The Changing Dynamics of I.S. Organizations: Strategic Use of Information Technology

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ABSTRACT

This report analyzes the business value of information systems and the ability of information systems to support strategic objectives. Included are eight case studies demonstrating different perspectives on the business application of information systems.

Also highlighted in this report are an analysis of the attributes of success in implementing information systems and a discussion of organizational strategies to improve the value of information systems.

This report contains 76 pages, including 17 exhibits.

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CONTENTS

THE CHANGING DYNAMICS OF I.S. ORGANIZATIONS: STRATEGIC USE OF INFORMATION TECHNOLOGY

EXHIBITS

I INTRODUCTION

A. PURPOSE

- This report is part of INPUT's Information Systems Program (ISP). It identifies the environmental forces that information systems (IS) organizations are facing which are generating new approaches for supporting the corporation's business needs. The emerging trend requires a new effort to expand the traditional "cost containment" IS charter to efforts that are more responsive and supportive of an organization's competitive needs.

- The report focuses on a select group of IS organizations that are making a direct business contribution to their firms' competitive positions. This research addresses the following questions:

  - Who are the representative firms using information technology (IT) to gain a competitive edge?

  - What environmental factors were present when these innovative corporations turned to IT for help?

  - When did they feel it was necessary to apply IT to support their corporation's competitive business needs?

  - Where are these firms using IT to directly support their business goals?

- Why are these new approaches working for these firms?

- How have they organized to meet these new challenges?

- How can other organizations emulate their approach and position IS as a strategic corporate asset?

B. SCOPE

- This research draws upon a diverse mix of companies that cross industry type, size, maturity, and business need. By design, its purpose is to concentrate on innovative approaches for using IS technology that directly support business needs. These approaches go beyond typical IS projects that automate business functions.

- The report examines a cross section of experience and documents how these firms have been successful. The questionnaire found in Appendix A was used as the basis for this research. A model is then presented which can be tuned to the reader's environment for applying IS technology to gain a competitive edge. Depending on the business concern or problem, all or part of the model can be used to identify issues and evaluate appropriate information technology (IT) solutions.

- The following individuals will find this report useful:

  - Top management, executive officers, and their staffs.

  - End users, decision makers, and their staffs.

  - Chief information officers and their staffs.

C. RELATED INPUT REPORTS

- 1985 Information Systems Planning Report.
- User Service Requirements: Large Systems (1985).
- Organizing the IS Department for End-User Computing (1984).
- End-User Software Requirements (1984).
- Evaluating the EDP Level of Service (1982).

II EXECUTIVE SUMMARY

- This Executive Summary is given in presentation format to help the busy reader quickly review key research findings.

- It provides an executive presentation, complete with script, to facilitate group communications.

  - The key points of the entire report are summarized in Exhibits II-1 through II-3.

  - On the left-hand page facing each exhibit is a script explaining that exhibit's contents.

A. BUSINESS BENEFITS

- Important benefits can be obtained through the use of information technology (IT) to strategically support a company's business.

- Information technology can improve an organization's ability to:

  - Be the lowest-cost producer of a product or service.

  - Offer a unique product or service.

  - Target or service special markets.

- Representative uses of IT to strategically support the business include:

  - Direct product profitability system.

  - Electronic shopping/marketing system.

  - Paperless environment/direct marketing system.

  - Microcomputer delivery truck system.

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BUSINESS BENEFITS

- Ability to Be the Lowest-Cost Producer
- Ability to Offer a Unique Product or Service
- Ability to Target or Service Special Markets

B. SUCCESS ATTRIBUTES

- Close working relationships are being forged between IS and the business to successfully employ information technology.

- Four major success attributes need to be present for this new team approach:

  - Creation of commercial partnerships between sponsoring companies and their customers, vendors, and/or distributors.

  - Use of innovative approaches in IT to support this partnership.

  - A fundamental corporate culture change in the way IS and the business work together.

  - A favorable impact on the entire organization, demonstrated by a collective sense of business purpose and high level esprit de corps.

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SUCCESS ATTRIBUTES

- Commercial Partnerships
- Innovative Use of Current Technology
- Facilitation of Corporate and IS Team Relationships
- Organizational Benefits

C. BLUEPRINT FOR CHANGE

- Successful use of IT requires a changed partnership approach between IS and business managers.

- The cardinal factor which provides the change catalyst is a successful pilot project that meets the following criteria.

  - A proactive effort that directly supports the business's ability to compete.

  - Support by a respected business manager who has a sound record of success.

  - A clear link to the firm's customer business needs and not a political corporate faction.

  - Small enough to be completed in less than one year.

  - Use of off-the-shelf proven technology that can be modified to meet the project's business needs.

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BLUEPRINT FOR CHANGE

- Proactive Effort
- Support by Management
- Understanding of Customer Needs
- One-Year Duration or Less of Pilot Project
- Off-the-Shelf Technology

III ENVIRONMENTAL DYNAMICS

- This section seeks to describe the pattern of successful information technology (IT) use to gain a competitive advantage. Respondents were chosen based on a demonstrated implementation of IT. The research sample companies and their respective strategic use of information technology are presented in Section E of this chapter.

- The respondents also represented a broad range of responsibilities and backgrounds. Only half were professional IS managers; the rest were operations executives, several with vice-president titles. Many of the managers interviewed had little formal IS training but had made a major business impact using IT. Sales for the respondents' companies ranged from $100 million to $3 billion, with higher than average DP cost to company sales ratios.

- This industry grouping was chosen to avoid the all-too-familiar success stories of the airline, car rental, financial, and aerospace companies which have a record of strategic use of information technology. The objective was to look beyond the tried and tested uses of IT to a sample that was less obvious.

- Knowing how each of these organizations has successfully applied technology to sharpen its company's competitive edge can provide valuable lessons, especially for those who think the strategic use of IS is only for large, technology-based organizations.

A. RESPONDENTS' VIEWS OF INCREASED COMPETITIVE PRESSURES

- A series of probes was presented to determine the business concerns or situations which existed and how they were related to the decision to use IT. It is interesting to find that almost all respondents indicated that the need to reduce costs constituted a competitive pressure. This is not surprising since cost control or containment has long been a popular use of IT. However, a key finding was that most of the respondents considered cost reduction only a first project or step in the use of IT. A majority of the respondents' IT use has been expanded to help offer a unique service or product, and some even found a way to use IT to enter a new market for their products or services.

- The key elements which contributed to the successful use of IT, based on competitive business pressures, are as follows:

  - The respondents were typically proactive. They recognized a competitive threat, but were able to think beyond a near-term solution. They did not just react.

  - There was usually one person or a team thought to be visionaries, forward thinking, and/or strategic thinkers. Their solutions went beyond conventional use of IT and usually included an IT link to their customers. The companies made it easier and more profitable for customers to buy their products rather than their competition's.

B. TECHNOLOGY IMPACT

- As a group, the respondents are technology drivers. The meaning of this term relates to how the companies use existing technology to solve business problems. Most chose off-the-shelf technology, but soon found themselves

persuading vendors to change, improve, or add product functionality to meet their needs. Most respondents (80%) said there was a lack of suitable technical solutions to address their problems.

- Examples ran the gamut from dealing with a corrosive shop-floor environment to extended development time required as a result of buying the first point-of-sale (POS) system on the market to having to cope with the poor quality of newly developed bar code scanning technology.

- While off-the-shelf technology presented problems for the respondents, they consistently overcame these hinderances through good vendor support and persistence. It should be made clear that the respondents did not require totally new technology. Rather, they needed modifications to existing technology such as reprogrammed memory for hand-held terminals and improved bar code printing quality. Given the results of their early efforts, they have contributed to the overall improvement of these technologies.

C. I.S. MATURITY/ADAPTABILITY

- The use of IT is not occurring because of top management directives or mandate. Rather, the sample group's examples can be characterized as team approaches with IS members usually playing a strong technical consulting role. There was little mention of organizational gimmicks like steering committees, MIS policy mandates, etc. to force cooperation between IS and the users. On the contrary, there was a spirit of cooperation, with many of the IS respondents working directly with their operating personnel peers. System solutions were arrived at through a business contention approach, where operating "stakeholders" championed a business idea and sought advice and approval from key managers within the corporation.

- Many IS organizations operate on a decentralized basis with IS personnel acting as account representatives assigned directly to organizational elements. There were various terms associated with this working arrangement, but the organizational reality is that IS and the business units are teamed up to ensure project success.

- One other innovative approach was called a "customer advisory board." This was a direct link with the company's customers wherein suggestions for improved service were collected and acted upon. This is the best example of a firm reaching out to its customers to find better ways of doing business. In this case the link was not only with existing customers, but with past customers as well.

- Additional probes were presented to determine the degree of IS involvement in five key areas of strategic use of information technology. The first two questions focused on prioritizing major business issues and developing strategy that defines how business goals would be accomplished. These kinds of activities are usually reserved for members of the board and top management. The probes were designed to see if IS was contributing to strategy development. Exhibit III-1 indicates that IS has rated its involvement at 3.4, based on a scale of 1 (not involved) to 5 (heavily involved). While this is not a particularly high rating, it is certainly higher than the often heard IS model complaint of "not involved."

- Given the possibility of using IT to support business strategies, the level of involvement rises in all but one category in the next set of probes shown in Exhibit III-2. This category, justifying costs and benefits for major IS projects, is rated low (3.1) because many respondents indicated that justification is a shared or joint effort. IS and the business stakeholder jointly champion the project justification, with the business member being the most important element.

EXHIBIT III-1

I.S. INVOLVEMENT WITH BUSINESS ISSUES AND STRATEGY

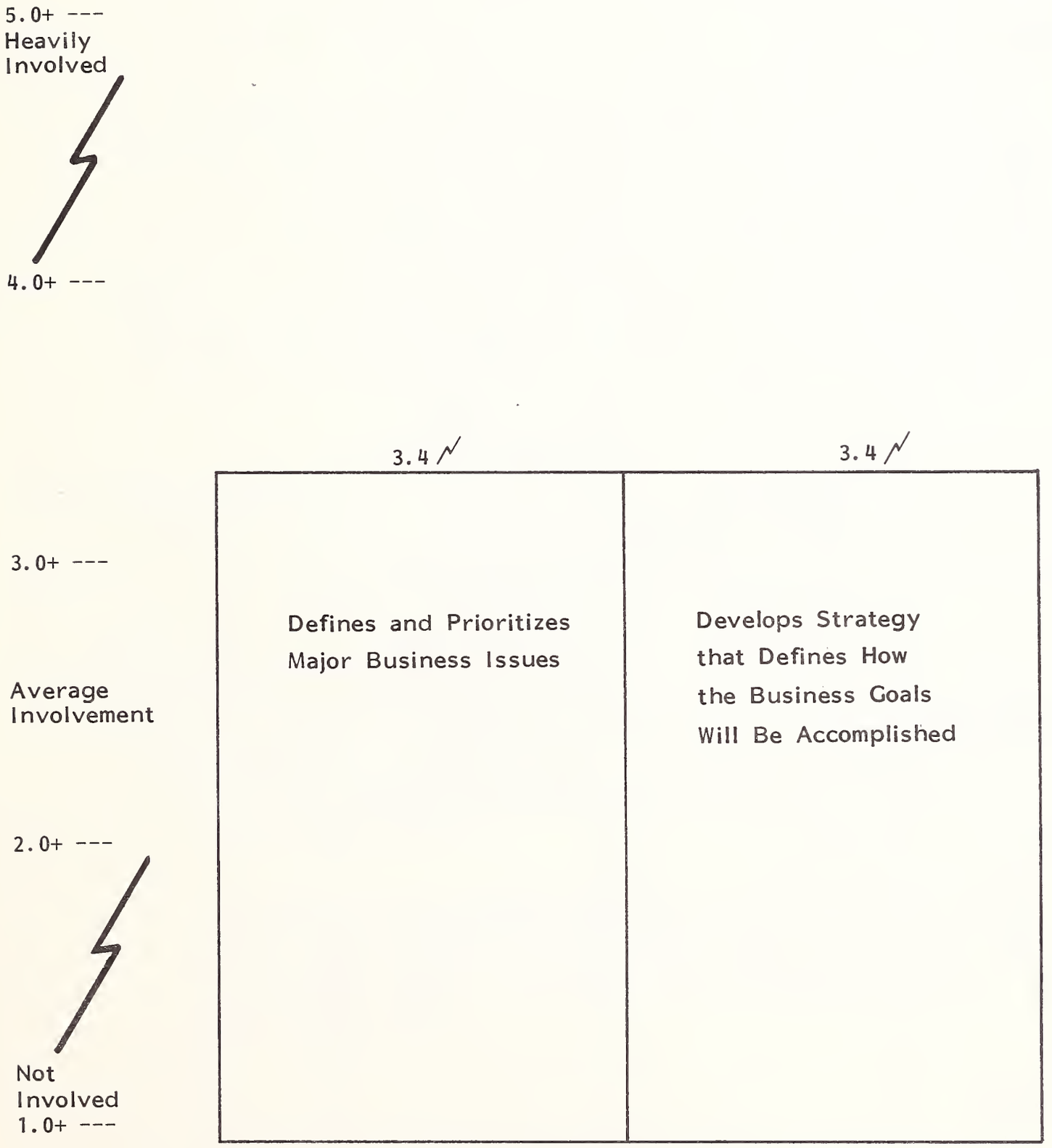
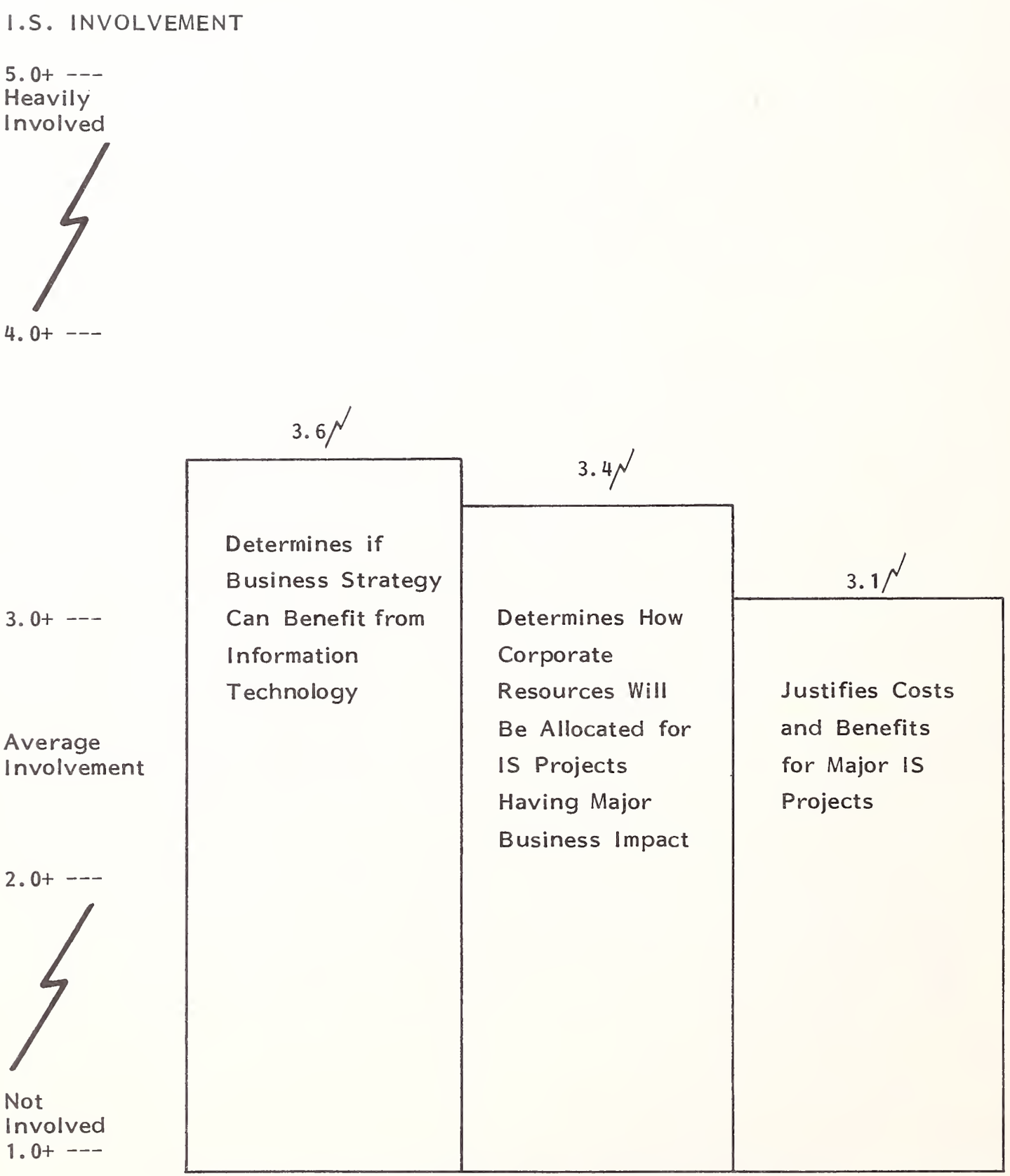


EXHIBIT III-2

I.S. INVOLVEMENT WITH I.T. STRATEGY, RESOURCES, AND COST/BENEFITS



D. BUSINESS BENEFITS

- The respondents rated the business benefits consistently well above average. Three general classes of benefits were measured--their ability to reduce costs, offer unique services or products, and target or service special markets using information technology.

- With few exceptions, this sample group produced business benefits in all three classes. Most first experienced benefits in their ability to reduce production costs or service. Subsequently, they found a synergism existed which allowed them to also accrue benefits in the remaining two categories. Exhibit III-3 provides a detailed listing of each respondent's strategic business benefits rating for all three groups. A summary explanation of the benefits achieved by each respondent is provided to explain their use of IT to achieve or improve their company's competitive position.

E. CASE STUDIES

1. GREETING CARD PUBLISHING COMPANY (GCPC)

- GCPC has been developing a process to strategically employ IT for the last eight years. The process began by developing a method for forecasting programmer staffing levels. The Director of Systems Development then communicated his objectives to the rest of the IS organization and throughout the corporation to solicit support.

  - A portfolio analysis was added between 1981 and 1983 wherein major divisions were evaluated to determine their business objectives and existing system support. This process helped to identify the system support voids or needs.

EXHIBIT III-3

BUSINESS BENEFIT RATINGS/TECHNOLOGY APPLICATION

S.I.C. Number	RESPONDENT'S STANDARD INDUSTRIAL CLASSIFICATION	INFORMATION TECHNOLOGY APPLICATION	STRATEGIC BUSINESS BENEFIT RATINGS		
			Lowest-Cost Producer	Offer a Unique Service/ Product	Target or Service a Special Market
2771	Greeting Card Publishing	Direct Product Profitability System	N/A	5	N/A
3291	Abrasive Products	Distributor Order Entry and Tracking System	4	4	2
5651	Family Clothing Stores	Point-of-Sale Retail Management System	N/A	4	4
5311	Department Stores	Electronic Shopping/ Marketing System	5	5	5
5122	Drugs, Proprietaries, and Sundries	Customer Retail Management Systems	5	5	5
7011	Hotels, Inns, and Tourist Courts	Nationwide Reservation and Occupancy System	5	3	5
6331	Fire and Casualty Insurance	Paperless Environment/ Direct Marketing System	5	5	5
5462	Retail Baking and Selling	Microcomputer Bakery Truck Delivery System	5	4	4
		Average Ratings	4.8	4.4	4.3

- In 1984, a phase of IS strategy selection began which firmly linked the system efforts to the business and quantified IT over- or under-utilization by division. This current thrust, called "technology scan," has been implemented to develop the various business entities. It requires an evaluation of IT alternatives, such as host systems development, end-user computing, and office technology, etc., and produces a determination of the mix of information tools that should be made available.

- From these efforts, the company has evolved a process called "enterprise analysis" which links the business to IS planning, defines business requirements, selects information strategy, and sets project priorities and budgets.

- The attributes which differentiate GCPC from many other companies are as follows:

  - Very stable IS organization with little personnel turnover in the last eight years.

  - No charge-back system for IS services.

  - Project specification development is formalized by IS analysts who work with the busines entities to document needs. This generates consistent project proposals for management review and approval.

  - IS budgets are developed after projects have been selected and approved, thus reducing pre-capital allocation data manipulation.

  - Ratio analysis which measures the use of IT for its knowledge workers to determine the level of IT support. Knowledge workers are those who work with corporate data and could benefit from using computers.

- An example of the results of GCPC's Enterprise Analysis is the Direct Product Profitability System (DPPS). This PC/mainframe system is a fully absorbed cost model which is used by marketing to negotiate scarce floor selling space in retail stores. Armed with comprehensive cost and revenue data, marketing is able to convince retail store management that GCPC products are high-profit and fast inventory-turning sellers. DPPS has been responsible for offering a unique service that sells GCPC products and generates customer profits above other competing products.

2. ABRASIVE PRODUCTS MANUFACTURER (APM)

- This manufacturer watched as its industry sales dwindled. Foreign competition systematically undercut prices and it seemed as if the entire industry was moving offshore. After hiring a technically-oriented IS manager, the management team confronted this competitive situation by asking, "Will we be a viable business in five years?"

- APM had built a one-hundred-year-old market reputation as a quality manufacturer based on its abrasive engineering skills. It currently produces approximately 350,000 different stockkeeping units and continually has nearly 20,000 work orders in process. APM's custom quality-engineered products do not lend themselves to mass production because there are few economies of scale possible for product standardization. This seemingly unsurmountable problem took three-and-a-half years and a multimillion dollar technology gamble to overcome. Known as the "APM Connection," the firm set out to provide its distributors with "the highest service levels in the industry" and to protect its market niche. The "APM Connection" is an order entry and tracking system which provides the following on-site distributor order functions:

  - Entry.

  - Tracking.

- Pricing.

- Delivery data confirmation.

- Improved service, product quality, and product cost leverage have resulted. This system utilizes an international communications network with satellite transmission linked to 27 countries worldwide.

- After successfully automating the front end of the business, three additional systems are being added to strategically support the manufacturing functions. Shop floor computer-integrated manufacturing (CIM), including robotics and nonstop processing, is under development to ensure that APC is the lowest-cost producer. The visionary "APM Connection" has provided a way to protect market share, satisfy customer service requirements, and blunt foreign competition. The Vice President and General Manager summarized the business benefits by saying the APC Connection makes it "easier to do business with us and harder to leave." Over the last 10 years, APM has grown from $17 million to $1.2 billion in sales, and its IT investment from less than 1.5% to nearly 1% of sales.

3. FAMILY CLOTHING STORES (FCS)

- The company has proven that centralization is still a viable IS alternative in these days of decentralization. The Vice President and Director of IS summarized his philosophy for the strategic use of information technology as follows:

  - "Information systems don't drive a company--they run in harmony with it and support its needs."

- FCS' needs were impressive. The requirements which the Point-of-Sale Retail Management System (POSMS) had to satisfy included:

- Supporting 2,400 stores from the East Coast to the Virgin Islands.

- Tailoring the system to eight separate divisions serviced through three distribution centers.

- Satisfying each division manager who operates his own stores and specialized product lines.

- Pioneering point-of-sale technology and store conversion which was "quite an experience."

- The POSMS provides complete retail store management functions each day from the time the store opens until it closes. IBM 3680 POS terminals and computerized cash registers linked by voice-grade telephone lines to three IBM 4341s provide the computer power that centrally manages the complete operation. Stockkeeping unit data are entered when each item is sold, providing the basis for managing the inventory and distribution functions.

- The bottom line for FCS' business benefits is that it is "the way management wanted to do business; they funded it and they want more." Having made a major investment in developing the system, the Vice President & Manager of IS feels, "We know there is a lot more competitive advantage we can get from the system; the synergistic possibilities are exciting."

4. DEPARTMENT STORES COMPANY (DSC)

- DSC is a large chain that is committed to using IT. Its visionary management team was faced with the usual skepticism, especially in an industry where profit margins are thin and inventory turnover is the way to increase profits. To finance these electronic sales generators, marketing turned to its suppliers. Starting modestly, DSC has built a reputation as a leading-edge retailer.

- This is a good example of proactive management use of information technology. In 1978, DSC installed an electronic bridal registry which "preempted the market." Since then there has been a steady stream of electronic shopping/marketing systems that include:

  - Stork Club baby registry.
  - Christmas gift registry.
  - "Media wall."
  - Media cube.
  - Furnish-home-computer.

- Once the major vendors saw the sales impact of the registry concept, they contributed funds to the project so that their products would get equal exposure. The Vice President of Marketing summarized his approach to system expenditures by saying:

  - "We don't spend money on anything that won't give us a tremendous return on investment. We look to earn solid profits, or we won't go ahead with a project."

- For DSC, the media is the message and the company is well on the way to setting the industry standard for electronic marketing. This use of technology is built upon video disks, photographic media, and computers to capture customer sales and book orders. Eventually, it will reduce the number of department store sites by letting shoppers browse data files rather than showrooms. Many of these shopping services are not new to retailing, but DSC offers them in a unique way.

- For example, the wedding registry produced a 20% increase in sales, or $5 million in additional revenues. The Stork Club baby registry is projected to generate $2 million more in sales. DSC does not aim to just keep up with their competitors; they are intent on creating a whole new way of selling.

- Using a mix of technology, the electronic marketing systems that have been implemented use:

  - Touch pads for customer input.

  - Micro-mainframe links for record keeping.

  - Programmable video disks for media displays.

  - Large (5'x11') in-store product displays called the "media wall."

  - Small (2'x2') media cubes for customer shopping within departments.

- The next level of electronic marketing will include the ability to finalize a sale by completing the financial transaction. Vendors, customers, and DSC all share in the benefits. For example, DSC's use of the media cube in the shoe department resulted in a 20% sales increase for a specialty line promotion. Vendors are finding this use of IT profitable because they can offer customers their total product line electronically. This would normally not be practical due to the lack of showroom size. For example, the furnish-home-computer features an entire furniture company's product line, not just the usual floor samples.

5. DRUGS, PROPRIETARIES, SUNDRIES COMPANY (DPSC)

- DPSC was very close to being sold by its parent firm because of poor profit performance. That was nearly 12 years ago and, like the legendary Phoenix, it has risen to become a trendsetter in the fiercely competitive drug distribution

industry. Now, 99% of its order entry is electronic. Two-thirds of its 15,000 customers use hand-held portable terminals for inventory and ordering DPSC products.

- DPSC competes for $11.6 billion of drug industry sales which come from 30,000 independent pharmacies, 14,000 chain drug stores, and 7,000 hospitals. Service to its customers has been the key to its business growth. Its industry leadership is directly tied to the use of information technology. Responding to a customer suggestion, DPSC has been listening to and helping customers be more productive ever since. To date, three systems create a win-win situation for both the company and its customers.

- Customers were initially provided hand-held terminals to automate their inventory and ordering drudgery. The distributor has since added modules for pharmacy pricing and third-party claims. Store owners can have these services for as little as $100 per month or they can opt to pay for additional services which make them even more productive and dependent on DPSC. Future offerings will include a drug interaction and patient profile system for drug stores and hospitals.

- Starting from supplying customers with free services, the company is now developing and marketing computer systems for the health care industry--a whole new market for the distributor. An explanation of the systems being offered follows:

  - Customer Premise Inventory/Order System--Provides hand-held microcomputer terminals based on a departmental shipping concept. Orders and warehousing are organized by customer departments; e.g., oral hygiene. This simplifies order, inventory, shipping, and restocking tasks.

  - Customer Pricing System--Drug products are shipped with two labels which include the dispensing value and quantity. This provides the

pharamacist with the information he needs to meet his gross profit objectives.

- Customer Claim System--Formats third-party claim payment data, minimizing errors and reducing the rejection rate from health care insurance companies.

- DPSC sales have increased from $1-3 billion and parent corporate management no longer wants to sell the drug business due to poor profit margin.

6. HOTELS, INNS COMPANY (HIC)

- This hotelier has not let a depressed regional economy drag down its sales. Instead, HIC's Vice President for Operations turned to information technology for help. Starting without a systems department, the company has developed a nationwide reservation and occupancy system that provides a competitive edge.

- Six years ago, the company implemented a pilot project to produce reservations and energy management systems. It resulted in a 14-month payback and reduced energy costs by 40%. HIC now enjoys an 85% repeat customer business, twice the industry average, and an occupancy rate that is five percentage points above the industry norm of 65-69%.

- HIC's total commitment to using IT goes beyond front-office operations to its financial, accounting, and energy management functions. The flexibility of its reservation system allows it to identify chronically low occupancy rates and react by offering discounts to tour brokers and vacation wholesalers. It can also guarantee rates for corporate frequent travelers for six months. Two hundred marketing staff members keep 11,000 rooms in eight states as full as possible. The reservation network is linked to lobby, check-out desks, and major airline reservation systems. Honeywell energy management system modules keep overhead costs at a minimum. A combination of Honeywell and

Burroughs micros keep the front/back office and energy management systems working in concert. Benefits have been transferred throughout the chain and new travel industry interfaces are being evaluated.

7. FIRE AND CASUALTY INSURANCE COMPANY (FCIC)

- Information technology has allowed this insurer to directly market its service by telephone and, at the same time, serve its existing customer base better and offer them more services.

- A short-lived experiment with a decentralized IS organization resulted in the conviction that strong, centralized support was the key ingredient to an aggressive service program. To that end, the company embarked on a 16-year effort to create a paperless environment.

- To support the IS organization, the Chief Information Officer was elevated to a position as a coequal management team member with other insurance division presidents. This has produced a cohesive upper management commitment to FCIC's guiding business objective of outstanding customer service. The results of this commitment have produced:

  - A customer-based focus group that provides guidance toward continually improving service.

  - Approximately 12 new or improved product lines which have made FCIC a billion-dollar company.

  - Ratings at or near the top by insurance industry watchers for customer claims satisfaction.

  - The elimination of sales agents that boost the price of premiums.

- The centralized IS organization uses a large-scale IBM/IMS network and a DEC VAX-11/785 office system to support the corporation's direct marketing efforts.

- To further support the paperless environment objective, the IS group is funding image processing research and development projects. Currently, 3M and IBM are participating in these projects to maintain and improve FCIC's ability to better serve its members.

8. RETAIL BAKING AND SELLING COMPANY (RBSC)

- This is a privately held, quality baking company serving 11 towns that has installed approximately 330 NORAN on-board microcomputers in its delivery vans. This small, self-contained computer links the production lines to the sales of RBSC's products. The NORAN computer, with its own memory, input pad, and dot matrix printer, is mounted on the dashboard of the trucks.

- The system is loaded with the day's delivery lists for each store on the route and provides the sales totals at the end of the day. Each driver detaches the computer at the end of the day and places it on the input racks. The data is then input to the company's mainframe where sales and next-day production files are updated.

- The use of this information technology has had a "dramatic and substantial business impact" according to the company's director of data processing. The route salespeople are also enthusiastic because it is a great timesaver and paperwork eliminater. Better still, it helps the sales force better serve customers. The system provides an accurate tabulation of what is selling and reduces store returns.

- RBSC can now maintain a 5% product wastage factor which translates into higher profits. Along with better profits, improved accountability has been achieved.

- Given this first success with the on-board computers, RBSC is planning a new danish pastry plant. The decision to build the new facility was based partly on improved sales data and the need to meet a competitive threat.

- Like most small businesses, RBSC had to prove that IT could really make a business improvement. A pilot test was constructed and proved successful. In bakery industry jargon, it passed the "taste test." Working closely with the vendor, new memory chips were programmed to meet RBSC specifications. The entire on-board computer system was designed, developed, and installed in 14 months. The use of this technology has not only made RBSC the lowest-cost producer, but has given management the confidence to build a major new production facility based on sales data collected by the system.

IV ORGANIZING TO SUPPORT CORPORATE BUSINESS GOALS

- A growing number of IS organizations are using information technology to strategically support their companies. This emerging trend signals a move toward more advanced use of technology that goes beyond IS's traditional cost containment role. Companies are using technology in commercial applications that run the gamut from developing a whole new IT-based business to telemarketing.

- Using IT to become more competitive is no longer found only in large, high-tech corporations. It now crosses industry groups, size of enterprises, stages of IS maturity, and business functions. In order to classify these expanded uses, the following group definitions will be used:

    - Cost leadership--A business strategy that requires a firm to be the lowest-cost producer of a product or service.

    - Product differentiation--A business strategy that necessitates developing a unique product or service.

    - Market focus--A business strategy that is employed to target or service special market niches.

- Information technology is either being used in a single business process such as marketing or in multiple (integrated) processes such as marketing, product development, and production. The strategic use of IS depends on competition

and business objectives. Representative examples for each of the above definitions are found in Appendices B, C, and D.

A. CORPORATE SUCCESS ATTRIBUTES

- The successful use of information technology can be measured by how organizations meet the following environmental demands:

  - Competitive pressures--Business factors such as price competition, rival product announcements, or loss of market share.

  - Technology use--How companies use information technology to improve business performance relative to their competition or the market.

  - IS maturity/adaptability--The ability of the information systems organization to support major business projects and tailor information technology to directly support business objectives.

  - Business/IS team response--Documents the key business/IS team qualities found in organizations that are successfully using IT to directly support their business.

1. COMPONENTS OF SUCCESSFUL I.T. IMPLEMENTATION

- Commercial partnerships should be formed using information technology to create business benefits for the sponsoring company and its vendors, distributors, and/or customers. This use of IT is designed to meet critical business needs that will benefit commercial partners in varying degrees. The result has been stronger business ties that are based on a mutual understanding of each individual company's business stakes and the beneficial use of IT to support collective business needs.

- These systems are usually championed by what can be called a visionary. This term refers to a key IS or business manager who sees the potential benefits and engineers the system's implementation.

- Managers/champions are best characterized as proactive. They are able to sense an opportunity or pending problem which could be addressed or solved using IT and then act upon this conviction.

- Technology is characteristically applied by choosing off-the-shelf components which are then modified to meet business requirements. This includes an ability to integrate and innovate IS solutions which use vendor support when modification is required. Matching technology to business requirements eventually will earn the support of senior management. Their support is only earned through demonstrated business results.

- A successful pilot project can lead the way to facilitating corporate change. A frequent approach is to develop an operations test-bed where the project is proved on a limited basis. It is better to find out that the project is faulty in a test situation rather than have it fail when it is supposed to be operational. As each pilot project becomes operational, the IT group builds a reputation for success.

- A contention approach can also be useful to resolve business issues which often prove to be problematic for system designers. Issues such as matters of corporate policy, responsibilities, etc. can create havoc. Concessions or altered business practices can often be resolved before they become a problem.

- One of the results of the research for this study was that there was a noticeably long-term or stable character to the respondents' IS organizations. On average, the project visionaries had been championing their projects for nearly 9 years and one for the past 16 years. In fact, in several cases, people

who had initiated projects when in a lower managerial position were later promoted because of its successful implementation. The project team was invariably composed of business leaders and IS technology facilitators working as technical consultants.

- Often there is an organizational impact which can be typically characterized by a high level of esprit de corps when the IS organization managers clearly feel they are part of the management team, working on projects that are an integral part of the business results. The level of responsibility and contribution to profits drives the IS budget, not artificial ratios of expense to sales. IS is less and less thought of as an overhead expense and seriously considered a business environment. More often than not, long-standing business functions are being automated first, and the synergistic follow-on projects capitalize on these foundation uses of information technology. The cooperative business-driven team spirit seems to bring to the surface outstanding leadership qualities in both the business and IS partners. A summary of this analysis is presented in Exhibit IV-1. The value for each success attribute is the percent of the respondents who demonstrate the attribute.

2. FACILITATING CHANGE

- The ability to strategically employ information technology is present in most organizations. This research has demonstrated that the catalyst for making it happen comes in many forms.

- Many organizations are able to build on successful IS projects to convince management that information technology should be considered as a strategic weapon. Picking a pilot project and team to demonstrate IT's worth is the first and most important step. The success pattern that emerges indicates that the IS organization wanting to prove that IT can directly impact the business has to look to the business needs for project candidates. This project should have the following rank-order characteristics:

EXHIBIT IV-1

CORPORATE SUCCESS ATTRIBUTES

COMPONENTS	ENVIRONMENTAL DEMANDS (Percent of Responses)			
	Competive Pressure	Technology Use	IS Maturity/ Adaptability	Business/ IS Team Response
COMMERCIAL PARTNERSHIPS				
1. Customer, Vendor, and/or Company Benefits Result	100%			
2. Information Technology Championed By a Visionary	88			
3. Management Style Was Proactive	88			
4. Information Technology Supports Customers, Vendors, and/or Distributors and Business	75			
TECHNOLOGY USE				
5. High-Level Technology Support Was Earned		100%		
6. Several Technologies Were Integrated		100		
7. The Use of Technology Was Innovative		88		
8. Implementation Required Pushing Technology		50		
FACILITATING CORPORATE CHANGE				
9. Pilot Project Selection was the Test-Bed			75%	
10. IS Organizations Built on Past Successes			75	
11. Contention Approach Used to Resolve Issues			75	
12. IS Organization Stability Was the Norm			63	
13. Business Stakeholder Championed Project			63	
14. Business/IS Team Membership Project Organization			63	
15. Persistence Overcame Past Setbacks			50	
ORGANIZATIONAL BENEFITS				
16. Projects Clearly Business-Driven				100%
17. Synergistic Business Benefits Result				100
18. High-Level Esprit de Corps Evident				88
19. Project Budget Briven by Business Benefits				88
20. Project Leaders Influential Managers				75
21. Outstanding Leadership Qualities Demonstrated				75
22. Tested Business Functions Are Automation Candidates				63

- Be a proactive effort to improve the organization's ability to cut costs, offer a unique service product, or target or service a special market.

- Be sponsored by a respected manager who has a sound business record of success.

- Be clearly linked to the firm's customer business needs and not a political entity within the corporation.

- Be small enough to complete in less than one year (preferably six to nine months) and have moderate business risk should it fail or be delayed.

- Use off-the-shelf technology that has been proven and can be modified to meet the project's business needs.

- Having found a project that matches the above criteria, choose the best business-wise team members possible, clearly define roles and responsibilities, expect setbacks, and adopt a can-do attitude. Grossly underrate the published business benefits expected and judicially calculate costs and time required. The first project should be planned so that follow-on modules will be built on the foundation of the first success.

- The project team is better off with a business leader, letting the IS members concentrate on making the technology fit the business needs. This can best be done by adopting a contention approach for resolving the business issues that must be addressed before an acceptable system solution is possible. This approach requires the business project leader to resolve the issues by cooperatively working with the firm's stakeholders. Various approaches, positions, and viewpoints are contended, so the resulting solution embodies the best corporate thinking.

- Nothing succeeds like success, so the outcome of the pilot project will always be measured in binary terms, success or failure. It is up to the project team to ensure that it is successful. Given the first rewards, follow-on use of IT to improve the firm's competitive position is easier and facilitating change fades as an issue, becoming a new part of the corporate culture.

3. ORGANIZATIONAL CHANGE MODEL

- The pattern that successful companies are employing differs from traditional or past use. There is definitely a new spirit of cooperation wherein the focus is primarily on business goals and objectives and secondarily on elegant technical IS solutions. The emerging model allows for a clearer definition of what the enterprise has to do to be successful and brings into focus how/whether IS can best help.

- Perhaps the use of this model can be best understood based on how an organization answers the following questions:

  - What should we be doing to be successful in our business?

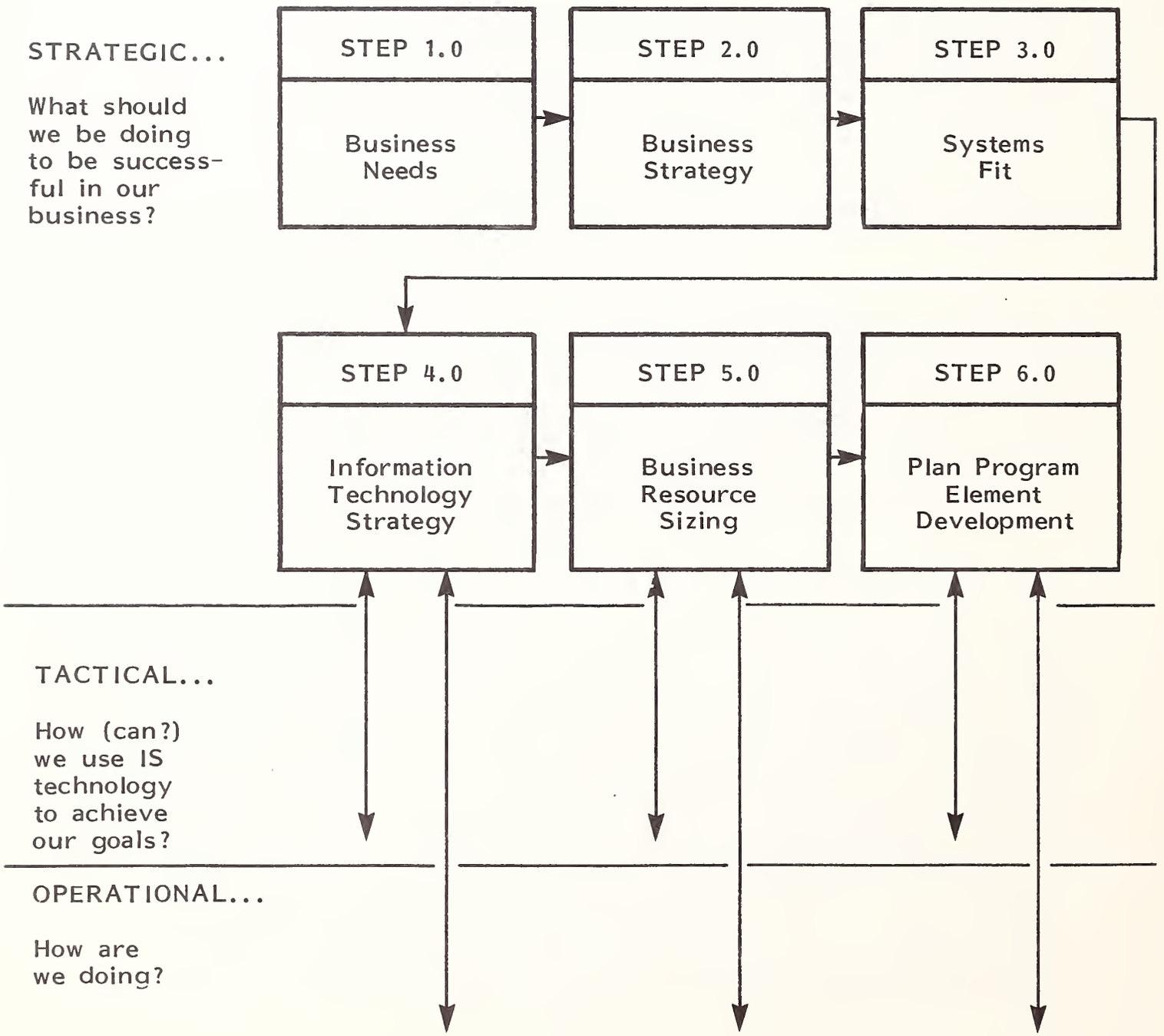
  - How is (can) IS technology being used to achieve our goals?

  - How are we doing, given our IT selection?

- A company's answers to these questions have far-reaching implications. If the right strategic questions are not asked by top management, then the management team charged with implementing the solutions at the tactical and operating levels may be implementing good solutions for the wrong business questions. Therefore, this approach does not provide a way for management to abdicate its responsibilities to plan, direct, and control. Rather, it provides a vehicle for isolating critical business needs and implementing a cost-effective solution which represents the collective wisdom and commitment of the enterprise. Exhibit IV-2 outlines six basic steps for employing IT to gain a

EXHIBIT IV-2

ORGANIZATIONAL CHANGE MODEL



competitive edge. It shows the linkages between the strategic and operational levels and the key business questions to be answered. This model will be explained in detail in Chapter V.

- The explanation will trace the steps taken by Cost Leadership Distribution (CLD) Company. CLD serves as a composite view of successful approaches, based on experience and the best methods discovered during this research. It serves as an outline of the most important elements required to identify and implement strategic opportunities using information technology.

V ORGANIZATIONAL STRATEGIES THAT IMPROVE I.S. RESPONSIVENESS TO CORPORATE COMPETITIVE NEEDS

A. PINPOINTING BUSINESS NEEDS

- Pinpointing business needs is by far the most difficult, misunderstood, and critical step in the whole process. It is here that management decisions and directions take shape and will be acted upon by the whole organization. There is a great temptation to rush through this process in the annual "management meeting" and think of it as a one-time event, not the continuous process required to investigate a good business solution.

- This step does not produce a one-time optimal solution that will serve the company for the next five years. While the step 1.0 tasks seem to be related entirely to the responsibilities of a president or CEO, we recommend that a management team (including the chief information officer (CIO) be part of the decision-making process. The reason for this is that all the management team members should be considered stakeholders. They all have a:

  - Business stake or detailed operating knowledge of the firm.

  - Commitment stake and are necessary key support team members.

  - Implementation stake and must contribute to its success.

  - Resource stake and will have to contribute resources.

- Exhibit V-1 outlines the three major tasks and their deliverables needed to pinpoint a firm's business needs.

- Building a functional business model (Task 1.1) is not an exercise in moving organizational boxes around. Rather it is a blueprint or X-ray of how the enterprise gets things done. As we all know, the way organizations get things done is usually different from the organization chart.

  - Many approaches exist for defining the functional business model. The end result should be a matrix that relates cost, revenue, and/or profit centers to the "do" functions that must be performed. The person or people charged with getting the work done is on an organization chart.

  - The functional business model is validated (approved) by a consensus of the stakeholders. The fact that this model will change, based on a real need resulting from new business goals, must be understood. In fact, the business model is used to determine an efficient allocation of functional responsibilities.

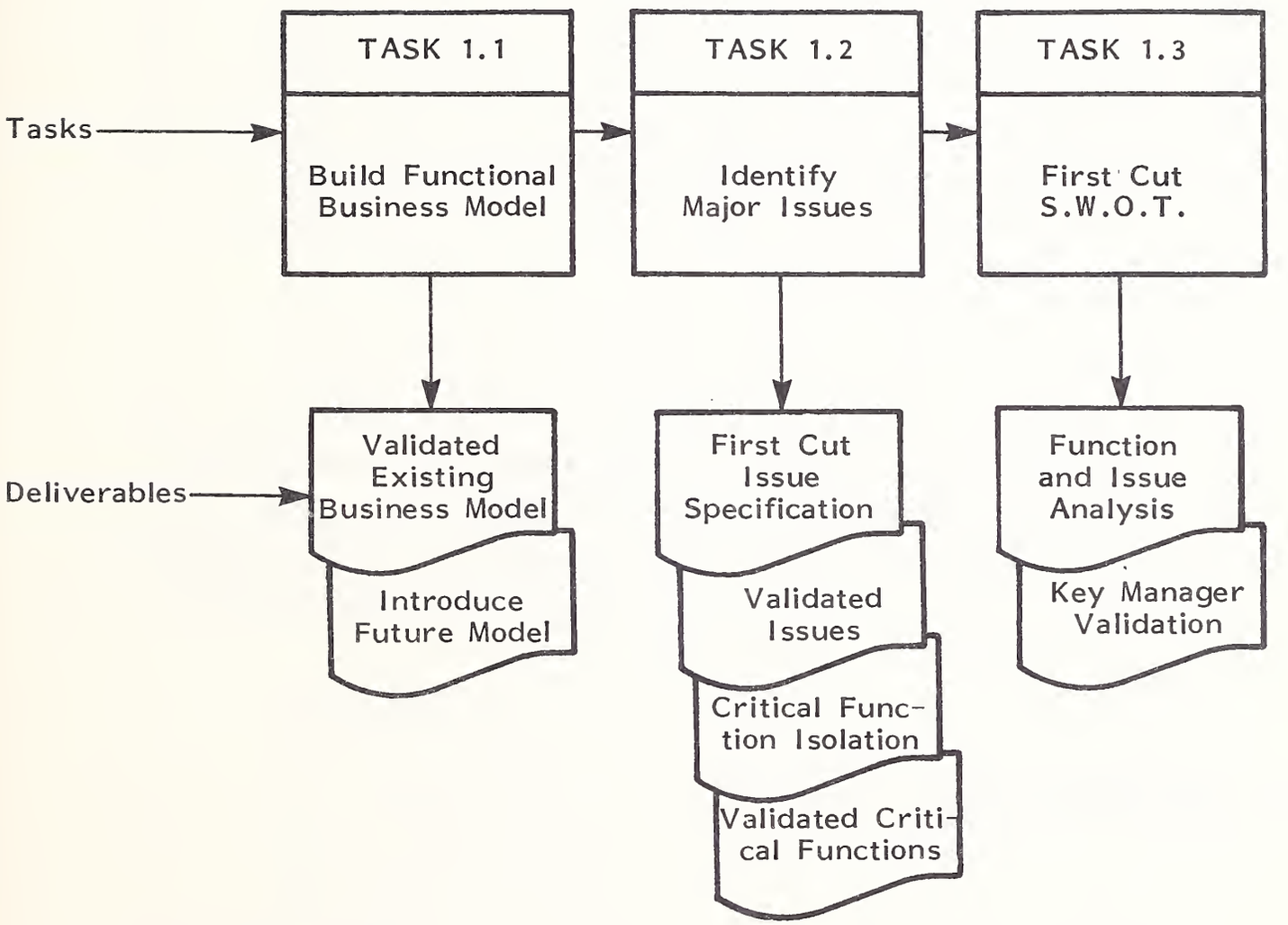
- Task 1.2, identifying major issues, requires the definition of key problems, concerns, or opportunities tht need to be addressed to meet the organization's goals. An issue is written as a cause and effect statement. The CLD issue developed in task 1.2 is as follows:

  - "The lack of a responsive way of capturing orders is causing customer disloyalty, lost sales, and an inability to effectively manage distribution facilities. This results in corporation cost of distribution that is 2.5 times greater than our major competitor."

- A manageable set of major issues is developed, validated, and related to the business functions within the enterprise. Notice that the CLD issue does not indicate that IS technology is the solution, but it certainly is a possibility. We will track this issue through the analysis to see how one firm gained a competitive edge by using IT.

EXHIBIT V-1

PINPOINTING BUSINESS NEEDS
(Step 1.0)



- The next task (1.3) requires a strengths, weaknesses, opportunities, and threats (S.W.O.T.) analysis. This analysis gives the management team a chance to establish each issue's current status (be it a strength, weakness, opportunity, or threat) and to determine the direction it is moving.

  - The requirement is to move strengths to opportunities and threats to weakness. The management objective is to move an issue away from the threat status through weakness to a strength and finally to the status of an opportunity. Opportunities are the highest value status; threats are the lowest and should be avoided. Returning to our CLD issue, the management team decided that the issue represented a weakness and without correction it would become a business threat within the next two years.

  - Regardless of the current status of an issue, the management team needs to decide if resources would be wisely spent to place them in a more favorable position. Analysis might prove that a weakness is not worth overcoming and those business functions might be a candidate for divestiture. In CLD's case, it was recognized that order entry is a key requirement for doing business.

B. EVOLVING A BUSINESS STRATEGY

- CLD's management selected the order entry issue as a major weakness and proceeded to develop a business strategy to deal with it. They completed the following six tasks:

  - Task 2.1 Structural Analysis--Decided which critical business functions were affected.

- Task 2.2 Business Goals--Decided what goals and objectives needed to be established to address the issue.

- Task 2.3 Competitor Analysis--Decided how their competition would react and what impact this would have on their plans.

- Task 2.4 Competitor Response Scenarios--Defined the most probable competitive responses.

- Task 2.5 Consistency Tests--Identified how an improved order entry approach would impact the organization and what changes were required.

- Task 2.6 Document Business Strategy--Developed a tactical alternative matrix from which to chose the best alternative.

- The tasks and their respective deliverables are shown in Exhibit V-2.

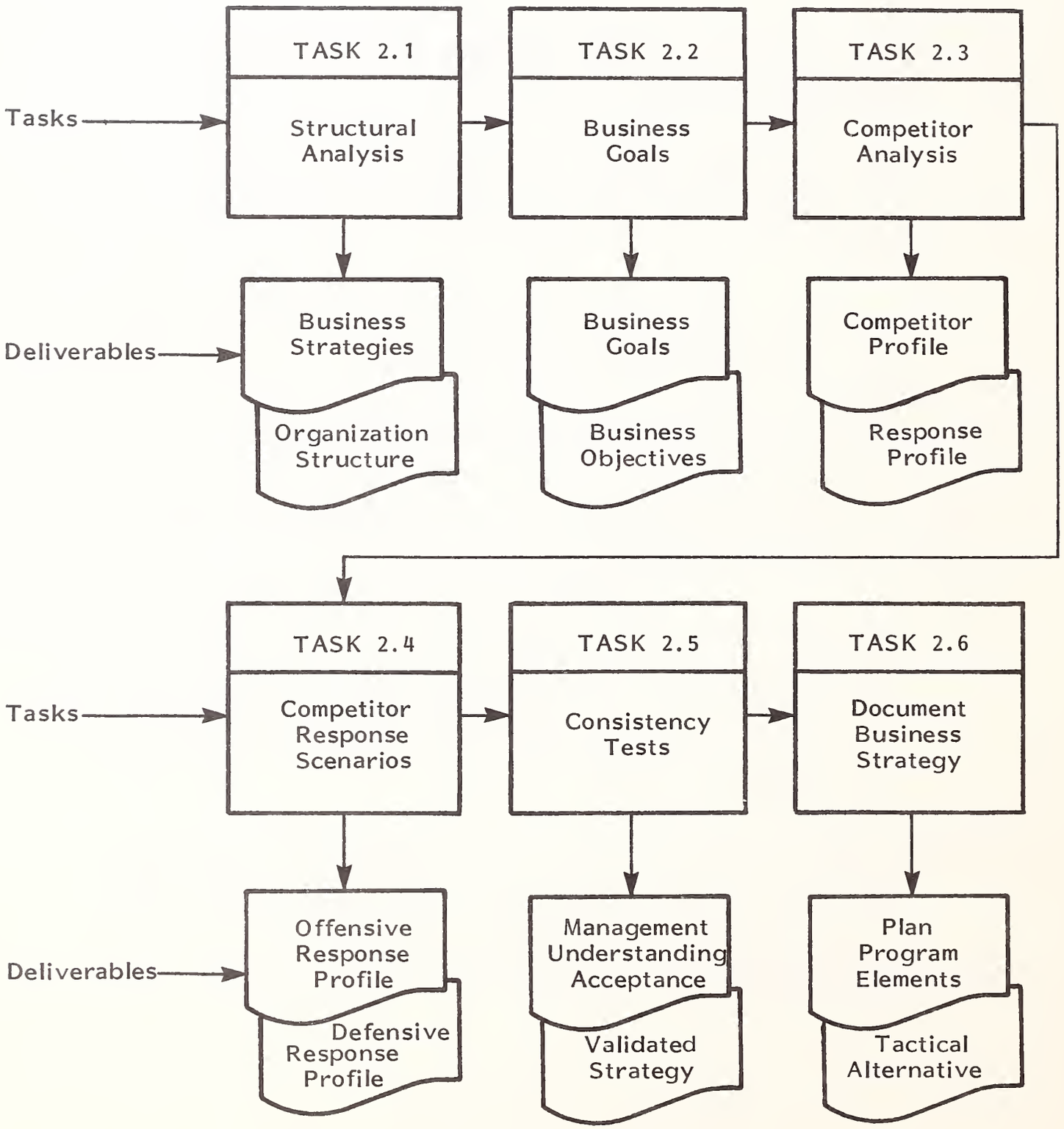
- Returning to our CLD example, the results of the management team's deliberations in terms of the deliverables were:

  - Task 2.1--A review of the existing order entry system (manual and automated) indicated that responsibility for taking, processing, and filling orders was shared among four different business functions. The existing procedure was time consuming, labor intensive, costly, and very confusing for customers.

  - Task 2.2--A recently completed customer satisfaction survey indicated that customer disloyalty and lost sales would continue unless order/shipment confirmation could be performed when the customer was placing his order.

EXHIBIT V-2

EVOLVING A BUSINESS STRATEGY
(Step 2.0)



- Task 2.3--CLD was in the number one sales position, but the number two profit position. A competitive analysis revealed that their major competition was aggressively using IS technology to drive down its distribution unit costs while building strong customer loyalty.

- Task 2.4--CLD's major competitor was known to be at least five years ahead with its order entry system. CLD's management now understood they were in a "catch up" position, but felt that their market niche required a fresh approach.

- Task 2.5--This fresh approach had to be consistent with existing and future marketing plans. The final strategy reflected these plans and resulted in a design concept so customer order entry would be functionally tied to the major geographical market segments where knowledge of the customer requirements and company operations was the strongest. Past centralized order entry attempts had repeatedly failed.

- Task 2.6--It has been demonstrated that when a firm begins to address an issue (distribution cost leadership in this example), other potential business benefits are discovered. In CLD's case, opportunities were presented which indicated that solving the cost of distribution issue would open the door to other collateral benefits if they chose to take advantage of them. Exhibit V-3 portrays a number of competitive strategies that could be addressed based on the tactical alternative matrix developed from this task. In addition to choosing to be the industry distribution cost leader, an improved order entry system could also generate better financial leverage from their accounts receivable float, improved customer name identification, and even a greater breadth of service offerings. These competitive strategies are indicated by an arrow in Exhibit V-3. The tentative tactical alternative matrix also provides a basis for evaluating the systems fit, which is explained in the next section.

EXHIBIT V-3

TACTICAL ALTERNATIVES MATRIX

TACTICAL ALTERNATIVES	COMPETITIVE STRATEGIES		
	Cost Leadership -- Lowest-Cost Producer	Product Differentiation -- Offer a Unique Service or Product	Market Focus -- Target or Service a Special Market
Market Specialization			• Service Offering Widens • Customer Segments • Geographical Market Segments
CLD Service Identification		• Advertising • Sales Force	
Sales Push or Pull		• Direct to Customers • Name Identification	
Distribution Channel Selection	• CLD-Owned Trucks and Vans • Leased Aircraft		
Service Quality		• Delivery On Time • Lost Package Percent • Customer Confidence	
Cost Position	• Lowest Distribution Cost		
Service Offerings		• Existing Services • New Services	
Price Policy	• Cost-Related • Credit-Related • Quantity Discounts		
Business Leverage	• Operations • Financial		
State and Federal Government Relationships	• Tariff-Making • ICC		

C. EVALUATING SYSTEMS FIT

- Of course, CLD was not without automated systems support for some of the order entry functions. In this respect, it was not any different from other firms with an existing systems investment. The evolving strategy had produced a set of business requirements which needed to be evaluated to make the following determinations:

  - Task 3.1 Link Applications to Business--Determined how existing systems supported present and future business requirements using an application system S.W.O.T. analysis similar to that performed for the business.

  - Task 3.2 Evaluate Business Fit--To determine which existing or new business functions and strategies were compatible with present systems.

  - Task 3.3 Isolate Critical Function Voids--Determined system support deficiencies; e.g., those that were lacking, not supportive, or which needed modification or replacement.

  - Task 3.4 Logical Systems Architecture--Established the logical (not physical) structure required to support the new business requirements. Architectural elements include system, system modules, data groups, technology, and communications network.

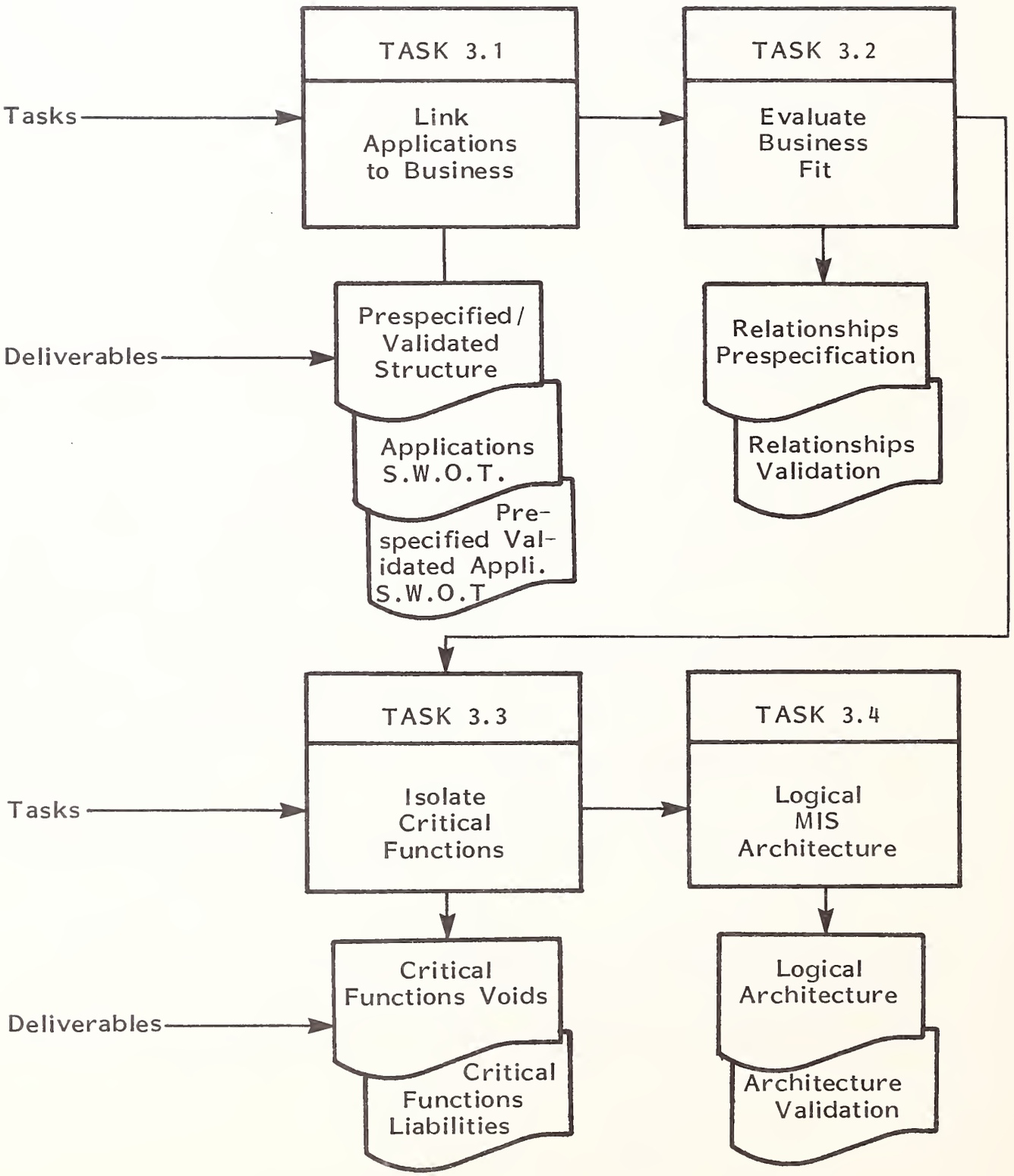
- A summary of the Step 3 tasks and their respective deliverables is found in Exhibit V-4.

- Step 3 provided the CIO with the ability to report to the management team which elements of the new order entry requirements could be supported and which would need new system requirements. This step provides the basis for

EXHIBIT V-4

EVALUATING SYSTEMS FIT

(Step 3.0)



an "order-of-magnitude" project specification; e.g., small, medium, or large requirement effort. In CLD's case, the answer was large. This really came as no surprise because the company was moving from a largely manual operation which had outlived its usefulness to the growth of the firm to an automated approach to keep pace with business and competition.

D. DEVELOPING A SUPPORTIVE I.S. STRATEGY

- CLD knew that a major project effort was required to meet the new business needs. The CIO was charged with the responsibility to develop a strategy for satisfying these needs that would provide an estimate with ±50% of the final cost. This analysis had to consider internal IS development, purchased outside software, and/or end-user computing solutions. The tasks required to develop a "first cut" estimate were:

  - Task 4.1 Scope Applications Requirements—Translate business requirements into a preliminary systems, data, hardware, software, and communications specification.

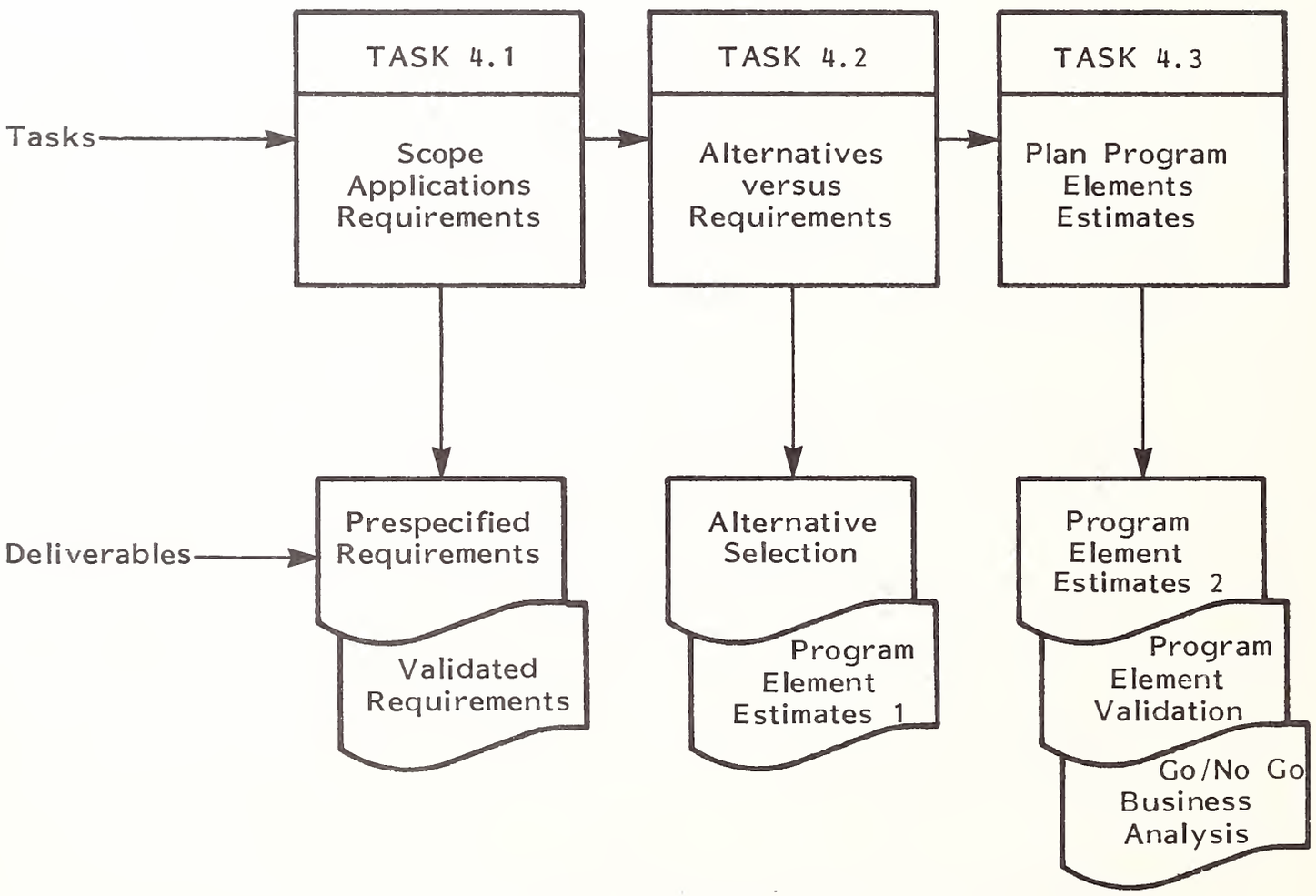
  - Task 4.2 Alternatives Versus Requirements—Evaluation of the major development options; e.g., internal, purchase outside resources, and/or end-user computing. A number of popular development alternatives were explored, such as traditional life cycle, prototyping, purchased applications software, etc.

  - Task 4.3 Plan Program Element Estimates—A cost/benefit estimate and a definition of IS-selected alternative priorities and strategies was developed.

  - A summary of these tasks is presented in Exhibit V-5.

EXHIBIT V-5

DEVELOPING A SUPPORTIVE I.S. STRATEGY
(Step 4.0)



- The CIO outlined a modular approach which was based on regional customer service centers (RCSC) as the major deliverable for task 4.1. The scope of the order entry and control system would include the business functions from order entry to money in the bank. In addition to meeting the immediate order entry needs, systems modules for marketing and order tracking and tracing were outlined for future design and development.

- Since CLD did not have the kind of IS expertise required for the full scope of this project, a mix of approaches was suggested. The IS tactical alternative matrix presented in Exhibit V-6 represents the key (task 4.2) deliverables that would be explored in step 5.0, Sizing Resource Requirements.

- Finally, the preliminary budget element estimates that had been developed jointly with the chief financial oficer (CFO) were presented and approved. A "go" decision was received after a presentation to the management committee to satisfy the deliverable requirement for task 4.3.

E. SIZING RESOURCE REQUIREMENTS

- This step of the analysis required a comprehensive cost/benefit evaluation. Working closely with key operations personnel, the task team developed several alternatives for implementing the order entry and control system. Prospective IS vendors were contacted and cost estimates were obtained.

- Capital, development, and installation costs were documented with the primary objective of determining what impact the new system would have on the unit cost of distribution and improved ability to service existing and future customers.

- This analysis served two purposes. First, it validated the projected impact on reducing unit costs and improved customer service. Second, it provided a

EXHIBIT V-6

I.S. TACTICAL ALTERNATIVES MATRIX

TACTICAL ALTERNATIVES	INTERNAL I.S. DEVELOPMENT	PURCHASE OUTSIDE RESOURCES	REGIONAL CUSTOMER SERVICE CENTRAL COMPUTING
1 Traditional Life Cycle ((TLC)	• Modified TLC Approach • Modular Design		
2 Prototyping	• Integrate System Modules Using Business Operations Mock-Ups		
3 Independent Systems	• Integrate Existing Message Switching System • Integrate Texas Tariff Rating System		
4 Purchased Application Software/ Services	→	• Modify Third-Party Software Vendor Utilities • DBMS/4G Language	
5 Contract Programming	→	• Hire Technical Personnel/Special Skills • Contractors for One-Time Requirements • Turnkey Vendors' Suites of Software	
6 Turnkey Systems (TKS)	→	• RFP Based on TKS Vendor • Test CSC Basis for Training and Installation at #29 and #3 CSC	
7 Special Processing Approaches, Ad hoc Reports, etc.	→		• Report Writer Special Analysis Packages • DAC Code Scanning Data Entry • Regional Background Processing During Off-Peak Hours
8 Office Systems	→		• Word Processing • Local Area Networks • Automatic Call Distribution

solid basis for the request for proposal (RFP) that would be issued to obtain a turnkey bid for system development. The success of the project depended on accurate system specification and cost and benefit projections with ±10% of actual final cost. Step 5.0 was completed as outlined in Exhibit V-7.

F. PILOT PROGRAM ELEMENT DEVELOPMENT

- The final step of the process requires a complete financial audit and establishment of all budget line items for the project. A complete pro forma corporate financial impact analysis was performed to include capital budgets, cash flow, net present value, and internal rate of return. The CFO was responsible for auditing the estimates and determining the viability of the analysis. With the CFO's approval, the management team reviewed and approved the budget. Exhibit V-8 outlines the tasks required for step 6.0.

- In summary, this approach provided CLD with a detailed request for proposal that was successfully bidded by a turnkey systems house. The approved bid was within the ±10% cost estimates figure and represented a comprehensive design which provided the company with a way to "catch-up" to its competition. The system, now installed in three regional customer service centers, provides a means for:

  - Operating at minimum unit cost of distribution.
  - Streamlining customer inquiry.
  - Integrating order taking with delivery/picking up operations.
  - Controlling package movement.
  - Applying accounts receivables cash rapidly.

EXHIBIT V-7

SIZING RESOURCE REQUIREMENTS
(Step 5.0)

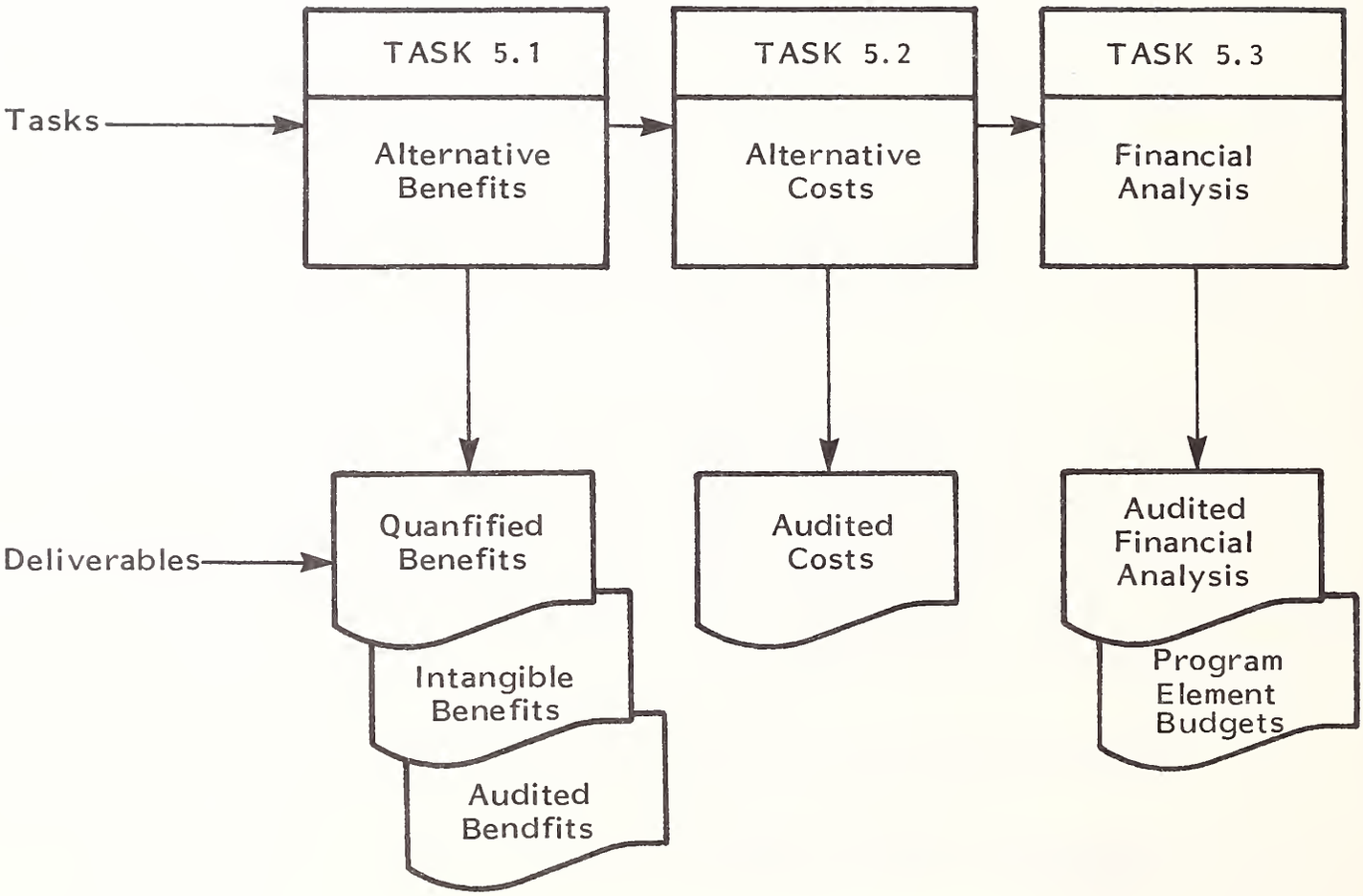
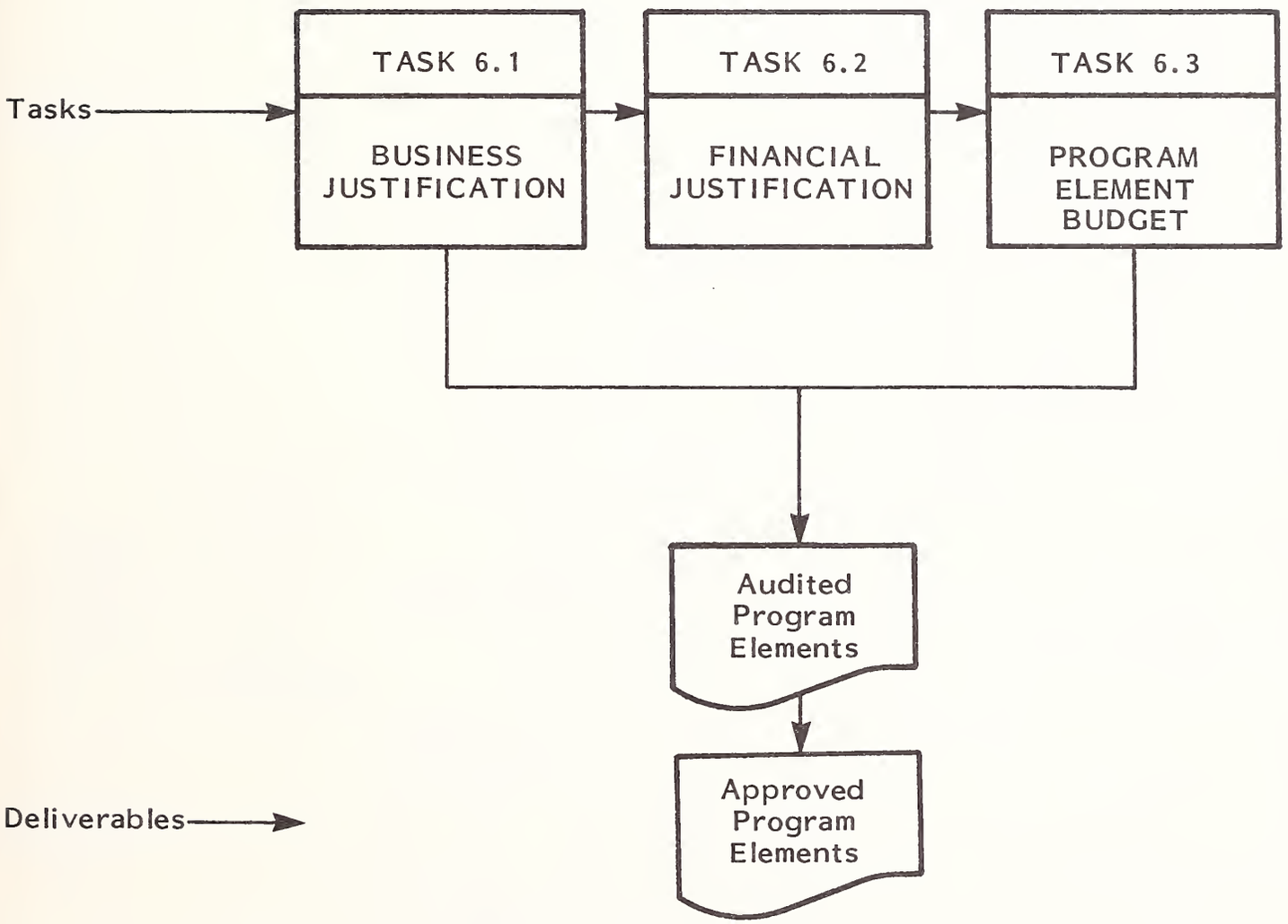


EXHIBIT V-8

STRATEGIC BUSINESS PLAN PROGRAM
ELEMENT DEVELOPMENT
(Step 6.0)

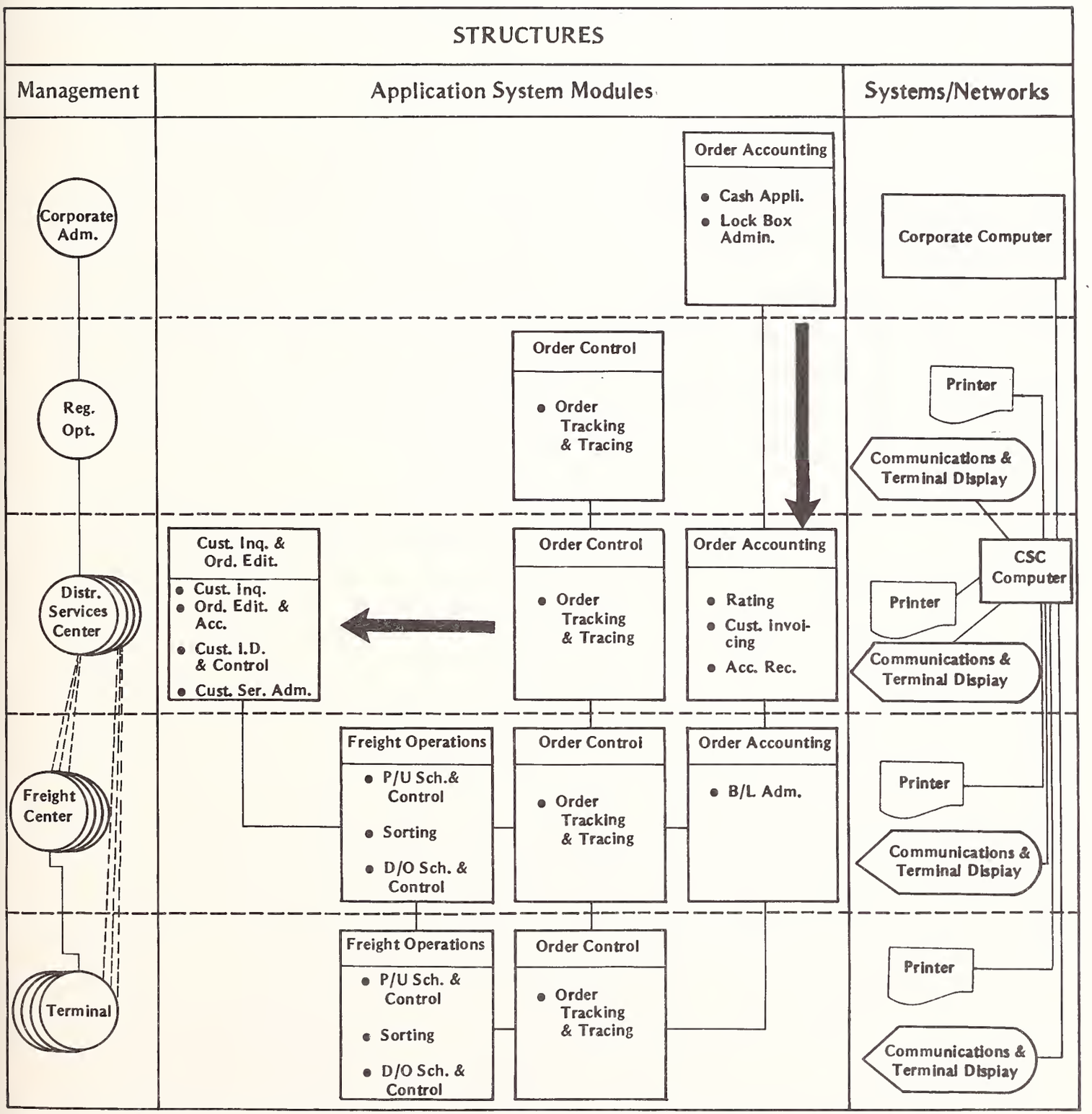


- This nationwide order-entry system (NOES) resulted in a completely designed specification to the record segment and field levels. Internal rate of return was calculated at 30%, with the average shipment unit cost reduced by 10% when the system was fully implemented.

- The successful use of information technology is presented in NOES model found in Exhibit V-9. This exhibit outlines the key management, application system modules, and communications network structures from customer inquiry/order editing to order accounting, or money in the bank, as shown by the arrows.

EXHIBIT V-9

NATIONWIDE ORDER ENTRY SYSTEM (NOES) MODEL



APPENDIX A

THE CHANGING DYNAMICS OF I.S. ORGANIZATIONS

Good morning (afternoon). This is _____ calling from INPUT, an international research and planning firm. We are currently engaged in a study of the Changing Dynamics of Information Services (IS) Organizations. A small, but growing number of firms, like yours, are using IS technology to gain a competitive edge. We would like a few minutes of your time to gain some basic information about your _____ and how it is supporting corporate objectives. Your answers and the identity of your company will be held in confidence. In appreciation for your help we will send you a summary of the report.

May we begin? Thank you.

1. To begin with, we would like to discuss the business concerns which existed prior to your decision to use IS technology to directly support your business goals. Was there a competitive pressure such as a need to reduce your cost of production?

Yes _____ No _____ DK _____ NA _____ REF _____

1a. If Yes, How did you use IS technology? (Int. Prompt: for example, did you install a new distribution system to increase inventory turns?)

_____

_____

_____

2. Was there a need to offer a unique service or product?

Yes _____ No _____ DK _____ NA _____ REF _____

2a. If Yes: What IS technology did you use? (Int. Prompt: for example, the use of an electronic market intelligence service which allowed you to spot untapped market niches and develop a new product.)

_____

_____

_____

3. Was there a requirement to enter a new market with your products or services?

Yes _____ No _____ DK _____ AN _____ REF _____

3a. If Yes: How have you employed IS technology to accomplish this? (Int. Prompt: for example, did you develop a whole new market which could not exist without an international telecommunications/order entry system?)

_____

_____

_____

4. Are there any business concerns we have not covered that directly contributed to your decision to use IS technology?

Yes _____ No _____ DK _____ NA _____ REF _____

4a. If Yes: What might these be?

_____

_____

_____

5. How did you organize and implement the IS solution, such as using the existing centralized IS services and a business task force?

Yes _____ No _____ DK _____ NA _____ REF _____

5a. If Yes: How was it organized?

_____

_____

_____

5b. If No: What new organizational approaches did you use?

_____

_____

_____

6. Were there new or changed corporate culture attributes required to implement the new system? (Int. Prompt: Such as IS playing a facilitator/technical role and the business project leader playing a managing/directing role?)

Yes _____ No _____ DK _____ NA _____ REF _____

6a. If Yes: How was this different from past systems development projects?

_____

_____

_____

7. Was there a new top management commitment to the use of IS technology?

Yes _____ No _____ DK _____ NA _____ REF _____

7a. If Yes: How did this happen?

_____

_____

_____

8. While you were developing the new systems were there any "missing ingredients"? (Int. Prompt: Such as lack of IS technical knowledge on the part of the business task team?)

Yes _____ No _____ DK _____ NA _____ REF _____

8a. If Yes: What were they? _____

_____

_____

9. Was there an unwillingness on the part of the IS task team members to try a new organizational approach?

Yes _____ No _____ DK _____ NA _____ REF _____

9a. If Yes: How did you resolve this situation? _____

_____

_____

10. Was there a lack of suitable IS technical solutions to address your problem?

Yes _____ No _____ DK _____ NA _____ REF _____

10a. If Yes: What technical solutions were lacking?

_____

_____

_____

11. Were there any "missing ingredients" we have not covered?

Yes _____ No _____ DK _____ NA _____ REF _____

11a. If Yes: What might these be?

_____

_____

_____

12. While using this new IS technology, how was change facilitated? (Int. Prompt: Such as a top management directive to make it work.)

Yes _____ No _____ DK _____ NA _____ REF _____

12a. If Yes: How was change facilitated?

_____

_____

_____

13. Were there any other organizational changes made that we have not covered?

Yes _____ No _____ DK _____ NA _____ REF _____

13a. If Yes: What might they be?

_____

_____

_____

We would like to measure IS's involvement in developing corporate business strategies that have contributed to improved competitiveness. Please rate the following areas using a scale of "one" to "five", where 1 is not involved and 5 is heavily involved.

How involved was IS in:

14. Defining and prioritizing major business issues such as providing a new service.

1 2 3 4 5 DK _____ NA _____ REF _____

15. Developing the strategy that spells out how a business goal will be accomplished.

1 2 3 4 5 DK _____ NA _____ REF _____

16. Determining if a business strategy could benefit from the use of IS technology.

1 2 3 4 5 DK _____ NA _____ REF _____

17. Determining how corporate resources would be allocated to support projects that have been indentified as having a major business impact.

1 2 3 4 5 DK _____ NA _____ REF _____

18. Justifying the costs and benefits of these major projects?

1 2 3 4 5 DK _____ NA _____ REF _____

We would like you to rate the business benefits that your company has accrued from IS Technology. On a scale of "one" to "five" (1-5), with 1 being minor improvement and 5 being major improvement, please rate the following:

19. Ability to be the lowest-cost producer using _____ (IS technology used).

    1 2 3 4 5 DK _____ NA _____ REF _____

20. Ability to offer a unique service or product using _____ (IS technology used).

    1 2 3 4 5 DK _____ NA _____ REF _____

21. Ability to target or service special markets using _____ (IS technology used).

    1 2 3 4 5 DK _____ NA _____ REF _____

22. Are there any benefits we have not covered?

    Yes _____ No _____ DK _____ NA _____ REF _____

22a. If Yes: What might they be?

_____

_____

_____

23. Thank you for your time. Are there any additional comments you would like to make?

    Yes _____ No _____

23a. If Yes: What might these be? _____

APPENDIX B: CLASSIC EXAMPLES—COST LEADERSHIP: LOWEST-COST PRODUCERS

A. AMTEL SYSTEMS CORPORATION

- Industry: Telephone apparatus (3661)
- IS Technology Used: Electronic telemarketing system.
- Strategic Business Use of IS: Direct sales/marketing system for increased sales productivity.
- Business Results: Automates routine tasks by dialing, delivering sales pitch, and recording prospect's response using limited voice recognition capability.

B. FIDELITY BROKERAGE SERVICES

- Industry: Security brokers and dealers (6211).
- IS Technology Used: On-line stock market query and trading system.
- Strategic Business Use of IS: Provides direct link to stock market for broker query and trading.

- Business Results: Second largest discount brokerage house, just behind Charles Schwab Inc., locks in approximately 100 of the nation's largest banks. Allows company brokers to be more productive and eliminates the need to purchase services from outside service companies.

C. OPEX CORPORATION

- Industry: Collection agencies (7321).

- IS Technology: Electronic mailing systems.

- Strategic Business Use of IS: Automated mailing equipment sorts, weighs mail, interfaces with postage meters, and processes large corporate mail volume.

- Business Results: Reduced mailroom costs and increased productivity for the corporate "information hub." Provides reduced postage costs and 18-20% personnel time savings.

APPENDIX C: CLASSIC EXAMPLES—PRODUCT DIFFERENTIATION: UNIQUE PRODUCT OR SERVICE

A. FEDERAL EXPRESS CORPORATION

- Industry: Small package air express service (4511).

- IS Technology Used: The company's existence is made possible by and will continue to grow based on IT. Federal's Memphis data center has been called "the data center that scares IBM" due to its complexity and criticality to the business.

- Strategic Business Use of IS: Federal Express has redefined its industry by completely integrating IT throughout the organization.

- Business Results: 1984 sales were $1.4 billion. Federal ships more overnight packages than any other competitor. It charges the highest rate of any small package company, but continues to deliver on time, with only 1 lost package in 22,000. The company has 14,000 couriers, 9,000 of which are on-line to their dispatching centers through console-mounted CRT in the vans. Federal's president has said information technology has made the company possible and will continue to help it grow.

B. AMERICAN HOSPITAL SUPPLY CORPORATION

- Industry: Manufacturer and wholesaler health care products (3842).
- IS Technology Used: Customer/supplier premise order entry system.
- Strategic Business Use of IS: Unique distribution system to gain market shares and position to support 100,000 customers and 8,500 suppliers.
- Business Results: System has resulted in major market share increase, inventory reduction, improved customer and supplier service, and purchasing leverage. System has provided organization with the ability to "lock out" competition and rapid industry data analysis to spot new order trends and customer needs.

C. AKZO COATING, DIVISION OF DUTCH CHEMICAL

- Industry: Paints and allied products (2851).
- IS Technology Used: Automated body shop estimating system. Provides access to spare parts listing, repair procedures, and labor-hour guidelines for 2000+ models.
- Strategic Business Use of IS: Improves customer loyalty and increases sales. Has provided a two-year lead over competition.
- Business Results: Captured 90% of the systems bought by body shops in the Netherlands and West Germany in 1985.

APPENDIX D: CLASSIC EXAMPLES—MARKET FOCUS: TARGET OR SERVICE SPECIAL MARKETS

A. SALESNET, D&B BUSINESS MARKETING SERVICE

- Industry: Telephone transactions processing (7399).
- IS Technology Used: Electronic market research system.
- Strategic Business Use of IS: Allows a product to be designed using potential customer input.
- Business Results: Salesnet processes market research data and creates pictures of the product's perceived strengths, weaknesses, and potential market. A product design is evolved based on real market customer demand data.

B. MERRILL LYNCH & COMPANY

- Industry: Security brokers and dealers (6211).
- IS Technology Used: Cash management account (CMA) system.

- Strategic Business Use of IS: Targets and services a special market by designing a system that "sweeps" idle funds into interest-bearing money market funds.

- Business Results: CMA manages $85 billion and still holds 70% of the market seven years after its introduction.

C. FIRESTONE TIRE & RUBBER COMPANY

- Industry: Tires and inner tubes (3011).

- IS Technology Used: Point-of-sale auto-care outlet system.

- Strategic Business Use of IS: Frees employees from administrative tasks to do a better job with more sales-oriented responsibilities.

- Business Results: Allows auto-care outlet managers to concentrate on market development and not administrative details. Also improves outlet service and inventory control.

About INPUT

INPUT provides planning information, analysis, and recommendations to managers and executives in the information processing industries. Through market research, technology forecasting, and competitive analysis, INPUT supports client management in making informed decisions. Continuing services are provided to users and vendors of computers, communications, and office products and services.

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