

**COMPUTERS
AND
POLITICS** High Technology in
American Local Governments

**JAMES N. DANZIGER
WILLIAM H. DUTTON
ROB KLING and
KENNETH L. KRAEMER**



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COMPUTERS AND POLITICS

High Technology in American Local Governments

*To the spice of our lives—
Lesley, Diana, Sherian, Norine.*

PREFACE

This book is a product of the Urban Information Systems (URBIS) Project, carried out from 1973 to 1978 by the URBIS Research Group of the Public Policy Research Organization (PPRO) at the University of California, Irvine. The project was supported by a grant from the National Science Foundation. The purpose of this project was to assess the state of the art in local government computing, to evaluate the impact computers have had on government services and management decision making, and to develop recommendations that local managers and officials could implement in order to make better use of information technology.

The project was conducted in two major phases (see appendix). The first was an extensive survey of computing in more than 700 U.S. cities and counties, which documented the current array of data-processing activities, the extensiveness of computing use, the impacts of computing, and the problems with computing. The data were provided by mayors, city managers, county administrators, county board chairmen, and other chief executive officers in local governments, and by managers of the data-processing installations in these governments.

During the second phase of the research, members of the project did intensive fieldwork in 42 cities specially selected for study. Interviews were conducted with local government personnel, documents and papers were studied, and questionnaires were completed by 50 to 100 personnel about their use, and their evaluations, of computer applications in their governments. One primary objective in this phase was to analyze the impacts of specific policies for the management of computers in local government. Results of those analyses are most fully explicated in this

book's companion volume from Columbia University Press, *The Management of Information Systems* (Kraemer, Dutton, and Northrop 1981). A second major objective of the fieldwork in the 42 cities was to determine the political and organizational effects of computer technology in local governments. These concerns are central to *Computers and Politics*.

Clearly, politics and administration are not separate. Consequently, we have dealt with the political aspects of implementation policy in *The Management of Information Systems* just as we have dealt with the management and implementation aspects of the political uses and impacts of computing in this book. Our conceptualizations and discussions in the two books are complementary and each offers a different, if interrelated, set of understandings about the roles of computer technology and the behavior of those who deal with the technology. We hope that each book will provide some answers to current questions about the effectiveness of computing in public organizations.

The intellectual origins of this book about the politics of computing extend far beyond the URBIS Project. When we started the project, most of the literature on computers reflected a rationalistic perspective. Major theorists such as Herbert Simon (1973, 1975, 1977) saw computers as an apolitical technology for improving the rationality of decision making and the efficiency of operations in organizations. It was unclear how useful this literature would be, because it was markedly apolitical and it also tended to be nonempirical, based more on speculation than on evidence.

At the time URBIS was initiated, our main guide to the empirical research on computers in organizations was an inventory of such research by members of our group (Kraemer & King 1977). Whisler's (1970) research on computing in the insurance industry was the primary empirical study available, and provided a grounding for our understanding of the role of automated information systems in complex organizations. Although this work guided our early conceptualizations, it also reflected the kinds of questions that arose in formulating our own research framework. Whisler had studied one private-sector industry with rather "primitive" computers, and had interviewed only one informant per company. Would the effects of computers in insurance companies be similar to their effects in public organizations? Would it be revealed that the major advances in the technology had brought about significant alterations in the nature of the effects? Would the political context of local government be important? In short, we recognized that our approach to the research required sensitivity

to the variations in the effects of computer technology among different types of organizations, different levels of technological development, and for different kinds of personnel within an organization.

Our perspective on “the politics of computing” was rather simple in 1974. We generally assumed that computing was likely to shift power toward technical experts and top managers in organizations. This assumption had been influenced by a seminal article by Anthony Downs (1967), by models of organizational behavior (e.g., Allison 1971), and by the literature on the role of experts in organizations (e.g., Ellul 1964; Crozier 1964). As we completed a series of exploratory case studies and then proceeded with the two major phases of the research, it became increasingly clear that the interplay between the technology and the political setting, and hence the politics of computing, could be both complex and variable.

Our understandings were substantially enhanced as we found relevance in other scholars’ work and as new research appeared. Three related studies that appeared during our research were especially useful. One was Kenneth Laudon’s (1974) series of case studies of computers in state and local governments, that suggested how computers can be shaped to match the institutional agendas of key actors. Another was Eric Hoffmann’s (1973, 1977) research on the role of computing in the Soviet Union, that illustrated the degree to which technical expertise can be pressed into the service of dominant political elites. And the third was Langdon Winner’s (1977) synthesis of the technology and politics literature, that revealed the connections between our research focus and broader conceptions of technology and society.

The main argument of this book contrasts four alternative perspectives that emerged from many sources. Each provides an approach for understanding the politics of computing in local governments. They are: managerial rationalism, technocratic elitism, organizational pluralism, and reinforcement politics. The refinement of these four perspectives occurred as we analyzed the data collected in the survey of 42 cities. In the ideal world of social science research, one specifies a clear set of competing theoretical frameworks, develops a set of plausible and testable hypotheses, defines them operationally, gathers data to test the hypotheses, conducts formal data analyses, and then writes up the conclusions. This rigorous method has seldom been applied successfully in major research about complex social phenomena. Our study is no exception. In fact, the reinforcement politics perspective emerged in the process of research and

data analysis. Data were not collected to allow a "critical test" of this perspective versus the alternatives. Nonetheless, we believe that the complex patterns of control and effects regarding the development and use of computing are best explained by the reinforcement politics perspective. Our research does have the advantage (relative to many studies) of producing a large body of systematic empirical data from survey techniques, consistent and comparable judgmental data from case-coded field appraisals, and suggestive insights from extensive field interviews. These alternative types of data inform the arguments and analyses throughout this book.

Books based on large-scale, multidisciplinary research projects such as URBIS are products of efforts by groups larger than are suggested by the authorship of any individual project publication. Throughout the URBIS project, we have benefited from the critical and unique contributions of many people who should share whatever credit this book merits. We want to acknowledge the contributions of these individuals. Most importantly, we thank two principal collaborators on the URBIS project. Their scholarly contributions to the project and to this book go far beyond our direct citations. Alexander Mood was the key force in shaping the overall research design of the URBIS project. Alana Northrop participated in the design and fieldwork of the second phase, and her critical reviews of our early work helped us formulate the reinforcement politics perspective.

Debora Dunkle, Linda Hackathorn, John Leslie King, Joseph R. Matthews, and David Schetter were invaluable to the URBIS project. Dr. Dunkle's talents in social science data analyses were extremely helpful to our work. Linda Hackathorn ably managed the complex census survey field operations and data-reduction activities. Dr. King has been a critical intellectual resource for the project throughout his involvement in the field research and group discussion. Joseph Matthews' constant attention to the needs of practitioners is responsible for much of the project's value to local government officials. David Schetter has been such a talented research administrator that we have often forgotten the difficulty of administering a multidisciplinary project in the complex bureaucratic environment of university and governmental agencies, procedures, and regulations. In addition, Robert Emrey, Henry Fagin, James Jewett, Fred Tonge, and Enzo Valenzi participated in the initial design of the URBIS project during the summer of 1973.

We also wish to acknowledge the support of others outside the URBIS project. Most important are the many local government personnel whose

patient cooperation was essential to the generation of our data bases. Lawrence Williams of the National League of Cities, Mark Keene and Stanley Wolfson of the International City Management Association, John Thomas and Bernard Hillenbrand of the National Association of Counties, and Robert Havlick and James Bohnsack of Public Technology, Incorporated, helped us to gain the support of the specific cities and counties for our research, and helped to disseminate our research findings to their membership. The URBIS National Advisory Committee (along with their affiliations at the time of our project)—Dr. Ruth Davis of the National Bureau of Standards; Dr. Robert Crain of the Rand Corporation; Gerald Fox of Wichita Falls, Texas; Robert Goldman of the Association of Bay Area Governments; Edward Hearle of Booz, Allen and Hamilton; Donald Luria of the U.S. Bureau of Census; Peter McClosky of the Computer and Business Equipment Manufacturers Association; Daniel McGraw of the State of Minnesota; and Dr. Ralph Young of Fairfax County, Virginia—provided critical reviews of our work during the initial design of the project. Our NSF program managers—Dr. Vaughn Blankenship, Dr. Richard Mason, and Dr. Frank Scioli—kept us aware of the need to address both policy issues and intellectual issues in our research. Moreover, they helped us in a very practical way by bringing such experts as Professors E. S. Savas, Merrill Shanks, and Bert Swanson to judge both the substance and the methods of the project at critical junctures.

Penetrating and helpful comments were provided by Professor Kenneth Laudon, who reviewed the entire book. And continuing guidance came from Dr. Vicki Raeburn and Jacqueline Doyle of Columbia University Press.

The Public Policy Research Organization professional staff rendered essential support throughout the project, and deserve special mention for their patience and competence. Doris McBride and Shirley Hoberman kept the project moving and on target. The PPRO secretarial staff, Nancy Brock, Elizabeth Kelly, Sherry Merryman, Helen Sandoz, and Georgine Webster typed and retyped the torrent of manuscripts. And Laurel Battaglia refined and clarified our prose.

The entire book is the joint collaborative effort of the authors. To denote the equal contribution of the authors, the order of authorship is random (and, by chance, alphabetical). Also, to facilitate the preparation of the final versions of each chapter, responsibility for individual chapters was assigned by lottery. Despite the substantial help and advice of many people, the remaining errors and omissions are clearly our responsibility.

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CHAPTER ONE

COMPUTERS AND POLITICS

William H. Dutton and James N. Danziger

POSTINDUSTRIAL SOCIETIES have applied high technologies to many activities during the past decades. This technological development has been a largely silent revolution—it has been dramatic in scale and scope but has seldom drawn public notice. Usually the public's attention has focused sequentially on different technologies whose impacts, costs, or benefits have been highlighted or dramatized by a major event. For example, mass transit systems, SSTs, space satellites, and nuclear power plants have been subject to intense, if brief, public scrutiny as a result of dramatic events such as the Three Mile Island accident.

One of the most pervasive applications of technology in this silent revolution has been that of computer technology in organizations. Computers and electronic data-processing systems are major tools of modern organizations and components of many other technologies. Occasionally a dramatic image of the computer has captured the public's imagination, as did the uncontrolled and threatening computers in the films *2001: A Space Odyssey*, *The Demon Seed*, and *Colossus: The FORBIN Project*. But computer systems usually exist at the periphery of public attention, because they are seldom perceived to entail the social benefits or costs of rapid transit systems, SSTs, or nuclear power. Though computer systems are critical components of rapid transit systems, SSTs, and nuclear power plants, computing is backstage, out of the public view. As a consequence, the costs and benefits and the broader impacts of computer systems are largely perceived as indirect and subtle, if they are indeed perceived at all. And when people do think of computing, it is usually as either a minor convenience or as an annoying inconvenience,

depending, for example, on whether the automated bank teller is functioning properly.

However, neither the lack of public scrutiny nor the subtle and indirect nature of computer effects negates the importance of this revolutionary change in the technology of modern organizations. A growing literature posits that computer systems have major consequences for the sociology and politics of organizations, as well as for the broader society. Yet we have little systematic knowledge regarding these consequences.¹ This book explores the impacts of computing on modern organizations by focusing specifically on the politics of computing in certain public organizations—American local governments.

From a political perspective, the nature of a technology's impacts is contingent on the answers to two fundamental questions:

1. *Who controls the technology?*
2. *Whose interests are served by the technology?*

These questions regarding technology correspond to classic issues in the study of politics: Who governs? Whose values are served as a consequence of who governs? Computers and electronic data processing are among the most widespread and general-purpose high technologies implemented by local governments. In this book we shall analyze these empirical questions about control and interests served; but in the concluding chapter, we shall also consider the related normative questions: Who *should* govern computer technology in American local government? Whose interests *should* be served?

Answers to these empirical and normative questions are complex because both the control and the impacts of computer technology in local government are often subtle and variable. However, the general thrust of our findings is clear. First, no single local government interest—managerial, technological, or political—unilaterally controls computer technology. In most local governments, control is fragmented among a pluralistic array of managerial, technical, and political elites. These elites have varying influences on decisions regarding the adoption, design, and implementation of computer technology. Typically, their interests are not monolithic; rather, each group's actions are affected by personal, managerial, professional and technical values and interests. Moreover, although all elites participate directly in decisions regarding the computer package, not all

have equal influence on the decision process. Technical elites are often most influential on the particular operational decisions, while some central and departmental managers combine with technical elites to produce more pluralistic outcomes on major developmental decisions.

Second, no single interest in local governments is always served by computer technology—the technology is highly malleable and can serve a variety of interests. In general, it has been shaped by those who directly control it to serve the interests of those who dominate the prevailing structure of influence within the local government. Thus, computing tends to reinforce not only the prevailing structure of control within local governments, but also the prevailing political and organizational biases of those governments. In this sense, computing has been a politically conservative technological innovation.

Our findings conflict with our judgment regarding who *should* control and who *should* be served by computing in public organizations. Since it is a malleable technology, computing need not reinforce the prevailing biases of an organization. We shall argue that control over computing and over computer experts should be decentralized to the users and clients of the technology in order that the technology might serve a broader variety of appropriate public interests.

In this chapter, we provide a background for this book based on the “technology and politics” literature. First we look at the concept of technology, and define our concept of computer technology. We then develop a theoretical framework for analyzing that technology in the context of the local political system. Finally, we discuss the outline of this book in relation to the theoretical framework developed in this chapter.

TECHNOLOGY AND COMPUTER TECHNOLOGY

What is Technology?

Recently there has been increasing interest in technology as a subject of study. Some define it narrowly, in terms of specific tools or machines (Goodman 1970; Mumford 1970). Others use a broader definition in which technology encompasses

. . . tools in a general sense, including machines, but also including linguistic and intellectual tools and contemporary analytic and

mathematical techniques. That is, we define technology as the organization of knowledge for practical purposes. (Mesthene 1977:158)

Perhaps the broadest definition is given by Jacques Ellul, who defines technology (“la technique”) as “the totality of methods rationally arrived at and having absolute efficiency in every field of human activity” (Ellul 1964:xxv). Although this definition might seem overly broad, Langdon Winner (1977:9) notes that Ellul’s notion “closely corresponds to the *technology* now used in everyday English.”

We shall employ Ellul’s general definition of technology and also distinguish three components of a technology. The term *equipment* is used to denote the class of objects normally referred to as technological objects—tools, instruments, machines, appliances, gadgets—that are used to accomplish a wide variety of tasks. The term *technique* defines the body of technical activities—skills, methods, procedures, policies, routines—in which people engage to accomplish tasks (Winner 1977:14–15). In addition, the term *people* is used to highlight the fact that people are critical elements in technological systems, distinct from either the equipment or the technique of the systems.

Within our broad conception of technology, we shall focus on “high” technology. One may place technologies on a continuum ranging from *simple* technologies,—screwdrivers or cookbooks—to *complex* or *high* technologies—computerized missile control systems or rapid transit systems. High technologies are extremely *complicated systems designed by specialists* who usually have formal training, are relatively professionalized, and operate in a team. The full workings of most high technologies are not easily understood by any single person. In sum, we define high technologies as *complex systems of people and equipment guided by technique and designed by specialists*.

Computer Technology as a “Package”

It should be evident from our definition of high technology that our notion of computer technology includes substantially more than the basic machines associated with computing. Computer technology encompasses a complex, interdependent system composed of *people* (e.g., users, computer specialists, managers), *equipment* (e.g., hardware such as computer