

Chapter 2

The Use of Computer and Office Technology among New York City's Nonprofit Organizations

Julian Wolpert and John E. Seley

INTRODUCTION

Nonprofit organizations that serve disadvantaged populations are widely perceived to be relatively unsophisticated in their technology planning and laggards in adopting new computer and office technology compared to commercial firms, government agencies, and other nonprofits that serve more affluent clients. These issues are compounded by the smaller share of disadvantaged households that have access to the Internet and hence are more difficult to reach through agency Web sites. The assumed consequences are a lower level of productivity for these nonprofits and underperformance in the scope, quality, and effective delivery of many types of services. Among the proposed remedies for these gaps are the following: more rigorous management evaluation of nonprofit operations, foundation and corporate grants to nonprofits to enable them to carry out a technology plan and upgrade technology levels where appropriate, and more targeted marketing by technology firms.

Are the assumptions about the technology lags valid, and if so, are the gaps pervasive among all types of nonprofits or just those that serve poor people? Is the adoption rate higher for some types of office and computer technology than for others? If the problem of lag is sector-wide, the relevant issue is whether nonprofit organizations have different incentives and constraints than private firms and government agencies in introducing computer technology into their operations. On the other hand, if the lags are largely confined to agencies that serve the disadvantaged, then what special obstacles inhibit the introduction of technology to these organizations?

Alternatively, if computer use varies among nonprofits, are the technology differences primarily between large and small organizations or between recent start-ups and long-established agencies? Or is size less important than type of service activity (e.g., health, hospitals, human services, arts, and education) in affecting the adoption rate for new technology? What does the evidence suggest about how various forms of computer (and office) technology are currently being used by nonprofits? Examination of these issues relative to nonprofit service providers in New York City is the focus of analysis in this chapter.

A framework for assessing investment decisions about computer technology by nonprofits is outlined initially. The framework is based on some of the fundamental differences between nonprofits, private firms, and government organizations that are expected to affect the incentives and constraints for these investments. The framework also recognizes the effects of differences between nonprofit organizations by scale of operations and types of service activity.

The framework is tested with data derived from a study of the 9,078 organizations that comprised New York City's nonprofit sector in 2001–02. The study findings are based on analysis of the 9,078 nonprofits enumerated in the IRS Master Business and Core Files and are supplemented by survey responses, which are dedicated to issues not covered by the IRS data and come from a sample of 3,088 of the organizations, stratified by service sector and size categories (i.e., expenditure levels).¹ The questionnaire probed basic financial information but also included a number of specific questions about service activities and clients, employees and volunteers, management strategies, and use of computer technology. The findings reported here pertain to the factors affecting the variety and level of computer use and the constraints limiting greater use. The final section of the chapter is devoted to the implications of the findings as well as a set of recommendations for encouraging appropriate and cost-effective adoption of suitable computer technology.

INCENTIVES TO COMPUTERIZE

Economic reasoning would suggest that the incentives for computerization, like other investments in private, public, or nonprofit sectors, are consistent with their cost advantages over current, more labor intensive methods of carrying out the organization's tasks. The timing of these investments in computer technology (i.e., the rate of adoption over time) and their costs involve potential gains from

1. The sample responses tested satisfactorily for correspondence against a set of universe characteristics (at significance levels between 95 percent and 99 percent). The responses were then weighted by sector and size to match the universe distribution. Thus, although respondents were not randomly selected, the high response rate (34 percent) and sufficiency of observations in each of the sector and size categories provide ample basis to regard the sample as representative of these categories. The findings reported in the text and tables do provide an accurate characterization of New York City's nonprofit organizations. A more complete description of the survey may be found in Seley, J. E., & Wolpert, J. (2002). *New York City's nonprofit sector*. Toronto, Canada: University of Toronto Press.

substitution of capital investments in computer and office technology for clerical staff (e.g., computer software for tracking expenditures or billing clients). The technology is expected to have the effect of reducing administrative and program costs and/or enhancing the revenue-generating and service capacity of the organization. The latent assumption is that decisions about adoption of computer technology are based on comprehensive knowledge of its advantages for the various operations carried out by the organization.

The use of computers in the private and public sectors (for databases, mapping, Internet, intranet, e-mail, etc.) has become ubiquitous. Even the local hardware store is likely to track inventory with a computerized cash register. But some firms are likely to be quite functional with little or no computer use, while others must constantly upgrade their computer equipment and software to carry out their activities.

Does this economic rationale apply to nonprofits? The potential benefits in cost savings or revenue enhancement from computerization should be at least as great for nonprofits as for comparable private firms and government agencies. Nonprofit organizations should also be able to base their decisions to invest in new equipment and software on a technology plan that enumerates their principal activities and tasks and weighs the cost advantages of computerization over current methods.

External pressures already exist. Many state, county, and municipal agencies now encourage (and some even require) that nonprofits apply by computer for government contracted services. Government agencies have increasingly detailed reporting and computerized record-keeping requirements for their contracts with nonprofits. Furthermore, growing numbers of clients and increased information demands by government agencies, foundations, and other funders require Web sites and databases (e.g., for large nonprofit hospitals or museums) and make time management more essential. Yet many nonprofits have outdated computers and little technical support and primarily confine their utilization to basic functions like e-mail and word processing. The immediate question is whether disincentives to computerize or other more urgent expenditure priorities account for these nonprofits' apparent lag.

CONSTRAINTS INHIBITING COMPUTERIZATION

Unlike the incentives, the constraints in our framework of analysis are assumed (according to generally accepted views among practitioners) to differentiate nonprofit organizations from private firms and government agencies of the same size.

Capital investment for acquisition and maintenance of hardware, purchase of software, and payment of competitive salaries to technical personnel are likely to be more problematic for nonprofits. They do not have the same access to capital markets as corporations do or to special appropriations for equipment as many government agencies do.

Nonprofits generally need to take out loans to cover capital expenditures, such as new hardware.

The pressures are severe for nonprofits to hold down administrative costs for space and equipment, because funders and other contributors are deterred by a high ratio of administrative-to-operating expenditures.

Few nonprofits are able to benefit from tax deductions and depreciation of new equipment.

Nonprofit revenues from government contracts are notoriously tight, rarely even covering programming costs, and seldom flexible enough to allow for purchase of equipment. Nonprofits serving disadvantaged populations are overwhelmingly supported by revenues from government contracts.

Very few foundation grants to nonprofits are targeted for office or computer technology.

Nonprofits often acquire used equipment through gifts from corporate donors but generally without accompanying grants for training or technical support.

Providing employment for unskilled people is part of the agenda for many nonprofits and may conflict with the drive for labor-saving technology.

Cost savings from use of office and computer technology are less for nonprofits because their salaries and benefits are generally significantly lower.

Volunteers are available to perform various clerical and administrative functions for nonprofit organizations. Volunteers are unlikely to have technology skills.

Direct personal contact is very important for many types of nonprofits whose clients include the elderly, recent immigrants with little command of English, and the mentally and physically handicapped. Computer technology that depersonalizes interactions is dysfunctional for these agencies.

Fund-raising for major gifts and recruiting of new trustees also requires person-to-person contact that can be only marginally assisted with computer software.

Combining the likely incentives and constraints for various forms of office and computer technology yields a mixed picture for different types of nonprofit organizations. Those that carry out primarily administrative and fund-raising activities are assumed to behave much like private firms in adopting new technology with only a modest lag. Very large nonprofit organizations (e.g., universities, hospitals, museums, etc.) are likely to keep pace with private firms of the same size. Smaller organizations, especially those providing social and community-development services to disadvantaged groups are expected to lag significantly behind the others.

TECHNOLOGY USE BY NEW YORK CITY'S NONPROFITS

Focus group discussions with representatives of nonprofit organizations prior to the survey suggested that many nonprofits had not introduced appropriate com-

puter technology as rapidly and comprehensively as comparably sized for-profit firms.

Nonprofits felt they were losing ground and falling behind the private sector and government in the use of advanced computer technology in their operations.

They reported difficulty in purchasing expensive new equipment and software and in their ability to hire qualified technical personnel.

In preparation for our survey of nonprofits, we expected to find significant variation by nonprofit service sector and size in the adoption of new computer technology for different purposes, in recognition of its benefits, and in financial and other obstacles to its greater use.

The 2000 survey stratified by organization expenditure levels and service sector probed for the following:

Current use of fax, copiers, e-mail, networked computers, Web sites, voice mail, etc.

Attitudes about the utility of computer technology and adequacy of current technology and trained staff to use available technology

Benefits to service users of greater use of technologies, such as Web site, etc., and

Reasons for not upgrading their technology

The survey findings (tables 2.1–2.8) revealed the following:

1. Office machines, such as fax and copiers, were used by virtually all nonprofits, while 77 percent used e-mail, 65 percent made use of networked computers, and 70 percent used voice mail (see table 2.1).
2. A smaller share of organizations (58 percent) had their own Web site or used cellular phones or beepers (48 percent) (see table 2.1). Among the various service sectors, adoption of computer technology is most pervasive among health organizations and least common for the supporting organizations (i.e., management of trusts and funds for various domestic and overseas charitable causes).
3. The most pronounced differences in both office machinery and computers occurred between the small and large nonprofits (see table 2.2).
4. Only a small share of those organizations with annual budgets less than \$100,000 had networked computers (21 percent), their own Web sites (43 percent), or access to cellular phones or beepers (13 percent). However, many more of these smaller organizations had copiers and fax machines and used e-mail. On the other hand, virtually all of the largest organizations used all the listed forms of technology (see table 2.2).
5. A very high proportion of nonprofits currently use computers for correspondence and reports, for budgets, and to manage databases (see table 2.3).

6. Computer use is substantially less for marketing and advertising and online purchasing or submission of funding applications (see table 2.3).
7. Only 19 percent of nonprofits fund-raise over the Internet (see table 2.3).
8. The differences in computer use, not unexpectedly, are much greater between the smallest and larger nonprofits than between service sectors (see tables 2.3 and 2.4). The variations by service sector were not significant.
9. Sixty-five percent of organizations (and a higher share of those in the arts, public benefit, and education sectors) reported that a Web site would enable them to improve service to users (see table 2.5).
10. Forty-two percent (and a larger share among education organizations) felt that use of e-mail would enhance their services (see table 2.5).
11. Almost as many organizations as supported e-mail favored greater use of Internet access, especially among health and education nonprofits (see table 2.5).
12. Greater use of computer databases for billing, accounting, and other purposes and use of telephone answering machines was favored by approximately one-quarter, especially among health and human service groups (see table 2.5).
13. Almost three-quarters of the organizations maintain that their computer technology is adequate (see table 2.6). However, a vast majority of even the smallest organizations reported that computers and office technology have a lot to offer and would enable them to improve the services they provide (see table 2.6).
14. The respondents were quite uniform in reporting (almost 94 percent) that financial constraints are the major barrier that prevents them from upgrading their technology (see table 2.7).
15. About one-quarter maintained that they lacked expertise (24 percent) or employee time (29 percent) to learn or use a new system (see tables 2.7 and 2.8).

Table 2.1 Use of technology, by service sector

Service sector	Fax	Copiers	E-mail	Networked computers	Own Web site	Cellular phones/beepers	Voice mail	Total
Arts	90%	90%	85%	59%	69%	28%	68%	100%
Education	96%	97%	75%	71%	56%	37%	70%	100%
Health	99%	98%	84%	82%	60%	72%	83%	100%
Human services and religious	91%	93%	69%	62%	45%	58%	65%	100%
Public benefit	93%	93%	86%	79%	69%	53%	83%	100%
Supporting organizations	82%	91%	70%	36%	60%	22%	51%	100%
All	92%	94%	77%	65%	58%	48%	70%	100%

Refer to footnote 1 in the text for details about the sample size and reliability.

Table 2.2 Use of technology, by size of organization

Annual expenditures (\$)	Fax	Copiers	E-mail	Networked computers	Own Web site	Cellular phones/beepers	Voice mail	Total
\$25,000–\$100,000	74%	87%	60%	21%	43%	13%	45%	100%
\$100,000–\$500,000	88%	87%	74%	52%	53%	33%	57%	100%
\$500,000–\$1 million	98%	94%	72%	68%	56%	40%	68%	100%
\$1 million–\$5 million	99%	98%	84%	77%	55%	53%	81%	100%
\$5 million–\$10 million	100%	100%	80%	89%	64%	77%	79%	100%
\$10 million +	99%	99%	88%	93%	73%	77%	89%	100%
All	92%	94%	77%	65%	58%	48%	70%	100%

Refer to footnote 1 in the text for details about the sample size and reliability.

Table 2.3 How computers are used, by service sector

Service sector	Correspondence and reports	Budgets	Databases/inventory	Marketing and advertising	Purchasing online	Filing applications online	Fund-raising over the Internet	Total
Arts	91%	91%	85%	76%	37%	38%	24%	100%
Education	95%	92%	90%	59%	40%	32%	15%	100%
Health	98%	100%	97%	63%	41%	32%	20%	100%
Human services and religious	94%	88%	88%	51%	31%	34%	20%	100%
Public benefits	94%	84%	89%	67%	40%	33%	21%	100%
Supporting organizations	100%	82%	75%	57%	26%	9%	15%	100%
All	95%	89%	88%	61%	35%	30%	19%	100%

Refer to footnote 1 in the text for details about the sample size and reliability.

Table 2.4 How computers are used, by size of organization

Annual expenditures (\$)	Correspondence and reports	Budgets	Databases/inventory	Marketing and advertising	Purchasing online	Filing applications online	Fund-raising over the Internet	Total
\$25,000–\$100,000	92%	78%	66%	50%	12%	17%	9%	100%
\$100,000–\$500,000	94%	83%	91%	60%	36%	32%	19%	100%
\$500,000–\$1 million	92%	82%	86%	53%	25%	22%	6%	100%
\$1 million–\$5 million	98%	96%	91%	66%	40%	37%	21%	100%
\$5 million–\$10 million	98%	98%	93%	57%	47%	33%	26%	100%
\$10 million +	99%	99%	98%	69%	49%	36%	28%	100%
All	95%	89%	88%	61%	35%	30%	19%	100%

Refer to footnote 1 in the text for details about the sample size and reliability.

Table 2.5 Technology that could improve service, by service sector

Service sector	Web site	E-mail	Internet access	Databases	Telephone answering systems
Arts	84%	44%	29%	28%	22%
Education	76%	55%	47%	24%	15%
Health	61%	41%	40%	37%	33%
Human services and religious	56%	37%	41%	27%	26%
Public benefits	75%	41%	34%	14%	15%
Supporting organizations	45%	44%	7%	28%	22%
All	65%	42%	34%	27%	23%

Refer to footnote 1 in the text for details about the sample size and reliability.

Table 2.6 Additional benefits from computers, by service sector

Service sector	Little to offer		Improve services		Lack trained employees		Technology is adequate	
	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree
Arts	96%	4%	3%	97%	44%	56%	27%	73%
Education	95%	5%	8%	92%	65%	35%	27%	73%
Health	99%	1%	5%	95%	51%	49%	38%	62%
Human services and religious	95%	5%	8%	92%	48%	52%	29%	71%
Public benefit	97%	3%	7%	93%	62%	38%	27%	73%
Supporting organizations	100%		8%	92%	47%	53%	20%	80%
All	97%	3%	6%	94%	52%	48%	28%	72%

Refer to footnote 1 in the text for details about the sample size and reliability.

Table 2.7 Reasons for not upgrading technology, by service sector

Service sector	Not enough financial resources	Not enough expertise	Not enough employee time to learn a new system
Arts	94%	22%	27%
Education	91%	34%	31%
Health	93%	19%	17%
Human services and religious	94%	29%	29%
Public benefit	95%	17%	18%
Supporting organizations	97%	22%	55%
All	94%	24%	29%

Refer to footnote 1 in the text for details about the sample size and reliability.

Table 2.8 Reasons for not upgrading technology, by size of organization

Annual expenditures (\$)	Not enough financial resources	Not enough expertise	Not enough employee time to learn a new system
\$25,000–\$100,000	97%	10%	36%
\$100,000–\$500,000	95%	26%	31%
\$500,000–\$1 million	93%	41%	36%
\$1 million–\$5 million	93%	31%	22%
\$5 million–\$10 million	100%	18%	9%
\$10 million +	91%	23%	24%
All	94%	24%	29%

Refer to footnote 1 in the text for details about the sample size and reliability.

TECHNOLOGY USE AMONG NONPROFITS WITH TARGETED CLIENT GROUPS

The survey of New York City's nonprofits also addressed issues such as the major client groups targeted for services. Questionnaire responses enable us, therefore, to examine computer and office technology use among agencies in all the size and service categories that primarily serve households with income below the poverty line, recent immigrants, the mentally and physically challenged, Afro-Americans, and Latinos. Comparisons can then be made with the control totals for all client groups (including children, seniors, non-Hispanic whites, etc.) and between each of the enumerated targeted populations listed above. The operating assumption is that nonprofits primarily serving low-income, minority populations lag behind other agencies in adopting office and computer technology.

The findings show the following:

1. The agencies targeting these five client groups have consistently greater access to major forms of office and computer technology than the control totals for all agencies (see table 2.9). Furthermore, the differences in both

Table 2.9 Share of nonprofits without access to office technology that target specific client groups

	Share of nonprofits that target specific client groups					Control totals
	< Poverty level	Immigrants	Mentally/ physically challenged	Black	Latino	
Fax	0%	2%	1%	0%	1%	8%
Copiers	4%	3%	1%	4%	2%	6%
E-mail	3%	5%	6%	6%	5%	23%
Networked computers	12%	19%	12%	13%	15%	35%
Own Web site	27%	28%	29%	22%	21%	42%
Cell phone/beepers	15%	21%	7%	17%	16%	52%
Voice mail	19%	19%	13%	14%	17%	30%

Refer to footnote 1 in the text for details about the sample size and reliability.

office and computer technology between these agencies are relatively small.

- Relative to the control totals, agencies targeting these five client groups were less likely than the control totals to report that “our technology is adequate” (see table 2.10). They were also somewhat less likely to suggest that “computers can improve our services” and “we lack trained employees.” The agencies servicing recent immigrants were more likely than the others to indicate shortcomings in use of computers relative to a more desirable level of use.

Table 2.10 Agreement on potential benefits from computer use

	Share of nonprofits that target specific client groups					Control totals
	< Poverty level	Immigrants	Mentally/ physically challenged	Black	Latino	
Computers have little to offer us	5%	2%	4%	5%	1%	3%
Computers can improve our services	86%	93%	87%	88%	91%	94%
We lack trained employees	39%	44%	34%	37%	40%	48%
Our technology is adequate	56%	42%	52%	61%	57%	72%

Refer to footnote 1 in the text for details about the sample size and reliability.

- The agencies targeting the five client groups were generally on par with the control totals in the ways that computers have been used (see table 2.11). The shares were somewhat higher for these agencies in “filing applications online” and “fund-raising on the Internet.”

Table 2.11 How computers are used

	Share of nonprofits that target specific client groups					Control totals
	< Poverty level	Immigrants	Mentally/ physically challenged	Black	Latino	
Correspondence/reports	93%	92%	95%	93%	95%	95%
Budgets	89%	93%	96%	89%	90%	89%
Databases/inventory	90%	91%	95%	91%	92%	88%
Marketing/advertising	58%	54%	50%	63%	62%	61%
Purchasing online	43%	45%	37%	39%	40%	35%
Filing applications online	39%	38%	30%	35%	35%	30%
Fund-raising on Internet	24%	19%	24%	26%	25%	19%

Refer to footnote 1 in the text for details about the sample size and reliability.

- Among the different ways that technology could improve service to clients, agency responses from those primarily serving the targeted clients were generally similar to the control totals (see table 2.12). However, somewhat

Table 2.12 Technology that could improve service to clients

	Share of nonprofits that target specific client groups					Control totals
	< Poverty level	Immigrants	Mentally/ physically challenged	Black	Latino	
Web site	51%	60%	64%	57%	57%	65%
E-mail	33%	45%	47%	42%	45%	42%
Internet access	35%	42%	42%	37%	40%	34%
Databases	27%	33%	42%	26%	30%	27%
Telephone answering systems	21%	28%	31%	20%	22%	23%
No need for more technology	15%	13%	7%	12%	10%	12%

Refer to footnote 1 in the text for details about the sample size and reliability.

smaller shares pointed to improvements through enhanced Web sites, especially among agencies targeting their services to households below the poverty line. Very few agencies indicated “no need for more technology.”

- The agencies targeting services to the five client groups were much less likely than the control totals to identify insufficient financial resources, expertise, or employee time as reasons for not upgrading their technology systems (see table 2.13). These deterrents were, however, more prominent for agencies serving recent immigrants.

Table 2.13 Reasons for not upgrading technology systems

	Share of nonprofits that target specific client groups					Control totals
	< Poverty level	Immigrants	Mentally/ physically challenged	Black	Latino	
Not enough financial resources	66%	76%	61%	65%	69%	94%
Not enough expertise	17%	24%	15%	19%	19%	24%
Not enough employee time for training	19%	25%	14%	17%	21%	29%

Refer to footnote 1 in the text for details about the sample size and reliability.

SUMMARY AND DISCUSSION

Our data and the findings of others do not permit direct and rigorous comparisons of the onset, rates of adoption, and ceilings in use of computer and office technology between nonprofit agencies and comparable private and public sector organizations. Theory and an understanding of the relative contexts of investment decisions in the three sectors would suggest a significant nonprofit lag. The lag is likely translatable into somewhat reduced administrative productivity that may or may not affect the cost-efficiency of services to clients. This issue of possible

underinvestment in technology must be probed through a comprehensive comparative study.

Findings from the analysis of New York City's nonprofits demonstrated rather widespread adoption of computer and office technology, especially among the larger organizations (e.g., hospitals, arts and cultural institutions, colleges, and comprehensive social services agencies), in each of the service categories. Among the smaller nonprofits, technology use favored the least demanding office and computer equipment and software in terms of cost and complexity.

Nonprofits that target their services primarily to disadvantaged groups (defined here as below the poverty line, minority, physically or mentally challenged, and recent immigrants) tended to be better equipped with office and computer equipment and more pervasive users than the control totals of all nonprofit agencies. These organizations receive much higher shares of their revenues from government contracts. Conversion to computer and office technology has proven to be both programmatically necessary and financially feasible for the contract recipients. Improved technology, especially in financial management, has served not only as a prerequisite for obtaining government or foundation assistance but also as a stimulus for improved client services and broadening of fund-raising capacity.

More recently established and smaller neighborhood-based agencies without government assistance that target their services to disadvantaged groups typically lack the financial resources and staff to benefit significantly from improved technology. They need to establish a good track record of service provision and thereby enlarge and diversify their funding sources to ensure their survival before developing a technology plan and investing in equipment. Foundation and corporate technology grants for equipment and software could be used most advantageously to fund fledgling nonprofits that are providing the most innovative and effective services to disadvantaged populations. Such grants could also enhance the prospects of these organizations to compete for government service contracts.

New York City's nonprofits are making functional decisions regarding the adoption of new computer technology. More detailed survey analysis would enable us to probe more deeply into their decisions at the margin (i.e., would additional resources devoted to technology and staff training help the organization and its clients more than other expenditures, such as improved staff salaries and benefits, reduced reliance on volunteers, or better facilities?).