Innovation

• Outside (civilian) intervention
  – OSD, Congress, DDR&E/DARPA, think-tanks
  – Influence mapping, OSD guidance, accountability

• Internal receptivity to change
  – Sponsors, mavericks, labs
  – Threats, wargames, experimentation

• Uniformed rivalries
  – Create incentives to stimulate competition
  – Inside and outside the Service…

 Needed: a targeted infiltration campaign
Summary

To create the conditions for disruptive systems to evolve into “legacy” systems:

• Service commitment is required
• Two-way cultural understanding matters
• Officer constituencies are key
• The expertise you must marshal lies well outside the technologist’s comfort zone

As technologies mature, Service integration becomes just as important as technical details
Questions?