

INFORMATION SYSTEMS PLANNING REPORT
UTILITIES SECTOR

NOVEMBER 1986

THE HISTORY OF THE
CITY OF BOSTON

FROM THE FIRST SETTLEMENT TO THE PRESENT TIME

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VOLUME I

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INFORMATION SYSTEMS PLANNING REPORT
UTILITIES SECTOR

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INFORMATION SYSTEMS PLANNING REPORT
UTILITIES SECTOR

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I MAJOR ISSUES

A. DRIVING FORCES

- Most utilities have completed major capital projects resulting in up to 50% excess capacity in many utility operations. Demand has slowed, increasing at a 2-3% rate annually. Nuclear power plant cost overruns have forced budget austerity. Thus, no new major construction projects will be required until the 1990s.
- Utilities have always dealt with government regulations. However, "enlightened" utilities are learning to work with regulatory agencies in an effort to get necessary rate increases and receive these increases in a timely manner.
- The economy has improved. Lower inflation and interest rates are usually good news to a capital intensive industry like utilities. Unfortunately, most of the major building programs were financed during periods of high inflation rates. Thus, the combination of excess capacity, slower growth in consumer demand, and high debt servicing requirements have placed most utilities in a major cost reduction program.
- Readily available excess electricity, made possible by cogeneration, has greatly lessened the need to expand capacity.



- Hardware and software obsolescence will impact many utilities. Basic commercial applications (e.g., billing, financial reporting, etc.) need to be upgraded. New billing and payment systems that take advantage of technological advances such as pay-by-phone and frequency emitting meters will need to be developed. Engineering and operation systems will require more integration with modeling systems to project capacity.
- Senior management at utility companies, selected generally for good day-to-day operations backgrounds, must begin using information as a competitive and strategic weapon.
- Exhibit I-1 summarizes the driving forces for the utilities sector.

B. ISSUES AND OBJECTIVES

- IS key issues for this sector focus on solving the paradox of containing costs while upgrading obsolete systems. In addition, management looks to IS to produce systems that improve productivity throughout the organization while applying the same cost constraints on IS as on other departments.
- Utilities that are under less severe cost pressures have issues and objectives encompassing data administration, formalizing end-user support organizations, and taking a more active role in the corporate planning process.
- Marketing and customer service improvements are playing a larger role in IS decisions. Utilities have become more marketing oriented in their efforts to provide services to more homes and businesses without increasing overall plant capacity.
- Regulatory reporting will continue to place a burden on information systems resources.



EXHIBIT I-1

**UTILITIES
DRIVING FORCES**

- **Regulation**
- **Economy (Inflation and Interest Rates)**
- **Excess Capacity**
- **Slower Growth in Demand**
- **Strategic Senior Management Orientation**



- As large utilities broaden their business bases, corporate IS plans should be integrated with the overall strategic plan.
- Since marketing's role in utilities is increasing, strong consideration should be given to relational data base systems for marketing information. The challenge: Must MIS persuade senior management that installing a marketing information system is necessary before marketing's role can be increased? The challenge is increased by the fact that senior management of utilities comprises good day-to-day managers, not necessarily those with a strategic orientation.
- End-user computing will grow in a more competitive environment since each department must have specialized systems to support the overall effort. A "plain vanilla" approach through batch-oriented corporate MIS will not provide timely and complete information to individual departments.
- The purchase of departmental minis and fourth generation application development tools by end-user departments is changing MIS' role to one of data manager and coordinator. Additionally, corporate MIS can continue to help with cost justification of systems for end-user departments.
- Asset management is a logical outgrowth of utilities becoming more competitive. Cash management, vehicle management, and facilities management systems have relatively high installation priorities.
- Exhibits I-2 and I-3 summarize the issues and objectives of the IS respondents for this sector.
- Management in the utility sector perceives IS as a technical asset, not a business asset. They are just beginning to see the advantage of IS as a strategic tool, but management is most concerned with cost containment and IS' role in achieving that goal by improving corporate-wide productivity.

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that this is essential for ensuring transparency and accountability in the organization's operations.

2. The second part of the document outlines the various methods and tools used to collect and analyze data. It highlights the need for consistent and reliable data collection processes to ensure the validity of the results.

3. The third part of the document describes the different types of data that are collected and analyzed. It includes information on both quantitative and qualitative data, as well as the specific variables and metrics used in the analysis.

4. The fourth part of the document discusses the various statistical techniques and methods used to analyze the data. It covers topics such as regression analysis, correlation analysis, and hypothesis testing, providing a detailed overview of the analytical process.

5. The fifth part of the document presents the results of the analysis, including the key findings and conclusions. It provides a clear and concise summary of the data and the insights gained from the analysis, highlighting the most significant results and their implications.

6. The final part of the document discusses the implications of the findings and the recommendations for future research. It provides a clear and concise summary of the key findings and the implications of the analysis, highlighting the most significant results and their implications.

EXHIBIT I-2

**UTILITIES
ISSUES**

- **Cost Containment**
- **Hardware and Software Obsolescence**
- **Customer Service Improvements**
- **Regulatory Reporting**
- **Productivity Improvements**
- **Integration of IS Plan with Corporate Strategic Plan**
- **Establishment of a Data Base of Marketing Information**
- **Increase in Organizational End-User Computing**



EXHIBIT I-3

**UTILITIES
OBJECTIVES**

- **Change from Internal Application Development to User-Driven Data Administration**
- **Continue Cost Justification for End-User Computing**
- **Install Capital Management System**



- IS measures its success in terms in which management is most interested--cost. Costs are compared to other departments and to IS departments of similar organizations. Some respondents do perform cost benefit analysis on major projects and communicate the results to management, but very little post-implementation analysis is performed. Most respondents believe they have moderate success in communicating their measurements to management.
- Most respondents have very minor involvement in corporate planning, but some see their role in this area increasing. One respondent is part of the corporate strategic planning group.

C. IMPACT OF TECHNOLOGY

- End-user computing has had a significant impact on this sector's Is department. It has broadened IS' scope and required it to become service oriented.
- Departmental processing has had little impact in this sector. The highly centralized approach to processing coupled with severe cost constraints has relegated the study of departmental processing to a very low priority in many companies.
- The major thrust in distributed systems development is micro-based end-user applications. One respondent is developing two systems using this technique.
- The respondents felt that the learning curve for relational data base use is very high. However, some respondents are developing applications using relational data bases and others are using relational-like fourth generation languages.

1. The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that proper record-keeping is essential for the integrity of the financial system and for the ability to detect and prevent fraud.

2. The second part of the document outlines the specific requirements for record-keeping, including the need to maintain original documents and to keep copies of all records for a minimum of seven years. It also discusses the importance of ensuring that records are accessible and retrievable at all times.

3. The third part of the document discusses the role of internal controls in ensuring the accuracy and reliability of financial records. It emphasizes that internal controls should be designed to prevent errors and to detect and correct any irregularities that may occur.

4. The fourth part of the document discusses the importance of regular audits in ensuring the accuracy and reliability of financial records. It emphasizes that audits should be conducted by independent auditors and that the results of the audits should be reported to the appropriate authorities.

5. The fifth part of the document discusses the importance of training and education in ensuring the accuracy and reliability of financial records. It emphasizes that all personnel involved in the financial system should receive appropriate training and education to ensure that they are able to perform their duties accurately and reliably.

6. The sixth part of the document discusses the importance of transparency and accountability in ensuring the accuracy and reliability of financial records. It emphasizes that all transactions should be recorded accurately and that the results of the financial system should be reported to the appropriate authorities in a timely and accurate manner.

- Fiber optics technology is of interest to IS managers, since it will permit transmission of graphics-based information due to its support of increased bandwidth.
- Most of the respondents believe that merging voice and data will be required in their organizations. This belief is based on the concept that voice communications costs would be reduced once voice and data are merged. The respondents are planning for merging voice and data, but believe it will be at least two years before it can be implemented.
- The lack of LAN standards is delaying the wide spread use of LANs in respondent companies. Respondents state that they cannot make an educated decision on which architecture to use, so most companies are taking a tentative, cautious approach to LAN implementation.
- Although not directly IS-related, new technologies are making available alternative energy sources at competitive rates.
- Exhibit I-4 summarizes the impact of the above technological issues on IS for the utility sector.
- The utility sector has had great success with its end-user computing support. One respondent has increased staff in this area at an annual rate of 10% since 1984 and now has a staff of over 60 people supporting end users. In other organizations, end-user computing has forced IS to become more business- and service-oriented. Ancillary benefits to establishing the end-user support organization have been to increase user understanding of the complexities of IS and heightened management awareness of the capabilities IS can provide.
- As in other sectors, the information center (IC) has been the focal point for end-user training. The more advanced end-user organizations have a separate training group that performs the following functions:

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EXHIBIT I-4

UTILITIES
IMPACT OF TECHNOLOGY

	IMPACT	COMMENTS
End-User Computing	High	Relatively constant staff levels; 5% AAGR 1986-1988. Broadened IS scope.
Departmental Processing	Medium	Result of competition and deregulation of energy sources.
Distributed Systems Development	Low/ Medium	Causing IS architectural problems. Some using 4GL for this.
Relational Data Bases	Low/ Medium	Learning curve is higher than anticipated. Primarily using 4GLs.
Voice/Data Integration	Medium	Most in planning phase. High potential for cost savings.
LANs	Low	Cautious approach. Lack of standards is precluding action.



- Trains other IS personnel.
- Develops computer-based training programs.
- Conducts seminars for user groups.
- Arranges vendor presentations.
- Conducts on-site classes.
- Conducts classes in the IC.



II NEW APPLICATIONS

- The major focus of the utilities sector for applications development has shifted from accounting-oriented applications to customer-oriented and asset management systems.
- Other new asset management applications include hand-held meter reading systems and automated mapping.
- A rate refund system will be implemented by an electric utility serving a large midwestern city.
- Exhibit II-1 lists major new applications being developed by the respondents in this sector.
- According to Exhibit II-2, application development staff concentrates on enhancing and maintaining existing applications. Development of new applications is held back by budget constraints.
- Users want certain hardware products such as networks for mainframes and laser printers. Software needs were divided into desirable utilities and specified industry-oriented applications software (see Exhibit II-3).



EXHIBIT II-1

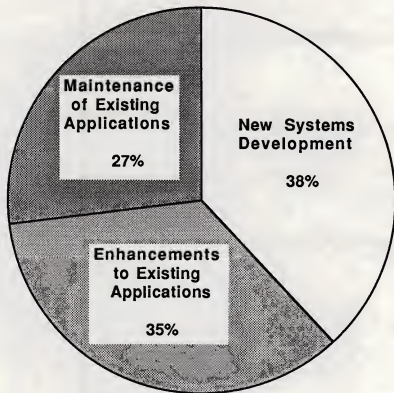
**UTILITIES
NEW APPLICATIONS IN 1986**

- **Customer/Marketing Information System**
- **Inventory Control/Materials Management**
- **Work Order Control System**
- **Power Distribution Information System**
- **Equipment Maintenance System**



EXHIBIT II-2

DIVISION OF APPLICATION DEVELOPMENT STAFF



Percent of Respondents

Cost Range: \$100,000-\$7,500,000



EXHIBIT II-3

USERS' COMPUTING NEEDS

- **Laser Printers**
- **Linking Mainframes**
- **Application Development Tools Optimized
for Developing Applications**
- **Packaged Software, Especially Accounting**



III BUDGET ANALYSIS

- Exhibit III-1 shows the 1986 budget distribution and projects the growth of budget categories in 1987.
 - The largest projected growth categories are data communications, external software, and microcomputers. This is consistent with the desire to reduce communications cost and the acceleration of end-user computing.
 - The smallest growth areas are mass storage devices and minicomputers, reflecting relatively large equipment purchases before the tax law changes (and reduced ITC) take effect.
- One-half of the respondents in the utilities sector indicated that their IS budgets will increase in 1987; however, only one-fourth of the respondents said their budgets will increase at a higher rate than 1986 (see Exhibit III-2).
 - Factors contributing to increasing the IS budget include (in order of most frequently mentioned factors):
 - Hardware.
 - Software conversion.
 - Personnel expenses.



EXHIBIT III-1

**1986 BUDGET DISTRIBUTION AND
1986/1987 CHANGES IN THE UTILITIES SECTOR**

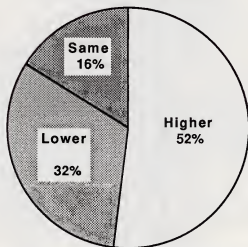
BUDGET CATEGORY	1986 PERCENT OF I.S. BUDGET	1986-1987 EXPECTED BUDGET GROWTH
Personnel Salaries and Fringes	35.1%	1.4%
Mainframe Processors	11.5%	4.5%
Minicomputers	1.4%	0.0%
Microcomputers	6.3%	6.2%
Mass Storage Devices	5.8%	-1.1%
Other Hardware	8.1%	0.3%
Total Hardware	33.1%	0.8%
Data Communications	4.4%	11.2%
External Software	6.1%	9.8%
Professional Services	4.4%	3.2%
Turnkey Systems	2.2%	5.1%
Software Maintenance	2.7%	6.6%
Hardware Maintenance	8.0%	9.1%
Outside Processing Services	1.8%	0.9%
Other	2.2%	1.1%
Total	100.0%	3.7%



EXHIBIT III-2

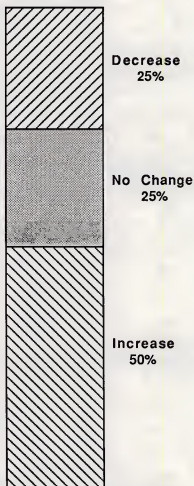
UTILITIES
BUDGETS WILL INCREASE MAINLY AT A LOWER RATE

1987 Budget Growth
versus
1986 Budget Growth



Percent of Respondents

1987 Budget
versus
1986 Budget



Percent of Respondents



- The following factors were mentioned as contributing to decreases in the IS budget:
 - . Cost containment.
 - . Reduced hardware purchases.

