UBRA - Title Page
- Chapter II
- Telecommun.
Letter
1987

March 6, 1987

NO ITEM TO INSERT

NO ITEM TO INSERT

Dear
NO ITEM TO INSERT
:

Please find enclosed the first shipment of data for your Information Systems Planning Report for 1987. This includes:

- A new Title Page, to be included immediately behind the front cover.
- A new Introduction section, to be filed behind the Introduction tab.
- The Telecommunications sector, to be filed behind the Telecommunications tab.

Please let us know your comments and queries on this material by calling (415) 960-3990 (West Coast clients) or (201) 299-6999 (East Coast clients).

Yours sincerely,

Graham Kemp
Vice President, Research

GK:ml

Enclosure

INFORMATION SYSTEMS PLANNING REPORT
TELECOMMUNICATIONS SECTOR

JANUARY 1987

INFORMATION SYSTEMS PLANNING REPORT
TELECOMMUNICATIONS SECTOR

CONTENTS

EXHIBITS

I INTRODUCTION

A. OVERVIEW

- The breakup of AT&T continues to create upheaval in this segment, with new network services and new competitive players creating new demands on information services (IS) departments.

- Lowering costs of long-haul communications and the growing importance of linkages have led to increasing traffic volumes domestically and internationally. This, in turn, has led to the requirement for tools to plan and manage new communications channels such as satellites, fiber optics, and new types of data networks.

- The industry continues to change. Merger and acquisition consolidations, new technologies, and deregulatory actions are creating both chaos and opportunity for IS departments.

B. DEFINITIONS

- The telecommunications market is a diverse one. This analysis focuses on AT&T, the Bell Operating Companies (BOCs), independent local exchange carriers (LECs), the long-distance interexchange carriers (IXCs), long-distance

resellers, and cellular telephone operators--in short, telephony telecommunications.

- Currently excluded from the analysis are the broadcasting and cable television industries, fiber optic and satellite networks, and the domestic operations of the international record carriers.

II MAJOR ISSUES

A. DRIVING FORCES

- IS managers at telecommunications companies were asked to identify their most important strategic, tactical, and operational issues, the definitions of which are provided in this report's introduction. This section reports the specific issues identified by survey respondents, but first, some general directions are presented.

1. GENERAL DIRECTIONS

- An industry association's research found telecommunications companies realizing revenue increases of 7.6% between March 1985 and March 1986 while employment dropped over 6%. Increased productivity per employee is due in part to the use of automated systems.

- However, INPUT's research found that in most cases, the IS department is expected to grow to meet increasing demands, although in the longer term, new technologies are expected to reduce personnel needs. In addition to anticipated larger staffs in most firms, higher IS budgets are being requested due to increasing vendor costs.

- In some cases, IS departments at telecommunications entities have been overloaded due to the demands of divestiture, a more competitive environment, and regulatory agency requirements for accurately reported data.

- This has sometimes led units within the company to seek independent solutions to departmental problems.

- For example, the marketing department of one BOC signed with a computer services vendor for a marketing application which incorporates vendor software on a minicomputer tied to the remote computing service for additional capabilities. IS was involved in selecting the solution but does not support the service in any manner.

- Not surprisingly, all telecommunications companies interviewed identified deregulation and divestiture as the two key drivers of change within the industry.

  - Deregulation has led to more competition. As one respondent said, "We have to get out there and hustle for customers."

  - Further, IS is being asked by marketing departments for more customer information to identify prospects for new services and for planning purposes.

- IS departments reported that management of their own internal telecommunications systems has become more important, incorporating all media--voice, data, facsimile, and video. This is an indicator of the continuing merger of voice and data responsibilities into one department, although there is a question about the amount of voice/data integration that will actually take place.

- One respondent reported analyzing the activities of companies outside the industry to identify models for using information services to competitive advantage, citing an airline and a medical supplies distribution firm as examples.

2. STRATEGIC ISSUES

- Among identified strategic issues telecommunications firms anticipate facing in the two- to five-year time period is the amount of centralized data processing the company will have during that period and how to manage decentralization while maintaining control of their systems.

- Another strategic issue relates to the regulatory environment and how the company, as a whole, will determine what activities will be allowed under the rulings of agencies overseeing deregulation of the industry and, specifically, how IS can plan its response in support of new activities.

  - Some users expressed concern and confusion over the sometimes conflicting roles of the various governmental agencies and individuals involved in deregulation.

- Due to deregulation, telcos are anticipating they will need to address often undefined nontelephone areas and will need to become more marketing oriented.

3. TACTICAL ISSUES

- Several users said that their tactical plans relevant to IS are still evolving, delayed by more pressing present needs. One anticipated issue is the degree of functional data processing and telecommunications integration and how much of this integration will actually occur.

- One independent telco reported facing tactical issues relative to the company's investments, both in the company itself and external investment opportunities fitting corporate goals. IS anticipates being called upon to provide systems and services supporting these activities.

- Another independent telco said that by order of the state public utilities commission, the firm must reduce its costs. One way of doing this will be to reduce its dependence on outside contractors and programmers while improving the quality of internal data processing specialists through higher salary levels and education.

4. OPERATIONAL ISSUES

- "Staying alive" was what one independent telephone company IS director reported as his immediate key operational issue. This comment is interpreted as reflecting real and potential challenges from competitive firms in some services the telco provides.

- The same company reported that staffing issues and the ability to manage change were central operational issues facing the firm.

- Marketing new services were mentioned as operational issues by another independent, who said the company was planning to offer new services such as point of sales and stock quotation services to its customers and IS was being called upon to support these areas.

- Another immediate operational issue described was IS' ability to meet demands from its users for tools leading to increased departmental productivity and the attendant needs for additional IS capabilities.

- A respondent at AT&T reported the company is completely reorganizing its data processing functions. With the exception of officials at the chairman of the board level, IS personnel have no idea what they will be doing in the immediate future.

- These directions are summarized in Exhibit II-1.

EXHIBIT II-1

TELECOMMUNICATIONS
I.S. DIRECTIONS

GENERAL	STRATEGIC	TACTICAL	OPERATIONAL
Increasing Productivity per Employee	New Technologies Lead to Staff Reductions	Level of Functional Voice/Data/Image Integration	Facing Competition
Functional Units Seek/Implement Own IS Solutions	Centralization versus Decentralization Issues	Investment Activities	Managing Change
Deregulation/Divesture Demands	IS Support of Allowable Activities	Cost-Cutting Mandates	Staffing Issues
Internal Systems Become More Important	IS Support of Unfamiliar Activities	Increased Internal Dependence; Reduced External Resources	Marketing New Services
Modeling Based on Nontelecom Industry Examples			Meeting User Needs With Increased IS Capabilities
			Reorganization Issues

B. IMPACT OF NEW TECHNOLOGIES

- In addition to reducing staffing needs and reducing costs, new technologies are being investigated to permit telecommunications companies to provide not just better but more rapid and new services to customers.

- Respondents are anticipating that technological developments will have a significant impact, particularly as data processing and telecommunications functions are merged. Over time, this will lead to a restructuring of the business.

- Being technologically driven will have an influence on how telcos will approach the market. Rather than being merely a franchised system, new technologies will require telcos to get into marketing situations. The threat of more technologically flexible competitors is changing attitudes in the formerly monopolistic environment.

- The impact of new technologies is shown on Exhibit II-2.

EXHIBIT II-2

TELECOMMUNICATIONS
IMPACT OF NEW TECHNOLOGIES

- Reduced Staffing, Costs
- Improved, New Services
- Data Processing/Telecommunications Integration
- Technological Competitiveness

III NEW APPLICATIONS

- New applications being implemented by respondents over the next 12 months include:
  - Billing and toll systems to replace outdated ones and fitting the requirements of deregulation.
  - Cable records management systems.
  - Streamlining in investment-oriented applications.
  - Customer service and service order systems.
  - Engineering applications.
  - Productivity improving applications.
  - Outside plant facilities inventory systems.
  - Digitized mapping systems.
- It is important to note that these applications were described by IS managers. INPUT has found that functional departments often implement systems meeting their own unique needs in a decentralized manner. IS may or may not be involved in or be knowledgeable of these initiatives.

- The anticipated costs of these new applications range from $100,000 up to $14 million for complicated systems, with the high range related to systems developed by the parent company in support of its regional telcos. In this case, the individual telco will be responsible for approximately 10-12% of the final cost.

- Costs are divided between internal staff expenses and the purchasing of applications software packages, with the emphasis placed on internal development. In a few cases, professional service firms will be contracted to develop the needed application.

- New applications are listed in Exhibit III-1.

EXHIBIT III-1

TELECOMMUNICATIONS
NEW APPLICATIONS
(Next 12 Months)

- Billing/Toll Systems
- Facilities/Plant Management
- Investment Support
- Customer Service
- Engineering
- Productivity
- Digitized Mapping
- Non-IS Departmental Applications

IV BUDGET ANALYSIS

- This analysis is based on information collected from telephone company IS managements. It does not cover the entire spectrum of the telecommunications industry, as described in Chapter I, Section B, and does not include expenditures in departments other than IS.

- It is important to note that the data gathered from IS managers often represented budget requests. In many cases, actual budgets received will vary from these requests and actual expenditures will vary from the received budget.

- Exhibit IV-1 shows the 1986 budget distribution and the projected budget growth for 1987 in this segment.

- The largest budget growth areas are in hardware, processing services, software, professional services, and turnkey systems.

  - Overall, hardware budgets, now accounting for approximately 27% of the IS budget, are expected to increase by nearly 26%.

  - Processing services, now accounting for approximately 12% of the IS budget, are expected to increase nearly 25%.

  - Externally purchased applications and systems software, representing slightly over 7% of the budget, are expected to increase 19%.

EXHIBIT IV-1

1986 BUDGET DISTRIBUTION AND 1986-1987 CHANGES IN THE TELECOMMUNICATIONS SECTOR

BUDGET CATEGORY	1986 PERCENT OF I.S. BUDGET	1986-1987 EXPECTED BUDGET GROWTH
Personnel Salaries and Fringes	32.1%	3.7%
Mainframe Processors	5.4%	15.7%
Minicomputers	5.2%	17.2%
Microcomputers	2.8%	11.5%
Mass Storage Devices	1.5%	4.6%
Other Hardware	12.0%	22.3%
Total Hardware	26.9%	25.2%
Data Communications	3.4%	-12.0%
Voice Communications	1.9%	-11.0%
Processing Servcies	12.2%	24.6%
External Applications & Systems SW	7.2%	19.0%
Professional Services	5.6%	14.1%
Turnkey Systems	5.9%	14.0%
Software Maintenance	1.6%	0.6%
Hardware Maintenance	1.3%	16.1%
Other	1.9%	-3.3%
Total	100.0%	12.0%

- The categories expected to decline are data communications, voice communications, and other services expenditures.

- Exhibit IV-2 shows that approximately 83% of the respondants expect their IS budgets will increase or remain the same for 1987, while 17% expect lower budgets.

- Factors contributing to the increases in 1987 IS budgets were:

  - Increased purchasing in support of planned data communications services and for more effective corporate information management systems.

  - Increased use of specialized applications and services available from third-party processing vendors.

  - Expected increases in needs to maintain newly purchased hardware, in some cases due to reduced staffing.

- Factors contributing toward decreasing or modest increases in IS budgets were:

  - Increased use of corporate facilities for data communications.

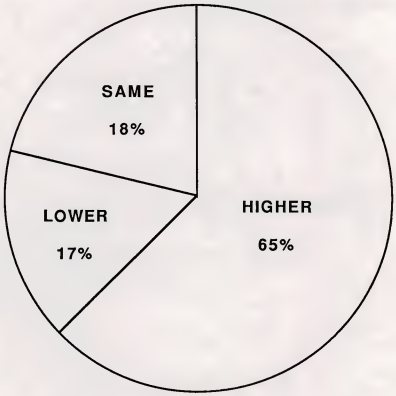
  - Lower costs and more effective management of voice communications services.

  - Increased reliance on internal capabilities for software maintenance.

- Overall, IS departments expect a 12% budget increase for 1987.

EXHIBIT IV-2

TELECOMMUNICATIONS BUDGET CHANGES, 1986-1987



V NEEDS, OPPORTUNITIES, AND CONCLUSIONS

A. UNMET NEEDS

- Several users indicated that vendors have yet to adequately adapt standards which accommodate an open systems environment.

- Others stated that vendors do not have the expertise to interface the computer information industry into communications industry services and do not understand how the telecommunications industry operates, either technologically or internally as a business.

- One firm required more reliable, and economical, fault-tolerant systems, reporting this technology will be implemented increasingly in the future due to user demands for on-line systems operating full time.

- These identified unmet needs are shown in Exhibit V-1.

B. OPPORTUNITIES FOR TELECOMMUNICATIONS I.S. DEPARTMENTS

- Increasingly, telcos are becoming market participants themselves, offering other firms applications and services developed for internal use to recover costs and generate revenues. These other firms may be other telcos or large telecommunications users managing their own networks.

EXHIBIT V-1

TELECOMMUNICATIONS
UNMET NEEDS

- Open Systems Standards
- Vendors Lack Technological, Business Understanding of Industry
- Fault-Tolerant Systems

- One challenge facing BOC-affiliated vendors is to secure business with other industry companies who may consider the vendor a rival.

  - This factor is a market inhibitor, based on both emotional and business grounds.

  - Partnering with or acquisition of independent companies may be colored by the affiliation. It is uncertain if such alliances will be beneficial or detrimental to the parties involved in attempts to sell in the telecommunications environment.

  - However, the motivation for such partnering is usually to enter broader information service markets, not merely telecommunications itself, in which case benefits accrue by giving BOC partners the ability to provide software and services to their customers, becoming a one-stop source of IS solutions.

- INPUT believes that telco entry into broader information services markets is slowly subsiding, in part due to the rapid involvement of the BOCs and the need for an evaluation period.

  - Fewer "independent" firms selling solutions to telecommunications companies will maintain a presence into the 1990s.

  - Those that will remain will often do so because they have found profitable and highly specific market niches and have entered into successful marketing and distribution agreements with telco subsidiaries.

- With merger and acquisition activities at a high level, the IS departments of telecommunications firms may have new, unfamiliar responsibilities:

- The IS departments of merging companies may need to work together to functionally merge their units, and there can be difficult technological and business issues to be overcome.

- IS departments may be called upon to evaluate the "fit" of a candidate acquisition company's technologies into the acquiring firm's business strategy.

- Technological change is creating new opportunities in the telecommunications segment. Many of the BOCs are installing local packet switching networks and are positioning themselves to offer protocol conversion services when the regulatory climate permits. These new networks will require tracking and bill accounting systems, and systems developed by one company may be sold to others with similiar needs.

- Software and systems supporting security functions within data and voice services are needed. Software is being developed to spot "hackers" attempting to test access codes against long-distance exchanges. Once detected, the next attempt is permitted, the line trapped, and the call traced to the violator.

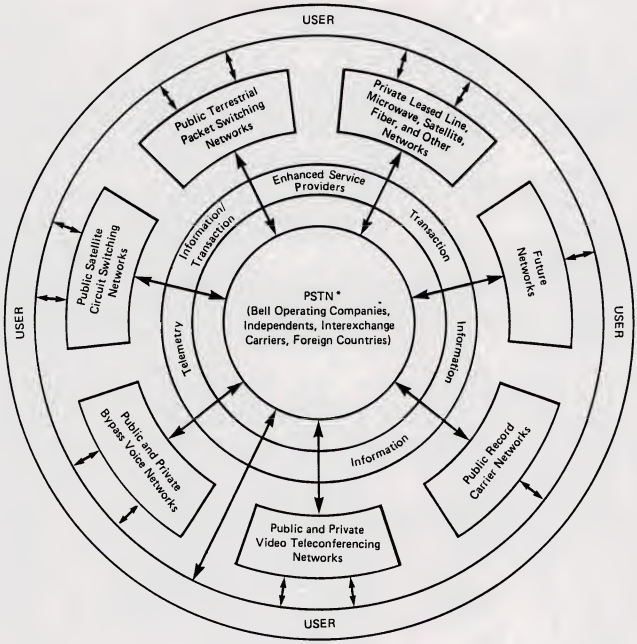
- The Integrated Services Digital Network (ISDN) is currently being tested. When implemented, ISDN-related applications will be developed by industry participants, their vendors, or, more likely, jointly.

  - Examples include messaging, teleconferencing, data base information services, transactions, and telemetry applications for alarms, equipment monitoring, and utility management.

  - ISDN thus represents opportunities for software development, professional services, information providers, and third-party services. Exhibit V-2 represents the range of ISDN distribution services.

EXHIBIT V-2

ISDN DISTRIBUTION SERVICES



* PSTN = Public Switched Telephone Network

- Opportunistic enterprises in information services (such as 976-exchange audiotex services), cellular telephone, long-distance, reselling, shared tenant services, and satellite services have arisen.

  - The BOCs are currently prohibited from actually providing information services directly, but are permitted to provide the facilities for delivering information services.

  - These newer participants often approach business with financial and marketing concerns overriding information service concerns, creating opportunities as well as risks for telcos with software, systems, and services to offer.

  - Unproven new enterprises may fail, and telcos may be left without an opportunity to benefit from an ongoing relationship after an expensive sales and development effort.

  - Cautious approaches are particularly recommended for shared tenant services which have thus far failed to generate significant interest.

- Cellular systems are operated by either independent firms or subsidiaries of the LECs. Due to regulatory and business requirements, these subsidiaries will often use remote computing services firms or internal systems to handle their billing rather than the bill processing facilities of the affiliated telco.

  - The cellular industry is characterized by volatile pricing driven by competitive influences, requiring the ability to rapidly change price schedules.

  - There are billing format inconsistencies between the regular telephone system, cellular billing, and "roamer" billing (for users outside their primary service area) which need to be addressed.

- In addition to billing services, cellular operators require value-added services such as traffic pattern analysis, channel usage statistics, and equipment efficiency reports, functions similiar to those handled by telco IS departments.

- Professional services opportunities are significant, and telecommunications firms with the surplus of resources necessary are offering these services to both customers and other industry members.

- Fiber optic networks, for the most part, are being designed as bulk service providers to other carriers. As end-to-end, switched services (including the local loop) via fiber cables are introduced by the local telcos, information systems to implement and then manage them will be needed.

- Other emerging areas in telecommunications are mobile data applications (using cellular, paging, or other radio common carrier frequencies) for field personnel and other requirements, digital radio-based rural telephone systems, proposed mobile satellite communications services, and radio positioning/messaging systems.

- These opportunities are shown in Exhibit V-3.

C. RECOMMENDATIONS AND CONCLUSIONS

- The first and foremost recommendation for telecommunications firms is to address their immediate needs appropriately; in other words, "mind the store."

- IS departments should survey end-user departments to determine anticipated needs and realistically evaluate their capabilities to support them.

EXHIBIT V-3

TELECOMMUNICATIONS I.S. OPPORTUNITIES

- As Vendors
  - To Other Telecom Firms
  - To End-User Telecom Departments
- As Acquisition Evaluators
- As Innovators of New Systems Supporting New Services: Data Networks, Cellular, Fiber Optics, Mobile Data

- It may be necessary for IS managers to surpress the tendency to attempt to bring all corporate IS functions under IS control.

- It is often desirable to loosen the IS ties in a decentralized approach, shifting responsibility to the functional departments for either developing, or contracting for, the application or service needed to support the department, particularly when needs are pressing and competitive opportunities are "now."

- Firms with additional capabilities and the backing of management should address external opportunities with other industry firms and end users.

- There are necessary cautions. For users considering product or service development in this market (and thus becoming vendors in their own right), INPUT recommends:

  - Recognition be made of the long lead times and planning cycles characteristic of the industry, leading to long sales cycles, particularly in regulated segments. This sluggishness, a holdover from the regulated environment, also means facing the fact that telco commercial activities may be developmentally hindered.

  - Firms be aware of the fact that needed systems are often massively complex and interrelated, a fact that can heavily influence service or software design. This suggests that systems developed to meet internal needs be the first priority for commercialization.

  - Firms recognize that the levels of automation can be significantly different among entities related to specific segment, prospect size, location, culture, and requirements.

  - Examination of ways of adapting software, systems, and services to large telecommunications users who are operating and managing their

own facilities and for international (particularly developing) markets where telecommunications infrastructures are being developed.

- Recognition that the marketing function can be expensive and that alternatives are available. For example, McDonnell Douglas Communications Systems Company is selling applications developed by the Southern New England Telephone Company.

- It is important for telecommunications companies to recognize their primary responsibility is to current customers. Resources directed toward ancillary activities must be available, the regulatory implications considered, and the business plan realistic before incursions into other, nontelephone (and, therefore, unfamiliar) activities are undertaken.

- INPUT's recommendations are shown in Exhibit V-4.

EXHIBIT V-4

TELECOMMUNICATIONS RECOMMENDATIONS

- **MIND THE STORE!**
- **Realistically Evaluate Departmental Needs and Decentralize Responsibility If Appropriate**
- **Address External Opportunities to Commercialize Solutions, Considering Necessary Cautions**