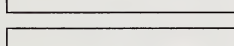
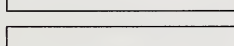
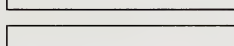
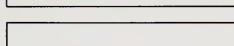
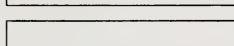
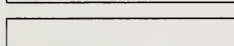
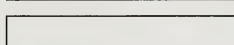
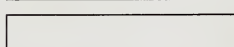
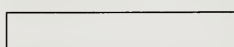
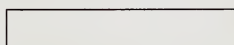
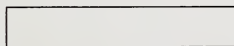
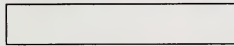
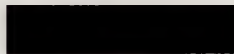


Executive Overview



Network Services Directions



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1980

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About INPUT

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

The company carries out continuous and in-depth research. Working closely with clients on important issues, INPUT's staff members analyze and interpret the research data, then develop recommendations and innovative ideas to meet clients' needs.

Clients receive reports, presentations, access to data on which analyses are based, and continuous consulting.

Many of INPUT's professional staff members have nearly 20 years' experience in their areas of specialization. Most have held senior management positions in operations, marketing, or planning. This expertise enables INPUT to supply practical solutions to complex business problems.

Formed in 1974, INPUT has become a leading international planning services firm. Clients include over 100 of the world's largest and most technically advanced companies.

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Planning Services For Management

To Our Clients:

This summary is an excerpt from a full research report, Network Services Directions, issued as part of INPUT's Information Systems Program (ISP). A complete description of the program is provided at the end of this Executive Overview.

If you have questions or comments about this report, please call INPUT at (415) 960-3990 and ask for the Client Hotline.



REPORT ABSTRACT

This report, produced as part of INPUT's Information Services Planning (ISP) Program, takes a comprehensive look at network services directions. It includes a technology scan and analysis of networking techniques, profiles of leading and innovative vendors, descriptions of user attitudes toward network services, and discussions of the applications which are now important and those which will likely become more important in the future.

The voice/data/image traffic split is quantified now and in 1991, and user directions toward private and virtual private networks are tracked.

Several case studies describe users' approaches to network services. The report concludes with detailed recommendations to users of network services.

OVERVIEW CONTENTS

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The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry, no matter how small, should be recorded to ensure the integrity of the financial data. This includes not only sales and purchases but also expenses and income. The document also highlights the need for regular audits to identify any discrepancies or errors in the records.

In addition, the document provides guidelines on how to handle cash transactions. It advises that cash should be kept in a secure location and that all cash receipts should be properly documented. The document also discusses the importance of reconciling the cash account regularly to ensure that the balance matches the actual cash on hand.

The second part of the document focuses on the management of accounts payable and receivable. It explains how to track the amount of money owed to the business and how to manage the collection of payments from customers. The document also provides tips on how to negotiate payment terms with suppliers and how to handle late payments.

Finally, the document discusses the importance of budgeting and financial forecasting. It explains how to create a budget that reflects the expected income and expenses for a given period. The document also provides guidance on how to use the budget to make informed decisions about the business's operations and investments.

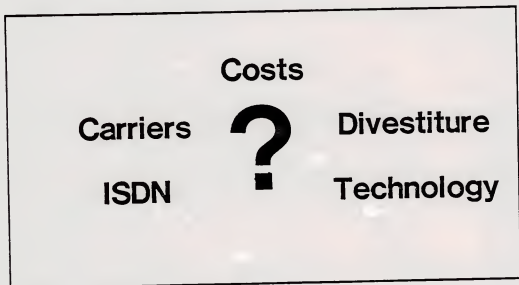
A. USERS WERE CONFUSED

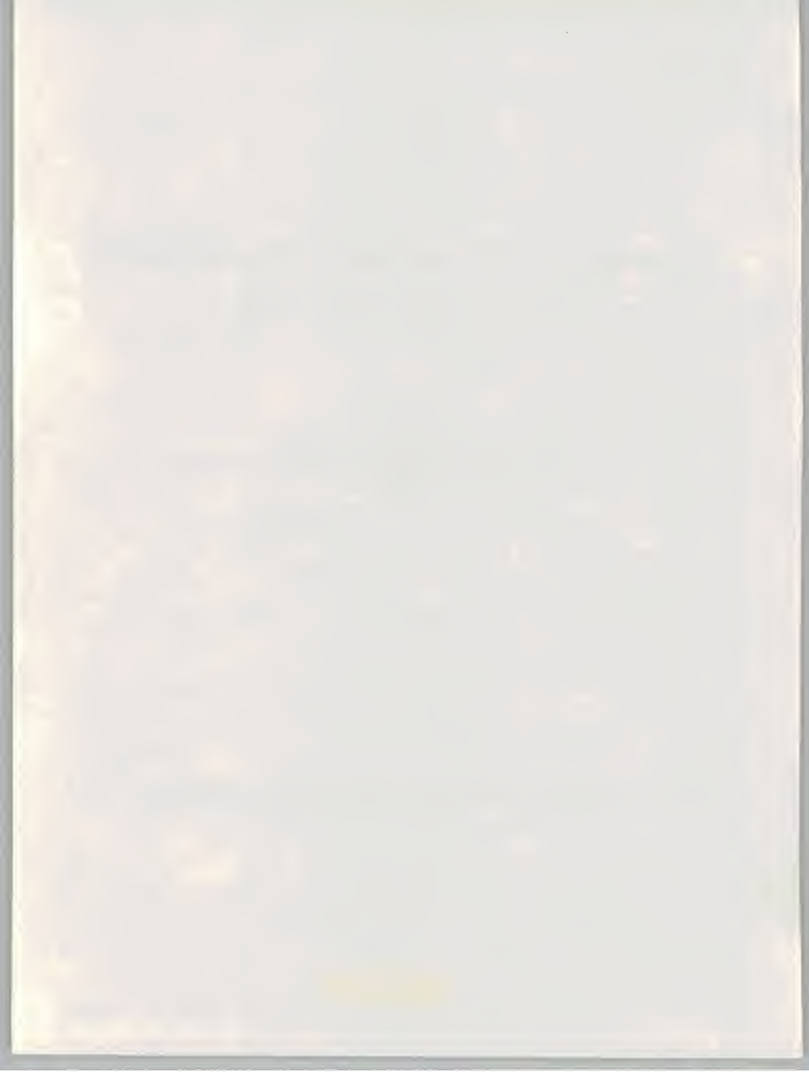
- The convergence of computers and communications is now upon us.
- Whereas the previous focus was on computing, there is more attention now being paid to the communications aspects of the information dyad. This takes the form of:
 - Internal communications, within and among work groups, between geographically distributed divisions, and among communities of interest.
 - External communications, with trading partners and, in some cases, with government regulatory agencies or trade associations.
- With the divestiture of AT&T and the end to one-stop shopping for communications needs, users were faced with a confusing environment and many remain confused. The causes include:
 - The rise of new carriers and new services.
 - Deregulation leading to competitive market forces.
 - The complexities of international communications.
 - Developing technologies.
 - Changing tariff and pricing structures.
 - Evolving, and sometimes competing, standards, such as the Integrated Services Digital Network.
- Users are aware that processing costs are decreasing while communications costs rise. They want more control of network expenses.

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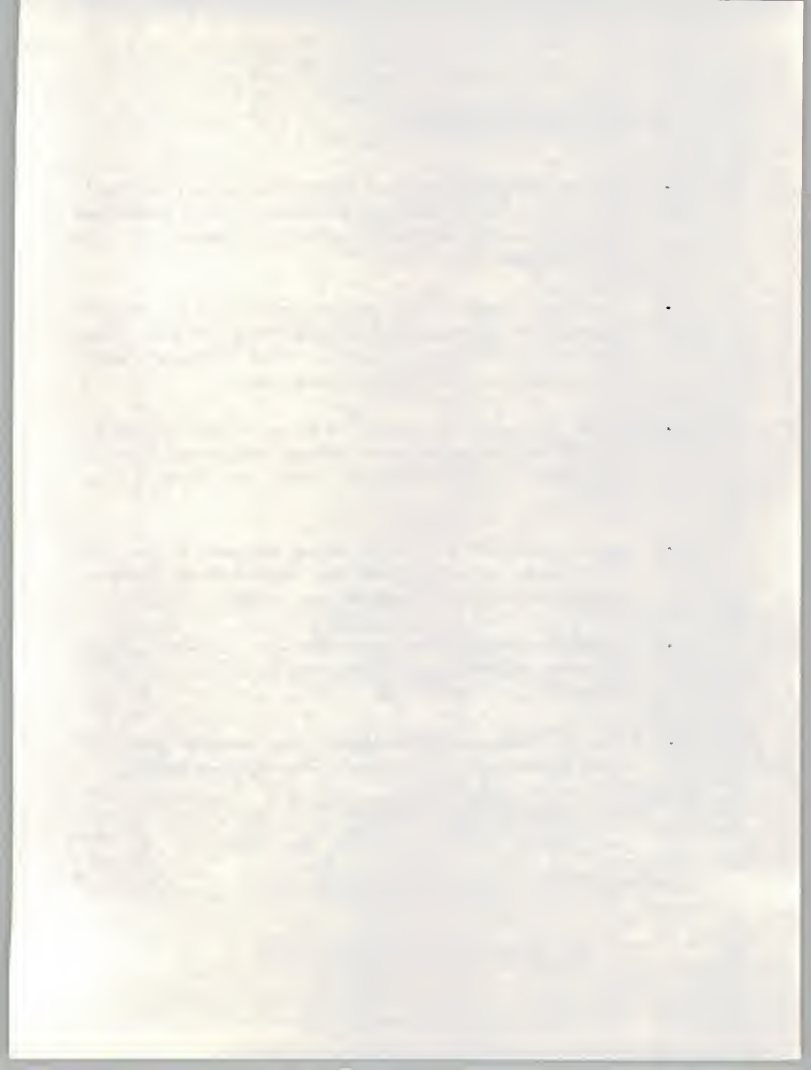
USERS WERE CONFUSED





B. USERS ARE EXPERIMENTING

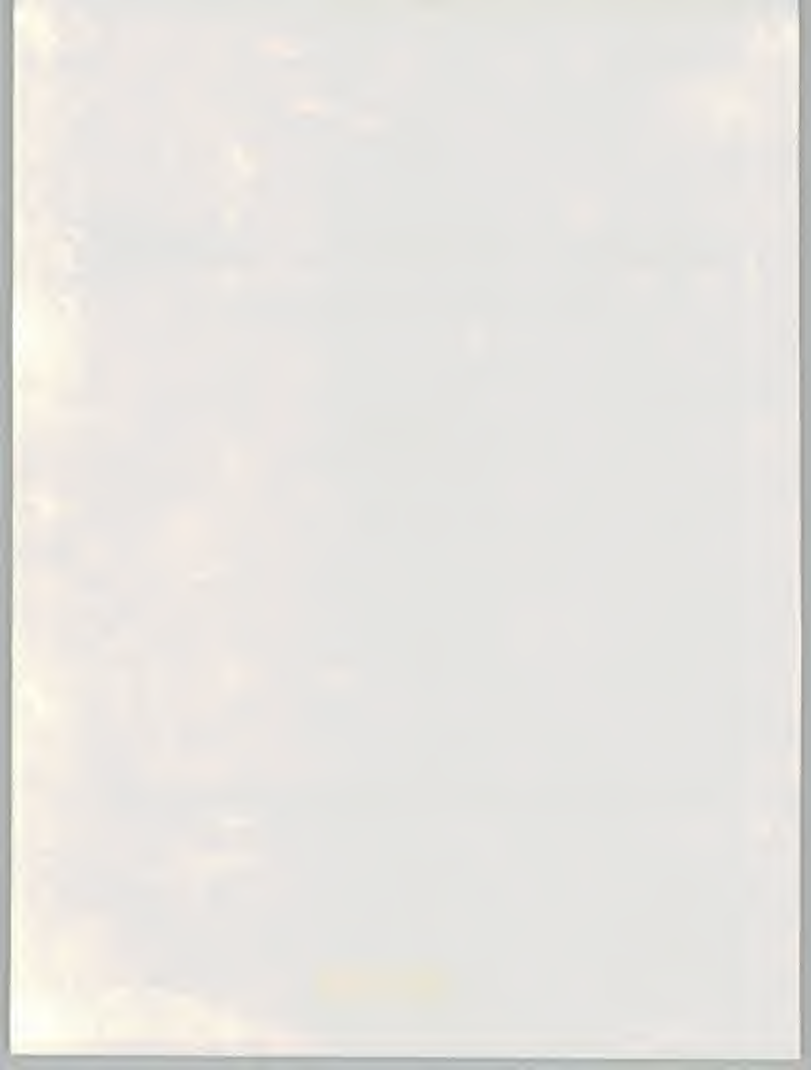
- While the dust has yet to settle from AT&T's divestiture, users are coming to terms with the new communications environment. They are aware of new options and many are experimenting with alternative approaches to needed network services.
- Many users are implementing private networks. The "Be Your Own Bell" strategy is more than a fad; it is driven largely by users wanting independence from network service vendors and more cost control. Another factor is their frustration due to long delays in getting needed services.
- In addition to hybrid networks combining private and public networks, new "virtual" private and software-defined networks afford both user control and the economies of a shared backbone network. These are being viewed favorably.
- Bypass methods such as microwave Digital Termination Services (DTS), satellite services using flexible small dishes (VSAT), lightwave systems, and cable television (CATV) data services are also available.
- Additionally, new networks such as fiber optic services are evolving, offering economical, wideband capabilities to users needing and able to manage the bulk capacity services now provided.
- Over the horizon is the Integrated Services Digital Network (ISDN) which will provide universal service using standard interfaces and access schemes.



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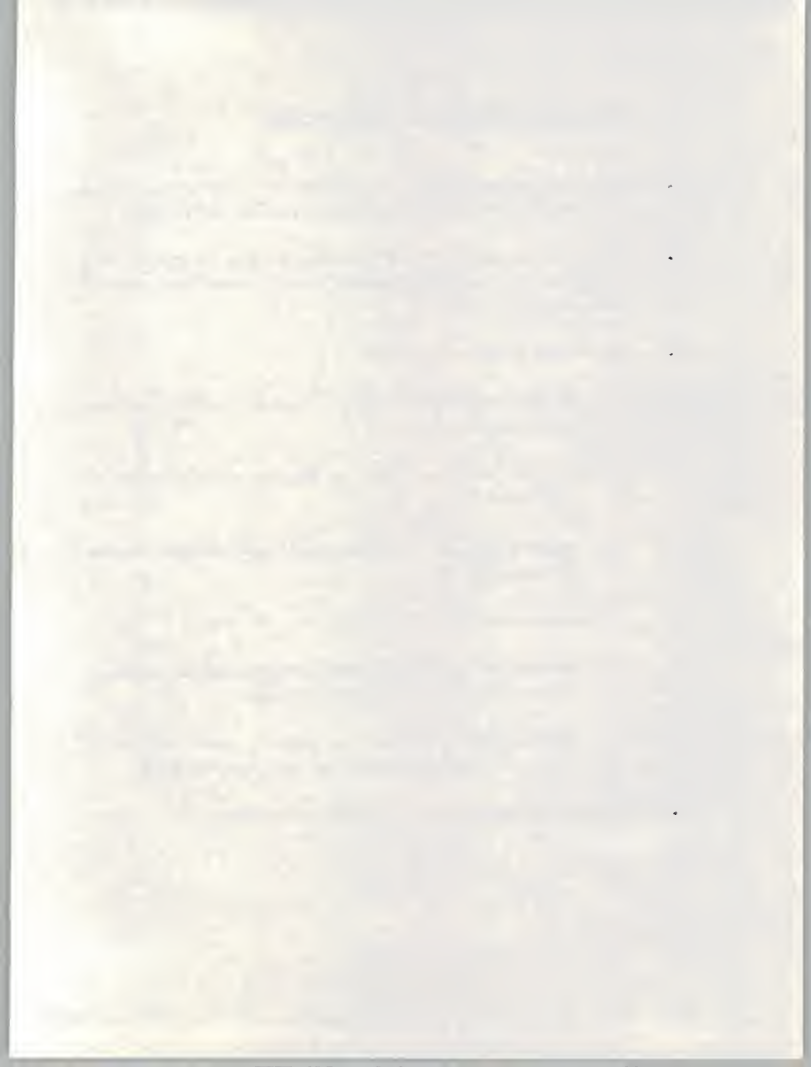
USERS ARE EXPERIMENTING

- “Be Your Own Bell”
 - Hybrid Networks
 - Virtual Private Networks
 - Bypass Options
- ISDN



C. THE NETWORK APPLICATION MIX IS CHANGING

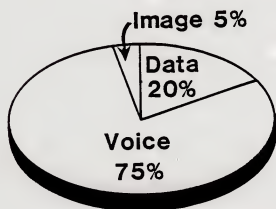
- Voice, time sharing, and data base access remain the dominant applications tied to network services. However, new services are now being offered.
- Network services providing "pure" communications links are often viewed as commodities. The applications available through a network is an important factor in vendor selection.
- Important applications will likely be:
 - Electronic data interchange, the exchange of business documents between trading partners.
 - Electronic mail, particularly as universal access standards are implemented.
 - Graphic systems such as linked computer assisted design and engineering workstations.
 - Teleconferencing in voice, video, and computer modes.
 - New consumer-oriented applications such as point-of-sales, credit card authorizations, and, in the longer term, videotex.
 - Additional business and consumer telemetry applications such as alarms, meter reading, and remote equipment fault diagnostics.
- The net result is that data will become a larger part of the mix.



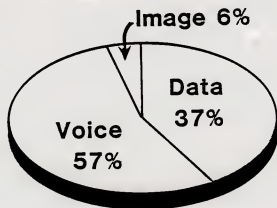
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THE NETWORK APPLICATION MIX IS CHANGING

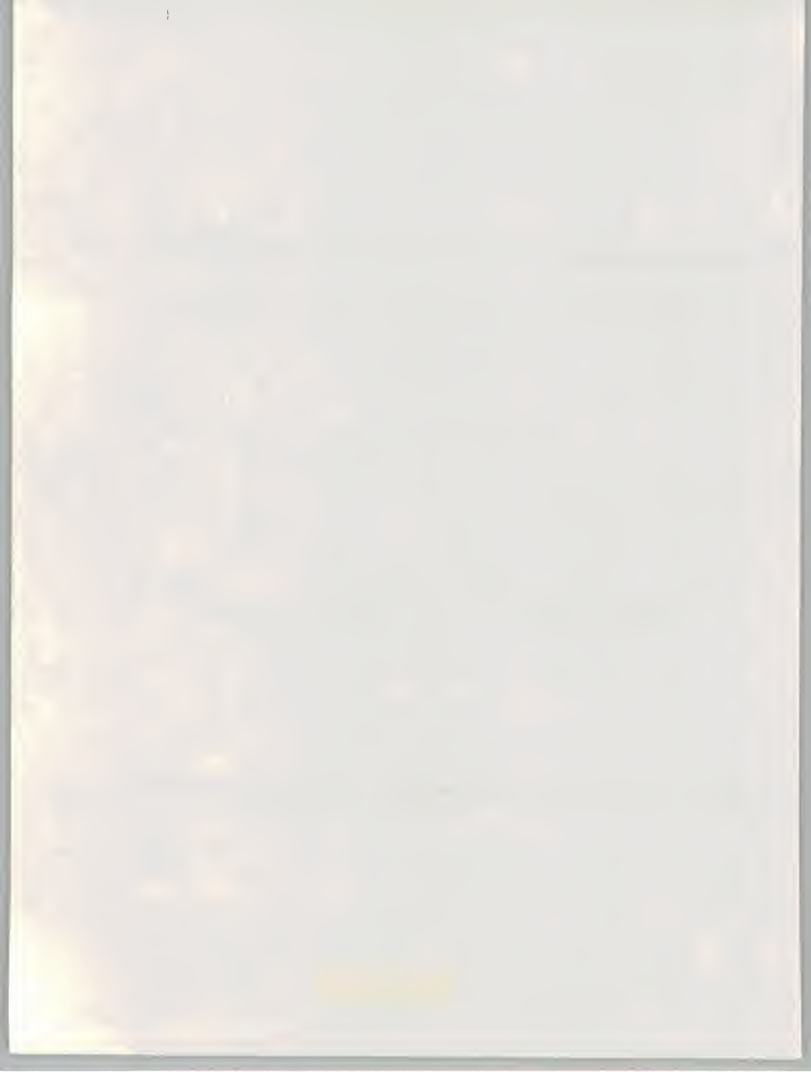
User Estimates



1986

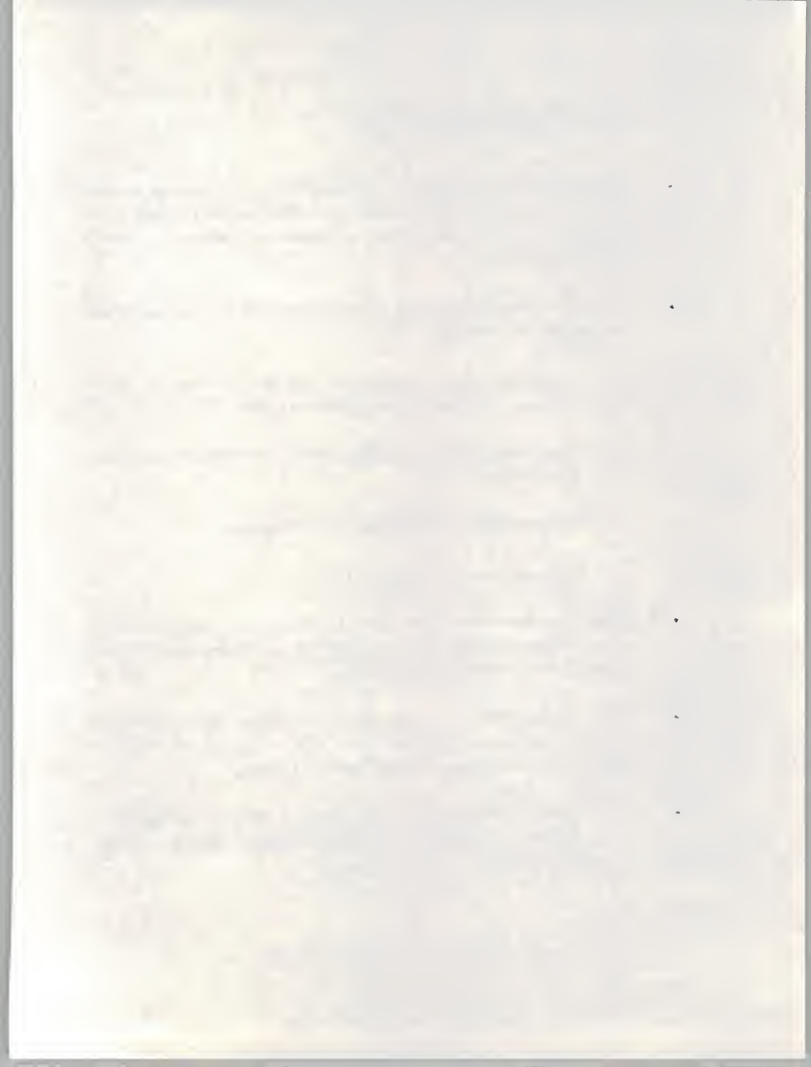


1991

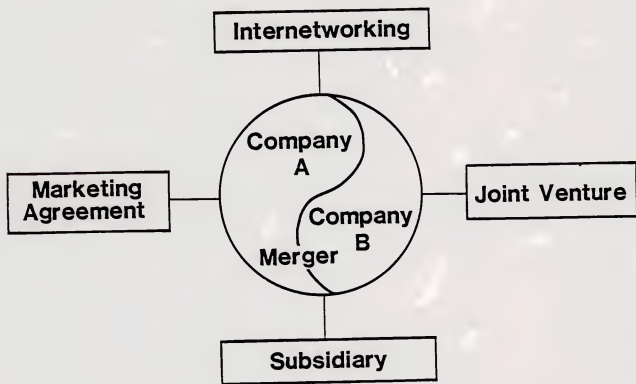


D. THE MARKET IS CONSOLIDATING

- Whereas the intent of divestiture and deregulation is to encourage competition, leading to cost and technological innovation benefits for users, it now appears the costs of competition on vendors is leading to a different environment.
- Examples of consolidation can be regularly read in the business pages of local newspapers. They include:
 - The merger of U.S. Telecom and GTE Sprint to form U.S. Sprint, combining now separate voice and data networks.
 - The purchase of RCA by General Electric, combining data communications services.
 - The purchase by British Telecom of an ITT division.
 - The partial ownership of MCI by IBM.
- Additionally, there are many examples of strategic partnering represented by joint ventures, marketing agreements, and internetworking which may be a prelude to more formal, future bonding.
- These amalgamations may mean the eventual return of communications monopolies; however, a more likely scenario is an oligopoly of a few major companies with the actions of each affecting the others.
- In the interim, constellations of communications companies are developing, linked formally or informally, to provide end-to-end services and often equipment to users.



THE MARKET IS CONSOLIDATING



the 1990s, the number of people in the UK who are aged 65 and over has increased from 10.5 million to 13.5 million, and the number of people aged 75 and over has increased from 4.5 million to 6.5 million (Office for National Statistics 2000).

There is a growing awareness of the need to address the needs of older people, and the need to ensure that the health care system is able to meet the needs of older people. The Department of Health (2000) has set out a strategy for the health care system to meet the needs of older people, and the Health Service Research Unit (2000) has set out a strategy for the health care system to meet the needs of older people.

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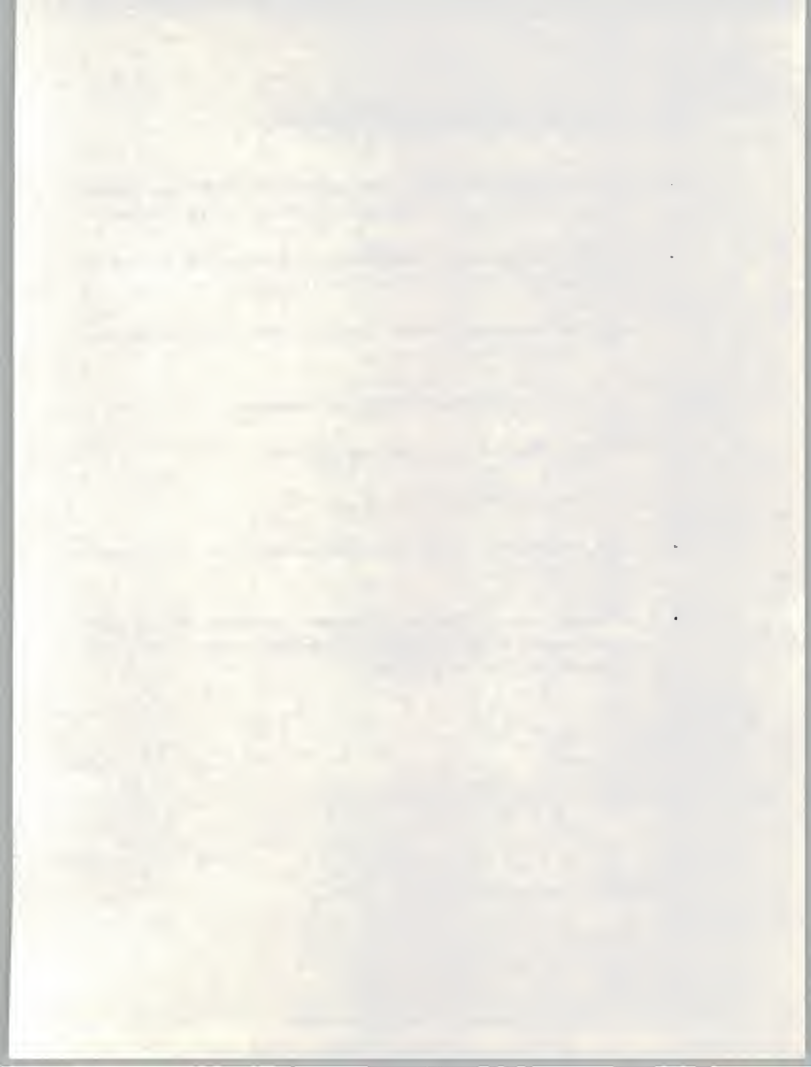
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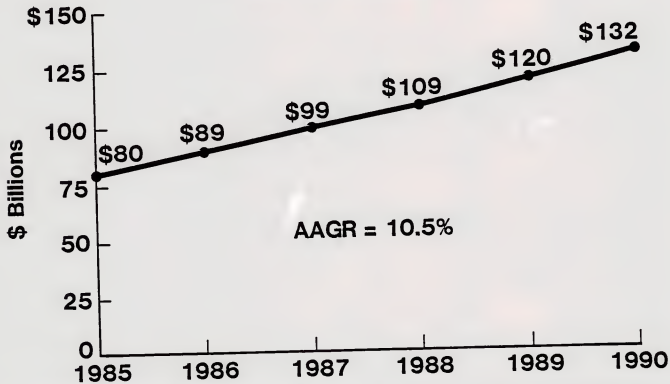
E. THE NETWORK SERVICES MARKET IS GROWING

- A healthy economy and growing awareness of the benefits of telecommunications mean continued growth in the network services industry as a whole.
- Data communications, now representing approximately 20% of corporate network service traffic, will increase. These increases are tied to:
 - The acceptance of microcomputers in business and the demand to link these tools to other processors.
 - The importance of information in the modern age.
 - Increasing activity on a multi-national level.
 - New applications.
- While the proportion of voice traffic will decrease, it too will continue to grow in the 10% range.
- INPUT estimates the 1985 market for network services (voice and data) at \$80 billion, growing at an average annual growth rate of approximately 10% to become a \$132 billion market by 1990.



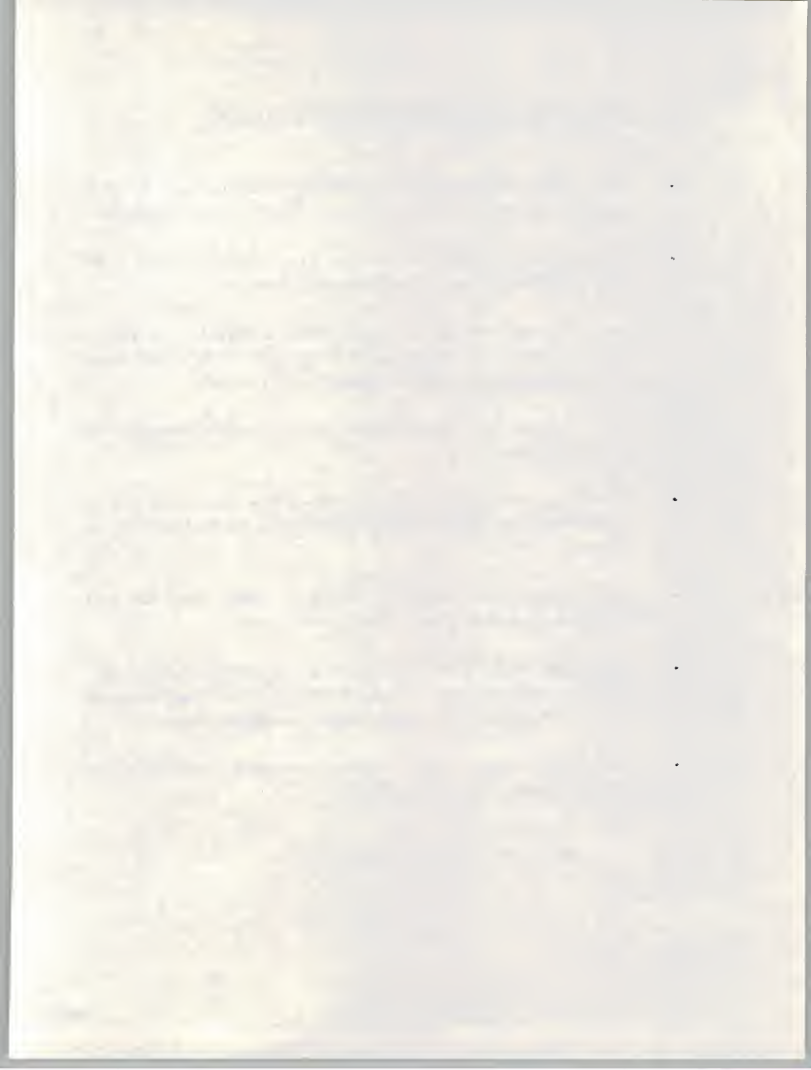
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**THE NETWORK SERVICES MARKET IS GROWING
VOICE AND DATA**



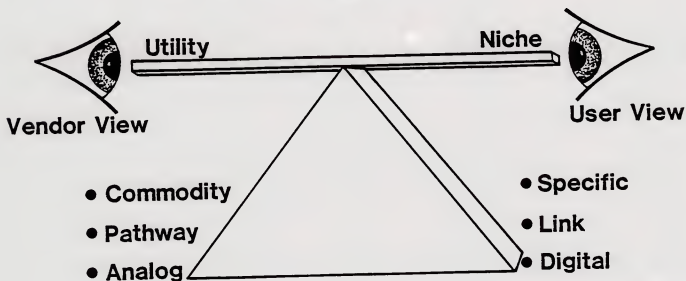
F. TOWARD ADAPTIVE NETWORK SERVICE TECHNOLOGIES

- While networks have often been optimized for voice, data, image, or various protocols, the evolution of network services is toward adaptive technologies.
- It is useful to consider two conflicting, yet complimentary, views of the generic "network" to further understanding of this concept.
 - The utility view sees networks in their most basic form, providing a commodity pathway between two or more points. This telephony-based view obscures the inherent adaptability of the network.
 - The niche view sees the network as fitting specific user needs and applications.
- The challenge to users and vendors is to balance these views, recognizing the multidimensionality of communications technologies, and to identify how the technology can be customized.
- While vendors want to be all things to all people (utility view), users want customized solutions for their specific needs (niche view).
- The networks of the future will be all digital, using a standard interface for a variety of terminal devices. The digital nature of future networks is highly adaptable: digitized voice and digital data will be indistinguishable.
- The Integrated Services Digital Network, when available, promises to provide a universal solution to individual problems.



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TOWARD ADAPTIVE NETWORK TECHNOLOGY



the 1990s, the number of people with a mental health problem has increased in the UK (Mental Health Act 1983).

There is a growing awareness of the need to improve the lives of people with mental health problems. The Department of Health (1999) has set out a vision of a new mental health system, which will be based on the following principles: (1) a focus on the needs of the individual; (2) a focus on prevention and early intervention; (3) a focus on recovery; (4) a focus on the needs of the community; (5) a focus on the needs of the family; (6) a focus on the needs of the carer; (7) a focus on the needs of the patient; (8) a focus on the needs of the professional; (9) a focus on the needs of the system.

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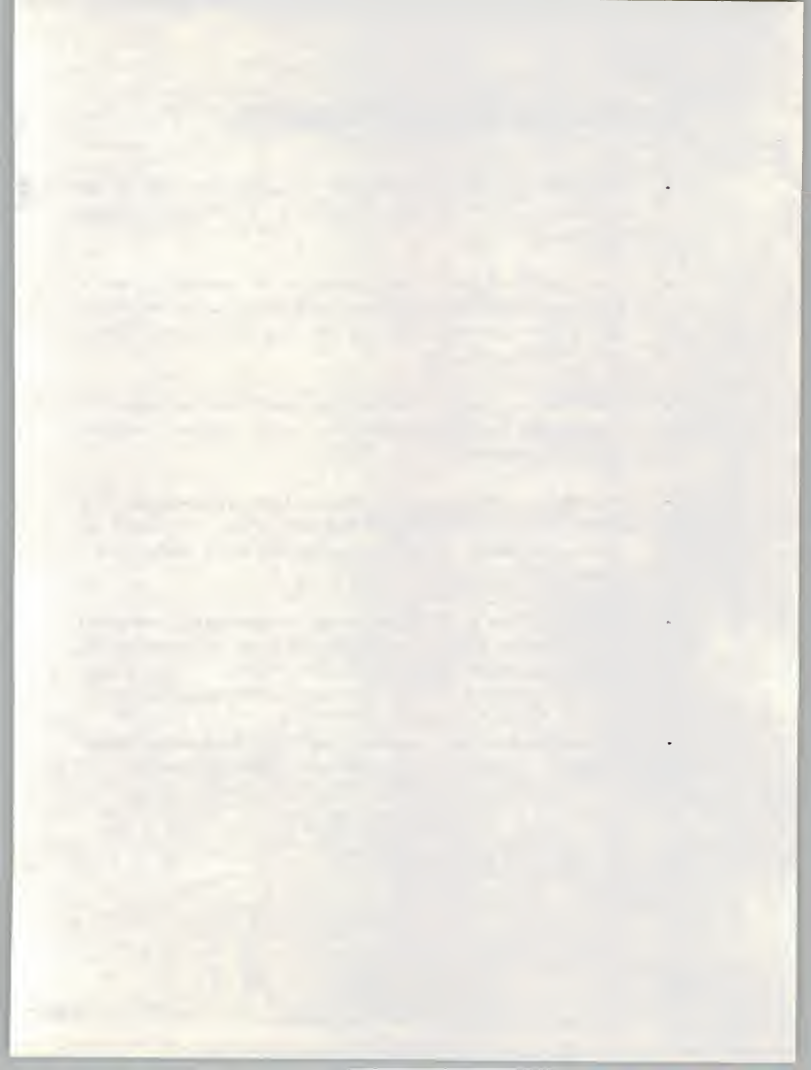
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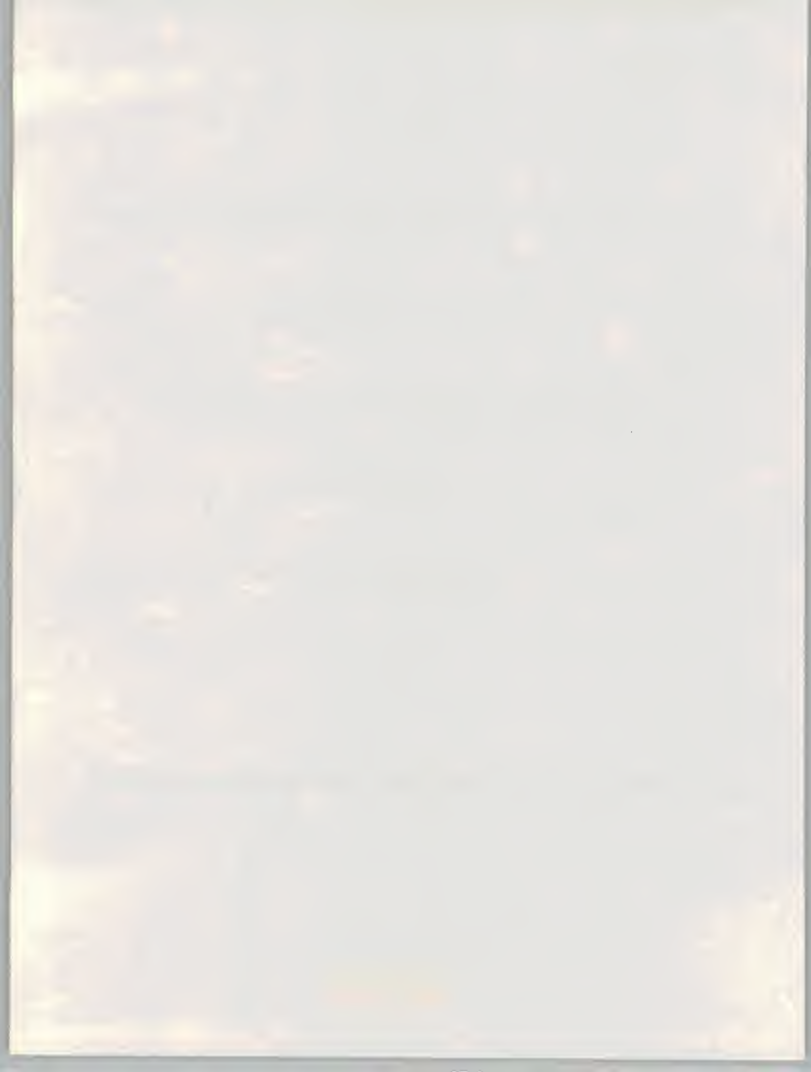
G. RECOMMENDATIONS TO NETWORK SERVICE USERS

- Users should consider adding technology assessment staff to monitor new developments and make recommendations for piloting new, innovative solutions.
- Users should investigate parallel developments and alternative solutions to problems and avoid the tendency toward the inertia of "comfortable" technologies. To ignore promising trends may mean a loss of competitive advantage and overlooked opportunities.
- Organizationally, the voice and data departments should be merged with cross-discipline training to prepare the way for voice/data integration initiatives in the future.
- Users should evaluate the cost effectiveness of software-defined and virtual private networks as an alternative to private network configurations and develop an organized method of evaluating competitive vendors using a decision matrix.
- ISDN developments should be monitored and management kept informed of both the benefits and risks of ISDN. Use of digital and software-defined networks can provide valuable experience for ISDN. A plan for reusing unneeded equipment when ISDN becomes available should be developed.
- Short-term equipment/service agreements provide flexibility and keep vendors interested in the organization, plus encourage competitive pricing.



RECOMMENDATIONS TO NETWORK SERVICE USERS

- **Add Technology Assessment Staff; Experiment with Innovations; Merge Voice/Data Departments; Cross-Train**
 - **Evaluate Competitive Vendors/Technologies Using a Decision Matrix**
 - **Monitor ISDN and Keep Management Informed**
 - **Stay Flexible With Short-Term Contracts**
-



the 1990s, the number of people in the world who are under 15 years of age has increased from 1.1 billion to 1.5 billion, and the number of people aged 65 and over has increased from 0.5 billion to 0.7 billion (United Nations 2002).

As a result of the demographic changes, the number of people in the world who are aged 15–64 years has increased from 3.5 billion to 4.5 billion. The number of people aged 15–64 years in the world is projected to increase to 5.5 billion by 2050. The number of people aged 15–64 years in the world is projected to increase to 6.5 billion by 2100 (United Nations 2002).

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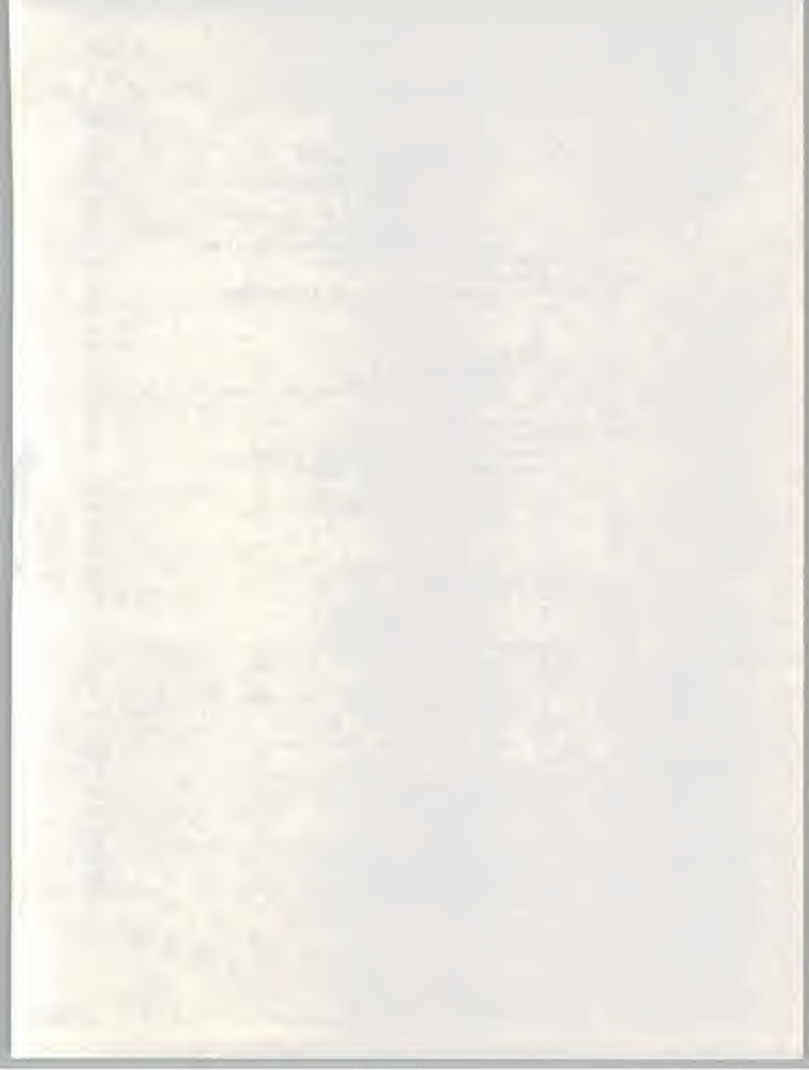
NETWORK SERVICES DIRECTIONS

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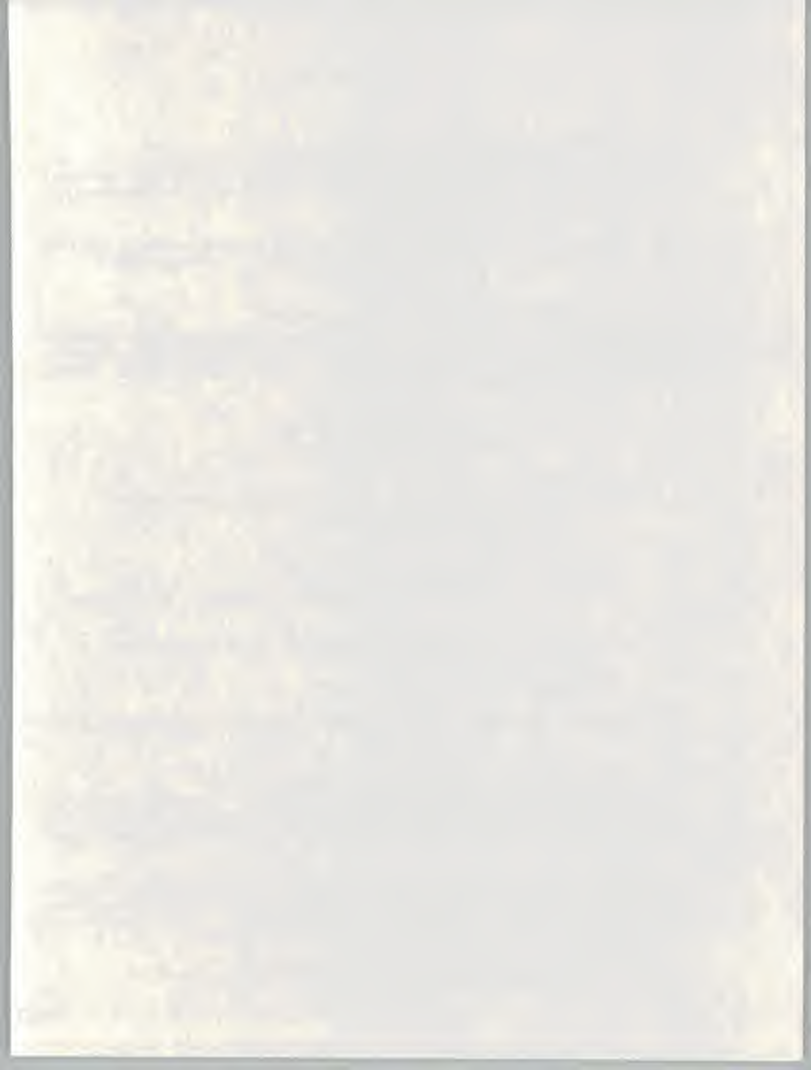
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