THE EFFECTS OF TECHNOLOGY ON OFFICE ADMINISTRATION, 1965-1993

An Honors Thesis

by

Chris A. Macklin

Thesis Advisor
Jacqueline De Voe

Ball State University
Muncie, Indiana

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Purpose of Thesis

This discussion of office administration will focus on the effects of technology. Specifically, it will cover the time period of approximately the last twenty-eight years. In this time frame, the effects which technology has had on the duties of office workers and managers will be studied. From this paper, one will gain some type of incite into how office management has developed and evolved into the complex occupation it is today.
In 1966, John Neuner defined the function of management simply as "to provide leadership and direction to a business organization (Neuner 3). He went on to break this down into four functions: organizing, planning, controlling, and leading (Neuner 4). Of course, the size of individual organizations vary and thus, so does the responsibilities of their office managers. For instance, it was commonplace for the position of controller to be combined with that of the office manager. Eventually though, due to the impact of automation and new technology, the duties of the office manager became more focused on the administration of work rather than the completion of it (Neuner 6).

Beginning in the mid-1960's, office practices began going through a new phase of technology. This was not the first phase of change for office practices though. The impacting changes started with the invention of the typewriter. It allowed work to be done more quickly, more accurately, more attractively, and more economically. Following the invention of the typewriter were such inventions as adding and calculating machines, cash registers, and bookkeeping machines. The use of these machines and methods got work done quicker, but they also generated new business activities and new job opportunities. More people needed to be hired to perform this added volume of work. This added to the duties of the office manager in two ways. First, he had to be adept at using these new inventions so that he could
train, guide, and supervise those employees using the machines.

Second, the amount of people which he oversaw had been greatly expanded. For this reason, managers saw fit to delegate some of their powers and responsibilities to another person, thus creating the position of assistant manager (Neuner 21-22).

The business practice phase of the mid-1960's can be called the cycle of "office automation". Automation has been defined as "the entire field of investigation, design, development, and methods of rendering or making processes or machines self-acting or self-moving." Therefore, in the office, automation refers to those self-regulating processes in which work is completed with a minimum of human effort. Automated data processing comes very close to fitting the definition of office automation. It is dependent upon the recording of original data in such a form that further use can be made of the data without the need for any subsequent manual recording. Unfortunately, it is not truly automatic, for it demands outside direction and frequent interruption of the processes. Man must still be the directing force, but once the machines have been programmed to carry out the activities, they can do so more quickly, more economically, and more accurately than by manual methods (Neuner 22).

The popular system of the 1960's was the tabulating system which used the Hallerith Codes. The code consisted of rectangular holes punched in cards. Another code, the Powers Code, used cards with round hole punches. In this tabulating system, hand or typewritten original source documents are
converted to these punched cards. The data on the source cards was called input and the punch cards were called input media. The processed data was known as output and the forms on which the processed data appeared was called the output media. By using a special attachment, such machines as the electric typewriter, calculating machine, cash register, bookkeeping machine, and teletypewriter could communicate with one another by means of common-language media—punched cards. This data processing procedure, known as integrated data processing, allowed data processing to be done automatically once the source documents had been prepared manually (Administrative Services 47).

Electronic data processing was the most recent adaptation in the mid-1960's of data processing. This was done through the invention and use of electronic computers. The computer could calculate and retrieve data with superhuman speed. The electronic computer system, like the tabulating system, depended upon a code or machine language. Alpha and numeric data had to be transformed into code on punch cards. This coded data, along with instructions for its processing, were fed into the computer and stored as electrical impulses. All instructions are carried out rapidly and written out of the computer on punch cards or business documents and reports (Martin 52). In 1965, nearly 5,000 electronic computers were in use by about 650 of the largest corporations representing every major industry.

These computers were being used to quicken such activities as accounting, inventory control, and the planning and control of
operations. But according to a survey by the American Management Association, they were used even more as a tool of management. So, just what were the effects of this new management tool? The first effect was an anticipated decrease in the number of supervisory jobs available. This was logical since the computer was expected to cause a declining rate of growth for clerical workers. Obviously, a smaller number of workers would need a smaller number of supervisors. Second, the content of the office manager's job changed with the use of the computer. This caused the accountants to branch out into such jobs as systems work and financial analysis. Therefore, the office management jobs became more technical and highly structured. In other instances, the supervision of several departments were consolidated into one job (Martin 34-35).

Many people felt, at this time, that the increasing adaptation of computers would cause office management jobs to become routine, downgraded, and eventually obsolete. Fortunately, for managers, there are two reasons why this did not happen. First, the decisions made by office managers involve too many intangibles and too much abstract thinking to subject the problems to mechanical analysis. Of course, the use of computers eased the jobs of the office manager.

Rather than spending hours dealing with a huge quantity of data, the office manager could simply formulate and calculate the data in a matter of seconds. Instead of reducing the degree of judgement required of office managers, the increased use of
computer operations resulted in an office manager position which was even more highly structured. While some jobs requiring little skill and judgement may have moved down the management ladder, other jobs requiring the compilation and interpretation of computer data moved upward. The second reason is the cost factor. The charges for rental fee or depreciation on a computer must be less than the dollar-valued amount of output which the computer produces. For example, if the computer has a depreciation expense of $120,000, then it would have to produce the work of eight employees with a wage of $15,000 a year. If not, the cost is deemed prohibitive to the installation of the computer (Neuner 28-30).

In 1964, Donal R. Shaul, a writer for Personnel magazine, surveyed 53 middle managers and 14 top managers in eight companies. Each of these managers had at least two years of operating experience with their electronic data processing system. It was confirmed that as a result of installing an EDPS the job of office manager had become more complex. In fact, 60% of the managers stated that they worked longer on planning activities after the installation than they had before. He also found that the managers had a greatly increased volume of information to analyze in greater depth and that they used more personal experience and judgement in this analysis. About two-thirds of the managers agreed that the computer had reduced the amount of time which they were required to spend on the function of controlling. This freed up more time for other activities and
As the decade of the 1970's occurred, people began to think of the office not as just the place where paperwork was done, but as the information or nerve center of the company. It was during this time period that companies made even wider applications of the computer in the office and increased integration of other machines with the computer to perform office work. Each of these machines shared something in common with the others; that is they all performed one or more related functions for processing information. Eventually, the concept of a family of information processing machine systems was born. Thus, the office, the place where the machines were used, became the information center (Johnson 8-10).

Before we look at the effects of this new technology, we need to examine these devices and functions which were coming into wide use during the 1970's. First, there is the function of word management. Word management is to text what data processing is to numbers. It is the electronic and/or mechanical capture, storage, manipulation, output, and ultimate disposition of text and graphic images. The primary end product is a hard copy output, usually paper. The most versatile and important tool for handling text is the word processor. Word processors are designed to simplify the production of documents by eliminating repetitive typing and providing extensive text editing capabilities. Its main point though is its ability to store information on removable storage devices. Other similar devices were electric typewriters with storage capability and text
editing systems (Barcomb 51-53).

Message systems also became popular in the 1970's. Electronic mail systems are point-to-point conveyors of different types of information (depending upon the system used). They serve many purposes, including the following: faster delivery of information, reduced photocopying volume and expense, geographic independence, time-zone transparency, and improved access to personnel. They can be either computerized or non-computerized. Computerized systems include computer-based message systems, teletypewriters, store-and-forward destination oriented systems, and computerized facsimiles. Non-computerized systems include videotex systems, audio systems, and conventional facsimiles.

Another modern function was micrographics. It is the capture, retrieval, and display of miniaturized, high-resolution photographic images. It usually contains either textual or graphic information and is stored either on paper or film. Some other popular modern functions were electronic filing and retrieval and electronic reminders and calendars (Barcomb 103-36).

The first major effect of these technological changes was two fold. It was clear that in the future there would be a great need for both workers and better qualified workers. The demand would be created in three ways: (1) people needed to replace those retiring, leaving the labor force temporarily, fired or promoted, and changing careers; (2) numbers needed for new openings caused by expansion; and (3) numbers needed for emerging
jobs brought about by the use of technology. In 1976, the U.S. Labor Department estimated that over twenty million office workers would be needed in 1985. That number would be an increase of 34% from 1974 (Delgado 51-52).

Besides the increase in the number of workers needed, the use of technology also caused the need for more qualified workers. These qualification needs can be separated into three categories: (1) need for office skills; (2) need for specialty skills; and (3) need for decision-making abilities. In the mid-1970's, few individuals were truly qualified for and even fewer were actively seeking office positions. Because of this, companies sometimes hired an underqualified individual who could only partially fulfill the requirements of the job. For example, companies that usually required 120 words per minute of shorthand began to accept people who could only do 80 words per minute. The same type of change was seen in the requirements of typists. This loss in skills affected the total production of office services (Delgado 53-54).

As mentioned earlier, the need for specialty skills was also brought about by this technology. Many employers began to seek individuals with special training in such areas as technical, medical, and legal areas. Word processing centers hired those who had good typewriting skills, particularly those with a high rate of keystroking speed and good transcription skills. Specialty personnel were needed in such areas as data processing, reprographics, records management, and mailroom systems. Each of
those areas could be a highly complex and sophisticated job due to the new technology which was constantly being introduced (Bikson 22).

Three different types of new personnel were needed, all of whom needed to understand this new technology. First, the system planner had to be an expert in the field, be creative in planning, and be able to train others how to operate the system. He must also be able to work with users to determine their needs and be able to communicate with them about their output. Second, the operators had to have the skills to run the equipment and had to be accurate in providing the input. They also had to be able to produce work at high rates of speed. Finally, the troubleshooter was needed to solve internal problems within the system, to overcome or counteract human error, and to cope with complaints effectively (Bikson 23).

The need for decision-making abilities was present because office work was seldom a routine effort. It involved making many decisions, some major and some minor. A worker had to have time-management skills so that important tasks were completed by the deadline. Each needed some training in developing good work habits and motion simplification as well as setting work priorities. In order to make these decisions, the office workers had to understand the functions of the office, the way in which the work flowed, the importance of accuracy, and the philosophy of the team approach (Bikson 24). Also brought about was the need for better supervisory skills. Supervisors had two basic
needs: an understanding of the work objectives and an understanding of people. With these two factors, supervisors were able to meet the need of profit maximization and to find the means to keep employees productive. As the need for office workers increased and the supply grew smaller, the supervisor had to have a keen talent for balancing work demands with each individual's abilities (Bikson 25).

Finally, the need for updating the employees was brought about. Although technological advances continued to make office work easier in some respects, all machines were still operated by human beings and therefore, human skills continued to set production levels. Thus, it became necessary to produce more and better qualified office workers who had the skills to operate the newest technology. (Wagoner 56).

The office manager had many responsibilities in the business of the 1970's, ranging from word and data processing and telecommunications to less formal and personal areas. He had to deal with politics in the office and time management of the human resources in the office. He needed a broad management view and had to take an organizational outlook in managing the office. Excellent leadership abilities were essential also (Long 30).

As the 1970's began to fade and the 1980's were on the horizon, a new type of office was coming about and a different type of manager was needed to run it. This new office was known as the administrative services concept (Johnson 11).

Gradually, the computer and its accompanying technological
devices changed the way in which an office functioned. It unified the separate functions of organizations and, at least conceptually, the previously separate functions in an office. For instance, it was demonstrated that the collection and recording of data in the office is basic, and hence related, to the processing, distribution, and storage of that data. Furthermore, the unique role that the office played in the modern organization became clear as greater reliance was placed on its product and information to serve the decision-making needs of management. Thus, during the 1980's, the office emerged from the concept of the narrower office management to the broader administrative office serving the entire organization. The office was now an agent provided to assist top management and all other parts of the organization (Johnson 12).

The purpose of the office as an administrative services function was to provide specialized knowledge on the entire information cycle of the whole firm; to respond to the physical needs of the employees regarding space, machines, and other things; to help ensure the security of the organization; and to care for the maintenance needs of the work force. Top management in all fields responded to the need for these services to assist in the administration of the main functions of their organizations. Often, new positions, such as V.P. of administrative services, were established to coordinate this growing function (Johnson 13).

Basically, the office evolved into a function made up of
many interdependent, complimentary units. In this view, the office is considered as six different units.

1. An economic unit producing value. It employs economic resources (people, space, capital) and produces a service (information).

2. A human-social unit of people with the usual types of human problems.

3. A geographic unit. It is a decision center where information is produced and used to make decisions.

4. An ecological unit concerned with the environment and how it affects the worker's comfort and productivity.

5. A technological unit of machines and new systems and their interrelationships.

6. A communication unit for sending and receiving messages (Johnson 14).

This type of atmosphere undoubtedly calls for the office manager to have different responsibilities. In a large firm where complex operations require specialization, each function may be headed by a manager who directs a separate department. In a smaller firm, the office manager would probably be responsible for overseeing all of the functions of the office. In general though, the responsibilities of all managers could be divided into two types: functional service responsibilities and managerial process responsibilities (Johnson 15).

Functional service responsibilities deal with each of the functional areas under the manager's jurisdiction. This includes all office services such as the use of office equipment and supplies, mailing and correspondence services, and electronic communications. Data processing and records management are also included. The manager is also responsible for all of the
administrative systems and procedures studies. This involves such things as simplification of office work, environmental controls, standards development, and other activities. Rounding out the manager's responsibilities are the duties of overseeing related information services and security controls for loss prevention (Johnson 15-17).

Managerial process responsibilities are those responsibilities which are implicitly assigned to most managers. These responsibilities include:

1. Understanding the total responsibilities of the unit being supervised.
2. Developing realistic goals for the unit in line with organizational practices.
3. Planning and organizing the assigned resources.
4. Directing employment activities and administering company personnel policies.
5. Supervising, evaluating, and motivating all personnel.
6. Setting appropriate productivity standards while considering employees' abilities.
7. Constantly seeking information to keep abreast of the demands of the job.
8. Develops controls used for evaluating and rewarding workers' performance.
9. Communicates effectively, within and outside the firm.
10. Keeps constant eye on bottom-line profit just as a plant manager would.
11. Understand fully how decisions are made and the role of the office as an information producer to furnish information upon which such decisions are made (Johnson 17-20).

It is very important that the managers possess good
technical skills. He must be able to communicate effectively. This not only includes the skills of writing, speaking, reading, and listening, but also the ability to conduct meetings, prepare a flowchart, give clear instructions, and ask effective questions. He must possess a sound knowledge of information systems and telecommunication technology for planning and control purposes. Also, somewhat related, are information coding skills, formulation of work performance standards, and procedural skills (Birchall 15).

Human skills needed by the manager are practically infinite. Such qualifications include the ability to perceive problems between people and the effective counseling, disciplining, and motivating of employees. In general, he must be able to interact positively and in a tactful manner with other people (Johnson 23).

Many studies show that as a person goes up the managerial ladder, he is in greater need of conceptual skills. One conceptual skill is the ability to view the organization as a whole and the office as one of its parts. The designing and creating of new work systems requires conceptual skills. The translation of complex relationships and issues into sound operating programs also calls for these conceptual skills. Finally, these skills are also needed to recognize and prioritize problem areas and to critique alternative methods of resolving problems (Hines 43-45).

As this era of office management came to pass, the concept
of the office changed forever. Rather than just a place in which the affairs of the business were carried on, the office was newly seen as a type of umbrella which covered all administrative functions of the organization, regardless of where they were performed. As the 1980's have passed through time and the 1990's are here, the administrative services concept of the office has continued to survive and is very healthy. Like a living organism, it adapts to changes and keeps on going.

Several technologies have advanced enough in the 1980's and 1990's to affect how office operations are carried out. Optical character recognition, or OCR, is one of these technologies. It is a method of scanning typewritten or printed material and converting it to electronic signals. It makes the processing and recording of written material much quicker and easier for office workers (Peck 27-28).

Facsimiles scan, transmit, and reproduce a document by electronic means. It scans a page several times for each line of type. The dark and light areas are transformed into high and low frequency signals and sent by phone line to a compatible machine at the receiving end where they are transformed to print. There are two types of fax machines, digital and analog. Digital machines are the most advanced and can transmit a page in less than a minute. It is the duty of the office manager to match the needs of the office with a suitable machine, while also taking into account the price of the machine (Peck 125-27).

In regards to the computer, four technologies are worth
listing. They are local area networks, databases, professional workstations, and software. Local area networks are designed to link together different pieces of office equipment so that this equipment may communicate with each other, share resources, and allow communication outside the office (Peck 86).

Professional workstations are combinations of hardware and software placed near a worker's desk to help him do his job. It may stand alone or link with information bases. Its ability to do advanced activities and processes distinguishes it from simple clerical and data entry stations (Long 103).

Databases are packages of information which workers can gain access to by using a modem and usually the proper software package. In general, there are four types of databases. The most informal type is called a bulletin board. They are started by users who wish to communicate with others having the same type of software. People can get up-to-date information from current information and services databases. For example, the Dow Jones News Retrieval Service allows a person to get current stock quotes. Information bank databases are similar to libraries. It offers current information and years of back information at the same time. Vertical databases are information services designed for certain professions. Westlaw, for example, is a database for the legal profession (Peck 144-45).

The 1980's saw a genuine explosion in the software business. Software exists for just about any type of activity that can be done on a computer. Of course, it is the word processing
software which gets the majority of the attention. When shopping for a particular type of software, one should be careful. Though many packages may seem similar, most likely there are some differences between them. One may have more advanced features and another may be more user friendly. Thus, it is important to learn all you can about a software package before you purchase it (Peck 45).

We now need to look at the effects on management of these latest popular advances. First, lower level managers have seen an erosion of their responsibilities due to some activities becoming routine work. Also, the amount of people being supervised decreased due to the automation, thus decreasing the amount of supervisors needed. Some managers saw their duties merged with that of another job with little or no pay increase. Others assumed more hands on activities such as training new employees and implementing new systems. Obviously, the technology has helped managers also. Their work has become more effective and efficient. They have more time to concentrate on the conceptual problems of the business since the computers do the routine jobs for them (Long 193-95).

The duties of the office manager have progressed greatly since the decade of the 1960's. The constant introduction of new technology has gradually eroded some of the routine duties of the managers. On the other hand, it has introduced new jobs and duties such as systems planner and administrative services manager. As new technology is introduced in the future, it is
only a matter of time before the administrative services concept of management is replaced with a whole new style.
WORKS CITED


