INPUT

STRATEGIC MARKET PERSPECTIVE

Opportunities for Outsourcing Supply Chain Management

U.S. Outsourcing Program

Opportunities for Outsourcing Supply Chain Management

INPUT®

About INPUT

INPUT®

Clients make informed decisions more quickly and economically by using INPUT's services. Since 1974, information technology (IT) users and vendors throughout the world have relied on INPUT for data, research, objective analysis and insightful opinions to prepare their plans, market assessments and business directions, particularly in computer software and services.

Contact us today to learn how your company can use INPUT's knowledge and experience to grow and profit in the revolutionary IT world of the approaching millennium.

SUBSCRIPTION SERVICES

- Information Services Markets
  - Worldwide and country data
  - Vertical industry analysis
- Systems Integration/Professional Services
- Client/Server Software
- Outsourcing
- Information Services Vendor Profiles and Analysis
- Internet Opportunities
- Electronic Commerce
- U.S. Federal Government IT Markets
- IT Customer Services Directions (Europe)
- Software Support (Europe)

SERVICE FEATURES

- Research-based reports on trends, etc. (More than 100 in-depth reports per year.)
- Frequent bulletins on events, issues, etc.
- 5-year market forecasts
- Competitive analysis
- Access to experienced consultants
- Immediate answers to questions
- On-site presentations
- Electronic report delivery

DATABASES

- Software and Services Market Forecasts
- Software and Services Vendors
- U.S. Federal Government
  - Procurement plans (PAR, APR)
  - Market Forecasts
  - Awards (FAIT)

CUSTOM PROJECTS

For Vendors—Analyze:
- Market strategies and tactics
- Product/service opportunities
- Customer satisfaction levels
- Competitive positioning
- Acquisition targets

For Buyers—Evaluate:
- Specific vendor capabilities
- Outsourcing options
- Systems plans
- Peer position

OTHER SERVICES

- Acquisition/partnering searches

Contact INPUT at: info@input.com, or http://www.input.com

Frankfurt • Perchstatten 16, D-35428, Langgöns, Germany, Tel. +49 (0) 6403 911 420, Fax +49 (0) 6403 911 413

London • Cornwall House, 55-77 High Street, Slough, Berkshire, SL1 1DZ, England, Tel. +44 (0)1753 530444, Fax +44 (0)1753 577311

New York • 400 Frank W. Burr Blvd., Teaneck, NJ 07666, USA, Tel. (201) 801-0050, Fax (201) 801-0441

Paris • 24, avenue du Recteur Poincaré, 75016, Paris, France, Tel. +33 (1) 46 47 65 65, Fax +33 (1) 46 47 69 50

San Francisco • 1881 Landings Drive, Mountain View, CA 94043, USA, Tel. (415) 961-3300, Fax (415) 961-3966

Tokyo • 6F#B, Mitoshiro Bldg., 1-12-12, Uchikanda Chiyoda-ku, Tokyo 101, Japan, Tel. +81 3 3219-5441, Fax +81 3 3219-5443

Washington, D.C. • 1921 Gallows Road, Suite 250, Vienna, VA 22182, USA, Tel. (703) 847-6870, Fax (703) 847-6872

INPUT Worldwide
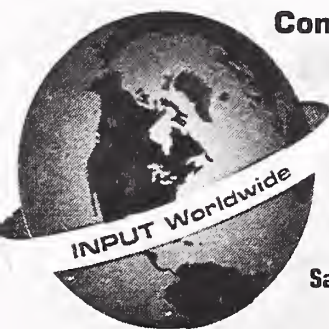
Abstract

This report identifies the ways in which supply chain management (SCM) outsourcing is being used to improve business operations. It examines both user and vendor points of view and identifies opportunities for each.

The analysis examines the benefits users expect from supply chain management outsourcing, the drivers and inhibitors of the decision to outsource SCM, the decision makers, and key vendor selection criteria. In addition to an analysis of the market for supply chain management outsourcing, this report provides a forecast of market growth through the year 2001.

This report is based on a subset of data from a primary research project involving over 130 telephone interviews conducted with leading North American companies across a number of industries.

U.S. Outsourcing Services Program

Opportunities for Outsourcing Supply Chain Management

Table of Contents

Exhibits

<div style="text-align:center">

I

</div>

Introduction

Business process reengineering efforts have led companies to relentless examination of processes to find and eliminate the fat and then refocus the business on meeting the needs and requirements of the customer. As the crest of reengineering activity passes, the new "lean and mean" company left in its wake appears to be extremely efficient—on paper—but will it work?

- Inventory and logistics costs are high, perhaps 10% of expenses.

- Customers have increased their demands for time-shrinking—requiring an increase in the speed of product flow from raw materials to sold products.

- Companies are just now realizing the high cost of these new, high service levels.

- Fewer employees means a different resource equation, including greater use of technology and outside suppliers.

The overall challenge is to do more with less; that includes meeting demand and managing the entire supply chain. The new goal is a seamless supply network that minimizes cycle times, strengthens inventory management, cuts transportation costs, and keeps customers happy. This integrated supply chain will create an efficient and effective flow that extends beyond materials requirement planning and manufacturing resource planning to a larger collection of the planning, scheduling, and financial tools needed to run a global enterprise.

The new supply chain management (SCM) model will be supported by technology throughout the flow. Reengineering reduced the number of interfaces and data hand-offs and encouraged wider adoption of the open systems infrastructures that will be required within and between companies. Much of the needed data is online and accessible. And outsourcing practices have become common as companies develop greater comfort with the approach and work with their vendors successfully to ensure the extended enterprise resource.

A
Scope and Purpose

1. Scope

This report is one of a series of INPUT reports on the outsourcing market (see Section D: Related INPUT Reports). This research-based effort focuses specifically on supply chain management outsourcing requirements and practices. Although INPUT allowed users to indicate their own definitions of supply chain management and the business and technical components included by these definitions (see Chapter III), INPUT was guided by a number of generally accepted notions of SCM concepts:

- The discrete activities may include the general administration of the supply chain, accounts payable/receivable, purchasing, order management (e.g., entry or processing), distribution logistics, manufacturing, order fulfillment, warehousing and inventory management, routing/scheduling, sales forecasting, order/shipment tracking, and customer service.

- The efficient and effective flow of information across discrete activities is the central information management issue.

- Completion of the entire chain may include a number of combinations of in-house and out-of-house personnel as well as a number of types of technologies owned and/or managed by these respective parties.

The focus of the research was on the outsourcing practices of U.S.-based user companies and the roles and responsibilities that outsourcing vendors have in these practices. INPUT specifically sought to identify gaps between users' expectations for outsourcing and vendors' activities.

2. Purpose

If SCM is to be beneficial, companies need to understand the many practical aspects of its implementation and vendors need to understand the potential market, its drivers and inhibitors, and the factors of success. Accordingly, this research addressed the following major questions:

- What are the drivers and inhibitors of SCM?

- What are users' objectives and objections regarding SCM outsourcing?

- What benefits do users anticipate?

- Which components of SCM are users willing to outsource?

- What is the impact of technology on SCM outsourcing?

- What is the nature of the relationship between the use of integrated business software (e.g., SAP's R/3) and the decision to outsource?

- What differences exist between user requirements and vendor capabilities?

- Who are the decision makers of SCM outsourcing?

- What are the salient vendor selection criteria?

Readers of this report will be assisted in a number of ways:

- Users will be able to evaluate their own practices and considerations against those of peer companies.

- Vendors will be able to identify and address gaps between requirements and offerings.

- Vendors will be able to focus more on components that users are willing to outsource.

- Vendors will be able to evaluate the impact of technology on users' willingness to outsource and technological shortcomings in the vendor's offerings.

B
Methodology

This report is based on telephone interviews conducted with representatives of user organizations and vendor companies who were knowledgeable about supply chain management and outsourcing activities within their organization. A total of 103 user interviews and 34 vendor interviews were conducted. Exhibit I-1 identifies key descriptive characteristics of the user sample.

Exhibit I-1

Profile of User Respondents by Industry

Industry	Percent of Sample	Smallest Company (No. of Employees)	Largest Company (No. of Employees)	Average Number of Employees
Communications	1	NA	500,000	NA
Discrete Manufacturing	40	25	300,000	35,500
Process Manufacturing	27	500	120,000	20,900
Retail	4	NA	NA	NA
Services	13	100	20,000	5,500
Transportation	7	NA	NA	NA
Wholesale	8	4	4,000	1,100

n = 103   *Source: INPUT*

The industries generally considered most active in supply chain management activities are represented. These companies range in size from small companies to the major corporations of America. On average, the number of employees at a given company in the sample makes the sample quite representative of the target market for supply chain management outsourcing.

Vendors active in applying information technology to supply chain management issues were also interviewed. Thirty-four structured interviews were conducted, along with a number of unstructured vendor interviews. Exhibit I-2 profiles the information service categories of the vendors participating in the structured interviews, and indicates the percent of their total offerings in each information services category.

Exhibit I-2

Vendor Respondents' Information Technology Offerings

Information Services	Chain Management Category			
	Inbound Logistics (%)	Manufacturing (%)	Outbound Logistics (%)	Services (%)
Services	50	34	53	60
Software	38	46	34	47
Processing	16	15	16	33
Entire Process	34	31	34	47
Total Participants in Chain Component (n)	32	13	32	15

n = 32   Source: INPUT

This table indicates that the vendors who were interviewed provide multiple information service offerings across a number of supply chain components. Some of these vendors offer a means of outsourcing the entire process.

C
Report Organization

Chapter I—Introduction—describes the purpose, methodology, and organization of the report.

Chapter II—Executive Overview—presents an overview of supply chain management outsourcing practices.

Chapter III—User Views of Supply Chain Management—reviews users' definitions of SCM, identifies their expectations from SCM outsourcing, and lists the aspects of SCM that users are willing to outsource.

Chapter IV—Impact of Technology on Supply Chain Management—looks at the influence of the Internet, integrated software packages, and electronic commerce on SCM.

Chapter V—The Role of Outsourcing Vendors in the Supply Chain Process— presents a market forecast, identifies the types of services being offered by vendors, and describes common outsourcing pricing practices.

Chapter VI—Conclusions and Recommendations—is a summary of the research findings that leads to specific recommendations for growing the SCM outsourcing practice while reducing its risks.

Appendices—Three appendices are included:

- Appendix A provides definitions of terms used in this report and shows the SIC codes that comprise each of the vertical markets.

- Appendix B includes selected graphs supplying greater detail than those in the body of the report.

- Appendix C is a copy of the user and vendor questionnaires used for the telephone interviews.

D
Related INPUT Reports

Other reports from INPUT that could be of interest in relation to this report include:

- *Impact of the Internet on Outsourcing and Processing Services*

- *Using the Internet for Business Operations*

- *Pricing and Marketing of Outsourcing Services*

- *Negotiating Outsourcing Contract Terms and Conditions*

- *Outsourcing Services Competitive Analysis*

- *Outsourcing Vendor Performance Analysis*

- *Internet Sales and Marketing Directions*

- *U.S. Applications Solutions Market, 1995-2000*

- *Outsourcing Market Analysis, 1994-1999*

II
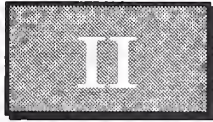
Executive Overview

A
Market Forecast

The market for SCM outsourcing will increase from $2.3 billion in 1996 to $5.7 billion in 2001, as shown in Exhibit II-1.

Exhibit II-1

Supply Chain Management Outsourcing Market Forecast, 1996-2001
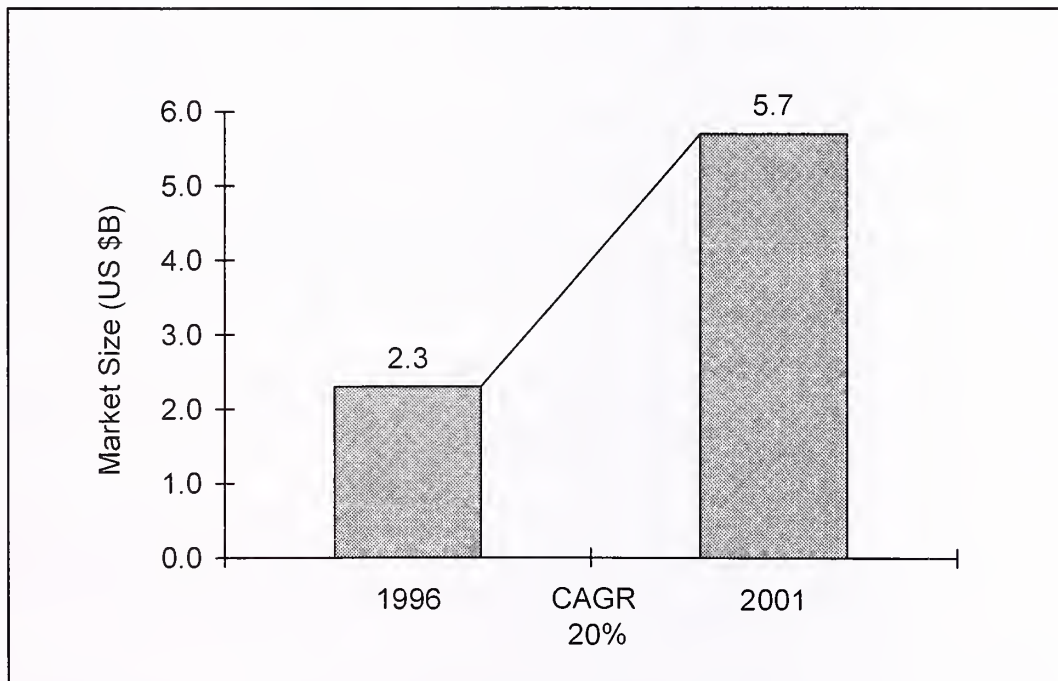
Source: INPUT

The compound annual growth rate (CAGR) for this market is 20%. This is a slightly lower rate than the rate for the overall outsourcing market, which is growing at 21% CAGR. Recent growth in supply chain management has been slowed by the lack of integrated software. As availability improves over the next several years, the growth rate will accelerate.

B
User Marketplace

1.   Range of User Organizations and Use of SCM Outsourcing

Manufacturing organizations are not the only users of supply chain management outsourcing. Although discrete and process manufacturing companies make up 67% of the users encountered, other vertical markets are also represented, including wholesale and retail distribution (12%), services (13%), and transportation (7%). There are also users in the utilities and communications industries.

The functional areas involved in SCM outsourcing are not widely varied. Clients report that inbound logistics is outsourced about two-thirds of the time, manufacturing about 80%, outbound logistics about 90% of the time, and service about 20%. This does not take full account of the fact that some vendors supply SCM services packaged together with other business so that they are not included in total numbers. Outbound logistics may be packaged together with shipping, or SCM may be sold with a contract for software products and supporting services.

2.   Why Supply Chain Management Is Being Used

The main drivers for the use of supply chain management are the needs to reduce costs (or achieve more cost-effective processes) and shrink manufacturing product cycles. In the last two years, according to several vendors, SCM has contributed to reductions of up to 40% when the entire process has been outsourced. Beneficiaries of these reductions in costs are also able to manage work better in relation to meeting customer needs.

The ability to shrink product cycle time is due to the use of information that makes it possible to supply products to customers as needed without encountering stock shortages.

The total range of improvements expected by users includes the ability to achieve more competitiveness, cost effectiveness, time shrinking, agility, and total quality management, as shown in Exhibit II-2.

Key objectives are increased competitiveness, rated 4.5, and cost effectiveness, rated 4.3, on a scale where 5 indicated an objective that was "very important".

Exhibit II-2

Key Supply Chain Management User Objectives
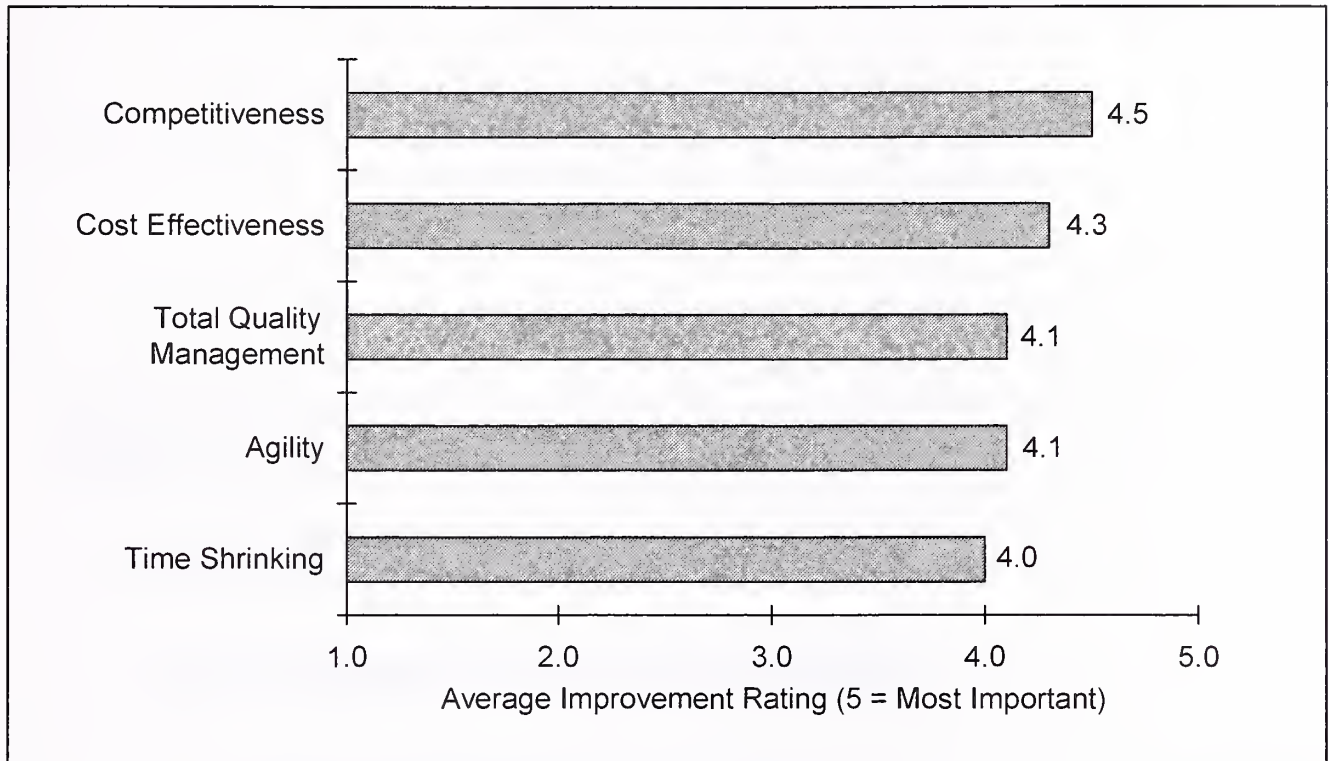
Source: INPUT

C

User Assessment of SCM Outsourcing

1. Benefits and Liabilities of SCM Outsourcing

Users show a high degree of enthusiasm about the benefits achieved with SCM outsourcing, as shown in Exhibit II-3.

Exhibit II-3

Key Benefits of Outsourcing Supply Chain Management

Horizontal bar chart with vertical axis labeled "Benefits" and horizontal axis labeled "Average Ratings (5 = "Very Important")":

Benefit	Average Rating
Improve Service	4.3
Up-to-Date Tech.	3.9
Cost-Effective IT	3.8
Expedite Redesign	3.4
Gainsharing	3.4
Elec. Commerce	3.4
Free Up Personnel	3.4
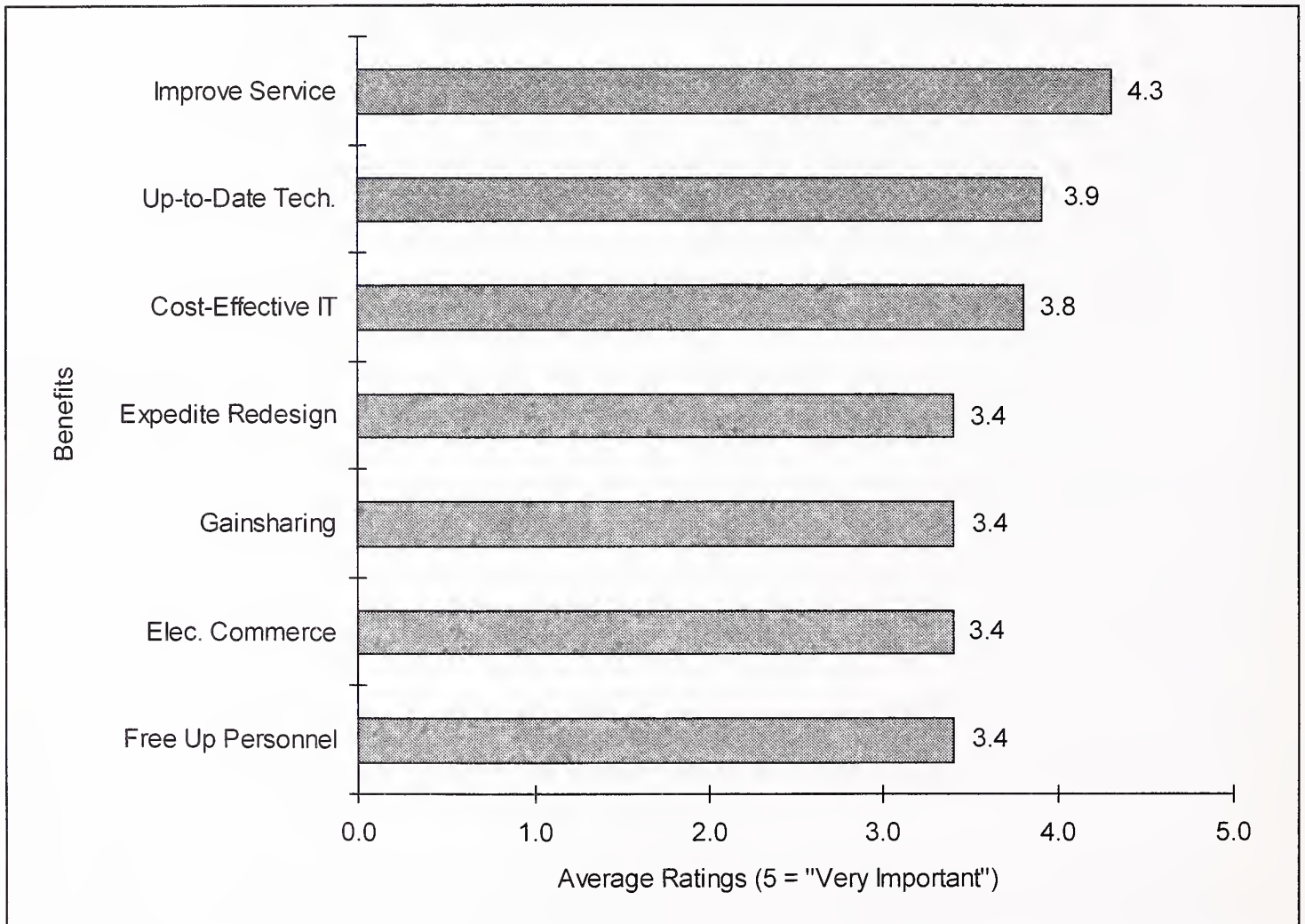
Source: INPUT

Eight benefits were judged as important, rating above 3.3 on a scale where 5 was high. Of particular importance to users is the fact that a high level of improvement has been obtained in service, a benefit that garnered a 4.3 rating. Users also report that high-ranking benefits include the use of more up-to-date technology, rated 3.9, as well as well as more cost-effective utilization of technology, rated 3.8.

Roughly one-third of users are unsure that benefits were obtained, however. This is one of the liabilities of SCM outsourcing reported by users. Other liabilities that were reported included:

- A perceived decline in quality

- Knowledge not transferred

- Loss of control

The response of several vendors to these objections is that users will obtain more success if they stick with the process and work with the vendor to improve results. They do acknowledge that transfer of knowledge is a real problem with some users. Not enough user time is freed up to enable users to gain adequate knowledge about what is going on. Among the improvements desired by users to maximize their use of SCM were:

- More consulting

- More training services

2. Vendor Performance

The most important measures of vendor performance by users are the ability to meet requirements and on-time delivery of projects. Next in importance are the capabilities that vendors need to meet those requirements and cost control. Users report a high level of satisfaction in vendors' fulfillment of these key measures of performance, as shown in Exhibit II-4.

Exhibit II-4

User Ratings of Satisfaction with Vendor Performance
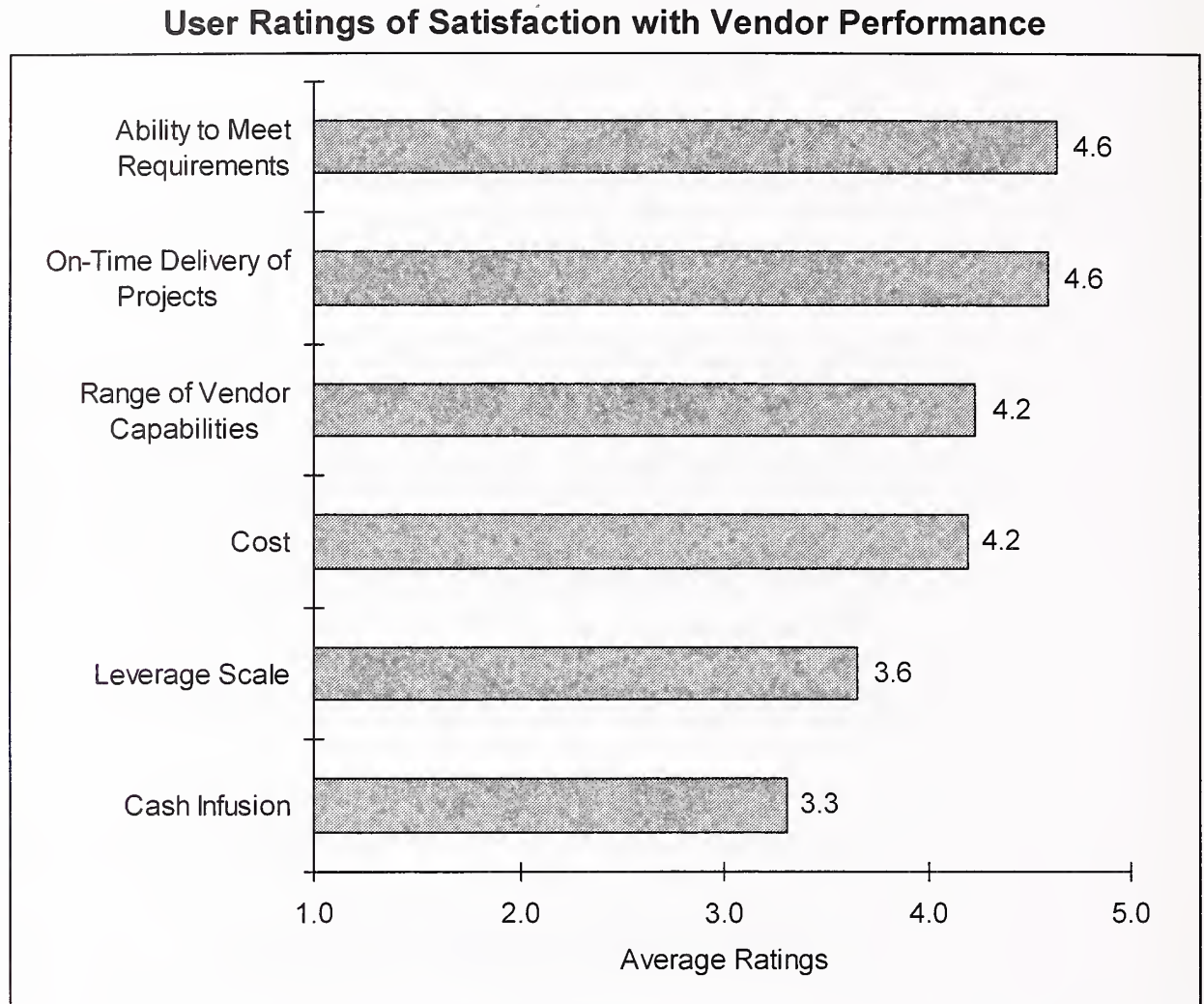
Source: INPUT

Users feel that vendors do have the capabilities to deliver systems that will meet their needs. They give high ratings to vendors' ability to meet requirements, on-time delivery, the range of vendor capabilities, and vendor cost effectiveness.

D

Vendor Outlook

1. Market Understanding

Vendors demonstrate a good understanding of what users are looking for. The objectives that they feel are being pursued with SCM outsourcing, which are shown in Exhibit II-5, are close to the benefits being sought by users as stated above.

Exhibit II-5

Vendors' Perceptions of Customers' Objectives for SCM

Objective	Rating
Competitiveness	4.5
Cost Effectiveness	4.3
Total Quality Management	4.1
Agility	4.1
Time Shrinking	4.0
Move to Make-to-Order Business	3.2
Mass Customization	3.1

Average Ratings of Importance of Objectives
(5 = "Very Important")
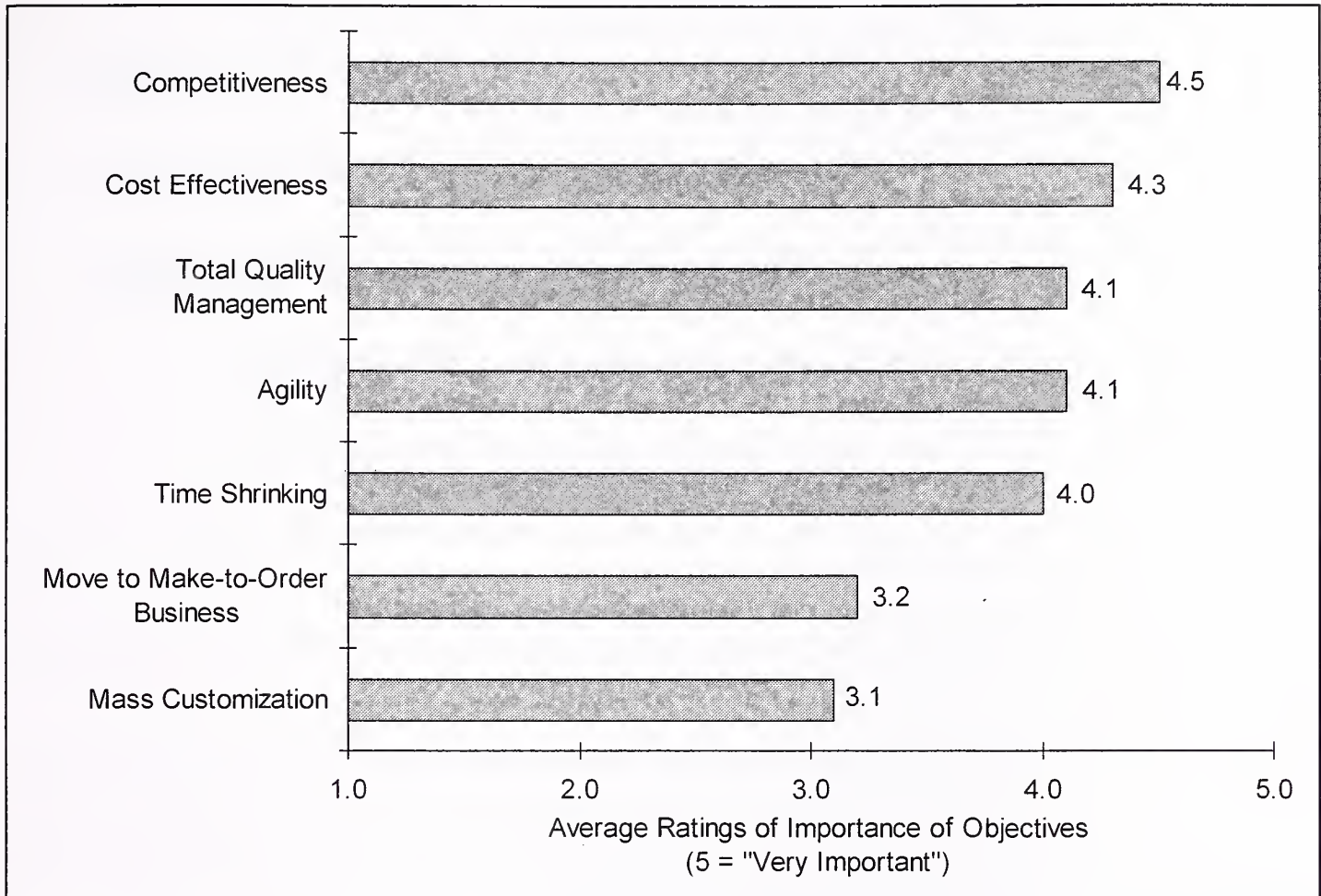
Source: INPUT

Vendors also demonstrate a good understanding of the selection factors used by SCM outsourcing prospects. They anticipate being graded on their responsiveness above all, followed by their reputation and the competence of their personnel.

Vendors' vision and global presence are less important to users during the selection process.

Exhibit II-6

Vendor Selection Criteria: Capabilities

Criteria	Average Rating
Responsive	4.7
Competent	4.6
Reputation	4.6
Vision	3.8
Global	3.5

Average Ratings (scale 1.0 to 5.0)
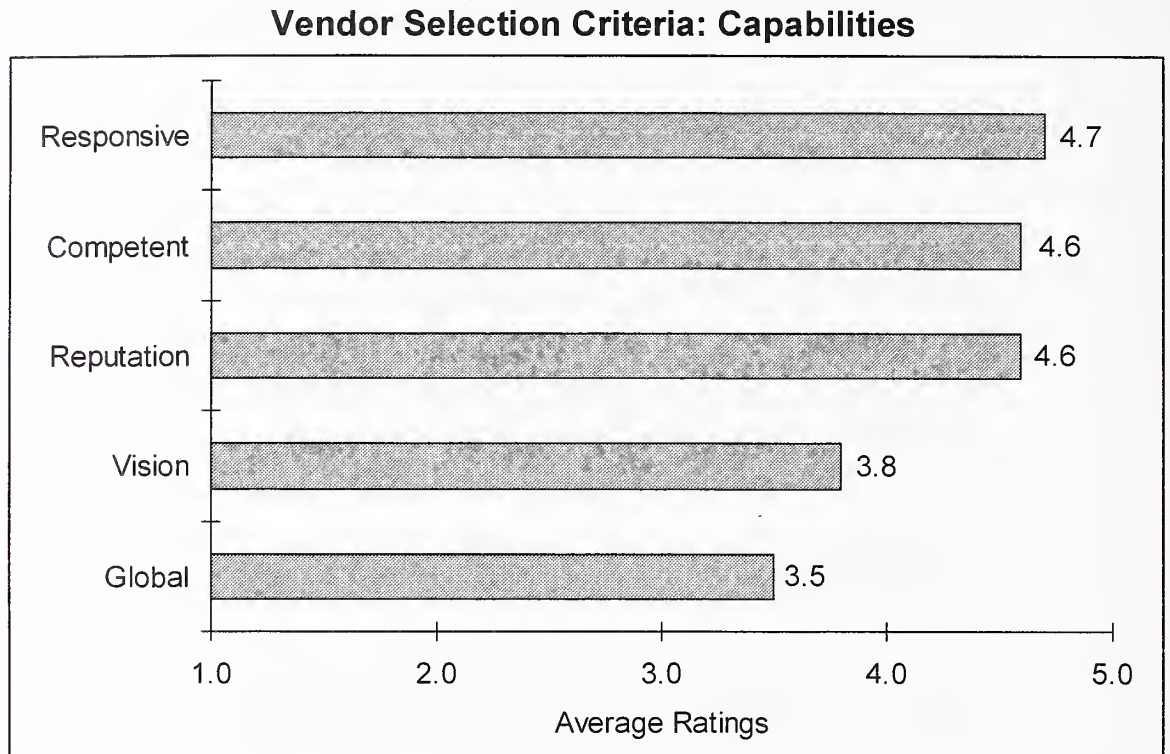
Source: INPUT

Vendors realize that users want improvements in SCM solutions, but they are not in agreement with the outlook of users or with each other. A few vendors think that more integration is needed. Other vendors think that improvements should be made in specific functional areas, but there is no agreement on the areas to improve.

Other than a few of the largest firms, vendors in general are not aware that some users are concerned with improving consulting or training so that they can improve their use of SCM (see Exhibit II-7).

Exhibit II-7

Additional Vendor Services Desired by SCM Users

- Better integration

- More consulting

- More training in SCM

Only a small percentage of vendors and users are actively pursuing more use of the Internet and electronic commerce, although there is general awareness of these capabilities and industry experts and several large vendors are discussing use of these capabilities.

2. Pricing Considerations

The factors that vendors report as most important in determining price are the cost of meeting requirements and interaction with prospects. Almost a third of vendors feel that covering costs and achieving an adequate margin is the price determinant. About one-fifth of vendors rely more on interacting with users and determining what value the system could have to them in setting the price.

Other pricing factors that vendors report include prices quoted elsewhere in the market and competitive prices.

Vendors also feel it is important to emphasize certain features or capabilities to support their pricing. The feature emphasized most often is integration of functions, although the abilities to tailor systems easily and to reduce costs have been used to close deals.

(Blank)

III

User Views of Supply Chain Management

Although supply chain management has had some "shelf life" in theory, it is rather new in practice. Until recently, SCM issues were rolled up within issues of logistics which, in actuality, translated to transportation and distribution. But reengineering, downsizings, the need to manage costs in the face of competition, and other forces at work in corporate America have brought the need to manage the supply chain into sharp focus.

This chapter examines the definitions of SCM, the expectations users have for SCM, and the components of the chain they are willing to outsource.

A

What Is Supply Chain Management?

1. Definition of Supply Chain Management

By most definitions, the supply chain extends from the point of creation to the point of consumption: from sourcing, to manufacturing, to distribution, to the final sale, and even to post-sale support. In the context of mass customization, where the goal is giving customers the product when, where, and how they want it, SCM supports the "how".

Viewed as a management science (i.e., operations research) issue, SCM is a multicommodity network flow problem with side constraints. It involves feeding all current data into the system, along with goals, and then doing a massive optimization.

Technically, SCM is supported by software that facilitates interactions among modules of the software suite implemented in companies to manage the entire flow of information along the chain components. Links are created up and down the chain to an optimum point where, theoretically, a sale of a finished good at the back end triggers the purchase of a raw material for making the next product at the front end. Implemented as a perfect system,

this linked chain would have no inventory build-up, no stock-outs, and a minimized time from raw material to finished product. Perfect systems don't exist, of course, and frequently companies don't link components such as logistics to accounting or marketing, because the logistics alone is so complex.

2. Key Drivers in the Move to SCM

The focus on supply chain management is being fueled mainly by two internal forces: rampant and relentless cost cutting and shrinking product cycles.

- Cost-cutting

The move to more cost-effective processes has impacted personnel resources by eliminating jobs or replacing higher pay workers with low wage, non-union shops. With either approach there is an increasingly fragmented work culture: low-paid workers get the work done without enthusiasm, loyalty, or "ownership". Or, when jobs are eliminated, the manager-level worker has a few workers who must now do the work of many. Both approaches force a more vertical, "silo" view of the various components of SCM in which the efficiency of the process may be sacrificed for effectiveness in each silo (e.g., purchasing, transportation, manufacturing, etc.). Supply chain management offers to bring the horizontal, customer-driven orientation into focus. SCM also promises to continue to reduce costs, which have fallen in some industries from 10-40% since 1994.

- Product Cycles

Most companies produce goods and build inventory in response to forecasts, resulting in inventory build-ups or stock-outs. There often is a conflict between the pull mentality, where the customer sets the demand, and the push mentality, where the manufacturer anticipates demand. To those fearing shortages and the costs they cause, reducing inventories seems less attractive. SCM offers a means of creating efficiencies throughout the processes so that, theoretically at least, the next product is anticipated, produced, and delivered exactly as the last one is being demanded by the customer. The more manufacturers know about product movement, the more they can trim inventories. Inventory is ignorance.

For large companies that typically require twice the time to ratchet up production (the industry average for a 20% increase is 176 days for a large company versus 84 for a medium-sized company), SCM may make them more competitive. An interesting benefit of SCM is that it replaces inventory with information. Companies of all sizes can gain.

B
User Expectations from Supply Chain Management

1.   Expectations--An Example

Companies are focusing on creating superior supply chain performance to build stronger customer relationships and improve financial results. The ability to react quickly to supply/demand and recessionary/inflationary pressures through SCM smoothes the bumps of business.

One key is ordering that is quick, accurate, and efficient. Efficient consumer response includes continuous replenishment, quick response, and vendor-managed inventory. In the food retail industry, for example, the process starts by sharing POS information with vendors. An industry-wide Efficient Consumer Response (ECR) program was started in 1994 in response to retailers' demands for changes. Retailers want the various units within a conglomerate (Sara Lee, for example) to work together. ECR will establish standards and protocols for communications and operations, reducing the current 104 days to move a manufactured food product from the plant to the customer to an estimated 62 days. This would represent a savings of $30 billion in inventory costs.

Other retailers are also interested in creating efficiencies and passing on the cost savings to customers. Large retailers such as Wal-Mart pull demand rather than waiting for a push from manufacturing. This eliminates intermediaries. Large retailers are also cutting out the wholesaler. For manufacturers, this means smaller shipping orders to more locations and higher transportation and administration costs. Though the process works best with a high volume of low-value products (e.g., grocery store items), retailers of nonperishable, higher-priced goods are demanding the same.

Retailers are working on narrow margins and insisting that their partners do the same. They want just-in-time deliveries, immediate order fulfillment, and cooperation with promotions. The ultimate goal is to get the product out the door as fast as possible at the lowest possible price, consistent with quality.

2. Users' Improvement Expectations of SCM

Exhibit III-1 presents the respondents' views of the importance of business improvements hoped for from supply chain management.

Exhibit III-1

Importance of Supply Chain Management Improvements to Users
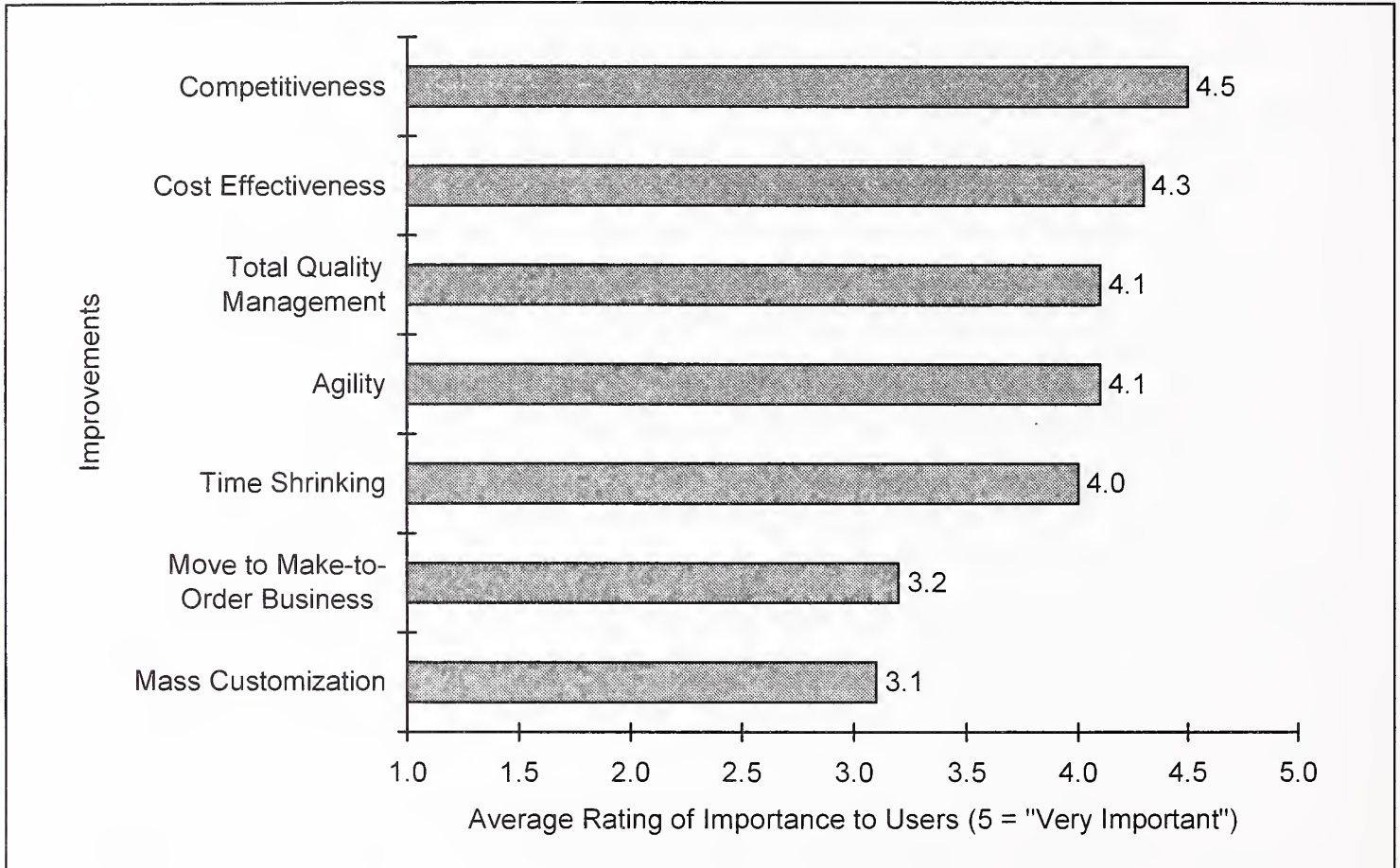
Source: INPUT

Users value achieving competitive advantage, rated 4.5, and improving cost effectiveness through integration, rated 4.3, as the most important potential benefits of SCM. The combination of these two as the highest rated benefits suggests that competitiveness has joined cost containment as the ultimate advantages that companies seek. This is consistent with current competitive pressures, cost-cutting trends, and the continuing pressures on pricing.

Specific customer-oriented changes are also important, although mean ratings for these items—becoming more agile, meeting total quality management objectives, and meeting demands for time shrinking—were slightly below the top two. Desires for these improvements vary both by industry type and by each company's stage in the reengineering cycle.

A number of users commented on combinations of improvements. Several spoke of reducing the inventory levels while improving the order fill rate, a

performance that benefits the company and users alike through increased efficiency. Other users mentioned the importance of inventory strategies in SCM by which capacity could be built up by having goods throughout the chain instead of physically building capacity (e.g., a warehouse or a larger manufacturing plant) and adding unnecessarily to fixed assets.

The least important improvements were the very specific approaches of providing mass customization and changing the business from build-to-store to make-to-order. Mass customization may not be perceived by users as having the same force as appeasing customers' price concerns and avoiding customer-annoying stock-outs. Users seem reluctant to change to a make-to-order system because the approach relies on the process—not the product—for success. Until comfort is built up, it is unlikely that traditional inventory levels will decline.

3. Users' Expectations To Outsource SCM

If competitive advantage and cost effectiveness are the goals of supply chain management, what are the benefits of outsourcing SCM to achieve these? Respondents were asked to rate the importance of potential benefits of outsourcing (see Exhibit III-2).

Exhibit III-2

Benefits of Outsourcing Supply Chain Management

Improve Service	4.3
Up-to-Date Tech.	3.9
Cost-Effective IT	3.8
Expedite Redesign	3.4
Gainsharing	3.4
Elec. Commerce	3.4
Free Personnel	3.4
Dist. Systems	3.3
Change Agents	3.0
Reduce Involvement	2.9
Internet	2.8

Average Ratings (5 = "Very Important")
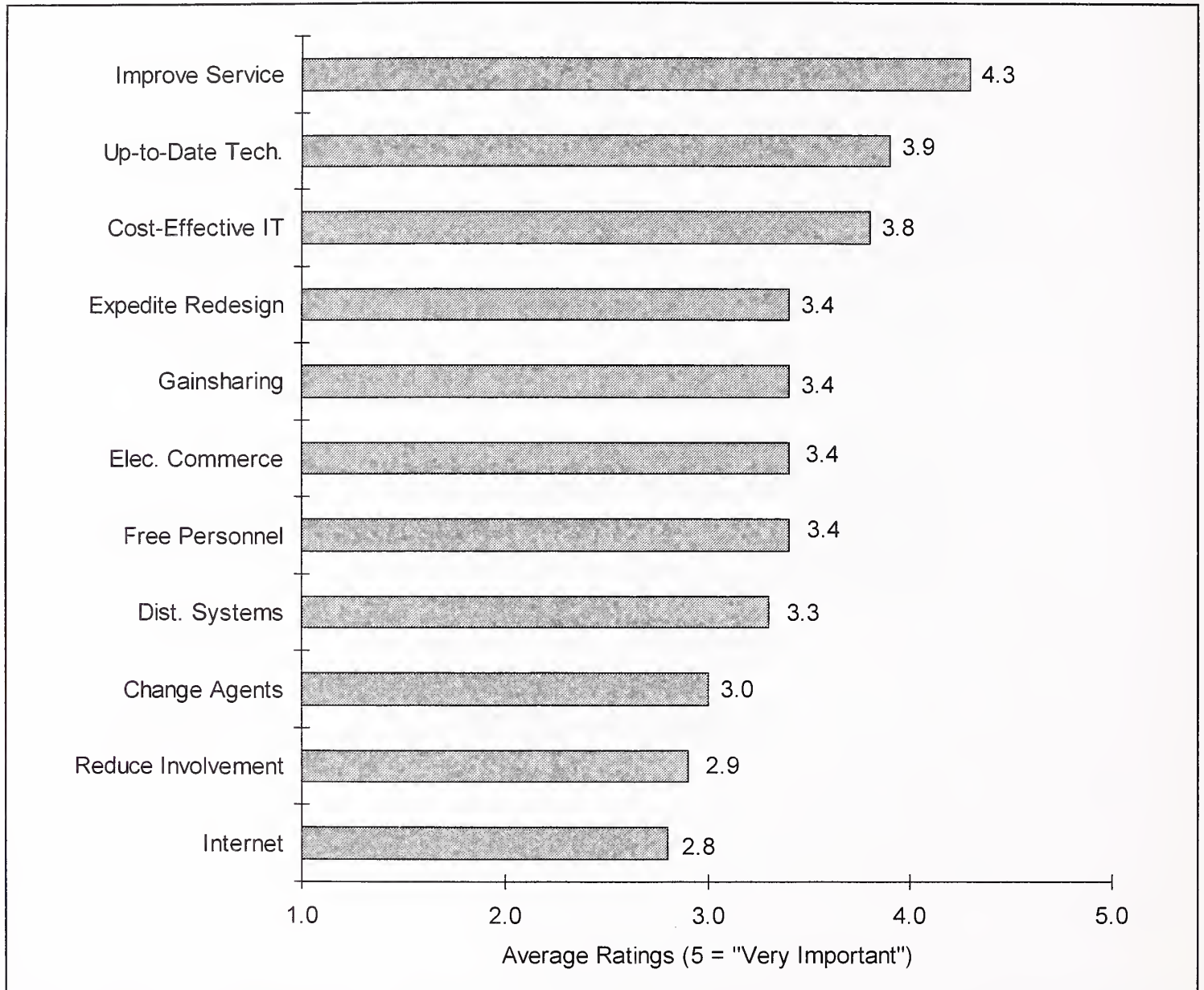
Source: INPUT

By far the most important benefit, according to the majority of respondents, was the opportunity to improve service levels through outsourcing. This was followed by technology updates and improvements in the cost effectiveness of IT.

A number of items were rated at approximately the same level. Users do not, on average, highly value the benefits of freeing in-house personnel, expediting redesign recommendations, or utilizing the change agents that completed any reengineering. Although professional services vendors frequently see outsourcing as a natural conclusion to streamlining and downsizing, companies seem to separate them. These users are also not

particularly attracted to the financial proposition of sharing the gains of doing the work in a more cost-effective manner with the outsourcer. Users seem equally unimpressed with outsourcing's ability to capitalize on technical changes such as the growth of distributed systems on the hardware side or electronic commerce on the software side.

The lowest average ratings of benefits from outsourcing show that exploiting Internet opportunities and reducing in-house involvement in the SCM process are not usually users' objectives for outsourcing. Presumably, users have developed their own in-house Internet/electronic commerce capabilities or use other, non-SCM vendors. Users may not yet connect supply chain functions to the types of opportunities available in electronic commerce, especially on the Internet. In terms of reducing involvement, users clearly do not view outsourcing as a means of shedding responsibility for the supply chain; spreading the risk is not valued as an outsourcing benefit. The notion that logistics is not a core competency and that outsourcing logistics will allow the company to focus on other, more critical issues is not accepted by these respondents. Users do stay involved; in fact, a new corporate position—chief resource officer—is emerging to manage all resources, including relationships with suppliers and outsourcers.

4. Users' Apprehensions About Outsourcing

Although an estimated 86% of major corporations currently farm out at least some services, versus 58% in 1992, outsourcing is not without its problems. Complications include: the nature of the distribution channels, the expectations of customers, the location and means of production, and the nature and size of the market. While the opportunity to turn fixed costs into variable costs is attractive, the downside is that payoffs often fall far short of expectations. Some companies report average savings of around 9%, instead of the 20-30% touted by consultants.

The financial sense is also frequently questioned. Because prices, especially in technology, can fall faster than the initial contract savings, deals may be made more expensive in the long run if future savings are not passed on to the company by the outsourcer.

The ratings of concerns or inhibitors regarding outsourcing (see Exhibit III-3) were nearly equal. Issues relating to the impact on the customer—fear that outsourcing would not deliver the expected benefits, fear of loss of control, fear of a decline in customer quality—were rated slightly higher than concerns over the impact on the company—critical knowledge gained by the outsourcers is not transferred to the company, the vendor puts the company at risk, and outsourcing becomes too expensive. One respondent also indicated that the future viability of the vendor is a concern--will this vendor

still be around in two years or five years? Another spoke of the decline in employee morale that can occur when parts of the business are outsourced.

The similarities in the frequencies of each rating of concern suggest that all of these issues are on the minds of prospective outsourcing customers and should be addressed by vendors.

Exhibit III-3

Outsourcing Inhibitors

Average Ratings (5 = "Very Concerned")
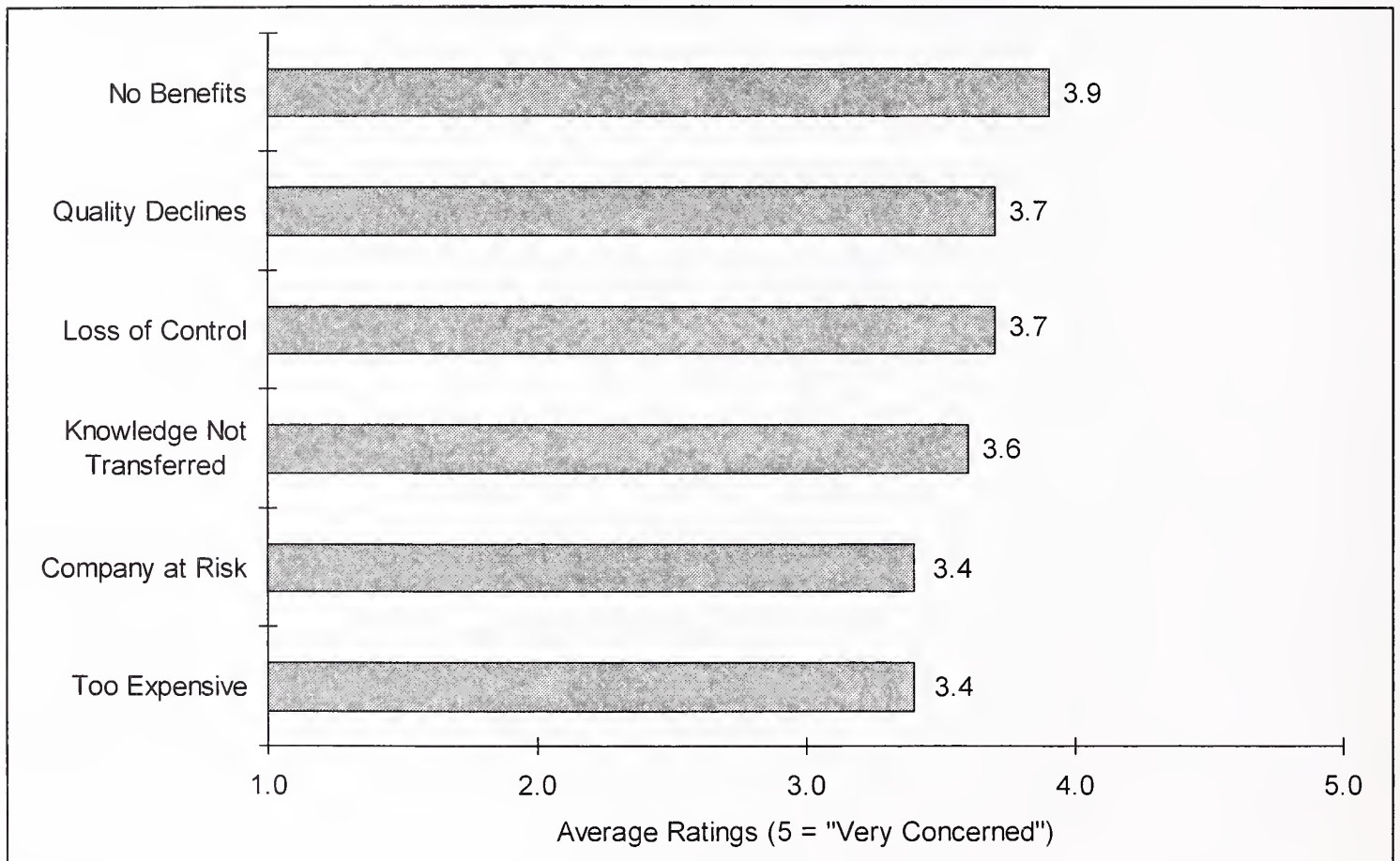
Source: INPUT

C

Aspects of Supply Chain Management That Are Outsourced

1. Overview

Many users and vendors involved in SCM outsourcing still describe work in this area in terms of the traditional types of activity being utilized. The SCM work will be called trucking, air shipping, or even supply or order delivery. Definition and classification was necessary to obtain data in a consistent manner for marketplace functions in terms of inbound, manufacturing, outbound, service, and other functions.

Definition and classification was also necessary to separate the activities of vendors into processing, software and services modes, or the entire job.

These classifications of vendor modes of work and market functions are used to describe the SCM outsourcing market, but the volume of work reported for these categories in the next section does not take account of the entire market, since some vendors provide work at no cost for some functions in order to get work in other functions.

- Red Pepper, now part of PeopleSoft, has sold contracts that deliver an entire solution for the price of the software involved.

- I2, Yellow Freight, and Preston provide outbound logistics as part of their shipping contracts.

- Major shipping firms including Federal Express provide additional services with shipping. A small part of such firms business is part of supply chain operations.

2. Aspects of SCM Being Outsourced

A significant portion of SCM is outsourced. Users report that the maximum percentage of work outsourced for any entire SCM function is 34%, except for service, where 47% of the entire function is outsourced (see Exhibit III-4).

Exhibit III-4

Use of Vendor Modes by SCM Functions

SCM Functions	Vendor Mode			
	Entire	Processing	Software	Services
% of Inbound Users	34	16	38	50
% of Manufacturing Users	34	16	34	50
% of Outbound Users	34	16	34	53
% of Service Users	47	33	47	60
% of Other Users	33	17	17	67

Source: INPUT

An interesting view of SCM use can be obtained by examining the combinations of SCM outsourcing taking place. The leading combinations— those involving more than 10% of users—are listed below:

- 35% of users outsource outbound and service

- 15% of users outsource all four components

- 15% of users outsource outbound and service

- 10% outsource manufacturing and outbound

- 10% outsource inbound, outbound, and customer service

3. Who Decides To Outsource SCM?

Although company executives are heavily involved in decisions to outsource SCM, IS and functional units are involved in many of the decisions. In some cases, IS and functional units play a greater role than executives do, as indicated in Exhibit III-5.

Exhibit III-5

Participation in SCM Outsourcing Decisions

Phase of Work	Decision Maker			
	Company Executives	Business Unit Management	Business Function Management	Information Systems
Outsourcing Decisions	95%	50%	67%	53%
Requirements Definition	60%	77%	80%	67%
Vendor Selection	53%	69%	84%	64%
Vendor Negotiations	42%	68%	88%	53%
Day-to-day Management	19%	64%	96%	78%

Source: INPUT

As the preceding exhibit shows, business functional management plays the strongest role in day-to-day situations, but also plays a strong role in vendor selection, negotiation, and requirements definition.

IS and business unit managers and top executives are also more involved in many decisions than many vendors are aware. The participative nature of decision making for SCM outsourcing makes it necessary for vendors to make sure they have made presentations to and/or discussed their strengths and capabilities with all the parties involved.

28

(Blank)

IV

Impact of Technology on Supply Chain Management

A
Impact of the Internet

Less than 10% of user respondents are now using or planning to use the Internet, but use is expected to increase rapidly. Several user respondents, who stated that they don't currently have plans to use the Internet, have engaged in searches to locate new suppliers. Industry consultants expect the Internet to have a significant impact on SCM outsourcing for the following reasons:

- The Internet provides an economic means of frequent communication between stages in supply chain management. For example, a significant reduction in the cost of telephone company leased lines can be achieved by using the Internet for communications.

- Interoperability: The Internet provides diverse partners with a standard means of exchanging data, ordering, and paying.

- Electronic commerce capabilities are being implemented on the Internet that will support supply chain management.

- The Internet provides a means of searching for additional sources of supply or other services.

A brief survey of 10 SCM outsourcing suppliers revealed that all expected the Internet to be used in the future. Over half said that existing clients had discussed the Internet with them.

Examples of emerging Internet-based SCM activity include:

- American Software announced in early 1996 that it was starting a joint venture with Intellimedia to offer supply chain management solutions on the Internet.

- A team of 15 vendors and users is developing a prototype virtual private network on the Internet (an "extranet"). The network will involve computer-assisted design and manufacturing as well as EDI. An initial project, for team member Caterpillar Inc., will attempt to shorten the time required for customer-requested product modifications from several weeks to five days.

Competition, the desire to improve customer service, and cost concerns will be strong drivers of an eventual transition to Internet-based SCM.

B

Influence of SAP, Oracle Manufacturing, and Other Integrated Packages

Vendors report that prospects for supply chain management outsourcing are most influenced in vendor evaluation by the availability of integrated capabilities, as illustrated in Exhibit IV-1.

Exhibit IV-1

Attractiveness of Vendor Features to Users

Features of Vendors	Relative Importance as Seen by Vendors
Integrated Capabilities	4
Ability to Customize Solution	2
Cost Reduction	2
Customer Services Component of Solution	1.4
Use of Current Information Technology	1.4
Application Strengths	1.1

Source: INPUT

Vendors believe that most users expect them to have application strengths and to be using current technology, but may have questions about their use of integrated technology. Consequently, it is important for vendors to stress integrated capabilities.

Users of supply chain management value integrated capabilities highly. They associate the use of integrated capabilities with the ability to achieve cost effectiveness and rank this second only to competitive advantage as a benefit of SCM, as shown in Exhibit III-1. Users also mention integrated capabilities in relation to the vendors that they feel are leaders in SCM outsourcing, such as Andersen Consulting, Logistics, and Ryder.

Some users also spoke of SAP and Oracle Consulting in regard to integrated capabilities. They felt that these vendors stood out for their ability to integrate functions in the manufacturing and supply areas, but said that they addressed a larger target than SCM outsourcing. The top tier of integrated software packages used in SCM, according to frequency of mention, includes those offered by the following companies:

- SAP

- Oracle

- J.D. Edwards

The second most-mentioned packages include those from Baan and Encompass, followed by the less frequently mentioned BPCS and DAI offerings. See Exhibit IV-2.

Exhibit IV-2

Integrated Software Packages Used for Supply Chain Management

Horizontal bar chart titled "Number of Mentions":
- SAP: 12
- Oracle: 10
- J.D. Edwards: 7
- Baan: 3
- Encompass: 3
- BPCS: 1
- DAI: 1
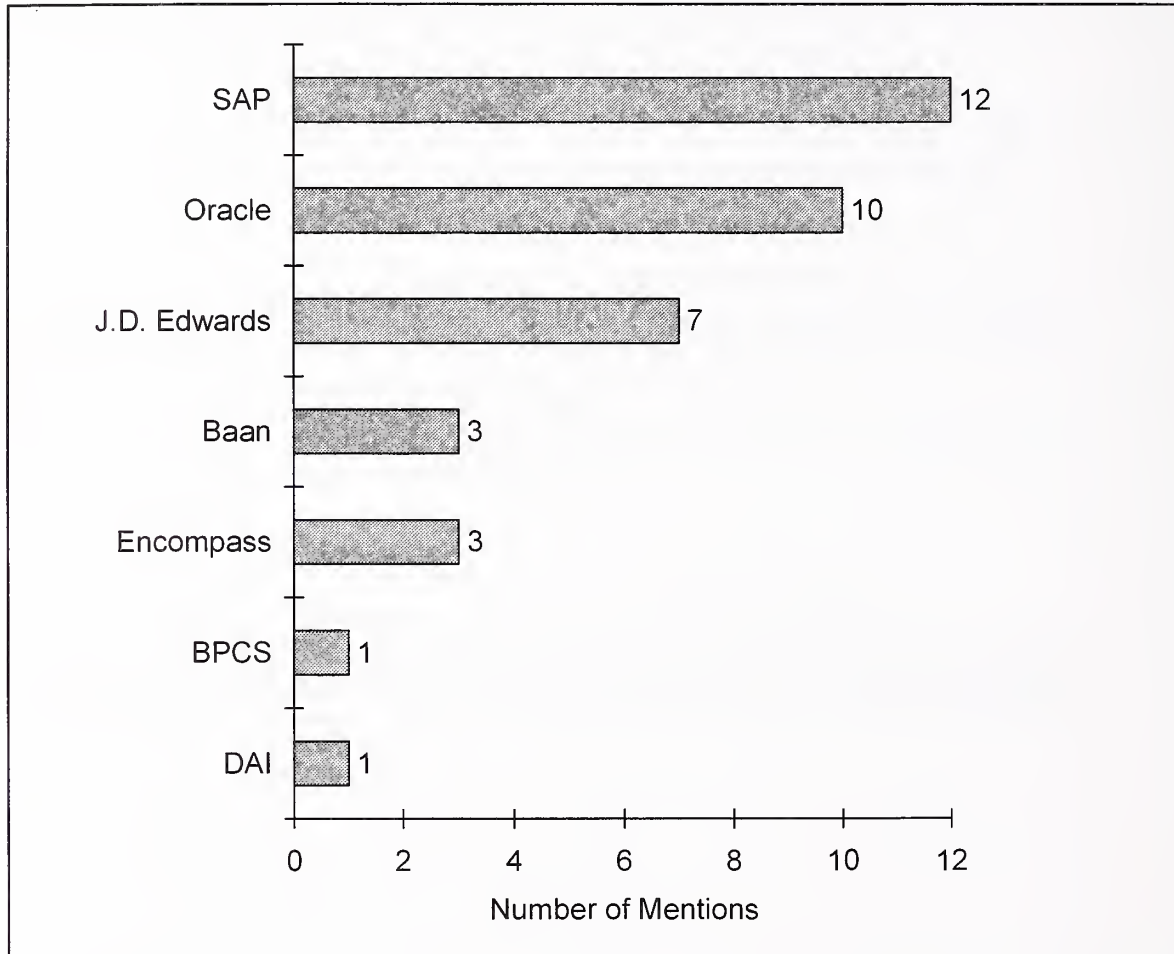
Source: INPUT

C
Use of Electronic Commerce in Supply Chain Management

At present, the use of electronic commerce is not rated by user respondents as one of the leading benefits of supply chain management; this is shown in Exhibit IV-3.

Electronic Commerce versus Other Benefits of SCM

Benefits of SCM Reported by Users	Average Importance to User (5=high, 1=low)
Improvement of Service	4.3
Up-to-date Technology	3.8
Cost-effective Use of IT	3.7
Electronic Commerce	3.3
Distributed Systems	3.3
Gainsharing	3.3
Free Up Personnel	3.3
Expediting Redesign	3.3

Source: INPUT

Although electronic commerce does not stand out among benefits of SCM to users, in general, some organizations commented that it is increasing in value as a concern since it can speed up the supply and replenishment process. Those users rating electronic commerce as an important or very important benefit of SCM were almost uniformly very large companies, 62% of which were in the discrete or process manufacturing industries.

Vendors also reported that electronic commerce was a concern, but ranked it as a lesser benefit than users ranked it, placing it in seventh place among nine benefits.

Over 50% of vendors, including large vendors such as Andersen Consulting and EDS, report that electronic commerce is an area of opportunity. Several said that interest in electronic commerce will rise as use of the Internet increases. The use of Internet technologies to locate and fill orders from new sources of supply will place a premium on being able to use fast, standard methods of payment. Of interest, Sun is developing capabilities in Java to support electronic commerce on the Internet as a result of inquiries from vendors engaged in SCM applications.

(Blank)

V
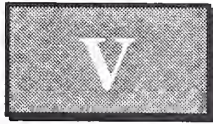
The Role of Outsourcing Vendors in the Supply Chain Process

A
Market Forecast

The market for SCM outsourcing will increase from $2.3 billion in 1996 to $5.7 billion in 2001, as shown in Exhibit V-1.

Exhibit V-1

**Supply Chain Management Outsourcing
Market Forecast, 1996-2001**
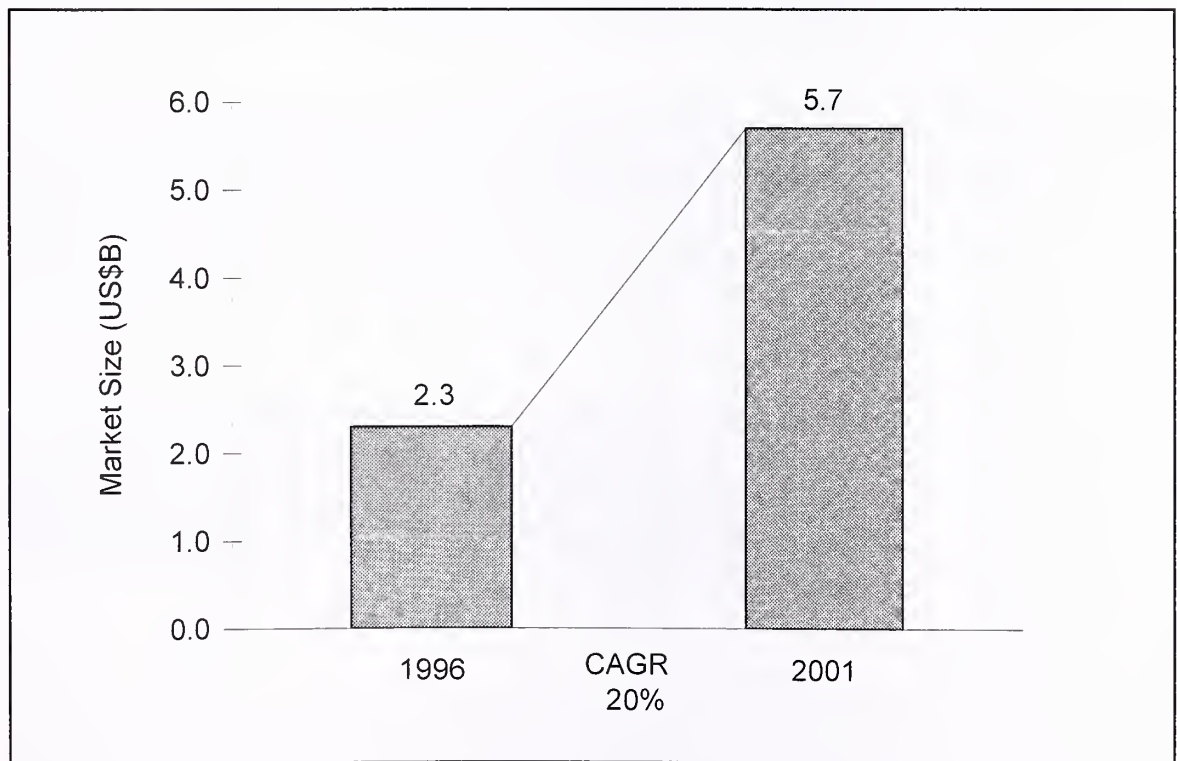
Source: INPUT

The strong rate of growth of this market, at a 20% CAGR, will be driven by increased availability of integrated software, intensifying competition, and the continuous need to improve customer service.

B

Types of Supply Chain Management Outsourcing Services

An examination of the background of SCM outsourcers indicates that many have moved into this application area due to prior experience in related applications such as warehousing and transportation, as shown in Exhibit V-2.

Exhibit V-2

Past Experience of SCM Outsourcing Vendors

Past Experience	Percentage of Companies (%)
No Prior Experience in Related Applications or Outsourcing	26
Warehouse Applications	24
Transportation-related	24
Outsourcing	15
Consulting on SCM Outsourcing Projects	11

Source: INPUT

Although almost 60% of SCM outsourcers have relevant application experience, two categories of vendors have no relevant application experience. One of them, the largest category of vendors, does not have experience in outsourcing, either. These vendors have become acquainted with the opportunity in the SCM outsourcing market and are responding to it.

Most SCM outsourcing vendors do not have significant prior experience in information technology, as Exhibit V-3 illustrates. Many of these vendors are smaller companies that began offering SCM as an outgrowth of experience in transportation, distribution, or logistics. Therefore, their expertise lies more in logistics than in IT.

Exhibit V-3

Prior IT Experience of SCM Outsourcers

Prior IT Experience	Percentage of Vendors (%)
Outsourcing IT Capabilities	15
Consulting on IT	11
Application Software Products	9

Source: INPUT

The lack of in-depth IT experience among SCM outsourcing vendors may help to explain why many vendors have a relatively small amount of business compared to other vendors in the field.

- The small size of some SCM outsourcing vendors is illustrated by the fact that annual outsourcing revenues of vendor respondents range from $2 million to $6 billion with an average revenue of about $113 million.

- Some of the vendors have very little or no present SCM outsourcing revenue, although they are competing for it, and others report that 100% of their revenue is from SCM outsourcing.

An exploration of the extent to which IT is used by SCM outsourcing vendors reveals that these vendors fall into two groups: those that are using very little IT in their work and those that are heavy users of IT, as shown in Exhibit V-4.

Exhibit V-4

Percentage of SCM Outsourcing Revenue That Is IT Related

Percentage of Vendors (%)	Percentage of Revenue (%)
19	0-10
10	11-40
14	41-60
57	>60

Source: INPUT

The difference in level of revenue mentioned above appears related to the difference in revenue from IT. An examination of the vendors with the highest level of revenues revealed that they were in the group that obtained more than 60% of their revenue from IT. This analysis suggests that a shakeout may eliminate vendors that don't gain sufficient knowledge of IT. New IT products and services, including new network capabilities and development techniques for workstation and client/server environments, are providing breakthroughs in SCM applications. Vendors who don't have the necessary capabilities are not going to survive.

C
Pricing Strategies for Supply Chain Management Outsourcing

SCM outsourcing vendors emphasize that user requirements differ among customers and prospects and cannot be met with a system made from standardized components. Most vendors state that the most important factor influencing pricing for SCM outsourcing is the cost of meeting customers' specific requirements, as indicated in Exhibit V-5.

Exhibit V-5

Factors Influencing Pricing for
SCM Outsourcing Bids

Most Important Pricing Factor	Percentage of Vendors Reporting Factor (%)
Cost of Meeting Requirements	31
Interaction With Prospect	21
Marketplace	15
Competition	6
Value Based	6
Outsourcing Needs	6
Don't Know or Refuse	15

Source: INPUT

Most SCM outsourcing vendors attempt to set prices that are somewhat above what will cover costs plus a standard markup. As noted in the prior exhibit, some vendors believe that interaction with prospects is the most important factor affecting pricing. Vendors also justify a markup in pricing or a premium by emphasizing special features or capabilities they can bring to the table. The features that banks emphasize most include integrated

capabilities and the ability to tailor or customize systems to meet requirements, as shown in Exhibit V-6.

Exhibit V-6

Features Emphasized by SCM Outsourcing Vendors to Support Pricing

Features Emphasized by Vendors	Percentage of Vendors (%)
Integrated Capabilities	33
Tailoring, Customizing Systems	16
Reducing Costs	16
Handling Customer Service	13
Using Latest Technology	13
Application Knowledge	9

Source: INPUT

Integration is a more important capability to promote than the knowledge of specific SCM components, according to a number of vendors. Several vendors noted that promotion of integrated capabilities demonstrated knowledge of the components. Vendors also pointed out that customers can influence what they will tend to promote in proposals. Some customers are highly interested in finding vendors who know how to serve customer service needs or utilize new technology. Vendors will attempt to learn what users want and this will influence what they stress as features.

D

Vendor Analysis of User Benefits

As illustrated in Exhibit V-7, vendors report that the chief benefits for users from SCM outsourcing are:

- Improvement of service functions

- Cost-effective use of IT

- Use of up-to-date technology

Exhibit V-7

Vendor View of Benefits of SCM Outsourcing

Improve Service — 4.7
Cost-Effective IT — 4.1
Up-to-Date Tech. — 3.9
Distributed Systems — 3.6
Free Personnel — 3.6
Utilize Change Agents — 3.3
Elec. Commerce — 3.2
Reduce Involvement — 3.2
Internet — 2.9

Average Rating (5 = "Very Important")
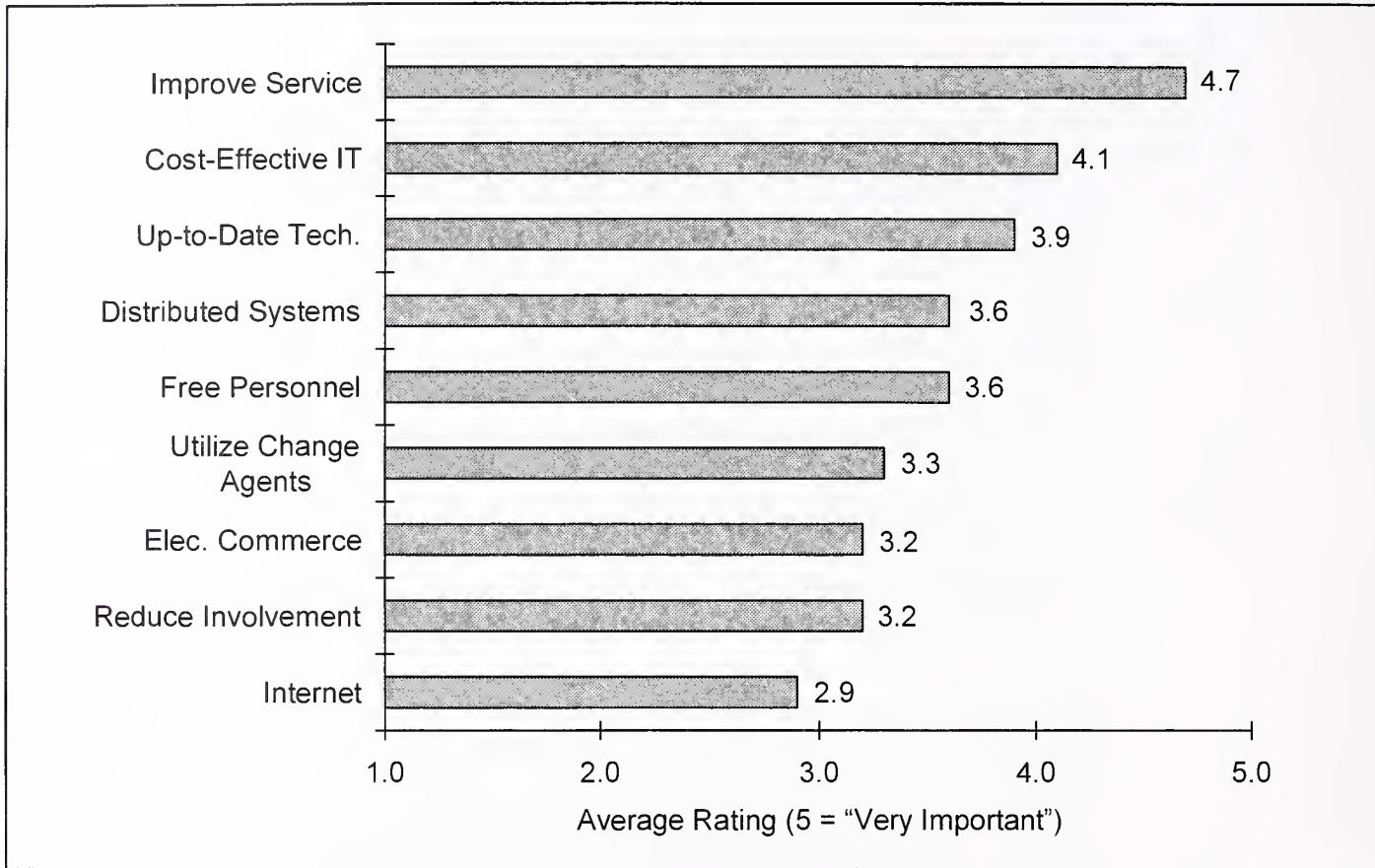
Source: INPUT

Vendors strongly agree the improvement of the service function is the most important benefit of SCM outsourcing. Vendors' views on this are in agreement with the users data given in Exhibit III-2, which shows that the highest ranking benefit for users is improvement of the service function.

Cost-effective IT ranks second among vendors as an important benefit of SCM outsourcing, followed by up-to-date technology. This closely correlates to user views: for users, the second most important benefit is followed by cost-effective use of IT and up-to-date technology (Exhibit III-2).

Vendors and users are in close agreement regarding other benefits. Freeing up personnel, which vendors feel is the fifth most important benefit, is tied for fourth place with three other benefits, from the user perspective.

VI

Conclusions and Recommendations

A
Conclusions

1.   The User Perspective

Users gauge their satisfaction with vendor performance according to the two primary areas of great importance to them:

- On-time delivery of projects

- Ability to meet requirements

  The second tier of performance areas important in satisfying users includes:

- Range of vendor capabilities

- Cost

Many users mentioned one other factor that was also important to them: the ability to leverage economies of scale. See Exhibit VI-1.

Exhibit VI-1

Key User Ratings of Vendor Performance

Horizontal bar chart:

Category	Rating
Ability to Meet Requirements	4.6
On-Time Delivery of Projects	4.6
Range of Vendor Capabilities	4.2
Cost	4.2

Average Ratings (5 = "Excellent Performance")
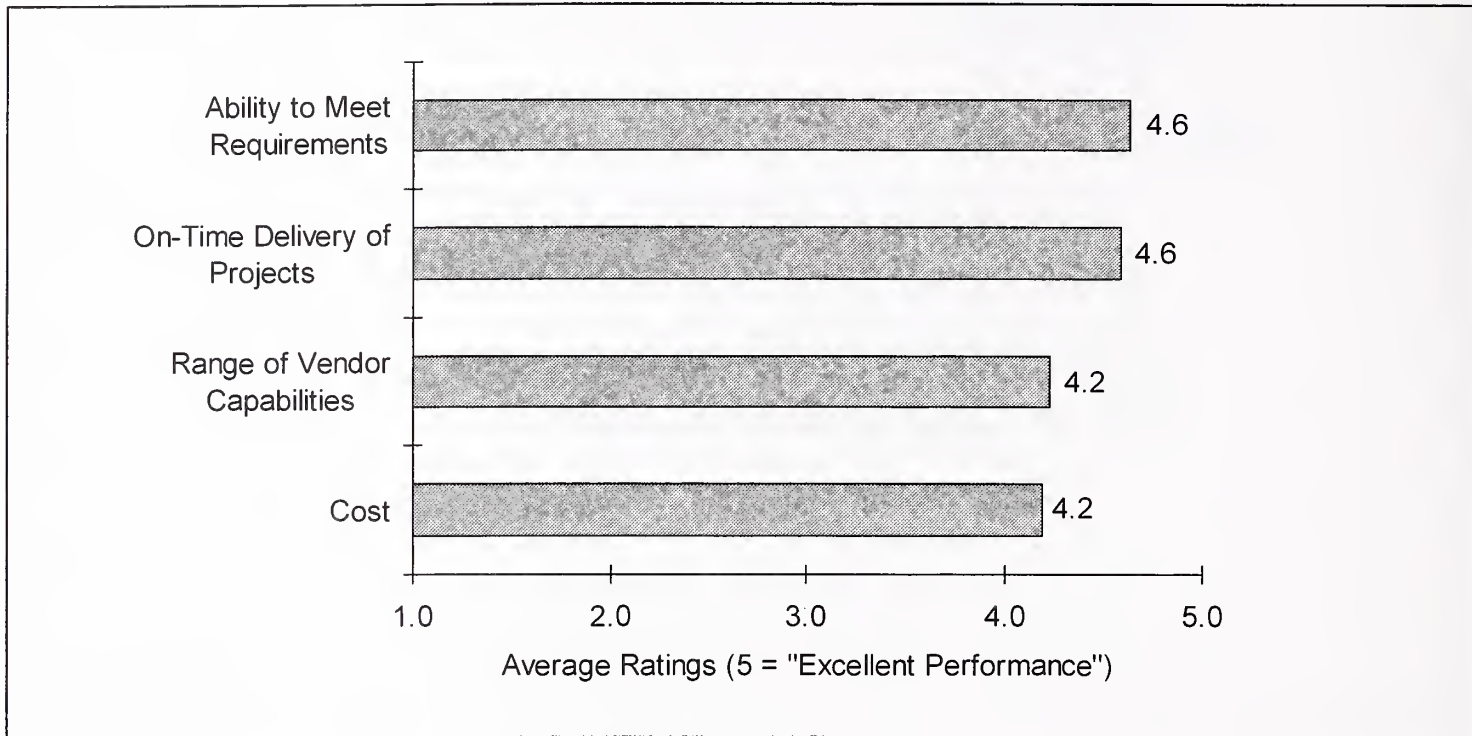
Source: INPUT

In regard to the factors users rated as important to their satisfaction with the SCM solution, knowledge of specific software was most important. Tied for second place in user satisfaction with the SCM solution were integration of multiple vendors and scalability. Less important was a vendor's willingness to use the user's in-house-developed code. See Exhibit VI-2.

Exhibit VI-2

User Ratings of Satisfaction with the SCM Solution
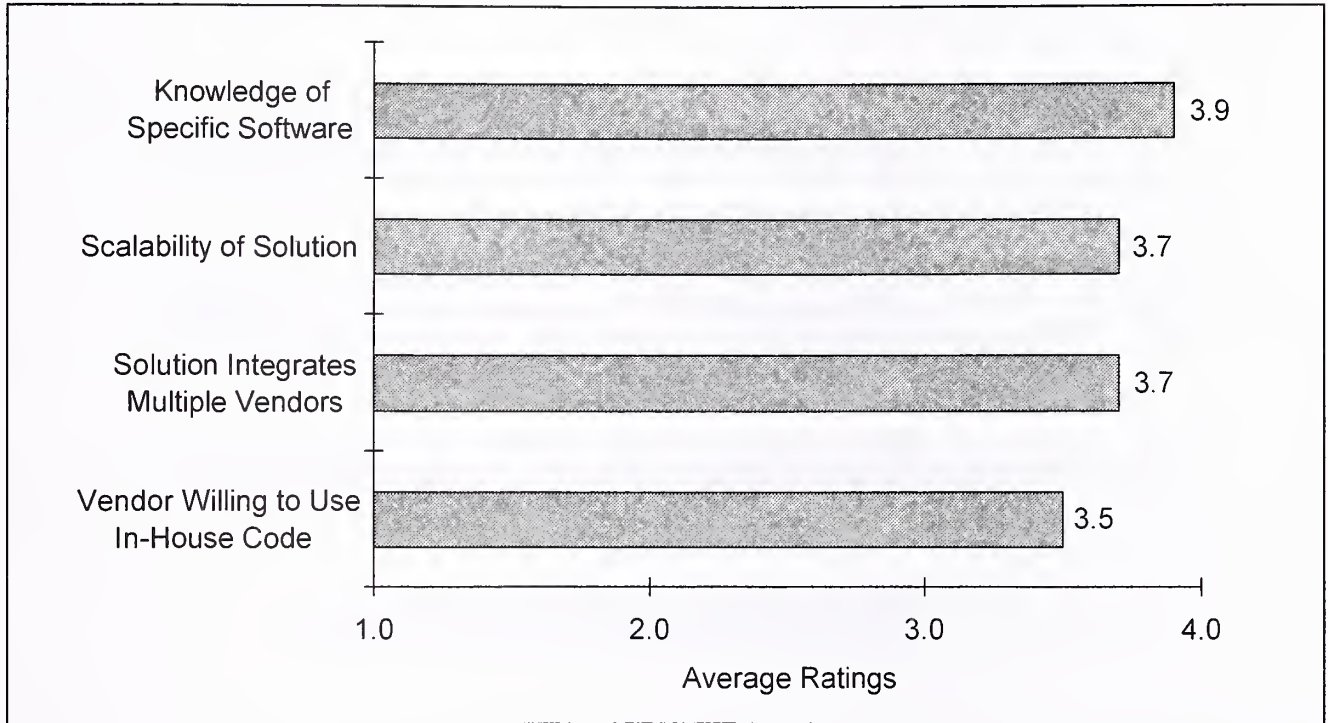
Source: INPUT

Because the software component of solutions has played an important role for vendors, the ranking of user satisfaction with a vendor's knowledge of software is an important indication of business satisfaction.

Users display a high to moderate level of satisfaction with vendor capabilities, as shown in Exhibit VI-3.

Exhibit VI-3

User Ratings of Satisfaction with the SCM Vendor

Category	Rating
Speed of Responsiveness	4.2
Competence of Vendor Personnel	4.2
Vendor Reputation	4.1
Global Presence	3.6
Vendor's Vision	3.5
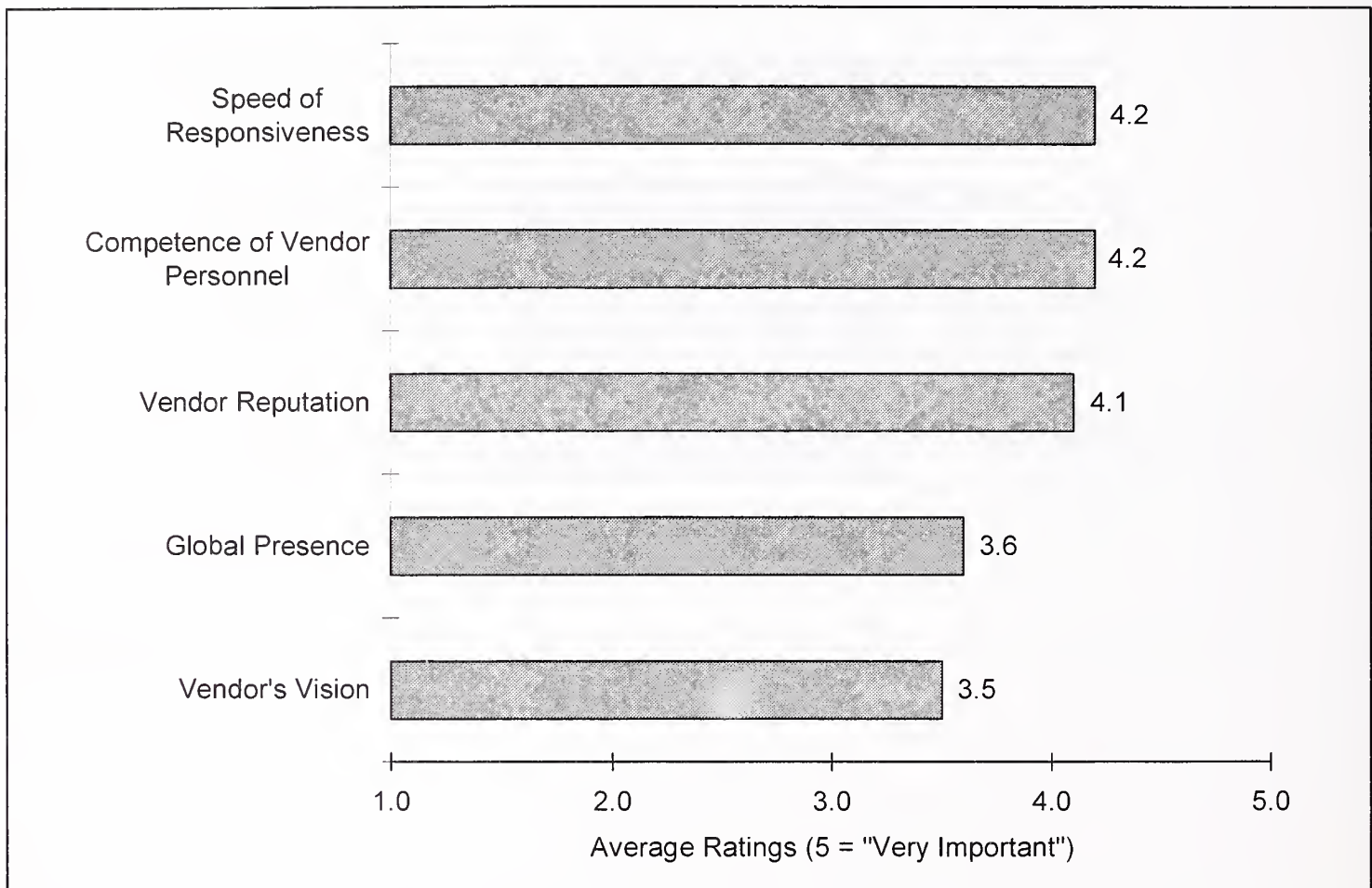
Average Ratings (5 = "Very Important")

Vendor reputation and personnel competence, as well as speed of response, are ranked high in the preceding exhibit, but the vision of vendors and their ability to provide solutions on a worldwide basis is ranked lower. Major vendors in the field, including Andersen Consulting and EDS, are addressing these two factors.

2. The Vendor Perspective

Vendors rate their performance on SCM outsourcing contracts at a high level in terms of meeting requirements, on-time delivery, control, and range of capabilities, as shown in Exhibit VI-4.

Exhibit VI-4

Vendors' Rating of Vendor Performance
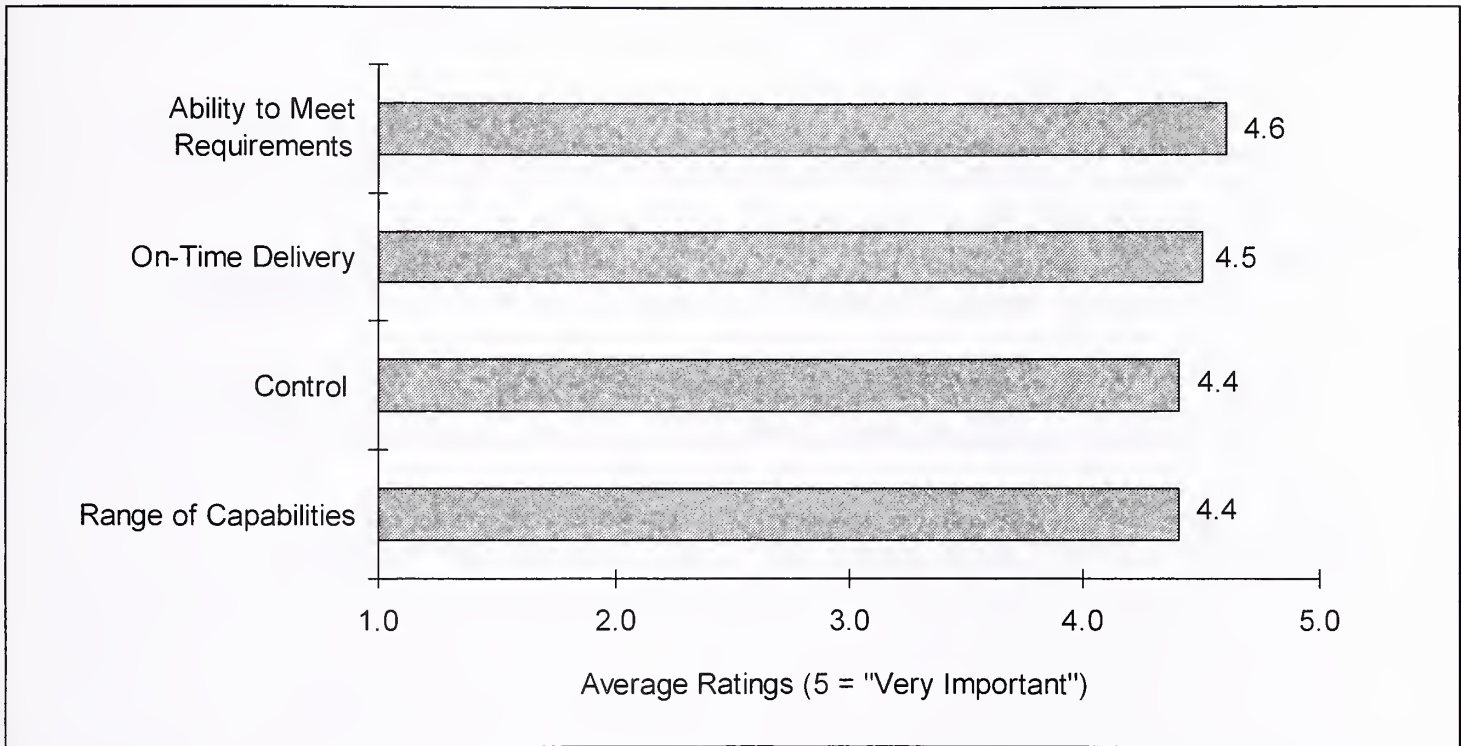
Source: INPUT

The specific selection criteria that vendors feel they will have to meet to obtain contracts from prospects include knowledge of supply chain outsourcing, ability to deliver integrated solutions, and the ability to deliver scalable solutions. The relative importance vendors assign to these criteria is shown in Exhibit VI-5.

Exhibit VI-5

Vendors' Perception of Solution Selection Criteria

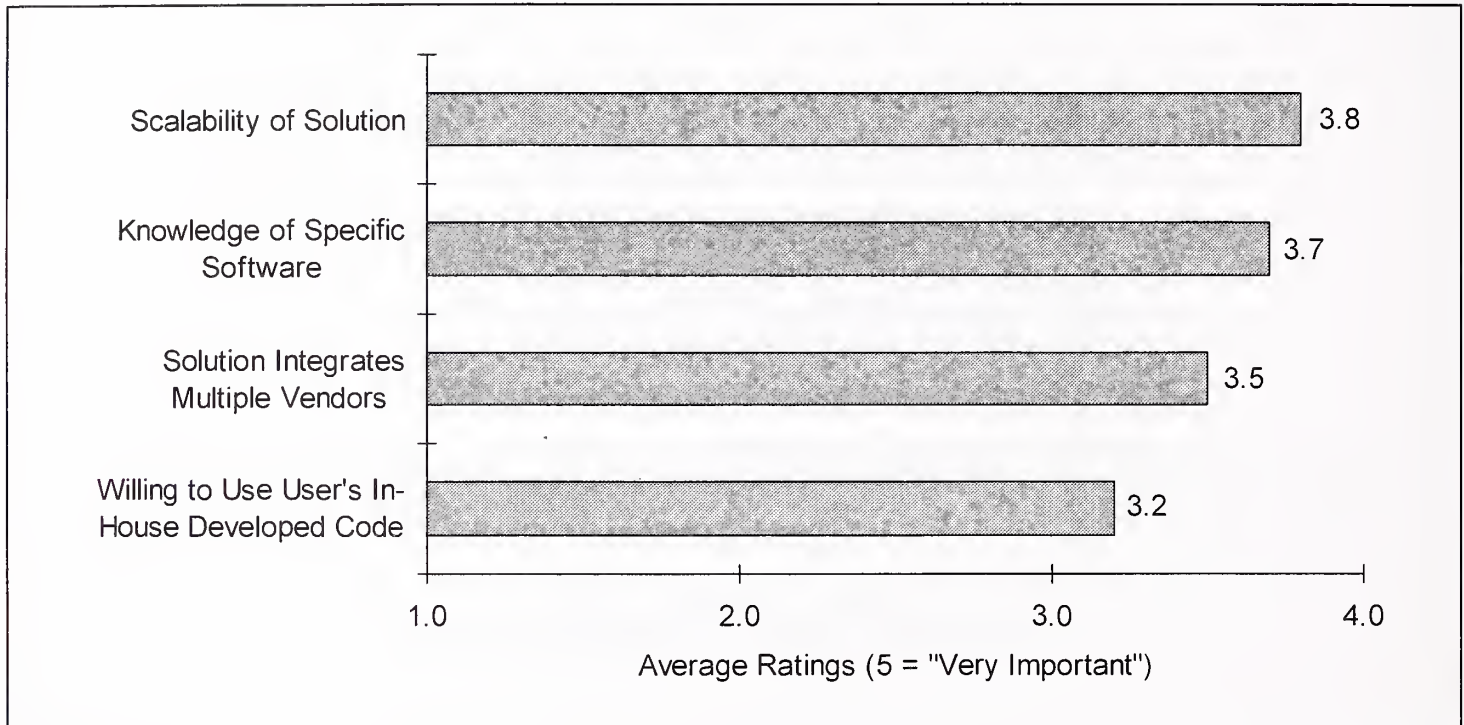| Criteria	Average Rating
Scalability of Solution	3.8
Knowledge of Specific Software	3.7
Solution Integrates Multiple Vendors	3.5
Willing to Use User's In-House Developed Code	3.2

Average Ratings (5 = "Very Important")

Source: INPUT

B

Recommendations

1. What Users Should Do Next

Industry experts and vendors feel that users of supply chain management outsourcing should analyze these functions more closely. One of the suggestions made in regard to this was that documentation should be improved. Automation of documentation was also mentioned. Several consultants serving SCM users felt that models of supply chain management should be developed for a number of companies that have SCM systems and/or use SCM outsourcers.

Other suggestions made by industry experts and vendors include:

- Investigate more use of electronic commerce to facilitate supply chain actions.

- Investigate use of the Internet to reduce costs of communication with industry partners and to develop more sources of supply.

- Develop better means of comparing services of competing SCM outsourcing vendors. Prototyping techniques and models should be developed.

- Try out new ideas before increases in the volume of business result in a problem.

2. What Vendors Should Do Next

Users recommend that vendors pay more attention to their ideas on improvements. The specific services that users wanted vendors to provide are compared in Exhibit VI-6.

Exhibit VI-6

Services That Users Would Like Vendors To Provide

Services Wanted by Users	Percentage of Users
More Consulting and Training	15
Better Communication	11
Analyze or Introduce the Use of the Internet	7
Address Worldwide Distribution	7
Improve Tracking Capabilities	7
Introduce More Electronic Commerce	7

Source: INPUT

Both of the highest ranking suggestions for vendors involve interaction between vendors and users. Users feel a need to develop better understanding of the SCM application area as well as of vendor offerings. Vendors who address this need will improve user satisfaction and can leverage improved communications, consulting, and training to increase business.

(Blank)
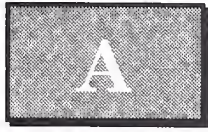
Definition of Terms

A
Introduction

INPUT's *Definition of Terms* provides the framework for all of INPUT's market analyses and forecasts of the information services industry. It is used for all U.S. programs, in Europe, and for INPUT's worldwide forecasts.

One of the strengths of INPUT's market analysis services is the consistency of the underlying market sizing and forecast data. Each year, INPUT reviews its industry structure and makes changes if they are required. When changes are made, they are carefully documented and the new definitions and forecasts reconciled to the prior definitions and forecasts. INPUT clients have the benefit of being able to track market forecast data from year to year against a proven and consistent foundation of definitions.

B
Overall Definitions and Analytical Framework

1. Information Services

Information Services are computer/telecommunications-related products and services that are oriented toward the development or use of information systems. Information services typically involve one or more of the following:

- Packaged software products, including systems software or applications software (called *Software Products*)

- A combination of computer equipment, packaged software and associated support services that will meet an application systems need (called *Turnkey Systems*)

- People services that support users in developing and operating their own information systems (called *Professional Services)*

- A combination of products (software and equipment) and services in which the vendor assumes total responsibility for the development of a custom integrated solution, or part of a solution, to an information systems need (called *Systems Integration*)

- Services that provide operation and management of all or a significant part of a user's information systems or telecommunications functions under a long-term contract (called *Outsourcing*)

- Use of vendor-provided computer processing services to develop or run applications or provide services such as disaster recovery or data entry (called *Processing Services*)

- *Network Services* has two components:

  - Services that support the delivery of information in electronic form—typically network-oriented services such as value-added networks and electronic mail (called *Network Applications*)

  - Services that support the access and use of public and proprietary information such as on-line databases and news services (called *Electronic Information Services*)

- Services that support the operation and maintenance of computer and digital communication equipment (called *Equipment Services*)

In general, the market for information services does not involve providing equipment to users. The exception is when the equipment is part of an overall service offering such as a turnkey system, an outsourcing contract, or a systems integration project.

The information services market also excludes pure data transport services (i.e., data or voice communications circuits such as T-1 carriers). However, where information transport is associated with a network-based service (e.g., electronic data interchange services) or cannot feasibly be separated from other bundled services (e.g., some outsourcing contracts), the transport costs are included as part of the information services market.

The analytical framework of the information services industry consists of the following interacting factors: overall and industry-specific business environment (trends, events, and issues); technology environment; user

information system requirements; size and structure of information services markets; vendors and their products, services, and revenues; distribution channels; and competitive issues.

C
Outsourcing

Outsourcing is a long-term (greater than one year) relationship between a client and a vendor in which the client delegates all, or a major portion, of an operation or function to the vendor. The operation or function may be solely information systems outsourcing-based, or include information systems outsourcing as a major component (at least 30%) of the operation.

The critical components that define an outsourcing service are:

- Delegating an identifiable area of the operation to a vendor

- Single-vendor responsibility for performing the delegated function

- An intended, long-term relationship between the client and the vendor, where:
  - The contract term is for at least one year
  - The client's intent is not to perform the function with internal resources

- The contract may include noninformation systems outsourcing activities, but information systems outsourcing must be an integral part of the contract.

For 1996, the outsourcing product/service subcategories have been defined as shown in Exhibit A-1 and defined below:

Exhibit A-1

Outsourcing Components
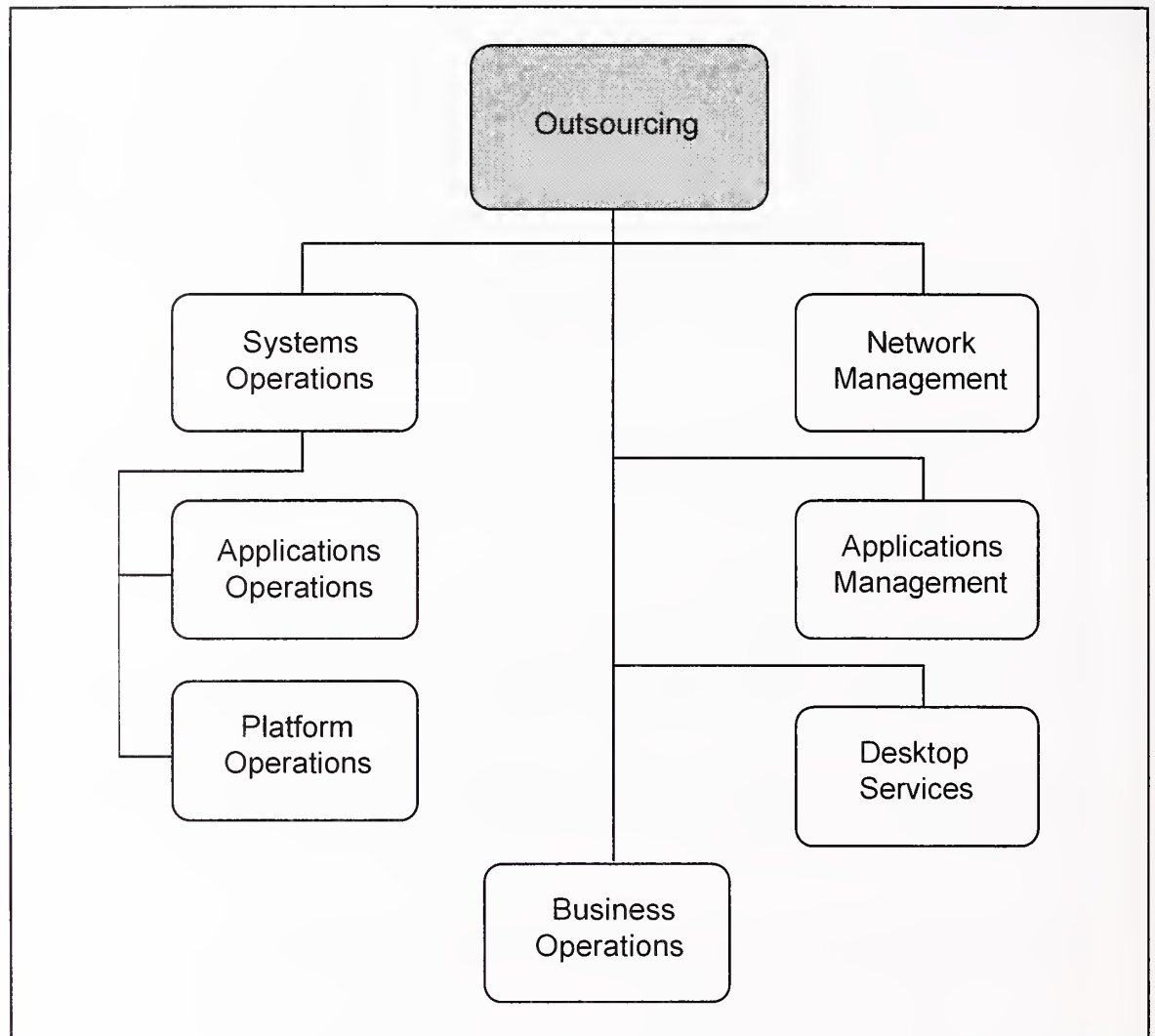
Source: INPUT

- *Platform Operations* - The vendor manages and operates the computer systems to perform the client's business functions, without taking responsibility for the client's application systems.

- *Applications Operations* - The vendor manages and operates the computer systems to perform the client's business functions, and is also responsible for maintaining, or developing and maintaining, the client's application systems.

- *Network Management* - The vendor assumes responsibility for operating and managing the client's data communications systems. This may also include the client's voice communications resources. A network management outsourcing contract may include only the management

services or it may cover the full costs of the communications services and equipment plus the management services.

- *Desktop Services* - The vendor assumes responsibility for the deployment, maintenance, and connectivity among the personal computers and/or workstations in the client organization. The services may also include performing the help-desk function. Equipment as well as services can be part of a desktop services outsourcing contract.

  Note: This type of client service can also be provided through traditional professional services where the contractual criteria of outsourcing are not present.

- *Applications Managemen t-* The vendor has full responsibility for maintaining and upgrading some or all of the application systems that a client uses to support business operations and may also develop and implement new application systems for the client.

  An applications management contract differs from traditional software development in the form of the client/vendor relationship. Under traditional software development services, the relationship is project based. Under applications management, it is time and function based.

  These services may be provided in combination or separately from platform outsourcing.

- *Business Operations* - Business operations outsourcing (also known as business outsourcing or functional outsourcing) is a relationship in which one vendor is responsible for performing an entire business/operations function, including the information systems outsourcing that supports it. The information systems outsourcing content of such a contract must be at least 30% of the total annual expenditure in order for INPUT to include it in the outsourcing market. Examples of business operations that are outsourced include telephone company billing and employee benefits processing.

Outsourcing vendors now provide a wide variety of services in support of existing information systems. The vendor can plan, control, provide, operate, maintain, and manage any or all components of the client's information systems environment (equipment, networks, applications systems), either at the client's site or the vendor's site.

D
Supply Chain Management

The efficient and effective flow of information across discrete activities is the central information management issue in supply chain management. The discrete activities of supply chain management may include the general administration of the supply chain, accounts payable/receivable, purchasing, order management (e.g., order processing), distribution logistics, manufacturing, order fulfillment, warehousing and inventory management, routing/scheduling, sales forecasting, order/shipment tracking, and customer service.

Completion of the entire supply chain may include a number of combinations of in-house and out-of-house personnel, as well as a number of types of technologies owned and/or managed by these respective parties.

E
Industry Sector Definitions

INPUT structures the information services market into industry sectors such as process manufacturing, insurance, transportation, etc. The definitions of these sectors are based on the most recent revision of the Standard Industrial Classification (SIC) code system. The specific industries (and their SIC codes) included under these industry sectors are detailed in Exhibit A-2.

INPUT includes all product/service categories except systems software products and equipment services in industry market sectors.

Note: SIC code 88 is Personal Households. INPUT does not currently analyze or forecast information services in this market sector.

Exhibit A-2

Industry Sector Definitions

Industry Sector	SIC Code	Description
Discrete Manufacturing	23xx	Apparel and other finished products
	25xx	Furniture and fixtures
	27xx	Printing, publishing, and allied industries
	31xx	Leather and leather products
	34xx	Fabricated metal products, except machinery and transportation equipment
	35xx	Industrial and commercial machinery and computer equipment
	36xx	Electronic and other electrical equipment and components, except computer equipment
	37xx	Transportation equipment
	38xx	Instruments; photo/med/optical goods; watches/clocks
	39xx	Miscellaneous manufacturing industry
Process Manufacturing	10xx	Metal mining
	12xx	Coal mining
	13xx	Oil and gas extraction
	14xx	Mining/quarrying nonmetallic minerals
	20xx	Food and kindred products
	21xx	Tobacco products
	22xx	Textile mill products
	24xx	Lumber and wood products, except furniture
	26xx	Paper and allied products
	28xx	Chemicals and allied products
	29xx	Petroleum refining and related industries
	30xx	Rubber and miscellaneous plastic products
	32xx	Stone, clay, glass and concrete
	33xx	Primary metal industries
Transportation Services	40xx	Railroad transport
	41xx	Public transit/transport
	42xx	Motor freight transport/warehousing
	43xx	U.S. Postal Service
	44xx	Water transportation
	45xx	Air transportation (including airline reservation services in 4512)
	46xx	Pipelines, except natural gas
	47xx	Transportation services (including 472x, arrangement of passenger transportation)

Source: INPUT

Exhibit A-2 (continued)

Industry Sector Definitions

| Industry Sector	SIC Code	Description
Telecommunications	48xx	Communications
Utilities	49xx	Electric, gas and sanitary services
Retail Trade	52xx 53xx 54xx 55xx 56xx 57xx 58xx 59xx	Building materials General merchandise stores Food stores Automotive dealers, gas stations Apparel and accessory stores Home furniture, furnishings and accessory stores Eating and drinking places Miscellaneous retail
Wholesale Trade	50xx 51xx	Wholesale trade - durable goods Wholesale trade - nondurable goods
Banking and Finance	60xx 61xx 62xx 67xx	Depository institutions Nondepository credit institutions Security and commodity brokers, dealers, exchanges and services Holding and other investment offices
Insurance	63xx 64xx	Insurance carriers Insurance agents, brokers and services
Health Services	80xx	Health services
Education	82xx	Educational services

Source: INPUT

Exhibit A-2 (continued)

Industry Sector Definitions

| Industry Sector	SIC Code	Description
Business Services	65xx	Real estate
	70xx	Hotels, rooming houses, camps, and other lodging places
	72xx	Personal services
	73xx	Business services (except hotel reservation services in 7389)
	7389	Hotel reservation services
	75xx	Automotive repair, services and parking
	76xx	Miscellaneous repair services
	78xx	Motion pictures
	79xx	Amuserment and recreation services
	81xx	Legal services
	83xx	Social services
	84xx	Museums, art galleries, and botanical/zoological gardens
	86xx	Membership organizations
	87xx	Engineering, accounting, research, management, and related services
	89xx	Miscellaneous services
Federal Government	9xxx	
State and Local Government	9xxx	
Miscellaneous Industries	01xx	Agricultural production - crops
	02xx	Agricultural production - livestock/animals
	07xx	Agricultural services
	08xx	Forestry
	09xx	Fishing, hunting and trapping
	15xx	Building construction - general contractors, operative builders
	16xx	Heavy construction - contractors
	17xx	Construction - special trade contractors

Source: INPUT

(Blank)

B
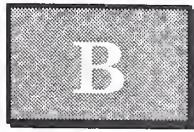
Selected Detailed Charts

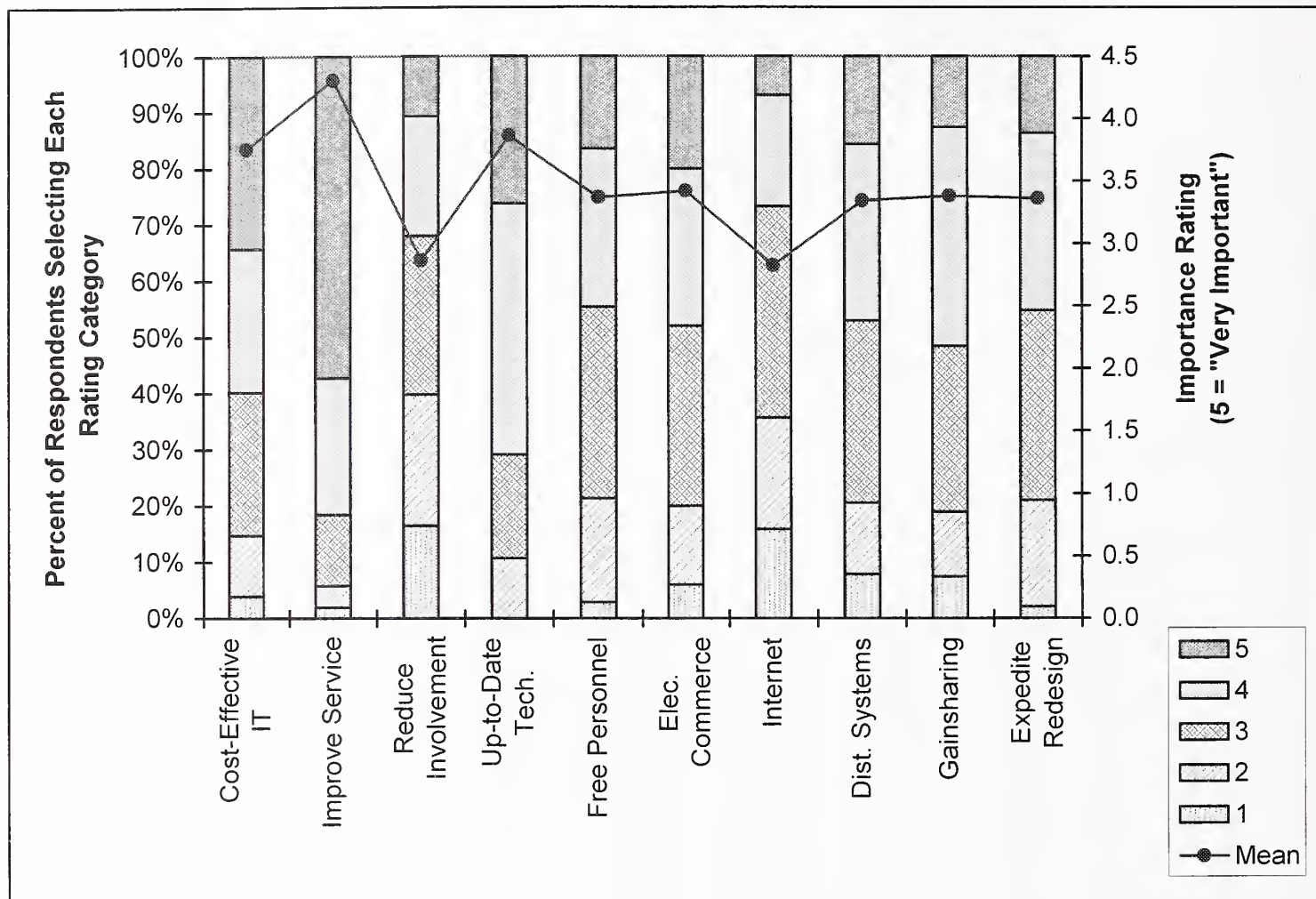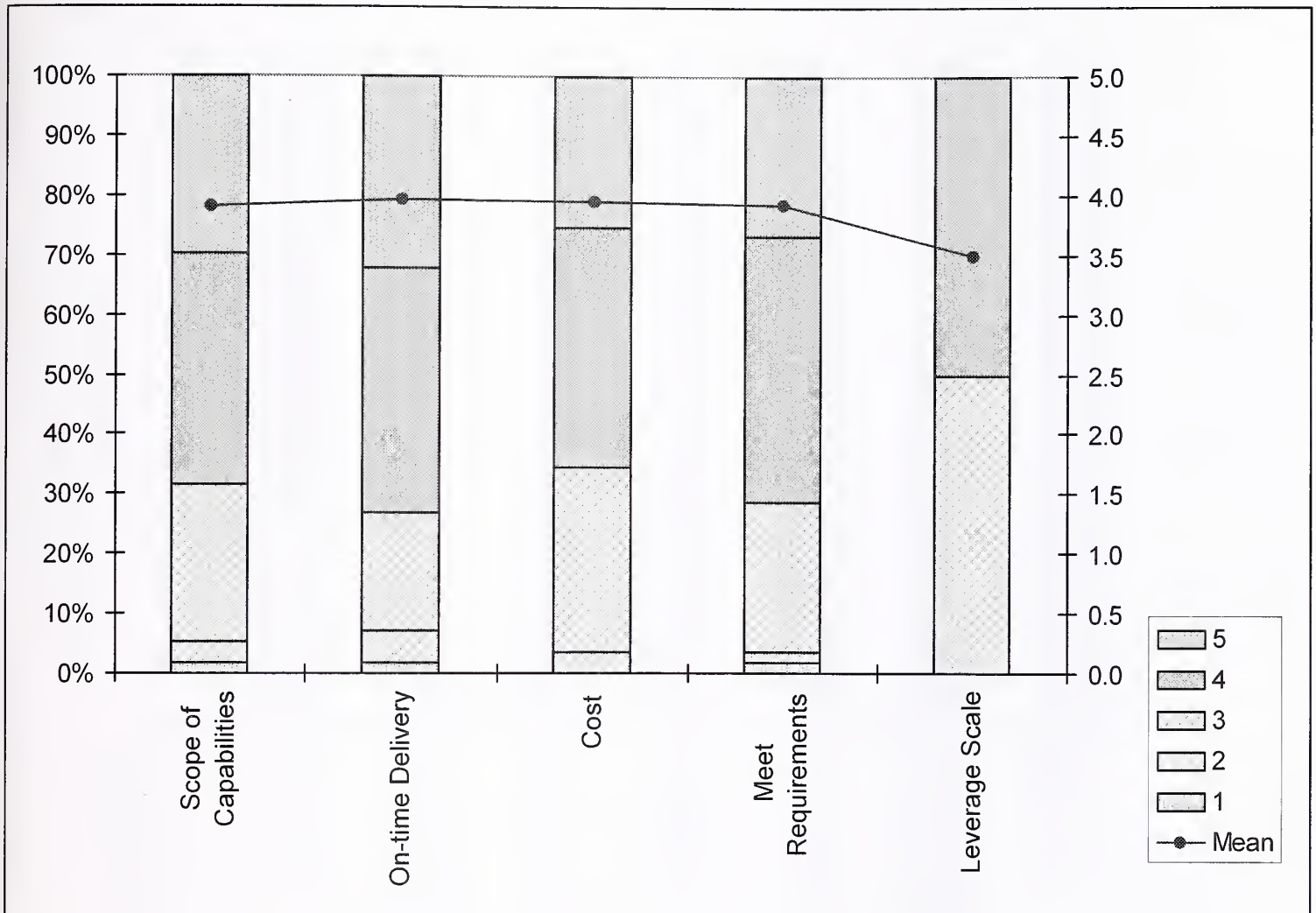## Key Supply Chain Management User Objectives
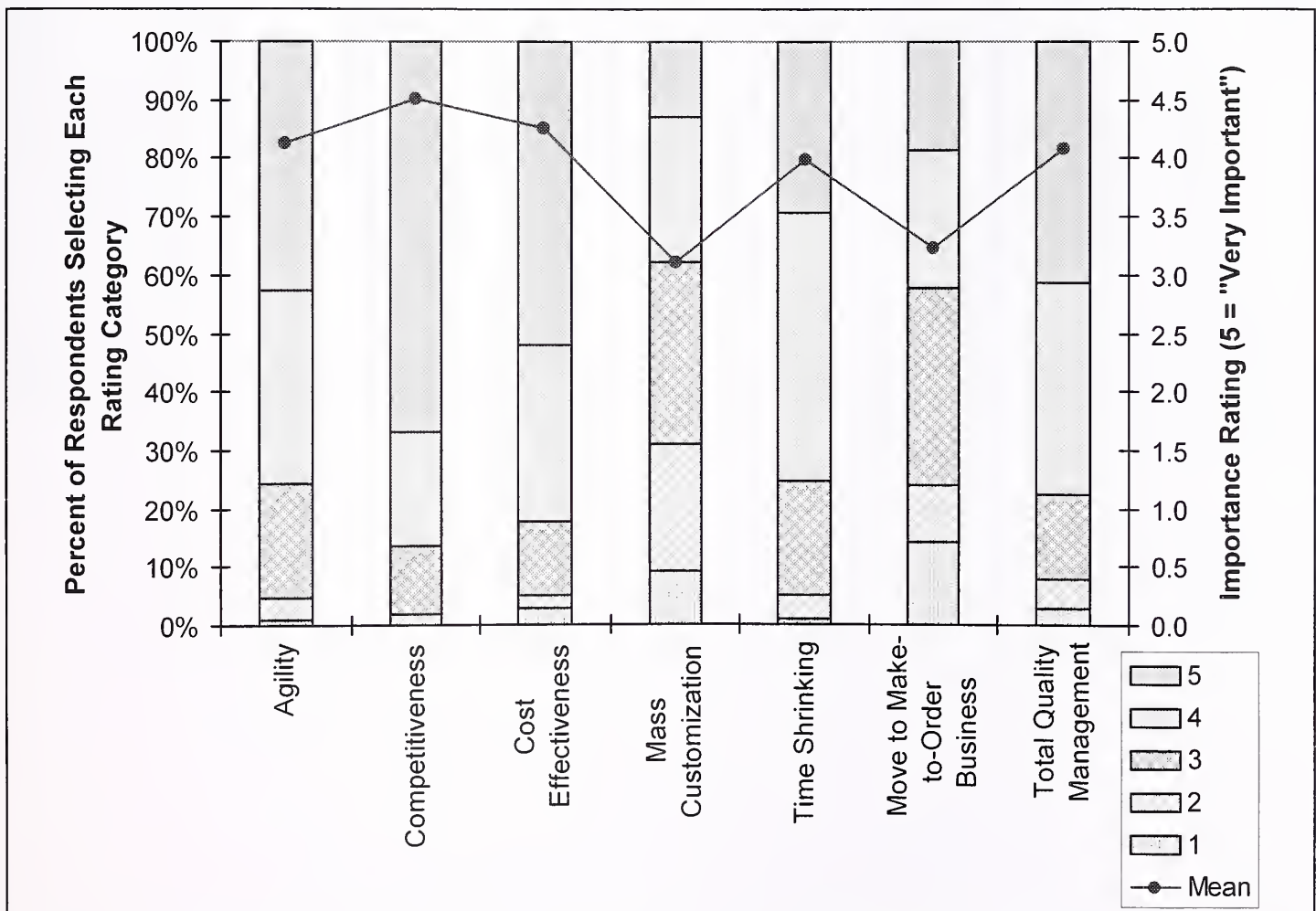
Source: INPUT

Exhibit B-2

Key Benefits of Outsourcing Supply Chain Management
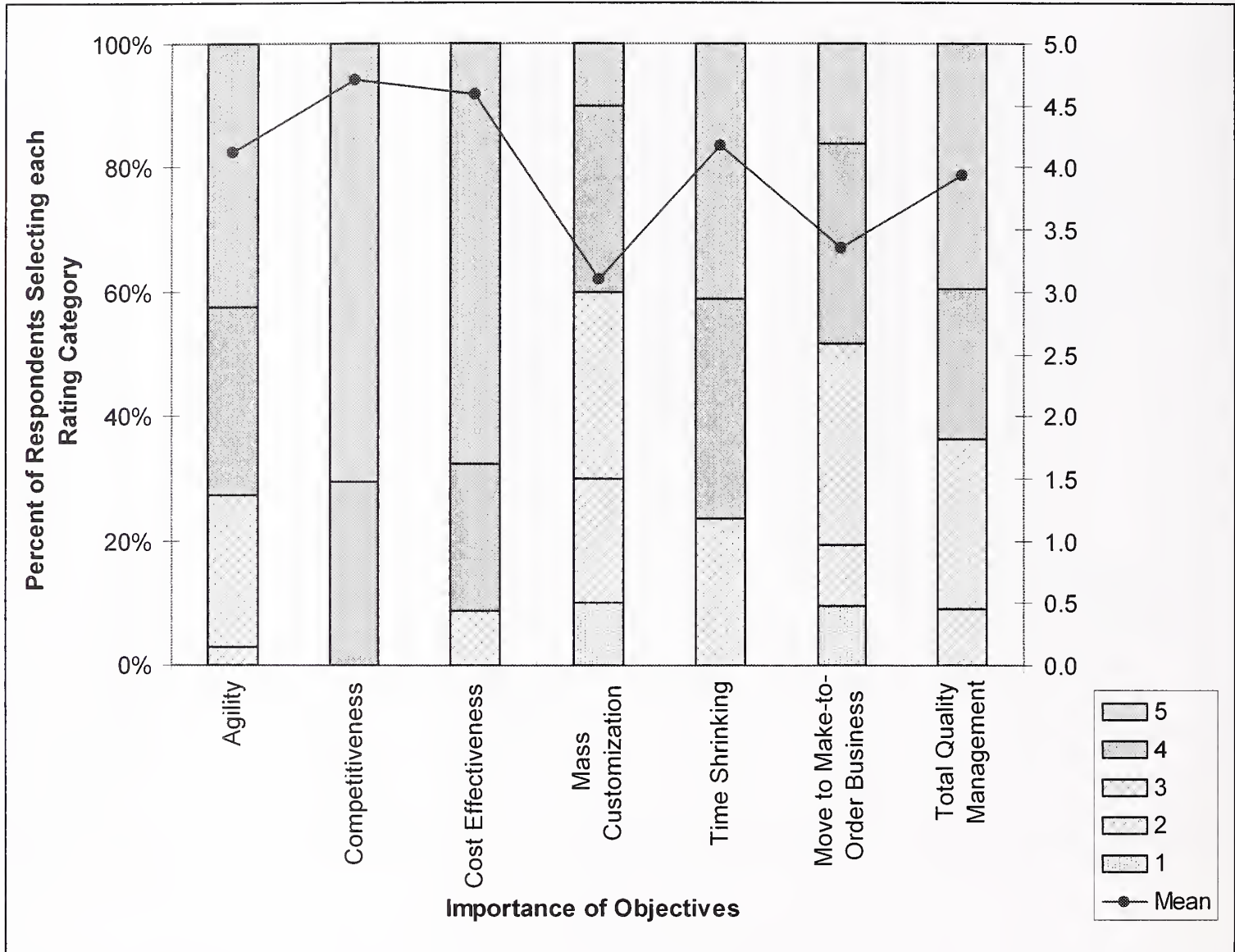
Exhibit B-3

User Ratings of Satisfaction with Vendor Performance
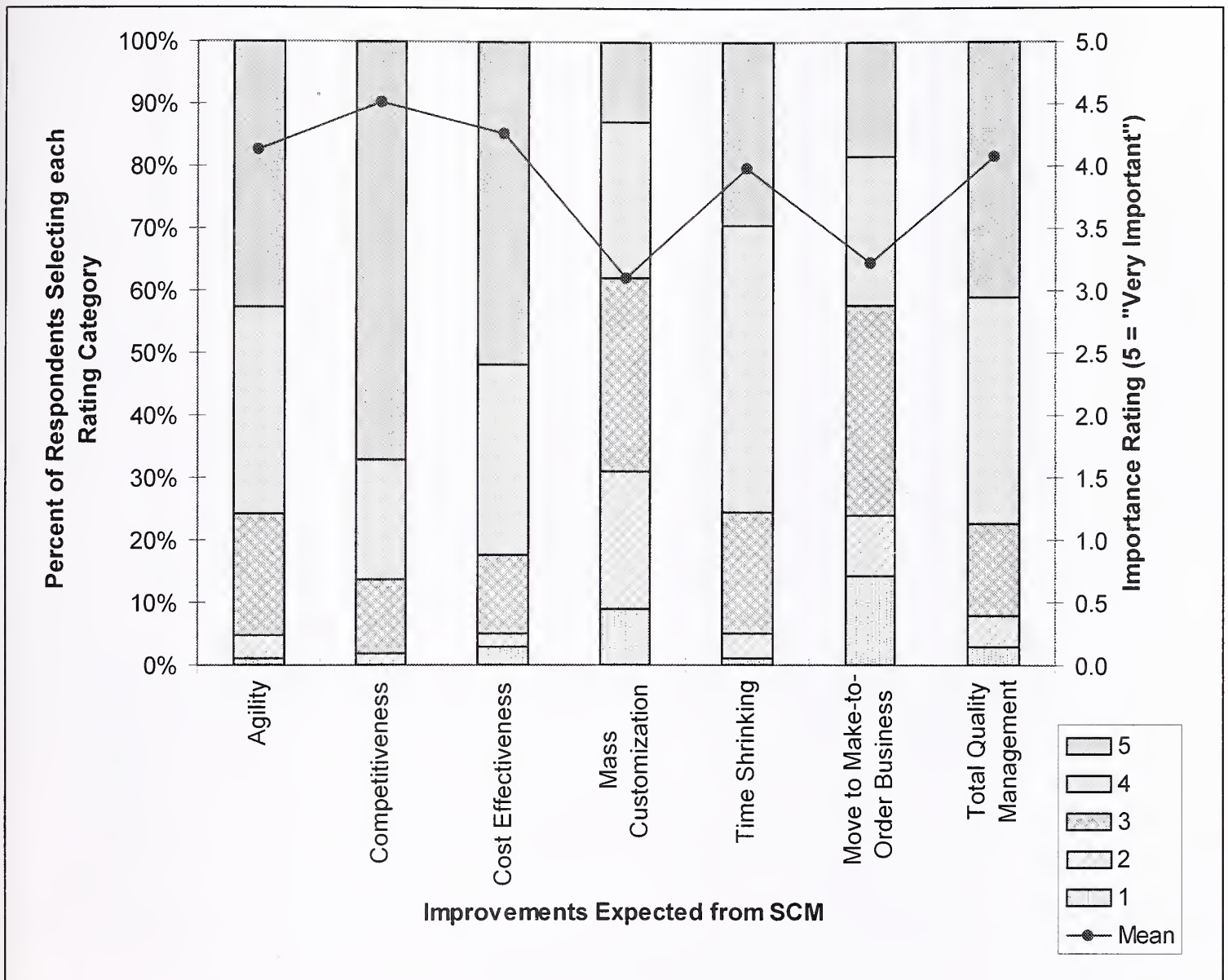

Source: INPUT

Exhibit B-4

Vendors' Perceptions of Customers' Objectives with SCM

Source: INPUT

Exhibit B-5

Importance of Supply Chain Management Improvements to Users

Improvements Expected from SCM

Legend:
- 5
- 4
- 3
- 2
- 1
- Mean

Source: INPUT

Exhibit B-6

Benefits of Outsourcing Supply Chain Management

OSA6

Benefits of SCM Outsourcing

Legend:
- 5
- 4
- 3
- 2
- 1
- Mean
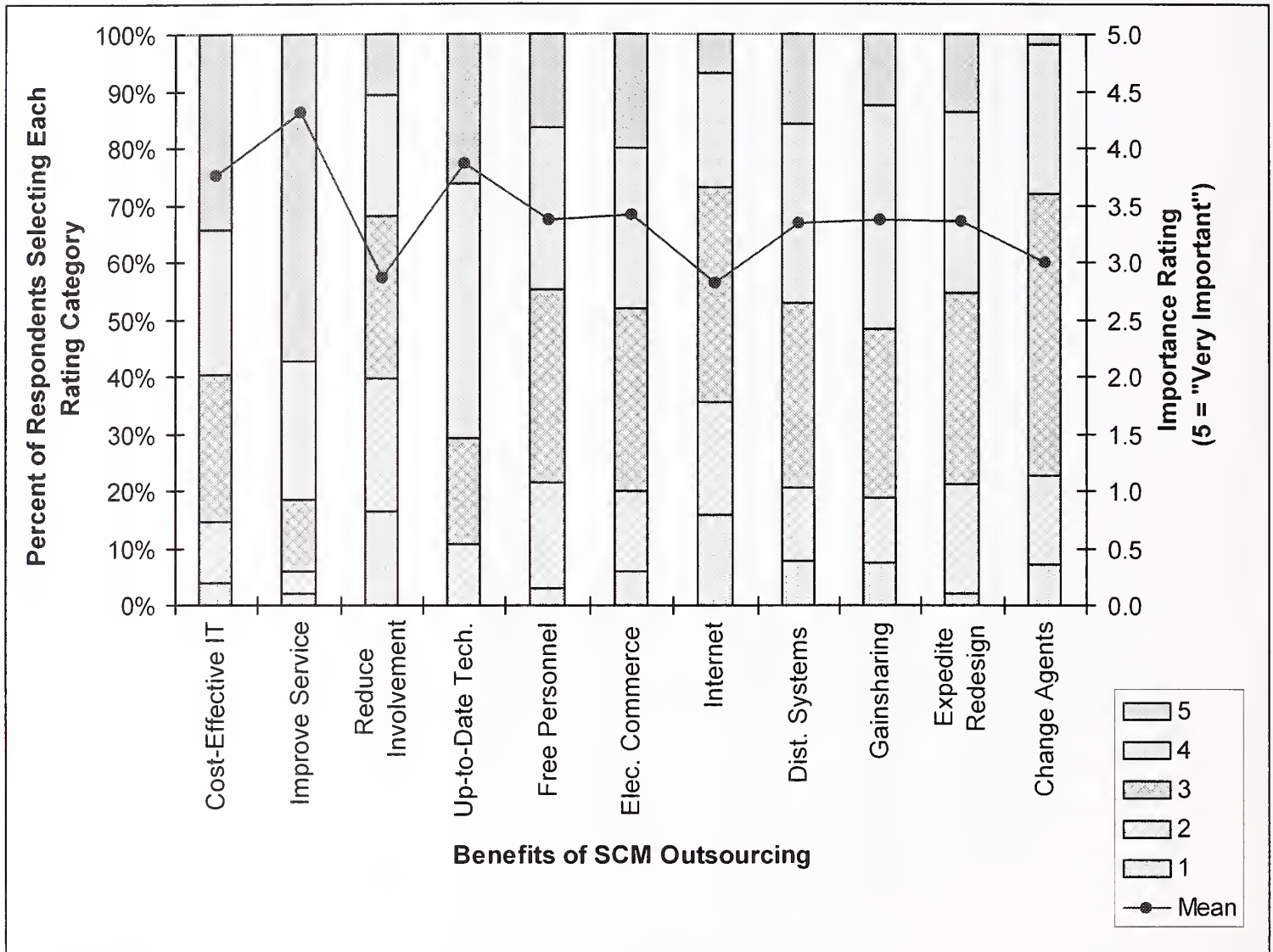
Exhibit B-7

Outsourcing Inhibitors
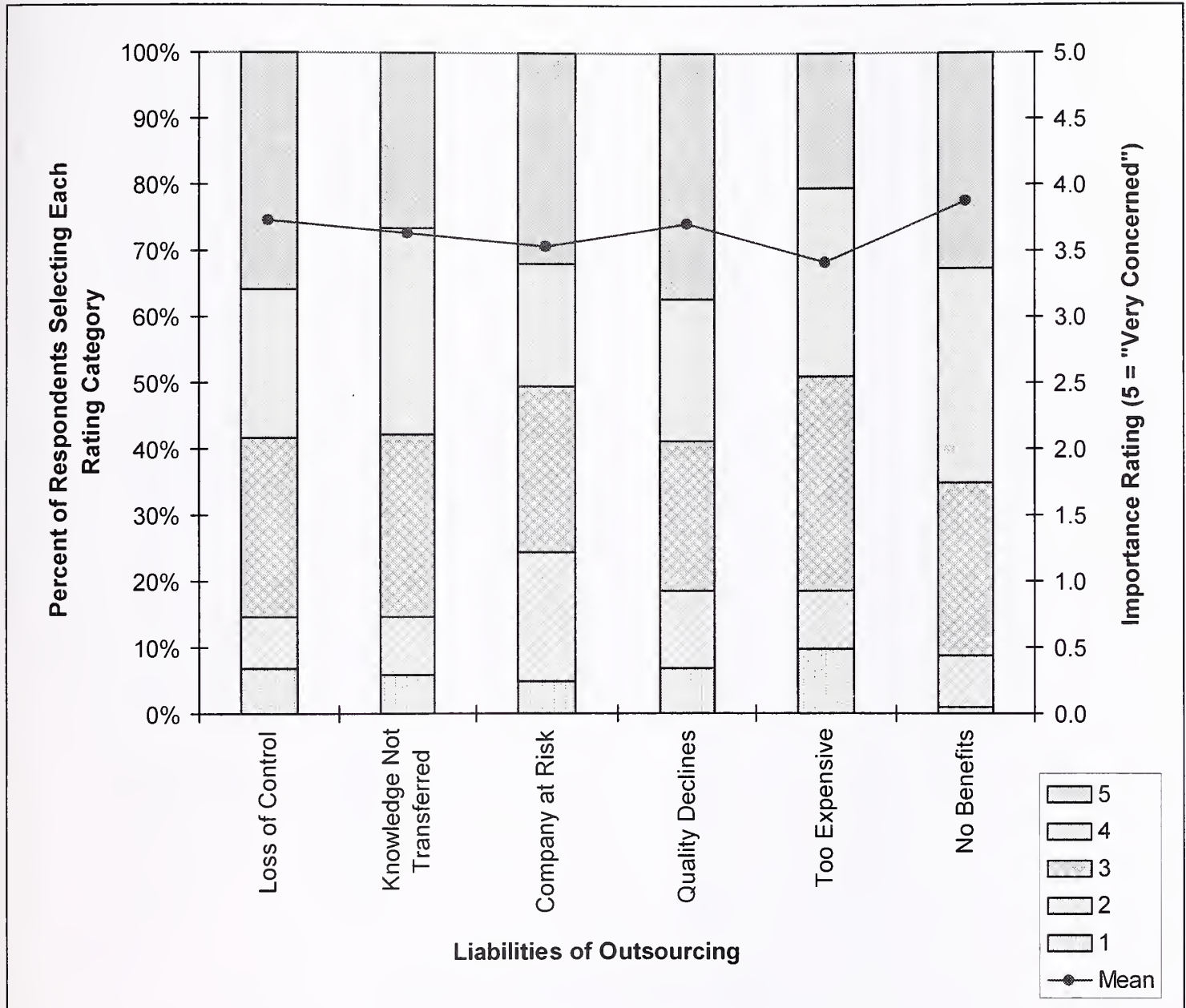
Source: INPUT

Exhibit B-8

Vendor View of Benefits of SCM Outsourcing
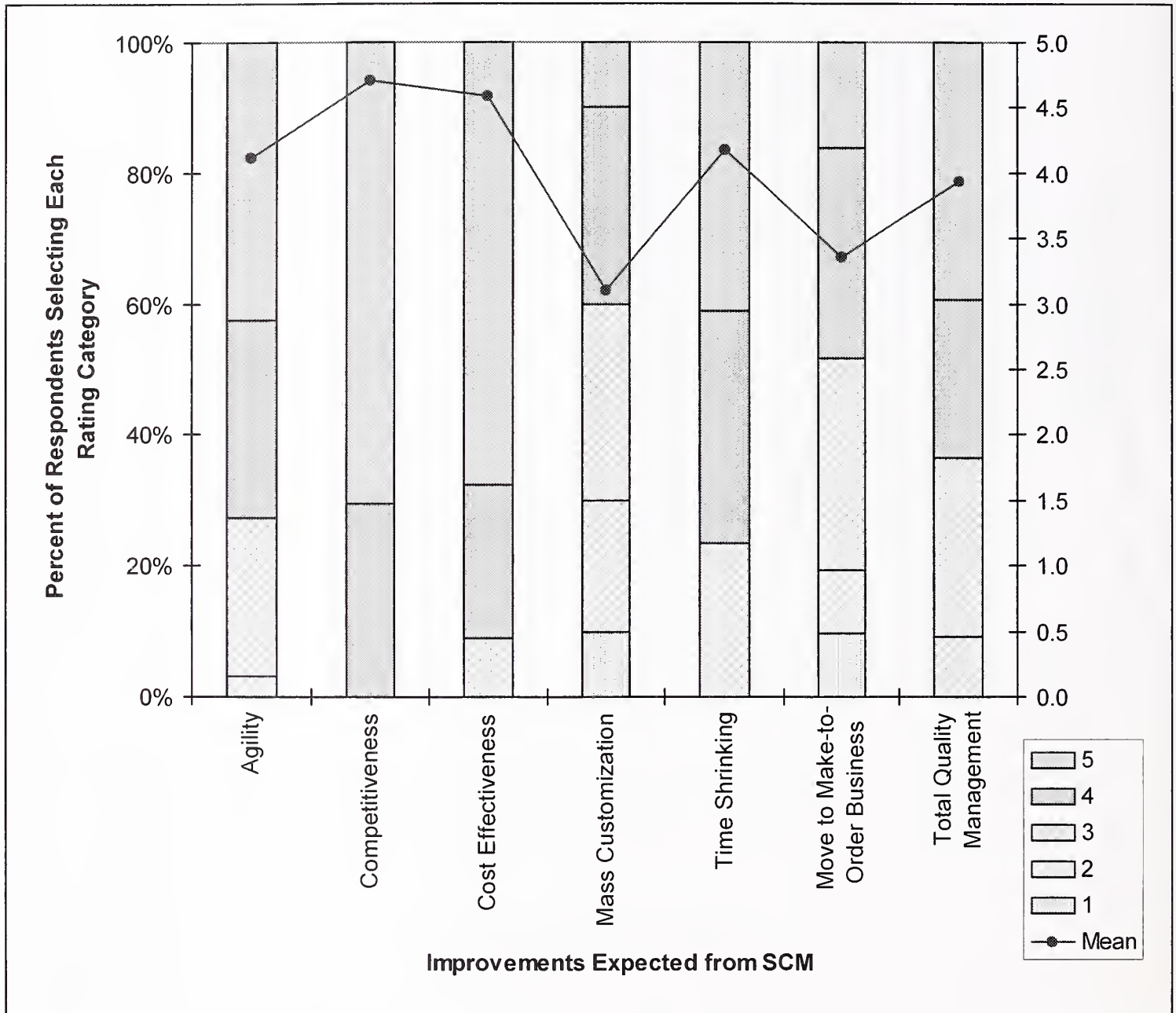
Source: INPUT

Exhibit B-9

Key User Ratings of Vendor Performance
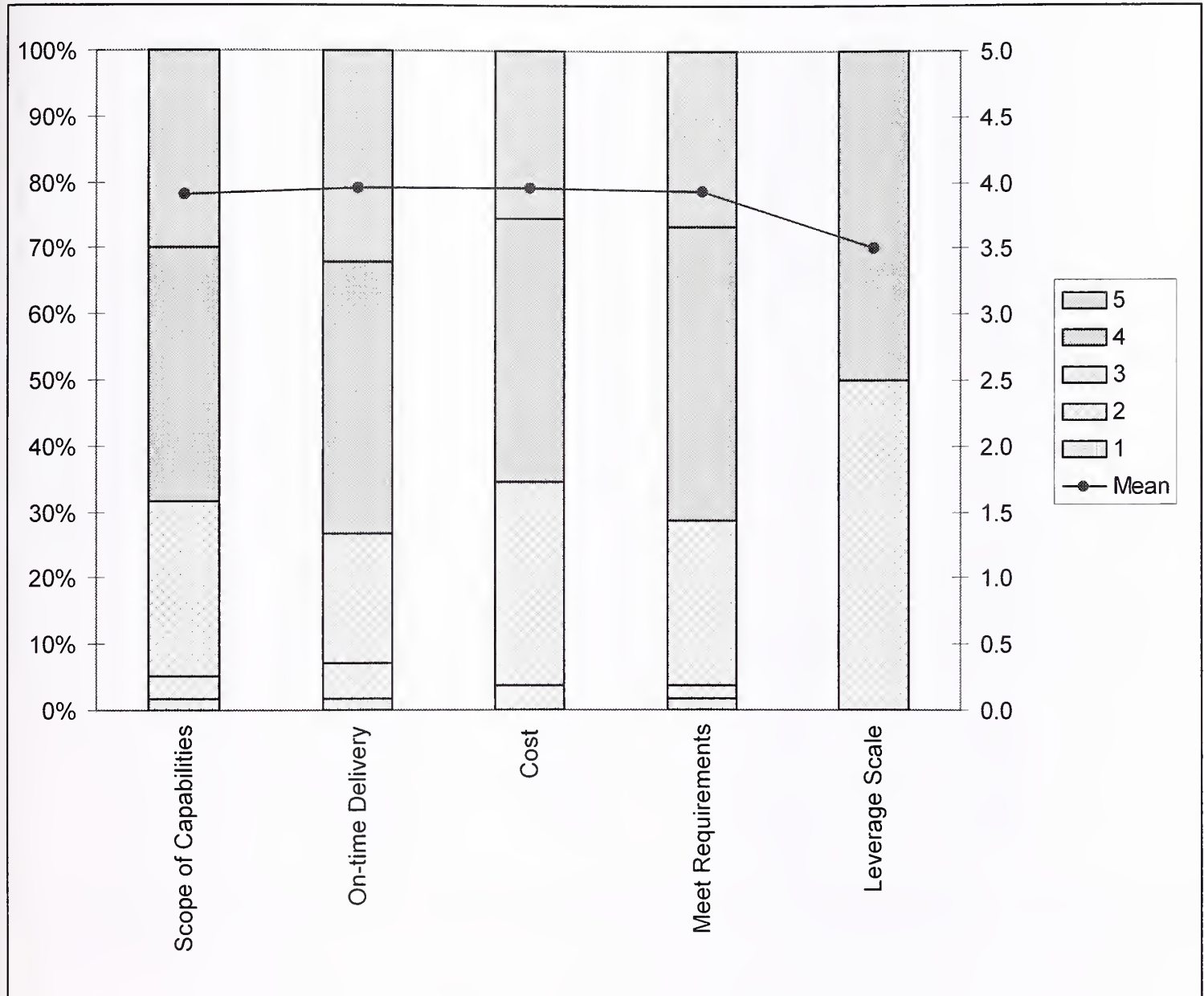
Exhibit B-10

User Ratings of Satisfaction with the SCM Solution
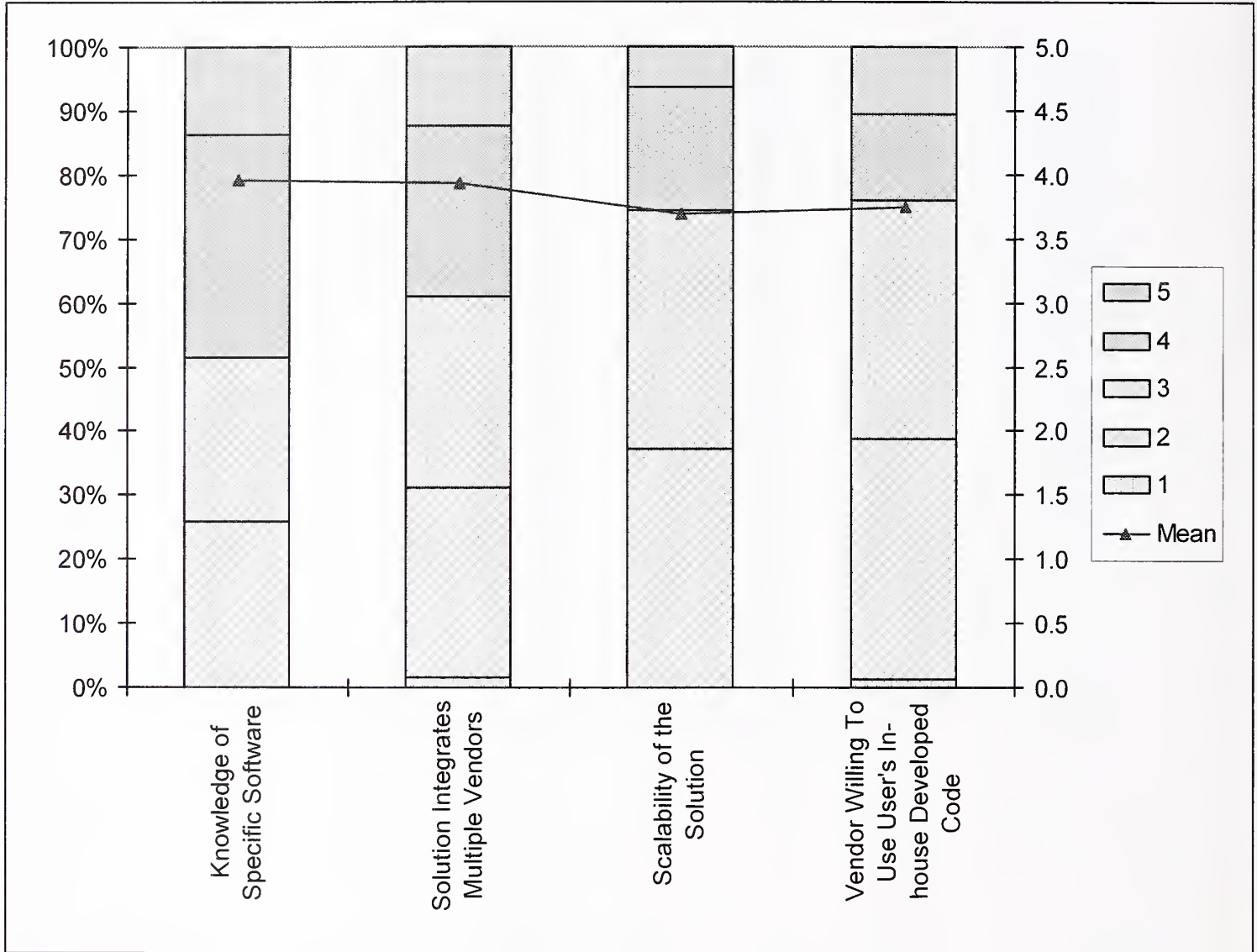
Exhibit B-11

User Ratings of Satisfaction with the SCM Vendor

Legend:
- 5
- 4
- 3
- 2
- 1
- Mean

Categories: Vendor Reputation, Competence of Vendor Personnel, Speed of Reponsiveness, Global Presence, Vendor's Vision
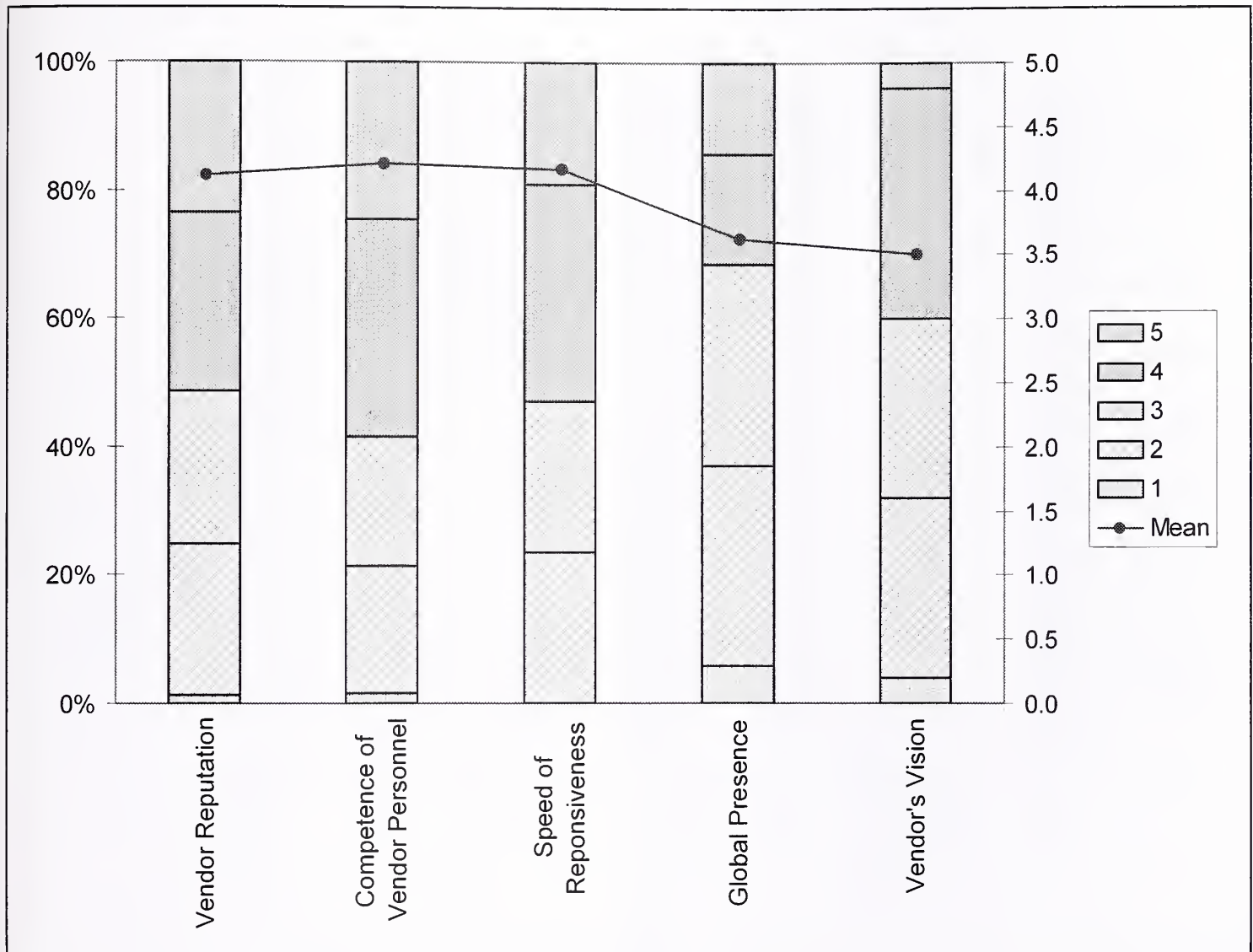
Source: INPUT

Exhibit B-12

Vendors' Ratings of Vendor Performance
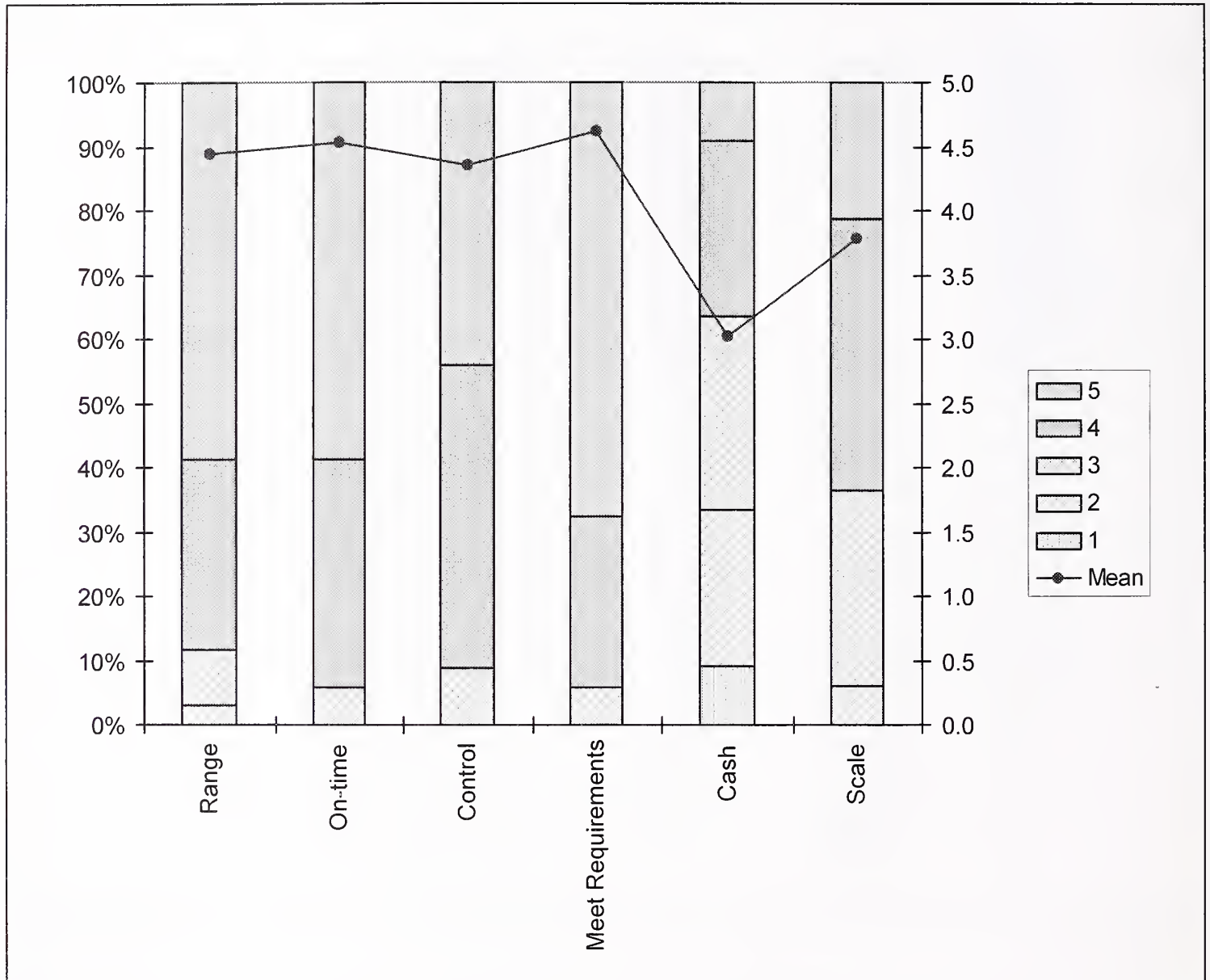
Exhibit B-13

Vendors' Perception of Solution Selection Criteria

(Blank)

C
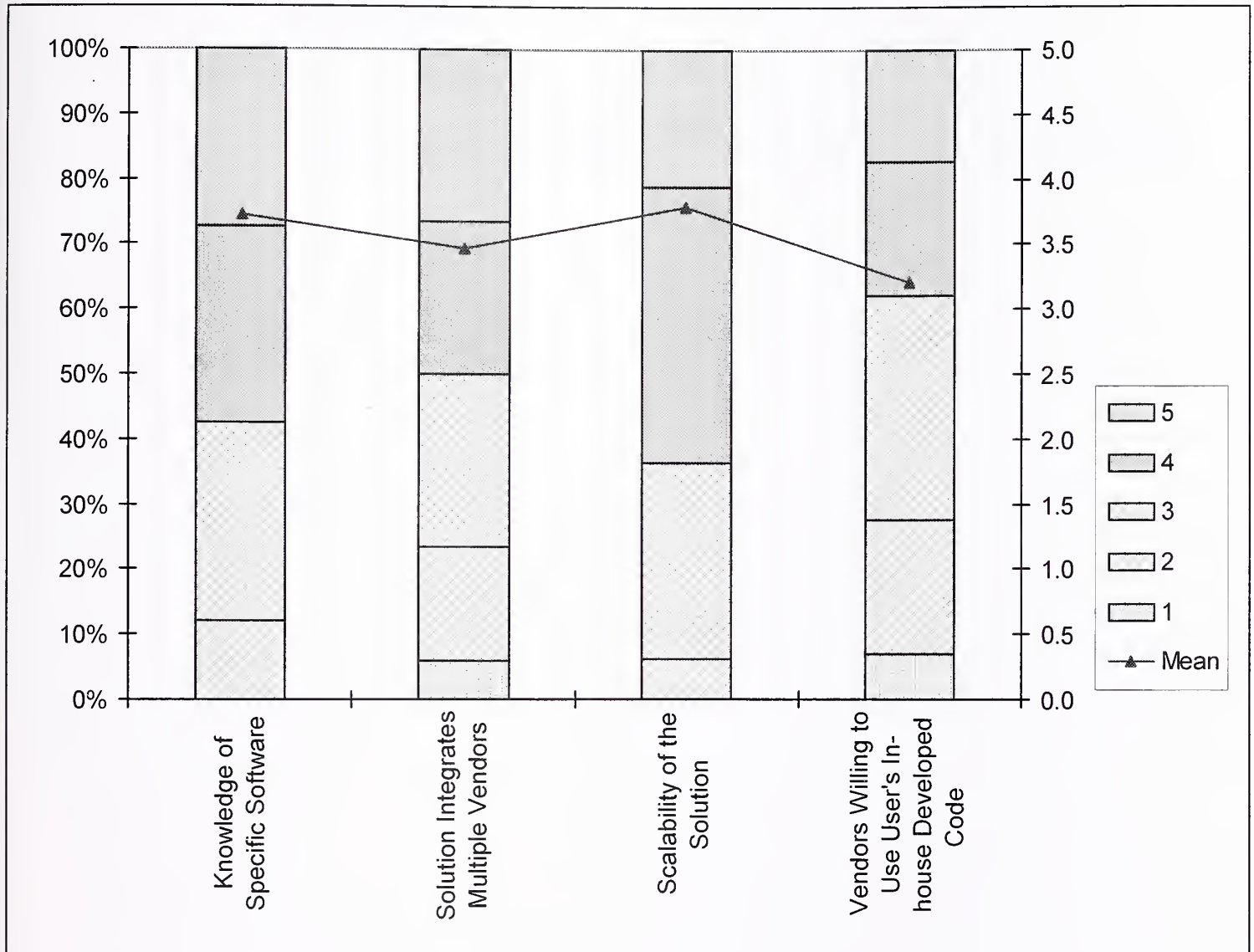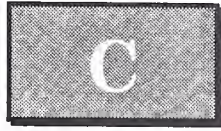
User and Vendor Questionnaires

User Questionnaire: Opportunities for Outsourcing

Supply Chain Management Information Services

[For Questions 1-5, please refer to Table 1]

1. For which of these components have you or will you outsource the IT aspects of the operation?

2. For each component you outsource, what is the name of the outsourcing vendor?

3. For each of these outsourced components, what type of IT service(s) does the vendor provide (e.g., run the application, run the whole department including IT, data processing, ongoing consulting or application maintenance)?

4. Who did you consider to provide this service?

Table 1

Component	Q 1 Outsourced ? (Y/N)	Q 2 Vendor? (Name)	Q 3 Type of IT Service?	Q 4 Considered vendors (Names)
Inbound logistics e.g., raw material purchasing inbound material tracking				
Manufacturing e.g., scheduling				
Outbound logistics e.g., order fulfillment inventory management distribution routing/scheduling				
Customer Support e.g., sales forecasting channel management				
Other (Specify) _____				

INTEGRATED SOFTWARE PACKAGES

5. Do you use any integrated software packages in supply chain management?

    _____Yes   [If yes] From which software vendors do you buy these packages?

    _____ No   Skip to Question 6

Table 2

Software Vendors	Q 5 Software Used? (Y/N)
Baan	
BPCS	
DAI	
Encompass	
GATX	
J.D. Edwards	
Oracle	
SAP	
Other (Specify)	
Other (Specify)	

6.   On a scale of 1-5 with 1 = not important and 5 = very important, how important to your company is each of the following improvements in supply chain management:

_____ Become more agile

_____ Achieve competitive advantage

_____ Increase cost effectiveness through better integration

_____ Provide mass customization

_____ Meet demands for "time shrinking"

_____ Change business from build-to-store to make-to-order

_____ Meet total quality management objectives

Any other highly important benefits from improving supply chain management?

VIEWS ON OUTSOURCING

7.   On a scale of 1-5 with 1 = not important and 5 = very important, how important to your company is each of the following benefits of this supply chain management outsourcing?

_____ Improve cost-effectiveness of IT

_____ Improve service levels

_____ Remove in-house involvement

_____ Introduce up-to-date technologies

_____ Free in-house personnel

_____ Want to exploit opportunities in electronic commerce

_____ Want to exploit opportunities from use of the Internet

_____ Want to capitalize on growth in distributed systems

Any other highly important benefits from outsourcing?

8.   On a scale of 1-5 with 1 = not concerned and 5 = very concerned, how concerned is your company about each of the following liabilities of outsourcing?

_____ Loss of control

_____ Knowledge is not transferred from vendor to company

_____ Vendor puts company at risk

_____ Customer quality declines

_____ Outsourcing becomes too expensive

Any other highly important concerns about outsourcing?

EXPENDITURE

[For Question 9, please refer to Table 3]

9.   What are your company's expenditures now and in the future on outsourcing of supply chain management — Now? In 2 years? In 5 years?

[If respondent refuses to provide a specific amount, ask for a range—Under $5 million, $6-15 million, $16-30 million, over $30 million—and place the range in the appropriate cell.]

[If respondent refuses to indicate a range, please ask if the amount is small for the company, a medium-sized investment, or a large expenditure. Place the word "small," "medium," or "large" in the appropriate box.]

Table 3

Dollar Expenditures	Now	2 Years	5 Years
Actual amount			
Range if no actual available			
$0-5 million			
$6-15 million			
$16-30 million			
Over $30 million			
Small			
Medium			
Large			

RESPONSIBILITIES

[For Question 10, please refer to Table 4]

10. For each of the following job titles, who has responsibilities in terms of making the outsourcing decision, defining the requirements, selecting the vendor, negotiating the contract, and day-to-day management?

Place X in appropriate boxes.

Table 4

	Outsourcing Decision	Requirements Definition	Vendor Selection	Vendor Negotiations	Day-to-Day Management
Company Executives					
Business Unit Management					
Business Function Management					
Information Systems					

Comments:

VENDOR SELECTION

11. For each of the following vendor selection criteria, please rate how important it is to your company and how satisfied your company is with the vendor.

Use a scale of 1-5 with 5 being "very important/satisfied".

Table 5

#	Criterion	Importance (1-5)	Satisfaction (1-5)	Reason for dissatisfaction (if satisfaction rating of 1 or 2)
1	Range of vendor capabilities			
2	Vendor reputation			
3	Competence of vendor personnel			
4	On-time delivery of projects			
5	Cost			
6	Speed of responsiveness			
7	Ability to meet requirements			
8	Knowledge of specific software			
9	Global presence			
10	Solution integrates multiple vendors			
11	Scalability of the solution			
12	Vendor willing to use user's in-house developed code			
13	Other (specify_____)			

OTHER COMMENTS

12.   What additional services would you like the vendors to provide?

13.   Do you have any other comments you want to make regarding the outsourcing of supply chain management?

Vendor Questionnaire: Opportunities for Outsourcing Supply Chain Management Information Services

[Refer to Table 1]

1. Which of the following business functions do you address with your outsourcing offerings? (Place an X in each appropriate row.)

2. For each of these outsourcing service offerings, what information services do you specifically provide? (Place an X in each appropriate row.)

Table 1

Category/ Components	Q1 (x)	Q2 Entire Function	Q2 Processing Support	Q2 Software	Q2 Services	Q2 Other (Specify)
Inbound logistics e.g., raw materials purchasing inbound material tracking						
Manufacturing e.g., scheduling						
Outbound logistics e.g., order fulfillment inventory mgmt. distribution routing/scheduling						
Customer Support e.g., sales forecasting channel mgmt.						
Other (Specify) _____						

3. [If vendor does not provide supply chain outsourcing]...

   Why does your company not offer supply chain outsourcing?

   What must change before you will start offering it?

   [End Interview]

4.   Why did you start a supply chain management outsourcing business?

[Prompts: Natural extension of existing outsourcing business, users requested that we offer the service, another vendor requested it of us, other]

5.   Who are your primary competitors in each service area [refer to Table 1]?

6.   On a scale of 1-5 with 5 being "very important," how do you rank the importance of these supply chain management objectives to your customers?

_____ Become more agile

_____ Achieve competitive advantage

_____ Increase cost effectiveness through better integration

_____ Provide mass customization

_____ Meet demands for "time shrinking"

_____ Change business from build-to-store to make-to-order

_____ Meet total quality management objectives

_____ Other (please specify _____)

7.   On a scale of 1-5 with 5 being "very important," how do you rank the importance of the following benefits of supply chain outsourcing?

_____ Improve cost effectiveness of IT

_____ Improve service levels

_____ Remove in-house involvement

_____ Introduce up-to-date technologies

_____ Utilize change agents

_____ Free in-house personnel

_____ Exploit opportunities in electronic commerce

_____ Exploit opportunities from use of the Internet

_____ Capitalize on growth of distributed systems

_____ Other (please specify _____)

[Refer to Table 2]

8.   On a scale of 1-5 with 5 being "very important," how do you rank
      the importance of each of the following vendor selection criteria?

Table 2

Criterion	Importance (1-5)
Scope of vendor capabilities	
Vendor reputation	
Competence of vendor personnel	
On-time delivery of projects	
Cost control	
Responsiveness	
Commitment to your needs	
Ability to meet requirements	
Knowledge of specific software	
Gainsharing	
Cash infusion (e.g., transfer of assets)	
Global presence	
Solution integrates multiple vendors	
Salability of the solution	
Will use user's in-house developed code	
Other (Please specify_____)	

9. What are your total outsourcing revenues now?

$_____ millions now?

10. What percent of these outsourcing revenues are from supply chain management outsourcing?

_____% from SCM outsourcing

11. How important to your total business is your supply chain management service(s)?

Why?

12. What projected revenue targets does your company have for:

$_____ millions in 2 years?

$_____ millions in 5 years?

13. What are the keys to your company's reaching these revenue projections?

14a. What percentage of your current customer base came from proactive selling versus reactive selling (e.g., responding to an RFP)?

_____% proactive

_____% reactive

14b.   By title, what person(s) do you target in your outsourcing sales?

_____Chief executives

_____Business unit managers

_____Business function managers

_____IS

_____Other (Please specify)   _____

15a.   What features and benefits do you highlight?

[Prompts: Asset acquisition, performance transformation, customized services, cost reduction, other]

15b.   What is your win rate as a percentage of your proposals submitted?

_____% wins of all proposals

16.   What mechanism (methods) do you use to price the service?

17.   Is this pricing mechanism the same as for traditional outsourcing? Why/Why Not?

18.   What major changes are likely to happen in this market over the next 5 years? Why?