Knowledge-based Warfare

By Patrick Lambe

The New Rules of War

For fifteen years, the US military has been striving to apply technology and information applications to achieve what it calls agility. The objectives will be familiar to business leaders: scale, reach, speed and flexibility in the face of changing conditions. For thousands of years, the military have been leaders in adopting and advancing knowledge management practices for reasons that become very obvious very quickly.

Technology amplifies a single soldier's destructive reach far beyond the soldier without that technology. However, the quest for agility has not just been about technology. Knowledge management, intelligence applications, and decision- making skills have been at the forefront of US military doctrine and spending over the past decades. Three core principles have emerged in this new doctrine, a framework close to the best-known hype of the new economy pundits at the turn of the millennium, and emulated by some very respectable organizations in the private sector.

To be agile and flexible, military personnel must have a common operational picture, typically provided by high tech intelligence and information systems. Assuming that personnel have been given sufficiently deep training to be able to interpret this intelligence in consistent ways, you will have what is termed a shared situational awareness. Finally, an understanding of commander's intent (broad goals setting out the current objectives) can be interpreted and adapted at the implementation level as the shared situational awareness changes.[1]

In theory, it sounds very good, much as the theories of new economy network-centric competition sounded good a few years ago. It's a model that we've sought to apply with mixed success to the business environment. But in the world of business, our enthusiasm for theories that ignore slow, unwieldy environments, slow, unwieldy people, and that overrate the ability of technology and information to replace what people do, is somewhat jaded. The old economy reliance on plant, capital and brute labour is seeing a resurgence, and sexy new economy concepts like network-centricity, agility and automation, are, for the time being, in remission.

Not in the military, if you listen to the press briefings from the US Central Command in Dohar, Qatar. Intelligence, situational awareness and broad goals, backed up by precision targeted bombs, are meant to fuel the coalition forces' rapid deployment into a lightning strike on Baghdad. No big battles, no set piece engagements. This is the US military's first chance to demonstrate the theory of knowledge-based warfare in a large scale invasion.[2]

Their enthusiasm for new theories over past experience is worrying. Most invaders who push deep into enemy territory without securing their supply lines, or try to take on big

cities street by street, either lose, or get disastrously bogged down, no matter how great their technological or human capital superiority. From Stalingrad to Vietnam, to the Russians in Afghanistan, the British in Northern Ireland, and the Israelis in the Occupied Territories, armies have learnt that superior technology and intelligence do not guarantee swift success when you are operating on the enemy's home ground. It's very easy for these operations to become very messy. When we got it wrong with the new rules for the new economy, people lost their jobs and their fortunes. There's more at stake when we go to war in one of the world's most consistently unstable flashpoints.

The Costs of Knowledge-based Warfare

On the face of it, the military press briefings from the Dohar command centre reflect none of these concerns. Death never seems further away than during the official reportage of the war. In the strangely distant, but never-ending series of pre and post strike images of perfect missile hits, and in the techno-war jargon of assets and packages, incursions and actions, there is no hint that a commitment to war is a commitment to burning, maiming, shredding and displacing human beings, and that technology is deployed to specifically that purpose. The technology, the intelligence systems, the training all conspire to that single end. No matter how honourably entered, or how justified an act of war is, it admits a shameful lack of agility, and it acknowledges our failure as human beings to readjust the world by any other means.[3]

Knowledge-based warfare sounds good in theory. It creates amplitudes of military effectiveness.[4] The reach that technology and intelligence and knowledge management give us, allow for death to be administered at a distance, on a large scale, where the messy details do not impinge. Even our vocabulary disengages our emotions, and allows us to pretend that this is a clean, smart, knowledge-enhanced project. And the precision of our munitions allows for the most part, our claim that we can discriminate between civilian and military casualties.

But if the enemy suffers from knowledge-enhanced warfare, the sword is double-edged in unanticipated ways. In the first week of the Iraq invasion, friendly fire and accidents accounted for two-thirds of coalition deaths. Our complex military machines and our enhanced intelligence capabilities are sometimes more lethal than even our foes.

There seem to be three main reasons why friendly fire occurs, all of them resulting in the identification of friendly forces as foes. The first reason relates to the design of information systems. Research on decision-making processes in friendly fire incidents involving speed and complex technology point to the design of the technology itself as being at fault. Often, the information that would identify the target as a friend is available but not presented in a form that would enable a fast identification to take place. In one incident in 1991 where a civilian aircraft was shot down near an airport by a US missile, the missile crew had only seconds to determine the nature of the target. Their information displays led them to believe the aircraft was descending rather than ascending, suggesting hostile behaviour. It was a mistake. The target's height was displayed as a single reading at any given time, so technicians had to remember what previous readings were. The trend over time was not displayed. The plane had been climbing consistently when it was

destroyed.[5]

The second reason behind many incidents is a strange phenomenon known as attentional tunneling. When intelligence becomes very rich and very complex, personnel who become very reliant on their intelligence feeds about what is known, effectively lose their peripheral awareness of what is going on around them on the battlefield, as well as their ability to interpret it. If they see something that the intelligence system does not cover, their uncertainty increases, and their self-preservation instincts take over.[6]

The third reason is a product of the distance that we apply our destructive force across, and the speed with which we operate. We often don't have the capability or the time to discriminate the fine detail of the situation we are responding to. And we are emotionally disengaged. When we can't see real people, no matter how professional we are, we are less inhibited about jumping to conclusions.[7] When you are operating in a desert at night, and you see tanks in the distance, and you believe you are the front line, you open fire.[8] And if you are exhausted, dehydrated, under immense stress, and in fear of your life, the quality of your technology gives you much less of an edge than we like to believe.

But each of these features reveals that our treasured agility and our new doctrine of war create the conditions where poor information design, attentional tunnelling, and mistakes of distance and speed, become devastating flaws.[9] Big, coordinated plans have some big advantages, despite their vulnerability to changing conditions: they are more efficient in their deployment of resources, and everybody knows where everybody else is supposed to be. Modular, networked, inherently adaptive plans are more expensive in their use of resources, because coordination and cross-deployment is severely limited, and they are inherently more risky.[10] Anybody could turn up anywhere. It's very difficult to predict where your own people are going to be next.[11] Big armies trying to operate like knowledge-based networks end up shooting themselves.

It seems that apart from the amplitude of our military effect, there are also costs to delegating our natural intelligence, experience and intuition to technology. So long as our casualty figures remain low, and so long as the vocabulary can be kept safe, we will probably, shamefully, live with that.

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[1] For a very clear account of this new doctrine, see Steve Barth, 'War management' *Knowledge Management* October 2001. M. Mitchell Waldrop 'Cutting through the fog of war' *Business 2.0* February 2002 discusses more of the background and describes some of the technology research that underpins this goal.

[2] Operation Enduring Freedom in Afghanistan was seen by the US military as a testing ground for these principles: "We have a notion of things we would like to happen, but it's not in the sequential sense or this linear sense that our brains tend to work in. We've been working this very hard, ourselves, to accommodate our thinking so we can be agile, more flexible in our responses. This is tough work, but don't think about it in terms of phasing -- in "once we're done with the bombing campaign, now it's the ground campaign" -- that is not how this is going to go." General Richard B. Myers, DoD News Briefing, 22 October 2001 at http://www.defenselink.mil/news

[3] Anne Soukhanov, US general editor of Microsoft's Encarta College Dictionary has analysed the euphemistic language of modern warfare. See Joseph P. Kahn, 'Jargon of war quickly crosses ideological gulf to daily usage' *Boston Globe* March 27, 2003. Mark Twain made a very similar point in his 1904 essay on the US invasion of the Philippines: 'The War Prayer' Charles Neider ed., *The Complete Essays of Mark Twain* (NY: Da Capo Press, 2000) p.679-682

[4] For an overview of the rate at which the US military has scaled up its operational reach even as it dramatically scales down its size, see Thomas E. Ricks and Vernon Loeb, 'Unrivaled Military Feels Strains of Unending War. For U.S. Forces, a Technological Revolution and a Constant Call to Do More' *Washington Post*, February 16, 2003.

[5] US decision researcher Gary Klein has made an extensive study of military decision making problems. He describes the airliner case and analyses it as an information presentation problem in his book *Sources of power: how people make decisions* (Cambridge, Mass: MIT, 1998) ch.6

[6] The US Army Research Laboratory has conducted extensive research on this phenomenon. For a good account, see Michelle Yeh and Christopher D. Wickens, 'Attention and Trust Biases in the Design of Augmented Reality Displays' *Technical Report ARL-00-3/FED-LAB-00-1 Prepared for U.S. Army Research Laboratory Interactive Displays Federated Laboratory* (April 2000)

[7] This perspective is less generously described by the British tank crew victims of one friendly fire incident in the early days of the war: Patrick Barkham, 'Troops' anger over US friendly fire' *BBC News* March 31 2003 http://news.bbc.co.uk/go/pr/fr/-/2/hi/uk_news/2901515.stm

[8] *Jane's Defence Weekly* news editor Ian Kemp commented on the Iraq friendly fire incidents in these terms: "It is a particular danger of modern operations when you get a fast battle. It has always been a factor. In a fast-moving battle it can be quite awkward, particularly at night and in poor visibility, to distinguish one from the other." Ian Kemp, 'The War Risks: Fast Battles Increase Faster Mistakes' *Birmingham Post*, March 26 2003

[9] Mackubin Thomas Owens, professor of strategy at the US Naval War College has called attention to the amplification of errors in fast-moving, technology enabled environments. 'Fratricide and Friction: Perfection in War' *National Review* December 11, 2002

[10] Klein *Sources of power* (1998) p.143-146 discusses the relative advantages and disadvantages of modular versus integrated planning approaches in the military.

[11] Anne Marie Squeo and Daniel Michaels, 'Preventing Friendly Fire – Rise in Allies Shooting Allies Comes as High-Tech Warfare Makes Minor Mistakes Deadly' *Wall Street Journal* March 25, 2003