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# Personal Computing in the 1990s

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## ABSTRACT

*Personal computers have changed the way that business is conducted in today's office. Every position in a company is affected by the use of personal computers from secretaries to top level management. Tasks and job duties are performed more easily, thereby increasing productivity. Personal computers in the 1990s will be networked via LANs to other personal computers, minicomputers and mainframes to enhance people's abilities and allow them to perform their jobs better. With the increased use of LANs, many LAN productivity applications will be utilized that will also increase productivity. E-Mail and groupware software will allow people to interact with each other without leaving their offices. These systems will reduce the amount of needless paperwork and time spent in meetings. The 1990s will also see an increase in the use of portable computers because of the small size and increased expansion capabilities, making it easy for users to tap into the network. These portables will allow employees to work at home and transmit any data to the office. Also, these portables will increase the productivity of many field applications. With the new advancements in personal computing, managers in the 1990s will need to understand these PC-based systems and how they impact individuals in the workplace.*

## INTRODUCTION

Before one can understand what personal computing holds for us in the 1990s, one must understand the impact personal computers have had during the last decade. The last decade saw the birth of the IBM PC in 1981. Within the next couple of years, secretaries were using PCs for word processing instead of the cumbersome, unproductive typewriters of the previous decade; and managers, who formerly dictated memos and letters to the secretaries, were producing the documents quicker and faster by themselves. In addition, with the introduction of numerous new software programs, office applications for the PC were unlimited. Thus, the introduction of the personal computer plus new software programs (spreadsheets, desktop publishing, word processing) equalled increased personal productivity in the office in the 1980s.

There will be many changes in personal computing from the 1980s as compared to the next decade of the 1990s to increase group productivity. In the 1980s great progress was made to increase personal productivity, but not at the group level. The term "personal computing" in the 1990s could be interpreted as an oxymoron. A better term for personal computing in the 1990s is "group computing" because of the expected increase in use of local area networks and applications like E-MAIL and groupware. In addition, portable PCs in the '90s will offer more connectivity features that take advantage of the increased use of LANs and network

applications, as well as providing the means to increase productivity in many office/work environments. Portables first came on the scene in the mid to late eighties and enabled people to work not only in the office but anywhere they chose. These advances in technology in the areas of LANs, network applications, and portables will not only change the office structure of today but also change the way people conduct business on a day-to-day basis.

## NETWORKS (LANs)

### What is a LAN?

LAN is an abbreviation for Local Area Network. A Local Area Network is a network which is limited in distance. It can be within the same building or in many buildings which are near each other. In fact, the 1990s has been called by many in the computer industry "the decade of the LAN." Since LANs will be an important part of the office environment, understanding LAN concepts will become more important to everyone involved in office design and structure. Understanding and explaining LANs is a complicated task because there isn't one universal LAN with one easy to understand definition. In addition, when you add the different Network Operating Systems and Computer Operating Systems that are available, the subject of LANs can become even more difficult to understand and manage.

Many confuse the actual network (LAN) with the network operating system. The network is the hardware used in the LAN including the adapter in the PC, the wire, the cable and with some networks the host adapter. Two of the popular networks today are Ethernet and Token Ring networks. The network operating system is the software that runs the network. Examples of network operating software include Novell's NetWare and Microsoft's LAN Manager. The network operating system works with the computer's operating system (i.e., DOS, OS/2, UNIX). All three work together when you have a LAN. For example, one may have an Ethernet network running Novell's NetWare on DOS.

LANs can be connected to other LANs via bridges (connects two similar networks) and gateways (connects two different types of networks). One may have different departments in their company connected to their own departmental LAN and with access to another departmental LAN. (This access can be controlled on for security reasons.) LANs can also be connected even if they are in different geographic locations by the use of remote bridges which transmit via a modem over telephone lines, more commonly known as Wide Area Networks (WANs).

### LANs in the 1990s

The installation and use of LANs is expected to increase in the 1990s. It is estimated that 61% of white collar workers will interface with computers by 1991 (Reed, 1990); and 47% of the desktops will be networked by 1992 (Brandt, Depke, Hammonds, Hawkins, and Lewis, 1990). Furthermore, a *PC Magazine* survey reported in the April 23, 1990 issue that 86% of those polled said that their plans for the office involved networking PCs on a departmental level, 81% plan on networking their PCs on an organizational level, and 92% plan on connecting their PCs to the internal mini or mainframe computer. Therefore, the understanding and use of networks will be a requirement for the successful business manager during the 1990s.

One of the reasons for the increase in installations of PC networks in the workplace is cost. Depending upon the number of users on a system, the cost of having PCs on a network can be less than having dumb terminals (terminals without intelligence) connected to the company's mini or mainframe computer, especially when a system supports a large number of users. Dumb terminals connected to a single minicomputer or mainframe tend to slow the system down significantly when many users access the system simultaneously. This is because dumb terminals cannot process information; instead, they must use the mainframe computer to process information. Thus, a larger system is then required to handle the additional users with dumb terminal hookups. With decreasing prices of PCs and with even lower prices expected in the 90s, many are switching to PC based networks. PCs can process information on their own; therefore, when they are used in a network situation with a large number of users, the performance will be better and costs will decrease. In addition, many of the traditional multiuser (like the IBM's system 38 Mini or 3270 mainframe) minicomputers and mainframes will be disappearing in the future due to the introduction of the new 486i processor computers like the Systempro offered by Compaq, which offers the speed and power advantages of the minicomputers at a fraction of the cost. These new machines are designed to handle large PC networks efficiently.

An example of the cost saving of PC networks can be seen by the system that Donald F. Tuline established at Richmond Savings Credit Union. He needed the credit union's minicomputer to do sliding scale financial analysis; however, this analysis couldn't be done on the minicomputer that the credit union owned without investing in a larger minicomputer system. Therefore, Tuline set up a PC based network which linked 250 tellers in 6 locations. In addition, the PCs in all these locations could be used for other daily office tasks like word processing. The cost of this PC based network was 30% less than having invested in a new minicomputer system (Brandt et al., 1990).

## NETWORK APPLICATIONS

### E-Mail

Another reason for using of LANs has to do with many of the applications that are available that work on a LAN. One of the most popular applications is an E-Mail system. E-Mail has many advantages in the office environment. First, it is very easy to send and receive messages. It eliminates the need for paper memos which have to be written either by the person sending it or a secretary, copied and delivered to the intended party. With E-Mail, the party who needs to send a message can type it up easily, address it to a receiver, and send it. In addition, if a hard copy of the message is needed, it can be easily printed out. E-Mail eliminates the need for anyone other than the sending and receiving parties to be involved with the execution and delivery of a message, such as secretaries, internal mail sorters and deliverers. Also, the user can scan messages to see who they are from and read the message that they determine to be most important first. Because of E-Mail many of the old corporate habits may disappear, such as unnecessary meetings. They are rapidly being replaced by messages, ideas, and reports via the E-Mail system.

The chain of cookie shops called Mrs. Fields Inc. has a network which operates an E-Mail system. This system sends business information between corporate and the individual stores.

This system has eliminated much of the business paperwork that was previously required. The chief executive of Mrs. Fields stated that the E-Mail system also has had an effect on the corporate structure by eliminating some layers of management because communication (E-Mail) between corporate and the stores became easier (Brandt et al., 1990).

### Groupware

LANs are responsible for another application called groupware or shareware, which is expected to become increasingly important in the 1990s. Groupware is a computer industry buzz word for group based software. The group based software of the 1980s generally consisted of some kind of E-Mail messaging system or was merely a distributed version of a popular PC-based application such as Lotus 1-2-3, MS Word, which ran over the network; however, the new groupware software of the '90s will be different. Many developers are trying to design software systems that foster teamwork among users. Xerox is even developing a video system into its groupware to enable workers to see each other while they work. By making the workers feel a part of the team, many feel that the quality and the productivity of their work will improve.

In the past the basic concern was to physically connect people to the network for basic data file sharing; however, the new groupware of the '90s will focus more on people and tasks. People handle many different tasks at work that may involve one person or different groups of people. Those different groups might then have tasks that interface with other groups within the company. The new groupware of the '90s will be able to coordinate many of these tasks automatically with the correct groups. There are some groupware software packages available today, but these operate at a lower level of sophistication when dealing with the relationship of people to tasks.

Coordination Technology is currently developing a beta testing groupware that enables each individual to establish their own habits for interacting with different people and groups. This package operates by task method rather than message method, like E-Mail. People can submit the documents to their boss or task leader using the groupware running over the network. There are reminders on the system that notify the worker and project leader that certain tasks are due, or past due. The software actually keeps real time, on-line information on all of the assignments that are due, past due and completed for the project team.

This new groupware software of the '90s will increase productivity in the workplace by eliminating countless status meetings. Time spent gathering employees in a room to discuss the items completed and items outstanding can now be done in seconds with a stroke of a key.

## PORTABLES

Portables will provide people with a way to access the network outside of the office.

### Portables of the '80s

In the mid-eighties the basic portable computer was a twenty pound, sewing machine-style computer that could be carted from the office to home with a few backaches. By late

1989, portable PCs were getting so small that one could easily put a computer in a briefcase for "computing on the go." These small computers were nicknamed "notebook computers" because of their size and shape (similar to a notebook). It is interesting to note that these new notebook computers have more power and speed than the original IBM PC which occupied an entire desktop.

The portable PC has affected the workplace in many ways. For many the portable is a second machine for computing on the road. A battery operated portable can be used on airplanes, in cars, in stores, or just about any place that people want to work, thus increasing personal productivity. In addition, portables are used in many field automation applications that increase productivity as well as decrease costs for the corporation.

Portables can be battery operated or AC powered. Deciding which type of portable to buy is quite dependent upon the user's needs. The user who travels frequently would benefit from a battery operated portable, while the user who works at home and the office might be satisfied with an AC powered portable. Each machine has positive and negative points because of current technology. Faster processors and more advanced features (screen type, hard disk size) require more power to operate. Therefore, the battery operated portables of the '80s were not high performance PCs as compared to the AC powered portables. In late 1989 much of this started to change with new technological developments.

### **Portables in the '90s**

Within the next decade voice recognition, color and 3-D screen are almost certain to become standard features on portable PCs. In addition, new battery technology will enable battery-powered portables to have advanced features currently available only on AC-powered desktops and portable PCs. Since this will be the decade of the LAN, these portables will also have advanced connectivity features that will link the portable on-the-road to the office. The use of modem/fax cards and cellular transmission accessories for the portable PC will be routine. Although the linking of data over phone lines did occur in the eighties, it will become a more common way of doing business in the '90s.

There will be an increase in the number of home-office users in America during the '90s. The numbers are increasing at a rate of 10% annually (Personal Technology Research & Daume/Swenson Inc., 1990). There are many reasons for this growth: quality of life improvements for employees; companies keep valued employees; reduction in office operating expenses; reduction in air pollution; and lower PC prices. By having more powerful portables available, corporations in the '90s will be able to have employees do most of the work at home. Employees will be able to access departmental LANs for E-Mail and groupware projects, link to corporate databases, and transmit data without ever leaving their home. Because of its physical portability, the PC itself can be taken into the office when the employee travels to work. In many cases this would eliminate the need for a stationary PC at the office or at home.

Portables will also be an important component of networks as many field applications, such as outside sales, become automated. These systems can serve numerous users over a wide variety of equipment: a single user PC; LANs; minicomputers; and corporate mainframes. The system provides salesperson productivity tools, direct mail and fulfillment, telemarketing, and sales and marketing management. The benefits of such a system can outweigh the initial investment.

"By automating the sales, and marketing functions, companies have increased sales anywhere from 10% to more than 30%" (Moriarty and Swartz, 1990:100). A women's and children's apparel division of Vanity Fair had their sales force use portables to access the database at corporate to obtain up-to-date order and inventory information on 2,000 SKUs. This system decreased the length of the company's order cycle, increased customer satisfaction, reduced cancellations, and increased sales by 10% (Moriarty et al., 1990).

## CONCLUSION

### Summary

Personal computers of the 1980s are responsible for many changes in the working environment. PCs provided the tools to perform many tasks faster and better, such as financial spreadsheets and word processing tasks. PCs also started to allow for better communication systems, such as E-Mail. Portable PCs enabled people to work just about any place possible, thus eliminating wasted time spent in travel. New PC applications allowed many tasks which were paper intensive to become automated, like a company's sales force duties. However, many of these changes occurred in few companies during the 1980s. The 1990s will see more companies utilizing the PC for many of these applications, thereby increasing group productivity as well as personal productivity.

### The Human Factor

Advanced technology will bring about many changes in the 1990s; however, what is sometimes overlooked is how changes in technology will affect people.

PCs will in the '90s bring about new ways of doing things within the workplace; however, many of the same work force issues will still remain, such as the motivation and training of employees. In the 1990s the same question of how to motivate employees will still be asked. The use of the PC in the 1980s increased personal productivity on many levels; but were the employees motivated to perform better, or did the PC just perform the job better? The PC can enhance one's ability to perform a job, but there will still be a need to motivate the employees to do the job in the first place. In addition, the PC cannot replace a motivational leader in the office. Also, working at home may not increase everyone's productivity levels. For those people who are disciplined, working at home with a portable may increase their personal productivity; however, there are many who need the atmosphere of the office to get them into the proper mood for work.

The 1990s will be the decade of the LAN because networks provide increased benefits for corporations. To harvest the benefits corporations in the 1990s will need to realize that proper training of employees must be provided. As technology advances employees will need to possess greater skills to properly use all of the equipment and software. The employees should be not only trained on just the computer skills but also interpersonal communication skills. With the advancement of E-Mail systems and groupware, the need to interact verbally is virtually eliminated. Instead of learning the skills necessary to interact with people verbally and generating interpersonal relationships, many might become accustomed to just letting their personal computer do the talking for them.

Personal computers in the 1990s will add benefits of increased productivity and reduced costs, but many of the same management issues will still remain. Managers must understand these new PC systems and the impact of new technology on the individuals within the workplace.

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