

Green Workshop Paper: Rethinking Counter Terrorism through the Lens of Complex Systems

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Recognizing the Problem

Long term, nonlinear and non-conventional strategic thinking has consistently been deferred by senior decision makers for decades, driven by the perceived urgency of the Information Age and its near instantaneous effects on mass communication and the media. While there are many intergovernmental strategic documents intended to guide senior decision makers in strategic planning and operations, such as the National Military Strategy, the Quadrennial Defense Review, the National Security Strategy, the Department of Defense Strategic Guidance, and the Quadrennial Diplomacy and Development Review, these documents indicate little recognition of the systemic nature of today's strategic environment. National framing of the strategic environment has essentially remained unchanged since our governmental institutions and planning processes were reconfigured sixty years ago to contain the spread of global communism. In fact, it has been argued that President Eisenhower's Project Solarium was the last successful attempt to systemically address a long range national security strategy. Recognition of the complex and systemic nature of today's strategic environment is lacking in U.S. Government and national security strategic planning, and the current strategic Joint planning process appears to provide little room for outside collaboration with those currently employing system methodologies.

The benefit of understanding the complex nature of our strategic environment would seem to be fundamental for policymakers and practitioners whose organizations are systemically part of this environment. Research in the areas of complexity and systems thinking covers a spectrum of concepts that frame regional and global environments, ranging from linear and deterministic approaches to predictability, to probabilistic constructs of complexity, chaos, bounded instability, and emerging systems. Common in much of this analysis is a focus on determining system boundaries, endogenous and exogenous impacts, identification and implementation of feedback loops, and an appreciation of the delays and time frames required to provide a sufficient understanding of relationships within and between systems. A primary objective of strategic planning and operational net assessment is to inform decision makers of the complexity of the environment in which they, and their competitors, operate and to broaden the horizon of their strategic thinking. An efficacious net assessment process must be focused on enhancing the ability of decision makers to make sense of an uncertain, turbulent, and complex environment.

Cause and Effect in a Complex and Uncertain World

Making sense of any phenomenon often begins with an ontology or epistemology of understanding – a framework from which to form judgment. The Age of Enlightenment placed heavy emphasis on observable phenomena that could be described or “explained” by laws of nature. Causal explanation of observed phenomena was largely based on the assumption of order in the physical universe and was eventually expanded to include systems of human

behavior. Our understanding of the physical universe has advanced significantly since the early Age of the Enlightenment (illuminated by Copernicus, Kepler, Galileo, Newton, and Huygens) and the Industrial Age (enabled by scientists such as Bernoulli, Kelvin, Faraday, and Maxwell). The paradigms of certainty and the reductionist approach to understanding cause and effect that characterized these periods were eventually eroded in the 19th and 20th Centuries by revolutionary thinkers such as Poincare, Einstein, Bohr, De Broglie, Schrodinger, Heisenberg, Feynman, Lorenz and others. By the first quarter of the 20th Century, the paradigm of “certainty” had been discarded through a revolution of thought and observation, and a more complex and non-deterministic universe was revealed.

Most people can accept that the purpose of science is to describe the structure and constituent characteristics of observable phenomena, perhaps even going so far as to *predict* behavior (through some inductive process of generalization). In other words, describing *what* something does or consists of and *how* it behaves. This is a migration from descriptive explanation to causal explanation and involves providing evidence that satisfies the conditionality of causal relationships: that *cause* temporally precedes *effect*; that cause covaries with effect; and, that no alternative explanations are plausible. A logical (though not, some would argue, a necessarily practical) outcome of this is an expectation of *predictability* and *testability*. The value of theory, many would contend, lies in its explanation of observed phenomena and its predictive power. But the predictability and testability of theory in a complex and non-linear environment that is characterized by uncertainty and chaotic behavior – behavior that is the result of non-linear dynamics in human activities creating deterministic, though non-repeating and largely non-predictive behavior – seems secondary to the importance of increasing our understanding of causal relationships that may be far removed in time and space. System dynamics practitioner, John Sterman, stated that, “The heuristics we use to judge causal relations lead systematically to cognitive maps that ignore feedbacks, multiple interconnections, time delays, and the other elements of dynamic complexity.” He went on to assert that, “...people use various cues to causality including temporal and spatial proximity of cause and effect, temporal presence of causes, covariation, and similarity of cause and effect...These heuristics lead to difficulty in complex systems...”

In an increasingly interconnected social environment, what seems to be lacking is a merger of social network and physical network theories focused on integrating hubs, nodes and connectors, system boundaries, endogenous and exogenous impacts, identification and implementation of feedback loops, and an appreciation of the delays and time frames required to provide a sufficient understanding of relationships within and between various stakeholders: nation-states, ideological movements and non-state actors, international and non-governmental organizations, and individual actors. Much of the literature that relates complexity, uncertainty, and system thinking to strategic planning focuses on three major areas of study: making sense of a turbulent environment for decision makers; the application of system dynamics and theories of complexity, chaos and emergence to the global environment; and, the evolution of the strategic planning process for large companies and organizations. A primary objective of Strategic Net Assessment is to inform decision makers of the complexity of the environment in which they, and their competitors, operate and to broaden the horizon of their strategic and operational thinking.

A New Strategic Environment

In the last decade of the 20th Century, the world experienced an epochal shift as profound in its effect as the Age of Enlightenment or the advent of the Industrial Age. But perhaps because it is difficult to assess a system recursively from within, the sweeping, paradigmatic and cultural changes of the Information Age have never been fully recognized despite the fact they have fundamentally changed our strategic environment. This is most evident in the rising phenomenon of terrorism and global efforts to counter this threat. The global connectivity and instantaneous communication enabled by the internet and social networking have rendered our previous strategies of “control” obsolete and, trapped within this 20th Century mind set, it has robbed us of our ability to correctly identify the opportunities and challenges confronting us every day. What ties seemingly unrelated but tectonic global events together is literally the complexity and systemic nature of today’s strategic environment. We must accept this complexity – and the uncertainty that accompanies it - and learn to adapt.

The world in which we live has changed, and our inability to recognize that change and to adapt could eventually lead to the extinction of our values and way of life, as surely as any species who fails to successfully evolve over generations. History is filled with well-intentioned failures. It is not for lack of effort, but for lack of vision and willingness to accept risk that aspirations often fall short. Perhaps it is also the inability to simply let go of comfortable but obsolete wisdoms and to force ourselves to seek solutions that do not plot within the range of normal, or even identifiable, distributions. Innovation and imagination are the stuff of great scientific, sociological, and economic breakthroughs. This is also true for governments and militaries. And yet, as a nation we seem to be calcified by our own perceived invulnerability, so hyper-focused on the tactical that we have devalued the operational and strategic.

An apparent shift to a focus on the *gestalt* of a system has evolved from the cyberneticists in the 1940s, the organismic biologists and system dynamics pioneers of the sixties, the chaos theorists of the seventies and eighties, to the network, system theorists, and complexity scientists of the nineties and early part of this century. Throughout this process, an isomorphic mapping has taken place that applies the core concepts of thermodynamics and evolution to emergent behavior in open systems. The isomorphic merging of system science in biology and the understanding of dynamic equilibrium and entropy from thermodynamics formed the basis of new theories of complexity and chaos that introduced the non-linearity of relational behavior in organic and inorganic systems. This approach to understanding complex systems and networks was at least partially the result of a revolution in science: the Information Age. This has direct bearing on the complex and non-linear global strategic environment in which we are now operating and will be operating in the future.

Defining and Bounding the Problem

We must ask ourselves, “If we aren’t willing to honestly accept our myopia, what hope is there to correct our vision?” Nonlinear thinking - the strategic connecting of dots – is consistently deferred by the urgency of more tactical concerns. And yet, what could be of more pressing urgency? It’s as if we are willing to explore every data point on or near a trend line, without ever questioning the applicability of the x and y axes or the linearity of the plot. We must stop simply *reacting* to the now: struggling to restore the past, rather than embracing the future. There will always be another crisis. There will always be the urgency of now, and the temptation to seek

deterministic (predictable) outcomes when the environment is *complex* and *systemic* in nature. But to miss opportunities by seeing *only* risk and threat, or by narrowly addressing only the most obvious and familiar aspects of complex problems, is worse than doing nothing. Examples of this complexity and our need to seek opportunities within it abound. *This is the purpose of conducting an ongoing Strategic Net Assessment.*

The Middle East and North Africa are experiencing a cultural and social upheaval unlike anything seen there in sixty years. Whether this is part of a long maturation process from post-colonial authoritarianism and repression to democratic self-determination, a period of Islamic enlightenment following a sort of post-Ottoman dark ages, or a reawakening of tribal and religious sectarianism remains to be seen. But whatever the basis, this movement is regional in nature but global in scope and is sweeping like a cultural tsunami across North Africa and the Middle East, leaving the detritus of authoritarian regimes and Cold War relationships in its wake.

In the meantime - though not necessarily directly related in a causal sense - an adaptive and complex network of violent Islamist anarchists and anti-modernists, as well as other ideologically-based extremist groups, continue their disjointed campaigns against the west and secular regimes in South Asia, the Caucuses, Iraq, Yemen, the Levant, Somalia, Algeria, Mali, Nigeria, the Philippines, Malaysia, and Indonesia. Localized and transnational terrorism is their medium of expression – they seek to destroy and then to control. Their offer of a “better life” is not in this world. The objectives of these inimical networks are antithetical to our own, and it is inevitable that their activities will increasingly (albeit sporadically) manifest themselves on American soil. Running in the background of these monumental shocks to the global system, are the continued effects of economic crises, food shortages wrought by earlier natural disasters, rising fuel prices, transnational crime and narcotics trafficking, and the increasingly apparent effects of climatological variations, deforestation, and rising atmospheric carbon dioxide levels.

We are now emerging from the technological advancements of the Industrial Age and still witnessing the epochal and liberating impacts of the Information Age. Now is the time to recognize the systemic and complex nature of the twenty first century – its shocks and resilient paths to a more sustainable future. The tools of influence in today’s strategic environment are credibility and strength. These are very different from force and power, and they are derived from values – the values enumerated in our Bill of Rights, Constitution, and Declaration of Independence, and in the policies and actions we pursue at home and abroad. In the Information Age, the “say-do” gap – proselytizing values that our actions do not seem to reflect - is impossible and undesirable to maintain. If Wikileaks provided any lesson, it was that “controlling” the message is no longer possible in today’s hyper-connected world. We must consistently apply our values or abandon hope of establishing credible influence and the moral strength necessary to effectively employ the tools of National power.

The bottom line is that coherency of purpose must be anchored in the values that characterize us as Americans and provide hope and opportunity to the rest of the world. Credible influence is earned through respect and strength, and this can only be demonstrated over time through consistency of action. In the Information Age, we must talk straight to partners and adversaries alike. Liberty, equality, and freedom of expression are values we cherish. Oppression, prejudice, and repression are inconsistent with our values. In confronting extremism and transnational crime, we can accept uncertainty by mastering complexity. The application of

military force is a last resort: to be used with consistency when the security of the nation, or that of our partners, is at risk; or, perhaps when required to do so as a leader in the international community of nations to maintain global order and to protect gross violations of human rights. But other tools of influence – diplomacy, economic influence, education, technological innovation – are far more powerful in today’s strategic environment when employed systemically, and reinforced through our free markets.

Assessing the Opportunity Space Beyond Risk and Threat

Beyond the threat and risk inherent in today’s global environment, there are opportunities for sustaining our prosperity and security at home and abroad. We must accept the interdependence of globalization, and seek converging interests. Urbanization, crime, joblessness, and health care aren’t challenges we, alone, face in America. It is time to pursue solutions the rest of the world might emulate, and embrace the challenge of global competition. While it is clear that Islamist extremism (or any ideologically-based form of violent extremism) is not a monolithic movement, its core principles provide connective tissue that loosely couple violent movements world-wide and domestically. Radical Islamism and other violent and disruptive movements exist as complex and adaptive networks.

Whether we are speaking in terms of economics, biologics, social sciences, or physics, complex dynamic networks spontaneously propagate without direction from a central intelligence. Complex networks are referred to as 'adaptive' or 'dynamic,' because they are self-organizing, constantly changing their interrelationships based upon the needs of individual agents and environmental impacts. While these networks emerge from common need preferences, a complex dynamic system is always greater than the sum of its parts. We need to interrupt that process by pursuing a comprehensive, integrated strategic campaign worldwide with Muslim partners and others to discredit and diminish the threat from radical Islamist extremists and other violent extremist groups.

While that campaign may already be well underway, we have yet to devise an efficacious approach to assessing its effectiveness. Previous attempts to do Strategic Net Assessments have been valuable and laudable, but none of these has yet been used to dynamically assess such a complex adversarial challenge, one that involves dynamic partnerships, individuals, movements, organizations, and nations states that exist simultaneously in virtual and physical space. Such an assessment needs to carefully bound the “opportunity space,” not geographically, but by national interests and values. The right diagnostic metrics must be identified with which to assess changes that will emerge through a confluence of our actions and those of our partners and adversaries through the non-linear feedback mechanisms of a complex and adaptive system of systems. Net Assessment is not intended to be predictive in nature, but rather to enhance the understanding and awareness of decision and policy makers over time and to eventually populate more sophisticated models that may provide a level of predictive analysis.

This Strategic Net Assessment might be structured along three *equally important* communities of interest. These communities represent three networks of global society: the public/government/insurgent networks; the private/commercial/ideological networks; and, the myriad non-state movements, International and Non-Governmental Organizations (IOs/NGOs) who dynamically share common interests and principles that may evolve and morph in response

to events on the ground. Perhaps the most important single aspect in assessing these adaptive communities is the establishment of a baseline condition and the development of an accurate and effective means of monitoring changes to that baseline over time. As a nation, we must work together with our global partners, especially those representing mainstream, ideals of governance and rule of law, if we are to ultimately discredit and diminish the threat posed by radical and violent extremists worldwide. To be effective, all three communities of interest must be carefully and aggressively monitored by global polling, behavioral surveys, and tools of system science. Some of these networks are benign, but other, competing networks are malignant and are as much a part of the system of systems we seek to assess as those of our partners. None of these networks operates in isolation from the others, and it is the dynamics of feedback among them that is critical to a successful Strategic Net Assessment.

Emergent behavior in and among these communities and networks must be closely monitored through the aggressive use of data mining and archiving, global polling, behavioral surveys, and related tools of the social, economic, political, environmental, and network/system sciences. This may call for new approaches to information gathering and analysis. Partnering with recognized pollsters internationally could improve our knowledge of, and sensitivity to, the effects our policies and actions as well as those of our partners and adversaries. An effective and on-going Operational Net Assessment must consider global effects in both the physical and virtual opportunity space. It is no longer possible or useful to assess only US and partner actions and perspectives, rather, the dynamic interaction among all stakeholders must be carefully evaluated in order to gain a sufficient understanding of the strategic environment in which our national interests of prosperity and security must be allowed to flourish and our shared values demonstrated.