

CAN THE USE OF A COMPUTER INCREASE YOUR BUSINESS PRODUCTIVITY?

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PURPOSE

This paper examines what happened when modern computer resources were employed in a variety of businesses in the Central Wisconsin area. Particular attention is given to changes that occurred in productivity, and to several other effects that the computer has had on these businesses. Some potential installation and operational pitfalls are identified, and are suggestions to avoid them are issued to present and potential computer users. The findings of this case approach study should be helpful to those contemplating the installation or expansion of computer resources.

This paper further reports findings in some recent literature regarding the constantly changing scenario confronting the business manager as s/he pursues selection and application of computer technology in the business environment.

BACKGROUND

Computers are everywhere! They are in our toys, wristwatches, and in our factories. They teach arithmetic, schedule airlines, provide entertainment, and diagnose diseases. In short, computers provide an incredible range of services in our society. (Kroenke, 1986)

While the cost of computers has generally continued downward, their power has continued to increase. Most experts believe that the true impact of computers is yet to be felt. As these tools of modern management become increasingly affordable, more and more businesses are finding it advantageous to put them to use in many new applications.

As business moves more and more into what John Naisbitt, in his book *Megatrends*, called the "information society", and the employees in those businesses move closer to what Peter Drucker calls "knowledge workers", business management must go through a transition from emphasis on production to a concentration upon the development, condition, and interpretation of information.

In the traditional production environment, the product and other industrial secrets were reasonably safe with loyal company workers. In the information-oriented business,

company secrets may be less important to the workers than the technology they use. (Smith and Medley, 1987, p. 18)

THE CENTRAL WISCONSIN EXPERIENCE

What follows is an examination of how computer resources have been used in seven firms in the Central Wisconsin area. Particular attention is paid to the identification of the firms; what they do with their computer resources; what productivity changes they have experienced; and what advice they have to offer others.

Participants in the Study

1. Gremmer-Bablitch of Stevens Point - Civil Engineering Services
2. Milwaukee Teleservices of Stevens Point - Insurance Services
3. Marshfield Oil Company of Marshfield - Petroleum Products
4. Modern of Marshfield - Upholstered Living Room Furniture
5. River Pines Living Center of Stevens Point - Skilled Nursing Care
6. Scenic Signs, Incorporated of Wausau - Commercial Signs and Silk Screening
7. WSPT/WXYQ of Stevens Point - Radio Station, providing Information, Entertainment, and Marketing Services

Computer Applications in These Firms

1. Gremmer-Bablitch makes use of three IBM personal computers for computer-aided design and drafting. In addition, survey equipment provides computer-readable input from field work to the computer, which in turn is used to draw contour maps, compute property lines, and produce estimates. Much of the hydraulic calculations for jobs are handled by the computer, and the computer is used for job tracking to record resources used on each job. In addition, word processing is used by office personnel.
2. Milwaukee Teleservices uses its Wang VS-55 computer for a variety of applications, including: storage and retrieval of all policy information, billing services, all accounting and general ledger services, policy administration, claims history and authorization, statutory reporting, and managerial reporting.

3. Marshfield Oil Company uses an IBM PC-AT and an IBM-compatible PC for accounts payable/receivable, payroll, monthly profit and loss statements, and inventory management. In addition, word processing is used extensively.
4. Modern of Marshfield is using an IBM System 34 for order entry, inventory management, process control, all accounting functions, merchandising, and sales forecasting.
5. River Pines Living Center has an IBM System 36 and two personal computers, which it uses for a wide variety of administrative functions including: word processing, accounts payable/receivable, account analysis, and staffing requirements. Shortly, they will begin to use these resources for payroll, patient accounts, medical records, and may link remotely to their corporate offices.
6. Scenic Signs, Incorporated uses a special-purpose computer for die-cutting vinyl lettering for signs, as well as for some design and layout work. Future plans call for adding computing resources for bookkeeping, accounting, inventory management, and manufacturing systems.
7. WSPT/WXYQ has a Wang 2200 minicomputer, a Wang personal computer, and an AT & T personal computer in use at present. These three systems provide computing services in four major areas: a.) Administrative tasks, such as accounting, bookkeeping, billing, payroll, business information reports, and sales projections; b.) Music rotation, which assists in the selection of music and programming; c.) CO-OP Advertising, which keeps track of the amount that manufacturers/ distributors will provide to the station's clients for marketing and advertising; d.) Election coverage system, which takes preliminary results and keeps track of election returns for use in reporting election results on a timely basis.

The amount of time which these firms have been using computer resources ranges from four months to 14 years, an average of 4.5 years.

Productivity Changes

One of the major thrusts of this study was an evaluation of the changes in productivity which has occurred in these firms as a result of the application of computer resources. Here is what our participating firms had to say about productivity increases.

1. Gremmer-Bablitch found it needed productivity tools, and found that the computer was several times faster and more accurate than manual methods. Although productivity increases are hard to prove, they realize savings because of the decision to

use computers. Because of the use of word processing, they were able to avoid hiring another secretary.

2. Milwaukee Teleservices indicated that they simply could not offer the services they offer without the computer. They anticipate that because the computer has kept operating lower, they will be able to offer their services at approximately 10 percent lower cost, providing a competitive advantage not otherwise available.

3. Marshfield Oil Company indicated that this was a hard question to answer. Probably the biggest advantage is the availability of timely information. This helps in making decisions faster, but probable has not resulted in any savings of personnel. It has resulted in better management of the firm, however.

4. Modern of Marshfield is absolutely sure that they have experienced considerable savings since the installation of the computer resources. In fact, the initial installation in 1973 was justified by the time and labor savings over a three to four period. Since then, the time and real dollar savings have continued to grow. In addition, the timeliness of information is critical in their business in order to maintain the competitive advantage; their computer system helps them do this.

5. River Pines Living Center has found that the systems they have installed has resulted in a personnel time savings of about 50 percent over the manual systems. In addition, the availability of more timely and accurate information is critical to the organization's operations.

6. Scenic Signs, Incorporated, which uses a special-purpose computer for die-cutting vinyl lettering, has found that the quality and speed of production is their primary gain over a manual method. In addition, the use of the computer by the art director for layout and design work shortens the amount of time and effort required for these activities.

7. WSPT/WXYQ, which readily admits it has not reduced the amount of paperwork in their firm, has found that the use of computer systems has made possible the production of much better, more timely and accurate management reports and information. They are able to provide more and better services than before the systems were installed. Also, although the workload has increased because of increased services being provided since the beginning use of the computer, the firm has not had to hire the number of extra people that would have been necessary without the system. This has amounted to a savings of about three positions.

Suggestions Offered by these Firms

One of the ways that information from this report could be used would be to share what others have experienced with those considering beginning or expansion of the use of computer resources. Of the suggestions offered, here are some of the more frequently heard.

1. Define clearly and exactly what you expect the computer to do to help your firm. Like any tool, it is only helpful if you know what you want to accomplish with it. Keep in mind, too, that everything doesn't have to be done with a computer!
2. Select the computer resources that fits your needs, not what someone may want to sell you. Carefully evaluate the match between your requirements and the computer's ability to meet your requirements.
3. If you or someone in your firm doesn't have the expertise to identify the "right" computer, hire a consultant who has the ability to work for you, and who thoroughly understands your business.
4. In selecting the computer system to meet your needs, pay particular attention to systems and software support services available from the vendor. This type of support most critical at the beginning, but is also an ongoing requirement for most firms.
5. Shop carefully for software (programs) that meet your needs. Like the hardware, the software must match exactly your needs and expectations. Here again, your in-house expert or the consultant can be invaluable.
6. For first-time users of computers, you should be able to justify your investment in the computer over a 3 to 5 year period from savings. If you can't, maybe you don't need one!
7. Look for a system that is expandable. The need for upward expansion of the system is critical as the firm and its computer applications grow. Don't get locked into a situation where you have to change systems to get the speed, power, or capacity you will need in a few years.
8. Start with a system that will provide data base capabilities, not just flat file capabilities. Increasingly, the ability for management to link files of information together is important for decision making, and that is difficult or perhaps impossible with a flat file system.
9. If you have to hire someone to run your data processing operations, be sure that person fits into the company; don't hire a technician, or someone who sees the computer as an end in itself.

10. Particularly if you are a small firm just starting to use a computer, look at the personal computer as a possibility. Newer technology offers very powerful computing in a small and relatively inexpensive package. Also, there is a lot of very reliable business application software available for the PC, and often at reasonable prices.

11. Keep your expectations within reason; don't expect the system to operate without error, or without service. Whatever you calculate for time to install and bring the system up to an operational level, double it, and you'll be about on target!

12. Be prepared to keep your firm in operation when (not if) your computer breaks down. Have service arrangements (both preventive and corrective) in place at time the system is installed.

13. ALWAYS have backup capability! Keep your firm's data duplicated and available for use when (not if!) you files are destroyed. It is relatively inexpensive for most firms to make an extra disk copy of the daily transactions; this should be a part of the daily operation.

What Does the Future Hold for Business Computer Applications?

Whether the question regarding productivity increases has been, or even can be adequately addressed, is subject to debate. What has been observed, however, is that area businesses, much like the rest of the world, have recognized the important contribution that computer resources can make, and have employed them in a variety of ways, and with considerable enthusiasm.

But can we expect from the future? Can we expect continued decreasing costs and increasing power in computers? Are there other signs on the horizon that we need to be aware of? In all likelihood, the answer to all these questions is "yes".

In the past 40 years, the computer revolution has followed a path similar to that of the printing press and movable type when they were introduced in the 1450s. During the last four decades of the fifteenth century, about 10 million pages of print were distributed to meet the increasing demands of an information-hungry world. (3)

Since the first commercial computer installation in 1954, we have witnessed a continuing downward spiral in both the size and the price of computing devices. Organized approaches to systems development can be traced to the 1960s and to technologies borrowed from military project management. This rapid evolution saw the recognition of common procedures, the emergence of a software industry, and the commercial packaging of applications. Now, the software industry has grown to a level that rivals hardware equipment in both dollar volume and management emphasis.

The proliferation of computers and compatible application software has resulted in increasing demands for communication links between computers. Data communications networks are now worldwide, offering virtually instant transfer of information where ever businesses are located.

Through all of this, users have penetrated the technological mystique that surrounded computers in the early days. Now, sophisticated users are capable of selecting appropriate software packages and establishing configuration needs, thereby reshaping the nature of computer utilization.

Today, many top managers no longer manage directly the physical organization of their business; they manage a conceptual organization, one based on information about that physical organization. These individuals are literally managing without ever seeing firsthand the organizations they run; they are totally reliant on information available to them from their computing resources. Just as the travel agent books airline passage for the traveler on a flight the agent never sees, today's managers make planning, organizing, staffing, directing, and controlling decisions about resources they may never see. Only 40 years ago, that would not have been possible.

According to Smith and Medley (1987, pp. 258-266), several specific changes are on the way that will revolutionize the managerial decision making through the employment of entirely new computing resources.

First, just as the microcomputer of today is much more "user-friendly" than the microcomputers of the late 1970's, computers in general will become increasingly user-friendly. Improved menu displays to support interactive users, better icon displays, graphics output generators, windows for easy transitions among applications, and color monitors are among the growing list of people-oriented tools. Added to this will be new developments in natural language processors, expert systems, and an entire sub discipline known as "artificial intelligence"

Second, the combined forces of market demand and technological response have brought about significant developments in networking and data transmission. The next decade will see increasing sophistication in this area as virtually all computer users will be brought into instant contact with each other and the information resources of the entire organization through improved and more economical communications technologies.

Third, some of the most dramatic technological breakthroughs have occurred in the area of input and output options to computer systems. Some that are more likely to see continued growth and refinement are: voice input and output; optical input; computer graphics enhancements (particularly in the area of typesetting and photographic reproduction); laser technologies which will speed both input and output; multiple

purpose devices which will incorporate both voice and data communications (such as computers also serve as telephones); and self-service computing, which will increasingly appear in public places like hotels/motels, airports, shopping centers, libraries, and health-care facilities.

Fourth, the expansion of computing technologies will provide both the larger and smaller computers. Supercomputer systems are increasingly needed for such areas as automated navigation, advanced image processing for mapping entire geographical regions, specialized production facilities such as factories controlled and served by robotics, decision support systems, expert systems, and other outcroppings of artificial intelligence. The potential for increasing sales of supercomputers is highlighted by the all-out development efforts undertaken by the Japanese government and a consortium of electronics industry giants. In the United States, computer manufacturers have received an unprecedented number of approvals to develop a family of super devices.

The interest in smaller systems stems largely from the need for personal convenience. Already, several major manufacturers offer "lap-top" computers; this area will continue to grow as newer technology offers improved display and processing capabilities in increasingly smaller devices.

Fifth, there will be increased demands for special-purpose computers and robotics devices. Already, we have witnessed significant demands for special-purpose computers to serve as communication protocol controllers, robotics drivers, and even as components for popular toys. As factories continue the drive toward automation, both robotics and special-purpose computers will see significantly increased application.

In conclusion, it seems safe to say that the real driving forces that will affect the future lives of managers, computer professionals, and society at large are still in the laboratories. Predicting the exact shapes, sizes, and capabilities of developments that have yet to surface is an impossible task. Unquestionably, however, new and more powerful technologies will emerge in the future. In short, the best is yet to come!

REFERENCES

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