# THE IMPACT OF BROWNSITING ON INFORMATION TECHNOLOGY VENDORS

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# THE IMPACT OF DOWNSIZING ON INFORMATION TECHNOLOGY VENDORS

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**Downsizing Information Systems Program**
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***The Impact of Downsizing on Information Technology Vendors***



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# Abstract

This report provides an in-depth analysis of the significant impacts that the downsizing of information systems is having on users and providers of information systems software and services.

It identifies the major trends driving the downsizing phenomenon and assesses the changes that will occur in the management of information systems in most corporations. It provides insights into how these changes will impact the organization of IS and the distribution of responsibilities in a downsized world, and interprets how these changes will significantly impact the nature of, delivery of, and requirements for offerings from information services vendors.

In addition, this report gives INPUT's analysis of how product and services vendors will need to respond to meet the changing requirements for offerings in a downsized environment, and suggests strategies for success.

This report contains 54 pages, including 21 exhibits.

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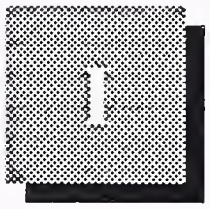
# Table of Contents (Continued)

# Table of Contents (Continued)

# Exhibits



# Introduction

INPUT has been conducting research on the downsizing of information systems for close to two years. The initial research was focused on gaining an understanding of the forces motivating the phenomenon and understanding the rate at which U.S. business was adopting downsizing as a general approach to the development of new and replacement of existing or aging information systems. Further research was conducted to gain an understanding of the types of architectures being deployed in downsizing efforts, and the management processes being utilized to achieve downsized implementations. Finally, a series of individual case studies were conducted to gain an in-depth understanding of how specific downsizing efforts were managed, and to what degree they met their stated objectives.

The results of this research have been presented in a series of reports, listed in Section D. Based on those results, it is quite clear that the downsizing of information systems is a major trend of revolutionary proportions which will have significant impacts on the information services (IS) industry throughout the remainder of the decade. The impacts will go beyond changes in the types of products and services offered to affect fundamental channel alignments, methods of sales and support, and competitive positioning.

## A
## Purpose and Scope

The purpose of this report is to analyze the impacts that the continued trend toward downsizing will have on the information services industry in general and various classes of information technology (IT) vendors specifically.

In addition, the report will present INPUT's insights into:

- The impact of downsizing on the management and organization of information systems within user corporations

- Potential areas of opportunity generated as a result of the continued move toward downsizing

## B
## Methodology

The data used in this study comes from three primary sources: an in-depth survey of CIOs, conducted early in 1992; in-depth case studies conducted mid-year; and current interviews of end users and vendors regarding actual experiences in undertaking downsizing initiatives. All of this research was conducted as part of INPUT's Downsizing of Information Systems Program.

In addition, in 1992, INPUT placed special emphasis on gathering information about downsizing activities as they related to major markets such as systems integration, outsourcing and professional services. This research was conducted as part of the Market Analysis, Systems Integration and Systems Operations Programs. The results of these findings were also utilized in the analysis for this study.

## C
## Report Structure

### 1. Report Organization

Following the Introduction, the report is organized into five additional chapters:

- Chapter II—Executive Overview—presents the general findings of the study and a synopsis of the conclusions and recommendations.

- Chapter III—Analysis of the Current Downsizing Trend—discusses INPUT's finding regarding the extent to which downsizing is becoming a major trend and the primary underlying business and technology forces fueling that trend.

- Chapter IV—The Impacts of Downsizing on the Information Systems (IS) Function—gives INPUT's views on the likely impacts that downsizing will have on the organization and distribution of responsibilities for the management of IS within the firm.

- Chapter V—The Impacts of Downsizing on Information Technology (IT) Vendors—examines ways in which the downsizing trend will affect the opportunities of various types of IT vendors.

- Chapter VI—Conclusions and Recommendations—summarizes INPUT's key conclusions drawn throughout the report and presents specific recommendations regarding approaches to the market in a downsized environment.

## D
## Related Reports

Other INPUT reports related to The *Impact of Downsizing on Information Technology Vendors* include the following:

- *Case Studies in Downsizing*
- *Methodologies for Information Technology Downsizing*
- *Systems Architectures for Downsizing*
- *Putting Downsizing in Perspective*

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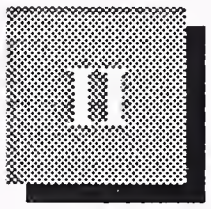

# Executive Overview

## A
## Introduction

### 1. Background

The introduction of the microcomputer into American business in the early to mid-1980s was largely ignored by most serious information systems professionals. Considered a personal productivity tool by its designers and by IS executives, it was fundamentally ignored as a potential component of most firms' information systems architecture until almost the turn of the decade. However, since that time three forces have combined that are revolutionizing the way systems are conceived, implemented and managed. They are:

- The re-engineering of American business into downsized organizations focusing on core competencies under a system of more decentralized decision making

- The evolution of the microprocessor itself into a high price/performance computing device, capable of executing minicomputer to mainframe classes of applications

- The growth in sophistication of end users with regard to both the capabilities of PCs and value of information systems as an integral part of their business. This is largely based on their experiences with the evolving PC.

The result has been an accelerating movement to downsize information systems. Hardly a topic of conversation three years ago, businesses are now witnessing a phenomenon in which INPUT's research confirms that over 80% of information systems (IS) executives have identified applications suites to downsize and 40% are already involved in the process. Exhibit II-1 summarizes factors that continue to drive and inhibit the movement to downsize information systems.

EXHIBIT II-1

**Forces Driving and Inhibiting Downsizing**

| Driving Forces | Inhibiting Forces |
|---|---|
| Business process re-engineering | Concerns over data quality/integrity |
| User demands for rapid response to changing business conditions | Significant transition costs |
| Business operations downsizing | Increased network complexity |
| Executive demands to lower IS costs | Lack of applications software |

Despite the significance of some of the inhibiting forces, the phenomenon continues to exist.

But the impact of the downsizing of information systems is going well beyond the substitution of downsized technology for large-scale hierarchical processing environments. It is dramatically changing the way IS is managed internally; it is consequently restructuring the demand for information systems products and services, as well as how they are delivered.

### 2. Objectives

The objectives of this report are to assess the effects that downsizing information systems will have on the internal management of information systems, and the information services industry that serves it. The analysis and conclusions are based on three years of user and vendor research on the subject.

The remainder of this chapter highlights the key insights and conclusions developed in more detail in Chapters III-VI.

## B
## Downsizing Issues for IS Management

### 1. Management of the IS Function

The primary impact of downsizing on the management of IS will be a migration of responsibilities from central or core IS functions to end-user departments, resulting in a significant re-alignment of staffing and organization, and a need to redesign IS management processes. A number of key issues must be addressed to insure that the transition is successful and the resulting environment can be managed.

Exhibit II-2 summarizes the key issues that must be dealt with during and after transition.

EXHIBIT II-2

**IS Management Issues**

| During Transition | Post Transition |
|---|---|
| Planning and accounting for hidden costs | Infrastructure planning/standards |
| Planning for organizational change | Ongoing training of decentralized professional staff |
| Certifying architectural approach | Ongoing network management |
| Retraining technical personnel | Maintenance of data integrity |
| Certifying change control processes | Managing technology upgrades |

INPUT's research indicates that unless these issues are successfully addressed up front, the downsizing effort is doomed to failure. Furthermore, successfully addressing these issues will be complicated by the fact that most end-user organizations have little familiarity with the day-to-day (behind-the-scenes) management processes that are used for the development of new systems or the management of operations.

## 2. Technology Issues

In addition to the management issues mentioned above, there are a number of technology issues that must be considered.

- Assembling the right technology for a particular downsizing implementation is not going to be simple. A myriad of offerings exist, but virtually no vendor has an integrated solution that is likely to meet a particular firm's needs.

- Applications packages for downsized hardware environments are few and far between, confronting most downsizing projects with a choice of either re-engineering existing applications on a custom basis, or converting existing code. These two approaches have different costs and different outcomes. Consequently, decisions must be considered carefully before a commitment is made.

- Network complexity and management will most likely go up by an order of magnitude. This is an area in which many in-house IS functions are already weak. Plans should deal with this issue early on in the process.

### 3. Principal Conclusions/Recommendations

#### a. Conclusions

- Downsizing is a viable strategy for restructuring applications and IS management processes to meet the requirements of many restructured businesses, but one should not expect it to save a lot of money. Benefits will come through flexibility and responsiveness to the business environment.

- Elimination of the mainframe environment is not likely and should not be anticipated. At its current level of evolution, the typical downsized environment simply can't deal with very high transaction volumes, which require access to huge, integrated data bases.

- Redesigning IS management processes and retraining IS professionals to meet the demands of the downsized environment are as critical to success as selecting the correct technology.

#### b. Recommendations

- Downsizing will have a significant organizational as well as technological impact. Solid plans must be made that deal with all aspects of the effort if it is to be successful.

- To reduce risk and supplement internal skills, information services industry vendors with downsizing experience should be considered key resources to be utilized in the process.

- Because technology alternatives are not clear cut and in some instances may not be thoroughly tested, INPUT strongly recommends that a pilot project be undertaken before any significant commitment is made to a large-scale downsizing effort.

## C

## Downsizing Impacts on the Information Services Industry

INPUT concludes that the impacts of downsizing on information services vendors will be dramatic. Although different market segments will be affected in different ways and to different degrees, virtually all vendors will need to deal in a world where:

- End users will become the dominant force in the purchase of outside products and services, and will demand total solutions
- Current marketing approaches and channels will need to be reconsidered
- Product characteristics and/or service offerings will need to be re-engineered to deal with a world of downsized technology
- Buyers will want more "doing" and less "advising" on how to do it

### 1. Downsizing Impacts by Vendor Class

Chapter V closely analyzes how various classes of information services vendors are being impacted by the downsizing revolution. Exhibit II-3 summarizes the impacts by vendor business function.

EXHIBIT II-3

**Level of Impact of Downsizing on Vendor Business Functions (L = Low, M = Medium, H = High Impact)**

| Business Attribute | Professional Services SI | Software Outsourcers Turnkey | Network & Products Services | Processing |
|---|---|---|---|---|
| Marketing Strategy | L | M | H | L |
| Sales Channels/Strategy | M | L | H | L |
| Product/Service Architecture | M | M | H | M |
| Product/Service Technology | H | M | H | M |
| Technical Expertise | H | M | M | M |
| Business Expertise | H | M | H | L |
| Pricing | M | L | H | M |
| Distribution | M | M | L | L |

INPUT believes that professional services and software products companies will be the most significantly affected as a result of downsizing, due to the fact that their marketing and sales focus will shift primarily to end users; also, they will need to retrain extensively to provide the technical and consulting services necessary to win engagements focused on downsizing.

Vendors whose offerings and services are primarily focused on infrastructure will find the turf more familiar, and the need for change and retraining less dramatic.

## 2. Principal Conclusions/Recommendations

### a. Conclusions

- Downsizing will further accelerate the demand for total solutions from information services providers.
- Overall expenditures for information services, including software products, will grow as a result of downsizing efforts.
- Whole new markets should emerge as end users and central IS seek to outsource the management of distributed facilities through desktop services, and rely more heavily on outside sources for the maintenance of applications suites.
- Users will compete with vendors for the scarce professional skills required to develop and manage downsized environments.

### b. Recommendations

- All vendors should consider changes in marketing strategy and product orientation as a result of downsizing.
- Alliances and/or acquisitions should be considered to provide total solution capability.
- Exhibit II-4 lists specific market opportunities by vendor class.

EXHIBIT II-4

## Downsizing Opportunities for IS Vendors

| Vendor Class | Opportunities |
|---|---|
| SI and Professional Services Firms | Downsizing SI engagements<br>Downsizing methodologies<br>Distributed applications templates |
| Outsourcers Industry-specific offerings | Transitional outsourcing<br>Desktop services |
| Software Products Turnkey Systems Firms | Client/server applications products<br>Distributed integrated platforms (DIP)<br>Network management software |
| Network and Processing Services Firms | Network outsourcing<br>Network management<br>Specialized transaction processing |

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III

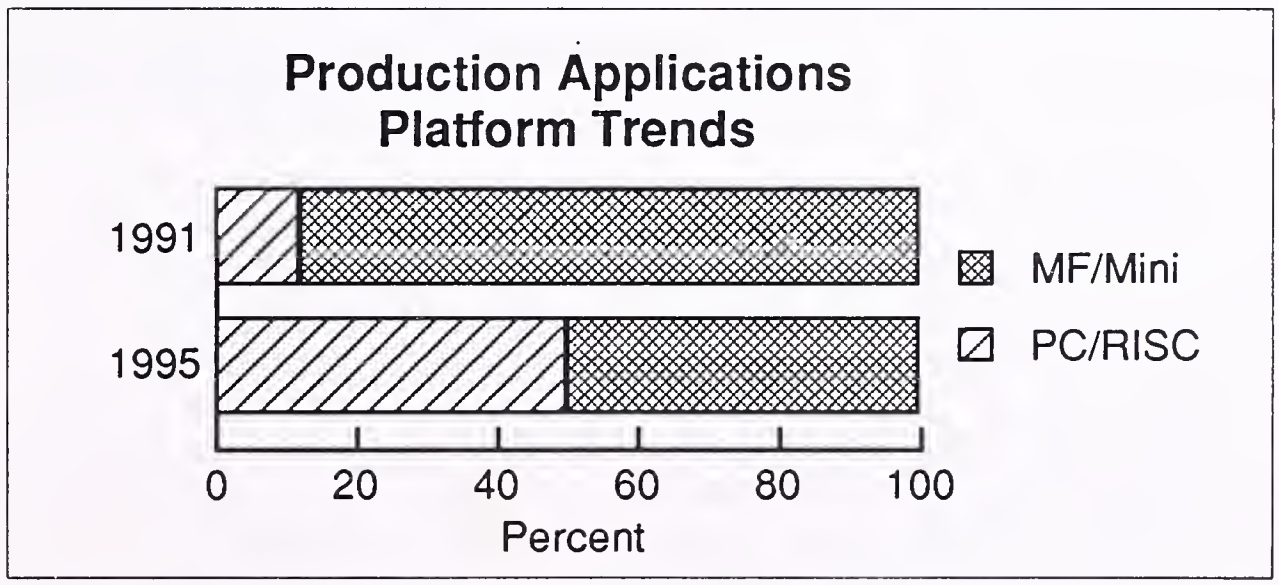
# Analysis of the Current Downsizing Trend

There is little doubt that the trend to downsize information systems has taken hold and will continue to be a major factor in the strategies of most businesses throughout the early part of this decade. INPUT's survey of CIOs completed in early 1992 showed that:

- Eighty percent have identified target applications suites for transition into downsized environments
- Forty percent have projects or pilots under way

The same survey provided considerable insight into how quickly various classes of applications would be likely to migrate to downsized architectures. (See INPUT's Putting Downsizing in Perspective for a more detailed analysis of specific classes of applications.) Exhibit III-1 shows how the CIOs participating in the survey estimated the distribution of production applications by platform in 1991, and how they felt that distribution would change by 1995.

EXHIBIT III-1

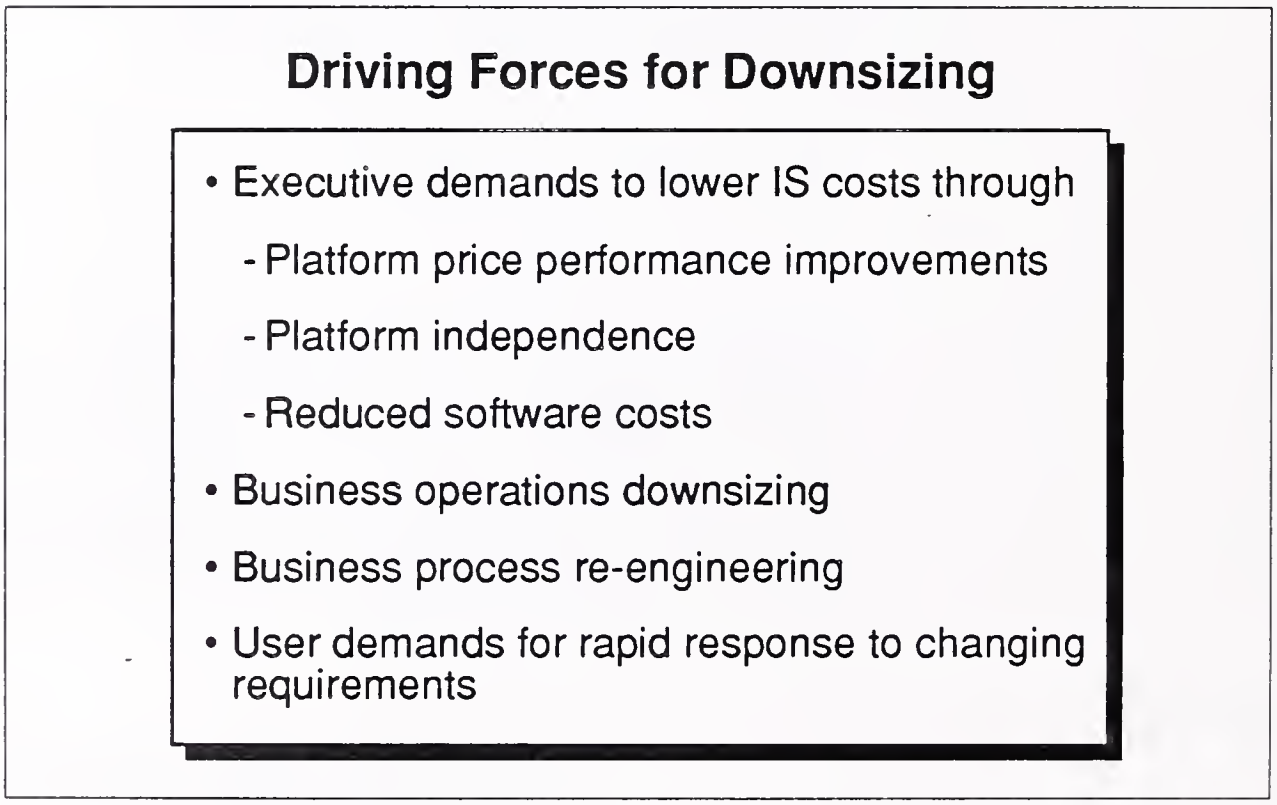



The remainder of this chapter examines the forces driving the downsizing trend and documents what actually appears to be happening when organizations adopt the downsizing strategy.

# A
# Driving Forces

Popular mythology would attribute the trend toward downsizing to the evolution of technology; more specifically, to the fact that the cost of MIPS on PCs and workstations is significantly less today than the price of the same compute power delivered through a mainframe. There is little doubt that this technological development has created the opportunity for downsizing and, in fact, is a key facilitator of the trend. However, the real motivations for downsizing are much more deeply rooted in the fundamental restructuring of business operations and changes in management processes. Exhibit III-2 summarizes the primary motivators based on INPUT's research.

EXHIBIT III-2




A brief discussion of each driving force follows:

### 1. Business Operations Downsizing

Quite literally tons of material have been published in recent years on the restructuring of business in general, and American business in particular, to meet increasing global competition and cope with shorter product life cycles. The effects on business organization and operations have been numerous, but two in particular have had a significant impact on the management and deployment of information technology. They are:

- The downsizing of business operations resulting in the flattening of organizational structures and the decentralization of decision-making authority

- The return to "core" competencies, or getting back to basics

The first has clearly put pressure on internal IS functions to realign applications to deal with decentralized management of the business process. In addition it has created pressure to provide access on business information on a decentralized basis to support more localized decision making. Both of these trends point strongly to consideration of downsizing the information systems function.

The second has caused executive management to look to outsourcing of non-critical business functions, including information systems, as a way to achieve greater focus on the key elements of the business.

### 2. Business Process Re-engineering

To support business operations downsizing and develop new and innovative ways of delivering products and services, many firms are looking to business process re-engineering, a total redesign of internal, customer-related, and/or supplier-related business processes. These re-engineered processes frequently make innovative use of technology that radically affects how business is conducted. The growing use of EDI (electronic data interchange) provides an excellent example of how the use of technology coupled with re-engineered processes can eliminate entire business functions, or restructure them directly into business operating units.

As the use of technology becomes an integral part of—rather than a mechanism to track—business processes, there will be a great deal of pressure to move the management of that technology directly into downsized operating units.

### 3. User Demands for Rapid Response to Changing Environments

Shortened product life cycles and increased demands for tactical adjustments to strategy and product/service offerings, coupled with end users' growing dependence on technology for the conduct of their business, have made end users increasingly less tolerant of frequently slow and sometimes ineffective responses from centralized IS functions. The situation has changed from that of the 1970s and 1980s in which IS was frequently accused of moving too far too fast, to one in which, in many instances, central IS is perceived as being a roadblock to change.

The result is that users are simply demanding control of their own destiny with regard to information systems. Though to some degree it can be argued that "taking charge" will turn out to be more difficult (even potentially disastrous) than end users anticipate, INPUT doesn't believe that arguments of that type will in any way diminish the pressure to migrate at least some systems to downsized environments over which end users will have more direct control.

### 4. Executive Demands to Lower IS Costs

Finally, the internal information systems function has not been immune to executive management's demands for cost cutting across the board. In some instances this has led to outsourcing some or all of the core IS activity. In other cases, IS executives are looking toward downsizing strategies to achieve real savings or at least disperse the costs. Anticipated sources of potential savings include:

- Platform price/performance improvements—taking advantage of the improved dollars/MIPS ratio of workstations and PCs

- Savings through platform independence—achieving hardware savings by designing in the capability to exchange expensive boxes for cheaper ones by leveraging the advertised application-independent benefits of open systems, etc.

- Reduced software costs—utilization of less expensive PC or workstation software instead of "high-priced" proprietary software designed to support hardware-specific operating environments

Whether or not any of these types of savings can be or have been achieved is highly case specific. As will be pointed out later in this chapter, results to date do not indicate that downsizing is likely to generate big savings.

All of these factors facilitated by continued advances in PC, workstation, and local-area network (LAN) technology will continue to fuel the movement toward downsizing for the foreseeable future. Advances in data base, GUI (graphical user interfaces), open systems and applications software products for downsized environments will accelerate the trend.

## B
## Inhibiting Factors

Despite the strong push that the driving forces have on the downsizing trend, there are some inhibiting factors. In a CIO survey, respondents were asked to list and rank factors they thought were inhibiting the downsizing trend. Exhibit III-3 shows the top four inhibitors.

EXHIBIT III-3

**Factors Inhibiting Downsizing (Ranked from Survey Results)**

| Rank | Factor |
|---|---|
| 1 | Data quality problems |
| 2 | Transition costs |
| 3 | Increased network complexity |
| 4 | Applications software not available |

### 1. Data Quality

CIOs are justifiably concerned about potential data quality issues in downsized environments. A good deal of their efforts during the 1980s were spent developing the technologies and processes to insure the integrity of shared data bases. Although many advances in distributed relational data bases have occurred in recent years, the technology still lacks the integrity of most data base management systems running on large mainframe environments. For certain classes of applications this will remain an inhibiting factor for at least the next two years.

### 2. Transition Costs

This also represents a legitimate concern. Data from INPUT's case studies in downsizing indicates that the cost of transition can be significant. In most instances it is a requirement that both the downsized and centralized environments operate in parallel during the transition. In addition, many organizations will find that existing PC, workstation and network environments are not of the quality or capacity to deal with "real" production applications, thus requiring significant capital investment.

### 3. Increased Network Complexity

As perceived from a CIO level, network complexity is a big issue. Centralized IS functions have their greatest experience level with hierarchical network structures. Most have dealt with LANs and some with WANs on only a limited basis. More importantly, network management software and diagnostic tools are not nearly as developed for peer-based networks as they are for traditional hierarchical structures. So the problem goes beyond just design and implementation to ongoing management.

### 4. Lack of Applications Software

It is true that there is significantly less applications software available for client/server and downsized environments. However, all indications are that major software firms are recognizing the opportunity and undertaking development activities to fill in the gap.

Overall, INPUT doesn't believe that any of these factors is having a significant dampening effect on the trend toward downsizing. The inhibitors are largely technology related and the vendor community clearly sees them as opportunities to provide new products and services. Most of these factors are already being addressed.

## C
## Current Status

INPUT's analysis of case studies and the current literature yields a number of insights into current approaches to downsizing, impacts on the mainframe environment, the benefits equation and key management issues raised by the downsizing trend. This section discusses each of these areas.

### 1. Current Approaches to Downsizing

To some degree, the first functional organizations to migrate to downsized technology have been the scientific and engineering communities. Workstation-based client/server (C/S) architectures provide a "natural" platform for compute-intensive or project-oriented activities where sharing data is typically limited to small work groups.

For most organizations the next major class of applications to adopt a downsized architecture has been office systems. In this case the migration has been bi-directional.

- Downsizing messaging and other office communication activities to LANs consisting primarily of PCs and print servers from mainframe environments

- Interconnecting standalone PCs into LAN-based departmental systems to provide local messaging, document, printer and file sharing

The majority of organizations are just entering the third phase of the downsizing evolution, the migration of major business or mission-critical applications to downsized architectures.

For all three classes of applications discussed above, the first step in the downsizing process has been to move the processing portion of the application to a downsized platform followed by the distribution or decentralization of the data base.

An INPUT survey of CIOs confirms this evolutionary pattern. Exhibit III-4 shows respondents' forecast for the phasing of the three classes of applications—compute intensive, office and critical. Exhibit III-5 provides similar information regarding the migration of data bases to downsized environments.

EXHIBIT III-4

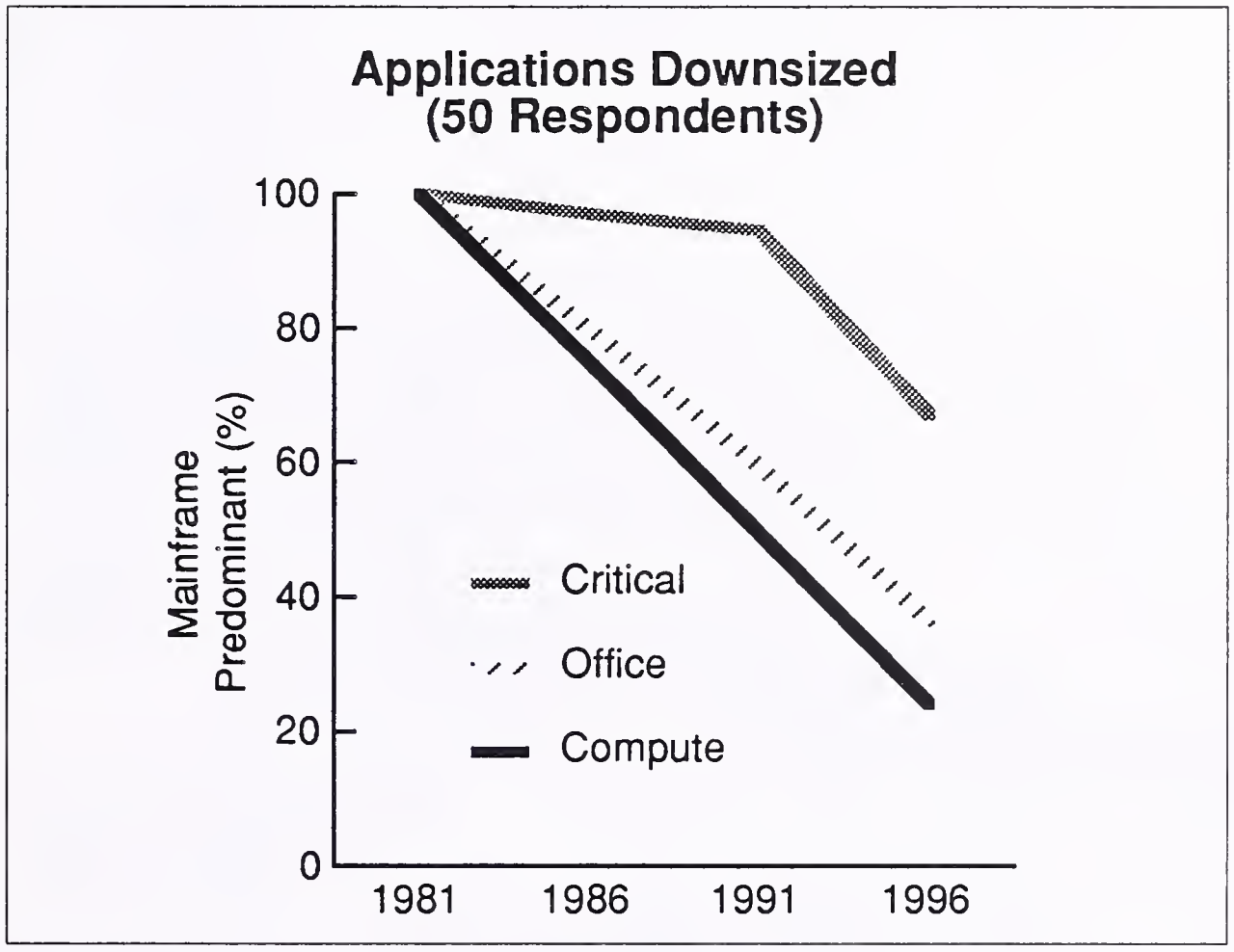
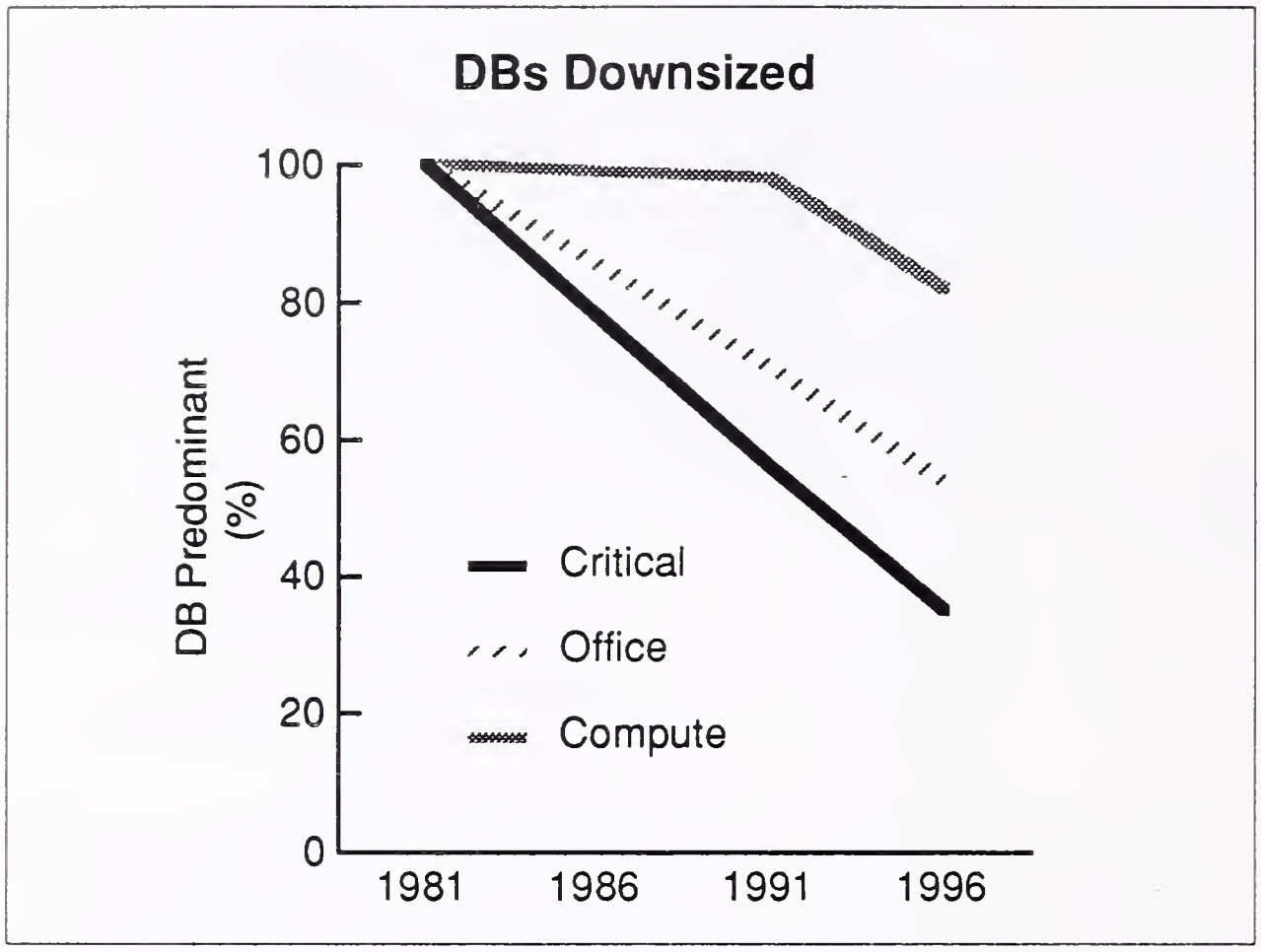


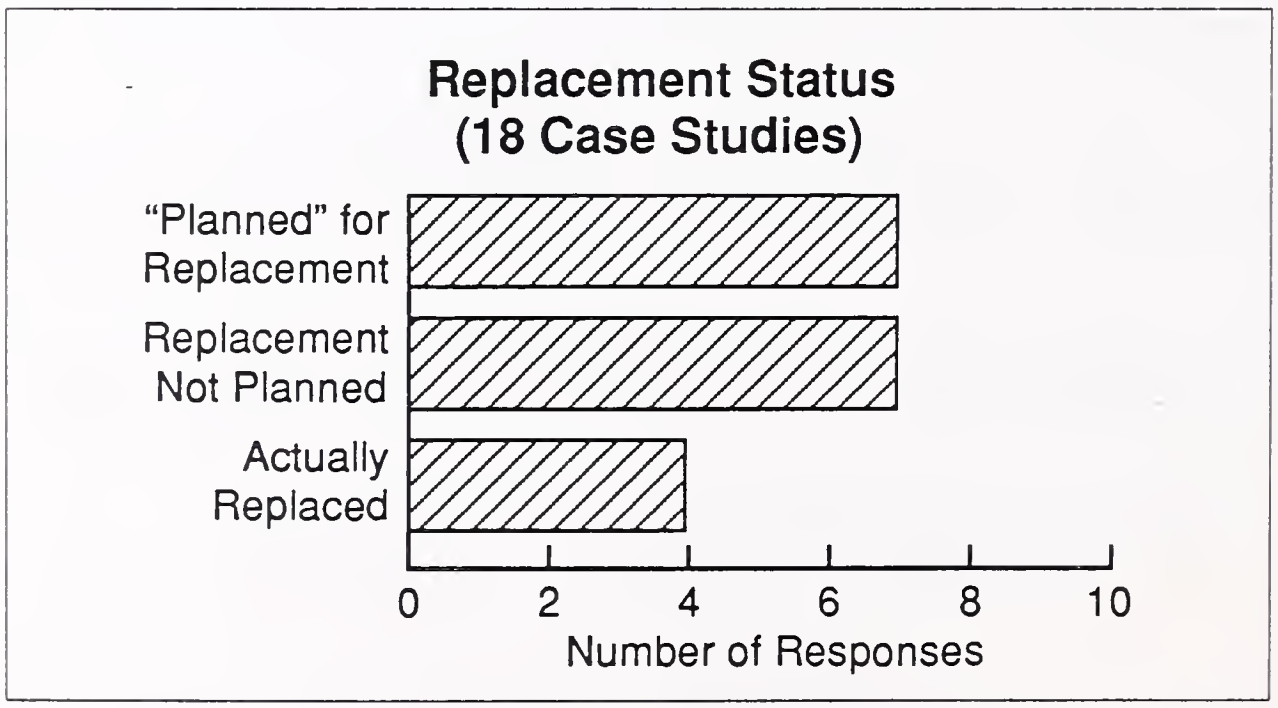
EXHIBIT III-5




## 2. Impacts on the Glass House

Is the mainframe dead? Not yet...but it certainly is being impacted. Exhibit III-6 shows the replacement status for the mainframes in 18 case studies analyzed by INPUT.

EXHIBIT III-6



Clearly the direction is to eliminate, or at least scale down, the number of mainframes where possible. But the figures are somewhat misleading. The case studies analyzed thus far show that when mainframes have been replaced or are planned for replacement they tend to be small and to have one or more of the following characteristics.

- Support a single application set
- Support a single user organization
- Require little data sharing

Until some of the problems associated with managing distributed, shared data are resolved, the downsizing of major applications supporting multiple organizations will be different. This will be so particularly where high transaction volumes are involved.

### 3. Realized Benefits

The data gathered thus far has not identified a large number of cases where significant financial benefits were achieved as a result of downsizing strategies. Out of the eighteen cases analyzed only two showed significant dollar savings. However, with minor exceptions, firms that have undertaken downsizing projects feel that the overall results have been beneficial. Exhibit III-7 gives a ranking of types of the top four benefits respondents said headed the list.

EXHIBIT III-7

**Realized Benefits Post-Downsizing (Ranked from Survey Results Factor)**

| Rank | Factor |
|---|---|
| 1 | Improved user responsiveness |
| 2 | Broader range of choices |
| 3 | Faster systems development |
| 4 | More effective use of IT |

### 4. Management Considerations

Regardless of the motivation and perceived benefits anticipated from a downsizing effort, there are a number of management considerations which surface in almost every case. These include:

- Consideration of the conversion versus re-engineering question
- Accounting for the visible and invisible costs
- Re-alignment of IS responsibilities

- Viability and selection of new technology
- Risk management

### a. Conversion versus Re-Engineering

Essentially, when considering the migration of any applications suite from the mainframe to a downsized or client/server (C/S) system, two approaches can be taken: conversion of the existing system, or re-engineering of the entire application. These approaches are significantly different, and have implications on both cost and future flexibility.

A straightforward conversion of the existing applications suite is generally lower risk and lower cost. Certainly this approach will accomplish a migration to higher performance technology; therefore, in theory, cost savings could be obtained through reduced hardware and software costs. However, it is unlikely to achieve as many of the "soft" benefits cited in Exhibit III-7.

- In most instances the processing of the information will be moved to the downsized environment, but the actual distribution of data to a C/S platform is far more complex than if the application were re-engineered.

- It is likely that the converted code will be much more difficult to maintain and modify than if the application had been re-engineered, reducing the opportunity to provide improved responsiveness to the need for change.

On the other hand, re-engineering offers the opportunity to implement changes to the business processes themselves. This provides for significantly improved benefits from an overall organizational perspective, as well as more effective utilization of the downsized technology. However, the costs and risks are high.

- The costs of design and implementation, including process and organizational re-engineering, are likely to be two to three times those associated with the more straightforward conversion.

- The risk that the implementation will fail is considerably higher.

To obtain the real benefits that downsizing can provide, the re-engineering route is probably the appropriate direction. But the trade-off in terms of cost, risk and organizational commitment must be analyzed carefully if the effort is to be successful.

### b. Accounting/Cost Analysis

If the primary objective of adopting a downsizing strategy is to reduce costs, careful attention needs to be paid to analyzing and tracking costs both before and after completion of the effort. As pointed out earlier, INPUT has not seen many cases in which companies were willing to claim

substantial savings as a result of downsizing. In many instances, headcounts and software costs for maintaining the new environment will exceed those of the centralized IS environment, excluding the downsizing project investment. There are a number of key factors that lead to this situation.

- As users absorb some or the majority of the responsibilities for managing both the operational and in some instances the ongoing development of their own systems, the need for localized departmental technical support will increase. This usually results in higher headcount on a multidepartmental basis than would be necessary for centralized IS.

- With additional in-house technical staff on hand on a departmental or decentralized basis, the tendency is to utilize that staff to implement departmental or other support systems that might not have been undertaken or funded by centralized IS staff.

- In many instances, the mainframe environment may decrease in size, but doesn't simply vanish (see section C-2). When this is the case, there is a high probability that overall costs to the corporation for provision of information systems will increase substantially.

This is not to say that the increased costs aren't justified by other benefits achieved through downsizing. It does, however, raise the management issue of if and how overall systems costs can be accounted for in a decentralized environment where many are likely to be hidden.

### c. Realignment of IS Responsibilities

Chapter IV addresses in greater detail the impact of downsizing on the internal information systems function. However, it is important to mention here, as one of the key management issues, that decentralization of the computing environment and/or development and maintenance functions in no way eliminates the need for solid management processes for the management of information systems. In fact, in most instances, those processes are likely to become more complex. Data security and administration, technology planning, and network management are just a few examples.

The point is that management questions need to be addressed as part of the overall design, whether the downsizing effort is for a single application suite or the entire IS function.

### d. Viability of New Technology

To date, the kinds of technology employed in downsizing efforts have varied considerably. There is no formula. Furthermore, there are only a few emerging standards to provide guidance as to which technologies are likely to survive and mature long term. So, selecting a viable technical architecture is a sophisticated and somewhat risk-ridden process.

From a general management viewpoint, a major investment in downsizing technology and implementation is not unlike any other major capital investment, and should be analyzed with regard to risk, just as a new investment in plants or facilities might be. Unfortunately, most major firms have never analyzed systems investments with the same degree of rigor as they do other capital-intensive undertakings. INPUT believes that the probability of a successful migration to a downsized environment will be much higher if necessary and rigorous planning is done before a commitment is made.

### e. Risk

Throughout this section, risk has been mentioned several times. There is risk associated with re-engineering business processes, selecting new technology, and developing management processes to insure successful operation in the downsized environment. One might argue that these risks exist when undertaking any major systems effort. So what's different here? The big difference is that undertaking a major downsizing project exposes the user firm to all of these risks simultaneously. This has not usually been the case (with some notable exceptions) with traditional mainframe implementations, in which development, management, and operational processes are more mature.

D

## Summary—Current Trends

- The trend toward downsized (and distributed) applications and supporting platform environments is well established and accelerating.
- A lack of clear-cut technical strategies and applications software, and the fact that few projects to date have demonstrated significant cost savings, have not inhibited the trend.
- It's not likely in the immediate future that downsizing will eliminate the mainframe, but certainly the number, complexity and size of these types of installations should decrease over time.
- Based on experience to date, the key to success will be dealing with the risks associated with the key management issues of process re-engineering and the impact of downsizing on IS management processes, in addition to successfully managing the migration to new and somewhat less mature technology environments.

The next chapter presents INPUT's analysis of how the downsizing trend will impact the management of IS over the next several years.

IV

# The Impacts of Downsizing on the (IS) Information Systems Function

Downsizing is already having an impact on the distribution of responsibility for the management of the information systems in many corporations; its impact will grow as the phenomena becomes increasingly mainstream. Most of the contemporary press tends to focus on the organizational impacts on the centralized IS function. However, the impacts are really corporate wide.

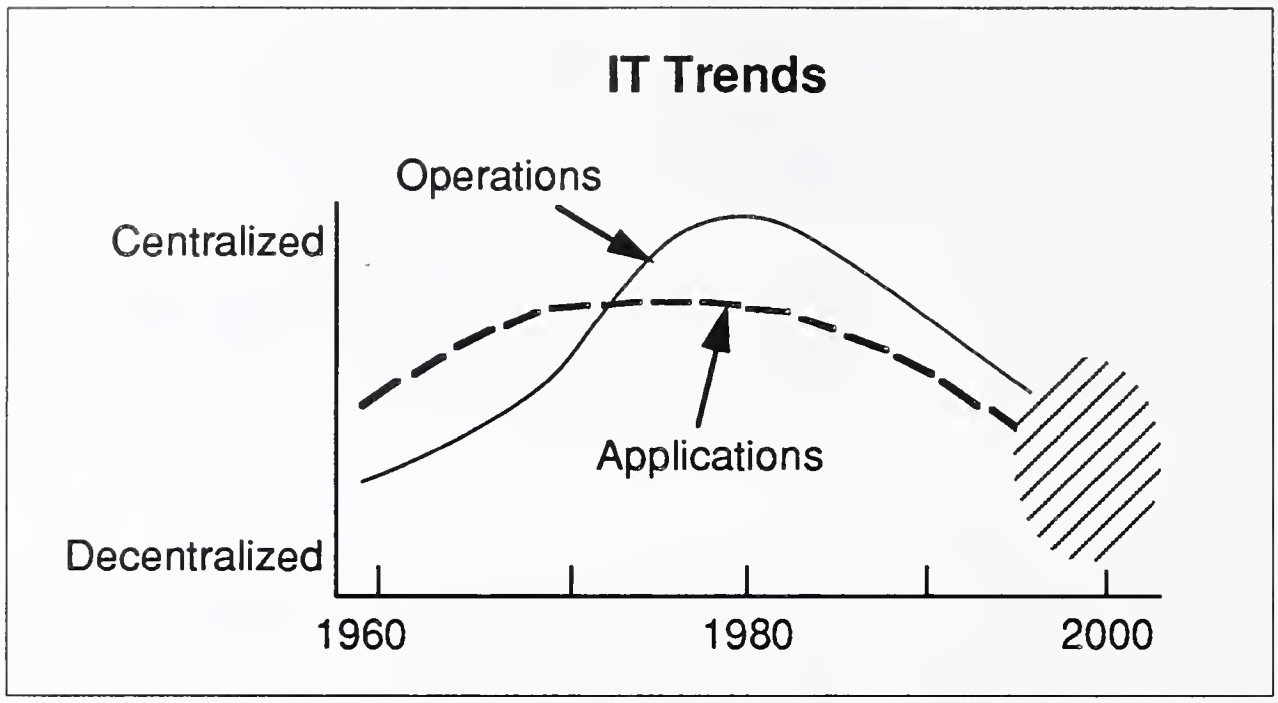
This chapter presents INPUT's observations on how management responsibilities will evolve as result of downsizing and discusses the new set of management issues which must be addressed if the transition to a downsized information systems environment is to be successful. The information used in developing INPUT's observations is based on the CIO survey discussed in Chapter I, and end-user and IS management interviews conducted in the development of the case studies presented in INPUT's report, Case Studies in Downsizing.

## A

## Evolving Trends/Changing Responsibilities

Exhibit IV-1 gives a representation of how the degree of centralization of the management of the applications and operational aspects of IS has evolved over the past thirty years. It suggests that the pendulum will have swung to the decentralized side by the end of the decade.

EXHIBIT IV-1




Though this trend toward decentralization will vary depending on industry group, there are a number of business factors in addition to the downsizing of information systems that tend to reinforce the notion of more decentralized IS management.

- The restructuring of American business is resulting in the allocation of more and more of the "doing" activities associated with traditional staff functions to the operating management. Is there any reason why this process should not apply to IS?

- The general pace of business requires that executive management empower individual operating units with more decision-making authority in order to respond to local geographic and specialized product/service requirements without resorting to hierarchical (and typically bureaucratic) decision-making processes.

Interestingly enough, all of these changes in the management process are being facilitated by more sophisticated information systems that emphasize embedding the technology into the process itself. The net effect on the internal IS functions is twofold:

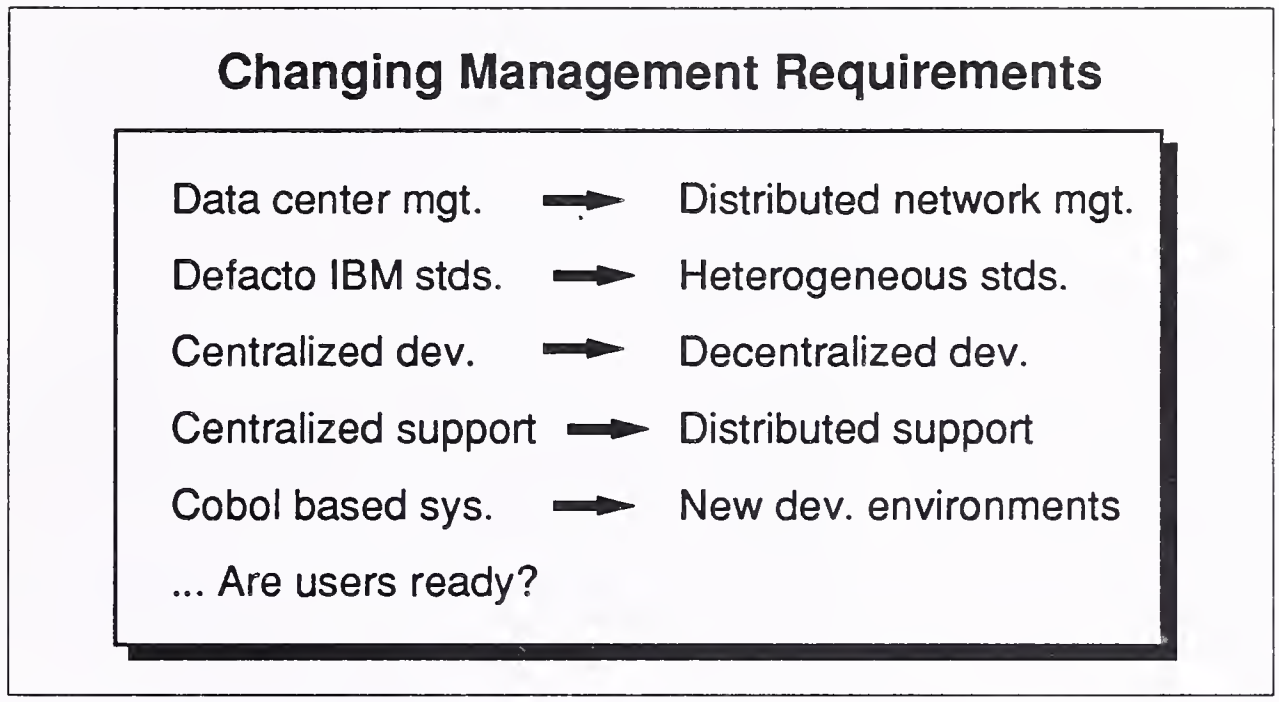
- What remains to be managed at a centralized level is changing.

- Central IS's traditional management responsibilities are changing dramatically.

## 1. Changing Management Requirements

In a post-downsized environment "what needs to be managed" on a centralized basis will vary considerably from the traditional centralized structure. Exhibit IV-2 gives a "before" and "after" snapshot.

EXHIBIT IV-2




- Data Center Management - In most of the cases that INPUT has examined to date, a corporate data center will survive the downsizing effort. However, its overall role in the network may be to function more as a peer-level server than as the dominant control and processing element in the overall IS architecture. What will require some centralized management approach will be the distributed network.

  In most instances these networks will be large and consist of LANs, WANs and SNA nodes. They will be physically made up of a variety of different technologies. Given the heterogeneous nature of the technology of these distributed networks, no single vendor's proprietary network management approach is going to work. Consequently, some overall scheme will be needed to insure reasonable levels of network integrity, etc.

- Standards - For many large traditional institutions the question of standards has been relatively straightforward. It was a matter of picking a suitable subset from IBM's or DEC's basket of offerings, and remaining current as these standards evolved.

  In the downsized world few standards exist. This complicates the technology selection process, and will require that institutions adopt or develop at least some customized suite of standards to insure connectivity, data integrity, etc. This is clearly a more complicated process than the approach taken in the totally centralized environment.

- Application Development/Maintenance/Support - With the exception of a few core systems, most applications development will shift directly into the hands of end-user organizations. What is likely to remain with the centralized IS function is an oversight function to insure connectivity at the data base or network level of major applications suites that have some requirement to share data.

Ongoing support will be provided in a similar manner. Many support activities, problem identification and resolution, cannot be handled on a centralized basis in a downsized heterogeneous environment. The support remaining with the central IS function is likely to be highly specialized and focused on training field personnel and/or the diagnosis and correction of faults that are beyond the capabilities of the average field support person.

- New Applications Architectures - As institutions migrate to downsized environments they will be abandoning traditional development languages and methodologies. COBOL simply is not likely to survive the transition to a client/server environment. This will present problems for both the decentralized development teams and central IS who will need to deal with serious retraining efforts to handle new development technologies.

## 2. Changing Management Responsibilities

As the downsizing process evolves within an organization, the responsibilities of the central IS function are likely to shift rather radically. To some degree this is a change in emphasis. In others, some primary responsibilities will simply migrate to end-user organizations. Exhibit IV-3 gives INPUT's assessment of how this degree of emphasis is likely to change.

EXHIBIT IV-3

**Impacts on Central IS**

| Responsibility | Before | After |
|---|---|---|
| Data center operations | High | Low |
| Network management | High | High |
| Infrastructure planning/stds. | High | High |
| Applications development | High | Low |
| Applications maintenance | High | Low |

- Data Center Operations - With the shared data center playing a decreasing role in the overall management of information within the firm, it seems apparent that this responsibility will remain with central IS. However, the responsibility will decline in importance over time.

- Network Management - This has always been a key responsibility of IS, and will remain at least as important, if not more so, in a downsized world, where the complexity of the task and the criticality of the function become even greater.

- Infrastructure Planning/Standards - If downsizing is to be successfully implemented, it is critical that some level of planning and standardization of infrastructure be achieved. With individual business units taking charge of their own destinies in terms of applications development and maintenance, some organization will need to take a leadership position to ensure that the technology platforms that evolve over time can communicate with each other at a physical and logical level. There will be a similar need to test new technologies and develop plans for migration of the distributed infrastructure over time. INPUT believes this will remain a core responsibility of IS despite the movement to downsizing.

- Applications Development and Maintenance - It seems quite clear that central IS's role in this area will diminish significantly in a downsized environment. In most organizations there will remain a requirement that some elements of corporate data be integrated, and that some common systems exist. However, responsibility for systems development and maintenance, a key function of the traditional centralized IS function, will diminish significantly as the downsizing of information systems proceeds.

## 3. The Emerging Central IS Function

Will central IS continue to exist as a function? The likely answer is yes, but its role will be significantly different. In the most successful transitions central IS will function as a planning, standards, and leadership organization with overall responsibility for the deployment of information systems technology in the firm, but with a significantly decreased role in the actual implementation or operational management of most applications.

INPUT's analysis of case studies and the CIO downsizing survey support this position.

- Organizations that have undertaken significant downsizing efforts have seen central IS budget reductions of between 20% and 40%.

- Central IS staffs have been reduced (largely through re-assignment to operating units) between 15% and 70%.

# B
# Critical Issues Impacting IS Management

For central IS there are a number of critical issues that need to be handled for successful evolution to a downsized environment.

- Staffing and training
- Transition management
- Repositioning of the central IS function

## 1. Staffing and Training

As previously described, the transition to a downsized environment will require new skills for both central IS as well as IS professionals who ultimately will wind up in systems organizations directly supporting individual business units. The skills required are already scarce within user and vendor organizations. Developing a strategy that will adequately prepare the personnel remaining with corporate IS, as well as those transferring out, will likely remain the responsibility of IS, and certainly provide a significant challenge.

## 2. Transition Management

It is highly likely that central IS will become the "transition management" organization in a major downsizing implementation. Operating under the general direction of a corporate steering committee or some other corporate organization to provide overall guidance, central IS's job will be to ensure that a high-risk transition occurs smoothly in an environment ridden with some significant risks.

In instances where operating management perceives that central IS is resisting the transition, or where user relations are simply strained, this will be a difficult task. User enthusiasm for downsizing frequently runs high. In addition, users are usually ignorant of the real technical difficulties involved in achieving a successful implementation, and may well interpret appropriate management control of the transition process as "foot dragging."

In the end, only a partnership approach will maximize the probability of a successful implementation. In many instances this will be hard to achieve.

### 3. Repositioning the Central IS Function

As IS manages the transition of many of its former responsibilities from the central organization to individual operating or business units, it will need to reposition its own role within the organization. Senior CIOs whose strengths have been in systems development or the control of operations are going to find themselves confronted with a new set of challenges. Many of these challenges will require the skills of a facilitator rather than a commanding general.

- Facilitating and leading an ongoing effort to ensure long-range viability of the architecture and the standards will be critical.

- Participating with senior management in the interlocking of the business strategy with the technical strategy will become increasingly complex, but no less important.

- Assuming leadership in terms of the ongoing development of the IS professional staff in a distributed IS organization will provide significant challenges.

In the end it is highly likely that central IS will assume a role similar to that of other corporate staff organizations that have decentralized the operational aspects of their roles. Human resources, finance and corporate planning are typical examples for most industries of functions that have ceded the majority of their former operational management responsibilities to line organizations. Leadership in the policy and process areas are critical to their success. In the case of IS, this leadership will need to be earned, not bestowed by virtue of a job description. It is likely to change significantly the personal skill requirements and attributes that qualify an individual to be a top-flight CIO.

## C

## Impacts On End-User Organizations

A successful transition to a downsized environment cannot be accomplished without the second half of the partnership—the end-user organization—successfully assuming major responsibilities for the daily management of important portions of the IS function. Many competent and experienced IS executives can attest to the fact that the successful execution of some of these responsibilities is not trivial, obvious or fun. Furthermore, as mentioned earlier, many end-user executives are very poorly informed on some of the realities of the management of the IS activity.

For downsizing to work, the transition plan must place significant emphasis on bringing end-user organizations "up to speed." There are a number of guidelines that will help to accomplish this task.

- No matter what the mind-set, operational management will find the management of its newly acquired IS responsibilities a challenging task. It will need a plan for absorbing the function into the organization, just as much as central IS will need a well-orchestrated plan for divestiture.

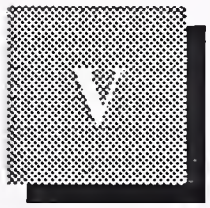
- There will be a requirement to acquire some technical knowledge on the part of senior management in the end-user organization. Furthermore, ongoing technical training of the IS professional staff within the end-user organization will be critical to long-term effectiveness.

- A partnership with central IS rather than an adversarial relationship will go a long way toward facilitating a successful transition and establishing the rapport required to achieve long-range effectiveness.

- INPUT's examination of case studies to date indicates that acknowledgment of these guidelines up front can go a long way to facilitating a successful transition to a downsized environment.

- Finally, end users should not necessarily expect to "save" money.

INPUT is currently undertaking a major field research project to examine the role of end users in downsizing activities. It will undoubtedly reveal some new insights. In the meantime, users should proceed enthusiastically, but with the full knowledge that the management of IS is probably not as simple as they thought.



# The Impacts of Downsizing Information Technology Vendors

The impact of downsizing information systems on providers of software and services will be just as profound as the impact on the management of information systems within user firms. It will create challenges and opportunities, and may fundamentally change the channel structure, pricing strategies and organization of the industry. This chapter presents INPUT's analysis of the factors motivating this change and explores in some depth the significant impacts that downsizing is likely to have on today's industry participants.

Section A discusses the factors driving change, and Section B gives an overview of the impacts on various classes of vendors. Sections C and D deal with software products vendors and professional services firms, two classes of vendors that will be most heavily affected by the downsizing of information systems.

## A

## Factors Driving Change

The two underlying motivators that will change the shape of the information technology (IT) industry over the next five years are: the continued migration of buying authority to the end user, and the ongoing evolution of client/server (C/S) technology.

### 1. End-User Buying Impacts

- As users continue to take charge of their destiny the current trend to solution buying will be accelerated. End users, even in post-downsized environments, are more interested in purchasing a solution that meets their needs than they are in building their own. Furthermore, it is unlikely that users will retain the level of full development staffs that central IS functions have traditionally maintained. Thus, as a focal point for buying shifts, vendors will increasingly need to demonstrate their ability to deliver total solutions.

- Selling to end users has a number of other characteristics that will necessitate changes in vendor strategy. End-user executive management is seldom impressed with the razzle dazzle of technology for technology's sake. The primary credibility test for a vendor will become his/her ability to discuss the business issues and solutions relevant to the buying executive's area of interest. Whether the subject is human resources or manufacturing, vendors will need to be able to discuss functionally specific needs.

- There will be many more buyers. As individual operating units assume responsibility for the majority of their systems activities, the number of contact points for a vendor in a given firm will mushroom. Likewise, the coordination and political problems associated in dealing with diverse interests and priorities will need to be managed on multiple fronts. These include the interests and priorities of whatever organization acts as the coordinator of centrally managed IS activities.

- Finally, end users' interests will be focused on results. Methodologies, processes and techniques, although necessary and appreciated, will not take the place of timely delivery of results. End users will expect vendors to carry more of the responsibility for the delivery of results than has traditionally been the case when dealing with central IS.

## 2. The Impact of Client/Server Technology

Today no single vendor appears to provide a complete package in terms of the client/server environment. Some vendors promote hardware, others operating systems, and still others focus on user interfaces. However, to obtain a meaningful business solution in the downsized C/S environment requires the successful integration of these "pieces" of technology with some effective applications software. Furthermore, vendors (with some exceptions) that have been on the leading edge with some of these technologies tend to be smaller, underfunded and not nearly as well organized on a geographic and marketing basis as they need to be to handle the global requirements of supporting decentralized systems for a major corporation.

The trends indicate that some of the smaller leading-edge players are banding together to gain critical mass to meet the demands of the downsizing market. Likewise, many of the larger, more traditional providers are scrambling to apply their ample resources to formulate a marketing and product strategy. But the fact remains that there are no clear winners at the moment, and the next few years are likely to provide more than a little trauma while both classes of vendors reposition.

# B
# Impacts by Vendor Class

The forces described above will impact various market segments in different ways. For example, providers of software and turnkey systems will encounter different types of problems and opportunities than, say, professional services companies. In this section INPUT presents its views on the impacts and opportunities that downsizing information systems is likely to have on vendors participating in various market segments. In sections C and D, a closer examination is given to the software products and professional services.

For purposes of this analysis INPUT's traditional market segments have been grouped as follows to reflect the commonality of issues and opportunities within the grouping:

- Systems integrators and professional services firms
- Outsourcers (traditional systems operations companies)
- Software products and turnkey systems companies
- Network and processing services firms

## 1. Systems Integrators and Professional Services Firms

SI and professional services firms face some of the greatest challenges and opportunities as a result of the downsizing revolution. The challenges are largely related to developing the in-house technical expertise to meet the changing implementation requirements. The opportunities are likely to come through industry specialization and a larger target market.

### a. Challenges

The biggest challenge facing professional services firms in dealing with downsizing is, and will continue to be, the acquisition and/or retraining of personnel in the technologies and disciplines required to be quality providers of downsized applications. Two factors will continue to aggravate the difficulty of that task over the next several years:

- The lack of standardization in platforms/architectures utilized for downsizing means that most providers will need to support multiple pools of expertise to effectively implement on these multiple architectures.

- Demand for the limited pool of professionals having this expertise will come from user organizations themselves in addition to other professional services firms and systems integrators.

A second major challenge will be geographic coverage. Downsized means distributed, in terms of both implementation and support. Many downsizing efforts will require that implementation, training and support take place in multiple locations, particularly when the client is a national or multinational corporation. Professional services firms lacking broad geographic coverage will need to overcome the problems of higher costs or lower credibility brought on by the requirement for distributed implementation and support.

### b. Opportunities

With the exception of pure "body shops," systems integrators and professional services firms have a tradition of having business expertise and knowledge of industry specialized applications, a critical asset in selling to end users. They are accustomed to selling to end users and in general take the solution-oriented and consultative approach to sales, which gives them an advantage over many other classes of providers. Systems integrators, in particular, have a tradition of dealing with line management, and in general are accustomed to presenting business-oriented solutions.

These strengths give SI and professional services firms access to some key opportunities, assuming they can overcome the challenges. The opportunities include the following:

- The development and sale of methodologies that are tuned or specific to the downsizing of information systems
- The delivery of systems integration services focused on the downsizing of traditional and industry-specific applications
- The development of application templates for industry-specific and cross-industry application solutions. These downsized application templates can be leveraged across many potential engagements with minor modifications.

## 2. Outsourcers

To some extent, companies that specialize in traditional outsourcing or systems operations face the same problems as professional services and SI firms because they frequently provide comparable services on a standalone basis or as part of an outsourcing contract. Nevertheless, they still are confronted with their own set of challenges and opportunities.

### a. Challenges

The unique challenges faced by outsourcers in a downsizing world center around the erosion of their traditional market and a potential reduction in the economy of scale that has been their primary source of margin.

- The traditional market has been the medium to large-scale mainframe environment (the "glass house") and associated hierarchical networks. Although INPUT does not maintain that the mainframe environment will vanish in the foreseeable future, downsizing will gnaw away at the size and number of these environments, resulting in a shrinking market in both the number and scale of opportunities.

- As users turn to outsourcers to manage their traditional environments while they downsize, outsourcers will be confronted with contracts that forecast decreasing requirements for mainframe cycles and storage over the life of the contract. This is exactly the opposite of their normal business situation, and works against the outsourcers' traditional business model of leverage through a constantly increasing economy of scale.

### b. Opportunities

However, some significant opportunities exist.

- Outsourcers with industry-specific offerings should continue to have strong appeal to end-user buyers. By investing in the downsizing of their own proprietary, industry-specific offerings, they should be able to gain whatever leverage is available through downsized technology without losing existing customers who may be considering migrating back to internally managed downsized applications.

- A second opportunity exists in "transitional" outsourcing, i.e., structuring outsourcing contracts in which the outsourcer takes over the operation and management of the customer's "glass house" as the customer downsizes various applications suites. Assuming the outsourcing firm has appropriate internal professional services capabilities, this type of contract could be coupled with a downsizing SI contract, making the outsourcer a partner in the entire downsizing process.

- To some degree, the opportunities mentioned above could be considered defensive. INPUT believes that there is at least one opportunity for outsourcers with significant new business potential: desktop services. From INPUT's standpoint, desktop services consists of four basic components:

- Supply services
- Connectivity services

- Equipment support
- User support

Exhibit V-1 gives a further breakdown of the types of services in each of these categories.

EXHIBIT V-1

**Components of Desktop Services**

| Service Class | Service Element |
|---|---|
| Supply Services | Equipment acquisition<br>Software acquisition<br>Consulting for purchasing |
| Connectivity Services | LAN management<br>Network interfaces |
| Equipment Support | Maintenance<br>Installation<br>Logistics management |
| User Support | Help desk<br>User training |

For outsourcers with sufficient assets and solid geographical coverage, offering desktop services has solid potential.

- It addresses a set of critical needs that most in-house IS functions are ill-equipped to meet, yet should be centrally managed to insure a high-quality downsized architecture.

- It allows outsourcers to leverage existing network infrastructure for connectivity between multiple locations of a single client and/or between major geographies serving multiple clients.

- It permits outsourcers to leverage their buying power for hardware, software, and LAN technology to serve multiple customers with common platform needs.

- Packaged with transitional outsourcing of a customer's mainframe environment, it offers a total solution to support a potential customer's downsizing strategy.

## 3. Software Products and Turnkey Systems Companies

Software products and turnkey systems vendors will face some of the biggest challenges over the next several years. Meeting end-user requirements for industrial-strength applications operating on C/S technology in distributed environments will require complete restructuring of the software industry, its products, methods of delivery and pricing. An overview of the challenges and opportunities is presented here. A more in-depth analysis of software products is presented in section C of this chapter.

### a. Challenges

The challenges are, to some degree, rooted in the evolution of the software products business. Traditionally, hardware vendors have dominated the systems software products arena by virtue of maintaining a closed and proprietary operating systems environment. They dictate, if you will, to applications developers the architecture in which applications or applications software products could be built. Consequently, the vast majority of currently available applications software products designed to meet industry-specific or cross-industry needs tend to be technologically wedded to the very architectures that are falling victim to the downsizing trend.

On the other side of the coin, the evolution of the workstation and PC software products business has led to a focus on the provision of generic tools to facilitate the office productivity of individuals within the corporation. With the exception of accounting, sales management and engineering, very little applications software exists that was designed for an environment that deals with multiple users on a network or addresses true business (non-office or engineering) applications.

Thus the challenge for the software products industry is to provide total application solutions on downsized C/S platforms even with an industry structure in which most major players' products only provide a subset of the functionality required or need re-engineering to operate in a downsized environment.

Other challenges exist as well.

- The industry is highly fragmented on the PC end, and with some notable exceptions is underfunded for major development efforts.

- A lack of C/S standards or even a truly dominant architecture means that new product offerings will need to be adaptable to a variety of operating system and network environments.

- The lack of profitability of many mainframe applications products vendors seriously constrains their ability to undertake a massive migration of existing products to downsized environments.

### b. Opportunities

- Clearly the best opportunity for applications software products firms is the development and marketing of high-integrity, multiuser, industry-specific or cross-functional applications. End users increasingly want to buy the solution, plug it in, and play it; to some degree, they are willing to forego customization in order to obtain speedy implementation. The more parametrically driven and adaptable the operating system, the better.

- For industry participants with sufficient capital and critical mass, such as Microsoft or Lotus, the development of a distributed integrated platform (DIP) presents a risk but also a great opportunity. The platform would consist of an amalgamation of currently popular products into a high-integrity LAN-based offering that could be sold and installed on the most popular hardware and network configurations.

- For systems software products companies a clear opportunity exists in the area of network management tools. Very little work has been done to date on providing tools that will diagnose errors, automatically recover where possible and provide diagnostic and loading information for distributed LAN environments. This type of capability will be a requirement as end users commit the ability to operate their business to downsized applications.

## 4. Network and Processing Services Firms

To some degree, network and processing services firms are less affected than software and professional services companies by the downsizing trend. Nevertheless, they will be affected.

### a. Challenges

- For processing services vendors, downsizing poses some threats. As transaction processing costs drop in the face of continued price/performance improvements on the desktop, processing services firms will need to be able to demonstrate more value added through application sophistication and functionality, in order to compete with downsized, in-house solutions.

- Network services companies on the applications side will need to provide a growing number of connection and protocol translation options to serve customers with heterogeneous distributed environments.

- Network services companies in the business of providing information will need to consider alternate approaches to the delivery, packaging and pricing of information in the face of constantly decreasing prices for CD ROM and a growing interest in multimedia information systems.

### b. Opportunities

Despite the challenges, some good opportunities exist.

- Faced with more complex network design and management functions, users will have a greater proclivity to look outside for firms that can provide the required physical/logical network and manage it for them. INPUT forecasts a large increase in demand for network outsourcing.

- Downsizing should also increase the demand for network management services, where all or part of the physical network remains with the customer, but planning and management services for the entire network are provided by a vendor.

- Downsizing some applications is going to prove to be close to impossible. These "difficult to downsize" applications are characterized by very high transaction volumes requiring access to huge integrated data bases. Users confronted with these types of applications are going to find themselves in one of two situations. Having downsized everything else, they can hang onto their mainframe to handle that one cantankerous application, or they can seek an outside supplier to run it. Processing services firms could find a good market with healthy margins by identifying these types of applications and providing specialized transaction processing services.

## 5. Challenges and Opportunities for IS Vendors—Summary

Throughout this section INPUT has presented some of the challenges and opportunities that information services vendors will face as a result of the growing trend toward downsizing. Exhibit V-2 summarizes the results.

EXHIBIT V-2

**Downsizing Challenges and Opportunities for IS Vendors**

| Vendor Class | Challenges | Opportunities |
|---|---|---|
| SI and Professional Services Firms | Developing and maintaining In-house technical expertise<br>Lack of standardization<br>Geographic coverage | Downsizing SI engagements<br>Downsizing methodologies<br>Distributed applications<br>Templates |
| Outsourcers | Decreasing market<br>Economy of scale | Industry-specific offerings<br>Transitional outsourcing<br>Desktop services |
| Software Products and Turnkey Systems Firms | Existing product sets<br>Lack of platform standards<br>Industry fragmentation and Capitalization | C/S applications products<br>Distributed integrated Platforms (DIP)<br>Network management Software |
| Network and Processing Services Firms | Decreasing transaction Processing costs<br>New gateway, protocol<br>Bandwidth requirements<br>Delivery, packaging, pricing | Network outsourcing<br>Network management<br>Specialized transaction Processing |

## C

## Software Products Vendors

In addition to the challenges noted in section B-3, software products companies face a number of other issues of significant impact as a result of downsizing.

- Downsizing is increasing the replacement rate of existing applications. This will create an accelerating demand for new applications software products with new characteristics, including scalability across platforms.

- Distribution mechanics and pricing strategies are changing.
- User requirements for software characteristics and development tools are changing.

Exhibit V-3 summarizes the major shifts in the software industry paradigm for applications software products vendors.

EXHIBIT V-3

**Applications Software Product Vendors**

| Attributes | Old | New |
|---|---|---|
| Features | Fixed | Constantly adding |
| Updates | Infrequent | Frequent |
| Sales | Field | Direct/indirect |
| Costs of sales | Labor bias | Advertising bias |
| Price | $10,000+ | $100+ |
| Customers | 100s | 100,000s |

Systems software vendors can anticipate some significant changes as well.

- The trend is increasingly toward the bundling of operating systems and end-user interfaces with the hardware at the PC level, insulating end users from the operating system itself and establishing de facto standards regardless of what is actually in the box. The bundling of Windows and DOS 5.0 on 386- and 486-based processors (frequently with other applications-enabling packages as well) is so common that it is getting difficult to buy an Intel-based product without automatically becoming a Windows user.
- There is a similar trend in the area of minicomputers as well. Minicomputers that formerly ran only a single proprietary operating system now frequently have available either the manufacturer's or third-party created UNIX operating systems.
- Providers of applications development tools (including CASE products) are finding their market changing as well. Users are mostly interested in "plug and play" applications. They have little interest in dealing directly with the design and implementation of applications at the data base system level and even less in compilers. As a result, providers of these products find that:

- The market for their products is increasingly the applications software products developer.

- Their data base management systems are being embedded and sold as part of a particular application suite or operating system environment.

Whether applications or systems software, the distribution and pricing strategies, as well as service and support, will continue to change rapidly over the next several years.

## 1. Software Distribution

The traditional method of software distribution for personal computers has been to bundle floppies with the documentation. The need to synchronize installations of common software products on LAN-based client servers has complicated the process and encouraged new distribution methods such as network downloading. Over time, that approach is likely to become dominant.

INPUT believes that in the future there will be a major shift to delivery of software on CD ROM. This medium is:

- Cheap and non-destructive
- Capable of holding code, documentation and video
- Increasingly popular in downsized environments

Though the movement to CD ROM is most visible in the PC and workstation world today, INPUT believes that CD ROM may become the primary distribution medium for all software over the long term, eliminating the need for printing billions of pages of material annually.

## 2. Channels and Pricing

As pointed out in Exhibit V-3, we can anticipate that the prices for typical packages in the downsized environment will drop significantly on a per-unit basis over time for a variety of reasons.

- There is increasing pressure from users for bundled pricing. Furthermore, they only want "bundled" what they actually need.

- Users will anticipate and get reduced prices for C/S packaging of products, whether the software is being used in an isolated or a shared mode.

- Users will want multiple ways to acquire their software, including direct purchase, lease, rate of usage, bundled, and on a long-term subscription basis. Providing this diverse array of options will have a significant impact on pricing strategies and, INPUT believes, will push prices downward.

Lower prices will impact sales channels significantly. INPUT believes that channel structure will be characterized by:

- More direct sales on PC and workstation platforms
- More indirect sales through bundling on all platforms
- Increased use of telemarketing for PC and workstation software
- A general decline in the use of field sales for most software products

### 3. Service and Support

Despite end users' desire to run "off-the-shelf" software, most real business applications will require some level of modification to meet end-user requirements. With limited internal resources in the distributed IS environment, users will need to turn to professional services organizations or the software product vendor itself for this customization.

This represents an opportunity for software vendors to garner additional ideas for product enhancements, and earn additional revenues. However, few software vendors at the PC level have successfully developed a professional services arm to date.

### 4. Summary

Downsizing will have a dramatic effect on software product vendors. To be successful, software products firms will need to:

- Provide applications suites that are useful as is, easily modifiable, and scalable (can be upsized or downsized); that can isolate the user from the mechanics of the operating system, and that have on-line networking capability

- Combine the necessary tools, operating systems and necessary data base software into a complete offering

- Provide ongoing service and support

- Have products that address mission-critical requirements

To achieve these objectives will require a significant rethinking of the offerings and services provided by most software vendors today.

# D
# Professional Services Vendors

As mentioned in section B-1, professional services (PS) companies will face several challenges in a downsizing world. Beyond acquiring and retaining the new skill sets required to deal with downsizing and becoming adept at working directly with end users across multiple geographies, there are a number of other issues with which professional services firms must deal to be successful in the downsized world.

Results of INPUT's research with end users underscore the shift in skills that will be required for PS firms seeking implementation projects. On a scale of 1 to 5, with 5 representing the highest rating, users rated both downsizing-client/server knowledge and in-depth understanding of network technology 4.1 as the primary motivators for selecting a PS firm. These are hardly the technical skills that were in greatest demand through the late 1980s for the vast majority of professional services companies. Many were getting by on COBOL, CICS and IMS. Although requirements for this type of professional technical expertise certainly won't vanish overnight, the demand eventually will wind down.

In addition, research indicates that there are significant shifts in what will be required of PS firms in the consulting and education components of the professional services business. Exhibits V-4 and V-5 illustrate how requirements for various aspects of the practice in these areas are changing as the primary buyer of professional services shifts from the "old" paradigm dominated by the internal IS function to the "new" one dominated by the end user.

EXHIBIT V-4

**Downsizing Impacts on Aspects of PS—Consulting**

| Aspect | Old (IS) | New (User) |
|---|---|---|
| Professional Skills | Primarily technical | Technical and business |
| Support Focus | General | Specific |
| Practice Focus | Planning | Implementation |
| Telecommunications | Design | Implementation |
| Projects | Long | Short |
| Applications | Design orientation | Software selection/modification |

EXHIBIT V-5

**Downsizing Impacts on Aspects of PS—Training/Education**

| Aspect | Old (IS) | New (User) |
|---|---|---|
| Philosophy | Teach the teacher | Teach the user |
| Emphasis | Planning—technical details | Implementation/use |
| Method | Varied curricula | Specific courses |
| Schedule | Ongoing/long | As needed/short |

Whether dealing with the consulting or the education and training side of the professional services business, it seems quite clear that end users will require more specific deliverables focused on current needs. As a consequence, firms specializing in these areas will need to reconsider and make adjustments to the tools and processes utilized in delivering their services to the emerging user client, as well as to the technical content.

The situation is not much different when examining the various aspects of the software support component of professional services. Exhibit V-6 compares the characteristics under both scenarios.

EXHIBIT V-6

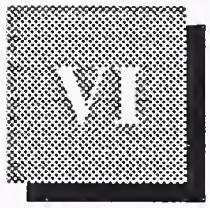
**Downsizing Impacts on Aspects of PS—Systems Support**

| Aspect | Old (IS) | New (User) |
|---|---|---|
| Operating Systems and Tools | Heavy requirements | Little need |
| Applications Development | Heavy—custom code | Light— customize code |
| Applications Modification | Heavy (build hooks) | Light (use hooks) |
| Installation and Testing | Plan and assist | Do |
| Integration | Heavy | Medium |

Here again we see a glaring need to restructure the processes of how support is provided, as well as the need to apply the new processes to new classes of technology.

Overall, downsizing will have a heavy impact on all aspects of the professional services business. To make the transition to a successful professional services vendor in the downsized environment, PS firms will need:

- Strong client/server technical skills, coupled with minicomputer, microcomputer and workstation literacy
- Comfort and solid management processes to deal with scalable applications and the use of templates to construct new applications
- Skills in software evaluation
- Adequate capital to redesign the processes utilized in delivering these services in a downsized environment




# Conclusions and Recommendations

INPUT's conclusions and recommendations are divided into three sections. Section A deals with the general impacts that downsizing has had, and will continue to have, on the use of information technology in general. Section B covers the specific conclusions and recommendations with regard to the impact of downsizing on the management of information systems within user corporations. Finally, section C summarizes INPUT's conclusions and recommendations with regard to vendors of software and services.

## A

## The Use of Information Technology and Services

INPUT believes that the downsizing of information systems will have a revolutionary impact on how information systems technology is deployed and managed in the current decade. These changes in technology management and deployment are the results of a major restructuring of how business is being managed, and the re-engineering of the fundamental business processes that support management objectives. It is not the relentless evolution of information technology itself. As it happens, recent advances in information technology are major facilitators of business process change, permitting:

- The re-engineering of business processes dependent upon the analysis of information regarding markets, internal and external business conditions, etc., in such a way that the processes can be conducted in real time by operational management

- The creation of direct electronic linkages between a firm's management, its customers, its suppliers, and its banks in a manner which reduces the need for staff operations, intermediaries and hierarchical decision-making processes traditionally devoted to gathering information to support operational decision making

- Direct integration of information technology into the manufacture and distribution of products, as well as product offerings and services

This being the case, INPUT believes that there are several conclusions regarding the deployment, development and management of information technology-based solutions that are inevitable.

- Line management, totally or largely dependent upon the IT-based processes, will insist on control of the functional capabilities and quality of the information systems driving those processes.

- With primary focus on managing the business, and information systems being important but secondary, line managers will look increasingly to outside product and service providers with particular expertise in their area of the business to function as partners in the continuing evolution of their systems requirements.

- Funding for changes in existing information systems and the creation of new systems will begin to come directly from line operations, thus increasing the pool of available funds to be spent on outside products and services and, in general, providing growth stimulus for the information technology industry.

- The control of information technology and its delivery will continue to require sound management processes, but the nature of those processes and the roles users, corporate IS and IT vendors play will shift dramatically, creating significant challenges for each.

## B

## Management of the Information Systems Function

### 1. Conclusions

- The general re-alignment of business functions to downsized organizational structures and more decentralized decision making has placed and will continue to place pressure on IS to re-align both IS infrastructure and applications to meet business information needs. Consequently, the examination of information systems downsizing as an IS strategy is inevitable for most corporations.

- Although senior management's objectives for the downsizing of IS typically place heavy emphasis on cost savings to be achieved through downsizing, such savings will seldom occur. The expense of getting through the transition will likely be high. However, most firms report a

high degree of satisfaction with a downsized environment, primarily because it tends to provide increased flexibility and rapid response to the needs of a more decentralized management structure, and places more control in the hands of line management.

- It is not likely in the immediate future that downsizing will eliminate the mainframe, but certainly the number, complexity and size of these types of installations is decreasing over time.

- For most firms there are no clear-cut approaches to selecting downsized hardware and software environments. Even though some de facto standards are emerging, it will be necessary to customize the solution in the vast majority of cases.

- Similarly, there are no standard approaches to managing the actual downsizing process.

- Downsizing requires a re-alignment of IS management responsibilities. More operational responsibilities will move directly into the hands of operating management. But the need for overall coordination in terms of infrastructure and network management will remain.

- This re-alignment of responsibilities will have a dramatic effect on the organization and skill requirements of IS professionals within a given firm. But, the role of central IS will not vanish in medium- to large-sized companies. In general, central IS will decrease in size significantly, adopting more of a staff role, but most likely will retain the responsibility for overall network management. IS staffs in operating divisions will grow significantly as they take over the direct day-to-day management of their own operations and development functions.

## 2. Recommendations

- The scope of a major information systems downsizing effort goes well beyond the typical systems project. By affecting organization, applications and infrastructure simultaneously, such an effort is by definition high risk. Therefore, IS management needs to ensure that the plan put in place to accomplish the transition deals with all of the nontechnical issues, and has the buy-in and support of key staff and line units that will be participating in or impacted by the project.

- Because there are no "canned" technological solutions, INPUT believes that a pilot study to test the proposed architecture will provide significant benefits, and offer the opportunity to test out the effectiveness of the proposed management processes as well. Choose the most enthusiastic user organization as a partner for the pilot.

- A solid cost/benefits study would be desirable, but a solid model predicting costs alone is a necessity. Regardless of how happy users are likely to be, someone is going to want to know what it all cost. Because of the multi-organizational impacts of these kinds of efforts, the modeling process is going to be difficult, and must be approved by all the significant players. Organizational costs in terms of re-organization and retraining are likely to be much higher than anticipated, and must be accounted for. Similarly, management should not presume that technology costs will decrease in the short term. Experience has shown that in most instances, anything already installed in user departments will need to be replaced or significantly upgraded as a result of downsizing.

- There are two fundamental approaches to applications downsizing. One involves the direct conversion of existing applications code, the other a re-engineering of the application. INPUT strongly recommends the latter approach, even though it is more costly in the short run. Unless applications are re-engineered, it's unlikely that many of the benefits, such as increased flexibility and responsiveness, will be achieved.

- Remember that downsizing implies keeping the existing environment running while migrating to a new technology and organizational paradigm. Therefore, firms should utilize outside product and service vendors not just to supplement existing staff, but to bring to bear unique skills or product/service offerings that will be required. Transitional outsourcing should be considered, and IS management should look to desktop services vendors and professional services firms with experience in downsizing as significant potential allies in any downsizing effort.

# C

# Information Technology Vendors

## 1. Conclusions

- Downsizing will have an overall positive effect on the information services market, creating new opportunities in virtually all market segments. However, vendors will need to adopt new strategies with regard to marketing and product architecture in order to leverage those opportunities.

- User buying will undoubtedly make available more money for the purchase of software and services, as the CIO ceases to become the gatekeeper on most development and maintenance budgets. However, users may be significantly more conservative regarding price.

- As users' buying influence continues to grow, vendors will increasingly need to provide total solutions and demonstrate industry- or function-specific business knowledge to be successful.

- The ongoing downsizing phenomenon will accelerate the existing trend toward end-user buying of software and services products, creating multiple sales points within any given organization.

- Products and services in all market segments will need to be tuned to the client/server (C/S) model in order for vendors to take advantage of the growing market opportunities brought about by downsizing.

- Different market segments (professional services, processing services, software products, etc.) will be impacted differently. Each segment will have its own set of challenges and opportunities. The professional services and software products segments will be most significantly impacted.

- Whole new markets with significant growth opportunities will develop as a result of downsizing. Desktop services and applications management are good examples.

- The key to success will be the capability to deliver full-function applications suites that are adaptable or scalable to multiple platform environments.

## 2. Recommendations

- All vendors should proactively consider changes in marketing strategy and product orientation as a result of downsizing.

- Alliances and/or acquisitions should be considered to allow vendors to present total solutions to the marketplace.

- Retraining in C/S technology as it applies to a particular vendor's market is essential. This needs to be coupled with the development or acquisition of in-depth knowledge of the business processes of a vendor's targeted industry segment(s).

- All vendors should consider innovative pricing approaches that can be tailored to meet the broader variety of business and cultural practices implied by end-user buying.

- Specific market segments will present different opportunities. Exhibit VI-1 gives INPUT's recommendations for four major classes of vendors.

EXHIBIT VI-1

**Downsizing Opportunities for IS Vendors**

| Vendor Class | Opportunities |
|---|---|
| SI and Professional Services Firms | Downsizing SI engagements<br>Downsizing methodologies<br>Distributed applications templates |
| Outsourcers | Industry-specific offerings<br>Transitional outsourcing<br>Desktop services<br>C/S applications products |
| Software Products and Turnkey Systems Firms | Distributed integrated platforms (DIP)<br>Network management software<br>Network outsourcing |
| Network and Processing Services Firms | Network management<br>Specialized transaction processing |

## D

## Summary—Conclusions and Recommendations

Downsizing will have a significant impact on all aspects of information services and systems activity. The implications go well beyond the introduction of new technology. We already know that the phenomenon is having a significant impact on how information systems will be managed in the foreseeable future. This being the case, it appears quite clear that the relationships between buyers and sellers of information technology and services will need to change as well. The ability to restructure these relationships and re-engineer product and services offerings to meet the requirements of downsized computing will have a lot to do with determining the long-term winners and losers in the information services market.