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Technical Note: Desktop Management in Practice

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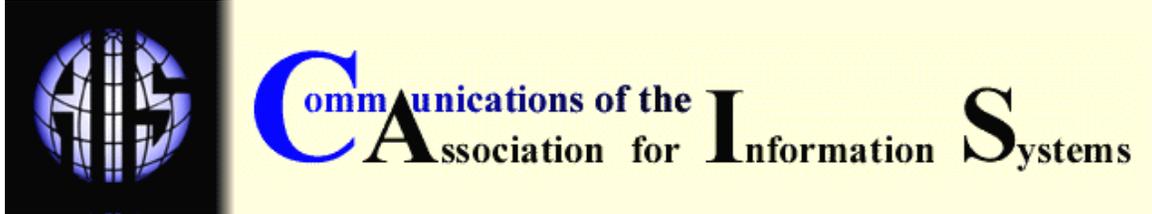
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TECHNICAL NOTE:
DESKTOP MANAGEMENT IN PRACTICE

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ABSTRACT

Desktop management is the set of activities employed to manage distributed IT resources within an organization. Reports from the late 1990s indicated that desktop management was not widely used.   This article presents the results of a survey about the extent to which desktop management functions and policies are currently implemented in practice and about the perception of the benefits of desktop management. The primary conclusion of this technical note is that desktop management, despite moderately favorable perceptions of its benefits, is still not extensively implemented. However, when our data are evaluated relative to earlier reports, it appears that the level of implementation increased somewhat between 1998 and 2002.

Keywords: desktop management, asset management, cost of ownership

I. INTRODUCTION

In August 2002, investigators from the Justice Department's Office of the Inspector General announced that at least 40 laptops from the FBI, DEA, and US Marshall's Service were missing, lost, or stolen [McCullagh, 2002]. Earlier reports indicated that the IRS lost or misplaced over 2000 laptops, desktops, and servers over a three-year period [McCullagh, 2002]. In October 2002 Verton [2002] reported that the United States Navy could not account for at least 595 laptops, some of which contained classified data.

IS professionals are routinely confronted with viruses that attack vital organizational assets. The Code Red worm infected over 359,000 Web servers in less than fourteen hours in 2001 by exploiting vulnerabilities in Microsoft software [FoundScan, 2002]. Even though Microsoft released a patch a month before the virus struck, apparently only a few organizations installed it [Skoudis, 2002]. By updating server software with patches that are readily available, 90 percent of worm invasions are preventable [Allen, 2003].

The incidents described in the previous two paragraphs can be mitigated if organizations practice effective "desktop management."   Desktop management consists of the systematic activities

performed by IS professionals to manage the hardware and software resources associated with personal computers, mobile computing devices, and local area network servers throughout an organization [Bradbard and Lewis, 2002].

Few previous investigations examined desktop management in practice. The studies that do exist are from the trade literature and do not report extensive data. In 1997, Comdisco Inc. developed the Desktop Management Index to assess standards and practices in desktop management [Miller, 1999]. The survey resulting from this 1998 exercise queried companies on a number of desktop management issues; industry response to the survey was good, and it was conducted again in 1999. In general, the results from both surveys indicated that desktop management was not being used widely [Kay, 1999]. A survey of 500 companies in 1998 found that only 49 percent of them used any desktop management practices and 27 percent had not addressed the topic at all [Essex, 1999]. Sager and McWilliams [1995] described numerous anecdotal cases and concluded that logistical knowledge of distributed corporate IT resources was minimal.

Thus, desktop management offers the opportunity to reduce problems associated with distributed IT resources, but as of the late 1990s the practice was not used extensively. The question is, now that the Y2K issue is settled and the mad dash to create e-commerce sites slowed, have companies turned more attention to desktop management? The purpose of this article is to address that question by reporting the results of a survey conducted in 2002 about

- the extent to which desktop management is implemented, and

- the perception of the benefits of desktop management.

This article is a follow up to Volume 8, Article 6 published by the authors in this journal in February 2002 [Bradbard and Lewis, 2002] in which we discussed the desktop management issue from a conceptual viewpoint. In this paper we begin with a brief review of the concepts presented in the previous article (Section II). Sections that follow describe the results of a survey to determine the status of desktop management and conclusions drawn from the findings.

II. THE DESKTOP MANAGEMENT CONCEPT

Desktop management in practice focuses on [Bradbard and Lewis, 2002]:

- the software tools that enable and facilitate the functions of desktop management,

- the managerial policies associated with the discipline of desktop management, and

- the benefits of desktop management.

DESKTOP MANAGEMENT FUNCTIONS

Desktop management software performs the following seven functions:

- Inventory management
- Configuration management,
- Remote software distribution,
- Fault and performance management

- Security management
- Help desk assistance
- Software metering
:

Table 1 presents examples of each of these functions.

Table 1. Management Software for Desktop Management

Desktop Management Software	Examples
Inventory management	As devices are added or removed from the firm, the inventory is updated. As hardware is upgraded the inventory is updated. When an asset changes location the inventory is updated.
Configuration management	When new hardware is added to a PC, configuration parameters automatically adjust. Remote retrieval of configuration data. New configurations can be automated and made repeatable.
Remote software installation	Upgrade an OS to a new version. Install a new OS. Upgrade an application. Install a new application.
Fault and performance management	Provide early warnings of an impending failure of a PC component. Automatically correct faults when they occur. Automatically identify faults and alert the appropriate person, restart systems. Performance tuning. Capacity planning.
Help desk assistance	Determine the source of hardware and software problems. Share solutions to problems. Remote retrieval of inventory and configuration data.
Security management	Prevent access to information by unauthorized persons. Prevent unauthorized changes in configuration. Prevent theft of the PC or any components. Monitor for the intrusion of a virus.
Metering software	Track concurrent usage so that software licenses are not violated. Track usage so that the proper number of licenses is purchased.

Inventory Management

Developing an inventory of all the hardware and software assets owned and leased by the firm is the usual starting point for desktop management. This function is one that is common in most of the desktop management tools since several of the other functions are dependent on the contents of this inventory. Black [1996] and Husselbaugh [1995] noted that this function involves establishing a baseline inventory and maintaining it perpetually. The contents of the inventory should include data on the assets themselves, asset ownership, and asset contracts [Kay, 1999].

Configuration Management

This activity involves the user settings and preferences on a particular personal computer. For example, in a Windows environment, configuration management would include information in the registry. As machines are installed or moved, standard or individualized configuration settings can be installed remotely. Information about a machine's configuration is available in the inventory database or can be accessed remotely from the individual PC. Support personnel can use this information to perform remote troubleshooting without visiting the user's location.

Remote Software Installation

The installed software will change during the lifetime of a personal computer either because new software is installed or an existing version of an operating system or application software is

upgraded. A common feature in desktop management tools is the ability to install or upgrade either an operating system or application software remotely. This tool works in conjunction with the inventory database and can determine whether an individual machine contains the necessary hardware requirements (e.g., main memory, disk space) for the upgrade. Support specialists can install or upgrade software for several hundred machines in several hours without ever leaving their office. Other changes that can be supported are remote modification, repair, and software removal.

Fault And Performance Management

Fault and performance management are related to monitoring the performance of various hardware components in a computer proactively. Through this type of activity, failures in hardware components, such as memory or a hard drive, can be predicted. This approach protects end users from catastrophic data loss or unexpected down time. When problems are detected, information can be sent to desktop management tools, which then can send an alert for display on a client or server monitor.

Help Desk Assistance

The help desk contributes to desktop management by enabling support personnel to troubleshoot user problems remotely by accessing problem incidents and data from the perpetual inventory that accurately describes the hardware and software environment of the user's machine. Armed with this information, the support specialist can assist a remote user more effectively.   In addition, desktop management applications often enable the support specialist to take over the user's monitor and guide the user to a solution.

Security Management

Security in today's distributed environment is a significant part of desktop management. Major threats include viruses, accidental loss of data, unauthorized access to data, theft of personal computers or their components (e.g., memory and processors), unauthorized transfer of data, or unauthorized copying of data. Protection from viruses can be achieved by installing virus detection software on servers and clients. Automated backups of hard drives to a network server can protect users from accidental loss of data. Other threats can also be deterred. For example, systems can detect unauthorized intrusions to the computer's chassis, power-on passwords, disable transfers of data to portable storage mediums (e.g., a floppy, Zip disk, or CD), or disable transfers via a serial or parallel port so that information cannot be transferred via a modem.

Software Metering

Firms usually license application software from the software vendor. These licensing agreements come with specific restrictions and limitations on the number of copies that can be used by the purchaser. A firm that fails to manage the number of copies may be purchasing far too many licenses or they may deploy more copies than their license permits. In the latter case, the firm could be guilty of software piracy and subject to penalties and fines if prosecuted. Mismatches in the proper number of licenses often occur as a result of the relocation of PCs to different users. The tools in this category are designed to monitor software usage so that these problems do not occur.

DESKTOP MANAGEMENT POLICIES

Desktop management is more than just using a set of software tools. It also involves a significant amount of coordination and organizational change, typically affecting corporate-wide policies and involving both the information systems department and functional business areas [Bradbard and Lewis, 2002].

Corporate-wide Policies

Effective desktop management can require firms to adopt and enforce hardware, software, and configuration standards; centralized purchasing; and restrictions on downloading software from the Internet. Because these policies have implications beyond the information systems area, they

require both the support of the organization's top-level executives and sufficient resource allocation.

The Information Systems Department

Issues about desktop management within the information systems department typically include the process of building and supporting an inventory database and determining desktop management software requirements. Likewise, decisions must be made about implementing desktop management with existing staff or by outsourcing.

Functional Business Areas

The data in the desktop inventory contains valuable information for various functional areas within the organization. It is particularly important that the data in the inventory are available to areas such as procurement, accounting, and human resources [Shoup, 2000). Policies and procedures are needed to ensure that the appropriate asset data are entered, maintained, and audited within the inventory, and that inventory data are appropriately accessible.

DESKTOP MANAGEMENT BENEFITS

The literature [see Bradbard and Lewis, 2002 for a review] suggests that desktop management leads to benefits in three areas:

- reduced total cost of ownership (TCO),

- improved user productivity, and

- enhanced competitive advantage.

These benefits are not mutually exclusive, but all ultimately translate into tangible or intangible cost savings.

Reduced Total Cost of Ownership

The Gartner Group [Simpson, 1997] estimated that 80 percent of TCO is determined by labor-intensive tasks related to administration and support. Each desktop management application discussed can reduce this labor component. Estimates by the Gartner Group of savings from desktop management, ranging from 5 to 35 percent, appear in several sources [Shoup, 2000; Simpson; 1997].   Kay [1999] cited a survey of companies that found average savings of 10 percent, and Helm [1998] estimated that desktop management could cut the IS budget by 25 percent. The overall trend is clear: desktop management reducesTCO**.**

Improved User Productivity.

Desktop management improves end user productivity in three ways:

1. The software tools reduce the time needed to respond to end-user problems. Responsiveness improves because support personnel can access either the user's machine or information about the user's machine remotely, thus speeding problem resolution,

2. The tools reduce downtime, i.e., the frequency and duration of events that disrupt end user activity. This reduction of disruptive events results mainly from configuration management, fault/performance management, remote software installation, and security management, and

3. The tools provide support personnel with information to serve end user needs better. For example, remote software installation enables the scheduling of automated software installation at times that will not disrupt the end user's work schedule.

Enhanced Competitive Advantage

Desktop computer systems, including laptops and PDAs, are typically an integral part of information systems designed to gain a competitive advantage. Although not the main reason for their success, desktop management contributes to the deployment of strategic systems.[Borck, 1999; Inacom, 2000; Kay, 1999; Miller, 1999].   Consider, for example, a firm implementing a sales force automation system that involves equipping a multinational sales force with laptop computers. The firm's ability to deploy and support this system quickly and economically can enhance the firm's chances of gaining a competitive advantage.   With effective desktop management practices, the firm ensures that it is able to implement this system more quickly than its competitors.

III. THE STATUS OF DESKTOP MANAGEMENT

To assess the extent to which desktop management is implemented and the benefits that organizations perceive from their desktop management efforts, a survey was conducted in the second half of 2002. The four-page survey instrument (Appendix I) addressed each of the seven functions of desktop management presented in Section II and the policies and benefits relating to the implementation of desktop management.   One thousand large U.S. companies were randomly selected and the survey was sent to one contact in each company, either the microcomputer manager or the top IS executive. In both cases, the respondent was asked to complete the questionnaire or pass it along to the most appropriate person in the company.

After two mailings and a series of follow-up phone calls, 44 usable questionnaires were returned. Since some addresses were invalid, this sample represented approximately a five percent response rate. The demographics of the respondents and their firms were as follows:

- Respondents
  - 40 (91%) were IT managers, the remaining 4 (9%) were group managers
  - 35 (80%) had been in the IT field for over 10 years, the other 9 (20%) less than 10 years
- Firms
  - 15 (34%) were manufacturing firms, 7 (16%) were financial, 6 (14%) were health care, the remaining 16 (36%) were communications, transportation, retailing or other
  - 16 (36%) firms employed more than 10,000 employees, 10 (23%) employed 5001 – 10,000, 15 (34%) employed 1000 – 5000, the remaining 3 (7%) employed less than 1000 employees
  - IT architecture
    - 33 (75%) firms employed more than 100 IT employees
    - 31 (70%) firms supported three or more hardware platforms (desktops)
    - 32 (73%) firms supported three or more desktop operating systems
    - 15 (34%) firms supported three or more network operating systems
    - 43 (98%) firms supported an enterprise network
    - 40 (91%) firms owned or leased 1000 or more desktop PCs
    - 13 (30%) firms owned or leased 1000 or more laptops and/or PDAs
    - 25 (57%) firms owned or leased at least 200 servers

The frequency and percent of the responses on each demographic item are presented in Appendix I.

DESKTOP MANAGEMENT FUNCTIONS

Following the first page, which contained the demographic items, the survey instrument was divided into three parts, relating to:

1. Desktop management functions,
2. Desktop management policies, and
3. Desktop management benefits.

In the first part, respondents were asked to indicate the extent to which activities in each of the seven desktop management functional areas were implemented within their organization, on a six-point scale (*1 = Not At All, 2 = Very Little Extent, 3 = Little Extent, 4 = Some Extent, 5 = Great Extent, 6 = Very Great Extent*). A summary of these results, ordered in decreasing sequence of the magnitude of the response means in each functional area, is shown in Table 2. The frequency and percent distributions for each of these items are reported in Appendix I.

The item means presented in Table 2 indicate the extent of implementation of 21 specific desktop management activities across seven functions. The last question in Table 2, asked the respondents specifically to indicate the extent of implementation of a desktop management program in their firm; the mean response on this last question was 4.12 (with a standard deviation of 1.07). On this question 31 (70%) of the respondents reported that desktop management was implemented in their company to some exent or more (i.e., response 4, 5, 6). Of the remaining 12 responses, 3 (7%) of the respondents indicated very little implementation (response of 2) and 9 (21%) indicated little implementation (a response of 3). None of the respondents reported that no desktop management activities were implemented (a response of 1) within their company.

Although the mean for the overall implementation of a desktop management program is 4.12 indicating "some extent," only six of the 21 item means indicate implementation to some extent or more (a response of 4, 5, or 6). These items include the following functions: software to prevent the introduction of viruses; software to track the source of desktop problems; software to share solutions to desktop problems; software to remotely install, upgrade, or remove application software; software to prevent unauthorized access to information on desktop devices; and software to track usage of licensed software.

Note that 10 of the 21 item means are between 3 and 4 which indicates that these functions were implemented from "little extent" to "some extent"; all of the inventory management items are in this range. The means of the remaining six items are between 2 and 3 which indicate that these functions were implemented only from "very little extent" to "little extent." Three of the items in this range are related to the fault and performance management function.

DESKTOP MANAGEMENT POLICIES

The second part of the instrument dealt with policies related to desktop management practice. The respondents were asked to indicate the extent to which these policies were implemented within their organization, on the same six-point scale. A summary of these results is provided in Table 3; the complete frequency/percent distributions for these items are shown in Appendix I.

Most of the responding firms reported a centralized purchasing operation for desktop hardware and software, indicating that this was implemented to a great extent. Likewise, IS/IT management and senior management support for desktop management, various data collected about desktop assets, written standards for personal computer hardware and software, and an identification procedure and reports for desktop assets were well in place in the respondent group. Commercial software for desktop management activities was implemented to some extent and was clearly more predominant than in-house developed software. Outsourcing desktop management was not a common approach in the respondent firms, with 82% of the respondents indicating that they did not outsource.

Table 2. Extent of the Implementation of Desktop Management Functions

Functional Category Desktop Management Activity	MEAN / STD Extent Implemented (1=not at all . . . very great=6)
Inventory Management	
Software is used to update the inventory when hardware or software is changed or upgraded	3.95 / 1.46
Software is used to update the inventory as assets are added and removed from the firm	3.93 / 1.56
Software is used to update the inventory when the physical location of hardware changes	3.57 / 1.69
Configuration Management	
Software is used to remotely retrieve configuration data from desktop devices	4.02 / 1.53
Software is used to automatically update configuration changes to desktop devices	3.80 / 1.62
Remote Software Installation	
Software is used to remotely install, upgrade, or remove application software	4.16 / 1.54
Software is used to remotely install, upgrade, or remove operating systems	3.32 / 1.68
Fault and Performance Management	
Software is used to provide early warnings of an impending failure of hardware components	3.11 / 1.60
Software is used to automatically correct faults when they occur or send out an alert	2.89 / 1.58
Software is used to monitor and tune the performance of desktop assets	2.73 / 1.56
Software is used to collect performance data to aid in capacity planning	2.66 / 1.48
Help Desk Assistance	
Software is used to allow the help desk to track the source of desktop problems	4.20 / 1.37
Software is used to allow the help desk to share problem solutions for user support	4.16 / 1.48
Software is used for remote retrieval of inventory or configuration data	3.73 / 1.69
Security Management	
Software is used to prevent the introduction of a viruses on servers and desktop devices	5.66 / 0.65
Software is used to prevent unauthorized access to information on desktop devices	4.11 / 1.66
Software is used to prevent unauthorized changes to configurations of desktop devices	3.84 / 1.51
Software is used to provide notification of system tampering on desktop devices	3.05 / 1.49
Software is used to prevent theft of desktop assets	2.55 / 1.59
Software Metering	
Software is used to track usage so that the proper number of licenses is purchased	4.02 / 1.56
Software is used to track concurrent usage so that software licenses are not violated	3.36 / 1.73
Overall, to what extent has your firm implemented a desktop management program?	**4.12 / 1.07**

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Table 3. Extent of the Implementation of Desktop Management Policies

Desktop Management Policy	MEAN / STD Extent Implemented (1=not at all . . . very great=6)
A centralized purchasing function is used for desktop hardware and software	5.07 / 1.09
IS/IT management supports desktop management efforts	5.02 / 1.07
Static data is collected about the asset (e.g., manufacturer name, model #, serial #, price)	4.89 / 1.22
Written standards are in place for the firm's personal computer hardware and software	4.86 / 0.96
There is a computerized database of the static, demographic & component data for the assets	4.68 / 1.36
Component data is collected about the asset (e.g., installed software, processor, RAM)	4.68 / 1.27
Demographic data is collected about the asset (e.g., location, user name, department)	4.64 / 1.31
The firm's senior management supports desktop management efforts	4.64 / 1.31
A labeling/identification scheme is used for all of the firm's desktop assets	4.61 / 1.33
Software is used to generate reports from the desktop asset database	4.43 / 1.52
Procedures are in place to capture & record changes to the demographic and component data	4.12 / 1.37
Software is used that automatically scans the component data and records changes	4.11 / 1.73
Commercial desktop management software is used for desktop asset management activities	4.05 / 1.71
Resources are available to insure that an accurate inventory of desktop assets is maintained	3.89 / 1.51
An auditing process is in place to determine the accuracy of the desktop asset database	3.86 / 1.46
A process is in place to reconcile the desktop asset database if an audit finds inaccuracies	3.59 / 1.55
Operating system features are used for desktop asset management activities	3.57 / 1.50
Procedures are in place to monitor leasing contracts for desktop hardware and software	3.42 / 2.00
A tracking scheme is employed to monitor the state of a desktop asset over time	3.35 / 1.62
Desktop management tools that were developed in house are used for desktop asset management	2.63 / 1.80
An outsourcing service is used for desktop asset management	1.77 / 1.68

DESKTOP MANAGEMENT BENEFITS

The third part of the instrument was concerned with the benefits that the respondents attributed to desktop management in their firms. The respondents were asked to indicate the extent of the benefit for each of the seven desktop management functions in each of the three benefit categories (reduced TCO, improved user productivity, enhanced strategic planning). Again, the same six-point scale was employed. A summary of these results is reported in Table 4; the frequency/percent distributions for these items are provided in Appendix I.

Table 4. Extent of the Implementation of Desktop Management Policies

Benefit Category Desktop Management Function	MEAN / STD Extent of Benefit (1=not at all . . . very great=6)
Reduced Total Cost of Ownership	
Security Management	4.59 / 1.02
Remote Software Installation	4.59 / 1.19
Inventory Management	4.59 / 1.25
Configuration Management	4.52 / 1.29
Help Desk Assistance	4.36 / 1.12
Software Metering	3.48 / 1.55
Fault and Performance Management	3.36 / 1.59
Overall, how beneficial with respect to <u>reducing the cost of ownership</u> has desktop management been for your firm?	***4.25 / 1.01***
Improved User Productivity	
Help Desk Assistance	4.66 / 1.14
Remote Software Installation	4.59 / 1.26
Configuration Management	4.25 / 1.40
Security Management	4.23 / 1.27
Inventory Management	3.59 / 1.56
Fault and Performance Management	3.41 / 1.45
Software Metering	3.02 / 1.50
Overall, how beneficial with respect to <u>improving user productivity</u> has desktop management been for your firm?	***4.05 / 1.05***
Enhanced Strategic Planning	
Inventory Management	4.27 / 1.34
Configuration Management	4.20 / 1.42
Security Management	4.14 / 1.29
Remote Software Installation	4.11 / 1.53
Help Desk Assistance	4.00 / 1.40
Software Metering	3.45 / 1.56
Fault and Performance Management	3.20 / 1.47
Overall, how beneficial with respect to <u>enhancing strategic planning</u> has desktop management been for your firm?	***4.02 / 1.23***
Overall, how beneficial has desktop management been for your firm?	**4.32 / 1.11**

Overall, desktop management was reported to be beneficial to some extent in the responding firms. One question asked the respondents specifically to indicate the extent of benefit of the desktop management program in their firm (across all three benefit categories); the mean response on this question was 4.32 (with a standard deviation of 1.11). Further, in each benefit category one question asked the respondents to rate the overall benefit of desktop management to that category. Again, the means here were in the range of 4, indicating some extent of benefit. The benefit ratings for five of the desktop management functions were relatively consistent; inventory management, configuration management, remote software distribution, help desk assistance, and security management were all deemed to be beneficial to some extent in all three

of the benefit categories.   However, the other two desktop management functions, fault/performance management and software metering were consistently rated the lowest with respect to the benefit provided in all three categories. This finding agrees with the fact that these two functions were the least implemented (Table 2).

IV. CONCLUSIONS

In general, the data from this survey indicate that firms are not using available software tools extensively in the practice of desktop management. With the exception of software to prevent the introduction of viruses on servers and desktops, the use of software for other activities is relatively low.

 In the case of inventory management, firms are not maintaining a dynamic database of desktop assets. This database is useful for configuration management and for assisting the help desk function. The lack of a dynamic database is likely related to the levels of implementation for configuration management and help desk assistance. The low means for the two items relating to remote software installation/upgrade are somewhat surprising. This feature is available in many current operating systems and enables rapid upgrades with minimal labor costs. Since operating systems need to be upgraded (or patched) frequently to prevent malicious software such as viruses and worms, it was expected that remote software installation/upgrade would be more widely used. The low means relating to the use of desktop management software and the use of operating system features to assist desktop management are also puzzling. Whether this software is not used because it is inadequate or there is a lack of awareness of the software's utility is not clear.

Another evident conclusion from the data is that management policies that enable the effective practice of desktop management are not widely implemented. Although there appears to be support in principle for desktop management from top IS management and modest support from the firm's senior management, this support does not result in practices that support desktop management.   Firms do recognize that actions such as centralized purchasing, use of a computerized database for the data about desktop resources, and written standards for hardware and software are important. However, practices that ensure these actions are carried out on a continuing basis are largely not in place. In other words, firms do build a database, but do not dynamically update the database over time. Evidence for this conclusion comes from the low levels of implementation relating to such activities as generating reports from the desktop asset database, lack of policies for updating the desktop asset database automatically, lack of auditing policies, and lack of policies for tracking leasing contracts.

To illustrate this last point, consider that the software tools that support desktop management work best in homogeneous computing environments. Widespread implementation of polices that promote central purchasing and written standards for hardware and software should promote homogeneous environments. Although 64 percent of the firms in this study implemented written standards to a great extent or better and 75 percent have central purchasing policies to a great extent or better, over 70 percent of the firms support three or more desktop hardware platforms and desktop operating systems.

On the whole, the respondents perceive that the extent of each of the three benefits of desktop management is modest in the sense that the means were never close to exceeding five (a great extent). With respect to the reduced cost of ownership, the software tools that are perceived as most beneficial are security management, remote software installation, and inventory management. Although the latter two are perceived as beneficial, the extent of their use is not that high.

Regarding the perceived benefits of desktop management to user productivity, the top three are help desk assistance, remote software installation, and configuration management. The first and third are dependent on a dynamic database of desktop assets, and the second is widely

available. As noted earlier, the data indicate firms are not building dynamic databases and using software that enables remote software installation.

Of the three benefits, desktop management is perceived as having the least benefit in enhancing strategic planning, inventory management and configuration management software are perceived as the most beneficial. It is surprising that software metering is not perceived as more beneficial. In any kind of strategic planning, one might expect the number of licenses required for new software would be an important factor.

The primary conclusion of this study is that desktop management, despite moderately favorable perceptions of its benefits, is still not extensively practiced. On the other hand, when our data are compared to earlier reports, it does appear that the level of implementation increased somewhat since the late 1990s. For example, Behr [2001] cited an analysis by the Gartner Group that estimated only 15 to 20 percent of the firms that purchased managed PCs use the management software that accompanies these PCs. Data from the current study indicate that 15 of the 21 functions in Table 2 are implemented to a great extent or more by over 30 percent of the firms.

The rapid changes with respect to information technology will continue to make the practice of desktop management challenging. Two changes that are particularly important are:

1. the move from desktop devices to mobile devices and

2. the speed required to patch Internet-facing systems.

The movement to mobile computing devices such as notebook PCs and personal digital assistants is continuing.   In May 2003 [Miller, 2003], dollar sales of notebook computers exceeded sales for desktop computers. Although TCO for portable devices is difficult to estimate, many managers agree that it is significant and may exceed the TCO for desktops [Hamblen, 2002].

Vizard [2003] reports "that there is a growing gap between the speed of which security attacks are being launched and industry's ability to respond" (p. 1). On a more positive note, "99% of all attacks result from known vulnerabilities" [FoundScan, 2002, p. 1] and are preventable providing IS management aggressively employs features of desktop management software that automate the upgrading/patching of vulnerable software.

Our results indicate that the derived benefits of desktop management are not perceived as strongly as one might expect. The challenges posed by desktop management together with incidents such as those reported in Section I, imply that managers should focus on the risks of not employing desktop management practices rather than its derived benefits. For example, Foundscan [2002] provides two attack scenarios where the cost of an attack is calculated.

LIMITATIONS

The firms that participated in this study report only moderate levels of implementation of most

- desktop management functions and

- the management policies that enable the effective practice of desktop management.

However, firms whose implementation levels are lower in these two areas are the firms most likely not to respond to this survey. In this interpretation, the actual levels of implementation may be much lower than the results reported.

It should be clearly recognized that, with only a five percent response rate, our conclusions are tenuous and broad generalizations cannot be drawn. However, these results are consistent with past studies and as such are indicative of a trend, albeit a sluggish one. In any case, it should be

evident that desktop management still offers great potential and should receive more attention in the future.

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EDITOR'S NOTE: The following reference list contains the address of World Wide Web pages. Readers who have the ability to access the Web directly from their computer or are reading the paper on the Web, can gain direct access to these references. Readers are warned, however, that

> 1. these links existed as of the date of publication but are not guaranteed to be working thereafter.

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APPENDIX I. DESKTOP MANAGEMENT SURVEY

Demographics of the Respondent (please check one response category for each item)

What is your present job?

 40 (91%) IT Management   3 (7%) IT Group / Project Leader   __ IT Analyst   __ IT Consultant

 1 (2%)   Other

How many years have you worked for your current employer?

___ Less than 1   22 (50%) 1 - 10   13 (30%) 11 - 20   9 (20%)   More than 20

How many years have you worked in the information systems/technology field?

___ Less than 1   8 (18%)   1 - 10   20 (46%) 11 - 20   16 (36%)   More than 20

Demographics of the Firm (please check one response category for each item)

What industry is your firm in?   1 (2%)   Communications   7 (16%)   Financial

1 (2%)   Transportation   1 (2%) Retailing/Wholesaling   15 (34%) Manufacturing

 6 (14%)   Health Care   13 (30%) Other

Approximately how many full-time employees work at your firm?

 3 (7%) < 1000   15 (34%) 1000 – 5000 10 (23%) 5001 - 10,000 12 (27%) 10,001 - 25,000
 4 (9%) > 25,000

Information Architecture of the Firm (please check one response category for each item)

How many full time employees work in your IS/IT department?

 11 (25%) < 100   29 (66%) 100 - 500   1 (2%) 501 - 1000   1 (2%) 1001 - 2500
 1 (2%)   2501 – 5000   __ > 5000

How many desktop hardware platforms does your firm support?

 3 (7%) 1   10 (23%) 2   8 (18%) 3   7 (16%) 4   3 (7%) 5   13 (30%) More
than 5

How many desktop operating systems does your firm support?

 3 (7%) 1   9 (21%) 2   13 (30%) 3   8 (18%) 4   6 (14%) 5   5 (11%)
More than 5

How many network operating systems does your firm support?

 15 (34%) 1   14 (32%) 2   9 (21%) 3   2 (5%) 4   1 (2%) 5   3 (7%)
More than 5

How many email systems does your firm support?

 29 (66%) 1   14 (32%) 2   3   4   1 (2%) 5
              More than 5

Approximately how many desktop PCs does your firm own/lease?

 4 (9%) < 1000   24 (55%) 1000 – 5000   11 (25%) 5001 - 10,000   3 (7%) 10,001 - 25,000
 2 (5%) > 25,000

Approximately how many laptops or personal digital assistants (PDAs) does your firm own/lease?

 31 (71%) < 1000   9 (21%) 1000 – 5000   3 (7%) 5001 - 10,000   1 (2%) 10,001 - 25,000
         > 25,000

Approximately how many servers does your firm own/lease?

 2 (5%) < 40   17 (39%) 40 - 200   18 (41%) 201 - 400   5 (11%) 401 - 1,000
 2 (5%) > 1,000

Does your firm have an enterprise network?   43 (98%) Yes   1 (2%) No

Desktop Management Activities and Software Tools

Desktop management consists of the systematic activities performed by IS professionals to manage the firm's hardware and software resources associated with personal computers, mobile computing devices, and local area network servers. Software tools can assist in this effort. For each of the activities below, please indicate the extent that your firm employs software to accomplish the activity, using the following 6-point scale:

1 = Not At All 2 = Very Little Extent 3 = Little Extent 4 = Some Extent 5 = Great Extent 6 = Very Great Extent

Activity	Extent Implemented (1=not at all . . . . very great=6)						
	Response Distribution						
	1	2	3	4	5	6	Missing
Inventory Management							
Software is used to update the inventory as assets are added and removed from the firm	5 (11%)	3 (7%)	8 (18%)	9 (21%)	12 (27%)	7 (16%)	
Software is used to update the inventory when hardware or software is changed or upgraded	4 (9%)	2 (5%)	10 (23%)	11 (25%)	10 (23%)	7 (16%)	
Software is used to update the inventory when the physical location of hardware changes	7 (16%)	6 (14%)	8 (18%)	8 (18%)	8 (18%)	7 (16%)	
Configuration Management							
Software is used to automatically update configuration changes to desktop devices	4 (9%)	7 (16%)	8 (18%)	9 (21%)	7 (16%)	9 (21%)	
Software is used to remotely retrieve configuration data from desktop devices	4 (9%)	4 (9%)	7 (16%)	8 (18%)	14 (32%)	7 (16%)	
Remote Software Installation							
Software is used to remotely install, upgrade, or remove operating systems	9 (21%)	6 (14%)	9 (21%)	7 (16%)	8 (18%)	5 (11%)	
Software is used to remotely install, upgrade, or remove application software	2 (5%)	6 (14%)	6 (14%)	11 (25%)	7 (16%)	12 (27%)	
Fault and Performance Management							
Software is used to provide early warnings of an impending failure of hardware components	9 (21%)	10 (23%)	5 (11%)	10 (23%)	7 (16%)	3 (7%)	
Software is used to automatically correct faults when they occur or send out an alert	10 (23%)	12 (27%)	7 (16%)	6 (14%)	6 (14%)	3 (7%)	
Software is used to monitor and tune the performance of desktop assets	12 (27%)	11 (25%)	8 (18%)	6 (14%)	4 (9%)	3 (7%)	
Software is used to collect performance data to aid in capacity planning	10 (23%)	15 (34%)	8 (18%)	5 (11%)	3 (7%)	3 (7%)	
Help Desk Assistance							
Software is used to allow the help desk to track the source of desktop problems	3 (7%)	3 (7%)	3 (7%)	15 (34%)	13 (30%)	7 (16%)	
Software is used to allow the help desk to share problem solutions for user support	4 (9%)	3 (7%)	2 (5%)	17 (39%)	9 (21%)	9 (21%)	
Software is used for remote retrieval of inventory or configuration data	6 (14%)	8 (18%)	4 (9%)	5 (11%)	16 (36%)	5 (11%)	
Security Management							
Software is used to prevent unauthorized access to information on desktop devices	5 (11%)	3 (7%)	7 (16%)	7 (16%)	11 (25%)	11 (25%)	
Software is used to prevent unauthorized changes to configurations of desktop devices	3 (7%)	6 (14%)	9 (21%)	11 (25%)	7 (16%)	8 (18%)	
Software is used to prevent theft of desktop assets	18 (41%)	6 (14%)	5 (11%)	10 (23%)	3 (7%)	2 (5%)	
Software is used to prevent the introduction of a viruses on servers and desktop devices				4 (9%)	7 (16%)	33 (75%)	
Software is used to provide notification of system tampering on desktop devices	8 (18%)	10 (23%)	7 (16%)	10 (23%)	6 (14%)	2 (5%)	1 (2%)
Software Metering							
Software is used to track concurrent usage so that software licenses are not violated	7 (16%)	10 (23%)	8 (18%)	5 (11%)	7 (16%)	7 (16%)	
Software is used to track usage so that the proper number of licenses is purchased	4 (9%)	4 (9%)	8 (18%)	7 (16%)	13 (30%)	8 (18%)	
Overall, to what extent has your firm implemented a desktop management program?		**3 (7%)**	**9 (21%)**	**15 (34%)**	**12 (27%)**	**4 (9%)**	**1 (2%)**

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Desktop Management Policies

To implement desktop management firms use a variety of policies and procedures. Please indicate the extent to which your firm has implemented the policies / practices listed below, using the same 6-point scale as before.

Policies / Practices	Extent Implemented (1=not at all . . . . very great=6) Response Distribution						
	1	2	3	4	5	6	Missing
Written standards are in place for the firm's personal computer hardware and software		2 (5%)	1 (2%)	8 (18%)	23 (52%)	10 (23%)	
A labeling/identification scheme is used for all of the firm's desktop assets	1 (2%)	3 (7%)	5 (11%)	7 (16%)	15 (34%)	13 (30%)	
Static data is collected about the asset (e.g., manufacturer name, model #, serial #, price)	1 (2%)	2 (5%)	1 (2%)	10 (23%)	13 (30%)	17 (38%)	
Demographic data is collected about the asset (e.g., location, user name, department)	2 (5%)	2 (5%)	2 (5%)	10 (23%)	16 (36%)	12 (27%)	
Component data is collected about the asset (e.g., installed software, processor, RAM)	1 (2%)	1 (2%)	7 (16%)	7 (16%)	14 (32%)	14 (32%)	
There is a computerized database of the static, demographic & component data for the assets	3 (7%)	2 (5%)		7 (16%)	21 (48%)	11 (25%)	
Procedures are in place to capture & record changes to the demographic and component data	1 (2%)	4 (9%)	10 (23%)	11 (25%)	8 (18%)	9 (21%)	1 (2%)
Software is used that automatically scans the component data and records changes	6 (14%)	3 (7%)	4 (9%)	11 (25%)	7 (16%)	13 (30%)	
Software is used to generate reports from the desktop asset database	4 (9%)	2 (5%)	2 (5%)	11 (25%)	13 (30%)	12 (27%)	
An auditing process is in place to determine the accuracy of the desktop asset database	4 (9%)	4 (9%)	7 (16%)	14 (32%)	9 (21%)	6 (14%)	
A process is in place to reconcile the desktop asset database if an audit finds inaccuracies	6 (14%)	6 (14%)	6 (14%)	12 (27%)	10 (23%)	4 (9%)	
A tracking scheme is employed to monitor the state of a desktop asset over time	9 (21%)	4 (9%)	8 (18%)	11 (25%)	7 (16%)	4 (9%)	1 (2%)
Procedures are in place to monitor leasing contracts for desktop hardware and software	14 (32%)	2 (5%)	4 (9%)	8 (18%)	5 (11%)	10 (23%)	1 (2%)
Operating system features are used for desktop asset management activities	6 (14%)	5 (11%)	7 (16%)	14 (32%)	8 (18%)	4 (9%)	
Commercial desktop management software is used for desktop asset management activities	6 (14%)	2 (5%)	7 (16%)	11 (25%)	5 (11%)	13 (30%)	
Desktop management tools that were developed in house are used for desktop asset management	19 (43%)	6 (14%)	3 (7%)	5 (11%)	7 (16%)	3 (7%)	1 (2%)
An outsourcing service is used for desktop asset management	36 (82%)			1 (2%)	4 (9%)	3 (7%)	
A centralized purchasing function is used for desktop hardware and software	1 (2%)		3 (7%)	5 (11%)	17 (39%)	18 (41%)	
IS/IT management supports desktop management efforts	1 (2%)		2 (5%)	8 (18%)	16 (36%)	17 (39%)	
The firm's senior management supports desktop management efforts	1 (2%)	2 (5%)	6 (14%)	8 (18%)	13 (30%)	14 (32%)	
Resources are available to insure that an accurate inventory of desktop assets is maintained	4 (9%)	6 (14%)	5 (11%)	10 (23%)	14 (32%)	5 (11%)	

Desktop Management Benefits

The benefits of desktop management can reduce cost of ownership, enhance strategic planning, and/or improve end user productivity.   For each activity below, please indicate the extent of the benefit for your firm for each benefit category using the scales provided.

Activity	Extent of Benefit(1=not at all . . . . very great=6)						
	Response Distribution						
	1	2	3	4	5	6	Missing
Reducing the Cost of Ownership							
Inventory Management		3 (7%)	5 (11%)	13 (30%)	9 (20%)	14 (32%)	
Configuration Management	1 (2%)	2 (5%)	7 (16%)	8 (18%)	15 (34%)	11 (25%)	
Remote Software Installation		3 (7%)	5 (11%)	10 (23%)	15 (34%)	11 (25%)	
Fault and Performance Management	5 (11%)	12 (27%)	6 (14%)	9 (21%)	7 (16%)	5 (11%)	
Help Desk Assistance	1 (2%)	2 (4%)	4 (9%)	16 (37%)	15 (34%)	6 (14%)	
Security Management			8 (18%)	11 (25%)	16 (36%)	9 (21%)	
Software Metering	5 (11%)	8 (18%)	9 (21%)	11 (25%)	5 (11%)	6 (14%)	
Overall, how beneficial with respect to **_reducing the cost of ownership_** has desktop management been for your firm?		3 (7%)	6 (14%)	15 (34%)	17 (38%)	3 (7%)	
Enhancing Strategic Planning							
Inventory Management	1 (2%)	5 (11%)	3 (7%)	17 (38%)	8 (18%)	10 (23%)	
Configuration Management	2 (5%)	3 (7%)	9 (21%)	10 (23%)	10 (23%)	10 (23%)	
Remote Software Installation	4 (9%)	4 (9%)	3 (7%)	14 (32%)	10 (23%)	9 (21%)	
Fault and Performance Management	6 (14%)	11 (25%)	6 (14%)	13 (30%)	5 (11%)	3 (7%)	
Help Desk Assistance	2 (4%)	5 (11%)	8 (18%)	12 (27%)	10 (23%)	7 (16%)	
Security Management	1 (2%)	4 (9%)	9 (21%)	10 (23%)	14 (32%)	6 (14%)	
Software Metering	5 (11%)	9 (21%)	9 (21%)	8 (18%)	8 (18%)	5 (11%)	
Overall, how beneficial with respect to **_enhancing strategic planning_** has desktop management been for your firm?	1 (2%)	5 (11%)	8 (18%)	11 (25%)	16 (37%)	3 (7%)	
Improving User Productivity							
Inventory Management	4 (9%)	7 (16%)	12 (27%)	9 (21%)	4 (9%)	8 (18%)	
Configuration Management	4 (9%)		6 (14%)	13 (30%)	13 (30%)	8 (18%)	
Remote Software Installation	1 (2%)	2 (4%)	5 (11%)	10 (23%)	14 (32%)	12 (27%)	
Fault and Performance Management	6 (14%)	6 (14%)	10 (23%)	10 (23%)	10 (23%)	2 (4%)	
Help Desk Assistance	1 (2%)	1 (2%)	4 (9%)	10 (23%)	18 (41%)	10 (23%)	
Security Management	2 (4%)	2 (4%)	7 (16%)	12 (27%)	15 (34%)	6 (14%)	
Software Metering	9 (21%)	10 (23%)	4 (9%)	16 (37%)	2 (4%)	3 (7%)	
Overall, how beneficial with respect to **_improving user productivity_** has desktop management been for your firm?		3 (7%)	10 (23%)	15 (34%)	12 (27%)	3 (7%)	1 (2%)
Overall, how beneficial has desktop management been for your firm?		**2 (7%)**	**6 (14%)**	**12 (27%)**	**15 (34%)**	**5 (11%)**	**3 (7%)**

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