

RESEARCH IN THE BEHAVIORAL AND POLICY SCIENCES AREA 1987-88

Faculty in the Behavioral and Policy Sciences Area (BPS) bring a diverse set of social and behavioral science disciplines and methodologies to bear on a broad range of managerial and public policy issues. BPS is composed of faculty groups that focus on corporate strategy, human resources and industrial relations, technology and innovation, organization studies, international management, law, communications, and system dynamics. These subgroups are not only linked together for administrative purposes, but reflect our vision of the interdependence of these functional areas for addressing the critical challenges facing managers and policy makers today.

In summarizing our work of this past year I will highlight that portion of our research that addresses some of the key challenges that we have chosen to give special emphasis in the School's mission, namely; effective management of technology and social/organizational change in today's global competitive environment. But before summarizing the work of individual faculty, a historical sketch of the BPS heritage and unique perspective we bring to the topics of managing change, human resources, and technological innovation is in order.

BPS: Historical Background

In 1957 Professor Douglas McGregor, the Director of the Industrial Relations Section and forefather of our Organization Studies Group, gave his famous speech previewing Theory X and Theory Y, concepts that were to become the foundation for his classic book, The Human Side of the Enterprise. McGregor's work sparked a generation of new thinking in participative management, organizational change and development, and the importance of human resources to organizational performance.

In the years that followed, the Organization Studies Group and the Industrial Relations Section took up these themes and together have redefined and broadened the fields of organizational change and human resources. The Organization Studies Group gave birth and nurtured the field of organizational development and planned change in the 1960s. Later, in the 1980s, faculty in the Industrial Relations Section laid the intellectual foundation for a new model of industrial relations that emphasizes employee participation and labor-management cooperation at the workplace and in strategic managerial decision-making and planning.

BPS faculty have also been on the forefront of establishing the professional field that is now known as the Management of Technological Innovation. As described in Edward Roberts' introduction to a book summarizing the evolution of this field, the management of technological innovation focuses on:

the organization and direction of human and capital resources toward effectively (1) creating new knowledge; (2) generating technical ideas aimed at new and enhanced products, manufacturing processes, and services; (3) developing those ideas into working prototypes; and (4) transferring them into manufacturing, distribution, and use.

Our research program in this area started in 1962 with a major grant from the

National Aeronautics and Space Administration. Over the course of twenty-five years our faculty members have been doing important empirical research on such subjects as the management of technical professionals and the engineering and the R&D processes, the creation and management of new ventures, and the sources of innovation. Concepts and practices that are now well established in the profession, such as the technical gatekeepers and users as sources of new innovations, grew out of the work of our faculty.

Research Summary: 1987-88

This has been an extremely productive and rewarding year for BPS faculty. We published a number of new and exciting books and several faculty received awards from their peers in recognition of their contributions. In the following summary, special attention will be given to work that builds on and advances our heritage.

Organization Studies. As noted earlier, MIT has been a leader in the field of organizational change and development since the field was born here in the 1960s. Professor Edgar Schein continued and updated this tradition this past year with the publication of the second edition of his highly regarded book on Process Consultation. This work analyzes how consultants and managers use knowledge of group dynamics to facilitate the process of organizational change and development. We are pleased to report that Professor Schein will receive the American Psychological Association Perry L. Rohrer award given in recognition of his outstanding work in the area of consulting psychology.

Deborah Ancona has also been studying group processes in organizations with special emphasis on the performance of new product development teams. She has examined how teams in several high technology firms manage their boundaries and negotiate for resources needed to perform effectively. This work contributes to the growing recognition that teamwork and effective problem solving are critical for delivering new technologies and products to the marketplace.

Professor Robert Thomas also has examined how basic choices concerning technologies are made and the political aspects of managing the development and implementation of new technology projects. He has followed three new technology projects in a major aerospace firm and concluded that the course of technology development is influenced by the dynamics of power and politics within these organizations. His work provides new theoretical insights into how managers and workers can use the discretion available in choosing among technological alternatives to address both their own needs and those of their organization.

Professor Thomas Allen has continued his longstanding research on the careers of technical professionals and the performance of technical groups with support from the National Science Foundation. Currently Professor Allen is updating his classic work on the relationship between age of the group, external communications, and group performance to revisit his earlier findings that group performance tends to peak and then decay after about four years' tenure.

Professor John Van Maanen published a new book titled Tales of the Field: On Writing Ethnography that explores his experiences with ethnographic methods over the course of his career. Professor Van Maanen has also

continued working on studies of how emotions and feelings shape organizational cultures.

Professor Lotte Bailyn completed the empirical analysis for her comparative study of professionals working out of their homes and offices. She concludes that professionals working at home experience high task satisfaction and place high value on intrinsic and family relations. Office professionals also experience high task satisfaction but lower personal life satisfaction and place a higher value on career and financial rewards. Professor Bailyn concludes that while homework offers potential benefits for individuals and organizations, managers will need to change their expectations and supervisory practices considerably if these mutual benefits are to be realized.

Several BPS faculty have been actively studying individual decision-making processes and thereby building a BPS presence in the field of behavioral decision theory. Professor Donald Kleinmuntz is applying behavioral decision theory to the study of information presentation formats used in decision support systems for managers under a grant from the National Science Foundation.

As part of his work for the Management in the 1990s project, Professor John Carroll has completed work on three case studies of how managers' expectations for new information technologies influence how microcomputers are introduced, supported and used.

Professor John Sterman has applied system dynamics modeling techniques to the study of dynamic decision-making in managerial organizations. By integrating his system dynamics methodologies with behavioral decision theory, Sterman is forging new ground in the analysis of how managers learn and how their dynamic decisions influence the macrobehavior of firms, markets and other organizations in their environment.

Industrial Relations and Human Resource Management. MIT has a long and distinguished history as a leading source of theory and public policy analysis in the area of industrial relations and human resources. Along with colleagues in Organization Studies, faculty in this area have been at the forefront in providing the theoretical and empirical documentation to the growing recognition of the importance of effective management of human resources to the performance of individual firms and the macro economy.

One critical set of human resource policy questions has to do with the relationships between new technology and the labor force. As part of their work for the Management in the 1990s Program, Professors Lisa Lynch and Paul Osterman are analyzing the employment effects of information technology in a large telephone company. They found that the effects of technology are not unidirectional--some jobs are lost, some of the new ones created are of lower skill and some are of higher skill. Their current work focuses on the human resource policy tools used to reduce the labor force and to adjust to the new skill requirements. In other work Professor Lynch has been examining the economic returns to private sector training among young workers. There is a general belief that American firms and workers underinvest in training relative to our international competitors. In this work Professor Lynch further finds that minorities and women receive proportionately less training than their male and white counterparts and benefit less from the training they receive.

Professor Osterman's newly published book, Employment Futures: Reorganization, Dislocation, and Public Policy illustrates the links between the human resource policies of firms and public policy. He analyzes the dynamics of human resource practices within American firms and then builds a framework for analyzing how public policies can complement and diffuse innovative firm-level practices. Additional insights are drawn from a comparison of employment policies of Sweden, Germany, Japan, and the U.S. This work promises to play an important role in debates over the future of U.S. employment and human resource policies.

Professor Mary Rowe continued her work on the management of diversity in the labor force, a topic that will gain increasing importance and exposure in the years between now and the turn of the century. In addition to adding to her rich data base on the practice of ombuds offices, Professor Rowe updated and published a paper on the legal issues associated with genetic testing of the workforce.

Professors Robert McKersie and Thomas Kochan extended their work on new models of labor-management relations by working with The Collective Bargaining Forum, a national group of corporate chief executives and union presidents. This group published a policy paper this year titled New Directions for Labor and Management in which they endorsed and encouraged the diffusion of many of the innovations in labor-management relations discussed in Professor McKersie and Kochan's recently published book, The Transformation of American Industrial Relations. We are pleased to report that that book will receive the Academy of Management's George Terry award for the best scholarly book on a management topic published this past year. Professor McKersie's leadership was further recognized by his academic and professional peers with his election as the President of the Industrial Relations Research Association.

Professor Phyllis Wallace continued her duties as this year's president of the Industrial Relations Research Association. In addition she completed her book manuscript in which she reports on the career and personal life experiences of a sample of Sloan School women and men graduates approximately five years into their careers.

Management of Technological Innovation. The effective management and use of science and technology are critical to the performance of contemporary organizations and the macro economies and society. As noted earlier, faculty in the Management of Technology subgroup are committed to discovering new concepts and methods for improving the ways new technologies enter organizations and are moved from the earliest stages of conception to productive uses in the marketplace and society.

During this past year Professor Eric von Hippel's book The Sources of Innovation was published. This book summarizes Professor von Hippel's most recent work documenting the interdependence between users and developers of technologies. He also documents how one can predict the source of an innovation by analyzing who has the most to benefit from it. And in a paper published jointly with Professor Glen Urban, von Hippel extended the concept of "lead users" as sources of new product ideas.

Professor Michael Rappa joined our faculty this year and is studying how revolutionary breakthroughs in technologies occur and are absorbed (or rejected)

within organizations. Professor Rappa published an initial paper on this subject and is conducting further experiments in various industrial settings to extend his data base and further test his model.

Professor Edward Roberts continued his longstanding research on technical entrepreneurship and new venture management. His edited volume, Generating Technological Innovation, devoted to these and related topics, was published this year. This book compiled the most significant contributions to the management of technology field that were published in our Sloan Management Review over the past two decades.

Strategy and Policy. While almost all of our research addresses issues of strategic concern to organizations, our Strategy and Policy group serves as the home for faculty who specialize in research on these issues. The group also serves as an important connecting point for others with strategic interests in a specific functional area of management. Professor Michael Scott Morton exemplifies this type of integrating role as head of the Management in the 1990s research program for the School. The Management in the 1990s program is a five-year, \$5 million corporate-sponsored program involving a large number of our faculty. Its purpose is to study the roles played by information technologies in the strategies and processes of organizations today and in the future. During this fourth year of the program Professor Scott Morton supervised the conceptualizing and drafting of the chapters for the book that will summarize the major findings and implications of this program.

Professor Michael Cusumano is studying the organization designs and production systems for software development in Japanese and American firms. He uses the concept of the "software factory" to describe his observations of the dominant Japanese approach, and contrasts this to the "craft" model normally used to describe software development in American firms. His analysis promises to provoke considerable thought and discussion among academics, managers and public policy representatives (such as Defense Department officials interested in software standards). Several working papers have been drafted in anticipation of combining them into a book manuscript in the upcoming year.

Professor N. Venkatraman is continuing his empirical research on measurement issues in strategy research. His work represents one of the very few efforts to bring rigorous empirical research methodologies to bear on strategic management topics. This past year he published a paper on planning systems and is now initiating a major project with several colleagues to examine the strategic value of using information technology. IBM is funding this project.

International Management. We have identified the challenges of managing in a global, highly competitive environment as a key dimension of our School's new mission statement. As such our International Management group plays a key role in helping to coordinate our efforts to address these issues.

Professor Donald Lessard's work this past year focused on how firms cope with exchange rate volatility as part of his broader interest in how firms respond to environmental turbulence. He has examined how "expert functions," such as the corporate finance staff, interact with line executives to frame and analyze problems and options and to implement solutions.

Professor Eleanor Westney is an organizational sociologist with special expertise and interest in Japan. This past year she published a new book titled Imitation and Innovation in which she analyzed how western organizational patterns and concepts were adopted and adapted in Japan during the Meiji period. Professor Westney also continues her comparative analysis of engineering careers and organizational structures in American and Japanese computer firms. One of her most interesting findings in this work is that in Japanese firms ideas, technology development, and new products tend to transfer through the transfer of project leaders from R&D to manufacturing. She suggests that this is a major reason why Japanese firms seem to be highly efficient in process innovation, technology transfer, and new product development. Professor Westney's work represents another example of the conceptual linkages we are exploring between technology, human resource practices, and organizational design and change.

Law. Legal issues are growing in complexity and cost and therefore gaining increasing attention by corporate executives and public policy makers. One strategy for reducing litigation costs lies in improving our skills at negotiations and conflict resolution. Professor Daniel Nyhart has been a leader in promoting improvements in negotiations through the development of computer-aided negotiations tools. This past year Professor Nyhart summarized much of his current work on this topic in a publication of the National Institute for Dispute Resolution, the leading foundation supporting the development of alternative dispute resolution techniques. Professor Nyhart, along with colleagues Mary Rowe, Robert McKersie, and Thomas Kochan, have been helping the National Institute develop its research program and disseminate new teaching materials on this topic.

Professor Judith Lachman's research addresses another dimension of the litigation explosion by developing a life cycle of accidents which relates accident deterrence incentives to prior compensation awards and dispute settlement institutions.

Senior Lecturer Jeffrey Meldman continued his work on legal aspects of software development and artificial intelligence.

System Dynamics. The field of System Dynamics was founded at MIT by Professor Jay Forrester. This past year Professor Forrester continued drafting chapters for a forthcoming book on his national economic model.

Professor John Sterman and Research Associate Peter Senge have also continued developing computerized case studies which can be used as "learning laboratories" in both action-oriented research and in teaching. A prototype of the People's Express case will be used as part of our orientation process for incoming Master's students this fall.

Communication. Senior Lecturer JoAnne Yates published several papers in her ongoing work on the evolution of communications technologies in industry. As part of her interest in this topic she is preparing a chapter for the Management in the 1990s research volume on the historical evolution of information technologies and their impacts on communications patterns and structures.

John D. C. Little: A Word of Thanks

Finally, this year marks the transition in the leadership of the BPS Area. We gratefully acknowledge the contributions that Professor John D.C. Little made as the head of our area from its inception in 1982 through this year. Professor Little will now return to research and teaching in the Marketing Group. We wish him well. During this past year Professor Little put his exposure to the behavioral sciences to work in a paper he published that reported the results of an experiment in voting patterns given various governing rules. We are also happy to report that Professor Little was awarded the George E. Kimball Medal of the Operations Research Society for his distinguished service to the society and the profession.

Thomas A. Kochan
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