Final Report of the Presidential Transition Office

December 2007

The Presidential Transition Office

The Presidential Transition Office (PTO) was established at the request of the President-elect with a key task in mind: to help the President-Elect make early decisions about the way in which the new White House is to be run, and how it is to be linked up to the executive branch agencies. The PTO was also tasked to prepare an analysis and briefing on the implications of a new approach to governance based on recognizing complexity and organizing to deal with it. After proposing the structure, the PTO was tasked with running a hypothetical policy cluster through the proposed format.

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EXECUTIVE SUMMARY

Due to the increasing pace and impact of technological change, we have entered a time of unprecedented uncertainty and possibility. These changes have significantly expanded the range of issues and trends with the potential to impact the very core of our nation, and have necessitated that we move beyond the traditional understanding of national security as a function of national defense. To serve and protect U.S. interests going forward the federal government must become more adaptive and flexible, and better capable of anticipating and responding to complex and inter-related realities. The Executive Branch must take the lead in transforming the U.S. government to the meet the challenges - and exploit the opportunities - of the 21st century.

To do this, we propose a number of reforms to the Executive Branch, and specifically the Executive Office of the President (EOP) and Presidential Cabinet. These reforms are intended to fulfill two specific purposes: first, to institutionalize the capacity for complex and forward thinking at multiple levels; and second, to move the EOP away from a reactive and centralized hierarchy towards a system of pro-active and decentralized networks. Although these reforms will add additional layers and positions to the EOP, the practical effect will be *smarter* government rather than *more* government.

Among the recommendations that follow is a call for the provision of training in what can be broadly referred to as *complex priorities* in the transition period between election and inauguration, and slowly being phased out into the tenure of the administration itself. To institutionalize and channel the capacity cultivated by this training, we propose the establishment of two key bodies that straddle levels, jurisdictions, and authorities: The Deputies Committee on Complex Priorities (DCOM) and the Principles Committee on Complex Priorities (PCOM). DCOM will consist of newly created Deputy-level representatives of each of the major existing executive councils and bodies (Deputy Assistant for Complex Priorities, in each council), and serve largely as a springboard for cross-disciplinary and cross-functionary analysis, assessing complex priorities and making recommendations for actionable policy clusters to PCOM. PCOM, on the other hand, will be comprised of The President of the United States, Executive Department Principles, Assistants to the President, and other key members of the Cabinet, and focus on executing policy by task forces that utilize resources, personnel, and action from different parts of government, as necessary.

We then consider how this enhanced system could work in the case of one real-world complex problem--climate change. Finally, we conclude with a few final observations and additional recommendations as to how these initial reforms can be carried beyond the EOP into the rest of the Executive Branch.

THE AGE OF COMPLEXITY

Advances in technology have ushered in a new era in human history. By connecting geographically and temporally dispersed people at unprecedented rates, the information and technological revolution has produced a networked world in which actors can communicate directly and constantly. Information and communications technologies (ICTs) have disproportionately empowered sub- and trans-national actors relative to states, compounding and accelerating the highly decentralized dynamics that emerged from the collapse of the 'bipolar' Cold War system.

Because of the increasing empowerment of agents, stemming from an increase in individual capabilities engendered by the info-tech revolution, as well as the vast interconnectedness of agents and a diminution of response-times to initial stimuli, a change in a single agent can cascade through the rest of the highly connected global network. These cascades can have immense effects on whole systems. The combined effects of individual empowerment and enhanced connectivity - exacerbated by lower transaction costs and decreased reaction times - have increased the likelihood of massive and continuous change, and accelerated the rate at which such society-shaping historical events can unfold.

We have entered what can be referred to as an "Age of Complexity," defined not only by the greater number of relevant variables, but also the greater degree of connectivity and interactivity among those variables. Outcomes are less certain, as there are exponentially more possibilities to consider.

The Age of Complexity is typified not only by technological developments, but also: increasing economic interdependence, the proliferation of governmental and non-governmental organizations, the information revolution, the fragmentation of groups, a rise in regionalism, the voluntary and forced migration of peoples, a surge in democratic forms of government, a rise in fundamentalism, the cessation of some intense enmities and the invigoration of others, a global shift of economic and military power, and environmental dislocation.[1] The compounding and mutually reinforcing nature of all of these phenomena provoke reactions which further add to the dynamism and complexity of world affairs. The overall effect is that change occurs in a *nonlinear* manner, such that minor incidents can aggregate and cascade into major outcomes and events that would once have been localized can easily and quickly take on global significance.

The challenges and opportunities before policy-makers are complex, in that they are networked and highly interactive. Such complexity in world events transcends the conventional barriers within and between discipline, locale, scale and time. This is especially true for climate change. Though on the surface an issue of science, its relevance as an issue of security and economics is increasingly accepted as a given. Borders and

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[1] James Rosenau, Many Damn Things Simultaneously: Complexity Theory and World Affairs, presented at the Conference on Complexity, Global Politics, and National Security, sponsored by the National Defense University and the RAND Corporation, Washington, D.C., November 13, 1996

even great distances are of ever-diminishing significance. Activity at the micro-level can quickly aggregate to the macro-level. The acceleration in the rate of change blurs the distinction between the short and the long-range.

NATIONAL SECURITY IN AN AGE OF COMPLEXITY

The national security of the United States has long been conceived in terms of the physical security of the U.S. homeland and U.S. interests abroad, and as such has traditionally been the domain of the Department of Defense (DoD), and to a somewhat lesser extent Department of State (DoS). The DoD continues to define National Security as "a collective term encompassing both national defense and foreign relations of the United States. Specifically, the condition provided by: a) a military or defense advantage over any foreign nation or group of nations; b) a favorable foreign relations position; or c) a defense posture capable of successfully resisting hostile or destructive action from within or without, overt or covert."[2] Such an understanding lends itself to a decidedly military-centric focus of security, one which fails to consider the much wider scope and interactivity of issues and challenges which impact vital U.S. interests at home and abroad.

As their interconnectivity increases and rate of change accelerates, the challenges and threats confronting the U.S. are likely to be greater in magnitude and consequence, such that focusing on any one at the expense of others will be to the great detriment of our national security. The complexity and interdependence of these challenges and threats, moreover, means that a policy targeted at one area can have a ripple effect, causing unintended consequences in other areas. Thus, the long-standing inclination to think of policy-making in *either/or* terms must give way to framing issues as *both/and*. The concept of *national security* itself must be expanded to transcend the term's conventional military association. In the words of one national security expert,

> "National security is now a compound function of how well the United States manages all of its assets and with how much foresight we invest them in our future. We need to expand the operational definition of national security from its core interest in physical protection towards a comprehensive definition that embraces the *sources and realities of power* in the 21st century."[3]

In this schema, a distinction between *national security* and *national defense* must be drawn. National defense, in broad terms, constitutes the physical defense of the US homeland and US interests at home and abroad. This often refers to the more traditional issues and threats related to the use of force and violence. National security, on the other hand, should be interpreted more broadly, as the capacity for the US to effectively pursue,

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[2] Department of Defense Dictionary of Military and Associated Terms, Joint Publication 1-02 (As amended to December 19, 2001)

[3] Leon Fuerth, Strategic Myopia: The Case for Forward Engagement, *The National Interest*, Number 83, Spring 2006

in both the short and the long-term, its interests and goals—in a world where the challenges to doing so are increasingly complex and interrelated. Understood as such, US capabilities or power is often contingent on US credibility, influence, and cohesiveness, among others.

As we seek to re-conceive *national security*, it may prove useful to collectively define, in broad terms, what we as a people envision for this nation five, ten, twenty, and even fifty years into the future. Those issues or challenges that serve as impediments or obstacles to the realization of this national vision thus become the threats to our *national security*. And yet, rather than merely articulating a set of prioritized threats demanding our attention, an expanded understanding of *national security* must view the world as a complex, dynamic *system of systems*, and frame policy accordingly.

It is from such an understanding that the premise of Forward Engagement, an approach to developing and executing policy that is long-term oriented, strategic, proactive, flexible and adaptive, was born

> The objective of Forward Engagement is to encourage a more profound and continuous interaction between long-range forecasting and long-range policy-making. Encouraging this development is key to better safeguarding our society from unanticipated, strategic surprise and, in particular, assuring the continued ability of democratic governance to successfully deal with an increasing rate of change in every area of human activity.
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> Forward Engagement makes a compound statement:
> (1)   Major social change is accelerating at a rate fast enough to challenge the adaptive capacity of whole societies, including our own;
> (2)   Foresight—the disciplined analysis of alternative futures—can provide timely warning of major issues ahead; and
> (3)   Governance—the process by which policy is set and carried out—needs to institutionalize foresight and adaptability to increasingly complex challenges.[4]

An addendum to Forward Engagement, particularly considering the conceptual contributions of Complexity and Systems theories[5] and the connectivity and dynamics of global issues, includes the term "Complex Priorities." Complex Priorities refer to the consideration of multiple intersecting issues across time which may have unintended or unexpected effects, and involve factors beyond those normally considered relevant to the issue. Complex Priorities specifically cater to the practice of policy-making, where the importance assigned to various issues is constrained by resources, but nonetheless must consider interactivity, short-term gains, and long-term interests. Complex prioritization involves a more in-depth, comprehensive view to ensure that decisions made are not simply surface-level political band-aids, but rather, provide broad-range, profound solutions to policy issues.

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[4] www.forwardengagement.org
[5] Please see Appendix B for a broad summation of the general principles of Complexity Theory

MANAGEMENT AND DECISION-MAKING
IN AN AGE OF COMPLEXITY

The decentralization of threats which characterizes the age of complexity necessitates a move away from both the highly centralized, hierarchical nature of U.S. decision-making, as well as from the stove-piped method of organizing responses to challenges according to discipline. Rather, this decentralization is such that threats mutate over time and are ever more interconnected, often making the response of a single U.S. government department simply inadequate.

The way that the U.S. government organizes its information affects the method by which it acts upon that information. The legacy system of U.S. governance defines issue responsibilities – and thus compartmentalizes policymaking – by department and according to discipline or region. The effect is to ignore the complex interactivity between issues, and a system that is not conducive to dealing with rapid change of the sort that has increasingly become the norm in global systems.

To deal with highly complex information, parallel organizational capacities are necessary. Networks, or decentralized channels of distributed connectivity, are a method of organizing and acting upon information that grants a high degree of flexibility to respond under dynamic circumstances. A decentralized network enables the distribution of a greater amount of information, the flow of which creates 'meta-information' or 'shared awareness' about the system as a whole to facilitate the design and execution of policy. Moreover, networks enable spontaneous and self-organized adaptation by all relevant scales of organization to respond to challenges with greater swiftness and coordination than is generally permitted by the highly stove-piped and bureaucratic nature of hierarchies.

The adaptability of networked organization to respond effectively to challenges throughout a system must not be handicapped by the micromanagement that is often emblematic of hierarchies. Rather, leadership must ensure that the organization allows for the formulation and execution of responses to issues at multiple scales, such that the response of each level of the organization reflects its familiarity or specific purview. Taken collectively, these individual level responses can be coordinated into a comprehensive organization-wide response. Such *multi-scale* networks, by allowing mission-oriented teams to emerge from coordination between different levels of a hierarchy, thus enable a concerted and whole-scale adaptive response to broad challenges. However, the broader objectives that determine lower-level activity should be framed from the top. While objectives should be framed at the highest level, exactly how those objectives are framed depends on how information is organized. In the case of the Executive Branch and the Presidency, the framing of objectives is thus largely a reflection of the manner in which the Executive Office of the President (EOP) and Cabinet organize and process information.

The Executive Office of the President and the Cabinet serve as the core of the Executive branch's response system for managing the global system, insofar as they are intended to frame issues for the President and advise him or her on how best to respond to them. Accordingly, the organization of this response system[5] should mirror the organization – and indeed complexity – of the broader global system it is intended to address. A response or advisory system for the President which reflects the diversity and complexity of issues in the global system is essential for comprehensive and effective policymaking. The greater diversity of ideas that can be generated from enhanced coordination within the Executive Office of the President (EOP) and the Cabinet – beyond the current limited interaction – could create the foundation for a networked system of organization and intelligence that cuts across and extends throughout the scales of the Executive branch and promotes access to information from multiple points and perspectives.

RECOMMENDATIONS FOR EXECUTIVE OFFICE REFORM

The following recommendations propose a method of restructuring of the Executive Office of the President (EOP) and its relations with the Cabinet with the overall aim of systematizing and institutionalizing a day-to-day focus on the identification and analysis of long-term and complex clusters of issues that have the potential to impact U.S. national security. The specific recommendations presented seek to address the aforementioned challenges of creating a culture and awareness for an expanded notion of *national security*, and for reforming the national security system so that it better accounts for and frames the range of complex and interactive issues that demand consideration in the policy-making process.

THE TRANSITION PERIOD AND BEYOND

Training in the theory and practice of complex systems and long-term strategic thinking must be a core component of the pre-inauguration preparatory orientation required of all individuals who will participate in upper-level Executive branch decision-making. Such advanced preparation will enable the incoming administration to hit the ground running. The orientation is intended to strengthen the EOP and Cabinet officials' abilities to comprehend and consider complex priorities for the future. Participation in this orientation process is encouraged for other groups of officials within the Executive branch as well, and is not limited to those senior officials who will be part of a newly established Principles Committee on Complex Priorities.

Principles Committee on Complex Priorities (PCOM)
Varying levels of training and information will be provided to those involved with the committee, in a manner sufficient to inform them to a level necessary to better fulfill their duties without saturating them with excessive information.

Orienting PCOM members towards interactive and interdisciplinary thinking – and towards methods of approaching policy clusters and topics from this perspective – will be the subject of a seminar workshop for each level of committee participation. Top-level officials required to receive training will include:

- Chief of Staff
- Assistant to the President for National Security Affairs
- Assistant to the President for Homeland Security and Counterterrorism
- Assistant to the President for Economic Policy
- Assistant to the President for Domestic Policy
- Director of the Office of Management and Budget
- All Cabinet appointees
- Other council heads

These senior officials will be required to attend a day-long seminar outlining the importance of long-term strategic and contingency planning. These methods and tools will help them to better consider and account for the future in policymaking. By convening the senior leadership in PCOM and orienting these officials towards the framing of issues as part of broader complex clusters with implications for the future, a culture of interdisciplinary cooperation may be cultivated early on and extended into PCOM's workings with the rest of the administration. In order to make this seminar fresh in the minds of the top level officials before the transition period commences, the seminar for those officials listed above would best take place in early January, several weeks prior to inauguration.

Additional training sessions may be helpful to strengthen and solidify the lessons learned in terms of considering complex issues. Offices below the senior officials in the EOP will receive additional training because they will have considerably more involvement in the process.

Deputies Committee on Complex Priorities (DCOM)
The next level will consist of the deputies to each of the aforementioned senior officials, and will be called the Deputies Committee on Complex Priorities (DCOM). These officials will be primarily focused on the consideration of forward and complex priorities, and as such they will undergo a longer and more rigorous orientation process. Ideally, this process will begin in late November or early December and continue on a weekly basis through inauguration. Members of DCOM will include:

- Deputy Chief of Staff for Complex Priorities
- Deputy National Security Advisor for Complex Priorities
- Deputy Assistant to the President for Homeland Security for Complex Priorities
- Deputy Assistant to the President for Economic Policy for Complex Priorities
- Deputy Assistant to the President for Domestic Policy for Complex Priorities
- Deputy Science Advisor for Complex Priorities

During the training process these deputies will be asked to complete a range of readings and brief assignments intended to enhance their understanding of and ability to consider complex forward priorities. Each deputy will have a support staff of 2-3 people who will also be required to attend and complete this training. Additional training for these staffers may be useful, and enable them to more effectively contribute to the efforts of the deputies. Initiating the training as soon as possible after the election will encourage the deputies and their staffers to begin preliminary work on specific issues and policy clusters that will require further attention once the transition of power occurs. Training seminars may occur on a weekly or bi-weekly basis, similar to a classroom environment.

Multi-Level Training
After the initial training process is completed for the members of the PCOM and DCOM, it is recommended that the President and Chief of Staff convene an initial informal

meeting of all members of the Principles Committee on Complex Priorities. The first informal meeting of the PCOM will examine one or more policy clusters with the discussion aimed at identifying the relevance and ramifications for the area of responsibility of each of the PCOM members. This meeting should be immediately followed by a first informal meeting of the Deputies Committee on Complex Forward Priorities, to flesh out the issues discussed within the PCOM with the aim of identifying specific challenges and opportunities and devising an action plan going forward. These informal meetings will allow the PCOM and DCOM to put to practice the multi-level training its members will have undergone, stimulate interaction among the members of each committee and between the committees, and illuminate any positive or negative aspects of the committees that may merit additional attention. Ideally, these initial meetings will take place after the completion of the requisite training by all members of the PCOM and DCOM, yet before the inauguration, so that the two committees will be functional when the official transition occurs and can begin work immediately.

Training Content
The proposed shift towards thinking in terms of complex forward priorities is largely informed by the emerging paradigms of systems and complexity theory. As such, the training provided to members of the PCOM and DCOM and their staff will follow formats inspired by successful precedents in the provision of training in futuring and Complex Systems.[6] Training sessions will include instruction on the following:

- Introduction to Complex Systems: Participants will be introduced to the terms and phenomena of Complexity Theory, which provide an effective explanation of the interactive trends and processes that shape world affairs.
- Application of Complexity Theory: Participants will apply the terms and phenomena of complex systems to their own expertise, in order to abstract a broader understanding of their own specialization.
- Interactivity of Issues: Participants will work together to tease out the interactivity between hypothetical political issues within the scope of both their specializations and complexity theory itself.
- Scenario Planning and Futuring Methods: Participants will learn and explore possible scenarios for each political issue inspired by the interactivity and complexity analyses.
- Policy Creation: Guided by the experience gained from preceding sessions, participants will create hypothetical policy focusing on the specific issue at hand.

Additional Training and Long-term Support
It will be beneficial to have other key members of the Executive Office of the President undergo similar training as the aforementioned officials, though perhaps in a somewhat abridged fashion. This training could be conducted in a large group seminar, with issue or

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[6] Such precedents include those set by The Project on Forward Engagement, The New England Complex Systems Institute, The Washington Center for Complexity and Public Policy, and Netform, among others

mission-specific breakout groups, for example. One benefit of such training is that it could increase connections and communications across the various offices, as people engage colleagues with whom they might not otherwise interact directly. Ongoing training sessions should also occur, though on a more periodic basis, throughout the tenure of the administration as necessary.

A FRAMEWORK FOR THE EXECUTIVE OFFICE OF THE PRESIDENT (EOP) AND UNITED STATES CABINET[7]

Although all incoming White House staff will be trained in Forward Engagement and Complex Priorities, as detailed in Section I, the Executive Office of the President (EOP) should be embedded with strong actors whose tasks include:

1) Regular participation in daily White House activities, staff meetings, etc;
2) Extrapolation, discussion, and definition of presidential priorities and their impact on short-term policy;
3) Identification of issues and creation of Presidential Task Forces for major complex challenges; and
4) Guidance of long-term policy decisions by principles such that far-reaching goals are broken down into manageable, component-level, value-added, and short-term policy goals. [8]

Deputies Committee on Complex Priorities (DCOM)
The existing structure of the White House and EOP is inadequate for addressing complex challenges or thinking in an interdisciplinary, comprehensive, and long-term manner. Given that the National Security Council (NSC) exists as a legislative mandate, and that a sudden elimination of existing policy coordination structures—such as the Homeland Security Council (HSC), National Economic Council (NEC), and Domestic Policy Council (DPC)—could be overwhelming to the interagency and bureaucratic system, Forward Engagement thought must be incorporated into the existing policy coordination structure without completely replacing it. While past administrations have limited themselves to narrowly defined understandings of national security, economic policy, domestic policy, and other discipline-based policy groups, the next administration will infuse comprehensive thought and forward thinking into all policy discussions. The following new responsibilities should be designated in existing EOP offices:

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[7] Please see Appendix A for an organizational diagram of the proposed institutions

[8] This process is inspired by the Component Level Implementation Process, a legacy of the Fall 2004 Forward Engagement Report, and defined by the following"1) Examine long-term developments, break them down into nearer-term components, and create short-term policies that will aggregate up to a positive long-term policy; 2) break long-range, multivalent objectives into smaller, subordinate steps; 3) Each smaller step would be beneficial unto itself, however, so that even with the accomplishment many small steps, individual benefits would be made, while realizing the long-range objective in the aggregate

     (1)   Deputy Chief of Staff for Complex Priorities

     (2)   Deputy National Security Advisor for Complex Priorities,

     (3)   Deputy Assistant to the President for Homeland Security for Complex Priorities

     (4)   Deputy Assistant to the President for Economic Policy for Complex Priorities

     (5)   Deputy Assistant to the President for Domestic Policy for Complex Priorities

     (6)   Deputy Advisor to the President for Science & Technology Policy.

While these persons will report to the Chief of Staff, they also will function as a nucleus for development of long-term, cross-discipline policy formulation in the White House. Together, these persons form the Deputies Committee on Complex Priorities (DCOM), which is intended to show representation from the vested leadership of existing policy coordination bodies (NSC, HSC, NEC, and DPC).

DCOM will serve as the engine for forward thought and policy implementation in the EOP and interagency structure. Instead of acting as an independent office that is separate from the remainder of EOP, DCOM members spend most of their time inside various existing nerve centers for policy coordination, and report to key presidential assistants. This allows for DCOM to continually draw from the resources of their host offices; question, challenge, and inform the daily policy discussion within their host offices and their parallel interagency Councils; and meet separately with other DCOM members to develop a coordinated long-term approach to policy. In effect, the disparate placement of DCOM members allows them to draw from existing resources – i.e., asking the right questions of the system – and also to pool resources to feed policy recommendations to the President and other principles – i.e., creating forward-thinking outputs.

As an entity, DCOM meets once per week (or as determined by the Chair) and is responsible for discussing concerns and opportunities, as determined or affected by the President's policy agenda. More than any other White House entity, this group applies the tenets of complexity and comprehensive, long-term thought in situations deemed especially important. The agenda for DCOM meetings is set by the Deputy Chief of Staff for Complex Priorities, based on consultations with other Board members regarding the most pressing issues being discussed in NSC, DPC, NEC, or HSC. When appropriate, the Deputy Chief of Staff may invite participation in discussion by a wide range of EOP or agency heads at the deputy level.

One of the larger responsibilities of DCOM is to cull and refine national long-term priorities, using the President's policy agenda as a guideline, from the daily policy dialogue around the White House and interagency. The lateral and vertical flow of information pertaining to complex priorities within the EOP will be facilitated by an established process for drafting and circulating memorandums. Each Deputy Assistant for Complex Priorities and his or her staff will be responsible for producing a weekly memorandum which tracks previously identified issues and clusters, and highlights

emerging issues and clusters that merit broader consideration. The council team producing a memo will be required to circulate their product to each of the other teams to give their colleagues the opportunity to weigh in with their perspective, and provide any input or comments. Once a memo has been considered by each of the teams it will be considered cleared, and forwarded to the DCOM Chair. The DCOM Chair and his or her staff will then have the responsibility of consolidating the weekly memos and inputting these into the agenda for the next DCOM meeting.

Through discussion within DCOM the committee will then produce a consolidated memo identifying key developments, issues, priorities and area-linkages—and providing recommendations—for consideration in the next meeting of PCOM. In addition, PCOM will have the authority to task DCOM with producing issue or cluster-specific memorandum, recommendations, and other such products, as it deems necessary

In addition, as Board discussions begin to reveal key linkages across issues (beyond narrow understandings of discipline), DCOM may issue white papers on these linkages to short-term actions for consideration by other EOP and interagency actors. In addition, DCOM may seek input from various agencies in order to develop a recommendation memo to the President. This memo may suggest an *ad hoc*, or perhaps a more permanent, creation of a Presidential Task Force to tackle a policy "cluster" of significant magnitude and importance. By design, DCOM is not vested with enough power to *implement* crosscutting policy decisions; instead, DCOM serves as a sensory mechanism that gathers and interprets latent knowledge in policy circles. Thus, upon receiving the DCOM memo, the President may also decide to convoke the Principles Committee on Complex Priorities (PCOM) for further action on an especially sensitive policy cluster.

Principles Committee on Complex Priorities (PCOM)
The Principles Committee on Complex Priorities (PCOM) is vital to any implementation of comprehensive long-term policy, and consists of the President, Vice President, Chief of Staff, the Assistant to the President for Science and Technology Policy, and the Secretaries of State, Defense, Treasury, and Education. Other persons may be invited as determined by the issue under discussion. In contrast to DCOM, which lacks the mandate to create and implement policy, PCOM consists of agency heads and other principals who will implement the President's decisions and who will eventually orient resources and employees towards the policy cluster under discussion.

One possible action of PCOM may be, as described above, to implement the creation of a Presidential Task Force for the policy cluster under consideration, with each agency seconding a senior official for participation. This task force, under the guidance of DCOM and the executive mandate of PCOM, would develop a national strategy that breaks down the larger, more overwhelming task of long-term thought into smaller, more manageable, component-level policy goals. Moreover, Task Forces would seek, incorporate, and apply resources, expertise, and personnel from all branches of government as necessary, transcending governance challenges of both discipline and scale.

Moreover, in tandem with DCOM's analytics, PCOM can create policy that integrates beyond discipline and explores the integration of responses to broader policy issues. An example may be a response to the broad issues of climate change and loss of US innovative capacity; a cross-cutting solution to both may entail investment in alternative energy technologies that both provide direct responses to matters of climate change and create an innovative industry that would address US innovation. Thus coordination would not only breach barriers of discipline (economics and science) but also those of issue (climate change and innovation).

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APPLIED POLICY CLUSTER: CLIMATE CHANGE

As the scientific debate over global climate change has come to a close, the political debate continues to bog down federal institutions, illustrating the government's inability to deal with complex, long-term problems. Climate change will have far-reaching implications for many seemingly disparate policy arenas, though when seen from a wide-angle, time-lapse perspective, it becomes clear that these implications are highly interconnected and self-reinforcing. Urban development from decades ago has led to transit patterns and habits that have produced increased greenhouse gas emissions that have slowly changed climate patterns. Even some of the smallest shifts in climate patterns have had demonstrable effects on agriculture, requiring massive modifications to all aspects of the nation's infrastructure—including transportation, water provisions, trade, energy, health care, communication, etc.—not to mention the massive public infrastructure projects soon to be required by rising sea levels. The staggering evacuations ahead of major weather events similar to Hurricane Katrina will pale in comparison to the relocations sure to be necessitated by threatening ocean levels. The problem begins to look overwhelming and almost incapacitating when one realizes that these relocations will, in turn, cause changes in agricultural patterns and systems that will also require coping and restructuring.

As evidenced by increasingly strong language from the Intergovernmental Panel on Climate Change, widespread media coverage, and the successful presidential campaign which included climate change as an issue central to US national security, climate change is a sufficiently important, complex, and long-term cluster of problems and policies to be run through the new framework for responding to such challenges through the Executive Office of the President. All White House staff that would be involved in climate change policy development is prepared to address this cluster of issues with respect to Forward Engagement and complexity theory. Climate change may well necessitate the creation of an *ad hoc* Presidential Task Force on Climate Change, following an innovative process of interagency study and policy development. As experts are beginning to recognize, the traditional structure of interagency response is insufficient for dealing with problems like climate change. [9]

Climate change would certainly be an issue addressed at weekly meetings of the Deputies Committee on Complex Priorities (DCOM); not only has the President-elect staked climate change as a significant administration priority during the campaign, but all agencies are beginning to sense the impending challenges to their traditional work processes posed by climate change. Given that agencies sense the administration's receptiveness to studying the impact of climate change, they begin to discuss and relay their concerns up the chain through standard interagency structures. The President-elect's newly-implemented system of sensing and responding to complex priorities will recognize

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[9] "Since climate change is an issue that straddles domestic and international domains, neither the National Security Council nor the Domestic Policy Council is equipped on its own to develop a coherent response across the federal government," Joshua W. Busby, Climate Change and National Security: An Agenda for Action, Council on Foreign Relations, CSR no. 32, November 2007

the prevalence and complex nature of this challenge and swing into gear. It is highly likely that climate change would be brought up organically within DCOM, in conjunction with other complex issues such as converging technologies, geopolitical inversion, and evolutionary secession. Increasingly, climate change will surface as a common thread of concern; all doubt as to its pressing importance will quickly fade.

DCOM Function In Regards To Climate Change
The Deputy Chief of Staff will begin to regularly invite participation in meetings by representatives from the Assistant to the President for National Security Affairs, the Assistant to the President for Homeland Security and Counterterrorism, the Assistant to the President for Economic Policy, the Assistant to the President for Domestic Policy, and all deputies working on complex priorities. In addition, experts from academia and industry will be invited on occasion, along with relevant agency heads. The agencies with representation at these Task Force meetings will be varied and as comprehensive as possible, as necessitated by the crosscutting and complex nature of global climate change. This will encourage the process of exposing otherwise stove-piped individuals and institutions to the interactive feedback loops embedded within this policy cluster—a process that began during the transition period between Election Day and inauguration.

At meetings of the Deputies Committee on Complex Priorities (DCOM), participants will bring to the table the many ways in which their policy spheres are influenced by climate change. Owing to their training in complexity theory and Forward Engagement, the Deputy Assistants on Complex Priorities are able to recognize the potential threats that climate change will pose to their policy offices well into the future. The Deputy National Security Advisor for Complex Priorities faces numerous security problems, including, but not limited to, the opening of the Northwest Passage, geopolitical shifts caused by populations displaced by rising sea levels, naval bases being threatened by rising sea levels, local wars over water as a precious resource, the collapse of alliance systems and multilateral institutions due to skirmishes over land, water, and disease, and more. The Deputy Assistant for Homeland Security - Complex Priorities has seen the problem of climate change manifested in new and more dangerous disease vectors, sea walls as potential targets for terrorist attack, the potential need to protect the border waters due to conflict over fishing rights with Canada, and increased severity of storms causing massive destruction to at-risk metropolitan areas. The Deputy Assistant for Economic Policy - Complex Priorities foresees a serious strain on the economy due to massive infrastructural development to deal with the effects of climate change, severe agricultural decline threatening the national and global economy, domestic fisheries might unexpectedly and rapidly collapse, and drastic, lasting water shortage will weaken the West Coast's economic foundation, crippling more than just Californian agriculture. Finally, the Deputy Assistant for Domestic Policy - Complex Priorities will be preparing to feel the domestic effects of many of the stated issue areas and will have the unique responsibility of preparing for the potential weakening of the federal system as region-wide disasters become more frequent and severe, forcing state governments to cope with more of the burden of dealing with disaster. All of these Deputy Assistants will participate in dialogue on climate change as a result of this issue's presence in discussions within interagency

groups with which their office is traditionally associated (NSC, HSC, NEC, and DPC, as appropriate).

When the Deputy Assistants for Complex Priorities convene as the Deputies Committee on Complex Priorities (DCOM), the interconnectedness of these issues becomes readily apparent—an irregular phenomenon under previous governing methods and systems. In discussing future contingencies of interest (FCIs) related to global climate change with one another, with other government agencies, and with experts from academia, industry, and the non-profit sector, the complex, networked nature of this policy cluster comes to the forefront of discussion. Interactivity and feedback loops between FCIs begin to emerge: agricultural decline could be reinforced by increasingly severe storms; increasingly severe storms could threaten new infrastructure built to cope with rising sea levels; new infrastructure built to cope with rising sea levels might damage or destroy sensitive ecosystems, leading to biodiversity loss; biodiversity loss could speed the collapse of already threatened fisheries. These are just a few examples of the interconnectedness of issues that DCOM will have to deal with in compiling useful information to pass onto the President and the Principles Committee on Complex Priorities.

Now that the issue has risen to and through DCOM it is perfectly clear that climate change is no longer an optional issue to be addressed by this presidency. The increasing urgency embedded within every report released by the Intergovernmental Panel on Climate Change illustrates the severity of this policy cluster—not least the loss of large ice sheets in Greenland and Antarctica could lead to rapid and noticeable rises in sea level. Similarly, the interconnectedness and immediacy of the issue becomes glaring as separate policy spheres realize that their specific problems cannot be dealt with individually. Though the arrangement discussed above is not certain to solve the problem of climate change (indeed, the problem has no single solution, as it is an ongoing issue to be dealt with continuously), it is likely to move the executive branch in the right direction very quickly.

PCOM Function in Regards to Climate Change
Whereas the primary function of DCOM is to act as a constant network node of data creation/collection/analysis/processing, the primary function of the PCOM is two-fold: to cull the most important points made by DCOM and discuss them with POTUS, and to act as the driver for policy implementation. The method by which the PCOM does this is through the creation of mission-oriented policy initiatives and the task forces that will achieve these initiatives.

For example, given the problem of drought and water shortages caused by climate change, DCOM can present to the PCOM a set of challenges that this causes to national security: in the foreign policy sphere, the lack of water is causing internal displacement and water wars in several African countries, which have led to greater unrest and terrorists taking advantage of the disturbance to set up training camps. In the domestic sphere, the lack of water is causing U.S. agriculture to suffer badly, with the American mega-farming corporations showing falling profit, further causing unstable food price levels.

Given this information, the PCOM will work with DCOM to determine the exact scope as well as methods (short-term, middle-term, long-term) by which the government can attempt to ameliorate the problem. Having done so, the PCOM will present a memo to the POTUS detailing its findings and solutions, and call for a meeting in which both DCOM and the PCOM will brief the President. Once the President signs off on the solutions, the PCOM will create a Climate Change Task Force to execute the ideas approved by the President- and which will submit a monthly status report to both DCOM and PCOM. This Task Force will be charged (under DCOM guidance) with the distillation of long-term policy goals already established into short-term, value-added goals which are beneficial to the United States in and of themselves.[10]

This Climate Change Task Force will be comprised at the head by Senior Executive Service (SES) members selected from the agencies that comprise the PCOM. Upon selection, SES members will begin rigorous, continual training in the concepts of Forward Engagement, modeled upon the similar training that occurs at the DCOM and PCOM levels; this will ensure that the heads of the bureaucracy become proficient with this method of thinking. Specific instruction will be given with a focus around the policy cluster.

After training, the SES members will be free to pursue initiatives within their agencies, and in conjunction with their Task Force, to fulfill the mandate given to them by the PCOM. If the PCOM, for instance, mandates that the Climate Change Task Force to speed up networking and inter-agency operations between the Department of Homeland Security and the Department of State to deal with climate-change problems, then the SES members in both organizations will need to come together, confer with DCOM in regards to possible solutions, and then execute the solutions as needed.
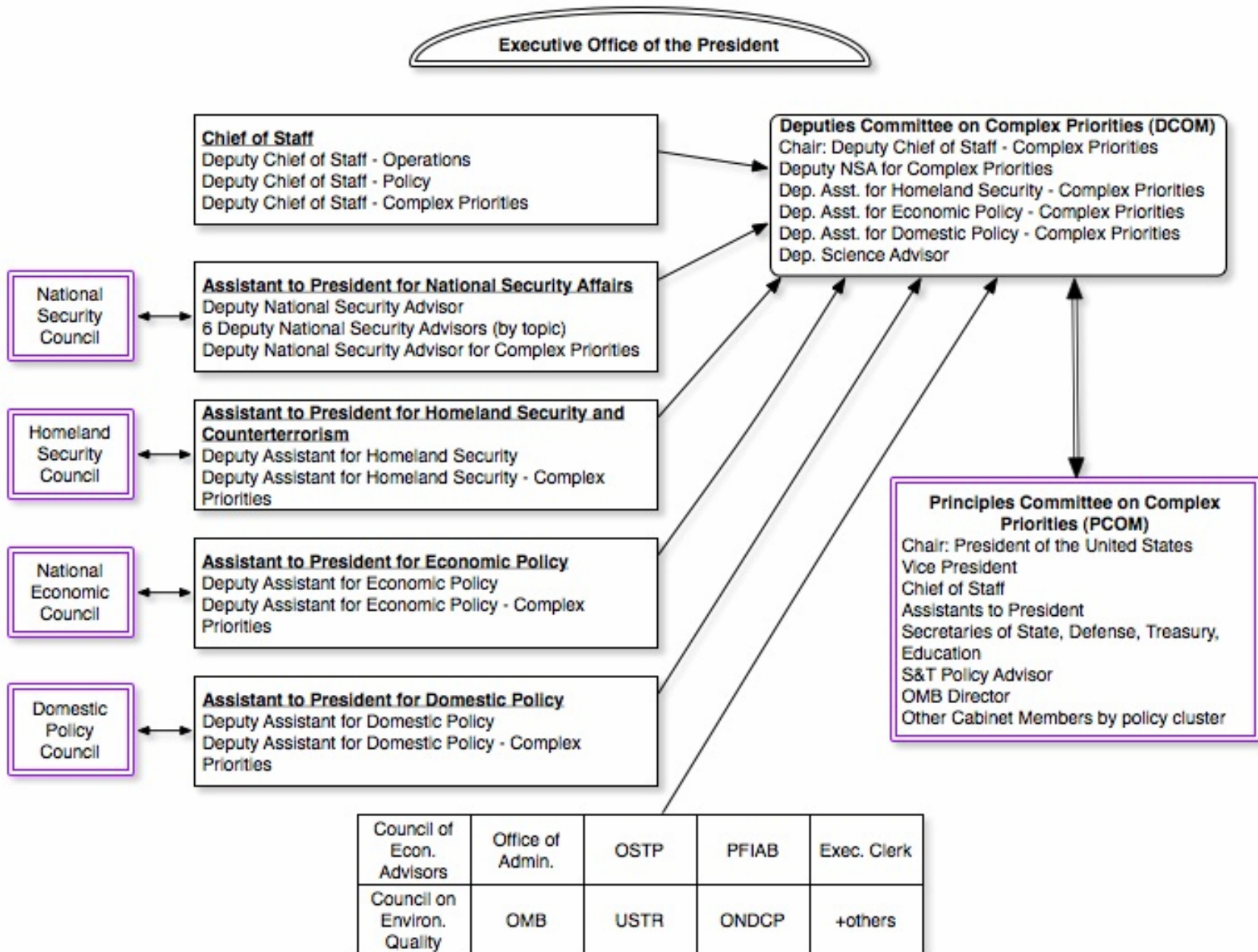
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[10] "The United States should prioritize so-called no-regrets policies, those that it would not regret having pursued even if the consequences of climate change prove less severe than feared.," Busby, ibid.

FURTHER RECOMMENDATIONS

- *Inculcating Complex Priorities and Forward Engagement in all high level policy officials*: Training of subsequent levels below the highest level policy makers, including deputies, assistant deputies, and so forth, will have the effect of spreading the concepts of complex priorities and Forward Engagement amongst the lower ranks of governance. This will be accomplished through formal training of lower level policy makers, and also more informally, based on lessons extracted from their superiors. The training will have an organic trickle down effect amongst government officials. Training should also be encouraged for state and local governance structures over time.

- *Coordinating with Congress*: By coordinating with Congress in the practice of Executive Branch governance, DCOM and PCOM may further orient governance for an Age of Complexity across the entire government system. Congress can follow the same training procedure as the executive transformation process. The congressional level changes should be informed by the propositions put forward by earlier Blue Ribbon Panels.

- *Enhancing Cross-Disciplinary Work*: By encouraging cross disciplinary work amongst multiple bureaus over the span of a government official's career, it will diversify their understanding of other bureaus and agencies, enhancing 'meta-level' knowledge of the whole organization, and a culture of systems thinking. Encouraging cross-bureau promotion from lower rungs of government is an idea taken from a model presented by a Civil Servant of Singapore's National Security Coordination Secretariat. This model will also increase communication across bureaus through formal and informal networking of officials.

- *Increasing the presence of Complexity and Systems Thinking in US Education curricula*: As Complexity and Systems thinking become prevalent models in governance specifically, and management and science in general, it will be necessary to train future generations with the model of thinking, ideally in the secondary or tertiary educational setting. An added benefit to studying these models in an academic setting will be increased understanding of the complexity systems and even innovations in the systems themselves. Such a task may well be worthy of exploration by a PCOM

APPENDIX A – Organizational Structure

Executive Office of the President

Chief of Staff
Deputy Chief of Staff - Operations
Deputy Chief of Staff - Policy
Deputy Chief of Staff - Complex Priorities

Deputies Committee on Complex Priorities (DCOM)
Chair: Deputy Chief of Staff - Complex Priorities
Deputy NSA for Complex Priorities
Dep. Asst. for Homeland Security - Complex Priorities
Dep. Asst. for Economic Policy - Complex Priorities
Dep. Asst. for Domestic Policy - Complex Priorities
Dep. Science Advisor

National Security Council

Assistant to President for National Security Affairs
Deputy National Security Advisor
6 Deputy National Security Advisors (by topic)
Deputy National Security Advisor for Complex Priorities

Homeland Security Council

Assistant to President for Homeland Security and Counterterrorism
Deputy Assistant for Homeland Security
Deputy Assistant for Homeland Security - Complex Priorities

Principles Committee on Complex Priorities (PCOM)
Chair: President of the United States
Vice President
Chief of Staff
Assistants to President
Secretaries of State, Defense, Treasury, Education
S&T Policy Advisor
OMB Director
Other Cabinet Members by policy cluster

National Economic Council

Assistant to President for Economic Policy
Deputy Assistant for Economic Policy
Deputy Assistant for Economic Policy - Complex Priorities

Domestic Policy Council

Assistant to President for Domestic Policy
Deputy Assistant for Domestic Policy
Deputy Assistant for Domestic Policy - Complex Priorities

Council of Econ. Advisors	Office of Admin.	OSTP	PFIAB	Exec. Clerk
Council on Environ. Quality	OMB	USTR	ONDCP	+others

<u>APPENDIX B</u>
Complex Systems[i]

Bill McKelvey and Steve Maguire[ii] define a complex adaptive system (CAS) as a system[iii] that is:

> comprised of numerous, [highly interconnected, interactive] entities or parts, each of which is behaving in its local context according to certain rules or forces. In responding to their own particular local contexts, these individual parts can, without explicit cooperation, cause the system as a whole to display emergent patterns, orderly phenomena and properties at the collective level. [Complex systems and their parts] are governed by rules that evolve, which are referred to as 'adaptive agents,' guided by 'internal models.'

These internal models or "schematas" are each agent's own rules for how it interprets and responds to stimuli in its environment. Because agents can change, adapt, and share schematas—largely in response to changes in other, connected aspects of the system—a CAS as a whole can learn and its behavior can adapt over time.[iv] The interaction of many, constantly adapting influences results in nonlinear, non-deterministic systemic dynamics. In turn, the whole of the system or process is more than, and different from, the sum of the parts.

Complex processes cannot be controlled in any meaningful sense, and they evolve in unpredictable ways. While the interaction of the components appears chaotic, complex processes generate observable patterns, a property called "self-organization".

A number of primary phenomena of complex systems include[v]:

▪ **Connectivity, Interdependence and Networks**: There is a high degree of inter-relationship, interaction, and interactivity between elements in a system and between a system and its environment. Such connections give rise to aggregate *networks*, the aggregation of links between any collectivity of agents. Certain agents and systems are not necessarily connected to one another *directly*, but are connected by degrees of separation facilitated by intermediary links. Networks extend in all directions, making a definitive start and end—even cause and effect—difficult or impossible to point-point, and making change within networks inherently nonlinear.[vi]

▪ **Co-Evolution**: Stemming from the notion of connectivity, co-evolution states that the evolution of one domain or entity is partially dependent on the evolution of other related domains or entities. In other words, one domain or entity changes in the context of the other(s). Due to co-evolution and interdependence, seemingly unrelated systems and even disciplines can greatly affect one another; hence complexity is referred to as an interdisciplinary science.

▪ **Adaptation, Exploration and Evolution**: Agents in a system are *adaptive*[vii], in that they actively try to turn what happens to their advantage in anticipation of the future, by constantly revising and rearranging their building blocks as they gain experience, all according to their schematas or internal models.[viii] To survive and thrive, agents must explore their space of possibilities and generate variety. Complexity also suggests that the search for a single 'optimum' strategy may neither be possible nor desirable. Any strategy can only be optimum under certain conditions, and when those conditions change, the strategy may no longer be optimal. To survive in a complex environment, a system must constantly scan the landscape, trying different strategies and possibilities

▪ **Feedback**: *Feedback* is the signal that is looped back from the agents within a system to control the system within itself; it is traditionally seen in terms of positive and negative feedback mechanisms, which are respectively described as reinforcing (i.e. amplifying) and balancing. Put another way, positive (reinforcing) feedback drives change, and negative (balancing, moderating, or dampening) feedback maintains stability in

a system. Feedback through networked systems is nonlinear, by nature of its exponential increase or decrease that aggregates or dampens trends.

- **Cascades, Sensitive Dependence on initial conditions & The Butterfly Effect**: As a result of the immense interdependence of agents within a networked system, a change in a single agent can cascade throughout the rest of the network. A cascade will occur as other agents react to the first agents' change by adapting themselves, resulting in immense effects on whole systems, a phenomenon known as the *butterfly effect*. As a result, systems are very sensitive to even ostensibly irrelevant influences.

- **Path dependence and Increasing Returns**: Due to positive feedback, initial advantages or tendencies in a system may remain, due to their relative initial ubiquity and advantage, and influence the development and progress of a system manifold.[ix]

- **Dissipative Structures, Far-from-equilibrium, Bifurcations, and Tipping Points**: These concepts refer to ways in which open systems exchange energy, matter, or information with their environment and which, when pushed 'far-from-equilibrium,' create new structures and order. Change will aggregate incrementally—often through feedback—until it reaches a certain threshold, or tipping point, where the event of a previously rare phenomenon becomes rapidly and dramatically more common.[x] The radical, nonlinear change from one phenomenon or status to another is referred to as a bifurcation.

- **Self Organization and Emergence**: *Self organization* is a process in which the components of a system spontaneously exchange information and co-adapt to produce coordinated and concerted behavior. Likewise, "emergent properties, qualities, patterns, or structures arise from the interaction of individual elements; they are greater than the sum of the parts and may be difficult to predict by studying the individual elements. Emergence is the *process* that creates new order together with self-organization."[xi]

- **Scale, Self Similarity and Nested Subsystems**: Similar characteristics may apply at different levels and scales of organization of a system.[xii] *Fractal*, a term taken from Chaos theory, is the term often used to describe the repetition of *self-similar* patterns across levels or scale. If a cluster is coherent and stable enough, then it can serve as a building block for some larger cluster. Building blocks at one level combine into building blocks at a higher level. Such *nested subsystems* are common ways of distributing intelligence and foci in both simple and complex systems.[xiii]

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[i] This text is taken from Neil Padukone (2007), *Complexity in Organizations: A Conceptual Overview*, LSE Complexity Group

[ii] Maguire, S. & McKelvey, B., (1999), "Complexity & Management: Moving from Fad to Firm Foundations", *Emergence: A Journal of Complexity Issues in Organizations & Management*, Vol. 1, No. 2: 19-61

[iii] A system is taken to mean "an integrated whole whose essential properties arise from the relationships between its parts" from Capra, Frithjof (1996), The Web of Life: A New Scientific Understanding of Living Systems, New York, Anchor Books, pp 27

[iv] Zimmerman, B., C. Lindberg, and P. Plsek, Edgeware (1998). Insights from Complexity Science for Health Care Leaders, Texas: VHA incorporated

[v] This list is inspired by Mitleton-Kelly, Eve (2003) "Ten Principles of Complexity & Enabling Infrastructures" in Mitleton-Kelly, Eve (ed), Complex Systems & Evolutionary Perspectives of Organisations: The Application of Complexity Theory to Organisations, Elsevier Press

[vi] Capra, 1996, pp 82

[vii] Adaptation is often referred to as 'evolution,' as many argue that the term 'adapt' connotes a one-dimensional adaptation *to* a system, while evolution implies a multi-dimensional mutual evolution *with* a system; see Mitleton-Kelly (2003). However, others argue against this assertion by stating that 'evolution' implies a sequential, even value-laden understanding of the phenomenon. Nonetheless, the terms 'evolution' and 'adaptation' are often used interchangeably in studies of complex systems.

[viii] Waldrop, M. Mitchell (1992), Complexity: The Emerging Science at the Edge of Order and Chaos, Simon & Schuster

[ix] An often-cited example of increasing returns is the VCR market: "The VCR market started out with two competing formats selling at about the same price: VHS and Beta. Each format could realize increasing returns as its market share increased: large numbers of VHS recorders would encourage video outlets to stock more pre-recorded tapes in VHS format, thereby enhancing the value of owning a VHS recorder and leading more people to buy one. (The same would, of course, be true for Beta-format players.) In this way, a small gain in market share would improve the competitive position of one system and help it further increase its lead…Increasing returns on early gains eventually tilted the competition toward VHS: it accumulated enough of an advantage to take virtually the entire VCR market," from Arthur, B.W. (1990) Positive Feedbacks in the Economy, Scientific American, February

[x] Grodzins, Morton (1958), The Metropolitan Area as a Racial Problem, Pittsburgh: University of Pittsburgh Press and Gladwell, Malcom (2000), The Tipping Point: How little things can make a big difference, New York: Little, Brown and Company

[xi] Mitleton-Kelly, 2003

[xii] For example, "in an organizational context, the generic characteristics of complex systems may apply within a firm at different levels (individual, team, corporate), as well as between related businesses and institutions, including direct and indirect competitors, suppliers, and customers, as well as legal and economic systems" (Mitleton-Kelly, 2003)

[xiii] Waldrop, 2003, pp 169