ORGANIZATIONAL LEARNING AND CHANGE: EVOLVING SYSTEMS IN A GLOBAL COMMUNITY

Louise K. Comfort
University of Pittsburgh, USA

Contents

Summary

This essay examines organizational learning as a primary strategy for organizations to assess, understand, and adapt to changing conditions. The continual process of societal and environmental change serves as both the stimulus and the requirement for organizational learning. Without the capacity to learn and adapt to new conditions, organizations atrophy or fail in practice as their initial structure and functions become increasingly ineffective in a changing environment. Learning, as a strategy to cope with change, is reviewed on different scales of size and complexity: individual, organizational, and collective systems. The concept of complex adaptive systems is offered as an example of interacting organizations that are able to learn and adapt in a changing environment. Four types of organizational adaptation are reviewed, as well as obstacles to organizational learning. Finally, two new approaches to computational modeling of organizational behavior are recommended as exploratory methods for understanding the dynamics of organizational learning. The essay concludes that the greatest resource available to organizations is their membership, and the greatest challenge to organizations is invoking the human capacity to learn. Sociotechnical systems that integrate mechanisms of information technology with flexible

organizational strategies offer a promising means to extend organizational learning to large organizations and interorganizational systems.

1. Introduction: Change as a Learning Process

Coping with change is a fundamental task for organizations—public, private, and nonprofit. Inherent in this task is a basic dilemma, as organizations are established to provide systematic regularity and reliable performance in often uncertain, dynamic environments. Consequently, organizations, once established, develop procedures and rationale for performance to maintain stability and to control errant behavior. Efforts to initiate change are frequently viewed as threatening to the known and accepted practices of the organization. Yet, change is endemic in social environments, and organizational practices, developed for one period in a community's experience, inevitably become dated and ineffective as the community evolves in its social, technical, cultural, economic, and political development.

How managers, as well as members, perceive, initiate, evaluate, reject, or accept change as part of the on-going practice of their organizations creates a continual dynamic between an organization and the environment in which it operates. If change cannot be denied in social organizations, how then can it be understood and managed? Identifying the conditions under which change occurs, establishing criteria to distinguish constructive from destructive change for the community, and creating a process through which individuals and organizations can adapt to change successfully are primary functions of leadership in all sectors of society: public, private, and nonprofit.

Organizational theorists acknowledge this tension between stability and change in maintaining high performance. Change in organizational routines, either planned or sudden, tends to be disruptive and slows down normal operations as members and clientele learn new routines. Yet, if organizational practice is inconsistent with the needs of its clientele, the organization loses credibility with its constituencies. The disciplines concerned with administration—in business, government, education, health, and nonprofit services—confront a theoretical mismatch between the traditional forms of organizational design and management as mechanisms to control error and maintain accountability for their management of resources and the dynamic, ever-changing environments in which actual organizations must function in their daily operations. The very rules and regulations that are designed to limit error often threaten or preclude the exploration of new possibilities and adaptations that may improve performance in shifting contexts.

Change, construed as learning, transforms threat into opportunity and engages the organization and its members in the process of adapting to new conditions. But this transformation requires careful design and critical monitoring in practice, and a continual process of evaluation against a goal that is widely shared by the large majority of participants in the process. When the process of change extends beyond single organizations to a wider set of organizations or a social system, the process of design, action, monitoring, evaluation, feedback, and redesign becomes vital to effective organizational performance. Understanding this process of change, or continuous learning, is essential to sustain effective performance in increasingly complex,

interdependent societies. This topic on Organizational Learning in the Encyclopedia of Life Support Systems summarizes relevant research on this problem and offers recommendations for continuing study.

1.1. Individual Learning

The exact form and dynamic of the learning process is never certain, and the appropriate means to initiate the learning process varies with the dynamic and the context. Theorists have identified three types of learning that occur in social contexts: individual learning, organizational learning, and collective learning. Individual learning is widely recognized and acknowledged. Yet, focusing individual learning in the context of a changing environment represents a dynamic process. To Herbert Simon, Nobel Laureate and decision theorist, this process constituted problem solving. With his colleague, Allen Newell, Simon developed a model of human problem solving that captured the dynamics of this process. In their model, humans have two types of memory, short-term and long-term. In short-term memory, humans with limited cognitive capacity are able to remember only seven items at a time, plus or minus two, but it serves as an individual's "problem solving space." That is, short-term memory allows the individual to hold and exchange information from different sources, mix and match different types of information to create a meaningful interpretation of the problem, and use that interpretation to determine a strategy of action. Karl Weick and his colleagues in cognitive psychology call this process "sensemaking." Long-term memory, in contrast, provides a support role in human problem solving in that it allows the individual to retrieve information from many years past and use it to supplement, justify, or question the strategy of action developed in short term memory. Problem solving, to Simon and his colleagues, constituted individual learning that led to action.

1.2. Organizational Learning

Organizational learning is a more controversial process. Chris Argyris and his colleague, Donald Schon, active proponents of organizational learning, acknowledge in their book, *Organizational Learning II: Theory, Methods and Practice*, that individuals learn, but contend that the processes of information exchange, reflection, and feedback within an organization result in a shared base of goals, knowledge, and practice that constitutes organizational learning. That is, individuals working within a given organization observe and adopt a preferred set of practices and norms that constitute a distinctive organizational approach to problem-solving and performance. Other theorists argue that what is attributed to organizational learning is rather a factor of heuristics, chance, or leadership. That is, organizations can only reflect the actions, beliefs, and practices of their individual members. In the judgment of these theorists, it is the individuals who learn, if learning occurs, and any consequent change in individual actions is interpreted as merely change in organizational practice.

1.3. Collective Learning

More difficult still is the process of collective learning. This process engages different types of organizations and individuals in a wider regional or societal process of learning. It occurs through the distribution, exchange, and feedback of information that

enriches the knowledge environment and informs individual and organizational actions. Without a systematic means to ensure regular performance of these information functions, however, collective learning falls into intermittency or worse, neglect.

1.4. Sociotechnical Systems

Current advances in information technology have altered the operational environment for both individuals and organizations, and created a wider basis for learning through sociotechnical systems. Sociotechnical systems include technical mechanisms of communication and information storage, retrieval, transmission, and exchange as well as the individuals who use these mechanisms and the groups that send and receive communications as active components of an operating system. Such components provide timely access to, and ease in transmission of, information within the system, and significantly increase the range of interactions among individuals within organizations and among sets of organizations in reference to a common event or problem. The systematic communication of information across organizational networks builds a common perspective among their members on current problems and techniques for addressing them, creating a basis for broader collective learning. Increasingly, organizations are integrating into their operational procedures opportunities for wider exchange of information among their members, graphic display of information using Geographic Information System techniques, and timely evaluation of performance and feedback on proposed strategies for action. These procedures use the convenience and technical ease of e-mail, exchange of electronic files, real-time chat formats, and access to distributed knowledge bases to create opportunities for organizational learning and change that did not exist 15 years ago. These sociotechnical advances lead to a reconsideration of organizational learning and raise the potential for collective learning among large populations, offering a powerful means of changing policy and practice for communities exposed to seismic or other types of risk. Researchers are currently exploring this avenue for increasing public understanding of community-wide problems and public engagement in their resolution by studying uses of the Internet for public policy purposes, electronic provision of public services, and community decision making.

For example, the use of computers for recording losses in lives and property following earthquakes as well as incoming contributions of disaster assistance enables practicing managers to match more appropriately the types of assistance available to needs of the families that suffered losses. The computers become "agents" in the emerging disaster response system, enabling human managers to access relevant information more quickly and easily as a basis for their decisions. Human managers, supported by technical means of communication and information dissemination, are able to address citizens' needs more effectively and efficiently within the same constraints of time and resources. Individuals, responding to timely reliable information, are better able to adjust their own behavior and practices to reduce risk and improve performance. As sociotechnical systems increase the number of interactions among their components—individuals, organizations, governmental authorities, and machines—around a given social or policy problem, the evolving system becomes a "complex adaptive system." Such systems are characterized by recurring patterns of interaction among individuals with different levels of responsibility for public services operating in organizations at different

locations but focused on a common goal. They are constrained by limits of tolerance in their operations at each level that, if exceeded, compel the whole system to rearrange its components in a new form that will increase its effectiveness in performance. This process of adaptation, or learning, is critical, for example, in communities exposed to recurring seismic risk

-
-
-

TO ACCESS ALL THE **22 PAGES** OF THIS CHAPTER,
Visit: http://www.eolss.net/Eolss-sampleAllChapter.aspx

Bibliography

Argyris C. and Schon D. (1996). *Organizational Learning II: Theory, Method and Practice*. Reading, MA: Addison-Wesley Publishing. [This book represents a cumulative summary of three decades of research and analysis on organizational learning by two scholars who were early investigators in this field.]

Axelrod R. and Cohen M.D. (1999). *Harnessing Complexity*: *Organizational Implications of a Scientific Frontier*. New York: The Free Press. [This book represents a cogent effort by two social scientists to translate concepts of complexity theory from more technical and mathematical disciplines into a framework applicable to social contexts.]

Bak P. (1996). *How Nature Works: The Science of Self-organized Criticality*. New York: Copernicus. [This book, by a noted physicist, gives an overview of self organizing functions in natural and inanimate settings.]

Carley K.M. and Gasser L. (1999). Computational organizational theory. *Multiagent Systems: A Modern Approach to Distributed Artificial Intelligence* (Gerhard Weiss, ed.), pp. 299–330. Cambridge, MA: The MIT Press. [This chapter outlines an approach to computational modeling of organizations as a means of explaining interactive behavior in complex, multiagent systems.]

Cohen W.M. and Levinthal D.A. (1990). Absorptive capacity: a new perspective on learning and innovation. *Administrative Science Quarterly* **35**, 128–152. [This article explains the limits on human ability to absorb new information under changing conditions.]

Comfort L.K. (1999). *Shared Risk: Complex Systems in Seismic Response*. Amsterdam: Pergamon Press. [This study examines 11 rapidly evolving earthquake response systems from the analytical perspective of complex adaptive systems.]

Harrison M.I. and Shirom A. (1999). *Organizational Diagnosis and Assessment: Bridging Theory and Practice*. Thousand Oaks, CA: Sage Publications. [This book offers a critical method of assessing organizational practice in order to improve performance.]

Kauffman S.A. (1993). *The Origins of Order*: *Self-Organization and Selection in Evolution*. New York: Oxford University Press. [This study bridges the concepts of adaptive learning and choice over time as an explanation of evolving patterns in biological and human systems.]

Kiel L.D. and Elliott E., Eds. (1996). *Chaos Theory in the Social Sciences: Foundations and Applications*. Ann Arbor: University of Michigan Press. [This edited collection of essays applies the concepts of chaos and complexity theory to social contexts and assesses its contribution to the social science disciplines.]

Lindblom C.E. (1992). *Inquiry and Change: The Troubled Attempt to Understand and Shape Society*. Second edition. New Haven, CT: Yale University Press. [This book presents a rigorous and critical inquiry into human efforts to manage social and political efforts at change.]

Luhmann, N. (1989). *Ecological Communication*. Chicago: University of Chicago Press. [This study examines the processes of communication within organizations and between the organization and its environment as a vital function in maintaining its capacity to survive.]

Prigogine I. and Stengers I. (1984). *Order Out of Chaos*: *Man's New Dialogue with Nature*. New York: Bantam Books. [This book is an early and important acknowledgment of nonlinearity in the universe and one of the first systematic works on chaos theory.]

Szayna, T.S., Byman D.L., Bankes S.C., Eaton D., Jones S.G., Mullins R.E., Lesser I.O., Rosenau W. (2001). *The Emergence of Peer Competitors*. Santa Monica, CA: The Rand Corporation. [This book presents an analytical approach by a group of computer scientists to exploratory modeling of organizational behavior in competitive contexts.]

Schon, D. (1987). *Educating the Reflective Practitioner: Toward a New Design for Teaching and Learning in the Professions.* San Francisco, CA: Jossey-Bass. [This book addresses the need for practicing managers to develop a more critical, reflective approach to their policies and practice in order to improve professional performance.]

Simon, H.A. (1999). *The Sciences of the Artificial*. Third edition. Cambridge, MA: The MIT Press. [This classic book makes the initial case for the use of computers to support the decision systems of organizations in order to improve performance.]

Weick, K. (2001). *Making Sense of the Organization.* Oxford: Blackwell Business. [This book outlines the critical stage in organizational performance of integrating current information from changing contexts in order to build a coherent profile in order to support action.]

Biographical Sketch

Louise K. Comfort is a Professor of Public and International Affairs at the University of Pittsburgh. Her teaching areas are organizational theory, information technology for public management, and policy design. She has done field research on organizational response and information processes in disaster operations following 14 earthquakes in 10 nations. She holds degrees in political science from Macalester College (BA); University of California, Berkeley (MA), and Yale University (PhD). She is the author of *Shared Risk: Complex Systems in Seismic Response.* 1999. New York: Pergamon Press.