

Toward a Complex Adaptive Intelligence Community

The Wiki and the Blog

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US policymakers, war-fighters, and law-enforcers now operate in a real-time, worldwide decision and implementation environment. Information about a new development in Baghdad is known in Washington within minutes. Decisions about a response are made in Washington within minutes. These decisions are implemented in Baghdad within minutes. The total “intelligence-decision-implementation” cycle time can be as short as 15 minutes. While this is an extreme example, it highlights the tremendous compression of the response time required by all involved compared to previous generations. This severe compression not only affects the highest priority issues, but also ripples back into the most routine intelligence, decision, and implementation processes.

“We must transform the IC into a community that dynamically reinvents itself . . . as the national security environment changes.”

It does so for good reason. The compressed response cycle gives the United States significant strategic and tactical superiority over our adversaries. Our national security is best protected when we operate more quickly than those who would do harm to our people and our freedom. This compressed response time allows us to disrupt, interdict, preempt, and respond to injurious efforts before our adversaries can achieve their goals against us.

This compression is not just a preferred work style within the US national security community. It is characteristic of the way the world works in the 21st century. Thus, not only do we respond more quickly, but also the circumstances to which we respond—in and of themselves—develop more quickly. These rapidly changing circumstances take on lives of their own, which are difficult or impossible to anticipate or predict. The US national security community— and the Intelligence Community (IC) within it—is faced with the question of how to operate in a security environment that, by its nature, is changing rapidly in ways we cannot predict. A simple answer is that the Intelligence Community, by its nature, must change rapidly in ways we cannot predict.

Wrong Way, Right Way

What was that? How can we change ourselves in ways we cannot predict? More directly, how do we modify our nature to enable such unpredictable changes? Before giving the right answer, there is a wrong answer that can be dismissed up front— reorganization. Any reorganization by

its nature is both predictable and slow. By the time any particular reorganization has taken effect, the causes that spawned it will have been replaced by new and different causes. The reorganization is thus not suited to address these new and different causes. All major restructurings are based on the assumption that we can take the recent past and predict the future. Such assumptions may have been reasonable in previous centuries, but not in this one.

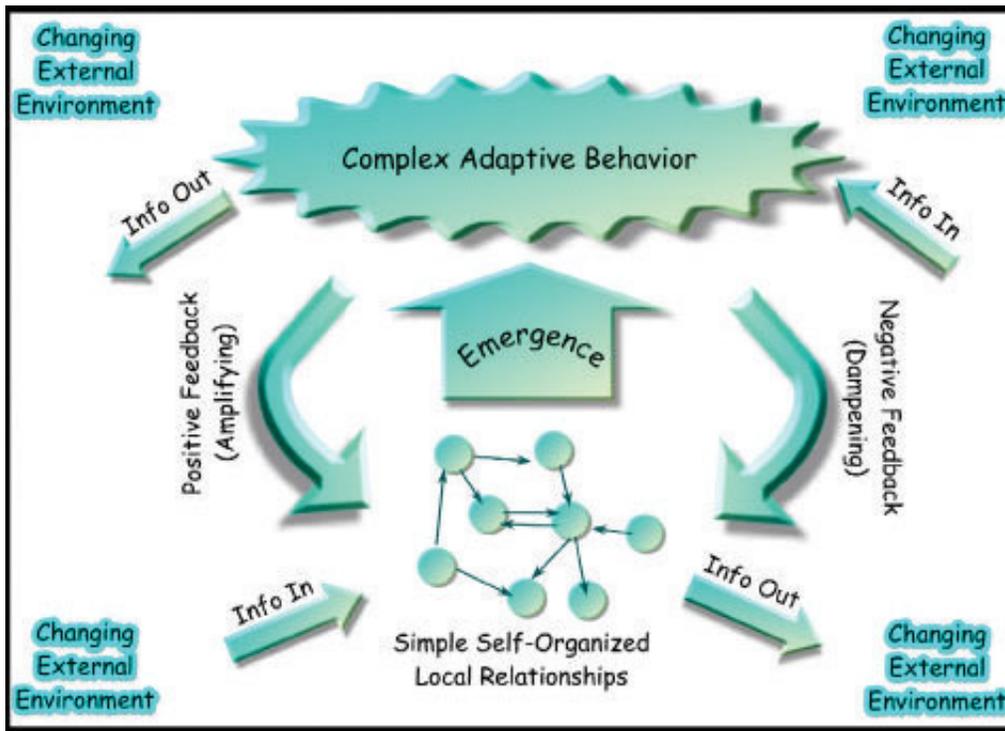


Figure 1 - Complex Adaptive Behavior

The only way to meet the continuously unpredictable challenges ahead of us is to match them with continuously unpredictable changes of our own. *We must transform the Intelligence Community into a community that dynamically reinvents itself by continuously learning and adapting as the national security environment changes.* Unless we, in the IC, allow ourselves this ability to change, we cannot hope to fulfill our mission to insure domestic tranquility, provide for the common defense, and secure the blessings of liberty for our fellow citizens from those who aim to deprive us of these values.

Complexity Theory

To describe a community that “dynamically reinvents itself by continuously learning and adapting” in response to environmental changes harks to theoretical developments in the philosophy of science that matured in the 1990s collectively known as Complexity Theory.^{P[1]} Systems that exhibit the characteristics described by Complexity Theory are known as complex adaptive systems. The six critical components of a complex adaptive system are:

Self-organization. Individuals (people, ants, chemicals) decide to act in similar ways in proximity to and in concert with each other, for their own reasons. For example, two boys independently

shooting hoops decide to go one-on-one to 20 points. A critical mass of individuals is required for self-organization to happen.

Emergence. The whole is greater than the sum of the parts. For example, 12 Canadian geese flying in a “V” is more than just 12 individual geese flying. The group behavior is distinct from the individual behavior.

Relationships. Individuals look at their nearest neighbors to try to figure out what is happening so they can make decisions. For example, House Speaker “Tip” O’Neil declared, “All politics is local.” By this, he meant that people vote for national leaders on the basis of what is happening in and around their homes. It doesn’t matter what the national unemployment rate is; it only matters what the local unemployment rate is.

Feedback. Information circulates, is modified by others, and then comes back to influence the behavior of the originator either as a positive (amplified) or negative (dampened) influence. For example, an ant crosses a pheromone trail it previously laid down. The ant says to itself, “I’ve already been here, so I’d better wander somewhere else.” It is also important that the historical memory of the system be part of the feedback (amplifying or dampening) loop.

Adaptability. The system is open so that information (and/or energy) flows in and out. New information enters into the feedback loops and influences the behavior of the individuals, and thus the overall behavior of the system adapts to the external environment. For example, think of a group of kids engaged in unsupervised play in the basement as a self-organized system. When the dad opens the basement door and yells “everyone gets an ice cream cone when the toys are picked up” and closes the door, he adds new external information into the system. The kids adapt to the external influence by stopping play and putting the toys away. Systems that are continuously open to new information from the environment and circulate the information within the system will continuously change in response.

Non-Linearity. Small changes in the initial conditions or external environment have large (unpredictable) consequences in the outcomes of the system—also known as the “butterfly effect.”^{P[2]} For example, when the dad yells down the stairs for ice cream, the kids adapt by fighting over who made which mess. In the ruckus, they knock over a shelf that breaks one child’s arm. The dad did not predict that he would be going to the emergency room by offering ice cream to the children.

Application to Intelligence

The objective that was identified at the outset of this article was that the Intelligence Community must be able to dynamically reinvent itself by continuously learning and adapting as the national security environment changes. Complexity Theory tells us that we can only achieve this objective if several conditions exist. Enabling these conditions will be a big change for the IC, but if we are serious about succeeding in improving ourselves, it is imperative that these changes be made.

Intelligence officers must be enabled to act more on their own. Just as people in a market are empowered to make their own purchases, individual ants in a colony can decide which task to perform, and military units are able to choose battlefield tactics in real-time, so, too, intelligence officers must be allowed to react—in independent, self-organized ways—to developments in the national security environment.

Intelligence officers must be more expert in tradecraft. It is this expertise that engenders the trust required for independent action. Military units know the rules of engagement and are thus entrusted to engage in battle. Ants have a hardwired rule set, which enables the colony. Cities are built on the rules that govern property deeds, titles, and liens. Expertise in tradecraft for each intelligence discipline must become a constant quest for each officer.

Intelligence officers must share much more information. Just as military units in the field must know where other units are located in geographic space, intelligence analysts must know where their colleagues across the Community are located in intellectual space. This knowledge results from sharing information. Information-sharing among individuals allows market niches to be filled, ants to fend off predator attacks, and plants to distribute themselves in the ecosystem. Increased information-sharing among intelligence officers will allow these officers to self-organize to respond in near-real-time to national security concerns.

Intelligence officers must receive more feedback from the national security environment. The only way to learn from and adapt to the changing national security environment is to be in constant receipt of feedback from that environment. Just as zoo-raised animals cannot compete in the wild, intelligence officers cloistered in the Intelligence Community are not adapted to or fitted for the national security environment.

Intelligence managers must be more persuasive about strategic objectives. Quadrennial strategic directions are good, but these directions must become part of the everyday dialog at all levels in the Community. Many intelligence officers, with their noses to the grindstone, know little about the overall strategic intelligence objectives. One must know how one's own piece of work fits into the overall intelligence mosaic, because the intelligence mosaic is constantly changing and, thus, one's own piece must constantly change to remain well fitted. Intelligence managers must be constantly communicating their constantly changing objectives. Intelligence officers will, in turn, adapt.

From intelligence officers who are allowed to share information and act upon it within a simple tradecraft regime will emerge an Intelligence Community that continuously and dynamically reinvents itself in response to the needs of the national security environment.

Self-organizing Tools: The Wiki

At first blush—and in the context of how the Intelligence Community now operates—the five prescriptions seem almost ridiculous, especially the two most important ones about information-sharing and independent, self-organized action. The good news is that technology advances in the last four years make implementing such prescriptions easier than one might initially think.

There is a new generation of Internet tools that enable people to self-organize around shared knowledge. The first of these self-organizing tools is known as “wiki.” It is named after the Hawaiian term *wiki wiki*, which means fast.^{P[3]} Wiki tools allow any person to add content to a Web site and any other person to edit the content. The most famous implementation of wiki is the *Wikipedia* (www.wikipedia.com). This is an encyclopedia created and edited by Internet users. It has been in existence since 2001 and now has over 1 million entries in over 100 different languages. By comparison, the 2004 edition of the 32-volume *Encyclopedia Britannica* contains just over 65,000 entries (store.britannica.com). Other wikis include dictionaries

(en.wiktionary.org), books (en.wikibooks.org), quotations (en.wikiquote.org), and document collections (wikisource.org).

The *Wikipedia* has an interesting and innovative “tradecraft,” or rule set, by which contributors and editors must abide. All content contributions are self-initiated. There is no editor-in-chief. Because all contributors are also editors, when a person notices an article that needs content revisions or does not abide by the rules, that person makes the edit. All previous versions of the article are available and all changes are attributable. Another wiki rule for the encyclopedia is that contributions must be facts; explicit or implicit points of view are out of bounds. They are edited out quickly.

Beyond the normal contributor, there are privileged contributors with administrative powers. They can adjudicate disputes among contributors. The existing administrators confer such powers to a person on the basis of the quantity and quality of that person’s contributions. If a person disengages from performing administrative duties, the privileges are revoked.

The rules themselves are also subject to the wiki process. Any person can introduce changes at any time. Disputes over the rules can be escalated to a board of administrators.

In sum, from the little bits of work by many, many people following simple rules of content contribution and editing, the most comprehensive, authoritative, and bias-free encyclopedia in the world has been produced in four years. This is an encyclopedia that is dynamically and constantly changing in response to the world as the world itself is changing. The lists of medals received in the 2004 Athens Olympics were updated as the events concluded. No manager made the assignment. No editor-in-chief reviewed the accuracy. It happened, as if by magic. A person took the initiative to update the entries and hundreds (or possibly thousands) of others reviewed the content for quality.

One of the *Wikipedia’s* strengths is also a weakness—no points of view. Much of the self-corrective knowledge in the Intelligence Community resides in personal points of view. Currently, almost no official outlet exists for points of view in the IC. A healthy market of debatable ideas emerges from the sharing of points of view. From the ideas that prosper in a market will arise the adaptive behaviors the Intelligence Community must adopt in order to respond to the changing national security environment. Not all good ideas originate at the top.

Self-organizing Tools: The Blog

A second self-organizing, information-sharing tool has matured in the last few years. It is called “blogging.” The term comes from “Web log,” shortened to “blog.” A blog is a journal or diary that is kept in the public space of the Internet. Individuals maintain personal blogs on an hourly, daily, weekly, or some other periodic basis. They are their own editors. Current technology makes it easy to manage one’s blog—see www.blogger.com, for example. Most blogs take the form of citing a current event and offering a point of view about it. Often one blog will cite a comment in another blog and comment on it. The “blogosphere” is truly a marketplace of ideas.

Enabling intelligence officers across the Community to express and share opinions may be one of the largest paradigm shifts ever for the IC. It will be uncomfortable for some because it will be in the blogosphere where the Community will ride along the edge of chaos. The blogosphere probably will obey the 99-to-1 Edison rule: “Genius is one percent inspiration and ninety-nine percent perspiration”—from wikiquote.com. For every 99 mediocre ideas, there will likely only

be one brilliant idea. A few brilliant ideas, however, are worth the investment of many mediocre (and chaotic) ones. It is these few brilliant ideas that will provide the direction for the Community to adapt to the changing national security environment. The few brilliant ideas will survive in the marketplace of ideas. As individual blogs comment on each other's ideas, the brilliant ideas will spread as feedback throughout the Community. Individuals, recognizing the brilliance, will respond. From this self-organized response will emerge the adaptive behavior required of the Intelligence Community.

A Sharing-Space

We need a space for change that is not organization dependent (remember, reorganizations are not part of the solution set). We need an independent space to begin implementing the five mission changes. To allow sharing and feedback, we need a space that is open not just to the Intelligence Community but also to non-intelligence national security elements. We need a space with a large critical mass of intelligence officers. We need a space that is neither organizationally nor geographically nor temporally bound. We need a secure space that can host a corporate knowledge repository. We need a flexible space that supports tools for self-organizing (wiki), information sharing (blog), searching, and feedback. We need a place in which tradecraft procedures can be implemented. In short, we need a space that is always on, ubiquitously distributed, and secure. We need an electronic network. We need SIPRNet.

SIPRNet (Secret Internet Protocol Router Network) is managed by the Defense Information Systems Agency (www.disa.mil). It is widely accessible by intelligence officers and other national security officers alike. It has been deployed to every embassy and every military command. It is a more attractive experimental sharing-space than the Top Secret Community Network (JWICS), because more intelligence officers access it, policy community officials access it, the tradecraft (security) rules are simpler, and it reaches more organizations and geographic locations. Moreover, SIPRNet is designed to host the Internet-based tools outlined above. Once the wiki and blog processes and content mature on SIPRNet— that is, once the IC embraces the mission changes and becomes proficient in the use of the technology—the wiki and blog could be replicated on the Top Secret network.

Effecting the Transformation

Robert Metcalfe, inventor of the Ethernet protocol and founder of 3Com, asserted that the value of a communication system grows as approximately the square of the number of nodes of the system. This assertion has become known as Metcalfe's Law. A single telephone or a single fax machine has no communication value. Two phones have a little value. Two thousand phones have some value. Two hundred million interconnected phones are a system that has incredible communication value.^{P[4]}

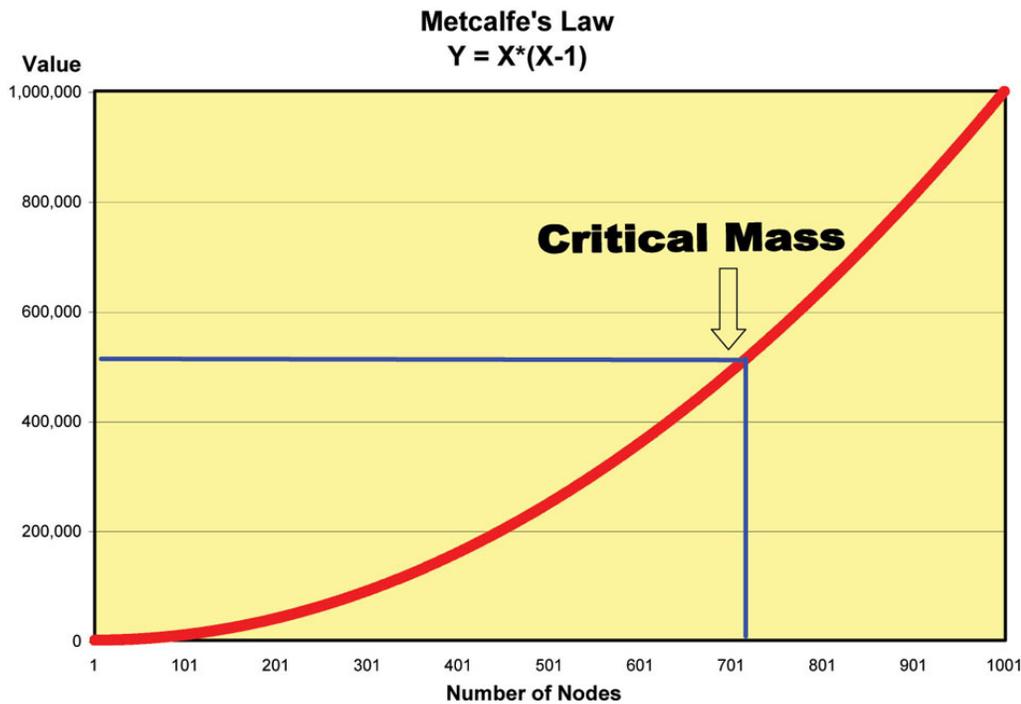


Figure 2 - Metcalfe's Law

I suggest a corollary to Metcalfe's Law. The value of a knowledge-sharing Web space (wiki and blog) grows as the square of the number of links created in the Web space. There is knowledge not just in content items (an intelligence cable, for example), but also in the *link between* one content item and another—a link, for example, from a comment in a blog to an intelligence cable. Think of the value of a blog that links a human source cable to an intercept cable to an image cable to an open source document to an analytic comment within the context of a national security issue. When such links are preserved for subsequent officers to consider, the value of the knowledge-sharing Web space increases dramatically. When 10,000 intelligence and national security officers are preserving such links on a daily basis, a wiki and blog system has incredible intelligence value.P[5]

At some point in the accelerating value along the Metcalfe curve, a critical mass is reached and the way we work begins to change. Two phones do not change society. Nor do 2,000 phones. Two hundred million phones, however, change society forever. The way the human world works is qualitatively different in the era of 200 million phones than in the era of no phones. This technology-driven societal change is what authors Larry Downes and Chunka Mui call the Law of Disruption.P[6] Once the Intelligence Community has a robust and mature wiki and blog knowledge-sharing Web space, *the nature of intelligence will change forever*. This is precisely the prescription we are looking for as laid out at the beginning of this article. The Community will be able to adapt rapidly to the dynamic national security environment by creating and sharing Web links and insights through wikis and blogs.

In Sum

This article identifies a pressing Intelligence Community issue— namely, that the IC must transform itself into a community that dynamically reinvents itself by continuously learning and adapting as the national security environment changes. It has elucidated the principles from an exceptionally rich and exceedingly deep theory (Complexity Theory) about how the world works and has shown how these principles apply to the Intelligence Community. These principles include self-organization, information sharing, feedback, tradecraft, and leadership. The article argues that from intelligence officers who are allowed to share information and act upon it within a simple tradecraft regime will emerge an IC that continuously and dynamically reinvents itself in response to the needs of the national security environment.

Jessica Lipnack and Jeffrey Stamps make a case that a successful virtual community is 90 percent culture and 10 percent technology.P[7] The most profound cultural change will be for IC managers to let go of their officers. Managers must trust their officers to share directly with each other and with the policy community. A manager's role will become less command and control and more teacher of tradecraft and communicator of purpose and objectives. The IC will need to put into place powerful incentives and rewards for managers to change. Intelligence officers *must* feel encouraged by their managers to spend their workday engaged in sharing activities. These changes will allow the dynamic learning community to emerge.

Recognizing that these changes in attitude and work processes will be challenging to implement, I have recommended some first steps. I have suggested that recent self-organizing and information-sharing tools from the Internet, the wiki and the blog, be deployed on SIPRNet. As these tools and processes become robust and mature, a critical mass will emerge that will change the IC's nature so that it can adapt to the rapidly changing national security environment.

The Intelligence Community is under extreme political pressure in the wake of the 9/11 Commission Report, the Senate's report on pre-war intelligence, and the WMD Commission's report.P[8] If ever there was a time for the Community to reexamine its modus operandi it is now. Our political leaders are demanding these changes from us.P[9] The changes in mindset suggested in this article are significant. Enabling intelligence officers to express their points of view independently in a Community-wide setting is groundbreaking. Equally avant-garde is letting intelligence officers create a body of intelligence knowledge without an editor-in-chief. Moreover, inviting our policy community counterparts—at State, Homeland Security, the military commands, and elsewhere—to be full participants in these information-sharing activities is breathtaking. If anything, however, these changes are timid compared to the changes required to bring the Community into the 21st century. We must overcome our inertia and act, or we will certainly continue to be acted upon.

P[1]See Roger Lewin, *Complexity: Life at the Edge of Chaos* (New York: Macmillan, 1992) and Steven Johnson, *Emergence: The Connected Lives of Ants, Brains, Cities and Software* (New York: Touchstone, 2001).

P[2]Edward N. Lorenz, "Predictability: Does the Flap of a Butterfly's Wings in Brazil Set off a Tornado in Texas?" A talk given in 1972 to the 139th meeting of the American Association for the Advancement of Science, as found in Lorenz, *The Essence of Chaos* (Seattle: The University of Washington Press, 1993), 181–84.

P[3]See Bo Leuf and Ward Cunningham, *The Wiki Way: Collaboration and Sharing on the Internet* (New York: Addison-Wesley, 2001).

P[4]Bob Metcalfe, "There Oughta Be a Law," *New York Times*, Section D:7, col.1, Late Edition, 15 July 1996.

P[5]Daniel W. Drezner and Henry Farrell, "Web of Influence," *Foreign Policy* 148, (November/December 2004).

P[6]Larry Downes and Chunka Mui, *Unleashing the Killer App: Digital Strategies for Market Dominance* (Cambridge, MA: Harvard Business School Press, 1998).

P[7]Jessica Lipnack and Jeffrey Stamps, *Virtual Teams: Reaching Across Space, Time, and Organizations with Technology* (New York: John Wiley and Sons, Inc., 1997).

P[8]National Commission on Terrorist Attacks Upon the United States, *The 9/11 Commission Report* (Washington: Government Printing Office, 2004)—PDF version available at: www.911commission.gov. US Senate, *Report on the US Intelligence Community's Pre-war Intelligence Assessments on Iraq* (Washington: Senate Select Committee on Intelligence, 2004)—PDF version available at: www.intelligence.senate.gov. Commission on the Intelligence Capabilities of the United States Regarding Weapons of Mass Destruction, *Report to the President of the United States* (Washington: The White House, 31 March 2005)—PDF version available at: www.wmd.gov.

[9]George W. Bush, *Executive Order Strengthening the Sharing of Terrorism Information to Protect Americans* (Washington: The White House, 27 August 2004).

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