

The Collaboratory for the Study of Generative Networks (“Collaboratory”) is a joint partnership between the Cebrowski Institute for Innovation and Information Superiority (CIIS) of the Naval Postgraduate School (NPS) and the Center for Technology and National Security Policy (CTNSP) at the National Defense University (NDU). The Collaboratory’s principal focus is on research leading to an improved understanding of “generative networks,” or non-institutionalized, context-rich, socio-technical systems typified by the Web, and the implications these have for national security policy; military planning; nontraditional military operations, such as rebuilding civilian infrastructure and providing humanitarian aid; capacity building, including governance and regulatory infrastructure; and other political and institutional domains.

The Collaboratory combines two concepts, “generativity” and “network,” in search of new and productive areas of theoretical, conceptual, and applied research.

Generativity, or what Jonathan Zittrain describes as “a system's capacity to produce unanticipated change through unfiltered contributions from broad and varied audiences,”¹ is the resilient and reflexive ability of systems to evolve, adapt, extend (their jurisdiction, authority, productive capacity) and transform – properties that are inherent to a productive ecosystem. It may therefore become necessary to analyze generativity as an economic metric. Thus, the concept of generativity is of particular importance in the postindustrial information age, just as understanding productivity as a measurement of output is the primary metric within industrial economies. Properly conceived, generativity addresses issues of a system's evolutionary fitness, sustainability, and ability to produce positive externalities.

Networks, the “rapidly evolving dynamical systems” described by Albert-Laszlo Barabasi,² will provide our analytical model for defining the structural properties of organizations. This will introduce the methods of network and complexity science to emergent organizational structures and therefore to apply new scientific management methods and understandings to emergent socially produced phenomena. Most applications of these concepts have been used in the analysis of either relatively stable systems or snapshots of dynamic systems. New research, more philosophically aligned with the mission of this Collaboratory, has focused on dynamic, event-driven temporal phenomena and dynamic networked systems.

While we see the importance of generativity and networks in everyday policy issues and domains – from the development of open source software supply chains to “open” security threats typified by decentralized and disaggregated terrorist networks – there remains room for conceptual and theoretical contributions. The relationship between generativity and network remains ill-specified and under-researched, as do the implications for political, security, and defense matters. The Collaboratory seeks to fill these theoretical and conceptual gaps while at the same time producing knowledge and expertise that can be used by policy practitioners and private industry.

Moreover, new social networking systems such as Facebook, Twitter, and YouTube provide individuals with new means of information generation, dissemination, and diffusion, simultaneously presenting accountability, governance, and coordination challenges to organizations, institutions, and other corporate entities, including states. Across distributed communities we have seen individuals, representing either themselves or large or small organizations, create governance structures without centralized control, and these individuals have been able to produce technologies of value to themselves and to broader society. At the same time such productive capacities have resulted in new types of threats and risks, and have exposed the structural weaknesses of current institutional design and policy. Informal networks of computer hackers pose a threat to the

information systems of strong and weak states alike, but the context of these threats can vary from activities like the recently formed NedaNet to cyber crime networks.

As the means of production become more decentralized and democratized, traditional models of authority are being transformed in important ways. Information itself is becoming increasingly digital and codified. The recent demonstrations over the disputed presidential election in Iran, for example, are among the many cases of generative networks challenging traditional conceptions of control and hierarchy and the manner in which information is produced and disseminated. Consequently, many formal organizations are witnessing their diminished ability to manage and direct the distribution of information as knowledge is increasingly reconstituted across an information commons ecosystem.

Thus, there is an important but as yet unmet need for more applied research into generative networks. This is seen in the emergence of open technology development and the increasingly central role of computationally supported collaboration and communication. The Collaboratory seeks to further develop the analytical, theoretical, and conceptual frameworks with which to understand these developments, particularly in the realms of national defense, military planning, and international security.

1 Jonathan Zittrain, *The Future of the Internet – and How to Stop It* (New Haven: Yale University Press, 2008), p. 70.

2 Albert-Laszlo Barabasi, *Linked: How Everything Is Connected to Everything Else and What It Means* (New York: Plume, 2003), p. 102