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Self-organizing innovation networks: implications for globalization

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Abstract

The most valuable and complex technologies are increasingly innovated by networks that self-organize. Networks are those linked organizations (e.g., firms, universities, government agencies) that create, acquire, and integrate the diverse knowledge and skills required to create and bring to the market complex technologies (e.g., aircraft, telecommunications equipment). In other words, innovation networks are organized around constant learning. Self-organization refers to the capacity these networks have for combining and recombining these learning capabilities without centralized, detailed managerial guidance. The proliferation of self-organizing innovation networks may be linked to many factors, but a key one seems to be increasing globalization. Indeed, globalization and self-organizing innovation networks may be coevolving. Changes in the organization of the innovation process appear to have facilitated the broadening geographical linkages of products, processes, and markets. At the same time,

globalization seems to induce cooperation among innovative organizations.

Research on innovation networks is used to illustrate these ideas. The evolution of the automotive industry provides a test case.



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Keywords

Network; Globalization; Innovation; Automotive industry

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Robert W. Rycroft is a Professor of International Affairs. He received his Ph.D. in Political Science in 1976 at the University of Oklahoma. During the last 4 years of his doctoral work and for a year after he completed the Ph.D., he worked first as a Research Associate and then as a Research Fellow in the Science and Public Policy (S&PP) Program at O.U. His research at the S&PP focused on US energy research and development policy. He then took a 1-year post-doctorate as a John Parker Compton Visiting Fellow at Princeton University's Center for International Studies, Woodrow Wilson School of Public and International Affairs.

Professor Rycroft was on the faculty of the Technology, Modernization, and International Studies Program, Graduate School of International Affairs, University of Denver, between 1978 and 1981. There he taught and conducted research in the management and planning of technological projects. In 1981, Professor Rycroft came to what is now The George Washington University's Center for International Science and Technology Policy (CISTP), Elliott School of International Studies. His teaching and research at the CISTP have focused on the areas of science, technology, and international affairs, environment and international affairs, and science, technology, and complexity.

Dr. Rycroft has coauthored nine books, the most recent of which is *The Complexity Challenge: Technological Innovation for the 21st Century* (with Don Kash). He and his coauthors have published more than 50 articles and book chapters. His articles have appeared in *Research Policy, Issues in Science and Technology, Science and Public Policy, R&D Management, Technology Review, Technological Forecasting and Social Change, Technology in Society, Research-Technology Management* and a host of others.

Don E. Kash received his Ph.D. in Political Science in 1963 at the University of Iowa. He became Director of the Program in Science and Public Policy at Purdue University in 1966, and continued in that position for 4 years. In 1970, Dr. Kash created the Science and Public Policy Program (S&PP) at the University of Oklahoma. During his tenure at Oklahoma, Dr. Kash was appointed George Lynn Cross Research Professor of Public Policy. After 8 years as director of the S&PP, Dr. Kash took a political appointment in the federal government.

Dr. Kash From 1978 to 1981, Dr. Kash was Chief of the Conservation Division of the US Geological Survey (Department of the Interior). In 1981, he returned to academic work, having been appointed to the Hazel Chair of Public Policy at George Mason University.

Professor Kash's academic teaching and research have focused on science and technology policy, energy policy, and policy analysis. More recently, these areas have been augmented by work in the area of science, technology, and complexity. Dr. Kash is author or coauthor of *The Complexity Challenge: Technological Innovation for the 21st Century, Perpetual Innovation: The New World of Competition*, and numerous books on energy policy, as well as numerous articles and research papers.

During his career, Dr. Kash has engaged in a wide range of policy advisory experiences, including work with the National Research Council, Office of Technology Assessment, and American Association for the Advancement of Science (AAAS). He is the recipient of the Distinguished Alumni Award from the University of Iowa and is a Fellow of the AAAS.

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