U.S. INFORMATION SERVICES
VERTICAL MARKETS, 1986-1991
UTILITIES SECTOR

DECEMBER 1986

CONTENTS

EXHIBITS

I ISSUES, TRENDS, AND EVENTS

A. DEFINITIONS AND APPLICATIONS

- INPUT divides the utilities market into three major segments:
  - Electric.
  - Gas.
  - Water and sewage/waste disposal.
- Telephone and telecommunications utilities are discussed in the telecommunications section.
- Electric utilities are divided into five classifications:
  - Investor-owned (those utilities with publicly traded stock).
  - Cooperatives.
  - Municipality-owned.
  - Federal-owned.
  - State projects/power districts.

- The three primary types of gas utilities are:
  - Transmission.
  - Distribution (local gas utilities).
  - Municipal companies.
- Water utilities are divided into:
  - Public or municipality ownership.
  - Private ownership.
- "Sewage and waste disposal services" completely describes this market segment.
- Administrative computing applications encompass:
  - Utility billing.
  - Customer service.
  - Cost allocation services.
  - Property records.
  - Inventory management.
  - Management reporting.
  - Cash management.

- Route management and analysis.
- Meter reading.

- General "operations" computing applications include:
  - Outside plant mapping.
  - Process monitoring and control.
  - Simulation of system usage.
  - Construction and contracting.
  - Equipment fault/success analysis.
  - Pipe network engineering.

- Specific electric utility operation computing applications include:
  - Piping layout and analysis.
  - Network configuration and analysis.
  - System state measurements, calculations, and analysis.
  - Switching-surge insulation performance assessment.
  - Load loss statistical calculations.
  - Schedules for thermal unit and gas turbine operations.
  - Electrical system topology.
  - Generating capacity planning.

- Gas utility operations computing applications include:
  - Gas supply balancing.
  - Pressure/flow simulation.
  - Capacity planning.
  - Inside plant mapping.
- Water/waste utility operations computing applications encompass:
  - Pressure/flow simulation.
  - Inside plant mapping.
  - Capacity planning.
  - Environmental hazards monitoring and reporting.

B. ISSUES

- Utilities' computer usage is diverse. The use of computers for financial and administrative applications differs significantly from computer systems used for operations.
  - Financial and administrative applications software combines business-oriented information with state and federal regulatory compliance.
  - Computer systems used in the operations side of utilities combine real time process and control applications with engineering and technical simulations.

- As a result, few hardware vendors can provide a single hardware system to meet utilities' data processing requirements.

- Electric utilities experience increased competition from gas utilities selling alternative energy sources and some large commercial customers who have installed cogeneration systems. Therefore, electric utilities are developing data bases of customer information to improve marketing efforts.

- Large public 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.

- The purchase of departmental minicomputers and fourth generation application development tools by end-user departments is changing IS' role to one of data manager and coordinator. Additionally, corporate IS can continue to help with cost justification of systems for end-user departments.

- 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 approved and receive these increases in a timely manner. Under the Reagan administration, the regulatory environment may have lessened somewhat.

- Interest rates directly affect utility operating costs. The high interest rates of the early 1980s dramatically increased the cost of capital for necessary improvements and plant additions and especially slowed the building of nonnuclear facilities.

- As a result of decreasing oil prices since 1984, fuel oils offer strong competition to gas and electric utilities as alternate fuel sources. For new construction, builders and architects, through their designs, influence fuel consumption patterns in the short run by selecting one fuel source over another.

- Hardware and software obsolescence will impact many utilities. Basic commercial applications (billing, financial reporting, accounts payable, accounts receivable) need to be upgraded and integrated.

  - New billing and payment systems that take advantage of technological advances such as pay-by-phone and frequency emitting meters are being developed.

  - Engineering and operation systems are being integrated with modeling systems to project capacity requirements.

- Administrative software modules are being integrated where one keystroke can transfer the data entered to all system modules requiring that information. Dividing a large application into smaller modules also breaks a high value sale into a series of smaller ticket sales, a valuable marketing tool for an industry with tight data processing budgets.

- Senior management at utility companies, selected generally for good day-to-day operations backgrounds, are beginning to use information as a competitive and strategic weapon.

- Growth will occur in:

  - Mainframe- and minicomputer-based operations and technical applications.

  - Microcomputer-based business and operations applications.

C. TRENDS IN ELECTRIC UTILITIES

- Readily available excess electricity, made possible by cogeneration, has three interrelated effects:
  - It has lessened the need to expand capacity.
  - It has led to increased selling and buying of excess electricity.
  - It has led to increased competition in selling electricity to municipalities and large industrial customers.
- For the past two years, cost overruns in nuclear power plant construction have forced budget austerity. These budget cuts have affected the rate at which IS management has purchased or written software for new applications.

D. TRENDS IN GAS UTILITIES

- Conservation efforts, begun in the 1970s, indelibly changed the natural gas industry. Industrial consumption of natural gas, which decreased 20% since 1973 for commercial customers, will decrease 5% per year through 1991.
- Fortunately, this decrease is offset by the steady increase in natural gas usage among the natural gas industry's top three users--retail trade, real estate, and service organizations. Natural gas consumption by these three market segments, accounting now for 50% of total U.S. gas consumption, is expected to grow by 5-10% annually through 1991.
- The overall share of natural gas sold to commercial accounts under "special conditions" (i.e., at a discount) has decreased from 42% to 39% of total natural gas consumption, a positive trend for the gas industry.

- Programs for recycling refuse into natural gas have begun and are successful on a relatively small scale. The technology challenge is to economically increase the scale and scope of refuse conversion.

- Declining prices for natural gas and oil have resulted in reduced industry profits; hence, further pressure on IS to curtail or delay capital spending. Alternative fuels such as low- and high-sulphur heating oil are less expensive. Therefore, users tend to purchase these fuels before natural gas.

E. TRENDS IN WATER AND WASTE UTILITIES

- Demand will steadily increase through 1991 by homes and industry for water and waste services.

- Hazardous waste disposal and monitoring is becoming a more important application as a result of the current level of interest by state and federal legislatures and the public.

F. EVENTS

- Public utilities (i.e., those with stockholders) are diversifying their business base to lessen earnings dependence on a single business. INPUT has identified the following diversification targets: real estate development, venture capital, financial services, retailing, and computer services.

- In 1986, Pacific Lighting (Los Angeles, CA) acquired drug store chain Thrifty Corporation (Los Angeles, CA).

- Portland General Electric (Portland, OR) has entered into real estate ventures (with Weyerhaeuser Corporation of Tacoma, WA), airplane leasing, and venture capital.

- Philadelphia Suburban Corporation (holding company for Philadelphia Area Water Company) acquired two computer software and services firms:

  - Stoner Associates, Inc. (Carlisle, PA), a supplier of applications software for the utility market utilizing Prime minicomputers and IBM mainframes, was acquired in January 1985.

  - Philadelphia Suburban Corporation also acquired Digital Systems, Inc. (Columbia, SC), a supplier of DEC-based turnkey systems to electric/gas/water/waste utilities.

G. FACTORS LIMITING GROWTH

- Factors that have held back growth in the utility information services market include:

  - Operations-oriented, rather than strategic-oriented, senior management that emphasizes cost cutting as opposed to using information as a competitive weapon or service differentiator.

  - Mainframe-based, batch-oriented administrative and financial software has been insufficient to accomplish basic tasks, consequently lessening the demand for more costly industry-specific solutions.

  - Sales of minicomputer-based turnkey systems for plant operations, which do not have integrated hardware or software increased rapidly following the problem at Three Mile Island but have slowed considerably in the past two years.

H. FACTORS SPURRING GROWTH

- Automation of repetitive tasks, such as meter reading, happened slowly in the utility business. Recently, utilities are adopting widespread usage of hand-held meter reading devices, which can automatically check for validity of data, store the data from hundreds of readings, then forward the data to the accounting mainframe for processing customers' bills.

- Industry associations for electric, gas, and water/waste utilities are increasing their roles by adding on-line data bases through the association's computer or public on-line data bases, which include information on:

  - Rates.
  - State government elected representatives.
  - Federal government lawmakers and regulatory agency personnel.
  - Population demographics.
  - Business demographics.
  - Status on key legislation.
  - Headlines and news briefs from industry periodicals.
  - Federal energy regulations.

- Microcomputer-based applications, especially those designed for utility districts serving 40-500 customers, will spur sales of computer software.

- Increases in the number of computer simulations, already proven cost-effective, will increase demand for specific applications available on supercomputers or the new minisupercomputers. Since each supercomputer system costs more than $15 million, processing/network services that sell time to users on these systems represent more cost-effective solutions than user purchase of the hardware and software.

II MARKET FORECASTS

A. INTRODUCTION

- INPUT divides the utility market into three segments:
  - Electricity.
  - Gas.
  - Water and waste disposal.
- The SIC (Standard Industrial Classification) for this market sector is 49 (491-497), which includes:
  - Electric services.
  - Gas production and distribution.
  - Combination electric and gas and other services.
  - Water supply.
  - Sanitary services.

- Steam supply.

- Irrigation systems.

- The number of utility companies in the U.S. in 1986 is shown in Exhibit II-1 and the number of utility company employees as of 1983 is depicted in Exhibit II-2. All but 2,000 utilities (privately-owned water utilities) are candidates for some level of computerization. These 2,000 privately-owned water companies, generally located in rural areas and serving less than 40 customers each, are sufficiently small that computerization may be uneconomical.

- The utility market appears relatively homogeneous. Information requirements for administrative computing at electric utilities should be similar to those of gas or water/waste utilities. Operations computing requirements are fundamentally similar, the key exception being government reporting requirements for electric utilities with nuclear power plants.

- In reality, a utility is built around its people. No two utilities approach the business in the same manner. As a result, some level of software customization is always required.

- Demand for industry-specific utility applications will grow 13% annually through 1991, increasing from $262 million to $537 million. User expenditures are shown in Exhibit II-3.

B. DEMOGRAPHIC FORECAST

- As a result of merger activity, the number of electric utilities will decline slightly between 1986 and 1991.

EXHIBIT II-1

NUMBER OF UTILITIES IN U.S. BY TYPE
1986

TYPE	NUMBER OF UTILITIES
ELECTRIC*	
• Investor Owned	218
• Cooperatives	1,055
• Municipalities/Publicly-Owned	1,900
• Federal-Owned	9
• State Projects/Power Districts	91
Total - Electric Utilities	3,273
GAS**	
• Transmission	150
• Distribution (Utilities)	450
• Municipal Companies	750
Total - Gas Utilities	1,350
WATER†	
• Public/Municipalities	18,000
• Private Ownership	6,000
Total - Water Utilities	24,000
SEWAGE AND WASTE DISPOSAL††	
• Sewage Services	5,000
• Combined Services	340
Grand Total	33,963

* Source: Edison Electric Institute
† Source: National Association of Water Companies
** Source: American Gas Association
†† Source: Sales and Marketing Management Magazine

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EXHIBIT II-2

NUMBER OF EMPLOYEES BY TYPE OF UTILITY, 1986

UTILITY	TOTAL EMPLOYEES
Electric	686,000
Gas (Production and Distribution)	230,000
Combination Utility Services	110,000
Water	105,000
Sanitary Services	55,000
Total	1,186,000

EXHIBIT II-3

UTILITIES INDUSTRY SECTOR
INDUSTRY-SPECIFIC USER EXPENDITURE FORECAST, 1986-1991

SEGMENTATION BY DELIVERY MODE	($ M) 1985	85-86 Growth	($ M) 1986	($ M) 1987	($ M) 1988	($ M) 1989	($ M) 1990	($ M) 1991	AAGR 86-91
Processing Services									
Remote Computing/Batch	$108	8%	$117	$126	$137	$150	$165	$181	9%
Facility Management	20	5%	21	23	25	28	33	38	13%
Total Processing Services	$128	8%	$138	$149	$162	$178	$198	$219	10%
Applications Software									
Mainframe/Mini	$75	11%	$83	$91	$100	$110	$129	$152	13%
Micro	33	18%	39	47	58	71	90	115	24%
Total Applications Software	$108	13%	$122	$138	$158	$181	$219	$267	17%
Turnkey Systems	$26	12%	$29	$32	$36	$40	$45	$51	12%
Section Total	$262	10%	$289	$319	$356	$399	$462	$537	13%

- Competition from alternate power sources, such as wind and solar, will force electric utilities to become even more efficient.

- Effective utilization of existing facilities may require some consolidation to meet changing economies of scale.

- To meet these new economies of scale, most mergers and consolidations will be among small- and medium-sized electric utilities.

- The consolidated utilities will be located near one another and may serve customers in more than one state.

- The number of gas utilities will remain relatively constant, assuming very few mergers among medium and smaller gas utilities.

- The number of water districts will also remain constant, assuming a minimum of merger and acquisition activity.

- The number of combined sewage and waste disposal operations will hold steady for the next five years since these operations are also relatively mature businesses.

C. ELECTRIC UTILITIES

- Although there are only about 3,000 electric utilities, expenditures for software and services by this segment accounts for approximately 55% of total utilities data processing expenditures.

- The administration and accounting functions at the largest public electric utilities (i.e., utilities with publicly traded stock) are heavily mainframe-based, batch processing-oriented. Large electric utilities, which have been

converting to on-line transaction-oriented customer service systems, account for approximately 40% of total utilities data processing expenditures.

D. GAS UTILITIES

- Information services expenditures by the 1,350 gas utilities account for 25% of total utility sector IS expenditures.

- Production of synthetic natural gas (SNG) or methane from garbage and other waste materials is increasing the available supply of natural gas.

  - More production and monitoring hardware and software will be necessary to support this burgeoning technology.

  - More applications software for simulating SNG plant design and transportation and storage will be required to support utilities. Furthermore, the growing number of municipalities determining the feasibility of converting effluent from waste water treatment to methane require software to aid in their analyses.

- Gas utilities will install improved gas transportation and storage monitoring hardware and software.

E. WATER, SEWAGE, AND WASTE DISPOSAL UTILITIES

- Similar to other utilities, water and waste utilities must improve asset management. Software to help allocate people, vehicles, heavy equipment, and computers and yielding an immediate, measurable return is desirable.

- Individual applications not requiring interface with the administrative mainframe or minicomputer will increasingly run on a PC.

F. PROCESSING SERVICES

- As more organizations convert from minicomputer- to microcomputer-based solutions, processing services will grow more slowly than overall computer services in the utilities market.
  - Note, however, that INPUT's IS spending forecast does not portend a negative growth rate. Rather, it indicates slower than average growth.
  - Many utilities, satisfied with the level and quality of processing service and not willing to hire and manage staff, will maintain the status quo relationship with processing services.
  - As processing services move from batch to interactive processing and install the expensive, full-function software required to completely manage a utility, more utilities will migrate to processing services rather than compete for data processing administrative, programming, and operations staff.
- Facilities management contracts are decreasing overall due to the proliferation of minicomputer- and microcomputer-based turnkey systems. However, many medium and large utilities wanting to avoid hiring, training, and management problems will remain loyal to facilities management services.
- Concerns for safety arising out of the Three Mile Island operating problem have led to a steady increase in disaster recovery services, much of which is processing service-based.

- To retain customers, many remote computing services now offer micro-to-mainframe communication links. This trend will continue.

G. TURNKEY SYSTEMS

- Turnkey systems, especially microcomputer-based systems, will grow faster than the overall market for three reasons:
  - Certain administrative functions, such as gas transmission analysis or vehicle maintenance management and scheduling, can be initially implemented on a microcomputer and sold as a turnkey system.
  - Existing micro-based applications can be networked or set up to run on multi-user micros or minicomputers. Turnkey systems, with single supplier accountability, represent a competitive alternative.
  - UNIX- or Pick-based technical or commercial applications, which were initially written for a minicomputer and are becoming more popular, can be easily ported to a microcomputer.
- The new 80386 microprocessor will soon open up a new class of computers offering highly competitive price/performance. While new software must be written to accommodate these machines, this is an opportunity for improved operating systems, better user interfaces, and, most importantly, integrated applications software.

H. APPLICATIONS SOFTWARE

- Mainframe and minicomputer-based applications software will grow at slightly less than overall user expenditures for all utility-related computer services. The factors influencing the growth of the market are more important than those factors impeding market growth.

- Factors influencing the growth of mainframe/mini-based software for utilities include:

  - Integrated software modules.

  - Growth in ownership of voice and data communication facilities by large utilities.

  - More federal and state government reporting requirements.

- Factors slowing the growth in demand for mainframe/mini-based application software include:

  - Lack of organizational plans for effective utilization of computers and application software.

  - Migration of current minicomputer applications to microcomputers. However, applications migration to micros will be limited by departmental needs for shared information.

- Microcomputer-based applications software will grow fastest of all computer services delivery modes since more detailed sub-applications will initially be micro-based. Vehicle management, which includes vehicle maintenance and operation scheduling, could initially be implemented on a micro rather than an integrated module as part of the utility administrative mainframe or

minicomputer. The growth in the number of IBM PC/XT/ATs and "lookalikes" underlie this tremendous demand.

- Large utilities are striving to install one microcomputer for every two professional employees. The growth in installed systems and the offering of site licensing by leading vendors will spur sales of micro-based software.

I. PROFESSIONAL SERVICES

- The largest utilities have implemented a number of specialized applications. In this case, the challenge is linking the processors and applications through system integration.

- Systems integration in the utility segment will be a major opportunity for vendors because:

  - Many utility districts (3,500) can effectively utilize system integration services.

  - Integration of existing systems is more cost effective than retraining users on new hardware and software.

  - Large system integration projects will start with mainframe data bases used in administrative and accounting applications, then will spread to technical applications.

  - Mainframe-based system integration projects imply a captive market for IBM services since the IBM account representative is in close contact with IS management in large utilities.

III COMPETITIVE DEVELOPMENTS

A. INTRODUCTION

- The utility information systems market is characterized by:
  - Large vendors selling mainframe-based administrative software.
  - A few large and numerous small vendors selling minicomputers and microcomputer software to manage operations.
  - Less than six large processing/network vendors providing specialized information services to utilities.
- The market shares of leading vendors in the utility sector are shown in Exhibit III-1.
  - Revenues for the top ten vendors represent 51% of total sector information services revenues.
- Information services for the utilities sector can also be divided into administrative and operations computing.
- The leaders in the administration systems market segment are:

EXHIBIT III-1

LEADING VENDORS IN THE UTILITY SECTOR
1986

VENDOR	Processing/ Networks Services	Software	Turnkey Systems	Professional Servcies	Total ($ Millions)	Percent Of Market
Energy Incorporated		$10.3	$6.5	$12.4	$29.2	11%
Babcock & Wilcox*	$17.0				$17.0	6%
GEISCO	$11.2	$3.0			$14.2	5%
Utility & Municipal Services	$12.0				$12.0	4%
Philadelphia Suburban Corporation**	$1.1	$2.6	$7.9		$11.6	4%
Quadrex Corporation			$8.8	$2.2	$11.0	4%
Equifax	$9.8	$0.8			$10.6	4%
CAP Gemini DASD				$9.5	$9.5	4%
Flow General		$5.0		$3.5	$8.5	3%
Network Computing Corporation	$8.5				$8.5	3%
TERA		$3.6	$2.3	$2.5	$8.4	3%
Total	$59.6	$25.3	$25.5	$30.1	$140.5	51%

* Formerly :UCCEL ** Combines: Stoner Associates and Digital Systems,Inc.

- Babcock & Wilcox (formerly the processing services operation of UCCEL in Dallas (TX)).

- Utility and Municipal Services.

- Philadelphia Suburban Corporation.

- The leaders in the operations market segment are:

  - Energy Incorporated.

  - Quadrex Computer Systems, Inc.

  - GEISCO.

  - Equifax.

B. ACQUISITIONS

- Few mergers took place among information services suppliers to the utility market segment in 1985 and 1986, likely a statement that:

  - This is a relatively mature market dominated by a limited number larger profitable firms.

  - Second-tier companies have not introduced significant new products or applications that would make them attractive takeover targets.

  - Information services vendors' internally generated cash has been sufficient to fund research and development, product marketing, and customer support activities.

- In the utility market segment for 1985 and 1986, INPUT identified two significant acquisitiions:

  - In December 1985, Babcock & Wilcox Corporation (a subsidiairy of McDermott Co.), which manufactures process control equipment for utilities, purchased the Dallas (TX) processing/network service of UCCEL Corporation for $4.8 million.

  - In 1985 and 1986, Philadelphia Suburban Corporation, the parent company of Philadelphia Suburban Water Company, acquired Stoner Associates (Carlisle, PA) and Digital Systems, Inc. (Columbia, SC). Philadelphia Suburban Corporation intends to become a major player in the utilities-based information services business.

C. FIRMS EXITING THE UTILITY MARKET

- No major vendors stopped supporting the utility market in 1985 or 1986. However, several firms which formerly received 100% of their revenues from the utility industry are broadening their focus to include other vertical applications.

  - Digital Systems, Inc. (subsidiary of Philadelphia Suburban Corporation) is targeting local and county governments in addition to the utility industry.

  - Quadrex Computer Systems (Campbell, CA) is selling turnkey systems to process industries, such as petrochemical and biological research.

D. VENDOR PROFILES

1. ENERGY INCORPORATED (One Energy Drive, P.O. Box 736, Idaho Falls, ID 83402, (208) 529-1000)

   a. Products/Services

- Energy Incorporated (EI) sells software, services, and computer systems for power generation applications for the electrical power industry.

- The company's 26 applications software products serve three key areas:

  - Engineering (utilizes IBM mainframes).

  - Plant management (utilizes IBM mainframes).

  - Real time monitoring and control (utilizes DEC VAX and MicroVAX and Intel computers).

   b. Markets Served

- Before 1985, EI served two markets--electric power utilities and destruction of hazardous toxic and waste materials. In 1985, EI spun off the firm serving the hazardous waste material business.

- EI is now 100% focused on the electric power utility industry.

   c. Company Strategy

- EI provides a full range of software and services to the electric power industry, designed to help manage existing and new power generation plants.

d. Recent Activities

- In 1985, EI spun off Waste-Tech Services, Inc., its subsidiary for the safe destruction of hazardous and toxic wastes.

e. Future Direction

- Energy Incorporated will emphasize its proprietary software products, consulting and risk assessment services, and real time process monitoring and control systems.

- EI will offer its monitoring and control systems on more vendors' hardware platforms.

2. EQUIFAX, INC. (1600 Peachtree Street, N.W., Atlanta, GA 30309, (404) 885-8000)

a. Products/Services

- Equifax offers a range of applications software products to the utilities industry.

- Applications software packages include:

  - Advanced Commercial Evaluation System (ACES)--commercial building energy audits.

  - Graphics software to show energy usage.

  - Utility customer information.

  - Scheduling weatherization programs for utility customers.

  - Job tracking weatherization programs for utility customers.

b. Markets Served

- Equifax targets all utility companies, emphasizing electrical utilities.

- Sales of utility industry software represent less than 5% of corporate revenues.

c. Company Strategy

- Since nearly 95% of company revenues are derived from processing services, Equifax will continue to emphasize those services, targeting the insurance industry, which accounts for nearly one-half of corporate revenues.

- In the utility area, Equifax will add more applications for portable microcomputers and hand-held calculators.

- Equifax will offer some of its applications on mainframe computers through GEISCO processing/network services.

d. Recent Activities

- Equifax made a number of acquisitions outside the utility business.

  - Equifax formed its insurance subsidiary through acquisition.

  - The company expanded its Canada-based credit reporting and collections operation through an April 1985 acquisition.

- The company introduced additional products in the credit collections area in 1985.

e. Future Direction

- Since all other company business segments are relatively large, INPUT expects Equifax to either grow the utility software business through acquisition or spin it off.

3. BABCOCK & WILCOX COMPUTER SERVICES (P.O. Box 10935, Lynchburg, VA 24506, (804) 385-3512)

a. Products/Services

- Babcock & Wilcox (B&W) provides processing/network services to utility companies.

b. Markets Served

- Electric power and energy industries.

- Processing/network services represent approximately 8% of 1985 corporate revenues.

c. Company Strategy

- The company's entry into processing/network services indicates its intention to become a full-line supplier of products and services to the utility industry. B&W has sold power monitoring equipment to electric utilities for many years. Processing services represent an extension of services designed to "lock in" customers.

d. Recent Activities

- Babcock & Wilcox purchased the Dallas-based processing/network service from UCCEL Corporation in December 1985.

e. Future Direction

- B&W will offer specialized data processing services to existing customers.

4. GENERAL ELECTRIC INFORMATION SERVICES COMPANY (GEISCO)
(401 North Washington Street, Rockville, MD 20850, (301) 340-4000)

a. Products/Services

- GEISCO provides interactive, remote batch, applications software and inquiry/response processing services to the utilities market sector.

b. Markets Served

- Electric utilities.

c. Company Strategy

- GEISCO provides a full range of integrated applications software for utility billing and other commercial activities.

- GEISCO-developed software can be accessed through the company's MARK III and MARK 3000 processing/network services.

d. Recent Activities

- The company introduced modules with additional features and capabilities for its integrated utility management software.

e. Future Direction

- GEISCO will maintain its position as a leading supplier of processing/network services and applications software to the utility industry.

5. QUADREX CORPORATION (1700 Dell Avenue, Campbell, CA 95008, (408) 966-4510)

a. Products/Services

- Quadrex Corporation's division, Quadrex Computer Systems, sells turnkey systems for plant monitoring and control and provides professional services to utilities.

- Its turnkey systems are based on Prime and Digital Equipment Corporation superminicomputers.

b. Markets Served

- Quadrex derives 80% of its revenue from utilities; the remaining 20% comes from process manufacturing industries.

c. Company Strategy

- Previously, Quadrex was a leading vendor of plant monitoring and control systems for nuclear power plants. The company is changing its direction away from utilities.

d. Recent Activities

- The company is lessening its dependence on the relatively saturated market for nuclear power plant monitoring and control systems.

e. Future Direction

- Based on its turnkey system experience, Quadrex could increase its system integration activities.

6. GENERAL RESEARCH CORPORATION (Division of Flow General Corporation, 7655 Old Springhouse Road, McLean, VA 22101, (703) 893-5900)

a. Products/Services

- Develops and markets applications software for the utilities industry and also markets processing/network services.

- Applications software products, which run on the DEC VAX minicomputer and IBM mainframes, include:

  - Environmental Information System.

  - Occupational Health Information System.

b. Markets Served

- General Research Corporation targets the utility industry, concentrating on utilities with nuclear power generation capabilities.

- Software and network services revenues in fiscal year 1986 for General Research were approximately $21 million.

c. Company Strategy

- Provide software and services for the storage, retrieval, and analysis of information pertaining to occupational health and environmental safety.

d. Recent Activities

- General Research introduced additional software modules for occupational health applications.

e. Future Direction

- GRC will expand its base of software, services, and supported hardware for this well-defined niche.

7. CAP GEMINI DASD (9045 North Deerwood Drive, Milwaukee, WI 53223, (414) 355-3405)

a. Products/Services

- CAP Gemini DASD provides contract progammers and consulting services to the utility market sector.

b. Markets Served

- CAP Gemini provides services to electric, gas, water, and sewage utilities.

c. Company Strategy

- CAP Gemini leverages its strengths in project management and internally-developed software to help sell to Fortune 1000 companies and large utilities.

d. Recent Activities

- The company helped many large customers implement fourth generation language applications and information centers.

e. Future Direction

- Integrate new technologies such as CD ROM disks in service offerings.

- Maintain its existing base of contract programmers, a difficult task in light of recruiting efforts by other firms, including CAP Gemini's customers.

8. TERA CORPORATION (2150 Shattuck Avenue, Berkeley, CA 94704, (415) 845-5200)

a. Products/Services

- TERA provides computer-aided services and software products to the utility and manufacturing industries.

- The company has developed and marketed its Plant Information Management System (PIMS), an on-line system that coordinates and controls plant maintenance for the utility industry.

- PIMS operates on IBM 43XX and 30XX mainframes with MVS or DOS operating systems.

b. Markets Served

- Utilities and manufacturing firms.

- Sales to utilities represent 85% of total revenue.

c. Company Strategy

- TERA provides computer-aided services and software products to the utility and manufacturing industries.

d. Recent Activities

- In 1985, TERA discontinued manufacturing and marketing its wind energy system to concentrate its resources on the utilities and process manufacturing industries.

e. Future Directions

- TERA will increase the added value content of its services through the acquisition of computer-related products and services.

9. DIGITAL SYSTEMS, INC. (P.O. Box 12, Columbia, SC 29202, (803) 799-4094)

a. Products/Services

- Digital Systems markets and supports turnkey systems for the utility industry and local/county governments.

- Specific products include:

  - Integrated utility management, utilizing DEC VAX or PDP-11 hardware.

  - Fund and encumbrance package, based on DEC VAX or PDP-11 hardware.

b. Markets Served

- Digital Systems sells to utilities and local/county governments.

- Sales to utilities represent about 75% of total revenues.

c. Company Strategy

- Provide a full range of products and services to the electricity/gas/water/waste utilities market.

d. Recent Activities

- Since market requirements for its products are so different, the company recently formed two divisions to sell its products.

e. Future Direction

- For 1987, Digital Systems will emphasize sales of its fund and encumbrance package to local and county governments.

10. TRES COMPUTER SYSTEMS, INC. (Division of Control Data Corporation, 14801 Quorum Drive, Dallas, TX 75240, (214) 385-5800)

a. Products/Services

- Tres Systems provides applications software and professional services primarily for utilities and municipalities.

- Tres' Customer Billing and Information System and its Materials Management System utilize IBM mainframe computers.

- Professional services include system design, software customization, and consulting.

b. Markets Served

- Tres Systems markets to investor-owned utilities, municipal-owned utilities, and local transportation agencies.

c. Company Strategy

- Tres' strategy concentrates on providing a full range of services and applications software for large utilities and transportation agencies.

- To lock in customers, the company's software is full featured and contains more than 1.1 million lines of code, an accomplishment that would be hard to duplicate in a timely manner.

d. Recent Activities

- The company began emphasizing sales to transportation authorities of its Material Management package.

e. Future Direction

- Sales of its Material Management System to local transportation agencies will represent at least 20% of total revenues in 1986.

IV INFORMATION SYSTEMS DEPARTMENT OUTLOOK

A. MAJOR ISSUES

1. DRIVING FORCES

- Administrative applications are being used to increase the efficiency of the business and administrative functions in the utilities sector.

- More utilities are using micro-mainframe links to connect personal computers with the corporate mainframe. While the utility's primary data processing is being done on mainframes, more individuals need access to relevant portions of that data. These individuals are analyzing department-specific data for use in planning or improving operations.

- As more non-DP managers in utilities have learned about the benefits of personal computers, these managers want more control of data relevant to their department. Local area networks provide the means for department managers to establish and connect departmental minicomputers with the corporate mainframe.

- The utilities sector, always a "cost conscious" business, has to maintain its lean-and-mean operating style due largely to cost overruns in the construction of nuclear power plants.

- Readily available excess electricity, made possible by cogeneration, has greatly lessened the need to expand capacity.

- Senior management at utility companies, selected generally for good day-to-day operations backgrounds, must begin using information as a competitive weapon.

2. ISSUES AND OBJECTIVES

- The major issues and objectives addressed by the utility sector include:

  - Cost containment.

  - Hardware and software obsolescence.

  - Customer service improvements.

  - Regulatory reporting.

  - Productivity improvements through improved assets (people, cash, vehicles, facilities) management.

  - Integration of IS plan with corporate strategic plan.

  - Establishment of a data base of marketing information.

  - Increase in organizational end-user computing, with resultant change from application development to user-driven data administration.

3. MANAGEMENT PERCEPTION AND ORGANIZATIONAL ISSUES

- Management views IS as an important resource, but its main emphasis is on IS as a cost-controlling source.

- In the past two years, some IS managers have had more management visibility and have seen their user base expand.

- IS should play a significant role in the planning process. However, the operations orientation of utilities' senior management has resulted in few true chief information officers.

  - As utilities venture into other fields, the role of the MIS director will increase commensurate with the competitiveness of the field(s) entered.

4. 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.

- A two-prong approach to data processing in utilities has resulted in very different DP impacts.

  - In larger utilities using mainframe computers, the proliferation of inexpensive micros has bypassed true departmental processing. Exchanging diskettes with necessary information is now a tradition.

  - In the medium and small utilities, cost-effective minicomputers serve as departmental (operational) processors and central administrative computers, made possible by local area networks.

- The major thrust in distributed systems development is micro-based end-user applications. An IBM PC or clone offers a very cost-effective solution to automating standalone applications.

- 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.

- Merging voice and data will eventually become a reality in utilities, according to IS managers. This belief is based on the concept that voice communications costs would be reduced once voice and data are merged. IS managers are now at the planning, not implementation, stage.

5. END-USER COMPUTING

- As in other sectors, the information center (IC) has been the focal point for end-user training. The larger end-user organizations have a separate training group that performs the following functions:

  - 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.

  - Coordinates purchases of micros.

  - Publishes in-house computing newsletters.

- End-user computing primarily centers on micro support and micro-to-mainframe applications and accounts for 5-15% of expenditures in large utilities.

B. 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.

- Other specific new applications in 1986 include:

  - Customer/marketing information system.

  - Inventory control/materials management.

  - Work order control system.

  - Power distribution information system.

  - Equipment maintenance system.

C. BUDGET ANALYSIS

- In 1986, the utilities sector experienced limited growth in overall IS budgets. This was due primarily to increases in salaries and fringe benefits in some utilities. Other utilities showed significant percentage decreases in their 1986 budgets, having made a major hardware or software purchase in 1985.

Utilities' 1987 budgets are projected to increase mainly as a result of increased expenditures for salaries and fringe benefits, data communications, and hardware maintenance.

  - Exhibit IV-1 shows the 1986 user budget distribution and projects the growth of budget categories for 1987.

- Sixty-eight percent of utilities believe their IS budgets will increase or remain the same in 1987, while about one-third believe the 1987 growth rate will be lower than 1986 (see Exhibit IV-2).

- Factors contributing to increases in the IS budget include:

  - Personnel.

  - Hardware upgrades and associated software.

  - Purchasing, rather than leasing, hardware.

- Two factors will contribute to expected decreases in utilities' 1987 IS budgets:

  - Purchases of less hardware than in 1986.

  - Cost containment.

- Nearly 55% of users indicated increased headcount in the MIS department in 1986 from 1985. Of the remainder, 23% of user departments showed a decrease in headcount while 23% said that 1986 headcount remained the same.

- The IS budget in the utilities sector is dependent on overall utility rate increases which, in turn, depend on government approved rate increases. IS managers must spend a considerable portion of their time "lobbying" for whatever funding they can get, especially with austere operating budgets. As

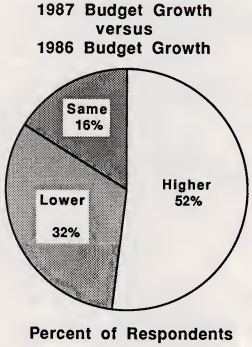
EXHIBIT IV-1

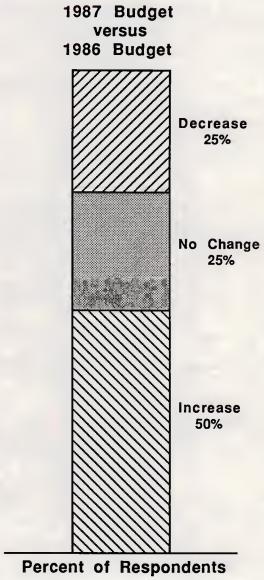
1986 BUDGET DISTRIBUTION AND 1986/1987 CHANGES IN THE UTILITIES SECTOR

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 IV-2

UTILITIES
BUDGETS WILL INCREASE MAINLY AT A LOWER RATE





a result, medium and smaller utilities' IS organizations usually lag in the use of new technology and systems.

- However, the largest utilities are often selected as development partners or beta sites for new hardware.

- Furthermore, similar utilities in different geographic areas do not compete with one another. The utility industry has established organizations such as the Electric Power Research Institute (EPRI) in Palo Alto (CA) to share operations-related information. Select data processing center information is also shared.

V NEW OPPORTUNITIES

A. ADMINISTRATIVE MARKET SECTOR

- Cost-effective applications software development is very important to users.
  - Vendors should offer the means to develop mainframe applications on personal computers, which can be tested and debugged locally, then uploaded to the corporate mainframe.
  - At $600 per hour for timesharing on a mainframe, the use of micros for program development has a tremendous payback.
- Software and professional services in support of local area networks (LANs) represents a growing area. Software must retain its functionality on the network. Professional services such as consulting with the LAN vendor may be necessary to sell more software and ensure the software actually works.
- Utility industry conferences in 1986 emphasized the "next generation" customer information system, featuring on-line data bases with information which can be updated by designated operators.
- While large utilities continue to use IBM mainframes for administrative and accounting applications, medium and small utilities have a large installed base of superminicomputers manufactured and serviced by (in descending order of installed base):

- Digital Equipment Corporation (DEC).

- Hewlett-Packard (HP).

- Prime Computer.

- Data General Corporation (DG).

- Providing integrated software for accounting and administrative applications running on these superminis represents an opportunity for software vendors.

- Discussions with DP managers at large utility companies revealed a trend toward combined telecommunications and other information services. Vendors can help these managers devise the means to effectively combine telecommunications and IS technologies.

- Another vendor opportunity is an easy one to identify and a much harder one to implement—linking IBM mainframe computers. DP managers at large utilities using IBM mainframes want to protect their investment in hardware and, especially, in applications software. An IBM mainframe network is the solution, according to some DP managers.

- Fiber optic communications increase telecommunications capabilities in two ways:

  - The number of simultaneous voice and/or data transmissions.

  - The ability to transmit more graphics-based information.

- Developing high quality industry-oriented software is always a vendor opportunity. Vendors who start with a clean sheet of paper and talk to many utilities to learn their software requirements have an advantage over those

vendors taking generic software and modifying it to fit the regulated utility industry. State and federal government reporting requirements for utilities are very specific; "generic" software cannot fully address these user needs.

- Partnerships between hardware vendors and other suppliers represent a "ground floor" opportunity. Examples include:

  - Turnkey systems for setting up, reading, and verifying data from hand-held meters.

  - Microcomputer-based systems using bar code readers for inventory management, paperwork management, and asset control.

  - Desktop publishing systems for newsletters and forms development and modification.

  - Automation of purchase requisitions and followup.

  - Automation of work orders and followup.

B. OPERATIONS AND MAINTENANCE MARKET SEGMENT

- Wide year-to-year variations in data processing budgets will accelerate the need for improved asset management. Utilities' major assets include buildings, vehicles, and the computer system.

- The most popular minicomputers in small and medium utilities are (in decreasing order of installed base):

  - DEC MicroVAX.

- Hewlett-Packard 1000.

- IBM System/36 and IBM PC.

- Microcomputer-based applications software or turnkey systems for asset management are needed.

- Low-cost microcomputers enable suppliers to sell redundant monitoring and control systems at very low prices compared to redundant minicomputer-based systems.

- Small utilities typically hire consultants to design specifications for systems used in operational applications. The consultant really determines the level of hardware and software integration. Savvy vendors will keep in close contact with consultants and help plan the system to be installed or the modifications necessary.

VI CONCLUSIONS AND RECOMMENDATIONS

- Trends toward deregulation and increased availability of other fuel sources are forcing utilities to become even more efficient.

- The most promising products and services will improve asset management and monitoring and control systems and provide turnkey solutions for such applications as desktop publishing, meter reading, and many business problems that can be effectively solved using bar code-based peripherals.

APPENDIX UT: FORECAST RECONCILIATION

- This appendix contains the following information:
  - Exhibit UT-1 which indicates the changes made to this year's forecast as compared to last year's.
  - An explanation of significant changes that were made to the forecast.

A. PROCESSING SERVICES

- Instead of $133 million, the 1985 remote computing/batch processing market is sized at $108 million due to a shift in reclassifying some revenue from facilities management to processing services, a result of a refined definition.
- INPUT reported an 11% AAGR for 1985-1990 in our 1985 report. The AAGR from 1986 through 1991 is now forecast at 9% for the remote computing/batch processing market.
- The overall processing services 1986-1991 forecast growth rate was reduced from 11% to 10%, reflecting a more mature market segment.

EXHIBIT UT-1

UTILITIES DATA BASE RECONCILIATION OF MARKET FORECAST, BY DELIVERY MODE

DELIVERY MODE	1985 Forecast ($ M)	1986 Report ($ M)	Variance as % of 1986 RPT	1985 Forecast ($ M)	1986 Forecast ($ M)	Variance as % of 86 FCST	85-90 AAGR Forecast in 1985 Report (Percent)	86-91 AAGR Forecast in 1986 Report (Percent)
Processing Services								
Remote Computing/Batch	$133	$108	23%	$226	$165	37%	11%	9%
Facility Management	12	20	-40%	19	33	-42%	10%	13%
Total Processing Services	$145	$128	13%	$245	$198	24%	11%	10%
Applications Software	$26	$108	-76%	$91	$219	-58%	28%	17%
Turnkey Systems	$40	$26	54%	$98	$45	118%	20%	12%

B. APPLICATIONS SOFTWARE

- INPUT reported 1985 applications software revenues of $28 million for the utilities sector. As a result of reclassifying certain engineering and scientific cross-industry revenues, the 1986 report indicates revenues of $108 million.

- The forecast for the overall utility sector applications software market decreased from 28% to 17%. However, opportunities for software vendors exist in specific market niches.

C. TURNKEY SYSTEMS

- INPUT's 1985 report indicated turnkey systems for the utility sector was a $40 million business. Subsequent interviews with vendors selling to the utility market revealed products believed to be minicomputer-based turnkey systems were, in fact, being sold separately as applications software.

- Since many utilities have installed minicomputers, the 1986-1991 growth rate for the dollar value of turnkey systems was reduced from 20% to 12%.