

OFFICE VIDEOTEX

INPUT

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## Offices

### NORTH AMERICA

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

**Detroit**  
220 East Huron  
Suite 209  
Ann Arbor, MI 48104  
(313) 971-0667

**New York**  
Park 80 Plaza West-1  
Saddle Brook, NJ 07662  
(201) 368-9471  
Telex 134630

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

### EUROPE

**United Kingdom**  
INPUT, Ltd.  
Airwork House  
35 Piccadilly  
London, W1V 9PB  
England  
01-439-8985  
Telex 23116

**France**  
La Nacelle  
Procédure d'abonnement 1-74  
2, rue Campagne Première  
75014 Paris  
France  
322.56.46  
Telex 220064 X5533

**Italy**  
PGP Sistema SRL  
20127 Milano  
Via Soperga 36  
Italy  
Milan 284-2850  
Telex 310352

**Sweden**  
Athena Konsult  
P.O. Persson & Co. AB  
Box 22114  
S-104 22 Stockholm  
Sweden  
08-52 07 20  
Telex 17041

**West Germany**  
NOVOTRON GmbH  
Am Elizabethenbrunnen 1  
D-6380 Bad Homburg  
West Germany  
(06172) 44402  
Telex 418094

### ASIA/AUSTRALIA

**Japan**  
Overseas Data Service  
Company, Ltd.  
Shugetsu Building  
No. 12-7 Kita Aoyama  
3-Chome Minato-ku  
Tokyo, 107  
Japan  
(03) 400-7090  
Telex 26487

K.K. Ashisuto  
Daini-Suzumaru Bldg., 6th Floor  
8-1, Nishi Shimbashi  
3-Chome Minato-ku  
Tokyo, 105, Japan  
(03) 437-0654  
Telex 781 26196

**Singapore**  
Cyberware Consultants (PTE) Ltd.  
2902 Pangkor  
Ardmore Park  
Singapore 1025  
734-8142

**INPUT**  
Planning Services For Management

# OFFICE VIDEOTEX

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1985

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AUTHOR

OFFICE VIDEOTEX

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BORROWER'S NAME

*11/22*

*Jim Westly*





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# OFFICE VIDEOTEX

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# OFFICE VIDEOTEX

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## I INTRODUCTION



## I INTRODUCTION

### A. SCOPE

- This report, produced by INPUT as part of the End-User Systems Planning Program, examines applications for videotex within the corporate environment.
- We selected this topic because of a demonstrated client interest in, and user awareness of, consumer videotex systems.
- Vendors, perceiving a more immediate and broader market for office videotex than for consumer systems, are creating further awareness.
  - Businesses are accustomed to paying for information and investing in information management systems as they become larger, more complex, and decentralized.
  - Also, in part due to slow acceptance of consumer services, vendors are promoting office videotex systems to help recoup their investments in hardware and software development.
- Vendors are confronting an interested, but as yet uncertain market. Based on INPUT's interviews, users are generally not clear on what applications, if any, are appropriate for office videotex.

- Videotex to some extent replicates existing systems.
- Determining and justifying its unique benefits is sometimes difficult.
- By independently implementing easier operations at the information creation and user levels, however, companies may in fact be moving toward videotex solutions without acknowledging or labeling the conceptual framework of their actions.
- The purpose of this study is not only to help Information Systems (IS) executives determine appropriate applications for office videotex, but also to provide information that will aid in the understanding of the equipment, standards, and issues involved.
- The study is also designed to serve as a guide to planning those elements of a videotex system that should be implemented in a particular business.
- The report addresses the following issues:
  - The development of electronic information access as a response to the problems of paper-based information management (Chapter III).
  - The applications appropriate for the videotex solution (Chapter IV).
  - Technical requirements and videotex standards and protocol (Chapter V).
  - Case studies of office videotex installations (Chapter VI).
  - Implementation procedures and operational considerations (Chapter VII).

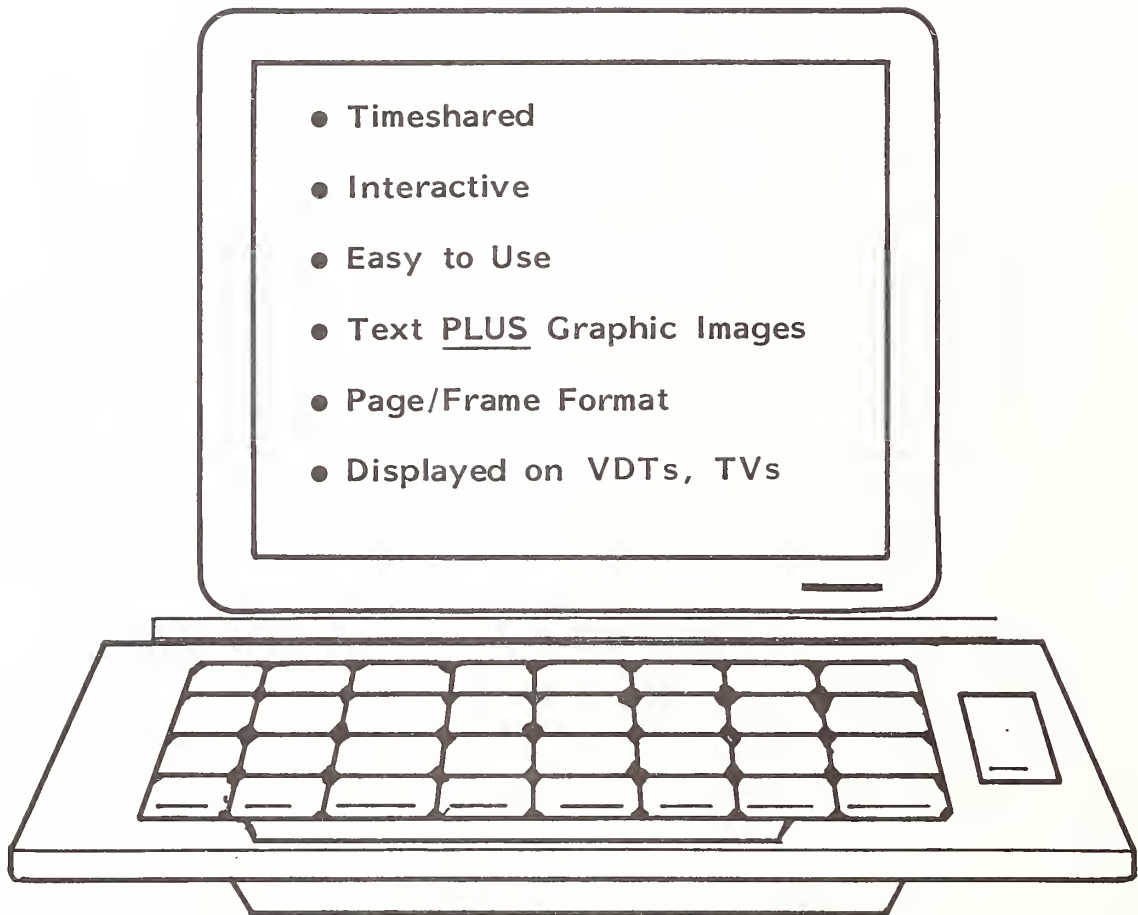
- Market and technological trends for office videotex (Chapter VIII).
- Conclusions and recommendations (Chapter IX).
- Definitions of terms used in this report appear in Appendix A.
- The questionnaire used in researching this report appears as Appendix B.
- Product profiles are contained in Appendix C.

## B. METHODOLOGY

- INPUT first questioned several of its clients to determine what issues needed consideration and clarification in this report.
- Several administrators of office videotex systems were asked to document their reasons for implementing a system and the problems and benefits they encountered.
- Extensive review and analysis of product literature and follow-up interviews with vendors and third-party experts added to the information evaluated in this report.
- The term "videotex" is used in this report to designate a timeshared, interactive, easy-to-use, information retrieval method using images and graphics (preferably in color), displayed in a frame or page format on Video Display Terminals (VDTs). Exhibit I-1 summarizes this definition.
- INPUT recognizes that the IS industry is not agreed on this definition. The term "videotex" is commonly used to describe nongraphic ASCII (American

EXHIBIT I-1

VIDEOTECH DEFINED  
INFORMATION RETRIEVAL THAT IS:





Standard Code for Information Interchange) displays. INPUT suggests that such systems be labeled "ASCIItext" for the sake of clarity.

- This study focuses on "closed" office videotex, designed for internal company use, and does not consider (except for perspective) "open," publicly available business or consumer services.

### C. PURPOSE

- In the modern corporation, access to timely information is strategically vital. As the amount of information required for efficient and productive corporate management has increased, the means of creating, updating, storing, distributing, retrieving and ultimately disposing of information have increasingly shifted from paper-based to electronic systems.
- Adding to the need for more efficient information management methods is the growing size, complexity, and decentralization of the modern corporation.
- Videotex, by definition, offers a user friendly, graphically attractive presentation system which may be more economical than alternative methods.
- Videotex has been heralded as a "breakthrough" consumer service. Skeptics, however, have described videotex as "a technology in search of a problem." A recent Forbes article concluded that "videotex is an idea that has everything going for it. Except for one thing: a market."
- Nevertheless, certain applications lend themselves to office videotex. This report's intent is to take a realistic approach in helping IS executives to determine if their corporation is a suitable candidate for an office videotex system.

#### D. RELATED INPUT REPORTS

- Interested readers are referred to the following INPUT reports:
  - Organizing the Information Center (1983).
  - Executive Workstation Acceptance: Problems and Outlook (1984).
  - Relational Data Base Design Strategies (1983).
  - Impact of Office Automation on Productivity (1983).
  - Maximizing the Acceptance of New Systems (1983).
  - End-User Micro-Mainframe Needs (1984).
  - On-Line Data Base Market Opportunities, 1984-1985 (1984).

## II EXECUTIVE SUMMARY



## II EXECUTIVE SUMMARY

- This executive summary is designed in presentation format to help the busy reader quickly review key research findings and recommendations. It will also provide an executive presentation, complete with script, to facilitate group communications.
- The key points of the entire report are summarized in Exhibits II-1 through II-5. On the left-hand page facing each exhibit is a script explaining that exhibit's contents.

## A. A TECHNOLOGY IN SEARCH OF A MARKET

- After years of press coverage and industry promotion, pioneering consumer videotex services are now on-line.
  - Videotex has been heralded as a major step toward the electronic home.
  - Consumer acceptance of videotex, however, is not living up to the optimistic forecasts of IS industry watchers.
- Consumer videotex interactively delivers information and services to subscribers' television sets via telephone lines in an easy to use and graphically attractive format.
- Vendors are now promoting office-based videotex as a way of improving corporate information management. As recognition of the strategic importance of information grows, new methods are constantly being evaluated. Videotex may represent opportunities for cost-effective, time-saving applications in personnel, marketing, corporate communications, operations, and other functions.

# **A TECHNOLOGY IN SEARCH OF A MARKET**

- **Consumer Videotex is Not Living Up To Forecasts**
- **Office Videotex Fits Specific Corporate Information Applications**

## B. WHY VIDEOTEX?

- It is unclear to many IS managers why office videotex is needed; however, some applications appear to justify the required investment.
- These applications can be categorized by the following criteria:
  - The need to provide information for a large number of occasional or casual users.
  - The need for an easy-to-use, interactive system.
  - The need for easy information creation and updating and the associated economies.
  - The benefits of attractive color graphics to enhance understanding and comprehension.
  - The need to access information other than that on the videotex system, including corporate data bases and outside information banks, thus sharing information resources.
  - The desire to introduce a nonthreatening "fun" technology as a first step toward office automation.
  - The desire for a pilot experience for possible future public or business-to-business services.
- Videotex meets these criteria as a means of managing and distributing specific categories of corporate information.



## **WHY VIDEOTEX?**

- **For a Large Number of Occasional Users**
- **For Easy Information Creation and Updates**
- **For Easy Information Retrieval**
- **For Easy Comprehension**
- **For Sharing Information**
- **To Introduce Office Automation in a “Fun” Way**
- **To Gain Experience For the Future**

### C. CERTAIN APPLICATIONS MAY NEED VIDEOTEX

- Applications suitable for office videotex are those requiring its updating ease and graphic capabilities; for example,
  - Frequently updated personnel manuals that otherwise would be out of date upon publication.
  - Illustrated procedures and repair manuals that continually need to be revised.
  - Telephone directories that are constantly being revised due to staff changes.
  - Electronic Mail, which otherwise would not be available to many in the company.
  - Price lists that are frequently changed.
  - Plant schematics showing cable installations, wiring, and duct work that would otherwise be difficult to locate.
- Applications not suitable for office videotex are those requiring a large amount of user interaction with the central computer; for example,
  - Repetitive data entry would be cumbersome on videotex.
  - End-user calculating and computing requires more computing power than videotex generally makes available to the individual user.
  - Programming and coding is also not suitable in a videotex environment for similar reasons.
  - Data manipulation and word processing are heavily interactive as well, and are not suitable for videotex.

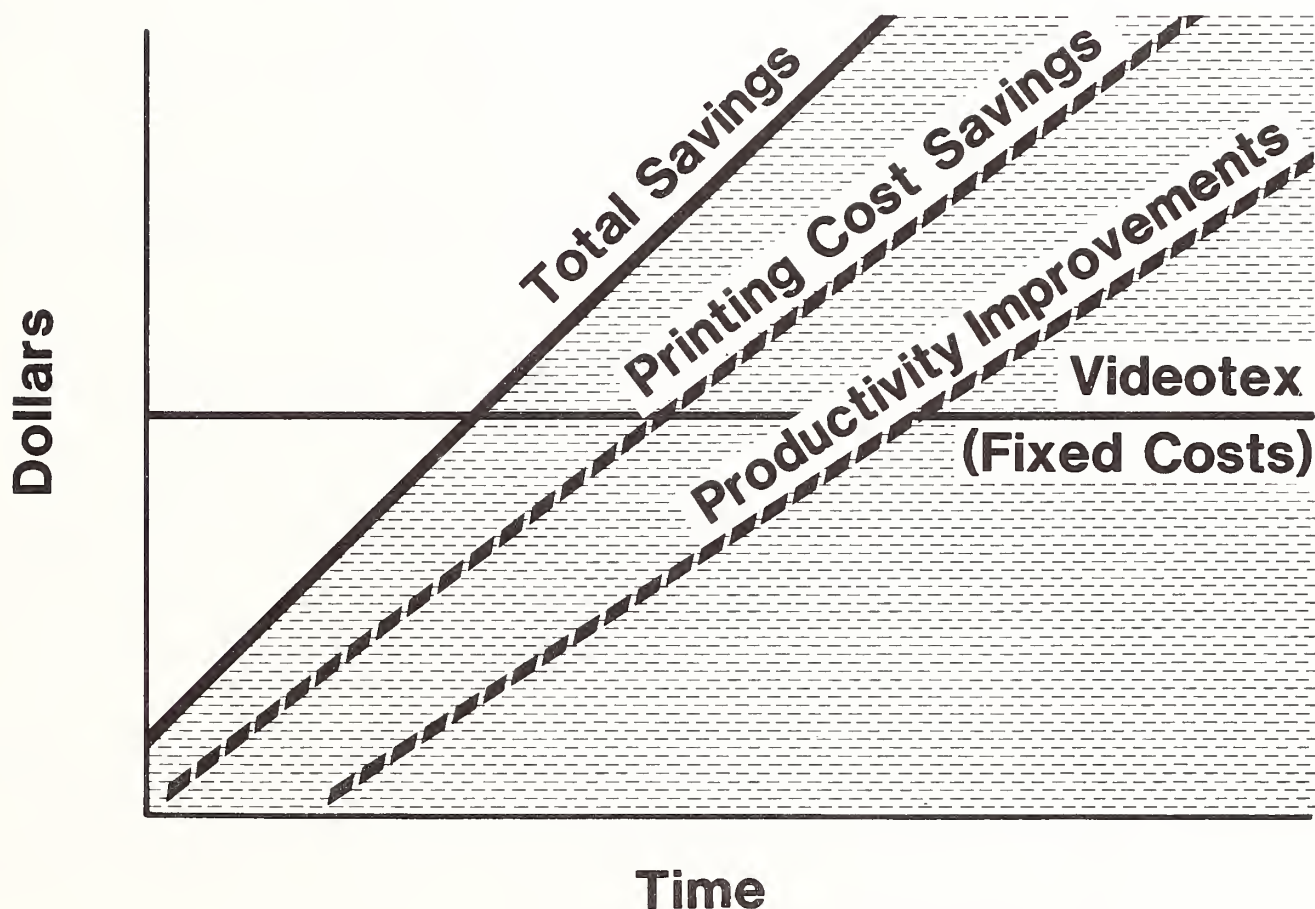
## CERTAIN APPLICATIONS MAY NEED VIDEOTEX

<b>SUITABLE FOR VIDEOTEX</b>	<b>UNSUITABLE FOR VIDEOTEX</b>
<b>Manuals</b> <b>Directories</b> <b>Electronic Mail</b> <b>Price Lists</b> <b>Schematics</b>	<b>Data Entry</b> <b>Calculating/ Computing</b> <b>Programming/ Coding</b> <b>Data Manipulation</b> <b>Word Processing</b>

#### D. ECONOMICS AND TIMING ARE FAVORABLE

- A videotex starter system can be installed for approximately \$60,000.
- Office videotex can be economically justified by printing cost savings and productivity improvements.
- Office videotex is less expensive than traditional data processing solutions to information management tasks.
- Company financial analysis is required to determine the break-even point, which is dependent on a number of company-specific variables; therefore, it is difficult to make general assumptions about videotex's appropriateness.
- Office videotex may be justifiable based on the company's need to do research and development for future applications.
- Videotex is a fairly advanced technology. While technological improvements and less expensive systems may become available, the benefits to be realized in the interim do not justify waiting, if there is a present need.

# ECONOMICS AND TIMING ARE FAVORABLE



**Break-Even Point Depends on Company-Specific Variables**

## E. THE OFFICE: A HOME FOR VIDEOTEX

- Videotex represents a set of attractive features for specific office applications; however, less complex, nongraphic ASCII solutions may be better suited for some tasks.
- Existing equipment can often be used for an office videotex system, resulting in economies and multifunctional advantages, but IS management will need to allocate special resources for videotex implementation even when installing a turnkey system.
- The standards issue should not detract from the benefits and limits of videotex. Users do need to decide upon the standard that best fits corporate needs.
- Companies considering open consumer or business-to-business videotex services should consider office videotex as a learning experience.
- In environments experiencing or anticipating difficulty with the adoption of office automation, office videotex aids the transition to multifunction workstations and helps overcome computer phobia.
- INPUT points out to prospective users that implementation of easy-to-use text graphics systems may incorporate some of the features of videotex. By labeling the evolving conceptual framework as "videotex," internal marketing of office automation could be made easier.

## **THE OFFICE: A HOME FOR VIDEOTEX**

- **Suitable Applications Exist**
- **Existing Equipment Can Be Used**
- **Resource Allocation Is Required**
- **Standards Must Be Established**
- **Videotex Provides Learning Opportunities**
- **Videotex Can Serve As Transition Tool in Office Automation**
- **The “Videotex Concept”**





III DEVELOPMENT OF ELECTRONIC INFORMATION  
ACCESS



### III DEVELOPMENT OF ELECTRONIC INFORMATION ACCESS

#### A. PROBLEMS OF PAPER-BASED INFORMATION MANAGEMENT

- It is estimated that over 50% of the work force is now involved in creating, manipulating and managing information--and the percentage is increasing. Due to the volume of information created and handled daily, corporations require efficient methods of information management as a means of survival.
- Paper-based information management methods are the most familiar.
  - Manuals, directories, product literature, bulletins, reports, memoranda are examples of messages carried on paper media.
  - Effective information management requires indexing and classification based on library science techniques.
  - Storage of archival and functional paper information puts constraints on the physical organization of a business.
  - Distributing and updating can demand inordinate work force effort thus hindering productivity and cutting profits.
- Electronic information access begins with on-line query procedures. Data base software makes possible efficient manipulation and retrieval, and search

capabilities shorten the time required to identify and locate information; yet these methods are often difficult to use.

- Accessing electronic information usually requires a certain degree of computer literacy, although "friendly" interface software attempts to bring the user closer to the electronic files.
- With the exception of Computer Aided Design (CAD) applications and business graphics, the retrieved data is usually limited to text or numeric information.
- Simpler systems, ideally incorporating color graphics, are desirable to aid in analysis and comprehension.

## B. CONSUMER VIEWDATA SERVICES

- The term "viewdata" has come to define any computerized, electronically distributed alphanumeric, symbolic, or graphic images displayed on terminals.
- Consumer viewdata services were originally promoted as a breakthrough medium for bringing information age benefits to the home. Much of the development work was done in Europe.
  - The British Prestel system was supported by the government telephone monopoly and motivated by a desire to increase network traffic, especially during nonbusiness hours.
  - French Teletel's hope was to replace telephone books with electronic directories. Other services were added by information providers (IPs).

- Viewdata covers several related technologies:
  - Teletext, Hybrid Teletext and Cabletext are one-way systems using the vertical blanking interval (VBI) of a television signal or a cable TV channel to deliver frames of information to subscribers. Hybrid systems allow dial-up requests for desired frames that are inserted into the data stream. Business teletext services are being developed.
  - Interactive CATV, as demonstrated by Warner Amex Cable Communication's "Qube," offers various services, and is primarily used for polling and pay-per-view applications.
  - Portable Teletext adapts display paging devices and portable terminals to information retrieval from coded broadcast signals, usually stock and commodity market reports.
  - Closed captioning decodes broadcast VBI information for display on the TV screen for the hearing-impaired and foreign language translation of programs.
  - Consumer videotex services offer interactive, full-color information services, using decoders attached to television sets, with the information delivered over telephone lines. The first such commercial systems have been slow to penetrate their markets.
    - Observers explain this by pointing to the sometimes decade-long periods it takes for public acceptance of new technologies, as well as the time required for costs to moderate.
    - Affecting acceptance are the market penetration of modem-equipped PCs connecting to ASCII data bases through information utilities, and computer bulletin board systems (CBBS), for hobbyists.

- INPUT suggests the term "ACSIItext" to describe data bases which do not utilize graphics.
- There are also videotex "kiosks" located in public areas, featuring tourist information, building directories, and advertising.
- Another related technology is Audiotext, which uses voice response and voice mail technologies to provide users with aural information through telephone access.

### C. BUSINESS VIEWDATA

- The distinction between consumer and business services is sometimes an arbitrary one.
  - ACSIItext Business Services. This provides technical journal articles, financial market information, and industry-specific information (such as legal research).
  - Business Videotex. INPUT defines this subset of business viewdata as characterized by the use of graphics. VideoLog, typical of such services, maintains an on-line catalog of electronics components, showing circuit paths and other product information, and is directed to computer and other manufacturers.
- Consumer and business information access methods are shown in Exhibit III-1.

EXHIBIT III-1

INFORMATION ACCESS

	CONSUMER	BUSINESS
Paper	Newspapers Magazines Radio /TV	Manuals Reports Memoranda
ASCII	Teletext Cabletext  Closed Captioning Interactive CATV Kiosks	On-Line Query DBMS ASCIIITex Portable Teletext
Videotex	Commercial Videotex	Business-to-Business Videotex Office Videotex

- Business Viewdata systems are designated as open or closed.
  - Open systems are available to anyone with the proper equipment and a service account.
  - Closed systems are limited to internal company or community-of-interest use.
- A business viewdata system may operate on its own computer system or may contract with an information service to set up "closed-host" systems operating on the service's equipment, and accessed through value-added networks or private lines.
- Past experience with all forms of viewdata indicates the potential for office videotex applications.



**IV OFFICE VIDEOTEX**



## IV OFFICE VIDEOTEX

- In interviewing IS, Telecom, and Office Automation managers, one question was repeatedly asked about office videotex: "What am I going to use it for?"

### A. APPLICATION CRITERIA AND BENEFITS

- Certain applications (described below in section B) emerge as appropriate for the videotex solution. All of these applications share at least some of the following criteria, which also describe the benefits of videotex:
  - Ease of use: Untrained users, even those without typing skills, need to use the system.
  - Fast: Response time needs to be rapid with information quickly displayed, regardless of numbers being served concurrently. Updates need to be instantly available.
  - Ease in understanding: Information needs to be self-explanatory and easily comprehended. Graphics are needed to aid understanding.
  - Fun: System navigation should be gamelike. Attractive color graphics need to be clear of clutter. The system needs to be frustration-free and work to overcome keyboard and computer phobia.

- Economy: Inexpensive terminals or inexpensive add-ons to PCs or workstations, along with existing communications links, can be easily cost/benefit-justified with minimal financial risk. Operations and management support levels--compared to those incurred by other ways of creating, producing, storing, distributing, and ultimately destroying information--need to be low.
- Interactive: Information for specific user needs can be obtained.
- Access: Decentralized workers need financial, inventory, or policy information. Access through gateways to various data bases, including commercial ones, is desirable.
- Volume: Large amounts of information need to be made available to many users.
- Learning experience: The company is having problems with the acceptance of office automation. Office videotex can ease acceptance of OA technologies. Alternately, the company may want in-house videotex experience for future business-to-business or consumer services market development.
- Transaction capability: Orders need to be processed. Videotex allows the use of standard electronic order forms.
- Communications: Electronic messages need to be posted for employees.
- Security: While information is accessed, transactions made, and messages posted, the integrity of the primary data base can be maintained by requiring passwords and system management options to control access.

- **Integration:** Much of the information deemed useful for adaptation to the videotex data base already exists in electronic form on mainframe, external, or departmental data bases. The system needs to format appropriate data for videotex display. It should also be possible to use PCs or multipurpose workstations, enhancing the value of installed equipment.
  - **Flexibility:** It is desirable for the system to be implemented first on a standalone, limited basis, able to evolve from the prototype and pilot stages to a fully integrated system, if warranted. Testing should be possible with minimal expenditure of company personnel and financial resources.
- These application criteria, representing the benefits of videotex, are summarized in Exhibit IV-1.

## B. APPROPRIATE APPLICATIONS

- It is difficult to think of information which cannot be made available through office videotex; yet certain types of information management are better suited than others to take advantage of videotex's unique characteristics.
- Admittedly, some applications may be beyond immediate practical needs. This list of possible applications is included to help generate creative thinking.
- Some of the applications are shown in Exhibit IV-2.

## EXHIBIT IV-1

### VIDEOTECH IS:

- Easy to Use
- Fast to Respond and Update
- Easily Understood
- Fun to Use
- Inexpensive Compared to Other Methods
- Interactive
- Accessible to Staff and Can Access External Data Bases
- Able to Provide Lots of Information to Many Users
- A Learning Experience for Future Applications
- Transactional
- Relatively Secure
- Usable with Existing Data and Equipment
- Flexible

## EXHIBIT IV-2

### SOME OFFICE VIDEOTEX APPLICATIONS

#### Marketing

- Electronic Catalogs
- "Kiosk" Advertising
- Price Lists
- Order Entry
- Account Status

#### Corporate Communications

- Newsletters
- Meeting Calendars
- Videotex Conferences
- Directories
- E-Mail

#### Personnel

- Manuals
- Work Assignments
- Teletraining
- Job Listings

#### Operations

- Illustrated Production Steps
- Travel Services
- Plant Schematics
- Project Management

#### General

- Information Services
- Company-Sponsored Recreation
- Emergency Medical Information

## 1. MARKETING APPLICATIONS

- Electronic brochures and catalogs display products and specifications in graphic format. When open to customers, literature response time is instantaneous.
- Product advertising is displayed on kiosk terminals placed in heavy traffic areas such as company building lobbies, or at information centers. Advertising frames can also be used for consumer services.
- Price lists are maintained, with new pricing structures posted immediately.
- Inventory levels are described both numerically and graphically.
- Orders are entered on standard forms. Inventory and production levels are automatically adjusted.
- Account status for individual clients is quickly accessible. Critical information, such as account arrears, is highlighted when defined parameters are reached.
- Shipping information is easily tracked, with maps or other displays showing customer order status and routing.

## 2. PERSONNEL APPLICATIONS

- Personnel policy manuals are available to all staff and are always up to date, replacing printed materials, which require frequent revision. With videotex, changes are instantly integrated and highlighted.
- Employee benefits, with options and a choice of plans, are compared. Open enrollment periods and new programs are quickly posted.



- Work assignment schedules are electronically posted with conflicts quickly resolved. Holiday and vacation schedules are easily adjusted and manpower requirements are maintained.
- Training schedules are posted on-line. Teletraining is accomplished in an electronic classroom environment where employees learn as schedules allow and as responsibilities and skill levels demand. Tutorials are available on various subjects, including personal computer training.
- Credit union file status is determined from the account holder's desk, with telebanking services provided.
- Job listings and employee transfer and referral incentive programs are internally posted according to Equal Opportunity Employment requirements.

### 3. CORPORATE COMMUNICATIONS

- Corporate newsletters and press releases are electronically published and distributed.
- Meeting calendars help in facility and travel planning.
- Annual and quarterly reports are available electronically, along with other stockholder information.
- Presentation graphics are prepared on the videotex frame creation system and incorporated in printed materials through available photographic processes.
- Videotex teleconferencing allows the simultaneous display of information on multiple terminals with a voice conference call supporting the presentation.
- Facilities directories guide personnel to the right building or office location, reducing transit time.

- Telephone directories are quickly updated when staff is hired or terminated, or reassigned in the organization.
- Electronic bulletin boards provide information of common or special interest. Employees can post in-house classified advertising.
- Electronic mail mitigates the frustration of telephone-tag and augments other messaging such as voice mail. Communications and participation are improved.
- Corporate library catalog information is available, with reservation capabilities.

#### 4. OPERATIONAL APPLICATIONS

- Illustrated procedure, repair and production manuals are always current and available.
- Travel guides support the efficiencies of corporate discounts. Trip planning services provide information about airline schedules, accommodations, restaurants, and client entertainment options, helping employees travel productively and in comfort. Checklists insure that required visas and vaccinations are obtained.
- Interplant transportation schedules are posted for employee convenience and efficiency.
- Supply ordering is accomplished on-line with inventory requirements adjusted accordingly. Charge-back systems are automatic.
- Corporate resource personnel directories refer workers to in-house experts for problem solving.

- Schematics, showing cable installations, wiring, air and heating ducts, equipment allocations, office floor plans, and architectural design help plant supervisors to manage facilities.
- Project management applications using CPM, PERT or other planning methods are available in graphic format to ensure smooth work flow and to maintain staff accountability.

## 5. GENERAL APPLICATIONS

- News, weather and sports information is provided on a custom-clipping basis for competitive market research, travel planning, giving background information for business calls, and as an employee benefit.
- Teleshopping at the company store offers employee convenience for work-related items.
- Video games and company-sponsored quizzes offer recreation during breaks and in employee lounges, improving morale and helping to overcome computer phobia.
- Medical information (e.g., first-aid treatment for poisoning) is maintained for quick emergency access.
- Not all applications listed are unique to videotex, but due to the nature of the technology they may be more effectively implemented on a videotex model.
- Some applications are user-motivated. Though the formats and files are established by system staff, users and departmental staff actually create and maintain certain sections of the data base.

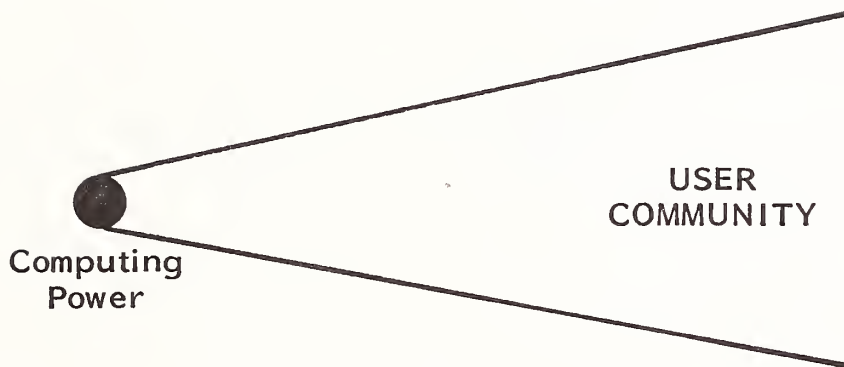
- Some data bases are best accessed through gateways to information and service providers. Examples include financial information, airline schedules, telebanking services, news and weather.
- Outside of the office environment, videotex can lead to work-at-home applications ("telecommuting"), assuming the system is "open" and a company is willing to explore this option.

### C. LIMITATIONS

- Another method of evaluating possible applications for videotex is to define what is unsuitable for office videotex.
- Generally, tasks requiring a large amount of user interaction are inappropriate because videotex applies a relatively small amount of computing power over a large community of users.
- These limitations are described in Exhibit IV-3.
  - Data entry. The repetitive functions involved are not enhanced by videotex features which may prove cumbersome.
  - Confidential information. While critical files can be protected by multiple passwords and other measures, security breaches are an on-going possibility in any system open to general use.
  - Statistical and calculation applications and other end-user computing applications. The software supporting these functions is not suitable in a videotex environment.

## EXHIBIT IV-3

### OFFICE VIDEOTEX LIMITATIONS



Videotex applies a little computing power over a large user community

Inappropriate applications are:

- Repetitive Data Entry
- Confidential Information
- End-User Calculating/Computing
- Programming/Coding
- Data Manipulation, Word Processing

- Programming and coding. Those involved in these functions would not find videotex features helpful.
- Data manipulation, word processing and document/proposal preparation. Little or no benefit is realized by attempting to apply a videotex solution to these heavily interactive functions.
- Evaluation of corporate culture and policy is necessary to help determine what is a proper application and what is not. Companies may not want to encourage workers to play games or handle their personal finances on the system.

## V TECHNICAL REQUIREMENTS





## V TECHNICAL REQUIREMENTS

- Much of the basic equipment required for implementing an office videotex system may already be in place. To make videotex features possible, additional equipment and software are necessary, with modifications required on some existing pieces.
- For security or quality control reasons, some companies may choose to maintain separate corporate computing facilities while implementing office videotex on a dedicated standalone CPU.
- The installed base is sometimes a factor in evaluating vendors offering compatible equipment and in determining what standards will be supported.
- Leading system, hardware and software products are profiled in Appendix C.
- Complete office videotex systems can be installed for approximately \$60,000. Less capable configurations, including ASCIItext systems, can be purchased for under \$8,000.

## A. HARDWARE

### 1. CPU

- Office videotex can be implemented using most existing host mainframe or minicomputers. Limited systems can be built around PCs. Residing on the computer memory are preexisting and videotex data bases, various application programs, and the videotex operating system software.

### 2. VIDEOTEX PROCESSOR

- Essentially a front-end processor which handles communications, formatting, and management, unloading these functions from the main computer.

### 3. I/O DEVICES

- Storage. The impact of additional storage requirements is a consideration in planning equipment configurations.
- Terminals. For ASCII-only services, virtually any VDT will serve. For high-quality graphics, higher resolution graphic terminals are desirable. Software or decoder boards convert and reassemble compressed graphics for display. Terminals not supporting graphics will only display text.
  - Hardware decoders incorporate a processor, a memory, and usually a character/pattern generator.
  - Upgraded personal computers and multifunction workstations are attractive because they offer local processing capabilities in addition to videotex functions. Much of the processing required for videotex may already be present, requiring only decoder software.

- Amber/Green "black and white" displays are acceptable if color is not essential.
- The simplest terminal would be a television or monitor with an attached control device integrating a decoder and modem. Home computers can also be configured for videotex.
  - On low-end configurations, a simple numeric keypad or the dual tone multifrequency (DTMF) telephone touch pad may be used; however, this is limiting, and a full keyboard is required for most office applications.
  - While some consumer systems arrange keys in alphabetical order, a standard QWERTY layout is preferred.
- Environmental considerations may indicate use of membrane keyboards or hardened terminal systems.
- Large-screen projection systems may be desirable for certain demonstration applications.

#### 4. FRAME CREATION SYSTEMS

- Frame creation systems are specially configured workstations where videotex personnel compose graphics and page formats.
  - Devices such as mice, light pens, digitizing cameras, graphic tablets, and possibly OCRs can be incorporated.
  - Prestel frames can be created at properly equipped PCs, whereas NAPLPS requires specific editing terminals.

## 5. COMMUNICATIONS LINKS

- Dial-up access through the installed plant twisted-pair wiring and PBX is the usual configuration.
  - LAN connections require system-specific interfaces.
  - CATV data services with interactive capabilities may offer an alternative for regional access.
  - VAN packet-switched networks are appropriate for dispersed location access and for access to distributed data bases.

## 6. MODEMS

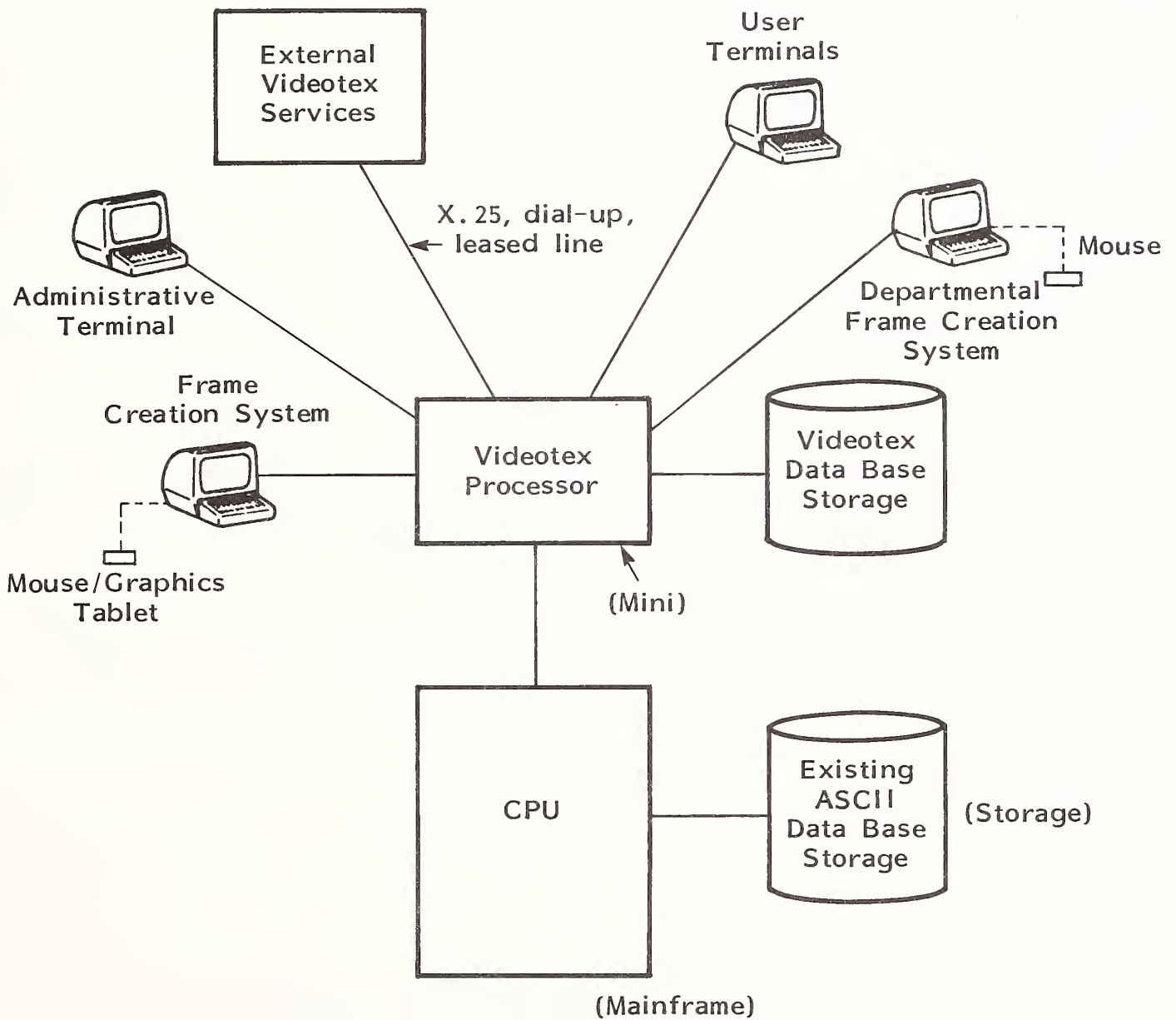
- Modems are usually associated with the terminals, or accessed through shared modem pools. Limited-distance modems (line-drivers) may be a possible solution when the distance to the videotex processor is within tolerances. Broadband LAN connections require RF modems.
- Exhibit V-1 shows a typical office videotex equipment configuration.

## B. SOFTWARE

- Software controls the hardware, communications, coding/decoding display, applications, management, and frame creation functions. In addition to software, firmware in the form of plug-in boards is available for the user side to convert PCs into videotex terminal emulators.
- Customized programs may need to be written for some communication interfacing requirements. Modules are available from turnkey system providers and videotex software vendors who offer customizing services.

EXHIBIT V-1

TYPICAL OFFICE VIDEOTEX CONFIGURATION



## I. SYSTEM SOFTWARE

- Utilities serve several functions:
  - Taking user input to produce accessible frames, with keyword assignment for searching.
  - Transferring frames from the frame creation terminal to host storage.
  - Conversion software takes ASCII raw data input from (for example) newswires or the corporate data base and prepares it for videotex page display.
  - Utilities also define and update service classes and user/terminal profiles.
- Application-specific software modules control banking and other transactions, travel services, directories, education, messaging, on-line help functions, and other common features.
- Programming software is used to develop user-written applications for customized needs and to design formatting of nonvideotex corporate data base information to videotex standards, among other uses.
- Frame creation software. Subsystems involved are:
  - Menu creation.
  - File construction, whereby options chosen on one screen lead to subsequent screens in an inverted "tree" structure.
  - Graphics and image creation.

- Text and visuals editing.
- Font and color selection.
- Frame security coding and access controls by permission levels and terminal types.
  - . Frame creation and maintenance software ideally permits untrained departmental users to construct and maintain their own videotex data bases.
- Management and accounting software:
  - Provides statistical audit trails on use, including date, time, duration of access, and screens assessed.
  - Provides summaries for evaluation of system effectiveness, internal market research, and charge-back (if appropriate).
  - Systems monitoring provides the system administrator with information on port use, availability and system status.
- Communications programs support log-in, limit unsuccessful log-in attempts, and define automatic disconnect time intervals, in addition to other communications functions. Translation tables may be incorporated to accommodate various terminal and modem types.
- Host and gateway interface software control communications options and standards. Gateways support connections to off-premises or off-system data bases and commercial services via X.25 networks.

## 2. USER SOFTWARE

- Decoder software is installed on PCs to enable service as videotex terminals, and to locally download and store frames. Alternatively, plug-in boards serve this function.
- Eventually, this family of products will be replaced by decoders on a chip now under development.

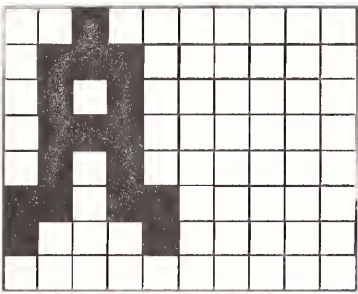
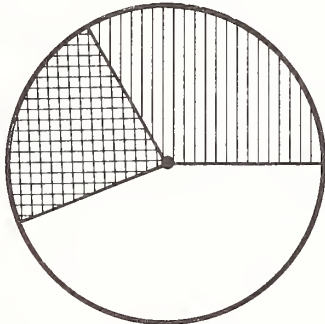
## C. STANDARDS AND PROTOCOLS

- The worldwide videotex industry is dominated by three major standards: NAPLPS (incorporating the Canadian Telidon standard), CEPT (incorporating the British Prestel and French Antiope/TELETEL standards), and the Japanese CAPTAIN standard. (Under INPUT's definition, ASCII is not true videotex.)
- The major videotex systems vendors and software providers support multiple standards.
- The North American videotex trend is toward NAPLPS; however, nonvideotex ASCII remains the dominant viewdata standard.
- The major standards each offer various benefits and features. NAPLPS and CEPT/Prestel are compared in Exhibit V-2.
- The graphics features of the currently available standards take two primary forms:
  - Alphamosaic refers to a method of displaying graphic characters and shapes using a limited set of basic mosaic elements. The display is



EXHIBIT V-2

VIDEOTECH STANDARDS COMPARISON CHART

	PRESTEL/CEPT	NAPLPS
Graphic Display		
Graphics Characteristics	Alphamosaic - Uses limited set of graphic building blocks	Alphageometric - Uses lines, arcs and points against coordinates
Resolution	Graphics are boxy	High resolution, smooth curves
Colors	Based on primary colors - limited	Unlimited color mixing
Terminal Requirements	Less Expensive	More expensive due to required intelligence
Frame Creation System	PCs can be adapted for frame composition	Requires Expensive Workstation
Image Display Time	Rapid Display	Frames need to be composed with most recognizable elements displayed first
Geographic Dominance	Europe	North America (Canada & U.S.)
Key Advantages	Less expensive	Better graphics, color
Key Problems	Lower resolution, fewer colors	More expensive

divided into a grid of rectangular cells, with subdivisions describing screen positions. The technique uses a dynamically redefinable character set (DRCS).

- . Colors are limited.
  - . Graphics tend to be "boxy," with medium resolution. Curves and diagonal lines may show "stair-stepping."
  - . Has low storage requirements, with the graphic character code fitting in RAM along with the text code.
  - . The supporting technology is relatively inexpensive.
- Alphageometric graphics describes a technique using lines, arcs, and points coordinated against the x-y axes to create patterns based on compressed digital commands called Picture Description Instructions (PDIs).
- . Colors are essentially unlimited.
  - . Resolution is higher and the lines are smoother.
  - . Hardware requires more intelligence at the terminal side and is therefore more expensive.
- A third, higher level graphics standard is called Alphaphotographic. The display of photographic images along with encoded text is similar to facsimile and slow-scan TV. Each point on the screen is addressed. Due to transmission and memory requirements, the picture shown is usually limited to a portion of the frame.

- The principal viewdata standards are:
  - ASCII. This is the communications protocol used in microcomputers and asynchronous terminals, using alphanumeric characters, special symbols and control codes. It is prevalent in viewdata, but as noted earlier, INPUT does not consider ASCII true videotex, since only primitive, character-oriented graphics are possible.
  - CEPT/PRESTEL. The British Prestel and French Antiope standards were combined by CEPT, the Conference of European Post and Telecommunications Administrations.
    - Prestel was the first videotex system, and uses an alphamosaic graphic coding scheme.
    - Images appear on the videotex screen more quickly than with NAPLPS.
    - This system is suitable for simple blocking graphics displays.
    - Currently, CEPT/Prestel terminals are lower in cost than NAPLPS. While this may be a factor in consumer markets, the desire for multifunctional workstations built around PCs seems to negate this advantage in office environments.
    - Frame creation systems are easy to use, can be based on PCs, and are also less expensive than equivalent NAPLPS systems.
  - NAPLPS. The North American Presentation Level Protocol Syntax, as advanced by AT&T, is approved for use in North America by the American National Standards Institute (ANSI) and the Canadian Standards Association. It incorporates the Canadian Telidon standard.

- NAPLPS uses a higher-level language. Data is more compact than CEPT/Prestel, taking about 1/3 the space of a normal graphics file.
  - Graphics, based on alphageometrics, have higher resolution and greater complexity than CEPT.
  - Limited animation displays are possible.
  - Complex graphics appear on the screen more slowly than on CEPT/Prestel systems. This can be accommodated by designing frames to reveal recognizable elements first, with details and color filled in. Display time may also be improved with local, hard-disk storage of frames (e.g., IBM PC-AT) with updates downloaded from central videotex storage as needed; this substantially increases terminal costs, however.
  - Another disadvantage is that NAPLPS requires intelligence at the terminal end to reconstruct compressed graphics, meaning more expensive hardware until this intelligence is available on inexpensive ICs.
  - Further, NAPLPS requires larger memory in both RAM and ROM, more processing power, and higher-priced frame creation systems.
  - NAPLPS software and plug-in boards are available for under \$250.
- CAPTAIN. Character and Pattern Telephone Access Information Network is the Japanese standard, designed for the unique requirements of that language, using alphageometric protocols and an extended character set with alphaphotographic characteristics.

- INPUT does not expect this standard to migrate significantly to North America and notes that several Japanese firms are backing NAPLPS in their product development, even for domestic use in Japan.

#### D. FEATURES DESIRED

- In planning an office videotex system, certain features are desirable. These are extensions of the benefits listed in Chapter IV, Section A.
  - Clear instructions. "Help" menus should correspond to the level of user proficiency. A "help" key should be assigned to a function key, or integrated into the keyboard itself.
  - Ease of use. Someone sitting at a terminal for the first time should be able to log onto and move through the system with no training. This means a menu-oriented operation.
    - Optimally, the user should not need typing skills, but could simply position a cursor over menu items in order to navigate to the desired information.
    - The framing structure should clearly instruct the user in both how to step backwards to the main menu and how to proceed to the desired information.
    - More advanced users should have the option of a command mode, without the hindrance of cumbersome menus.

- Frame comprehension. A videotex system is frame oriented. Each display is a self-explanatory, self-contained unit.
  - Frames must be uncluttered and attractively designed.
  - Characters should be oversized and should use various fonts.
  - Graphics can relate to the information presented; for example, a data base of travel information may show a representation of an airplane.
- Ease of frame creation. System operators should be able to create easily without a degree in art.
  - This might indicate use of standard frame formats and/or mouse-type controls, allowing easy shaping of diagrams and charts and easy color selection.
  - Color coordination assistance may be desirable to assist those who are color-blind or unable to design frames with complementary colors.
- Inexpensive terminal devices and/or inexpensive add-ons to PCs or workstations should be available, allowing a wide range of installed-base terminals to be used with the system on a cost-effective basis.
- Similarly, the videotex system should be able to use other existing hardware, such as the CPU and the communications links.
- "Transparent" gateway capability is desirable, permitting users to access information stored on multiple company mainframes or minicomputers and to retrieve information in any format from off-net viewdata systems.

- Gateway directories indicate the services and data available. This may be added to the system later on, but the ability to do so should be an early consideration.
- These features are shown in Exhibit V-3.

## EXHIBIT V-3

### DESIRED OFFICE VIDEOTELETYPE FEATURES

- Clear instructions
- Easy use
- Frame simplicity
- Easy frame creation
- Inexpensive terminals or inexpensive PC conversion
- Uses existing hardware and communications links
- Data base "transparency"



VI OFFICE VIDEOTEX CASE STUDIES



## VI OFFICE VIDEOTEX CASE STUDIES

### A. CASES

- Office videotex is a relatively new office systems concept, and there are only a few dozen operational installations. The first to implement internal systems were leading computer and communications companies.
- Exhibit VI-1 compares six office videotex installations.

#### I. PACIFIC BELL "INFO-PAC"

- This system was implemented in January, 1984 primarily to improve in-house communications on a cost-effective basis, and also to acquire a working knowledge of the technology to help evaluate impact on network traffic.
- Info-Pac operates on an IBM/SVS 1.1 Version. It began based on the Prestel standard, but has been converted to NAPLPS.
- There are 250 terminals--videotex-capable IBM PCs--serving over 400 users statewide.
- IBM equipment was chosen because of availability, multifunctionality, color graphics capability, and ease of use, and because terminals can be easily upgraded.

EXHIBIT VI-1

SIX OFFICE VIDEOTELEX INSTALLATIONS

OPERATOR	COMMENTS
Pac-Bell Info-Pac INFO-PAC	General Applications
IBM	General Applications
General Motors - Buick Division EPIC	Open to Dealers; Supports Sales
General Foods	General Applications, Possible Consumer Services
Monmouth County Board of Realtors/ AT&T IS	AT&T Manages System; Provides Real Estate and Relocation Services
Digital Equipment Corp.	Electronic Brochures and General Applications

- When operating in the Prestel mode, frames were created on a specially-equipped IBM PC. With the move to NAPLPS, three frame creation systems are used: two are based on PCs using Cablesare's PicturePainter and Verticom's PLP 200 software. There is also a Frame Creation System (FCS) from AT&T.
- Some 25 departmental information providers manage sections of the system's information base.
- Senior and middle management personnel are the primary users.
- Available features include company news, marketing information, electronic mail, electronic directories, conference schedules, local event announcements, and news stories of interest to department managers. Other applications are being considered.
- Plans include expansion to other offices around the state, gateways to external data bases, and transaction capabilities.
- Info-Pac is managed jointly by the information systems organization with responsibility for hardware and software, and an operations/administration staff within the marketing information group with additional responsibilities for industry relations and analysis functions.
- A key benefit of the system is that it has introduced staff to easy-to-use microcomputing, giving users confidence to try PC applications such as word processing and spreadsheets. Another benefit is the ease of information creation.

## 2. IBM/ARMONK, NEW YORK

- Experimenting in-house for several years with three systems, IBM maintains internal videotex evaluation facilities based in Armonk, New York; Dayton, Ohio; and Atlanta, Georgia.
- The Armonk system serves approximately 400 users. It is based on the IBM Series I, supporting 32 ports and several hundred thousand frames. Additionally, information stored on corporate data bases is converted to the videotex format for display on specially-equipped IBM PCs. The system is being changed from Prestel to NAPLPS.
- They provide a telephone directory, travel information, stock market prices, personnel services, financial planning services, supply ordering, product center support, and a reservation system for meeting rooms.
- The displays are formatted so that, for example, travel schedules begin with routes between company locations and corporate discounts at nearby hotels. Stock market queries are first answered with IBM's current prices.
- Employees are able to use financial planning services in a question and answer format for estate, retirement and personal planning, with complicated problems resolved on-line.
- Frames are created with an on-line editor program installed at designated terminals, including IBM PCs.
- Evaluations show positive results. An early-identified need for keyword search capabilities is now being implemented.
- A company spokesman says that internal videotex, like computers, can be justified primarily as a productivity enhancer.

- The Armonk facility is managed by a team consisting of a Series I programmer, a VM programmer, an operator, an administrator, and two senior professionals overseeing the project, with departmental information providers.

### 3. GENERAL MOTORS, BUICK DIVISION--EPIC

- The Electronic Product Information Center is based at Flint, Michigan and is operated by the "Marketing Through Technology" Department. EPIC is open to Buick dealerships.
- The company originally piloted a system based on Telidon/NAPLPS terminals with a DEC VAX 11/780 minicomputer at its heart, and IBM PC XT's supporting IBM/videtex software as the terminals. Connections are established through dedicated leased lines and 1200-baud modems.
- Now, EPIC is based on IBM's PC videtex system and is controlled by IBM-ATs based at the dealerships, with information downloaded from the company mainframe computers.
- Features include a 2,000-frame product information file, a car configuration program that allows sales staff to "build" a car based on customer-desired options, a "Dollars and Sense" program providing financial information on loan payments and fuel economy calculations, a car locator function that searches other dealer inventories for specific model availability, and an order status function that dials into the main office computer to check on the status of an ordered vehicle.
- Access to public data bases (CompuServe, Dow-Jones, and the Source) is also supported.
- A billboard function automatically activates when a terminal is inactive for ten minutes or more. This cycles through a set of product advertising screens.

- In pilot testing, two terminal types were distributed to dealers and others on the system: a stand-up, circular cabinet terminal, and a desk-style circular cabinet with chairs for prospects. This latter cabinet has been modified based on dealer input and is the one which will be offered when the system is fully implemented later in 1985.
- Comments during the pilot program centered on the speed of the system, which relied on leased-line access to the DEC VAX. The second generation of EPIC operated from PC XTs, but response time was still viewed as slow. With the migration to PC AT systems, the company feels that problems of response time have been solved because the data base is downloaded in off-hours to local storage on the micros in dealer locations.
- Eleven people are working on the project in the areas of frame creation, information processing, data entry, verification, documentation, and training.
- Buick cost-justifies EPIC by its saving of orders that otherwise would be lost due to customer dissatisfaction with incorrect or outdated information.

#### 4. GENERAL FOODS

- The New York company uses Videodial's TSV 5000 software (which runs on an IBM mainframe) for its developmental internal videotex system that uses mainframe stored information (see product profiles in Appendix C).
- During the system's one year in operation, the company has explored in-house applications and is considering an information-provider role to consumers on public videotex systems, and possibly to others in the trade.
- Color graphics capability is described as "the whole value," other systems being available for text-only information.



- Project staff consists of six people, with centralized frame creation services, data base maintenance and administration under the Information Services Department.
5. AT&T REAL ESTATE INFORMATION SERVICE/MONMOUTH COUNTY BOARD OF REALTORS
- Approximately 250 real estate offices representing over 2000 realtors in this New Jersey county access this NAPLPS system, managed by AT&T Information Systems.
  - AT&T-IS developed the application as a demonstration of capabilities and as a forerunner of future services, as well as in an attempt to make the industry aware of the possibilities of mechanized data bases.
  - Under terms of the contract, AT&T maintains the network and handles frame creation at its facilities, but the Board owns the data base.
  - Sceptre terminals are used by the agents.
  - AT&T also provides an extensive, continuing training effort and user support through an "800" number response center. This is viewed as necessary due to the cross-section of people represented in the real estate community, representing a variety of skills and concerns about the technology. One of the first questions asked by new users is, "What can I break?"
  - Graphically displayed are drawings of houses, floor plans, local multiple listings, street and zoning maps, distances to various points, community profiles, and other relevant information. Current interest and mortgage rates plus financial requirements for specific loan packages are also provided.
  - A large number of corporate offices are located in the community and the system has been particularly helpful in executive relocation services.

- Electronic mail can be routed among realtors.
- Reaction has been positive, with user suggestions centering on frame design improvements (e.g., to facilitate house-hunting in specific areas).
- Future plans include the enhancement of visuals with digitized photographs to support textual property descriptions (later in 1985), the ability to match client profiles with appropriate listings, and the opening of similar services elsewhere.
- Separately, sources at AT&T's Cellular Radio Division reported plans to provide specially-equipped Buick automobiles with videotex terminals able to display listings in graphic format to prospects while in the field.

#### 6. DIGITAL EQUIPMENT CORPORATION--DECview

- DEC is very active in videotex, promoting its systems as part of office automation. Its internal system was implemented to develop applications, and also to satisfy the company's widely distributed information management needs.
- The internal system links 54 computers internationally, with over 5,500 subscribers. It was originally based solely on ASCII, but now supports NAPLPS as well.
- The system is managed in distributed fashion, with departmental information providers maintaining individual data bases. The company compares the management structure to a telecommunications group, but notes that in some office videotex implementations, finance or other departments may manage the facility. Project management skills rather than technical knowledge is needed.

- The system is configured on distributed host computers ranging from a Micro Vax to a VAX-based 86000 system with DECnet, X.25 and satellite links to various locations, supporting a transparent user interface regardless of accessed information location.
- Applications include bulletin boards, newsletters, catalogues, electronic brochures, order processing for manuals and business forms, personnel policy and procedure manuals, financial data comparing company stock to other computer manufacturers, price lists comparing DEC and competitive products, and travel services.
- Economic justification is based on savings in print management, savings on traditional data processing applications and data maintenance, and also on reduced training costs for end users compared to other methods. The company's videotex training manual consists of a single 3" x 5" card.
- Planned future enhancements include Prestel and CEPT capabilities, as well as additional gateways to external data bases.

## **B. ANALYSIS AND CONCLUSIONS**

- Whereas several office videotex systems are operated by communications and computer companies motivated at least partially by a desire for in-house experience in product and service development, other industry groups are applying the technology in productive and beneficial ways.
- Some of these systems demonstrate that responsibility for data base management can be distributed among departments, with ease of information creation aiding in this process.

- Some operators are opening their systems to customers and sales agents, thus ensuring the timeliness of information distribution in the marketing chain. Others are using it primarily as an upper- and middle-management tool.
- System managers are of course prone to describe user acceptance in favorable terms, but there is no reason to doubt that acceptance levels are indeed high, particularly when operations staff is responsive to requests for features and to suggestions for system improvements.
- Similarly, though they are unwilling or unable to quantify amounts, system managers report that office videotex is saving money as it improves productivity.
- Management structures vary, but one operator notes that technical knowledge is not a primary requirement, rather that project management skills are more important than technical knowledge in implementing and maintaining an office videotex system.

VII OPERATIONAL REQUIREMENTS



## VII OPERATIONAL REQUIREMENTS

### A. PLANNING A VIDEOTEX SYSTEM

- Because of the expense and complexity involved, a comprehensive planning process is needed to evaluate the usefulness of office videotex and to select the correct solution.
- The planning process should provide the IS manager with "ammunition" in support of proposals presented to corporate management.
- Further, the process should help build an alliance across departmental lines. A task force representing involved departments is desirable in developing the plan.
- It is politically important to involve personnel at all levels. Involved staff is more likely to accept and endorse recommendations.
- The services of an experienced outside consultant may be useful in situations where departmental needs are in conflict, and when technical expertise is needed.
  - The consultant can help in conflict resolution and can provide focus to the project.

- If a choice of vendors is determined by the nature of existing equipment, vendors may provide advisory services.
- Conversely, if a number of systems is being considered, vendor consulting services may not be objective.

## B. ISSUES AFFECTING PROJECT DECISIONS

- A number of questions need to be answered in approaching the office videotex plan. The issues they involve will provide important criteria for a "go/no go" decision.

### I. ORGANIZATIONAL ISSUES

- Does the company recognize a need to remain competitive by installing modern facilities?
  - Is the company observing increased profits for its rivals due in part to modernization of plants and the implementation of productivity enhancements? Is it believed that improved internal communications will positively affect productivity and profitability?
  - Is upper and middle management getting the information needed quickly enough for decision support?
- Has the company decentralized? How have internal information traffic patterns changed? Is it an appropriate time to take a systems approach to information management?
- Does the corporate image support the use of advanced technology?



- Is the company experiencing or anticipating difficulties in the acceptance by its personnel of office automation?

## 2. FINANCIAL ISSUES

- Is the financial climate favorable for equipment purchases?
- Based on an economic analysis, is office videotex a cost-effective solution to at least some information management problems?

## 3. EQUIPMENT ISSUES

- Has the company added noncommunicating terminals and freestanding systems?
  - The upgrading of this equipment to videotex capability can facilitate the exchange of information and resources as part of an overall office automation strategy based on multifunctional systems.
- Is the company's CPU suitable for videotex applications?
  - Alternatively, the company may have reasons for wanting videotex, but may wish to maintain separate computing equipment or use a third party's services.
- This IS manager should also determine:
  - What will be the impact on staffing?
  - What long-term needs will the videotex system address?
  - How can we recover with minimal risk if the videotex system is not accepted?

## C. CURRENT AND FUTURE REQUIREMENTS REVIEW

### I. NEEDS ASSESSMENT

- It is important to understand the structure of the company's communications channels by conducting a needs assessment, which includes a status quo review.
  - Examine costs in each area suitable for videotex, focusing on text and image communications--including order entry, data base queries, and messaging.
  - What kinds of information are transmitted? Between whom? How often? By what methods? What about changes tomorrow?
  - How is equipment currently distributed? What departments will use the proposed system? How many new terminals are needed and how should they be placed?
  - What are the company's growth plans and how might the videotex system expand within those plans?
  - Have communications been adjusted to adapt to current limitations? What increased costs can be identified due to these limits?
- Needs assessment can be part of a wider look at the company's communications processes. Specific procedures relating to the videotex project are:
  - An equipment inventory to identify terminals which can be upgraded with videotex capabilities.

- A user survey to determine likes and dislikes about current information access methods.
  - Identify problem areas where videotex may offer a solution.
  - Identify cases where lack of information resulted in unproductive time, poor customer response, or lost orders; for example, is marketing getting its price changes to the sales force quickly enough? Can the order entry process be streamlined?
- Determine traffic statistics for functions which would migrate to the office videotex system (e.g., electronic messaging, data base access).
- Map organizational structure showing work relationships. Show physical and electronic communications links and calling patterns. For example:
  - How are interdepartmental memos now distributed?
  - What are the informal information flow paths?
  - Where is there duplication of effort and files which could be centrally maintained on the videotex data base?
- Determine features wanted. How important, for example, are color graphics?
- Determine special circumstances which need to be addressed, such as security.
- Determine any physical requirements or constraints: is there room for equipment?

- If the needs assessment does not lead to a videotex implementation decision, the process will help determine how best to manage present information systems.

## 2. UNDERSTAND CORPORATE GOALS

- Orient the videotex plan to the corporate strategic plan and divisional plans, using the language and timeframe of those plans.

## 3. ANALYZE CORPORATE FINANCIAL CONSIDERATIONS

- What funds are now available to implement recommendations? What are the limitations? Will funds be available in the future?
- Does the company have policies governing capital equipment: leasing, renting, purchasing?

## 4. RECOGNIZE CORPORATE CULTURE, PERSONNEL, AND POLITICAL FACTORS

- Perhaps the most difficult and far-reaching issue which videotex planning may trigger is: "What organizational changes make sense in addressing the future information system needs of the company?"
- What are executive and managerial attitudes toward office automation?
- How much support or resistance will the plan arouse?
- What is the corporate self-image? Will it dictate functional, design, or stylistic decisions--particularly if the videotex system is open to customers?

## 5. EVALUATION PHASE

- Gather and organize vendor information, attend trade shows, and talk with industry peers to gain insight into various perspectives. Evaluate alternatives generically; choices will be narrowed later.
  
- Evaluate desired features, e.g.:
  - Monochrome versus color.
  
  - Graphics or ASCII only.
  
  - Resolution desired.
  
  - Special terminals or PC/workstation access.
  
- Conduct on-site evaluation of systems being considered and interview users of the type of equipment you are considering, particularly those having organizations that are structured like yours.

## 6. DECISION POINTS

- Once a decision has been made supporting a videotex solution, the specifics of that solution need to be addressed.
  - a. ASCIItext or Full Color Graphic Videotex?
  
- If the ability to distribute electronic graphics is clearly not needed, ASCIItext is the choice. Development of an easy user interface may be the objective.

- b. Open or Closed?
- There are degrees of accessibility. The system may be accessible only from within the organization, or it may include ports for access by field offices or customers.
- c. Standards
- If videotex is chosen, which standard fulfills your requirements?
  - High resolution indicates NAPLPS, simpler graphics indicates CEPT/Prestel with somewhat lower costs.
  - Is the installed base of equipment compatible?
  - Are desired external data bases compatible?
  - Will the standard be supported in the long-term? Will it fulfill long-term needs?
- d. In-House or Timeshared System?
- Implementing videotex is possible using outside support centers and service bureaus, i.e., remote computer timesharing specifically for videotex.
  - A third-party computer is used.
  - Third-party software analysts, programmers and other support staff are used; therefore, impact on in-house staff is minimal.
  - Remote support eliminates the need to tie up existing on-site equipment or to purchase new equipment.

- It is suitable when the company's primary computer activities leave little capacity for videotex.
- It allows an opportunity to assess the videotex solution for future in-house implementation.
- The service bureau is a suitable solution when only a small, specialized, closed-user group is projected.
- e. Internal Development or Turnkey Systems?
- Companies motivated by a desire to understand videotex from the ground up may wish to develop their system internally; however, several factors indicate a turnkey decision:
  - Company data processing application backlog may preclude timely implementation.
  - Staff expertise may not be sufficient. Resources may not be available to procure this expertise.
- Consulting firms can assist the company in developing its videotex project on a short-term contractual basis.

#### D. REPORTING TO MANAGEMENT

- Once a course of action has been determined, IS must justify the recommendation to management.

- Though a verbal report may suffice in some situations, the expenditure of significant funds or a major project implementation usually requires a formal, written report.
- Exhibit VII-1 charts the steps toward office videotex decisions.

## E. ECONOMIC CONSIDERATIONS

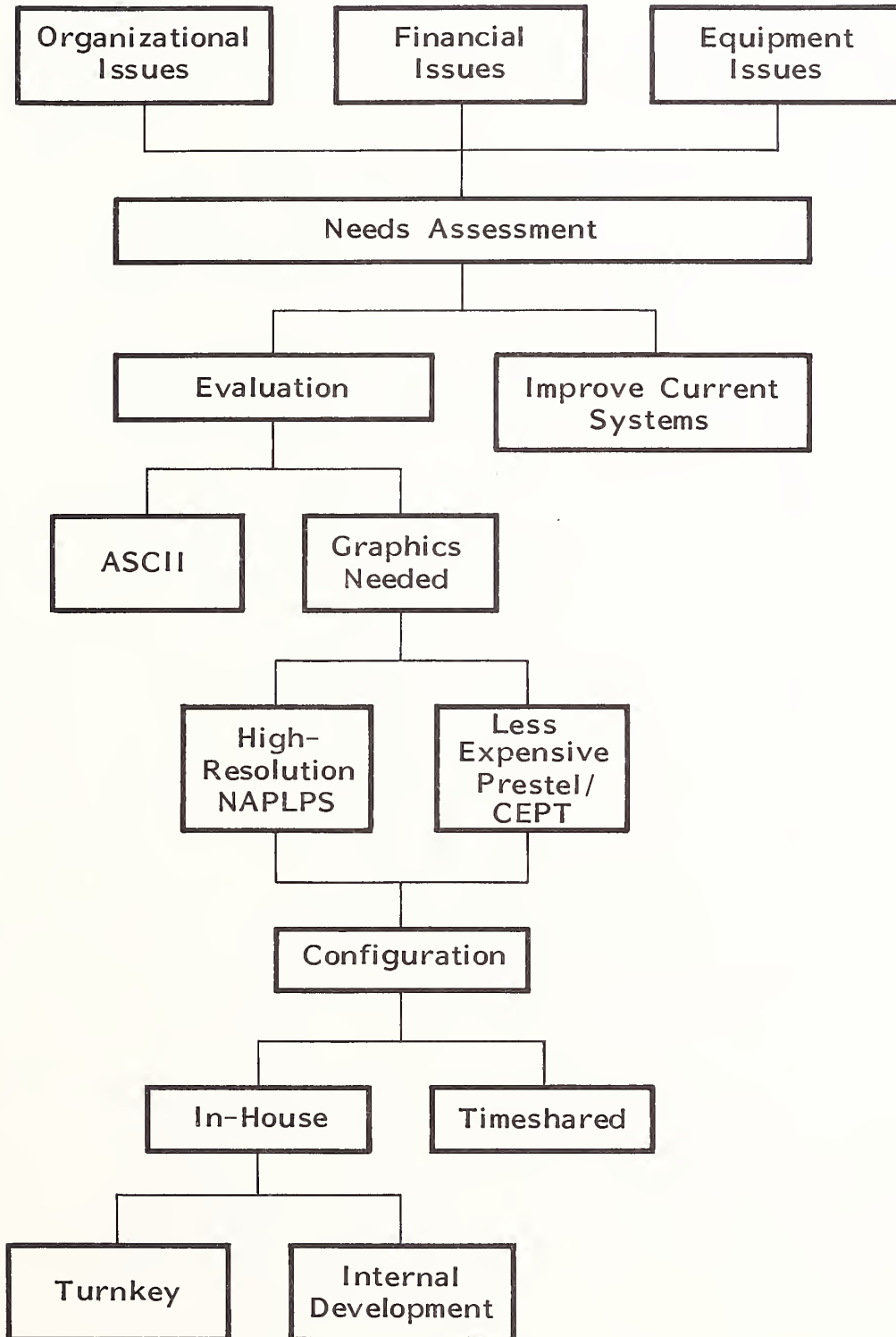
### I. OVERALL ECONOMIC JUSTIFICATION

- The procurement, installation and operational costs of any new system must be cost-justified.
- Economic motivation can be extrapolated from previous consumer videotex experience.
  - British viewdata was developed to increase traffic on the telephone network, particularly during nonbusiness hours.
  - The primary French motivation was the desire to reduce the expense of telephone directories.
  - Additionally, both countries wanted to be in the forefront of new technology development, in anticipation of future markets.
  - U.S. companies active in viewdata are motivated by a desire to sell corporate information publicly, or to extend marketing services electronically.
    - This accounts for the participation of media organizations such as Time Magazine, CBS, and Dow-Jones, and the involvement of diversified marketing organizations, such as American Express.



EXHIBIT VII-1

STEPS TOWARDS VIDEOTEX DECISIONS



- Banking industry participation is motivated by a desire to reduce "back office" processing expenses with home banking.
- Therefore, justifying an office videotex system in economic terms can be based on:
  - Cost avoidance.
  - Research and development investment.
  - The value of extending existing information and services to broader markets and/or users.

## 2. REAL AND INTANGIBLE BENEFITS

- Incremental hardware, software and operational costs can be determined based on the planned system and support configuration.
- This needs to be compared to expected savings, which can be partially quantified; however, some benefits may be difficult to describe in financial terms.
- Hardware costs may replicate existing or projected expenditures, affecting how videotex expenses are allocated.
  - For example, the company may be planning to procure additional PCs or terminals as part of its office information plans.
  - In this case, only videotex decoder software/boards and system-specific costs should be charged to the project.
- Conversion costs would be kept low by using existing corporate data base files.

- System management expenses can be estimated based on required application development and other effort associated with implementation.
- A system's administrator and one or two frame creation specialists may be needed, but since departmental information providers ideally develop and maintain sections of the data base, little, if any, additional personnel would normally be required. The system administrator may have other responsibilities.

a. Tangible Benefits

- Determine what savings can be realized by converting various print-based manuals and procedures to electronic publication. Reduce this figure by an estimated amount covering the expected volume of paper-based materials. Time spent in document preparation will remain constant, but savings will be realized from reduction of waste in updating information.
- Videotex may be justified by a payback projection based on printing cost savings alone.
- Additional savings may be possible by replacing corporate video production with office videotex presentations.

b. Less Tangible Benefits

- The savings realized by analyzing time value benefits is sometimes difficult to determine. Nevertheless, a realistic projection may be based on:
  - Estimated value of productive time saved by referring to electronically available documents and using on-line services, such as supply ordering and facility scheduling.

- Estimated value of time saved by personnel who normally would look up reference materials for staff.
- Estimated savings in telephone calls for routine information.
- Estimated savings in implementation compared to traditional data processing tools due to individual departmental maintenance of data bases.
- Estimated savings on training required for more complex information retrieval methods.

c. Intangible Benefits

- Other benefits are qualitative and difficult to price. These include:
  - Improved quality of work life.
  - Staff morale improvements.
  - Training benefits.
  - Competitive advantages of instantly available, timely information, particularly that used by field offices and distributors.
- Exhibit VII-2 is a suggested worksheet designed to help determine the economic factors associated with implementing and managing an office videotex system.

EXHIBIT VII-2

COST/BENEFIT ANALYSIS WORKSHEET

<b>TANGIBLE COSTS</b>	
<u>Hardware</u>	
- Processor	_____
- Terminals	_____
. Modems	_____
. Decoder Boards	_____
- DEDUCT planned terminal/PC acquisitions regardless of videotex	( _____ )
<b>SUBTOTAL Hardware</b>	_____
<u>Software</u>	
- Videotex software package	_____
- Decoder packages	_____
- In-house or 3rd-party software development	_____
<b>SUBTOTAL Software</b>	_____
<b>TOTAL SYSTEM COSTS</b>	_____
<u>Personnel</u>	
- Administrator (percent of time)	_____
- Frame creation personnel	_____
- Other personnel	_____
<b>SUBTOTAL Personnel expenses - 1 yr.</b>	_____
<b>TOTAL EXPENSES - First Year</b>	_____

Continued

EXHIBIT VII-2 (Cont.)

COST/BENEFIT ANALYSIS WORKSHEET

<b>SAVINGS ANALYSIS</b>	
Printing costs: (by department)	_____
Publication distribution costs: Mail courier, misc.	_____
DEDUCT continuing printing costs	( _____ )
<b>SUBTOTAL Estimated printing savings</b>	_____
Video production estimated savings	_____
Productivity gain estimates (by departments)	_____
Telephone cost savings estimate	_____
Estimated training cost savings	_____
<b>TOTAL ESTIMATED SAVINGS</b>	_____

Compare Tangible Costs to Estimated Savings  
to Determine "Pay Back" Period

**Intangibles**

- Improved quality of work
- Improved staff moral
- Value of Timely Information

## F. TIMING

- Videotex is an advancing technology, but the major components are familiar.
- Future improvements will serve essentially to "fine tune" the technology.
- Competitive factors may lower prices and new, presumably less expensive systems are expected from Japanese manufacturers.
- In INPUT's opinion, waiting for cheaper equipment does not appear justified if there is a present need for office videotex. The economic benefits that will accrue in the interim will offset any savings realized by deferring purchase.

## G. IMPLEMENTATION

- Office videotex system implementation follows the same procedures as the implementation of any computer, office automation or telecommunications system.
- Generally, it is a good idea to follow the threefold approach of prototype, pilot, and production. This strategy follows a progression of implementation with low investment at the outset, when the risks are greatest.
  - Prototype: One user community tests a portion of the implementation plan. This stage is designed to enable discovery and assessment of technical weaknesses. Several competing products may be tried to determine what is best for the company. This can be accomplished by either short-term lease arrangements or evaluation programs.

- Pilot: Wider implementation. Seeks to identify human factors rather than technical factors that need to be considered before full implementation. This stage may also be used to test assumptions on "before" and "after" productivity levels.
- Production: Full implementation. The original plan may be modified based on earlier experience.
- Post-implementation review occurs some time after full implementation to determine if the benefits projected are being realized, and if not, what can be done to improve the situation.

#### H. OPERATIONAL ISSUES

- A number of organizational issues need to be addressed concurrently with project implementation:
  - Who will have access to the system? Where will terminals be located?
  - How and when will the data base be updated? Who will have responsibility?
  - For how long will duplicate, paper-based information be maintained?
- Videotex system policies should be established under the aegis of the appropriate administrator.
  - Guidance can be obtained from groups like the Office Videotex group of the Videotex Industry Association (VIA).



- Company data base managers would also have perspectives to offer, based on current use patterns.

## I. MANAGEMENT/MAINTENANCE

### I. DEPARTMENTAL RESPONSIBILITY

- A department needs to be assigned responsibility for the videotex system. Two models are available.
  - In consumer viewdata, a service center manages the system with Information Providers (IPs) maintaining individual data bases. For large corporate installations, a separate department may centralize the required coordination functions within, say, the corporate Information Center (IC). Individual departments serve as IPs, using formats designed by IC staff.
  - A primary Information Provider, such as Marketing Information, Personnel, or Finance may manage the system. Technical knowledge is not required, but project management skills are needed.
- In any case, DP/IS support is needed, and would ideally take the lead in implementing and managing an office videotex system. Its interests are involved and its expertise is required.

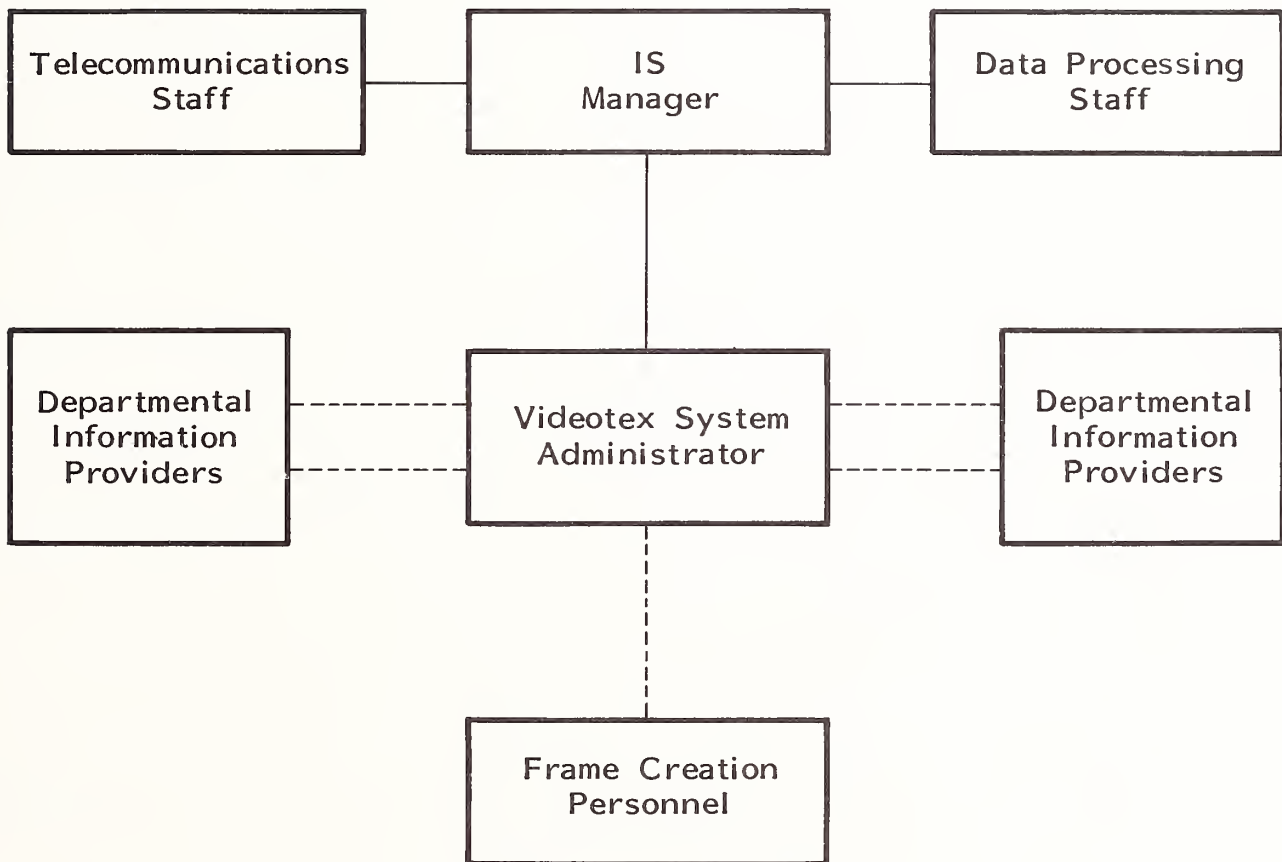
### 2. PERSONNEL REQUIRED

- DP staff is needed in the design and implementation phase to solve interfacing problems, to write application software unavailable from outside sources, and to install and maintain equipment.

- By definition, videotex is easy to run. The only unique personnel needed are those involved in the frame creation process.
  - Depending on the data base size, one or two staffers, perhaps from the graphic arts or data base manager's department, can be assigned frame creation responsibilities.
  - Frame creation personnel should ideally have graphic arts abilities, be able to design frame formats for the corporate IPs to essentially "fill in" data, and be able to provide guidance on the mechanics and aesthetic aspects of frame creation.
- Depending on the size of the system and volume of supervision required, a system administrator or coordinator may be required, perhaps on a part-time basis.
- Exhibit VII-3 shows an example of personnel organization in a videotex unit.

EXHIBIT VII-3

SUGGESTED VIDEOTEX UNIT  
PERSONNEL ORGANIZATION





VIII TRENDS IN OFFICE VIDEOTEX



## VIII TRENDS IN OFFICE VIDEOTEX

- Based on observation of marketplace and technological trends, INPUT forecasts the following events as affecting office videotex.

### A. MARKETPLACE FACTORS

- As noted, consumer videotex has been slow to develop in the U.S. For at least the medium term, office videotex services will represent a larger market than consumer services. It will be viewed as an automated corporate information center.
- It is likely that consumer videotex success will first come to the existing ASCIItext information utilities, rather than to videotex systems now operating. These text-only services will upgrade to NAPLPS and build on their existing base of subscribers.
- Trintex Corporation, backed by Sears, CBS, and IBM, will put considerable resources behind a consumer service later in the decade. The company will benefit from the experience of others, and its success will affect office videotex's prospects.
  - Trintex service will probably be based on a multifunctional PC terminal, such as the PCjr. and compatibles.

- IBM has been testing multiple office videotex systems in-house for several years.
- AT&T has experience in pioneering ventures and will continue to be a major factor in videotex.
  - With experience in the consumer and business videotex markets, AT&T can apply adequate resources to continue the "battle of the information giants" in this area.
- DEC, with the most machines used for videotex, will continue to be a market force in office videotex. Aggressive Japanese companies, such as Sony and Fujitsu, will also be players.
- The other major computer firms will continue their videotex development in office systems, relying on their installed base to pull the technology into customer organizations.
- Appreciation of the videotex solution to certain internal office information problems will continue to grow, driven by vendor marketing and the conceptual framework of the technology.

## B. TECHNOLOGICAL TRENDS

- NAPLPS decoders on a chip will become available from the major semiconductor manufacturers, possibly during 1985.
  - These ICs will obviate the need for standalone decoders, plug-in boards, and software.

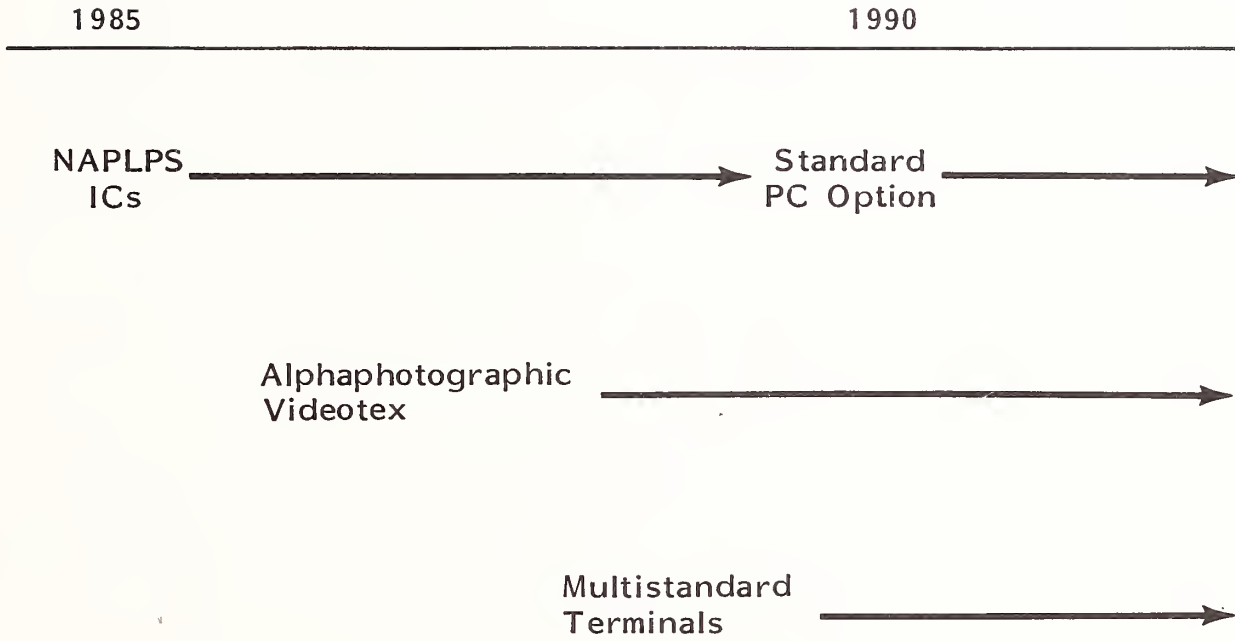


- The NAPLPS decoder chip will become standard, or a very low cost option, on most PCs, terminals, and workstations, thus effectively establishing the U.S. standard once and for all.
- The modem-on-a-chip will likewise become available.
- Volume production of these ICs will mean lower videotex-capable terminal costs.
- Alphaphotographic systems coupled with high definition display monitors will emerge, allowing color photo displays. Compression techniques coupled to emerging PC-based videoconferencing will compete with facsimile for "true copy" document transfer.
- Videotex-supported computer conferencing, with easy creation and display of graphics, images, spreadsheets and documents, will be increasingly useful in decentralized organizations.
- Local Area Networks (LANs) will increase videotex transmission speed, overcoming the screen-refreshment time lag of NAPLPS systems--a frequent user objection to the standard.
- Frame creation systems will routinely employ digital camera inputs. Easily manipulated image editors will allow end users to massage screen information into individually useful formats.
- Prices will decline for laser printers, enabling production of high-speed hard copy of screen data.
- Over time, storage will be less and less expensive, and the technology will migrate to optical disk storage, permitting the maintenance of massive electronic files.

- Multistandard terminals will become available, reducing the confusion engendered by multiple standards, particularly for international data flows.
- The integration of all services, including voice mail, electronic mail, facsimile, and applications, will ultimately provide a seamless continuum of capabilities in the office of the future.
- Exhibit VIII-1 shows key videotex technology trends.

EXHIBIT VIII-1

KEY VIDEOTEX TECHNOLOGY TRENDS





**IX CONCLUSIONS, RECOMMENDATIONS, AND SUMMARY**



## IX CONCLUSIONS, RECOMMENDATIONS, AND SUMMARY

### A. CONCLUSIONS

#### 1. VIDEOTEX ATTRIBUTES

- Though videotex may not be appropriate in all settings and for all applications, its general attributes are worth noting:
  - Ease of access and use.
  - Color graphics.
  - The inherent economies of office videotex.

#### 2. AN OA TRANSITION STRATEGY

- Organizations experiencing or anticipating problems with acceptance of office automation (OA) technology may find videotex an attractive migration strategy.
- By implementing ease of operations at both the end-user and information creation levels of information management, the corporation may in fact be moving toward videotex solutions without acknowledging it.

- A videotex framework, expressly labeled as such, can pave the way for internal acceptance of OA.

### 3. CORPORATE CULTURE

- It is important to recognize that a new breed of computer-literate manager is emerging who does not shy away from the keyboard. They may want the power in their own hands, without the friendly user interface, which may be intrusive. System design can accommodate this desire while improving access and information flow to all levels of the corporation.
- Other corporate culture questions need to be addressed:
  - Does the company wish to make videotex terminals universally available to its workers?
  - If so, will they be accepted, and will the projected benefits be realized?

## B. RECOMMENDATIONS

### I. LONG-TERM VIEW NEEDED

- Whereas early experimentation and prototype installations may be considered when resources permit, INPUT recommends that IS managers take a long-term view of videotex as comprising a set of features that offer distinct advantages in the electronic office.



- The long-term view sees the integration of videotex features with existing office products, services, and procedures.

## 2. EXAMINE ALL OPTIONS AND ALTERNATIVES

- Videotex offers a set of attractive features, but each corporation has a unique set of circumstances which may dictate less complex solutions. These solutions may encompass:
  - Monochrome, ASCIItext.
  - Standalone "kiosk" systems.
  - CUGs on information utilities or at service bureaus.

## 3. GRAPHICS ARE IMPORTANT, BUT...

- Graphics capability is currently available on a departmental, as-needed basis in business graphics packages such as Lotus, and in micro-to-mainframe applications.
- Though color graphics are attractive, users should not ignore the cost effectiveness of monochrome, ASCIItext applications to solve corporate information management problems.

## 4. USE A TURNKEY SYSTEM

- Users considering office videotex unanimously indicated they would be more likely to purchase a turnkey system. INPUT recommends this approach to save the IS manager from allocating resources which might not be available.
  - System installation and program development is handled by the vendor.

- Cost benefits accrue more quickly. Ultimately, the price of implementation may be lower considering the learning curve involved, and the chances of costly errors.

## 5. ANTICIPATE APPLYING RESOURCES

- Despite the advantages of a turnkey system, the IS manager should expect having to apply DP resources for linkage development to the company data base, as well as to gateway management for external connections, and sometimes, to assist in adapting corporate communications facilities to the videotex system.
- Also, the impact on the corporate network of additional videotex traffic needs to be considered.

## 6. USE THE EXISTING BASE

- Users should plan to adapt their existing base of workstations and PCs. Vendors offer inexpensive add-on boards and decoder software packages. Except in cases where public kiosks are desirable, existing equipment--or equipment which would be added to the company anyway--should be used.

## 7. IMPLEMENT IN STAGES

- INPUT recommends implementation in stages, adding features and data bases as the system evolves. Prime departmental candidates for office videotex are those which will make use of the graphics capability most productively, such as sales/marketing, and finance.

## 8. INTERNALLY SELL THE SYSTEM

- The importance of internal marketing and public relations cannot be underestimated.

- Videotex is considered by many to be a new consumer medium; however, as has been demonstrated by those who have installed systems (and by this report) the technology can offer significant benefits in the corporation setting. Appreciation of these benefits is as much a part of internal promotion as is simply plugging in the system.
- Training is minimal; therefore, direct the effort which would have been applied to training to an effective in-house selling job, to help ensure that the desired benefits are realized.

### C. SUMMARY

- Videotex may have suffered a credibility loss due to unfulfilled expectations in consumer markets. In spite of this, IS should not be distracted by the technology's lackluster history to date; its poor record is simply not relevant in the corporation setting.
- Videotex offers an effective response to specific information management problems, using an increasingly stable technology.
- Since existing equipment can often be used and implementation costs can be controlled through gradual development, the risks involved are manageable.
- Assuming that the need exists, and assuming a corporate culture is open to innovative solutions, office videotex can enhance productivity, reduce costs, share resources, and bring other measurable benefits to the organization.



## APPENDIX A: DEFINITIONS



## APPENDIX A: DEFINITIONS

- Alphamosaic - A method of displaying characters and graphics using a limited set of basic mosaic elements.
- Alphageometric - A method of displaying graphics and characters using transmitted geometric instructions called "picture description instructions", or PDIs.
- Alphaphotographic - A very high resolution method of displaying visual elements, where each point on the screen is addressed.
- Antiope - The French system for coding, display, and transmission of view-data, now primarily used to describe the teletext, one-way system, with Teletel describing French Videotex.
- ASCII - American Standard Code for Information Interchange. A standard describing English alphanumeric characters, symbols, and control codes.
- ASCIItex - INPUT's suggested definition for electronic communications of text-only information.
- Business viewdata - a computerized information retrieval system distributed over a network and primarily designed to service businesses.

- Captain - Character and Pattern Telephone Access Information Network. The Japanese coding scheme designed for the unique requirements of that language.
- Capture - See frame grabbing, below.
- CEPT - The European videotex standard, incorporating Prestel and Antiope, established by the Conference of European Post and Telecommunications Administrations.
- Closed User Group (CUG) - A limited community of users accessing videotex services.
- CPU - Central Processing Unit.
- Data base - Any collection of information. In viewdata applications, it is organized for rapid search and retrieval.
- DRCS - Dynamically redefinable character set, describes the alphamosaic graphic characters and shapes under the Prestel/CEPT standard, using a grid of rectangular cells and screen-positioned subdivisions on the display.
- Frame - A displayed screen, also called a page.
- Frame Creation System - A microcomputer specially equipped with input devices (such as mice, graphics tablet, light pen) and software for the composition of videotex pages. May also represent higher-level, specialized workstations.
- Frame grabbing - An electronic process which receives, decodes, and temporarily stores (or "captures") in local terminal memory a predesignated viewdata frame of information for display. Primarily associated with broadcast teletext.



- Gateway - A videotex software package which permits access to distributed data bases through the primary videotex processor/CPU. May support x.25 packet-switching network connections.
- Host computer - A computer and its associated data base which, although operating as a separate entity, is accessible through a network.
- Information Provider (IP) - An organization which provides informational services or products through a videotex service managed by a system operator.
- Keyword - A method of retrieving information from a data base by using matching descriptors.
- Kiosk - A free-standing videotex terminal, usually located in public areas.
- Menu - A page listing options for display of information on a terminal.
- Modem - A device allowing communications between computers over telephone lines (from MODulate/DEModulate). The device converts digital signals to the analog required for most telephone system designs.
- NAPLPS - North American Presentation Level Protocol Syntax. A videotex standard approved by ANSI and the Canadian Standards Association, incorporating Telidon.
- Office videotex - An in-house system designed for use within a company or organization. Also "private" videotex.
- Picture Design Instructions (PDIs) - A 96-character instruction set for text control, graphics design and color control used in the NAPLPS standard.

- Portable teletext - An adaptation of pagers that displays coded broadcast information, used primarily for financial news and information, but also suitable for electronic mail and other applications.
- Prestel - Denotes the first videotex standard and service, developed by the British PTT, which uses alphamosaic coding. It has been incorporated in the CEPT standard.
- Resolution - The sharpness of terminal-displayed images.
- Service bureau - A remote, timesharing videotex operation owning and maintaining hardware and software for customer use on a third-party basis.
- Teletel - See Antiope.
- Teletext - One-way electronic communications of text and graphics, with the vertical blanking interval (VBI) of a television signal traditionally used as the transmission medium.
- Telidon - The Canadian videotex standard, incorporated into NAPLPS.
- Transaction - Indicates buying, selling, and transfer of goods, services, or funds.
- Tree structure - Hierarchical arrangement of a data base, with each level providing increasing detail based on the previous level.
- Vertical Blanking Interval (VBI) - The space between TV images when the scanning picture returns to the top of the picture. Teletext and closed captioning codes are inserted here.
- Videotex - Two-way, interactive, or transactional electronic communications featuring text and graphics displayed on a video screen.

- Videotex Industry Association (VIA) - An industry group, based in Rosslyn, Virginia. It has an Office Videotex group working on issues and concerns of this segment.
- Videotex processor - A special purpose front-end processor which handles communications and management functions of a videotex system, working directly below the central processing unit (CPU).
- Viewdata - Any computer-based electronic communications system displayed on a video screen. May be one-way, as in teletext, or two-way (interactive), as in videotex.



**APPENDIX B: OFFICE VIDEOTEX QUESTIONNAIRE**



## APPENDIX B

## OFFICE VIDEOTEX QUESTIONNAIRE

INPUT is working on a report about office videotex systems. We will make recommendations on how, and if, corporations can use videotex for internal use. We would like to get your ideas on what the report should cover.

In return for your help, we will send you a summary of this study.

1. Off the top, can you think of anything special you would like to see addressed in the report?

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2. Do you have an office videotex system or are you considering one?

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3. For what applications would you imagine you or a company like yours would be using an in-house system?

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4. Why would you consider videotex and not some other type of system?

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5. How important do you think is the ease of use and the colorful graphics videotex can provide?

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6. How would you manage a videotex system? \_\_\_\_\_

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7. Would you configure the system yourself or would you buy a turnkey operation?  
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\_\_\_\_\_
8. Would you use a consultant? \_\_\_\_\_  
\_\_\_\_\_
9. How would you go about selecting a vendor for an office videotex system?  
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\_\_\_\_\_
10. What problems do you have in considering videotex? \_\_\_\_\_  
\_\_\_\_\_
11. If you were to implement a videotex system, would it strictly be for in-house use, or do you think you might connect with other data bases, either public like a Viewtron system, or another commercial data base?  
\_\_\_\_\_  
\_\_\_\_\_
12. Could you see integrating a videotex system with your corporate data base, or do you think it would be better to have it as a standalone system?  
\_\_\_\_\_  
\_\_\_\_\_
13. Would you also want to include field offices for your customers to give them access?  
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14. Have you considered working with an information utility like The Source to set up a private closed access arrangement on their system?

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15. Do you have a preference for special purpose terminals or would a multi-purpose workstation or PC be better?

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16. Could you estimate how many terminals you would foresee being put on a videotex system at your company? And how many users would that typically represent?

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17. Does the standards issue cause you any problems? \_\_\_\_\_

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18. Do you know of anyone else who might have some views on office videotex?

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Well—that about does it unless you can think of anything else you would like to see us look at....

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I want to thank you for your help and assistance.



## APPENDIX C: PRODUCT PROFILES



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- A large number of companies, some of which are based in Europe and Canada, offer videotex systems, software, and components. These product profiles center on the existing products of major U.S.-based companies but include some smaller vendors offering low-end, ASCIItext systems.

### A. AT&T INFORMATION SYSTEMS

- Company has historically been active in videotex and offers turnkey systems, software, terminals, and components.

#### I. SYSTEMS

- The AT&T Videotex Information System is an integrated group of components for private videotex networks, including a frame creation system, ten Scepter terminals, and a minicomputer data base controller with management terminal and printer.
- Frame Creation System (FCS) Series 500 consists of a control unit, graphics tablet, keyboard, and monitor, with software for operations, text, and graphics preparation.

- FCS Series 700 incorporates a control unit (operating under UNIX), monitor, keyboard, and management terminal. It creates frames from photos or drawings using a video camera (not supplied).

## 2. HARDWARE

- Video Slide Maker peripheral that transfers graphic images from a monitor, video source, or the frame creation system to 35-mm film.
- SK, TK, and XE public access terminals, for advertising and other information display, vary in size and are designed for standalone public telephone enclosures and custom configurations.
- The Sceptre Videotex Terminal is cordless, has a qwerty keyboard plus function keys. It displays using a standard television or monitor and connects through an RS 232C port to printers. Has a built-in autodialer (five number memory) and an integrated 300/1200 bps modem. Sceptre supports ASCII and NAPLPS.

## 3. SOFTWARE

- System software included in the Videotex Information System is based on UNIX and provides tree-structured data base development and management, specialized applications capability, frame usage statistics, production interface, and system communications and administration facilities.
- Data Driven Graphics transforms statistics into business charts and graphs.
- Custom Graphics permits creation and storage of libraries of customized characters, symbols, and fill textures for incorporation into newly created frames.

- Company also sells an AT&T Personal Computer NAPLPS Decoder software/video adapter package, allowing PCs to emulate SCEPTRE terminals, priced at approximately \$600 (OEM).

#### 4. CAPABILITIES

- System can expand in memory and number of ports.

#### 5. COSTS

- The Videotex Information System: \$140,000.
- FCS Series 500: \$32,900.
- FCS Series 700: \$57,100.
- Sceptre Terminals: \$900.
- Public access terminals range from \$4,600 to \$7,000.
- All costs are approximate.

#### 6. APPLICATIONS

- Private and public systems supporting all types of videotex services.

### B. DIGITAL EQUIPMENT CORPORATION

- The company has a number of standalone systems and software products supporting Prestel and NAPLPS videotex.

## 1. SYSTEMS

- A VAX VTX package includes 10 DEC professional PCs with dual disk drives, color monitor and modem, and 10 PRO/NAPLPS software packages.

## 2. SOFTWARE

- PRO/Videotex augments existing corporate data bases by adding graphics capability, and runs on a Professional 300 10-MB hard disk system. System is standalone, allows users to download text and graphic information from the host for review, and does not require constant connection to a host computer. Locally stored information can be automatically updated by the remote host in off-hours, taking advantage of lower communications costs.
- PRO/NAPLPS software decoder is designed for the Professional 350 series of microcomputers using the existing communications port and graphics board. Requires PRO/Communications software, the DEC VC24I Extended Bit-Map option and a DEC RD 50 or RD 5I hard disk.
- VAX VTX runs under VMS, converts any VAX to a videotex processor sharing the CPU with other applications, supporting VT 100/200 terminals and DEC's personal computers.

## 3. CAPABILITIES

- VAX VTX can be integrated with the company's ALL-IN-1 software, and is suitable for distributed videotex applications. It is integrated with DNA and DECnet software, meaning the system can connect transparently to remote VAXs through menu selection.



#### 4. COSTS

- VAX VTX: \$25,000.
- PRO/NAPLPS software: \$195.
- Pro/Videotex; \$895.
- Trial Programs:
  - VAX VTX is available on a timeshared basis from DEC's Computer Services Business Organization.

#### 5. APPLICATIONS

- VAX VTX is suitable for office videotex.
- Pro/NAPLPS is directed to the information worker who accesses NAPLPS data on remote host computers.
- PRO/Videotex can be used for product displays, or for public kiosk systems.
- The company intends to develop software supporting NAPLPS and Prestel on the Rainbow PC product line, allowing the PC to serve as a frame creation system. DEC is also establishing training workshops to support its products.
- DEC is working with software developers such as Genesys Groups and Aregon International for office system product development.

## C. HONEYWELL INFORMATION SYSTEMS

- The company is in a partnership behind Chicago's Keyfax public videotex service, and is marketing a package of French hardware and software for office videotex systems, supported by Honeywell CPUs.

### 1. SYSTEMS

- InfoNow uses French-developed software and Minitel terminals from Videographic Systems of America, representing France's Telic Alcatel. The system is centered around a dedicated Honeywell DPS 6 minicomputer.
- RETRVE was developed in England, and uses either a DPS 6 or capacity on a DPS 8 mainframe. System is targeted primarily to the company's installed base.
- Both systems are Prestel, with alphamosaic graphics.

### 2. CAPABILITIES

- Both systems support keyword search. A company spokesman says that while InfoNow and RETRVE feature graphics, there has been little user interest in office graphics.

### 3. COSTS

- Systems are priced at approximately \$250,000, including a CPU supporting 1,000 users.
- Terminals are priced at approximately \$650 for black and white, to \$1,200 for color, including integrated modems.

#### 4. TRIAL PROGRAMS

- Honeywell operates a free videotex support center at Shiller Park, Illinois, for testing, training, developing, and promoting the use of office videotex.

#### 5. APPLICATIONS

- Electronic messaging, legal and contract document retrieval and editing, directories, purchase orders, organizational data, and product reference libraries.
- Software developer Groupe Francais d'Infomatique (GFI) plans to adapt software to various protocol terminals.

#### D. IBM

- IBM maintains several internal videotex systems, and has several sizes of systems suitable for office videotex. Additionally, any PC can be adapted to NAPLPS videotex.

#### I. EQUIPMENT

- SVS/I package with 256K of memory, a 29-Mb disk file, with eight ports (supports eight simultaneous users) is priced at approximately \$56,000, including a Series/I.
- A double-sized system, with 64-Mb disk file and 16 ports is priced at approximately \$68,000.
- A large system with 0.5M memory, 400-Mb disk files, and 32 ports is priced at approximately \$146,000.

## 2. SOFTWARE

- SVS Videotex software carries a basic license priced at \$12,500 (one-time). Requires host EDX basic supervisor software (one-time price of \$225, monthly fee of \$132), EDX programs preparation facility (\$135 plus \$174 monthly), plus additional software (\$170).
- One time software charges total \$13,030.
- Decoder software (NAPLPS to ASCII) for the PC (\$250) requires graphics board (Plantronics recommended, priced between \$300 and \$500), asynch adaptor (\$150), and modems; the PC jr. version (\$220) does not require a graphic board.
- Additional charges are dependent on exact configurations required for printers, tape drive back-up, etc.

## E. SHUTTLE CORPORATION-SCRATCH PAD VIDEOTEX SYSTEM

- Company provides a turnkey ASCIItext package including hardware, software, modems, frame creation terminals, printers, and application packages, accessible to all PCs and many terminals.

### I. HARDWARE

- CPU is the Scratch Pad supermicrocomputer, with parallel 16-bit 68000s capable of 1.25 mips.
- Shuttle Information Terminals come in 17-key numeric-only and 52-key alphanumeric models, connecting its on-board 1200/300-baud modem to a standard RJ-11 telephone jack and standard television.

- Scratch pad can interface with virtually all mainframes.

## 2. SOFTWARE

- Home banking, electronic mail, bulletin boards, on-line conferencing, host interfaces, expanded communications applications, personal computer translation tables, National Oceanographic and Atmospheric Administration Weather Wire, stock services, AP News wire, and Financial Calculation modules are available.

## 3. CAPABILITIES

- Comes in a modular design, allowing phased growth from 4 to 48 incoming lines.
- Has character block graphics capability.

## 4. COSTS

- Low-end turnkey package costs \$85,000. A 48-part system costs \$135,000. Application software modules are licensed on an annual basis.
- Software maintenance agreement for enhancements and upgrades is 12% per year of current one time or annual charge for each module.

## 5. TRIAL PROGRAMS

- Company will install a four-port, upgradable system for a 90-day testing and evaluation on-site trial for \$50,000, which can be applied to system purchase.

## 6. APPLICATIONS

- System has been purchased by banks, and is promoted for small business public systems and as a text-only office system.
- Company operates Seattle-based Shuttle Express public system with CUG capability, and hopes to set up a national network of systems owned and operated by local businesses.
- Will provide on-line demonstration account to potential customers.

## F. SPERRY

- Company offers the Series 1100 videotex system supporting Prestel, CEPT, and NAPLPS standards, plus software packages designed for their line of personal computers.

### I. SOFTWARE

- The Series 1100 videotex system software is installed on an 1100 mainframe, configured with a Distributed Communications Processor running with the DMS 1100 data base package, under the CMS 1100 operating system with Cobol applications.
- PC Editor turns the Sperry PC into a Prestel frame creation and editing terminal.
- PC Display enables the PC to act as a videotex host.
- PC Prestel decoder software combines with the PC's telecommunications capability to enable access to videotex information.

- Personality +II decoder software allows access to ASCII information and NAPLPS services on a standard Sperry PC.

## 2. CAPABILITIES

- Interfaces with the company's MAPPER fourth generation language are available, and one is under consideration for the SperryLink office automation system.
- Gateway access is possible for public and private networks. Prestel, German, Swiss, and French standards are suggested, with plans to support IBM and DEC systems.
- The high-resolution graphics capability of the Sperry PC does not require an additional color graphics board.

## 3. COSTS

- A Series 1100 videotex software package costs up to \$50,000 depending on modules desired, not including required equipment.
  - PC Editor: \$399.
  - PC Display: \$299.
  - PC Prestel: \$199.
  - Personality +II: \$159.
  - All prices are approximate retail.

#### 4. APPLICATIONS

- Videotex is seen as a value-added product for the company's MAPPER fourth generation language and SperryLink office system.
- Sperry has been active in the international sector, with system sales to governments, financial institutions, travel services, and other industry groups.
- The company is a systems integrator rather than a turnkey systems provider.
- In future, the company may integrate Videotex 1100 with a recently announced micro-to-mainframe UNIX line of products.

#### G. TANDY CORPORATION

- Company offers VIS- Videotex and Office Information System, targeted to large companies and information providers.

#### 1. SYSTEMS

- Software is supported on the Radio Shack TRS-80 Model 16 B operating under Xenix, and is accessible from any terminal.

#### 2. CAPABILITIES

- VIS is keyword- and menu-driven. Can be expanded to handle 200 incoming calls daily, assuming each call averages 5 to 10 minutes. Information providers can maintain and update data bases in remote mode.



### 3. COSTS

- The basic VIS system centered on a TRS-80 Model 16 B with dual disk drives, 384-K RAM, 12-megabyte hard disk, two modems and VIS software ranges from \$13,000 to \$15,000. The CPU alone is priced at approximately \$5,800.
- VIS software is \$3,500.
- VIS Multiplexer Software is \$1,000 and requires VIS software.
- An 8-line multiplexer is \$6,000, with an additional 8-line upgrade kit priced at \$2,000.
- IP manuals are \$35 and user manuals are \$10.

### 4. APPLICATIONS

- Daily schedules, policy files, bulletin boards, factory inventory, corporate sales figures, production capabilities, client or patient reports.
- Company plans to add capability for electronic mail.

### H. TELELOGIC INC.—TEX

- According to this Massachusetts company, TEX supports standalone PRESTEL, NAPLPS, or ASCII videotex systems.

### I. HARDWARE

- "TEX" refers to a low-cost device containing an FSK demodulator (not a modem) using DTMF "touch tone" keypads and television monitors as the user

terminal. The unit incorporates a Phillips Prestel decoding chip and acoustic couplers for 1200-baud incoming data.

- "SAM" (Shared Access Modem) is located at the host data base.
- Alpha keyboards, a printer, and IBM PC interface will also be available.

## 2. SOFTWARE

- Editing, home banking, electronic mail, sales order processing, and custom applications are available from associated software vendors.

## 3. CAPABILITIES

- Supports DEC, IBM mainframe and minicomputers, IBM PCs and compatibles, as well as NCR, Microdata, Sperry, Prime, Honeywell, and Tandem computers.
- System is approved for use with Tymnet, with other VAN certification expected.

## 4. COSTS

- Fully operational system supporting a community of 10 to 80 users is priced under \$8,000. Tex terminals priced at \$100 with host-end modem equipment is approximately \$600.

## 5. TRIAL PROGRAMS

- Associated software vendors offer pilot demonstration programs for \$8,000 to \$10,000.

## 6. APPLICATIONS

- Home banking, sales order processing, directory information, product information, education, travel, electronic mail.
- A very inexpensive, although limited system, suitable for small community-of-interest applications.

### 1. VIDEODIAL

- Company provides software for IBM mainframes, supporting multiple videotex standards, various applications, and management utilities.

#### 1. HARDWARE

- Access is possible on various terminals, including adapted television sets, dedicated videotex units, and PCs.
- Frame creation is possible on adapted micros.

#### 2. SOFTWARE

- TSV 5000 operates as a subsystem of the IBM Customer Information Control System (CICS).

#### 3. CAPABILITIES

- The number of concurrent users is restricted only by the size of the CPU, and not the software.
- Supports NAPLPS with options for Teletel, ASCII, and other standards.

- Product supports keyword and tree search.
- Provides management with statistical reports, interactive business graphics, and gateways.

#### 4. COSTS

- A perpetual license for a fully configured system is priced at approximately \$125,000.

#### 5. TRIAL PROGRAMS

- Company operates a service bureau which bills monthly, permitting remote, third-party computer access and staffing support. Can be used to research needs and options, for pilot programs, and for test applications.

#### 6. APPLICATIONS

- Provides transaction and informational services.
- The service bureau can be used by small, specialized CUGs or by organizations sharing access to information.

#### J. WANG

- Offers a software decoder for the Wang Professional Computer called PC Viewdata Decoder (\$250). Package transforms Prestel data and graphics to ASCII, requiring a standard monitor card and color monitor.

- Wang will focus its marketing overseas, where PRESTEL is being used more heavily, but may eventually market decoders for NAPLPS and other variations of Prestel (CEPT, and the French Teletel standard). The company has reportedly been developing equipment for office videotex.
- The following companies fall under the heading of service bureaus, special interest groups, and closed-user groups:

#### K. GENERAL VIDEOTEX CORPORATION—GROUPLINK ON DELPHI

- Company operates the ASCII-only Delphi public information utility, offering Private and Special Interest Grouplink CUGs accessible through Tymnet and other VANs.

##### 1. HARDWARE

- Subscribers use own PCs or communicating terminals to gain access; GVC's host equipment is used.

##### 2. SOFTWARE

- Users require appropriate communications software.

##### 3. CAPABILITIES

- Private Grouplink accessed directly. Special Interest Grouplink is a private area within the public Delphi menu, with access restricted. Five main features can be included (additional features cost more).
- GVC provides documentation and customer service, and will install dedicated private lines and host equipment if requested.

#### 4. COSTS

- Private Grouplink set-up fee is \$4,750, with minimum monthly use charge of \$275. Optional billing of members available, paid to the network operator.
- Special Interest Grouplink set-up fee is \$500, with royalties paid on use and billed by Delphi. Users must have accounts, available at a discount, with commissions paid to network operator.

#### 5. APPLICATIONS

- Electronic mail, electronic shopping, group appointment scheduler, newsletters, polling, conferencing, formatted input forms for order entry and other applications. Links to the Source, CompuServe, and Dialog.
- Suitable for decentralized, relatively small user groups.

#### L. THE SOURCE

- This information utility offers ASCIItext Private Network Services, allowing data base sponsorship on a portion of the system for company use.
- Software provided supports menu creation, keyword searching, order processing, private bulletin boards, and identification of active users available for computer conferencing.
- Users can also link to regular Source services, including electronic mail, financial information, and teleshopping services.

- Access is possible through Telenet, Uninet, "800" numbers, or smaller regional networks called SourceNets, operated in several metropolitan areas. International access is also possible.
- The start-up fee is \$5,000, covering training, software, sponsor accounts, and data base storage.

#### M. COMPUSERVE

- This information utility offers "Interchange" private ASCIItext services.
- A company may run a 90-day pilot test of the system with unlimited use through ten simultaneous ports for \$5,000.
- Included in the test are "Framer," to build and maintain the private data base; "Display," to navigate through the system; and "InfoPlex," electronic mail with file editors, word processing, and other programs available.
- The pilot test includes 5 million characters of storage.
- Beyond the pilot, an Interchange account can be established for \$5,000 per month for unlimited, two-port simultaneous use with additional ports available on a sliding scale starting at \$1,800 per month, or at an hourly charge for additional use.
- Access is through the CompuServe Network, Tymnet, and Telenet.
- Internal office videotex systems can also be implemented using service bureaus such as that operated by Videodial (profiled earlier in this section), and DEC. Temporary arrangements can be made with Honeywell's facility near Chicago.







