INTEGRATING OFFICE SYSTEMS

INTO THE ORGANIZATION

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Offices

NORTH AMERICA

Headquarters
1943 Landings Drive
Mountain View, CA 94043
(415) 960-3990
Telex 171407

New York
Parsippany Place Corp. Center
Suite 201
959 Route 46 East
Parsippany, NJ 07054
(201) 299-6999
Telex 134630

Washington, D.C.
11820 Parklawn Drive
Suite 201
Rockville, MD 20852
(301) 231-7350

EUROPE

United Kingdom
INPUT
41 Dover Street
London W1X 3RB
England
01-493-9335
Telex 27113

Italy
Nomos Sistema SRL
20127 Milano
Via Soperga 36
Italy
Milan 284-2850
Telex 321137

Sweden
Athena Konsult AB
Box 22232
S-104 22 Stockholm
Sweden
08-542025
Telex 17041

ASIA

Japan
ODS Corporation
Dai-ni Kuyo Bldg.
5-10-2, Minami-Aoyama
Minato-ku,
Tokyo 107
Japan
(03) 400-7090
Telex 26487

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Planning Services For Management

INTEGRATING OFFICE SYSTEMS
INTO THE ORGANIZATION

INTEGRATING OFFICE SYSTEMS INTO THE ORGANIZATION

ABSTRACT

Office systems are increasingly being integrated into some organizations' way of doing business--knowledge workers cannot perform without them. These organizations are achieving productivity and profitability gains, and workers report an increase in the quality of their work life.

This report explores the current status of office systems, discusses the barriers surmounted by successful organizations, identifies office system integration approaches, and recommends prerequisites and actions for integrating office systems into the organization.

The report focuses on the strategic and "social" aspects of integrating office systems into the organization from a corporate perspective. The technical aspects of integration are important and are described, but for this report are secondary factors of office systems integration.

This report contains 93 pages, including 17 exhibits.

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INTEGRATING OFFICE SYSTEMS
INTO THE ORGANIZATION

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INTEGRATING OFFICE SYSTEMS
INTO THE ORGANIZATION

EXHIBITS

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I INTRODUCTION

I INTRODUCTION

A. PURPOSE

- This report is part of INPUT's Information Systems Program (ISP). It explores the current status of office automation, identifies office system integration approaches, and recommends prerequisites and actions for integrating office systems into the organization so that they are a part of how the organization effectively does business.

- The report answers the following questions:

    - What is the status of office systems integration?

    - Why are office systems often on the perimeter of IS strategy?

    - What role should office systems play in the corporate IS strategy?

    - How have corporations successfully integrated office systems into their organizations?

    - What are the benefits of integrating office systems into the organization?

    - How can office systems integration efforts be justified?

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-   What barriers (political, organizational, technological) are impeding office system integration efforts?

-   Who should be responsible for designing, developing, implementing, supporting, and managing office systems?

B.   SCOPE

-   This report will focus on the non-technical or strategic and "social" aspects of integrating office systems into the organization from a corporate perspective.

-   For this report, office systems are defined as systems that support departments or work groups, excluding standalone personal computers supporting a single individual.

-   Office system technology and the technical aspects of integration are important and will be described, but for this report are secondary to integrating office systems into the business of the organization.

-   This report can be used to aid discussion about how to integrate office systems into the organization.

-   The following people should find this report pertinent:

    -   IS managers and planners.

    -   Office systems implementors.

    -   Information center staff and managers.

    -   End-user managers.

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C.   METHODOLOGY

- INPUT conducted a series of on-site and telephone interviews with management involved in implementing office systems in manufacturing and services organizations. In the financial, services, and retail industries, office system solutions are often replicated from one office to another.

  - Knowing the needs of one office allows development of a solution for all offices.

  - Integration efforts are believed to be more advanced in these industries.

- INPUT was interested in determining what lessons could be learned from office system integration efforts in such organizations that are applicable to other organizations in which office system solutions needed to be more varied and consequently could not be easily replicated.

- We asked the following questions in each organization:

  - What is your office system approach?

  - Is your office system approach part of a corporate-wide IS strategy or is it more on the perimeter?

  - Are office systems integrated into your organization technically and in terms of supporting corporate and departmental missions?

  - What barriers did you surmount to integrate office systems into your organization?

  - How have office systems been cost-justified?

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- What benefits have you achieved?

- To what do you owe the success of integrating office systems into your organization?

D. REPORT ORGANIZATION

- Chapter II is the Executive Summary in presentation format.

- Chapter III presents definitions, current status of office systems, and the benefits of integrating such systems into the organization.

- Chapter IV contains two in-depth case studies and an analysis of each, describing the barriers each surmounted.

- Chapter V discusses the prerequisites for office systems to be integrated into the organization.

- Chapter VI examines managing office system integration with emphasis on choosing a technical approach, justifying, and implementing office systems with equal attention to the technological and human factors.

- Chapter VII contains conclusions drawn from the research and provides recommendations for integrating office systems into the organization.

E. RELATED INPUT REPORTS

- Interested readers are referred to the following INPUT reports:

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- <u>Organizing End-User Departments for Information Systems,</u> 1984, reviews the critical issues surrounding the surge of interest in end-user computing and examines the emerging role of IS as the director of this revolution.

- <u>Micro-Mainframe: End-User Experiences,</u> 1985, describes various M-M methods and their advantages and limitations, suggests implementation strategies, and projects changes in the technology and marketplace.

- <u>Micro-Mainframe: Corporate Impact,</u> 1985, describes the organizational and technological effects of M-M in the corporation in light of the growing demand for end-user access to corporate data bases. The impact of M-M products on the current inventory of standalone micro and mainframe software is also analyzed.

- <u>Micro-Mainframe: Software Planning,</u> 1985, categorizes the M-M software products necessary to accommodate M-M access, with special attention on security and data integrity requirements. The report recommends a software development/acquisition strategy.

- <u>Intelligent Workstations: Connecting the End User,</u> 1985, defines the tools, compares intelligent workstations with terminals and microcomputers, describes their benefits and limits, recommends implementation strategies, and identifies future usage, market, and technological trends.

- <u>Micro Multi-User Systems,</u> 1985. There are a number of issues to be considered with regards to multi-user systems: what settings are most appropriate for MUSs; how they compare to other solutions; standardization; compatibility; connectivity; reliability; and cost benefits. This report provides user implementation recommendations and a technological trend analyses.

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- Training: Prerequisite to Successful End-User Computing, 1985. Why are some organizations much further ahead in end-user computing? This report presents the thesis that one of the main factors is training. The report provides a map to IS management for establishing a meaningful training program.

- Methods of Cost/Benefit Analysis for Office Systems, 1983. This report describes the data collection and analysis techniques used for justifying office systems. It also identifies productivity and cost reductions measurements used by major corporations, and presents two in-depth case studies illustrating successful justification techniques that can be used as guidelines to IS organizations.

- Impact of Office Systems on Productivity, 1983. This report establishes a framework for understanding office productivity problems and for evaluating white-collar worker performance. It defines four productivity performance levels and evaluates office systems at each level.

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II EXECUTIVE SUMMARY

II   EXECUTIVE SUMMARY

- This Executive Summary is given in presentation format to help the busy reader quickly review key research findings. It also provides an executive presentation, complete with script, to facilitate group discussions.

- The key points of the entire report are summarized in Exhibits II-1 through II-4. On the left-hand page facing each exhibit is a script explaining that exhibit's contents.

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A. THE WORK GROUP SYSTEM IS A NATURAL GATEWAY

- The work group/departmental system can connect the individual worker and the divisional, corporate, or external computer resources. It is a natural and cost-effective gateway between personal computers and wider area services.

- A strategic office systems architecture must incorporate the interconnection of five levels of computing: personal, work group/departmental, divisional, corporate, and external computer resources.

- The departmental system, whether an integrated office system (IOS) or personal computer linked via a local area network (PC/LAN) with file, print, and communication servers, is the repository of departmental-oriented information and services appropriate to work group needs.

- Using the work group system, knowledge workers can work collaboratively to perform more effectively the specific tasks necessary to run the business. These employees can:

    - Communicate electronically with each other.

    - Share files and data bases specific to their needs.

    - Use common business forms.

    - Access remote computing facilities.

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EXHIBIT II-1

WORK GROUP SYSTEM IS A NATURAL GATEWAY
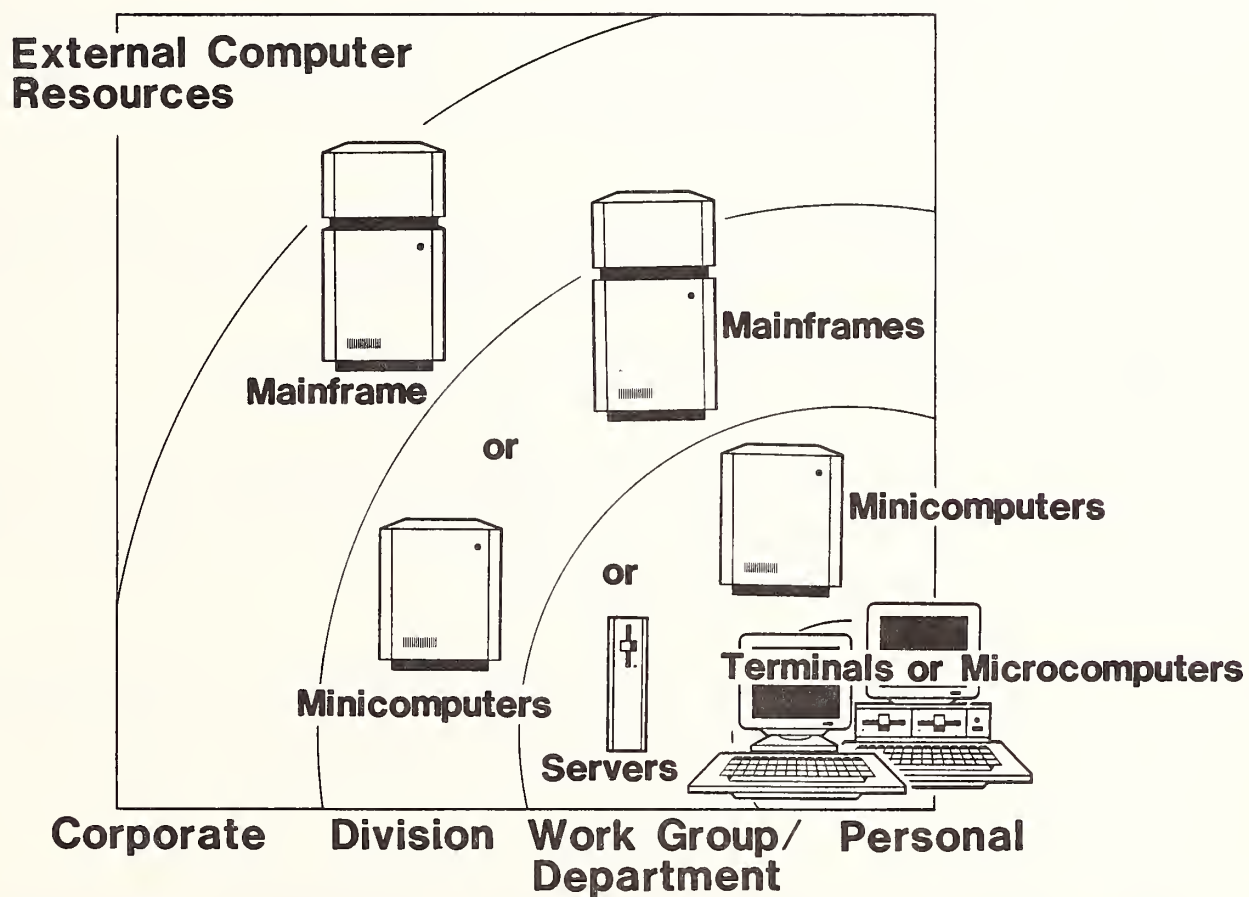
B. BARRIERS TO SURMOUNT

- Successful integration of office systems into the organization requires surmounting barriers regarding who is to control the effort, what technical approach to take, and how to justify office system implementation.

- In organizations where office systems are integrated into the business operations, the IS function is responsible for managing the technology. They have this responsibility because they have shown they can meet the needs of users on time and on budget.

- User management is responsible for ensuring that office systems efforts make business sense and that savings from office automation are meaningfully used.

- The choice of IOS or PC/LAN is a strategic decision.

    - The decision should be guided by the nature of the computing environment envisioned by management and by the applications required by work groups or departments.

    - Issues to address include cost, the type of workstation required, applications required, availability, implementation effort, and the ongoing support required.

- Cost justification with some degree of formality will always be required. The key is to know what benefits to look for.

    - Incremental office automation efforts done at the departmental level require justification based on the objectives of the department.

    - For corporate-wide office system efforts, focus on value justification.

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EXHIBIT II-2

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BARRIERS TO SURMOUNT

- **Organizational Control**

- **Technical Approach**

- **Justification**

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C. PREREQUISITES FOR OFFICE SYSTEM INTEGRATION

- Management must take a broad view in order for office systems to become integrated into the organization's business procedures.

- The planning process is critical to develop agreement about the scope of office systems implementation. Critical planning inputs are a long-range office systems strategy, a short-range tactical plan, and annual business/systems plans from each department.

- Part of management's vision should include the strategic system and data architecture. A backbone communications network is required, usable by office systems selected for compatability and ability to meet user needs.

- The most critical step of office automation implementation is the needs analysis.

  - A needs assessment must be undertaken with a firm understanding of current and future business objectives.

  - The emphasis of the assessment must be on identifying functions, processes, and activities the work group and individual knowledge workers perform which have a high value in meeting business objectives.

- No more than two or three vendors should be selected, and systems selected should, at the very least, be able to handle the simple transfer of data.

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EXHIBIT II-3

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PREREQUISITES FOR OFFICE SYSTEM INTEGRATION

- **Broad Management Vision**

- **Plans:**

    - **Long-Range Office Systems Strategy**

    - **Short-Range Tactical Plan**

    - **Annual Business/Systems Plans**

- **Backbone Communications Network**

- **Standards for Office System Selection**

- **Needs Assessment**

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D.   MANAGING CHANGE

- Implementing office systems is a catalyst for some very significant changes-- changes in how workers do their jobs, in how individuals and work groups communicate with one another, and in the very structure of the organization.

- It is necessary to design and implement solutions paying equal attention to social and technical requirements.

- Management must accept responsibility for integrating office systems into the organization.

- Promoting sociotechnical system design, using good implementation approaches, and providing for adequate training and ongoing support are necessary to address the people side of implementing systems.

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EXHIBIT II-4

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MANAGING CHANGE

- Promote Sociotechnical System Design

- Use Good Implementation Approaches

- Provide Adequate Training and Support

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III STATUS OF OFFICE SYSTEMS IMPLEMENTATION

III STATUS OF OFFICE SYSTEMS IMPLEMENTATION

A. DEFINITIONS

1. OFFICE AUTOMATION

- Office automation is the direct use of computer and communication technology by office workers who are not computer specialists, working alone or in groups, in support of their activities.

- Direct use by individuals differentiates office automation and the use of office systems from data processing, which is generally large-volume, transaction processing oriented.

- The fact that users are not computer specialists also distinguishes office automation from data processing.

  - Office automation implementation issues are generally more involved with addressing people issues, while data processing implementation issues are more involved with system optimization and capacity management.

  - However, the distinction between office automation and data processing is rapidly blurring.

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2.   OFFICE SYSTEMS

- Office systems, for this report, are defined as systems serving groups of workers either in departments or logical work groups.

- The departmental/work group system is an information system to support the business activities of a group of knowledge workers who work together to accomplish a business mission.

- The most common office system technical solutions today are:

a.   <u>Integrated Office Systems (IOS)</u>

- IOS such as Data General's Comprehensive Electronic Office (CEO), Digital Equipment's All-in-One, Hewlett-Packard's Personal Productivity Center, or IBM's System 36 for the office are examples.

- These systems generally are more appropriate for an entire department or even a divison than for smaller work groups.

- IOS serving fewer users are supermicros such as an IBM PC/AT running Microsoft Corporation's PC Xenix or UNIX-based supermicros such as NCR Corporation's Tower system running Century Analysis Corporation's Officeware.

- UNIX-based software for work group systems are Alis from Applix, Inc. (Southboro, MA); Crystal Focus from Syntactics Corporation (Santa Clara, CA); Emerald One from Emerald City, Inc. (Toronto, Ontario); and Interactive Office Series from Handle (Tahoe City, CA).

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b.   Personal Computers Linked Via a Local Area Network (PC/LAN)

- Many PC/LAN configurations have been implemented using IBM, Apple, and other vendors' personal computers linked with local area network technology from Corvus, Nestar, or 3Com. These PC/LAN systems may also include file, printer, and communication servers.

c.   Other

- Other technical solutions include departmental use of host-based office applications (host-based OA) such as IBM PROFS or home-grown, host-based office applications.

- A popular variation of this solution is the micro-mainframe link (M-M link), whereby an individual or work group participants can access data bases on a mainframe and download data specific to their departmental needs.

- These technical solutions make it difficult for some IS managers to distinguish between office automation and data processing. In this case, office automation is just another data processing application.

3.   INTEGRATING OFFICE SYSTEMS INTO THE ORGANIZATION

- Integrating office systems into the organization denotes creating a unity out of diverse technologies and delivering timely office services to support effective work group functioning.

- The organization and its workers are able to perform most effectively because office systems are integrated into the way of doing business.

- Systems are implemented to satisfy the needs of a work group, not just individuals working on their own.

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4.   WORK GROUPS

- Work groups are groups of five to 50 office workers who are closely related by function and exhibit strong, daily interaction.

- Examples of work groups are: a research team comprised of a manager, several research professionals, and support staff; or, a marketing team consisting of a marketing manager, product marketing managers, administrative assistants, and secretarial support staff.

- In a 1983 vendor-published study describing how to design a system to make knowledge workers more productive, two fundamental conclusions were reached:

    -    Knowledge workers spend most of their time communicating.

    -    Knowledge workers communicate mostly with people within the same work group.

- Both of these conclusions have major implications in the design of an organization's overall system. Any tools that enable knowledge workers to become more efficient and effective communicators will have an effect on the overall efficiency and effectiveness of the entire organization.

- The statistics behind the two conclusions are shown in Exhibit III-1.

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EXHIBIT III-1

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KNOWLEDGE WORKER COMMUNICATIONS

● Knowledge workers spend most of their time communicating.	
– Communication Activities	65%
· Face-toFace (32%)	
· Written (20%)	
· Phone (13%)	
– Reading, thinking, and analyzing	35%
● Knowledge workers communicate mostly with people within the same work group.	
– Face-to-Face Communication	
· Within the work group	48%
· Within the Building	17%
· Within the company (other location)	13%
· External to the company	22%
– Written Communication	
· Within the work group	40%
· Within the building	24%
· Within the company (other location)	22%
· External to the company	14%

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B.   THE "IDEAL" OFFICE SYSTEM

I.   TECHNICAL ASPECT

- In an organization where office systems are integrated into the business, the integrated office system can consist of various, diverse office products, including computers, word processors, applications software, and communications networks linked to allow the processing and manipulation of data in every form: text, data, voice, graphics, and image.

- The system is the repository of departmental/work group-oriented information and services.

  - The information may be downloaded from a corporate data base or created by individuals within the work group.

  - It can also be the repository of personal files of individuals which may or may not be shared within the work group.

  - The services can be resident on the IOS or on file servers accessible by each personal computer linked via a local area network.

  - The key is that the services are standard and appropriate to the needs of the work group.

- Architectually, the departmental/work group computer provides the interconnection between the individual and the division, the entire corporation, and external services. It serves as a natural gateway between a local area network and wider area networks. Exhibit III-2 shows the work group system architecture.

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EXHIBIT III-2

WORK GROUP SYSTEM

External Computers

Division and
Corporate Computers

Tape
Archives

Access
Ports

WORK GROUP APPLICATIONS

Electronic Mail	Time Management
Data Base Access	Forms
Shared Files	Budget
Document Production	Department-Defined

PERSONAL APPLICATIONS

Word Processing	Record/File
Spreadsheet	Management
Graphics	Personal-Defined

Storage

Printers

hared Peripherals

IOS or

Connection

Direct

PBX

LAN

File, Print Communication Servers

RS-232, ASYNC Ports

Terminals

Persona! Computers

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2.   CAPABILITIES AND FEATURES

- Regardless of the technical solution, the office system supports the effective functioning of a work group or department.

- Typical office system capabilities include:

    - Word processing (sometimes quite sophisticated electronic composition and printing/electronic publishing functions).

    - Electronic mail/message handling.

    - Spreadsheet and graphics (decision support).

    - Electronic filing.

    - Record/file processing.

    - Electronic calendar.

- A voice store-and-forward (voice mail) application is available with some IOS. Eventually, these integrated office systems will be configured to handle teleconferencing, PBX-type voice telephone operations, image processing, access security, and time-and-attendance monitoring.

- Ideal work group systems provide the following features:

    - Transparent access to a community of other users (via electronic mail and/or voice mail).

    - Transparent access to personal, work group/departmental, and corporate data bases.

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- Document or file management which supports collaborative efforts but maintains the integrity of shared documents and files.

- A common user interface employed to implement functions which is easy to learn and use and includes menu structures, command sets, help aids, and system prompts.

- Integration of applications so that documents or files can be easily moved from one function to another or from one system to another.

3. ORGANIZATIONAL ASPECTS

- Organizationally, these systems are integrated.

  - Every level of employee--clerical, professional, and management-- within a work group can hook into the system and use it with minimum training and maximum ease.

  - Workers can apply its capabilities in support of the business, and the system's capabilities are, in fact, mandatory to the effective running of the business.

  - These employees can:

    . Communicate electronically with each other.

    . Share files and data bases specific to their needs such as price lists, product lists, reports, or financial data.

    . Use common business forms which will speed their production and movement throughout the work group and within the organization.

    . Access remote computing facilities.

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- They are thus able to work collaboratively, as they do already, to perform more effectively the specific tasks necessary to run the business.

C.   WE ARE NOT THERE YET—UNINTEGRATED OFFICE SYSTEMS

1.   STARTING WITH WORD PROCESSORS

- Early office systems were the standalone, shared logic, and clustered word processing systems implemented in thousands of organizations.

- In many of these organizations, the word processing systems selected were chosen by administrative and other non-data processing departments to meet immediate and local needs for document production.

- Even if they were selected by the data processing department, they were not necessarily selected with ease of communication with other computer resources in mind.

- In some of these organizations, the word processing systems have been enhanced with more sophisticated functions such as electronic mail, spreadsheets, graphics, and simple data base management capabilities.

  - The core word processing system is used solely by secretarial/clerical workers.

  - There is beginning to be some use of the enhanced system functions by professional and managerial workers.

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2. PERSONAL COMPUTER EVOLUTION

- Next came the influx of personal computers brought into many user departments by managers or professional workers disillusioned with the data processing department and wanting a more prestigious technical solution than a word processor.

- Again, these personal computers were not necessarily selected for their ability to connect to and use other computer resources.

- With use and vendor marketing efforts came a demand for more capability and, specifically, for connection to corporate data bases.

- Also, workers in the same department needed to share expensive resources such as high-quality printers or larger filing systems.

- Some organizations have implemented local area networks to enable these workers to share peripheral resources and, in other cases, to share files or programs.

3. IOS PILOTS

- In some organizations, the IS department convinced management to pilot an integrated office system such as a Data General CEO or DEC's All-in-One.

    - Some of these organizations, unfortunately, still just have the one IOS.

    - The costs of corporate-wide IOS implementation are often judged to be exorbitant for not clearly understood benefits.

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4. POCKETS OF USERS

- Generally, the status of office automation today is pockets of users. These users and the systems they use are essentially isolated from other users and their systems. At best, there is an "after-the-fact" integration effort underway.

D.   OFFICE SYSTEMS INTEGRATED INTO THE ORGANIZATION

- In the early 1980s a few organizations--usually Fortune 1000 companies-- initiated a corporate-wide office automation study.

  - A task force was formed made up of staff from IS, administration, personnel, finance, and selected end-user departments.

  - The task force was charged with the responsibility for identifying the needs for office automation and developing a strategy for implementing office automation corporate wide.

1. CORPORATE-WIDE ARCHITECTURE SERVES AS BACKBONE

- Today, some of those organizations have implemented a corporate-wide communication network.

  - Office workers at all levels use a variety of automated office services connected to the network.

  - The most valuable application used by workers to simplify operations is electronic mail.

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- In some cases, the organizations also enhanced their major information bases, and there is widespread access of corporate data bases with varying degrees of security.

- Office systems are selected for their ability to meet user needs and for their connectability to the communications network and corporate data bases. Such office systems can be from several vendors and can be IOS or PC/LAN solutions.

2. THE "COOKIE-CUTTER APPROACH"--BRANCH OFFICE AUTOMATION

- In financial services industries such as banking or insurance, each branch and each regional office is basically similar to every other.

- In a brokerage, for example, once the needs of one branch office are defined (and some agreement reached by other branches that these needs are representative), an office system solution can be selected to serve the entire organization. We call this the "cookie-cutter approach."

- E. F. Hutton is one of the best examples of an organization which has implemented a comprehensive, corporate-wide branch office automation solution, based on the Data General CEO.

    - Each system is connected into a corporate-wide network, and each system is integrated as to how account executives and support staff do business.

    - They are dependent on system capabilities not just for access to client information (more traditionally a data processing application), but also for office services such as word processing, electronic mail, and appointment recordkeeping.

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- Account executives can, for example, personalize customer mail, selectively mail, or sort through customer accounts with minimal effort.

E. BENEFITS OF INTEGRATING OFFICE SYSTEMS INTO THE ORGANIZATION

1. GENERAL BENEFITS

- The general benefits from office automation expected and achieved include:

    - Cost avoidance/cost savings/cost displacement benefits such as reduced staff, avoidance of staff increases, reduction in use of external services, elimination of use of outside labor and facility expenses, elimination of lease/rental costs, reduced travel costs, reduced mail handling costs, reduced filing and storage space, reduced telephone costs, and reduced inventory.

    - Value-added benefits such as increased sales; increased customer satisfaction (and increases in customers); improved customer service; and improved availability, timing, and accuracy in information delivery.

    - "Soft justifications" such as improved image, improved employee satisfaction, enhanced sense of control over job, enhanced decision-making, survivability, and improved competitive position.

2. SURVEY EXAMPLES

- Some specific benefits cited by survey respondents include:

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- Ability to recruit ambitious college graduates who are looking for sophisticated office systems (financial services and engineering research).

- Expanded business 125% without adding staff (brokerage).

- Marketing benefits—we can show our clients we take our own advice (consulting service).

- Increased computer literacy—office systems are an introduction to computers and all their terminology, workings, limitations, and rewards (computer manufacturer).

- Pervasive attitude of users looking for ways to do their jobs better (high-tech manufacturer).

- Simpler business operations—we do not write as many formal letters with electronic mail capability (aerospace manufacturer).

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IV OFFICE INTEGRATION STUDIES

IV   OFFICE INTEGRATION CASE STUDIES

A.   SYNTEX

I.   BACKGROUND

- Syntex Corporation is a multinational, multientity manufacturing, research and development pharmaceutical organization. Syntex has approximately 10,000 staff members at its manufacturing and sales offices throughout the world.

- The Corporate Information Systems (CIS) supports corporate departments and Syntex business units in Palo Alto (CA).

    - Major business units such as Syva, Labs, Research, and Diagnostics have their own Business Unit Information Systems groups.

    - Combined staffing in these groups is approximately 400. They provide information services to Syntex operations worldwide.

- The Syntex office system approach is part of an overall IS strategy. In fact, Syntex CIS management does not distinguish office systems from other information management technolgy.

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- Office systems are considered to be just one more technology for delivering information services.

- They allow users in a department the ability to share data, store personal files, and access secure corporate data.

- Because departmental systems offer a single gateway from a department to corporate computer resources, they offer a significant cost savings over costly modems and interface cards at each personal computer.

- Depending on the specific needs of individuals, departments, and/or divisions, a variety of office system solutions are employed within Syntex, such as:

    - Departmental minicomputers such as Wang VS, Wang OIS, or Hewlett-Packard.

    - Personal computers, some linked via value-added networks such as TYMNET to mainframe resources. (Syntex CIS is currently assessing PC/LAN applicability to work group needs.)

    - Host-based applications such as SPACE, a Syntex-developed electronic mail capability.

2. OFFICE SYSTEMS ARE PART OF I.S. STRATEGY

- Office systems are integrated into Syntex business operations.

    a. Technically

- Syntex is in the proces of implementing a backbone architecture and network which will allow connections to multiple vendor computer resources and access to corporate data for approved office systems and/or personal computers.

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- Using approved systems, workers can avail themselves of certain services discussed below.

- Syntex has a three-tiered architecture as shown in Exhibit IV-1.

    - Corporate IS provides central core services such as electronic mail, translations of diverse systems protocols, a backbone network, and processing of corporate data.

    - Departmental systems, in addition to department-specific automation, provide shared resources and also are used to download corporate data specific to the department.

    - Desktop systems provide personal productivity tools.

    b.   Departmental Missions

- Work groups are able to use automated tools in support of their activities.

- These tools include:

    - Word processing for memo and report production.

    - Common budget routines using departmental budget data.

    - Access to outside proprietary data bases needed by research scientists.

    - Applications specific to a department such as a laboratory information management system.

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EXHIBIT IV-1

SYNTEX OFFICE SYSTEM ARCHITECTURE

DESKTOP

- Word Proces-sing
- Graphics
- Data Mgt.
- Spreadsheet

DEPARTMENTAL

- Document Production
- Downloaded Data
- Functional Automation
- Shared Resources

CORPORATE

- Corporate Data Processing
- Network Services
- Electronic Mail
- Presentation Graphics
- Protocol Translations

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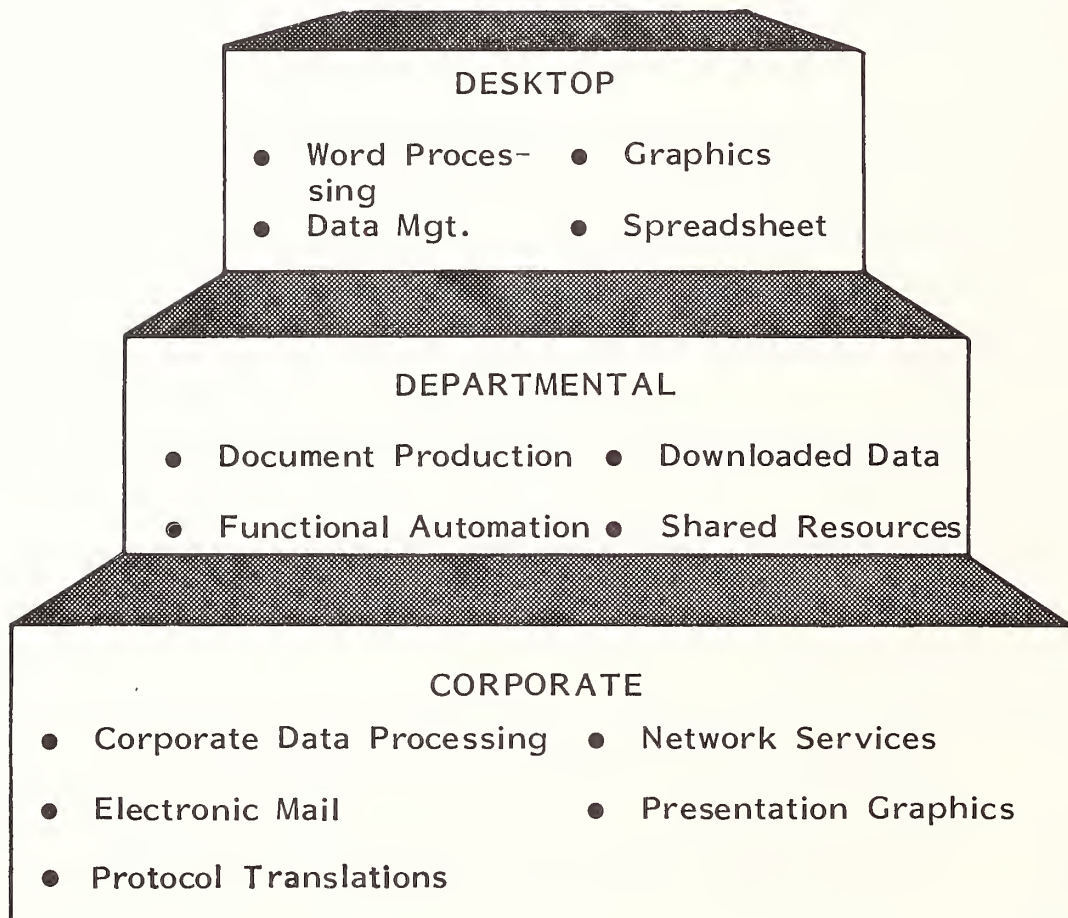
3. STANDARDS

- Because the needs of Syntex work groups vary from division to division and operation to operation, CIS realized that no one office system would suffice. Integration efforts therefore began with a plan to develop an architecture which would support a multi-vendor system environment.

- CIS also established a task force to define standards for systems selection which could interface with the Syntex architecture. Standard setting was a multidepartment effort with voting members representing the major divisions: Corporate, Diagnostics, Research, and Labs Divisions. Other field units were represented by CIS consultants assigned to work with these field units.

- CIS and the team then had to educate management and staff as to the benefits of a common approach, including:

    - Bulk purchase agreements that lower the cost of obtaining systems. Further, Syntex can strengthen its bargaining position with key vendors by standardizing on their products and becoming a major customer.

    - Interface to corporate networks to allow linkage of Syntex worldwide businesses. The Syntex corporate network is more cost-effective than vendor network services for telecommunications. Further, protocol translation can be provided on corporate computers accessible through the network.

    - Standard Syntex support—consulting, installation assistance, training, a help line, and ongoing support. By choosing standard selections, users do not have to become technical experts; they can rely on CIS for such expertise.

INPUT

- The standards group believes that use of non-standard systems or software presents a problem of migration paths once the useful life of the system has come to an end and movement to a replacement system is required.

    - Training and procedural dependencies will have been strengthened in the user department.

    - Conversion costs may be significant if a non-standard product is brought in as a replacement.

- Standards developed do not necessarily serve all divisions. Divisions or departments can go with other systems, but will not be able to benefit from the CIS infrastructure and services.

4. JUSTIFICATION

- Office systems are cost-justified the same as any other investment. Office system acquisition vies with other business investments at the corporate level and in the business units.

- A business case must be stated answering:

    - What is the problem being addressed?

    - What are alternative solutions?

    - What are the associated costs and benefits for each solution?

    - What are the pros and cons for selecting one or another solution?

    - What is the final recommendation?

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INP

5. SUCCESS FACTORS

- IS management attributes the success of their office system approach to mutual trust.

    - IS deals with users from the point of view that users know their business.

    - Users operate from the point of view that at Syntex, CIS is the expert in managing technology.

    - This trust is largely the result of IS always meeting project deadlines and budgets.

- IS management also believes that a successful implementation stems from attention to human factors.

    - Each implementation begins with a realistic assessment of the work group--are the individuals positive about using an office system or do they have a "show me" attitude? What experiences have individuals already had with technology?

- Training is considered a critical contributor to a successful implementation, but the training must be selected with the individual's attitude in mind.

    - Sometimes hand-holding will work best, and sometimes CIS has to let work group members learn on their own.

    - CIS directs users to in-house training by Information Centers located in Palo Alto and other busines units and seminars offered by vendors or third parties.

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- Based on Syntex's success, IS provides the following guidelines to planning for training.

  - Learning is accomplished more quickly on standard products supported in-house. It's easier to learn to use a product when someone with experience is available to help.

  - People feel more comfortable learning when they are not under a lot of time pressure. It is important to allow for individual needs. Some people take a long time to feel at ease with the machine; others become proficient quite rapidly. Trainers estimate that it takes 20 to 60 hours for an employee who has never touched a computer to become proficient with a sophisticated application.

  - Depending on prior experiences with computers, employees will have different training needs. Experienced users can benefit from computer-based training courses, manuals, and relatively inexpensive books. Most users prefer a human teacher, however.

  - The amount of training required is directly related to the complexity of the tasks. Be patient--do not expect too much too fast.

B. AN ANONYMOUS FINANCIAL SERVICES GROUP (FSG)

I. BACKGROUND

- FSG is a large financial services group with offices in U.S. and European cities.

- Services offered by each of these offices, staff composition, and the needs for office services are essentially the same worldwide. The size of each office, however, varies.

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INP

- Some 15 regional offices in major cities serve as administrative hubs for outlying offices.

- For example, the Chicago office provides administrative services such as billing for all offices located in the greater Chicago metropolitan area and in nearby Midwest cities.

● Two to three years ago, to become more productive, the firm's professional staff began adopting personal computers.

- Professionals, however, worked in isolation because the different systems could not communicate with each other.

- Still, they needed to collaborate on proposals and final reports and to share data and files.

● One line of business for this consulting firm, in addition to financial services, is management information systems.

- Taking their own advise, the MIS consulting group, co-located with corporate-wide IS, decided to look for a departmental system that would let staff share information, collaborate on projects, and still keep their personal computers.

- Important selection criteria were that the solution be open to diverse personal computers and word processors, each system be able to support remote access by consultants in other offices in the region, there be a growth pattern without major conversion efforts, and there be integration of certain office applications such as word processing and electronic mail.

INPUT

- FSG considered local area networks to link different personal computers, but rejected that solution because it would not link computers in geographically dispersed offices. Further, they found no software which would enable them to do more than transfer raw data back and forth.

- FSG finally chose an integrated office system which would enable them to perform word processing, electronic mail, scheduling and appointment record-keeping, financial modeling, and communication to external data bases, and connect diverse personal computers.

2. OFFICE AUTOMATION IS INFORMATION SYSTEMS AT FSG

- At FSG, office automation is essentially synonymous with IS.

    - There is little need for connection from region to region or from region to corporate.

    - Some financial figures must be communicated periodically from the regional administrative centers to corporate, but this requirement can be met without a sophisticated communications network.

    - Also, there is little need for regional offices to access corporate data bases. Consequently, an office system located in each region into which nearby offices can connect provides knowledge workers with office and information services.

- Just like a typical data processing project, OA must be implemented at FSG with attention to human factors, user participation, a project plan with milestones, and business case justification.

INPI

3. JUSTIFICATION WAS THE BIGGEST BARRIER TO SURMOUNT

- As in many organizations, money to be spent on administrative support is difficult to come by. In the consulting services industry, management usually wishes to allocate available financial resources for marketing efforts.

- Since the MIS group preached the importance of information/office systems as a strategic resource, the justification finally accepted by management was:

    - Strategic justification—we are in the business of selling employee expertise and we have to be more productive in how we service clients.

    - Ability to obtain additional revenue—by adding new products and services such as financial modeling acquisition/divesture analysis and loan assessments, we can become more competitive.

    - Ability to attract college graduates who are technically literate and demand tools to make them more productive.

4. BENEFITS ACHIEVED

- By implementing an IOS at the first location, FSG achieved:

    - Productivity improvements—with reduced bottlenecks in word processing and improved timeliness of report production.

    - Marketing benefit—clients are impressed that the company takes its own advice and has planned an approach to office services.

    - Recruiting gains—they have been able to attract and retain top caliber college graduates.

INPUT

5. REPLICATABILITY

●   The initial effort has been so impressive to management that other offices are adopting the same IOS solution.

    -   They are not having to do an extensive needs assessment, but rather only a verification that needs in other offices are the same.

    -   Each MIS group meets with the first group to gain insight into issues and solutions.

    -   An informal network of implementers has developed, sharing experiences with each other. Staff from each office with an IOS is using programs and procedures developed at the first and subsequent installations.

6. SUCCESS FACTORS

●   Management understands that they must have reasonable expectations. Every individual user and each work group has its own learning curve—some are avid users and others will never use the new systems.

●   They understand that training is mandatory. While they have not established the training services that Syntex offers, they encourage management to allocate training time and make computer-based training available for employees to use.

●   They have developed a project plan for each system implementation with a realistic implementation timeframe and objectives they consistently meet.

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C. LESSONS FROM SYNTEX AND FSG

● Even though these two examples represent two different industries, their approaches to integrating office systems into the organization are similar.

I. SIMILARITIES

a. Vision Management

● Both organizations had a vision and direction for office automation.

- In both cases, management wanted to provide cost-effective tools to enable individuals and work groups to perform their work more effectively.

- In particular, they wanted to provide a systems approach which would support sharing of data and information-handling resources, promote collaboration, and offer cost-effective connection to corporate and outside computing resources. This last factor was critical at Syntex, but not at FSG.

b. Planning

● Both organizations essentially treat office systems as just one more technical solution in the IS arsenal. Office automation is an application which must be planned for and managed just like other IS applications.

c. Attention to Human Factors

● Management at both companies stated that they perhaps pay more attention to human factors with IOS.

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- They ascertain individuals' readiness for change and attitudes toward technology.

- They do not force technical solutions on users who resist.

d. Training

- Depending on workers' experience with technology and readiness for change, training approaches were designed in both organizations.

  - The Syntex approach emphasizes a human teacher and reflects a corporate-wide appreciation for comprehensive training and a bigger budget which has come from a longer history with office automation.

e. Standards

- Management at both companies recognize the value of standards for system selection.

  - Syntex, because of a longer history providing technology management, has strong user backing for setting standards and developing comprehensive services for standard systems.

  - At FSG, because the IOS supports many popular microcomputers, selection standards relate more to software. Users are encouraged to buy the same software used by others. Users are then supported by an informal network of experts on these software packages.

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2. DIFFERENCES

a. I.S. Services

- Syntex is highly decentralized with each business unit being autonomous and having its own information services.

    - A strong corporate CIS has created consensus among business units and gotten major divisions to fund a corporate-wide network development.

- At FSG, while the organization has a corporate MIS, it is not involved in providing any information services to regional or branch offices. Each FSG office can use its funds however they see fit, and there is little motivation to fund a corporate-wide office system network.

b. Replicatability

- At Syntex there is little replicatability between offices in major business units.

- At FSG the needs of each entity are the same and the capabilities required of an office system are functionally replicatable.

- It should be possible to achieve some economy of scale and leverage the implementation experience of the early IOS installations at FSG.

    - However, at FSG there are major cultural differences in each branch-- management styles differ, the receptivity to technology differs, and the availability of funds differs.

    - At FSG, they do not believe that they could develop an implementation approach which will satisfy all the offices, and so treat each system implementation as unique although each implementation team taps into the informal network of IOS experts.

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D. BARRIERS SURMOUNTED

- In the two case studies and at other organizations in which INPUT conducted telephone surveys, we found that successful integration of office systems into the organization required surmounting the following barriers.

1. ORGANIZATIONAL--WHO CONTROLS?

- At Syntex, FSG, and all the other organizations, IS came to be in charge of office systems integration.

    - Through a process of education on the potential benefits of office automation and on the process of implementing office systems, the IS organization had shown themselves to be expert at managing the implementation of technology.

    - They had also proved themselves capable of establishing realistic implementation expectations--signed off by users--and of implementing office systems on schedule and on budget.

    - Users participated in the overall implementation process, but implementation was the responsibility of IS. The key to achieving such control is that IS proved themselves to be a credible operation--one which user departments could trust to provide appropriate information processing technology in a cost-effective and timely manner.

2. JUSTIFICATION

- The ultimate justification at Syntex, FSG, and the other corporations was that management and users were convinced they could not perform their business

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without office systems. Office systems are now justified in the same way as any other potential investment.

3.   TECHNICAL

● At Syntex, a corporate-wide network architecture was defined along with a long-range plan for implementation. Standards for system selection compatible with the architecture were established.

● At FSG, the choice of technology was a specific integrated office system with an open architecture allowing connection by a variety of compatible personal computers and word processors.

● Having standards makes system selection easier. Potential new users need not investigate a multitude of systems because IS, and at Syntex the user-based task force, has already investigated choices which would meet the majority of user needs and which are compatible with the long-range plan.

● Other systems not compatible could still be selected at Syntex, but users of these systems would not be able to benefit from IS services including the network, protocol translation services, and ongoing support.

● At FSG, users of non-compatible systems could not easily use administrative support services.

4.   SECURITY

● The one critical barrier still to be surmounted in almost all of the organizations surveyed was security. It is a significant barrier which needs to be addressed, but the solution is just now emerging.

● A summary of the case studies is shown in Exhibit IV-2.

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EXHIBIT IV-2

CASE STUDY SUMMARY

- ● Similarities of Syntex and FSG:

  - Management Vision – to provide cost-effective tools to enable work group collaboration and cost-effective connection to other computing resources.

  - Planning – OA must be planned for and managed just like any IS application.

  - Attention to Human Factors – OA requires attention to individuals' readiness for change.

  - Training – seen as critical to success of OA.

  - Standards – corporate support and services possible for standard system selections.

- ● Differences Between Syntex and FSG:

  - IS Organization – strong IS at Syntex built consensus on direction among decentralized business units. At FSG, IS plays minor role.

  - Replicatability – needs at FSG offices are similar, so solutions are replicatable. At Syntex, variety of office needs dictates greater flexibility.

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V PREREQUISITES FOR INTEGRATING OFFICE SYSTEMS INTO THE ORGANIZATION

V PREREQUISITES FOR INTEGRATING OFFICE SYSTEMS INTO THE ORGANIZATION

A. VISION AND PLANNING

I. TOP MANAGEMENT HAS A DREAM

- The vision management has toward office automation clearly establishes just how closely office systems will be integrated into the organization.

    - However, top management must first have clear business objectives and share these with management and staff throughout the organization.

    - These objectives will guide any office systems integration efforts.

- Management must take a broad view toward office automation in order for office systems to become integrated into the way the organization does business. If top management says "I want all office workers to be supported with access to information and tools to make them more effective contrib-utors to the success of this company," the potential for office system integra-tion is much greater than when management has a "show me" attitude.

- Ideally, management should promote the redesign of jobs to take advantage of new technology. Otherwise office automation may simply replicate existing, often inefficient work methods.

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2.   PLANNING AND OFFICE SYSTEM INTEGRATION

- The planning process is critical to develop agreement about the scope of office systems implementation. Many "stakeholders" should be involved in a corporate-wide planning effort--top management, IS, personnel, finance, user management, and end users.

- The planning process is one of educating these stakeholders on the potential benefits of office systems.

- The most critical planning outputs are:

  - A long-range office systems strategy and plan which identifies the required human and financial resources and defines the overall technical approach (system architecture, vendor selection, and the order of application implementation).

  - A short-range tactical plan which details actions in the initial office system integration effort.

  - Annual business/systems plans from each department and/or division regarding what office systems are needed, how they will be deployed, and what additional resources are necessary. This plan incorporates systems planning into the budget process and is one of the most important contributors to the ongoing integration of office systems into the organization.

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B. NEEDS ASSESSMENT

- The most critical step of office automation implementation is the needs analysis within each organization. Innumerable studies conclude that an inadequate needs assessment leads to office automation failure. Implementing technology for technology's sake is a waste of resources.

- Any analysis of needs must be undertaken with the current and future business mission and objectives clearly in mind and agreed to by all participants whether they are the study team or those being assessed. The emphasis of the assessment must be on identifying functions, processes, and activities the work group and individual knowledge workers perform which have a high value in meeting business objectives for the work group, department, or organization.

1. WHAT DO WE ALREADY KNOW ABOUT NEEDS?

- A starting point is the following list of user needs.

    - As discussed in Chapter III, Section A, knowledge workers have strong needs in the area of communications.

    - In Exhibit V-1, specific user needs are presented in order of importance.

    - The highest ranking needs were found to be communications-related and are best met by systems that support the work group.

- These needs transcend business objectives.

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EXHIBIT V-1

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USER OFFICE SYSTEM NEEDS

	Personal	Work Group	Division	Corporate
1. Increase access to remote information		X	X	X
2. Reduce work interruptions		X	X	X
3. Reduce delays in written communications	X	X		
4. Reduce Telephone Tag		X	X	X
5. Provice more support resources.		X	X	
6. Reduce redundancy in tasks and information	X	X	X	X
7. Level workload		X		
8. Support personal composition, calculation, storage, and retrieval	X	X		
9. Decrease irrelevant information and contacts		X	X	X
10. Support personal administration.	X	X	X	X

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2.   PERFORMING A NEEDS ASSESSMENT

- It is easy to determine user needs for known office system solutions. Project
  staff may simply ask: "Do you need a personal computer and a spreadsheet?"
  It is better to determine what is done in the context of meeting business
  objectives.

- James H. Bair of Hewlett-Packard, a long-time researcher of user needs and
  wants, recommends that an effective way to gather information about user
  needs is through oral interviews and written questionnaires. Exhibit V-2 shows
  suggested questions to determine communications needs.

- Each of these questions should be qualified.

  - For example, "How many phone calls do you receive in a day related to
    furthering your business objectives?"

  - A realistic assessment of whether activities performed by knowledge
    workers actually contribute to the business may identify areas of
    unproductive activity which, if curtailed or modified, could also have a
    significant impact on the business.

- These questions can be a starting place to determine knowledge worker
  needs. The questions must be asked of everyone in a sample work group.
  Exhibit V-3 provides additional questions about knowledge worker activities.

- Questions must also be asked regarding needs for specific information services
  and specific information sources appropriate to a department or work group
  within the given industry.

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EXHIBIT V-2

QUESTIONS REGARDING KNOWLEDGE WORKER COMMUNICATIONS NEEDS

- Interpersonal Communications Questions:

  - How many phone calls are received daily?

  - How many phone calls are initiated daily?

  - How long do employees talk on the phone daily?

  - How many meetings are hosted weekly?

  - How many meetings are called by others weekly?

  - How long are the meetings attended?

  - Does someone answer an employee's phone if he is not available?

  - How many phone messages does someone take for others daily?

- Written Communications Questions:

  - How many memos are written daily?

  - Are written communications prepared on a word processor?

  - Do employees mind typing?

  - What is an employee's typing skill level?

  - Do employees use word processing equipment?

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EXHIBIT V-3

GENERAL QUESTIONS
ABOUT KNOWLEDGE WORKER ACTIVITIES

- Do Knowledge Workers . . .

  - Use hand-held calculators over an hour daily?

  - Work on budgets, financial plans, mergers, acquisitions, divestitures, expense accounts, tax plans, or other financial documents?

  - Analyze the sales and revenue impact of price changes, interest rate changes, or cost changes?

  - Perform or access cost/benefit analyses for capital spending planning?

  - Combine numbers from several reports into one?

  - Manually manipulate computer generated data?

  - Access modeling or other programs on remote computing services?

  - Forecast future variable values?

  - Plot graphs over an hour daily?

  - Prepare client or management presentations?

  - Reschedule over five weekly appointments?

EXHIBIT V-3 (Cont.)

GENERAL QUESTIONS
ABOUT KNOWLEDGE WORKER ACTIVITIES

- Do Knowledge Workers . . .

  - Forget appointments or deadlines?

  - Search for documents, files, or notes for over fifteen minutes?

  - Make reminder lists of over ten items?

  - Allocate people, material, or equipment?

  - Assign subordinates over six assignments which must be tracked?

  - Schedule projects with over five tasks?

  - Interrupt everything for urgent information demands from others?

  - Work on lengthy proposals and contracts with others?

  - Dictate or draft speeches or articles longer than eight pages which will be revised?

  - Send urgent messages to several co-workers simultaneously?

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3. ASSESSING RESULTS

●   Useful information about how people spend their time and how much time they spend can be derived from such questions. This data can be part of office systems justification and can serve as baseline data for a subsequent assessment of whether productivity has actually improved.

●   Analysis of data collected will identify patterns of communications showing with whom and how users need to interact, and also:

    -   Information services and information sources most useful in user's work.

    -   Work efforts for which office automation is appropriate.

    -   A ranking of needs useful in prioritizing applications development.

●   An information workflow analysis can also be done based on some of the above questions.

C.   **WHO IS RESPONSIBLE**

I.   STAKEHOLDERS

●   The stakeholders in office systems integration efforts include:

    -   Top management--those responsible for the final implementation decisions, particularly those related to financial and human resource allocation.

INPUT

- Line management--those responsible for decisions involving their functional area exclusively.

- IS management--those responsible for decisions involving technology management.

- Office automation project team--those performing many of the needs assessment, planning, and selecting activities involved in implementing office automation. The participants should minimally represent technical services and the initial user communities.

- Technical staff--those performing technical activities such as installation, configuration, applications tailoring, program development, and pilot testing. Trainers are often initially from this group, but the training function may eventually migrate to either the human resources function or to the user community.

- End users--the non-technical staff using office systems.

2. RESPONSIBILITIES OF KEY ACTORS IN THE IMPLEMENTATION PROCESS

- Technical staff and IS management make decisions related to managing technology. Top management and line management make decisions related to managing the business.

- IS management should be responsible for technical integration efforts such as system design and establishing standards with input from users.

- User management should be responsible for ensuring that ongoing office system efforts make business sense and that savings from office automation are meaningfully used.

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- Each of the stakeholders alone or in combination with others is involved in each major phase of the implementation process, as shown in Exhibit V-4.

D. STRATEGIC SYSTEM AND DATA ARCHITECTURE

- Part of the vision held by management should include the strategic system and data architecture.

1. STRATEGIC OFFICE SYSTEM ARCHITECTURE

- A strategic architecture must incorporate the interconnection of five levels of computing as shown in Exhibit V-5.

- The work group/departmental level connects the personal level and the divisional, corporate, or external levels. It is a natural and cost-effective gateway between personal computers and wider area services.

2. DATA AND SERVICES ARCHITECTURE

- Coincident with the system architecture is a data and services architecture as shown in Exhibit V-6.

- Personal computers hold personal data.

- Departmental systems (or the file servers of PCs linked via local area networks) hold departmental records, files, and programs.

    - If the departmental system is an IOS, it also holds personal records.

    - The departmental records can be comprised of data downloaded from divisional, corporate, or external computers or of data created by work group members.

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EXHIBIT V-4

RESPONSIBILITIES OF KEY ACTORS
IN THE IMPLEMENTATION PROCESS

	Top Management	Line Management	I.S. Management	OA Team	Technical Staff	End Users
Needs Assessments	K	R	K	P	I	I
Planning						
Strategic	K	I	R	P	I	I
Tactical	K	I	R	P	I	I
Business/ Systems	K	R	K		I	I
Justification						
Initial	I	R	I	P	I	I
Ongoing	I	R	I	I	I	P
System Selection	K	I	R	P	I	I
Installation			R		P	I

R = Primary responsibility including resource allocation, P = Perform the activity, I = Provide critical input to the process, K = Kept informed

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EXHIBIT V-5

STRATEGIC OFFICE SYSTEM ARCHITECTURE

External
Computer Resources

Mainframes

Mainframes

Minicomputers

or

Minicomputers

or

Servers

Terminals or Microcomputers

Corporate   Division   Work Group/   Personal
Department

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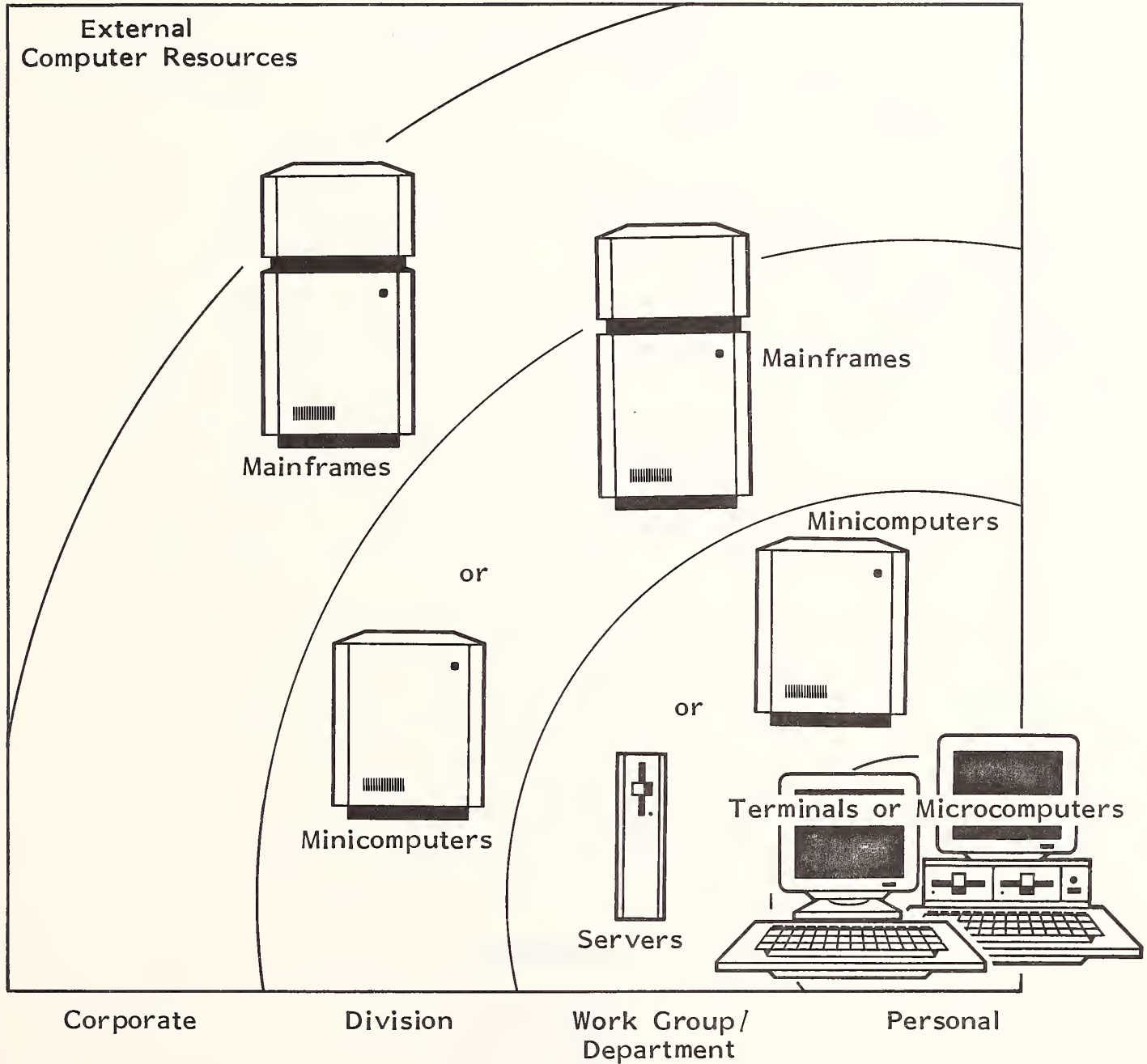
EXHIBIT V-6

DATA/SERVICES ARCHITECTURE

EXTERNAL SERVICES

Dow Jones   Specialized Data Bases   Dun&Bradstreet   Electronic Mail   Dialog

Specialized Programs   Associated Press

CORPORATE INFORMATION AND SERVICES

Accounting   Customer   Financial   Marketing   Personnel   Payroll

Manufacturing   Inventory   Electronic Mail   Claims   Library

Demand Deposit   Data Base Management   Project Management   Policy Holder

DIVISION INFORMATION AND SERVICES

Document Production   Data Base Management   Division Data

Graphics   Library   Protocol Translations   Telecommunications

WORK GROUP/DEPARTMENT INFORMATION AND SERVICES

Word Processing   Modeling   Departmental Data

Budget   Project Control   Statistical Analysis

PERSONAL INFORMATION AND SERVICES

Word Processing   Spreadsheet   Graphics

Help Services   Dictionary   Personal Files

- Divisional and corporate computers, which may be one and the same, perform their respective computing.

- Some services are offered at more than one level, such as data base management and telecommunications offered at the departmental, division, or corporate level, or word processing and data analysis available at the personal, departmental, or division level.

E.   STANDARDS FOR SYSTEM SELECTION

- An organization, for technical and organizational reasons, may not be able to meet its needs with systems from only one vendor. To take advantage of corporate services such as the network protocol translations and ongoing support, system selection standards (or guidelines) are useful.

- The minimum system selection standards recommended are:

    - Limit the number of vendors to be selected to two or three at most.

    - The systems selected should, at the very least, be able to handle the simple transfer of data.

- In choosing the system vendor, the office systems task force should consider the following.

I.   BREADTH AND DEPTH OF A VENDOR'S OFFERINGS

- A vendor's offering should span the range of primary office services: word processing, electronic mail, spreadsheet, graphics, and data base management.

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- Secondary services might include electronic filing and time and calendar management.

- The depth of each area is defined by the ability of the system to provide adequate function for a range of users--from secretary to executive, and from novice to expert.

2.   INTEGRATION CAPABILITY

- The vendors' products should be able to work with each other in as integrated a fashion as possible.

   -    Data files should minimally be exchangeable.

   -    Ideally, outputs of one function should be integrated with outputs of another. For example, graphics or spreadsheets should be insertable into a document and, best yet, still usable within any function. When a spreadsheet is inserted into a document, the spreadsheet function should be usable from word processing if a change is necessary to the spreadsheet.

- The most important aspect of integration, however, is the system's ability to integrate with other systems, especially the corporate computer and those systems performing functional automation such as a manufacturing system.

   -    The office system cannot, and need not, take the place of functional automation.

   -    However, office workers need access to the information processed on these specific systems.

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3.   SERVICE AND SUPPORT

●   Training, consulting, and ongoing support are also important considerations. These can be provided by the vendor or third-party organizations. The vendor should minimally offer initial consulting, implementation assistance, followup troubleshooting, and diagnosis.

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VI MANAGING OFFICE SYSTEM INTEGRATION

VI MANAGING OFFICE SYSTEM INTEGRATION

A. CHOOSING A TECHNICAL APPROACH IS A STRATEGIC DECISION

- We described the two principal office system approaches in Chapter III, Section A.2, "Office Systems." To review:

    - IOS--A multi-user system with work group members working on dumb terminals or personal computers in an emulation mode, connected to a central computer. Examples are DEC's All-in-One, Data General's CEO, or systems serving fewer users such as the IBM PC/AT.

    - PC/LAN--A "system" of personal computers connected via local area networks which may also contain file, print, and communications servers. Examples are IBM PCs connected via local area networks from 3Com or Nestar.

- The selection of an approach is not merely a technical choice--it is a strategic decision. The decision should be guided by the nature of the computing environment that management envisions and by the applications required by the work groups or departments.

1. KEY ISSUES

- There are several key issues to address.

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a.   <u>Cost</u>

● The cost components for an IOS or PC/LAN solution include initial outlay, cost of adding an additional user, average cost per user, and ongoing costs. Currently, the IOS solution is overall less costly than the PC/LAN solution.

- Initial outlay. The IOS (such as the DEC All-in-One or Data General CEO) is initially more costly than a comparable group of linked personal computers. PC/LAN costs can be incremental and a more evolutionary financial outlay is possible.

- Adding an additional user. This is generally less costly with an IOS than with a PC/LAN.

. Per user PC/LAN costs for each addition include the micro-computer, additional cabling, and a network controller card.

. However, diskless personal computers are fast approaching the price of an IOS terminal, so this disparity may disappear.

- Average cost per user. This is currently less with an IOS.

. Cost per user starts high with the multi-user system and improves as more users are added, until the system reaches capacity. Then a new system must be added, bringing the cost per user higher again.

. With the PC/LAN solution, the cost per user remains relatively stable.

- Ongoing costs. Faults in a local area network installation are currently more difficult to identify and diagnose. Consequently, the PC/LAN can be more costly to support.

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- Costs for service and support for an IOS, particularly if it is a DEC All-in-One or Data General CEO, can be budgeted with standard maintenance contracts.

b. Type of Workstation Required

- Users have a larger variety of workstation options with the PC/LAN solution as long as they have the appropriate network interfaces, support the same protocols, and have the necessary software.

  - With a personal computer, the user is not contending for resources.

    - Response is comparatively instantaneous.

    - Each personal computer user can carry out activities without affecting others in the work group.

c. Applications Required

- If the primary applications required are dependent upon shared data bases, an IOS is the best solution.

  - Considerations about data base integrity and consistency can be handled better on an IOS (or host system).

    - It is easier to impose control over data on an IOS if security requirements are tight.

    - Further, with the IOS, large tasks can be handled via dynamic resource allocation which can not be easily accomplished with the PC/LAN solution.

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INPUT

- If users are primarily concerned with individual computing tasks, with only occassional needs to share files or access corporate or department data bases, the PC/LAN solution is best.

d. Availability

- When the central computer of the IOS is down, all workers with dumb terminals are down.

- The failure of a server in the PC/LAN can inhibit individuals from sharing files or resources, but they can still function in a standalone mode.

- All users of an IOS are forced to work only during system uptime, whereas with private personal computers, users can work at odd hours.

e. Implementation and Ongoing Support

- The IOS is available as a complete solution from a single vendor.

  - This minimizes the complexities of installation and reduces the need for technical support on a variety of equipment since there is not a multitude of different systems to be integrated and supported.

  - Ongoing service and support is available from one source with the IOS.

- The PC/LAN solution usually evolves.

  - There are a number of different personal computers in use.

  - Integrating them into a network requires a technical specialist or the development of the technical capability to perform the installation and configuration activities.

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- If each personal computer user is using different software, conversion problems must be addressed.

- The diagnostic and monitoring functions on local area networks are still deficient, so isolating network problems is a potentially time-consuming and expensive activity with the PC/LAN.

2. SUMMARY OF ISSUES FOR IOS AND PC/LAN SOLUTIONS

● Exhibit VI-I provides an IOS and PC/LAN issue summary.

B. JUSTIFICATION

I. IS IT STILL REQUIRED AND ON WHAT BASIS?

● INPUT's survey asked "How have office systems been cost-justified in your organization?" Some responses were:

- "The economy dictates we run lean and mean. We require user departments to show a productivity increase with fewer people able to do the same or more. We also accept hardware cost displacement as a justification." (High tech manufacturer.)

- "Office automation efforts require the same justification as any other request for funds. OA must vie for funds to open a manufacturing plant and consequently OA is scrutinized very carefully. We have to show a business case." (Syntex.)

- "Through education we try to instill in our users the following justifications: cost displacement, time reduction, quality increase, and survivability. We leave it up to the user departments to do their own justification." (Computer manufacturer.)

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EXHIBIT VI-1

IOS AND PC/LAN ISSUE SUMMARY

Issues \ Solution	IOS	PC/LAN
Cost		
Initial Outlay	High one-time cost.	Smaller increments.
Adding Users	Lower increments.	Higher increments.
Average Cost per User	Costs start high and decrease with increase in users.	Costs stable regardless of number of users.
Ongoing Costs	Relatively stable and certain.	Because problem identification and diagnosis is relatively immature, may be costly.
Type of Workstation	Dumb terminal with no standalone capability. Personal computers.	Variety of standalone personal computers.
Applications Best Suited	Those requiring shared data bases, tight security, or dynamic resource allocation.	Individual computing tasks and sharing resources.
Availability	Dependent on IOS.	Flexible.
Implementation and Ongoing Support	Single-vendor complete solution minimizes complexities. Service available from one source.	Installation configuration, conversion, and support is complex with multi-micro environment.

- "We justified our IOS on the ability to obtain additional revenue by being able to offer a service (large-scale financial modeling) we could not do on personal computers. Also, since we're in the business of selling people time, we need to be more productive in how we service our clients--it gives us product differentiation if we can be more productive and consequently less expensive than our competitors." (FSG.)

- "We justified our IOS network on our ability to expand business without adding staff, our ability to reduce overtime, equipment displacement, and reduced telephone and branch mail costs." (Brokerage.)

- "We justify system acquisition on the value it adds to our staff's capabilities--they are able to do things they never could before." (Aerospace.)

- "We have no required return on investment for OA efforts. Occasionally, some manager complains about costs. We say 'we'll take the system away.' They quickly back off. They can't live without the capabilities." (Computer manufacturer.)

- Cost-justification efforts at these companies ranges from hard dollar cost reduction to no financial justification--office systems are required to "add value."

2.   HOW DO YOU PERFORM A FORMAL COST JUSTIFICATION?

- Innumerable methodologies exist which are useful if there is a need to perform a formal cost justification. INPUT's report Cost/Benefit Analysis for Office Systems describes one method.

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- Every major office systems vendor can provide a methodology. Examples include:

  - Data General. <u>Executive Guide to Estimating and Measuring OA Benefits</u>, available from Data General representatives.

  - IBM. <u>Management of End-User Computing: Justification Guide</u>, document number G52--4233, available from IBM account representatives.

3. THE KEY TO JUSTIFICATION

- Even though many companies have achieved positive benefits, management in most companies still requires financial justification. The key to winning management's approval is knowing what benefits to look for.

   a. <u>Incremental Costs</u>

- Such costs are included in each year's budget. If the previous year's effort was successful and funds are available, these incremental costs should be authorized.

- A simple rule to follow to justify incremental costs is that if the department requiring a justification is a cost center, justify on the basis of cutting costs. If it is a revenue generating function, try to show how the office system will add revenue.

   b. <u>Corporate-Wide Efforts</u>

- If attempting to justify a corporate-wide office systems effort, then a more formal and pervasive justification is required.

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- Without any history of office automation, focus on value justification at all levels of operation within the organization, as shown in Exhibit VI-2.

- Within the context of meeting overall business objectives, it is possible to justify office systems on how they can improve efficiency and get the right things done at each of the levels identified in the exhibit.

4.   MANAGING THE SAVINGS

- When cost benefits are required, management must be responsible for ensuring that any savings from office automation are translated to cost benefits, either cost avoidance or cost reduction.

- If a worker takes less time to perform an activity, savings come only if the need for additional workers is avoided--for example, hiring may be frozen.

C.   MANAGING CHANGE

- The overall purposes of integrating office systems into the organization are to improve worker productivity, cut costs, increase revenues, and increase profitability. To gain worker commitment, management should also have improving the quality of work life as a goal.

- Organizational objectives of improving performance through introducing technology are sound. New technology presents companies with opportunities for economic health and growth in highly competitive world markets through the introduction of new and improved products and services.

- It is necessary to design systems with equal attention to social and technical requirements, to use good implementation approaches, and to provide adequate training and ongoing support.

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EXHIBIT VI-2

VALUE JUSTIFICATION

AT THE:	JUSTIFY BASED ON:
Corporate Level	Meeting organizational goals such as offering a new product with above average profits.
Departmental Level	Meeting department goals: if the department is a cost center such as payroll, show how OA can cut overhead; if a revenue center such as marketing, show how marketing efforts can be expanded.
Process Level (Tasks and Activities to Accomplish a Job)	Shifting efforts from maintenance to results: for example, shift from information gathering to analysis and decision making in budgeting
Activities	Shortening time spent on low value activities and substituting more efficient activities, such as reducing telephone tag with electronic mail.
Actions	Reducing number of steps and wasted actions for time savings, such as substituting automated file and retrieval for manual methods.

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I.   SOCIOTECHNICAL SYSTEM DESIGN

• Sociotechnical system (STS) design is a theory that promotes the integration of technology, management, and social systems along with analytic procedures to determine how to organize work better.

• The design resulting from a sociotechnical approach generally has workers organized in a work team structured around clusters of tasks required to complete a product or provide a service.

  - Decisionmaking is often performed at the lowest possible level within the organization.

  - Workers see all the tasks, how their job fits in with the whole, and how they contribute to the end product or end service.

  - A well-designed system provides jobs in which the workers have a choice about how the work is to be performed.

  - Further, they have variety of tasks. Often workers are cross-trained in all tasks.

• An implicit part of the design is that the computer is used by employees as they need it, as opposed to the computer setting the work pace or feeding work to the employees.

• The steps to such a design are:

a.   Scan the Work Group

• Examine the purpose of the work group and identify its inputs, staff, products, and boundaries with other groups.

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b. Perform a Technical Analysis

- Divide the clerical group's work process into the changes that occur in the output (product or service) as it moves through the production process.

    - This step identifies where technology can be brought to bear and identifies the key variances--deviations in the process which should be controlled to assure successful production.

    - An example of a key variance would be an incomplete form. Someone must obtain the necessary data.

- If the work group consists of professional and managerial workers, look at the deliberations regarding problematic issues facing an organization about which people reflect and communicate.

    - This process of tracing deliberations, understanding the degree of the deliberations structure (e.g., regularly scheduled meetings to discuss problems versus ad hoc exchanges), and understanding the different skills of the parties involved clarifies what system must be designed and what technology can be used.

    - For example, electronic mail and a "work in progress" system can facilitate communication and track decisions necessary for the development of a plan or creation of the current year's budget.

c. Control the Variances

- Determine how deviations are now handled and identify alternative means of operation to reduce deviations.

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- Ideally, variance control can be placed at the earliest possible point in the production process and with the fewest number of people involved.

- One goal of this step is to eliminate the need for supervisors to intervene in how workers handle deviations, thereby giving workers a greater sense of autonomy.

d. Social System Analysis

- This is the step in which the coordination between people needed to make the process work under changing conditions is identified. Workers' roles, their feelings about their jobs, their needs for privacy, their status, their inter-action, and the group's relationships with other work groups are examined.

e. Sociotechnical Design

- This is the final step in which the technical and social aspects are combined in a new way. Workers and managers participating in the process now have the skills to adapt and fine-tune the solution so it continuously meets social and technical requirements.

- Organizations using this approach to design office systems are achieving significant productivity improvements which translate to increased profit-ability. Further, participants are satisfied with and enthusiastic about the restructured work and their role in contributing to a solution.

2. IMPLEMENTATION APPROACHES

- Much has been written about implementing office systems. Experiences at many organizations point to particular approaches which lead to success. In summary:

INPUT

- Involve potential users of new systems from the very beginning of the implementation process. Let them make choices about their futures.

- Perform a needs assesment. Focus on current and future business objectives when assessing how to improve operations. Determine the organizational and departmental goals and strive to apply office systems to enable the achievement of these goals.

- Select a solution compatible with workers' needs.

- Prepare and follow a plan addressing technical issues and human issues. Plan to present equipment as an aid to increase productivity, not as a replacement for staff. Identify and plan for worker comfort when planning new office layouts.

- Make sure that schedules and budgets are met. Keep users and managers informed of implementation status.

- Start small. Introduce the first office system as a pilot and learn from the experience to fine-tune subsequent efforts. Make sure the first introduction is into an area where benefits are immediately needed and where success will be immediately evident.

- Proceed gradually. Phase in subsequent systems as workers are ready for change. Prepare workers with information about the potential impact of office systems.

- If possible, do not force anyone to use equipment if they do not want to. Allow workers to adjust to change at their own pace. Listen to, and use, worker feedback to identify problems which can be solved.

- Provide initial and ongoing training and support.

- Share the successes of users. Promote sharing of innovative office system use.

- Start immediately. Making the transition to an organization with office workers supported by new technology takes time for phasing in and for adjustment.

3. TRAINING AND ONGOING SUPPORT

a. <u>Train, Train, Train</u>

- Three types of training are necessary:

    - Conceptual--what is office automation, why should we use office systems, what can the technology do and what doesn't it do.

    - Basic operations--how to operate the hardware and software.

    - Application--how to apply the system on an ongoing basis.

- The training support structure can be as informal as a network of peer trainers or as formal as information centers and course offerings.

- Refer to Chapter IV for the guidelines for planning for training used at Syntex.

b. <u>Support--A Pervasive Infrastructure is Required</u>

- Users will need ongoing support to continue integrating office systems into the organization. Training, user documentation, consultation, installation/configuration assistance, applications development or tailoring, diagnosing problems, and repair are needed on an ongoing basis.

INPUT

- Support is needed from a corporate office automation function and at the departmental level.

    - The corporate group is responsible for strategic development and corporate-oriented activities such as network planning and standards development.

    - The corporate group also provides acquisition support (needs assessment, technical product evaluations, and configurations), training (formal courses and informal support of departmental peer-level trainers), application support (development, consulting services, a help line), and technical support (maintenance or liaison with vendors).

- At the departmental level, a local support person is also needed.

    - One of the organizations surveyed has a network of office automation coordinators throughout the organization of 50,000 employees.

        . Each department has one person who is assigned responsibility for user support on personal computers or terminals connected to departmental systems.

        . The person may spend as little as one-quarter of his or her time supporting end users.

    - The key is that every department has a coordinator focused on office systems. One of the coordinator's responsibilities is to keep in touch with the corporate office automation group.

- There should be a strong emphasis on sharing new ways of using office systems.

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VII CONCLUSIONS AND RECOMMENDATIONS

VII CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

- In many organizations, office systems are not yet integrated into the organization. There are only pockets of office system users. At best, there is an "after-the-fact" integration effort under way.

- Some organizations, however, have implemented a corporate-wide communications network into which are tied office systems selected for their ability to meet most user needs and for their connectability to the network and corporate data bases.

- In other organizations such as financial services or retail, a "cookie-cutter" approach has been taken.

  - An office system solution has been selected to serve the entire organization's offices--usually at the branch level--based on an in-depth assessment of one or two branches.

  - Because all branches are essentially alike, the solution and the implementation approach can be replicated throughout the organization.

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INPUT

- Typical barriers surmounted in these organizations in which office systems are a way of doing business are: resolving the control issues, developing a justification approach, and planning a technical approach appropriate to the organization.

- In organizations where office systems are integrated into business operations, IS is responsible for managing the technology.

  - IS has been given this responsibility because they have demonstrated they can meet user needs on time and on budget.

  - User management is responsible for ensuring that office systems make business sense and that any savings are meaningfully used.

- Cost-justification efforts of some degree of formality will always be required by management. The key to justification is knowing what benefits will win management's approval.

- The strategic office systems architecture should include five levels of computing: personal, departmental, division, corporate, and external.

- Choosing a technical approach is a strategic decision which should be guided by the nature of the computing environment that management envisions and by the applications required by work groups or departments. Key issues to consider in choosing either an IOS or PC/LAN solution are cost, the type of workstation required, applications required, availability of resources required, implementation, and ongoing effort.

- Standards for office system selection are necessary to take advantage of corporate services such as the communications network, protocol translators, and ongoing support.

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- The most critical step of office automation implementation is a needs assessment.

  - Any needs analysis must be undertaken with the current and future business mission and objectives clearly in mind and agreed on by all participants, whether they are the study team or those whose needs are being assessed.

  - The emphasis of the assessment must be on identifying functions, processes, and activities the individual and work group perform which have a high value in meeting objectives.

B.   OFFICE AUTOMATION IS A CATALYST FOR CHANGE

- Implementing office systems is a catalyst for some very significant changes—changes in how workers do their jobs, in how individuals and work groups communicate with one another, and in the very structure of the organization.

- The transition to the automated office must be planned and managed to reach an appropriate balance between people and technology.

- It is necessary to design and implement solutions paying equal attention to social and technical requirements, using good implementation approaches, and providing adequate training and ongoing support.

- User participation in the analysis and design process of implementing office systems is mandatory. When people participate in changing their jobs and designing equipment uses, they often are able to invent uses that increase organizational capabilities on an ongoing basis.

INPUT

- The goal of office automation should be to create profitable results for the organization while improving the quality of work life for the individual.

C.   RECOMMENDATIONS

- If not already done, perform an assessment of individual and work group needs for information and information handling services which can assist in meeting current and future business objectives.

- Determine a technical choice based on the needs of work groups and individuals and on the nature of the computing environment that management envisions.

    - The primary technical prerequisite for integrating office systems into the organization is a communications architecture providing interfaces from the individual and work group to division, corporate, or external data bases.

- Develop standards for connection to the communications network.

    - Limit the number of selected vendors to two or three at most.

    - Require that any system selected provide for the simple transfer of data.

- Consider also the breadth and depth of a vendor's office system offerings including integration capabilities and vendor service and support programs.

- If not already done, begin the planning process to integrate office systems into the organization.

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- IS needs to develop a long-range plan which identifies the required human and financial resources and defines the overall technical approach, and a short-range tactical plan which details the actions in the initial office systems integration effort.

- On an ongoing basis, require that each department plan for and budget systems in the annual budget process.

- To justify a corporate-wide office system effort, focus on value justification-- what value can office systems provide at the following levels of operation within the organization.

  - Action level. How can office systems reduce the number of steps and wasted actions to achieve time savings?

  - Activity level. How can office systems enable workers to shrink the amount of time spent on lower value activities and substitute more efficient activities?

  - Process level. How can office systems be used to shift from mainte-nance tasks and activities to accomplish a job to results-oriented tasks and activities?

  - Departmental level. How can office systems be used to meet depart-mental objectives?

  - Corporate level. How can office systems help meet organizational goals?

- Some guidelines for easing the justification process are:

  - Establish a management level task force to look for business problems that may be helped by office systems. Have the members discuss the benefits they have realized and how they have avoided problems.

INPUT

- Establish standards for measuring the impact of office systems within each department. Include such measures as ability to meet deadlines, quality of results, expense reduction, employee turnover, and improved employee satisfaction.

- Audit departmental progress with office systems to assess whether office automation has actually achieved the desired impacts.

- Require user management to take responsibility for ensuring that time savings from office automation are translated to cost benefits in a form such as reduced future hiring.

- Management must accept the responsibility for integrating office systems into the organization.

  - Promoting sociotechnical system design, using good implementation approaches, and providing for adequate training and ongoing support go a long way toward addressing the social side of implementing systems.

  - Tap into the capabilities of the human resources staff, some of whom will understand and be able to practice the sociotechnical system design approach.

- Develop a pervasive training and support capability which supports the ongoing adaption of office systems. Both a corporate capability and a departmental capability will be required.

- These recommendations are shown in Exhibit VII-1.

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EXHIBIT VII-1

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RECOMMENDATIONS

- Perform Needs Analysis

- Determine Technical Choices

- Develop Connectivity Standards

- Evaluate Vendor Offerings

- Begin Planning

- Justify Focusing on Values-Added

- Involve Users and Management

- Develop Training and Support Plan

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APPENDIX A: SUGGESTED READINGS

APPENDIX A: SUGGESTED READINGS

- James H. Bair and Laura I. Mancuso (1985). The Office Systems Cycle. Palo Alto (CA): Hewlett-Packard Company.

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