EXECUCOMP

Maximum Management with the New Computers

F. WARREN BENTON

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PREFACE

The ability to use computers effectively is critical to the achieve-
ment of organizational objectives and many individual career
goals. However, most of the books and much of the available
training emphasize the operation and programming of computers,
or cater to very specific end-user groups. Yet the most basic deci-
sions regarding computer systems, decisions as to their ultimate
use within an organization, are usually made by managers who
lack both familiarity with computer terminology and operations,
and the proper perspective of their capabilities and limitations.
As the pace of innovation accelerates, this deficiency becomes
more significant, especially for the small business or individual
computer user, or the user of a large system anticipating an up-
grade of the system's terminals. Even larger management-
oriented computer systems can be expected to become more flex-
ible and versatile for users, challenging the managers using such
systems.

This book is a comprehensive review of the uses of computers
for the planning, organizing, and controlling of large and small
business and governmental organizations. It is intended for man-
agers in businesses and governmental agencies for professional
reading and in-service training and career development, for indi-
viduals using computers for small businesses, as well as for upper
undergraduate and MBA/MPA students. Focusing on the poten-
tial of the more recent computer technologies, including micro-
computers, intelligent terminals of larger computer systems, and

advanced office-oriented technologies, the book covers current approaches to management as well as such topical issues as productivity improvement, impacts of computers on employees, and effects of computers on organizations. Computer applications are examined to illustrate their possible contributions to these approaches and problems, and procedures for the planning and implementation of computer systems are presented.

The book includes sixteen "software profiles" which explain in a brief format a particular type of computer use in management, such as word processing, data base management, or graphics. The profiles occur as parts of chapters, but they are also identified separately for the following two reasons:

1. Separate identification allows readers to focus attention upon specific types of applications, when this is their immediate interest. The profile discussions then direct the reader to appropriate chapters for more detailed discussions of specific approaches to management problems.
2. Because management goals and problems are not usually perceived by managers in categories that directly correspond with specific types of computer programs, this approach allows a book organization that is recognizable to managers, while avoiding duplicative and repetitive discussions of software.

Each chapter begins with a short fictional quote, to introduce the chapter topic. The realistic situations portrayed in these quotes are drawn from my own experience (and the experiences of those working with me) as the Director of the Oklahoma Department of Corrections, as a management consultant, as an associate director of a productivity center, and as a professor.

Many people have helped in the development of the book. It is a pleasure to have the opportunity to thank them. Judy Silberstein contributed in many ways, as an understanding wife and as a creative and insightful critic. At the John Jay College of Criminal Justice, City University of New York, and at the National Center for Public Productivity (an institute within that College), my colleagues provided support, encouragement, and a wealth

of information. At John Wiley & Sons, John Mahaney provided the initial editorial commitment for the development of the book, and provided creative support as it was developed. Balwan Singh supervised the editorial aspects of the book's production, including the generic coding process necessary for typesetting the book directly from microcomputer diskettes. Jane Bloom did the copy editing. The design was conceived and executed by Lee Davidson. Kirk Bomont was the production supervisor.

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PART

I

THE MANAGER AND THE MACHINE

CHAPTER 1
COMPUTERS
AND MANAGEMENT
IN THE 1980s

I saw it coming. The secretaries had been issued word processing computers, several managers at work were using portable computers which they brought home periodically, and the company's big computer system was expanding every year, taking over accounting, then inventory, then some of our personnel records, and so forth. However, when my son and daughter came home from school with a listing of the computer programs they developed at school, I finally saw the light. I needed to develop my skills in this new technology. I bought a personal computer through a program at the company, which covers part of the cost. After some formal training as well as some effort on my own, I found the computer to be very useful. I also understood more fully the company's big computer system. Recently, the effort paid off. I was promoted past several other managers, to manage the development of a company-wide office automation program, primarily because of my experience with the computer.

Business and government organizations are turning to computers to maintain records, process documents, facilitate communication, and provide management with information upon which to base planning and operational decisions. Today, practically all businesses and government agencies, along with many individuals and small businesses, use computers for some aspect of their operations, and expanded use is inevitable.

During the 1960s and 1970s the greatest growth in computer use was in large organizations. With the advent of smaller personal and desktop systems, the 1980s will see greater expansion of use in small businesses and individual applications. The large-scale computer systems will not be unaffected by this change, as the traditional terminals—the work stations connected to the main computer—will be upgraded to offer the benefits of desktop computers. Thus, a terminal that was used during the 1970s only for information retrieval from the main computer, in the 1980s can be capable of many desktop computer operations as well. Use of the small computers and enhanced terminals offers important opportunities:

> Small businesses can benefit from the economies of computer-based record systems, accounting and inventory systems, and management analysis services.
>
> Computers can aid managers in making decisions, allowing them to consider a wide range of important but complex factors in planning overall business strategy.
>
> Management employees at all levels can be freed from day-to-day paperwork to focus on more important problems and opportunities.
>
> The office systems of the future can be a reality not only for large corporations and government agencies but for small businesses and individuals as well.

Great opportunities for improved productivity and profit do not come without challenge and risk. The decisions made by computer professionals about large computer systems during the 1960s and 1970s will be made in the 1980s by individual managers with respect to their desktop computers and enhanced terminals.

A new dimension of executive competence is required to select and implement computer systems successfully. Along with traditional skills in organization planning and control, budgeting and finance, and personnel management, executives will need to become skilled in the application of computers to their work. Not only must managers, small business operators and owners, and individuals understand the technology, operations, and potentials of desktop computers and enhanced terminals; they should also take advantage of the insights developed through success and failure of large-scale management computer systems over the last two decades. This experience will help managers achieve the greatest benefits and avoid common but expensive mistakes.

We will look closely at the new computers and their programs and potentials. We will also examine the experiences of larger businesses and organizations with large-scale systems, in order to apply lessons learned from past successes and failures to future systems, both large and small.

RECENT COMPUTER TECHNOLOGIES IN MANAGEMENT

Since their earliest development, computers have been applied to management problems. However, because of the cost of both the acquisition and operation of such systems, initial applications have had to be large and highly structured in operation. People who operated such systems were passive extensions of the technology.

Several technological developments of the 1970s and 1980s are changing that early pattern, making possible active participation and control of computing by managers. Most important have been the technological advances in many of the components of computers, including the chips that process the information, the memory devices that store the information, and the peripheral devices that put the information on paper, send it to other computers, and perform many other functions as well. These advances are lowering the price, size, and operating cost of computers. Systems can thus be developed expressly for individual users or smaller organizations, enabling control to shift to the local user.

Improvements in software (the instructions that tell the computers what to do) have enabled computers to serve users in a more flexible, friendly, and responsive manner. This has also increased the control of the local user over the computer.

Improvements in software technology have enabled many widely used application programs to be operated on many different brands and models of computers. This has led to greater competition among software developers, and a greater volume of sales, permitting a combination of high performance and individual specification that would have been beyond the budget of the typical user a decade ago.

Developments in the technology of office applications—including electronic networks interconnecting several computer work stations with such peripheral devices as printers, as well as with other computer systems and networks outside the office through telephone lines—enable management-oriented computer systems to do much more than was possible a decade ago.

These innovations immediately affect the individual owner-user of a computer system, whether in a small business, professional practice, or home application. The innovations will also affect users of large-scale computer systems. The expression "dumb terminal," while usually used to refer to a very minimal type of computer terminal, actually describes the condition of many terminals attached to larger systems. The terminal, consisting of a screen, keyboard, and perhaps a printer, is dependent on the mainframe. The people using the terminal therefore become dependent on the mainframe and its programs as well.

New technology will permit the terminal to become a more flexible, diversified, and responsive device. At times it will function under the control of the mainframe in the traditional manner. At other times it will function under the direct control of the local user, as a word processor or general office systems device. Sometimes it will function as a personal computer, providing services of professional and personal benefit. Sometimes, through telecommunications, it will tie up with other terminals or with other mainframe computer systems or networks, enabling access to functional services, data libraries, and other systems of general use. The new terminal will have a greater range of peripheral de-

vices available, although many will be shared with other users throughout an office.

High quality printing devices will provide multi-colored graphic presentations of materials.

Office copiers will accept documents directly from a terminal, producing collated and bound copies from the electronic signal.

Telecommunications devices will permit rapid communication of messages to large numbers of persons.

Records storage systems will permit rapid storage and retrieval of letters, documents, and data.

While the new computer technologies will enable systems to become more responsive and flexible, this will place new responsibilities on the users. Managers will have opportunities to make the same mistakes on their many small computer terminals and systems that the large-scale operators have made on their large systems over the last several decades. In the past, major losses of productivity occurred because of a relatively few very expensive mistakes. In the 1980s, even greater levels of productivity may be lost because of a great number of less expensive mistakes. While the cost of each error or problem will be lower, the cost resulting from such an error may be an economic disaster to a small business. Avoiding such mistakes will require a new competence on the part of the user-manager of the management-oriented computer system, whether served by a single computer or a large scale system.

MANAGEMENT COMPETENCE

Competence in the many aspects of computers is already an important element of the corporate manager's preparation for a successful career. It is fast becoming a necessity for the successful small business operator or individual professional as well. There are many interpretations as to what such a competence should

consist of. One approach is to develop a familiarity with micro-computers and an ability to program in BASIC, which is a core element of some academic computer literacy programs. Other approaches include training in more traditional computer curricula, usually by students preparing to become computer programmers, designers, and engineers.

The problem with these and many other approaches to training and educating managers for a computerized work-world is that they are often incomplete. A skill development effort must confront the actual decisions and problems that managers, small business operators, and individuals face in dealing with computerization. Most often these involve:

Whether or not to use a computer for a particular activity or to continue to perform it manually.

Selecting and working with computer-related personnel and consultants, and computer stores and software sources.

Making or approving selection and purchasing decisions about hardware and software.

Developing or approving plans for implementation of a computer system.

Dealing with conflict and complaints about the performance of the computer system.

Diagnosing functional problems not due primarily to hardware or software error, but rather to manager or business ability to support and use the system.

Identifying, specifying, and implementing improvements in computer-generated reports and displays.

Training and motivating employees to use the system effectively.

These problems will not necessarily be managed more effectively merely because the manager or business owner can program a small computer at home to balance a checkbook. Nor will they be solved through insight into hardware operations, or knowledge of various programming languages. Rather, the man-

ager must know how to use small- and large-scale computer systems *as management tools*.

TWELVE COMPUTER COMPETENCE STANDARDS FOR EXECUTIVES

The process of developing competence in management with computers should be guided by some basic goals and objectives. Competence standards are intended as guides that describe the general abilities needed by managers, not the methods or learning processes by which the abilities would be gained. Thus, a business organization might use such standards to guide selection of the content of a training program, while an individual manager might use them more as a self-evaluation checklist. The identification of a set of competence standards for executives must be grounded in some basic principles of management with computers.

A basic principle in the successful use of computers in management is that people manage organizations, businesses, and professional practices. Computers can only assist managers in this effort. Computers cannot be a substitute for competent managerial performance.

A second principle is that managers must be able to make informed decisions about the development of their computer systems, since they know the most about their businesses and professions. The ability to become competently involved in the ongoing development and operation of a computer system is itself a necessary management skill.

A third principle is that, while much of the programs and equipment associated with desktop computers and enhanced terminals is new, there is much to learn from the experiences of other users and operators, including those associated with large computer systems for big corporations and government agencies.

Based upon these principles, 12 computer competence standards for executives can be identified. These standards can guide an individual executive in career preparation and development decisions. They can guide trainers and academic professionals

in the development of workshops, courses, and curricula in computer skills for executives. Finally, they can guide small and large organizations in the development of skills for their employees, to prepare them to use computers effectively in their daily work.

1.   The executive should understand the basics of how large and small computers work, as well as the terminology used to describe those operations.

Managers must understand the basic operations of computers so that they can make informed decisions about equipment, software, and operations. While a technical knowledge of semiconductor operations or machine language is not required, an awareness of types of computer systems and peripherals, their capabilities, interfacing technologies, and application programs most certainly is. An important dimension is an understanding of the meaning of key terms and expressions used by computer professionals. Without this, plans and specifications cannot be read and interpreted, and problems cannot be diagnosed.

2.   The executive should understand the evolving technologies of computer systems, especially as they apply to the full range of management applications.

Computers are evolving rapidly because of technological innovations that reduce costs, increase speeds, and expand the physical and functional capacities of computer systems. An executive should understand the technological innovations at a nontechnical level. In addition, the executive should be able to anticipate many of the changes in the management environment that technological innovation will bring about, so that plans and decisions can make the most of such opportunities. Maintaining such a level of awareness requires not only initial training but also continuing exposure to one or more magazines or newsletters that examine the evolving functions of computers in management.

3.   The executive should be able to define the longer term organizational needs for computer support, so as to effectively participate with computer professionals in the development of new applications.