

Chapter 11

**Office Automation in
Small Business**

Contents

	<i>Page</i>
The Importance of Small Businesses	283
Factors Affecting the Use of Office Automation in Small Businesses	284
Extent of Office Automation in the Small Business Sector	286
What are the Problems?	287
Capital	287
Software	288
Time	289
Training	289
Security	289
Vendor Responses	290
Future Impacts of Office Automation on Small Businesses	290
The Market for Business Services	291
Productivity	291
Competitiveness and Scale.	292
Employment and Skills	292
Policy Options	293

Table

<i>Table No.</i>	<i>Page</i>
11-1. Percent of Firms Using Personal Computers by Size of Business , 1983 V. 1985 .	286

Office Automation in Small Business

Small businesses play a vital role in our economy, and technological changes could affect that role. Small businesses are often a vehicle for basic innovations; they create new jobs; they serve small, local, and specialized markets not otherwise served; and they employ marginal resources that larger companies cannot utilize effectively. This chapter provides some general background and a summary of the limited information currently known about the effects of office automation on small businesses.

The first phase of office automation required relatively large capital investments and much specialized expertise, and was chiefly implemented in large organizations. The availability of small computers and software packages designed for small-scale operation is recent. Manufacturers and vendors are now emphasizing this market. But very small firms, and in particular beginning entrepreneurs, are often uncertain and apprehensive about taking the first steps toward automating their offices. They would like to know more about the experience similar small businesses have had with automation, but may find that it is difficult to get objective, disinterested information. Researchers and experts in the Nation's business schools and universities could help to develop a body of information to fill this need. Few researchers have studied the effects on small business. This chapter can provide

a starting place for more detailed assessments and discussions.

Purchases of office automation equipment by small businesses are rapidly increasing as the prices of the equipment come down and as this market becomes a major focus of vendors. Computer systems have been used for several years by entrepreneurs and consultants working out of their homes, but the hardware and software used for this purpose were hardly differentiated from that sold for amateur, recreational, and educational use in the home market. Now small computers and specially designed software packages are coming into use by very small firms such as farms, restaurants, mom and pop stores, and entrepreneurial sellers of business services, as well as for the larger category of small business, firms with up to 500 employees. They are being used for many applications, including accounting functions, networking with peers, and research.

There have been few or no studies on the impact of office automation technologies on employment, job content, productivity, or survivability of the small business or beginning entrepreneurs. Because of the importance of the small business in the U.S. economy, the extent of adoption of automated office equipment in that sector and the problems faced in implementation of automated systems by small businesses merit special attention.

THE IMPORTANCE OF SMALL BUSINESSES

Organizations with 100 to 500 employees, although considered small businesses in law and regulations, tend to have a well-developed organization structure, formal procedures, and company policies much like those of midsized organizations. Over 99 percent of all firms, in the United States, fall within this category. While such firms might not be able to use a mainframe computer, they are likely to be able to mobilize the assets and acquire the exper-

tise to proceed rationally and systematically toward some form of office automation if they choose to do so. But with personal computers, organizations with fewer than 100 employees can automate. Even very small firms, such as a family business or a new venture by one or a few people new to entrepreneurship, can automate many of their office procedures by using, for example, word processing, spreadsheets, and automated mailing procedures.

Such organizations are often the incubators of new industries, new products, and new services. Their problems are often different in kind from those of larger firms. Relatively little is known about the factors that determine their survivability and growth. For that reason, the focus of this chapter is the question of what is known about the potential effects of office automation on independent firms having fewer than 100 employees.¹ Unless otherwise stated, the term "small business" in the rest of this chapter means firms having 100 or fewer employees and the term "very small business" is usually applied to those with 20 or fewer workers.

Such small businesses are a major part of the American economy, accounting for over 34 percent of the U.S. labor force, and 32 percent of sales.² These figures do not include self-employed workers, who constituted 10 percent of the work force in 1982, making the very small business share of total employment even higher than indicated in most studies.³ They are a particularly important part of many industries, such as agriculture, construction, wholesale and retail trade, and business and personal services.

¹The Small Business Administration has two definitions of a small business including those with fewer than 100 employees and those with fewer than 500 employees. The latter category includes 99.7 percent of total firms in the United States. An establishment is a business located at one physical site, an enterprise is a business consisting of one or more establishments, and the word "firm" refers to all establishments under the same ownership or control.

²Executive Office of the President, *The State of Small Business: A Report of the President* (Washington, DC: U.S. Government Printing Office, March 1984), p. 73.

³"Job Generation," *Economic Policy in the Eighties: The Small Business Factor* (Washington, DC: Small Business Administration, June 1984), p. 6.

Nonagricultural self-employment increased by more than 45 percent between 1970 and 1983. Eugene H. Becker, "Self-Employed Workers: An Update to 1983," *Monthly Labor Review*, July 1984, pp. 14-18.

All of the net increase in jobs (984,000) between 1980 and 1982 was attributable to firms with fewer than 19 employees.⁴ These small businesses produced a total of 2,650,000 new jobs, more than offsetting the 1,666,000 jobs lost by larger businesses.⁵

Small businesses train beginning workers in needed skills, providing two out of three workers with their first jobs in the private sector; larger firms reap the rewards of this training through increased productivity due to the availability of trained workers. Small businesses also account for almost half of women's jobs and provide jobs for the elderly and those wishing to work part-time or intermittently. In addition, small firms are said to be more innovative than large firms and they offer services considered too differentiated or too small in market potential to be pursued by large firms.

This is, therefore, an important segment of the U.S. economy. Should Government policies aid small business in their efforts to use new technologies such as office automation? Can the private sector be encouraged to help? Or will office automation tend to change or diminish the role that small business plays in the economy?

⁴*The State of Small Business: A Report of the President*, op. cit., pp. 26-27. The 1985 edition of the same report did not update these figures.

⁵*The State of Small Business: A Report of the President, 1985*, p. 2. But many small business firms start up and many others go out of business each year. In addition, firms are constantly moving in and out of this classification due to expansion, contraction, and purchase by larger firms. This dynamism of the small business sector is thought by many analysts to be a useful indicator of overall business cycles; these cycles are felt by small business 3 to 6 months before they affect large businesses.

FACTORS AFFECTING THE USE OF OFFICE AUTOMATION IN SMALL BUSINESSES

The factors affecting the use of office automation technologies in small businesses center around the price and availability of equip-

ment, the growth needs of the firm, and the available labor or skills. The declining price of microelectronic equipment is making it more

feasible for small businesses to purchase. Access to capital, however, is often still a problem. Even a few thousand dollars in capital investment can be significant. High interest rates limit the ability of very small firms, and especially new businesses, to invest in capital equipment, and the bankers' interest in lending small amounts is minimal. Many small firms simply do not feel the need for computerization yet, although that situation seems to be changing rapidly.

The targeting of the small business market by manufacturers and retailers has no doubt influenced many to purchase and caused most at least to consider the technologies. The interest of the vendors is evident from the increase in advertising aimed at small businesses and the number of small business seminars offered by vendors and retail outlets.

The retail computer store has been the most common method or site of purchase because vendors have been unwilling to develop a sales staff to deal with small businesses. Thus, the sales effort has been largely passive. The vendors now are dealing with that problem by means of seminars oriented to small business owners and new entrepreneurs, attracting a target audience with which their sales forces can deal more efficiently.

The dynamics of the firm and of the industry of which it is a member affect a firm's need for and use of automated office equipment. A business that is growing rather than stagnating is likely to use it to service more clients or provide faster response to clients. A growing firm is also more likely to have the capital or credit to purchase new equipment. Struggling firms sometimes expect that office automation will allow them to compete more successfully with larger firms. For example, a small travel agency may find that the addition of a computerized reservation system *is* necessary for it to survive and compete.⁶

⁶Judith Kamm and Aaron Nurck, "The Organizational Implications of Implementing Technology in Small Businesses" (Department of Management, Bentley College, Waltham, MA), *4th Annual Bentley College Small Business Resource Center Research Conference*, spring 1984.

Businesses of less than 100 employees make up over 45 percent of the miscellaneous business service industry, and an even larger proportion of another seven industries expected to grow rapidly in the next decade.⁷ The miscellaneous business services, the finance, insurance and real estate industry, and professional services (health and legal), are already heavily impacted by office automation. Personal services, such as beauty shops, dry-cleaning establishments and repair services are likely to be less affected by office automation.

The availability of people to use the equipment will also influence the decision to automate. More highly trained, specialized personnel such as systems analysts and programmers may be needed if the office's activities are in any way highly specialized or nontraditional, and only a few specialized very small businesses are likely to have such people, unless they are themselves the owners/entrepreneurs. The higher cost to the small firm of pension plans and other benefits, the costs of recruiting and hiring these workers, and the small scale of operations and markets put smaller businesses at a disadvantage. Once they have automated their operations, however, they are less likely to be able to employ unskilled neighborhood labor, untrained new or occasional workers, or family employees.

The proliferation of incubator facilities that provide computer and telecommunications equipment on a shared basis to small firms or beginning firms will provide many of them with their first opportunity to use such equipment. Builders are developing "smart buildings" prewired for computer and communications networks, and are renovating older buildings and furnishing them with electronic equipment for lease to small business/entrepreneurs. Such facilities will provide small businesses with the benefits of office automation at an affordable cost. The number of incubator facilities in the United States doubled in

⁷Bruce Phillips and Kim Beverly, "Employment Projections in Large and Small Business-Dominated Industries, 1982-1995," draft memorandum, Small Business Administration, Jan. 4, 1985.

the last year and shows signs of continued increase. They are attracting private investment capital as well as private-public partnerships, and with a two-thirds survival rate for the

small businesses using these facilities, appear to be successful.⁸

⁸“Business Incubators Are Doubling in Number Each Year,” *Wall Street Journal*, Nov. 14, 1985, p. 1.

EXTENT OF OFFICE AUTOMATION IN THE SMALL BUSINESS SECTOR

The lowering of prices has allowed small businesses to begin heavy purchasing of automated office equipment, as evidenced by several marketing studies.

Although, more large firms use computers than small ones, small firms are increasing their purchases steadily. Comparison of a 1983 Dun's 5000 survey⁹ and a 1985¹⁰ survey show the increases. (See table 11-1.) The increases in purchases for small firms were 60 to 70 percent during this short period. In fact, firms purchased more than twice as many computers during this time as they had predicted they would in the 1983 survey.

Small firms responding to the 1983 survey used their computers mostly for accounting while the largest firms used them for financial analysis and forecasts. By 1985, the use of financial analysis/spreadsheets had decreased overall and the “other category” had increased from 8.5 to 78.0 percent, indicating heavier usage of specialized applications.¹¹ This con-

firms the need for specialized software and specialized personnel in the small business if they are to use computerized systems effectively. All of the surveys studied indicated that small businesses are conservative in their choice of systems and the use to which they are put, which is mainly word processing and accounting functions. Larger firms are apt to be more interested in state-of-the-art equipment and more innovative applications than are small firms.

In 1980, *Inc.* magazine surveyed its readers and found 48 percent of the respondents then using minicomputers and microcomputers or small business computer systems;¹² 22 percent were using word processors.¹³ Only 4 years later, 57 percent owned/leased microcomputers and 28 percent owned/leased minicomputers.¹⁴ The median number of employees of these companies was less than 25. Personal computers are used most often by management, followed closely by engineers, clerical and middle management; the most common use is word processing, followed by accounting/bookkeeping, file/list maintenance, and records/schedules. Further automation of tasks was planned by 72 percent of the respondents within the next 2 years.

The small business market for communications equipment is also increasing rapidly. It was over \$3 billion in 1983.¹⁵ The cost of tele-

⁹Joseph Duncan, “Business Bets on Microcomputers,” *D&B Looks at Business*, August 1983, p. 45.

¹⁰*Dun & Bradstreet Looks at Business*, vol. 3, No. 3 (New York: Dun & Bradstreet Corp., May/June 1985).

¹¹*Ibid.*, p. 4.

Table 11.1.—Percent of Firms Using Personal Computers by Size of Business, 1983 v. 1985

Size of business (number of employees)	1983	1985
1-19	14.50/0	23.90/0
20-99	22.4	36.3
100-499	27.3	47.2
500-999	44.5	71.8
1,000 or more	65.7	85.4
All firms	31.9	46.1

SOURCE Joseph W Duncan, “Dun's 5,000 Survey Shows Dramatic Increase in Use of Personal Computers,” *Dun & Bradstreet Looks at Business*, vol. 3, No. 3, May/June 1985

¹²*Inc. Office Technology I* (Boston, MA: United Marine Publishing Co., Inc., 1980).

¹³*Inc. Office Technology II* (Boston, MA: United Marine Publishing Co., Inc., 1980).

¹⁴“inc. Personal Computers” (Boston, MA: *Inc.* Publishing Co., Inc., 1984), and “*Inc.* Minicomputers” (Boston, MA: *Inc.* Publishing Co., Inc., 1984).

¹⁵Frost & Sullivan, “The Small Business Communications Equipment Market Report,” A 1254/D-1, winter 1983/84.

phone services is high on their list of problems, according to testimony before the Committee on Small Business in 1984.¹⁶ Small businesses are faced with much more complex choices now in the selection of telephone and other communications services, which intensifies the cost problem.

Most businesses (66.7 percent) used their computers as stand alone workstations, ac-

¹⁶ "Impact of Changes in the Telecommunications Industry on Small Business," Hearing Before the Special Task Force on the Impact of Telephone Costs, U.S. Congress, Washington, DC, June 26, 1984, p.405.

ording to the Dun & Bradstreet 1983 survey. Larger firms were more likely to use personal computers in telecommunications link-ups. Very small firms often used their microcomputers to replace a Telex or Twix communications service and were comparatively strong in their use of commercial databases.

It is evident from surveys, advertising efforts by vendors, and retail sales activities, that small businesses are purchasing automated office equipment in increasing amounts. Some are purchasing out of genuine need to improve their productivity and others are purchasing because the competition is doing so.

WHAT ARE THE PROBLEMS?

The very small business is faced with a myriad of problems when considering office automation. Included among these are:

- **Capital**—Even though the prices of equipment have decreased tremendously over the past few years, this may still be an expensive undertaking for the very small firm whose access to capital is limited.
- **Time**—A large investment of time is required to evaluate, purchase, and learn to operate new systems.
- **Expertise**—Small businesses often lack the expertise and the financial capability to hire technology experts for evaluation, implementation, and maintenance of automated office systems.
- **Training**—Small businesses often lack the time and expertise to train operators of the new equipment. In addition, the cost of training is usually overlooked when planning the purchase of new office technology equipment. The result is neglect of the training function and underutilization of the equipment.
- **Repair services**—Equipment is often purchased at retail outlets and the follow-up services are not available in a timely manner.
- **Software**—Much packaged software is available for small businesses but it may not be entirely suitable to a firm's specific needs.

- **Security**—Lack of knowledge about computer security and little control over shared information systems are a problem that the small business will have to deal with in the future as proprietary and private information becomes more accessible to all employees through computerized systems.

Capital

The capital needed to purchase hardware may actually be the lowest cost involved in converting to automated office equipment. Once it is purchased and installed, the owner/manager needs someone to turn to for help when it does not work and the vendor may or may not provide good support. The implementation costs, which include training and temporarily lowered productivity, are often unexpected. The five U.S. industries that are dominated by small businesses—services; retail and wholesale trade; construction; finance; insurance and real estate; and agricultural services have capitalization rates much lower than industries dominated by large businesses.¹⁷

¹⁷ Bernevia McCalip, et al., "The Sensitivity of Small Businesses to Interest Rate: A Cross Sectional View, Congressional Research Service, U.S. Congress, Library of Congress, Washington, DC, May 26, 1982.



Photo credit Hewlett-Packard Co

A small business owner/manager seeking productivity through automation

This ratio will have to change if smaller businesses are to automate their offices.

The switch to computers can be a costly and frustrating experience for a small business. A company selling cheerleaders supplies leased a computer system that would accept phone-in orders, check customer credit limits, figure shipping charges, adjust inventory, print an invoice, add the order to accounts receivable, and update inventory when supplies arrived. Within 6 months, orders were piled up from high schools ready to begin the football season, angry customers canceled orders, and attorneys general in three States were pressuring the owner to deliver the goods. What had happened? Like many businesses, this company had purchased hardware first and then purchased software from an independent supplier. The owner hired, then fired a computer expert who was unfamiliar with the business operation; neglected to solve poor inventory control problems present before the computer

system was implemented; and failed to become involved in the switchover. The owner blamed the equipment vendor and the software supplier and they blamed the business owner. The equipment has been reclaimed by the vendor and the owner is suing them.¹⁸

Software

The problems and costs of choosing suitable software are even more significant than those involved in choosing the hardware. Larger firms often have software designed specifically for their use. In these companies, programmers can spend 60 percent of their time doing maintenance on programs.¹⁹ This is not feasible for the small business manager. Small firms must make do with packaged software that often does not work well for them, and the developer is unavailable to them for consultation. A survey by the U.S. Chamber of Commerce in 1984 found that half of the respondents felt the need for more information than was found in their software manuals, 39 percent found the manuals hard to understand, and 23 percent complained of not having enough written instruction.²⁰ General Business Services, a firm that provides consulting services to 50,000 small business clients through franchised counselors, notes that many of the client firms are purchasing microcomputers, but only a small percentage of them are using their equipment fully. The effective use of the equipment depends on the motivation of the users and on improvement and availability of helping aids such as teaching diskettes, trained consultants, and user friendly languages,

A small cleaning services firm bought a computer when a 15-year-old bookkeeping machine broke down. The owner was convinced by a salesperson that a computer would only cost \$2,000 more than a new bookkeeping machine. However, he then had to spend \$8,000 for customized software. He later learned that the

¹⁸Dennis Kneale, "Garbage Out: The Wrong Equipment in the Wrong Hands Can Turn the Computer Dream Into a Nightmare," *The Wall Street Journal*, May 20, 1985, p. 83C.

¹⁹David Thompson, "Small Business Buyers in the Retail Computer Market," *Desktop Computing*, May 1983, pp. 58-61.

²⁰"Small Computers Market Study," *Nation's Business*, U.S. Chamber of Commerce, September 1984.

system was too small to track all 6,000 of his customers; two employees trained on the machine never got it working; and a second expert said fixing the system would take an additional \$8,000 in programming and equipment. The owner now stores the computer in an upstairs corner since he could not find a charity to accept it. He is aware of his mistakes—trying to computerize before it was necessary, buying hardware before software, failing to get written guarantees, and failure to plan for training cost. He feels he should have hired a consultant for a second opinion before purchasing the system.*

Time

Time is a major problem. An owner/manager with a 50-to 80-hour workweek will find it difficult to invest the extensive time required to investigate office automation equipment and then learn how to operate it. The lack of time to learn the system could quickly cause discouragement. The equipment is then neither properly nor fully utilized. And he or she often lacks the knowledge needed to evaluate whether automated equipment is really needed. The pressure to be competitive or to purchase because peers are doing so may influence a business owner to buy equipment without the analysis of needs, benefits, and costs that should precede such a purchase.

Training

Training of personnel is another problem faced by the very small business. The manager must not only know how to use automated office equipment, but often must also train employees. Alternatively, he or she must hire trainers or pay for commercial courses; hire new already trained people; or depend on self-teaching software. As the costs of software and training can be twice that of the hardware, this is a significant problem. Salvate's respondents²² indicated that lack of trained personnel

was a problem for them. This may, however, only be a short-term problem, diminishing as existing employees are trained, as more and more new workers are already familiar with computers from school courses, and as there is more and more self-teaching software. At present, however, it is a significant barrier to automation for very small firms.

Bradley Schiller explores the role of small business in training workers and concludes that this may be the most important function of small business.²³ The economy benefits by having a large pool of trained workers available. The advantage to the beginning worker is the opportunity to gain marketable skills, under close supervision, in a variety of activities—all of which are generally denied to them in larger businesses. Schiller points out that 67 percent of male workers obtain their first steady job with firms of fewer than 100 employees.

Small businesses now provide a valuable service to the economy and to other businesses by training new entrants to the labor force in specific skills and in general business skills. Only the successful adoption of office automation technologies will enable them to continue this function. However, there are costs to the small business employer. According to Schiller, there is a general exodus of employees from small firms to larger firms (300,000 in the past 9 years), where they obtain an average of 23 percent in wage increases in the first year. High turnover can be very costly to the small firm. The productivity of new workers is often less than wages paid and the small business may not keep the employee long enough for the increased productivity to pay off.

Security

As small businesses become more aware that information is a primary resource they will necessarily be more concerned about computer

*Kneale, op. cit., p. 84C.

²²James Salvate, "Microcomputer Survey," School of Business Administration, California State University, Long Beach, CA, 1984.

²³Bradley R. Schiller, *Human Capital Transfer From Small to Large Business* (Washington, DC: Small Business Administration, July 1982).

security. Not only could their information be accessed by competitors but it could be distorted or destroyed, deliberately or accidentally, by insiders. The Small Business Computer Crime Prevention Act (S. 1920), which became effective October 1, 1984, provides for educational assistance to small businesses in the area of computer security." Specifically, it provides that the Small Business Administration should, through its extensive network of counselors to small business, provide the computer security education that small businesses lack and may need.

Hearings held in March 1984 emphasized the problems that the small business has with computer security—lack of divisions and specialized employees (one employee could have access to all company information), the high cost of purchasing specialized computer security systems, lack of knowledge/education about the problems, and little control over the information systems used because of leased communication lines, timesharing computers, or packaged software. Even basic security measures such as audit trails are not enforced in many small firms and separating employee duties is difficult.

²⁴*Small Business Computer Crime Prevention Act (S. 1920)*, Hearing Before the Committee on Small Business, U.S. Senate, Mar. 7, 1984.

Leslie Ball, founder of the Association of Computing Machinery's Special Interest Group on Security (SIGSAC), testified to Congress that small business membership and seminar attendance in that group was extremely low, indicating that the growing awareness of the problems of protecting information is not reaching this group.

Vendor Responses

The vendors are aware of the problems faced by the smaller business in adapting to office automation technologies. Available but not fully utilized yet, are systems and components that address these problems, such as:

- software with a 30-minute learning time;
- modular systems that can grow with the business;
- self-diagnostic systems;
- use of natural languages for easier retrieval of data;
- customer hotlines for quick, accessible help; and
- expert systems that simplify managerial tasks.²⁵

²⁵David Cushing, "Vendor Watch: Perspective on Small Business Automation," *Venture*, November 1984, pp. 123-158.

FUTURE IMPACTS OF OFFICE AUTOMATION ON SMALL BUSINESSES

The impacts of office automation will depend on the overall growth of the economy, the growth stage of the firm, and the growth stage of the industry of which it is a part. It will affect the demand for certain kinds of business services, the extension of their markets, and the employment levels and skills needed.

Small business is a heterogeneous category including very small to medium-size firms, low and high technology firms, professional and unskilled services. Within firms under 100 em-

ployees, there may be a very big difference in the effect of office automation on a three employee owner-managed business and a firm of 50 employees. Some jobs are similar such as that of a secretary, and some functions are similar such as payroll. But compared to larger businesses, small firms have less uniformity by occupation and more multifunction personnel. Some small business firms, both high and low technology, are dynamic and growth oriented. Some are not. The difference may depend on entrepreneurship, location, and demo-

graphics more than on technology.²⁶ However, the use of available technologies will eventually affect their competitiveness.

The Market for Business Services

Forty-three percent of small businesses are involved in providing services to other businesses. This industry is projected by the Bureau of Labor Statistics to develop the most new jobs between 1982 and 1995, growing at a rate of 3.9 percent per year.²⁷ Although these rates are high compared to other industries, they are low compared to past years, when business services employment grew at a rate of 7 percent per year.

The use of office automation equipment will allow firms to perform services such as graphics, printing, and forms generation in-house. Electronic publishing systems can cut printing and documentation costs by up to 50 percent.²⁸ These trends could decrease the demand for these services from small businesses.²⁹ On the other hand, office automation technologies could also facilitate the entrance of small businesses into national and international markets.

Productivity

Most businesses that have automated office functions feel that they have become more productive, often by decreasing time spent on word processing. Small professional offices may gain productivity by adding clerical chores to the professional job, thereby eliminating clerical jobs. Examples of this include legal offices that use a computerized database from which the lawyer can develop simple wills and other legal papers without benefit of clerical

help, and small advertising firms that can computerize all client presentation formats, allowing professionals to compose these without clerical help. Conceivably, professional firms could also go in the opposite direction, having the clerical help develop the basic computerized will or presentation, allowing the professional to spend more time on exceptional work.

Nonprofessional offices may find greater productivity in upgrading clerical skills to include some management functions, such as information gathering and organizing, in order to decrease the need for professionals. The small farmer, though reluctant to switch to computers, is finding that the use of computers will aid in generating the cash flow statements and business plans that banks are now demanding.³⁰

The use of a microcomputer for administrative information processing such as accounting/billing forces the manager to develop more organized work habits that will improve efficiency and lower recordkeeping costs. It could also increase effectiveness by permitting more communication with customers and potential customers and a faster response time to customers' needs without a comparable increase in the time and labor required. Income taxes and other Federal paperwork that require a great deal of time could be accomplished with much less stress and time with the aid of a computerized system.

Loss of control of information is a significant problem for the growing business; the use of a computer can alleviate this by allowing the owner/manager to control all records.

Effective use of the equipment purchased will depend on the motivation of the users and on improvement and availability of helping aids such as teaching diskettes and of trained consultants. However, in the effort to minimize costs, the use of trained consultants is most likely to be deferred or eliminated thus reducing the effectiveness of the automation.

²⁶Peter Drucker, "Business Innovation: Our Entrepreneurial Economy," *Current*, May 1984, pp. 14-18. See also, Bruce Phillips, *The Marketing of Small Business by Big Business* (Washington, DC: U.S. Small Business Administration, August 1983).

²⁷Valerie Personick, "The Job Outlook Through 1995: Industry Output and Employment Projected," *Monthly Labor Review*, vol. 106, No. 11, November 1983, pp. 24-36.

²⁸Maureen Nevin Duffy, "Publishing an 'Inside Job' With Today's Technology," *MIS*, Nov. 21, 1984, p. 42.

²⁹Carol Anderson, "SME Word Processing Department," *SME News*, winter 1985.

³⁰"Computers: How Ya Gonna Sell 'Em Down on the Farm?" *Business Week*, Feb. 18, 1985, p. 144.

The use of office automation technologies could aid small businesses in becoming more efficient and effective. However, there is some risk that firms may overburden themselves with debt to make this capital investment, overestimating the benefits or underestimating the time it will take to realize them.

Competitiveness and Scale

A special value of small businesses is that they can serve small, specialized and widely dispersed markets that, in general, large firms would have to aggregate and standardize or ignore in the name of economies of scale. Advanced information technologies may perturb these special niches. They have allowed the financial service industries, for example, to diversify products, tailor them to special needs, and offer them nationwide (e.g., special investment funds); and conversely, by aggregating markets on a greater scale, to offer more standardized products (e.g., mail order life insurance policies with rates determined only by age, and requiring no medical examination). These offerings can intrude on specialized niches formerly filled by small businesses. On the other hand, real estate firms, formerly small and highly localized businesses, have in some cases gone nationwide. Information and communication technologies, by nullifying the barrier of distance and time, can also allow very specialized (and formerly very small) firms to operate in larger markets. To do so, however, will demand a high level of entrepreneurial and management skill that is always difficult to muster in a new or very small business.

Employment and Skills

A general increase in overall economic activity could increase the demand for services, allowing small businesses to expand and/or encouraging the formation of new businesses. The Bureau of Labor Statistics predicts that the miscellaneous service sector, which has a

large share of small businesses, will provide a large proportion of the new job opportunities over the next 15 years.³¹ Many of these service industries, such as hotels, restaurants, educational and medical services are labor intensive and, although already automated to some degree, may not be as heavily impacted by automation as business services.

The Salvate microcomputer survey³² indicated however that 11 percent of the small firms surveyed were able to eliminate employees because of the use of a microcomputer and 59 percent expected to cut back on employment needs in the future. A U.S. Chamber of Commerce survey³³ also showed staff reductions in 11 percent of the respondents' firms and 63 percent reported more efficient use of staff. A 1985 survey by the same organization showed that 16.5 percent of respondents plan to reduce hiring in the future because of automation. Since small business is the largest employment growth area, this could have significant impact on employment opportunities if it is representative of all small firms.

Drennan notes that less skilled labor which used to be concentrated in manufacturing is now concentrated in the service sector.³⁴ He predicts slower growth in clerical jobs in offices, including the business service industry, which is predominantly small businesses.

In the near future, higher level skills than are currently required may be needed by small businesses who wish to automate. However, in the long run, less skilled labor maybe needed as people become familiar with computer equipment in grade/high school and as the equipment becomes more user friendly.

³¹"Employment Projections for 1995" (Washington, DC: U.S. Department of Labor, Bureau of Labor Statistics, Bulletin 2197, March 1984), p. 31.

³²Salvate, op. cit.

³³U.S. Chamber of Commerce, op. cit.

³⁴Matthew P. Drennan, *Conservation of Human Resources* (Washington, DC: U.S. Department of Labor Report, January 1983).

POLICY OPTIONS

The public interest in the health of small business is well established; a strong small business sector prevents overconcentration of economic power and wealth and provides opportunity for the exercise of initiative, innovativeness, independence, and challenge to obsolete industries and firms. Small businesses have also played a major economic role in job creation; training and testing of new workers; serving small, specialized, or dispersed markets; and productively utilizing resources that would otherwise be wasted. As small firms are faced with technological change that may bring about structural changes in their economic environment, the related public policy questions are:

- Will office automation make larger firms more efficient and allow them to participate in small and dispersed markets, putting small business at a further disadvantage? Or can small businesses also use office automation to become more productive and increasingly able to compete with larger firms, in local or in larger markets? To the extent that small businesses adopt office automation, will their important role in creation of new jobs diminish?
- If small businesses do not adopt office automation, will the economic and social benefit that they have provided by training new workers be diminished?

Only if they remain productive and competitive can small businesses continue to create

new jobs, train first-time employees, serve specialized markets, and utilize marginal resources. In the future, this is likely to require them to participate in economy-wide changes in basic technologies-viable small businesses that did not adopt the telephone, the typewriter, electric lighting, and motor vehicles would be difficult to find. Thus, small businesses sooner or later will have to use computers and probably some other office automation.

Congress may therefore wish to consider actions to encourage and assist small businesses with efforts to automate. These actions need not involve major programs or large expenditures since they would be directed only at reducing the problems encountered by very small or beginning firms that have themselves made the decision and taken steps toward improving their productivity. Congress might, for example, urge the Small Business Administration to expand its instructional and counseling services to small entrepreneurs who are considering the use of office automation equipment for the first time. SBA could also provide initial training for employees of very small firms at low cost, or provide a telephone advice and information service to supplement the often inadequate support services available to small computer users through computer stores and vendors. It could provide incentives for banks to provide small low-interest loans for the purchase of computers, software, and maintenance and support.