User Ratings of Mainframes

Problem:

It is axiomatic that equipment selection is one of the most critical functions of data processing management. Moreover, there are many facets to the problem, such as vendor support after the sale, that deserve as much consideration as the quality of the hardware.

This report conveys the results of Datapro's 1986 survey of User Ratings of Mainframe Systems. This year's survey summarizes the users' experience with more than 1,300 installed mainframe systems. The users' ratings pinpoint strengths and weaknesses of each manufacturer's equipment, software, and support, and provide information that should be of great value in computer acquisition.

Solution:

Datapro is pleased to present, in conjunction with *Computerworld*, the 1986 edition of the annual Computer Users Survey. This year's survey is based on responses to questionnaires mailed to a cross-section of computer sites listed with International Data Corporation (IDC). This report summarizes the results received from mainframe users. For the results of the minicomputer users polled, please refer to Report E90-100-201, which follows.

The users were asked to rate their systems in 23 subjective categories and respond to a variety of questions covering such areas as system configuration, programming languages, and planned acquisitions. They were also asked if they would recommend the system to other users.

This report includes a number of charts and tables for easy comparison of the various systems. In many cases, we have also compared the 1986 survey results with the 1985 results to help you spot trends and changes.

We would like to stress that individual profiles or ratings should never be the major consideration in making an acquisition decision. The reader can use the material in this report to help formulate questions about a computer system as the evaluation process proceeds. The information within this report is very informative if used with discretion and with the understanding that there are many factors involved in selecting the right computer system to meet your particular needs.

SURVEY METHODOLOGY

The 1986 survey has been based on results received from 14,344 questionnaires mailed to known computer users listed with IDC. The total number of questionnaires was divided into two groups: 9,002 surveys were mailed to minicomputer users and 5,342 to mainframe users. In addition, the users were chosen based on the computer system they had installed. Datapro supplied IDC with a list of specific system models to be included, in the mailing, and the model

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was listed directly on the mailing label. In an effort to improve the response rate and thereby increase the statistical validity, the users were contacted twice; a first request was followed two weeks later by a second request.

Each questionnaire allowed the user to rate one computer system and specifically requested that the rating apply to the system listed on the label. The recipient was encouraged to reproduce the form if he/she wished to rate additional systems. The IDC labels were used as initial validation vehicles and for identification and elimination of invalid and duplicate returns. All returns were analyzed by senior Datapro analysts and some returns were judged invalid for one or more of the following reasons: more than one system model was rated on a single form; the response was a duplicate; the form was received after the deadline; the ratings section of the questionnaire was not completed; the systems rated were not mainframe or minicomputer systems; or the response revealed a vested interest on the part of the respondent. In addition, system models receiving fewer than five valid responses were grouped together under "Other Mainframes" or "Other Minicomputers."

Of the 14,344 questionnaires mailed, 3,701 responses were received from 3,509 respondents, a return of 26 percent on the total mailing. Of the total responses, 61 were judged invalid, giving us 3,640 valid responses from 3,448 users. Of these valid responses, 1,302 rated mainframe systems for a return of 24 percent, while 2,338 rated minicomputers for a return of 25 percent.

Datapro batched the valid returns by manufacturer and model and sent the returns to Mathematica Policy Research, Inc. for tabulation of the results. The summary information was prepared in the form of either averages, percentages, or weighted averages. Weighted averages were computed in a manner similar to that used for most college grading systems: "Excellent" is weighted as 4, "Good" as 3, "Fair" as 2, and "Poor" as 1. The tallied numbers for each value are then multiplied by the corresponding weight, and the average is taken by dividing the sum of the products by the total number of responses for that category.

THE 1986 QUESTIONNAIRE

Users were asked to answer 31 multiple-part questions. Each user was asked to identify the manufacturer and model of his/her system, as well as the month and year of installation and the method of acquisition. Users were requested to identify the type of industry their company was in, principal applications, and the sources of those applications programs. We also asked the users for information about their hardware and software configurations, and about acquisitions or implementations planned for 1986.

The remaining questions asked the users to rate various aspects of their computer systems. The categories rated included ease of operation, reliability of system, reliability of peripherals, maintenance service (responsiveness and effectiveness), technical support (troubleshooting, education, and documentation), manufacturer's software (operating system, compilers and assemblers, and applications programs), ease of programming, ease of conversion, and overall satisfaction. Additional ratings included timeliness of hardware installation; timeliness of software installation; ease of expansion; compatibility of terminals, peripherals, and software carried over from other systems; power/energy efficiency; productivity aids; software support delivered by the vendor; noise level of equipment; and ease of keeping up with and implementing vendor changes to hardware/software.

This year we also asked users if they were using certain software packages in the following categories: data base management systems, data management systems, application development tools, utilities, communications software, performance monitors or security systems, and system enhancement packages. Users who checked off any of the listed packages were asked to rate those packages on a scale of 1 to 10, with 1 as the lowest rating and 10 as the highest.

Finally, we asked if the computer system did what it was expected to do, and if the users would recommend their computer system to others.

SURVEY RESULTS

Table 1, "Mainframes by Vendor Summaries," contains the results on 20 model groupings from 8 mainframe vendors, representing 1,302 user responses.

Financial Alternatives

Users have three options by which they can acquire their computer system: purchase, rent/lease from the manufacturer, or lease from a third party. Each method of acquisition offers its own benefits, and each method should be examined carefully to see which of these methods would be most beneficial to your company. By using the purchase option, the user can enjoy benefits such as the investment tax credit and depreciation schedule allowances. With the rapid advances in technology, however, many users feel that rental/lease from the manufacturer is the best option for them, because it allows them to upgrade faster to new systems. Also, many vendors include maintenance in the rent/lease price. The advantages a user can receive from third-party leasing are faster delivery and more attractive lease prices.

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Method of Acquisition	1986	1985	1984
Purchase (%)	54	56	51
Rent/Lease from Mfgr. (%)	14	14	24
Lease from 3rd Party (%)	32	30	25

Chart 1. Financial alternatives.

Applications—1986	Applications—1985
1. Accounting/Billing	1. Accounting/Billing
2. Payroll/Personnel	2. Payroll/Personnel
3. Order Processing/Inv. Control	3. Order Processing/Inv. Control
4. Purchasing	4. Purchasing
5. Sales/Distribution	5. Sales/Distribution
6. Manufacturing	6. Manufacturing
7. Banking	7. Engineering/Scientific
8. Engineering/Scientific	8. Banking
9. Education	9. Education
10. Insurance	10. Mathematics/Statistics

Chart 3. User rankings of principal applications.

One of the questions we asked, therefore, was how users acquired their systems: outright purchase, rental/lease from the manufacturer, or third-party lease.

Reference to Chart 1 shows that the percentage of purchased systems has decreased this year. For the past few years, the percentage of purchases has been going up, probably because many vendors, including IBM, were making outright purchase more attractive by lowering purchase prices and raising rental and lease prices. Perhaps in 1985 users found it more difficult to borrow the money needed to purchase a system outright, or they were less inclined to risk a large outlay of money until the economy improved.

Industry and Applications

One of the questions we asked the users was "What type of industry describes your company?" Chart 2 shows the market penetration in each industry by manufacturer for each class of computer systems.

We also asked the survey respondents to specify their principal applications. In 1986, as in 1985, the top three applications were accounting/billing, payroll/personnel, and order processing/inventory control. (See Chart 3, "User Rankings of Principal Applications.") Banking, in eighth place last year, moved up to seventh place, while Engineering/Scientific moved from seventh place to eighth place. Insurance, not even

in the top 10 last year, replaced Mathematics/Statistics in tenth place.

Hardware Configurations

Several of the survey questions asked users to describe their hardware configurations. Main memory capacities continue to increase. About 40 percent of the mainframe users had at least 16 megabytes of main memory on their systems, with 26 percent using between 16 and 32 megabytes. Five percent of the survey respondents had installed systems with more than 64 megabytes of main memory. Just 2 years ago, the majority of the users had installed between 2 and 8 megabytes of main memory, and only 2 percent of them were using more than 32 megabytes.

Our survey also shows an increase in disk storage capacity. In 1985, 77 percent of the systems included at least 1.2 gigabytes of disk storage, up from 66 percent in 1984. In 1986, nearly 80 percent of the systems had at least 1.2 gigabytes of disk capacity, with 31 percent using more than 10 gigabytes. In 1985, only 20 percent used more than 10 gigabytes of disk storage.

We also asked the users how many local workstations/terminals and how many remote workstations/terminals they were using. Chart 4 shows the usage of

Type of Industry / Manufacturer	Banking/Finance/Securities	Chemical/Petroleum	Construction	Education	Engineering/Scientific	Government	Health Care/Medical	Insurance	Legal	Manufacturing	Media	Public Accounting/Consulting	Retail/Wholesale	Service Bureau	Transportation	Utilities (Public)	Other
Amdahl (17)	5.88	0.00	0.00	0.00	0.00	17.65	5.88	11.76	0.00	23.53	0.00	0.00	0.00	0.00	5.88	17.65	11.76
Burroughs (186)	24.73	2.69	0.00	5.91	0.54	12.37	5.91	3.23	0.00	15.59	0.54	1.08	8.60	6.99	2.69	1.08	7.51
Control Data (9)	0.00	11.11	0.00	44.44	0.00	22.22	0.00	0.00	0.00	22.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Honeywell (64)	1.56	1.56	4.69	15.63	0.00	4.69	1.56	6.25	0.00	31.25	0.00	0.00	9.38	3.13	6.25	0.00	14.05
IBM (708)	11.02	3.11	0.85	7.34	1.84	7.77	6.07	9.32	0.28	23.16	1.55	0.99	8.90	2.68	2.12	5.93	7.06
NAS (21)	19.04	0.00	0.00	4.76	0.00	4.76	0.00	4.76	0.00	23.81	0.00	0.00	0.00	14.29	0.00	14.29	14.29
NCR (178)	33.71	0.56	3.37	8.43	0.00	7.87	5.06	0.00	0.56	12.36	0.56	0.00	15.17	5.62	0.00	3.93	2.80
Sperry (88)	0.00	3.41	0.00	10.23	3.41	9.09	3.41	0.00	0.00	32.95	1.14	1.14	15.91	3.41	5.68	4.54	5.68
Other (31)	3.23	6.45	0.00	16.13	9.68	16.13	3.23	3.23	0.00	19.35	0.00	0.00	0.00	6.45	3.23	3.23	9.66

Chart 2. Computer usage by manufacturer and industry type.

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No. of Workstations/ Terminals per System Manufacturer & Model	Local						Remote					
	None	1-5	6-15	16-30	31-60	Over 60	None	1-5	6-15	16-30	31-60	Over 60
Amdahl												
580 Series (17)	0.00	0.00	0.00	17.65	0.00	82.35	0.00	0.00	0.00	11.76	0.00	88.24
Burroughs												
A 3 (10)	0.00	0.00	0.00	60.00	40.00	0.00	10.00	10.00	20.00	20.00	40.00	0.00
A 9 (14)	0.00	0.00	0.00	28.57	28.57	42.86	0.00	7.14	28.57	0.00	14.29	50.00
V Series (7)	0.00	0.00	0.00	14.29	28.57	57.14	0.00	14.29	0.00	0.00	14.29	71.42
B 2900/B 3900 (82)	3.66	4.88	17.07	24.39	25.61	24.39	10.98	15.85	15.85	9.76	10.98	34.15
B 4900/B 5900 (45)	0.00	0.00	17.78	26.67	24.44	28.89	24.44	6.67	6.67	15.56	13.33	33.33
B 6900/B 7900 (28)	0.00	0.00	10.71	17.86	17.86	53.57	0.00	17.86	10.71	0.00	28.57	42.86
Control Data												
All Models (9)	0.00	0.00	33.33	22.22	11.11	33.33	11.11	0.00	0.00	0.00	11.11	77.78
Honeywell												
DPS 7 (30)	0.00	6.67	20.00	33.33	30.00	10.00	20.00	16.67	23.33	23.33	13.33	3.33
DPS 8 (34)	2.94	0.00	5.88	26.47	29.41	35.29	5.88	14.71	8.82	11.76	11.76	44.12
IBM												
4361 (120)	0.00	2.50	11.67	27.50	38.33	19.17	16.67	22.50	14.17	20.00	13.33	13.33
4381 (219)	0.00	0.46	1.37	5.94	24.66	67.12	12.79	6.39	8.22	12.33	12.33	46.58
4300, Other (55)	0.00	0.00	5.45	9.09	36.36	49.09	16.36	12.73	10.91	5.45	7.27	41.82
308X Series (289)	0.00	0.00	1.73	4.50	8.65	85.12	2.08	2.42	4.50	5.54	7.61	77.16
3090 Series (25)	0.00	0.00	0.00	4.00	8.00	88.00	0.00	0.00	0.00	0.00	4.00	96.00
NAS												
All Models (21)	0.00	0.00	9.52	4.76	23.81	61.90	0.00	0.00	4.76	9.52	4.76	80.95
NCR												
8500/8600 (178)	0.00	12.92	24.72	30.34	21.35	10.67	21.91	15.73	17.98	14.04	10.11	19.10
Sperry												
1100/60 (26)	0.00	3.85	15.38	30.77	11.54	38.46	11.54	15.38	23.08	15.38	7.69	23.08
1100/70 (57)	0.00	1.75	5.26	15.79	26.32	50.88	1.75	19.30	12.28	29.82	5.26	29.82
1100/90 (5)	0.00	0.00	0.00	0.00	0.00	100.00	0.00	0.00	0.00	20.00	20.00	60.00
Other (31)	0.00	3.23	6.45	22.58	12.90	54.84	3.23	16.13	9.68	9.68	12.90	38.71
All Mainframes (1,302)	0.31	2.76	8.91	16.59	21.43	49.77	10.52	10.52	10.60	11.67	10.60	44.70

Chart 4. Usage of local and remote workstations/terminals.

local and remote terminals by manufacturer and model. About 50 percent of the mainframe users had more than 60 local terminals in operation, while 45 percent were using more than 60 remote terminals. In 1985, only 38 percent of the respondents had more than 60 local and 60 remote terminals.

Software

The computer application development life cycle is a highly labor-intensive cycle. As labor costs climb, so does the cost of software development. As computers increase in capability and speed, and as users become accustomed to results, the clamor for additional applications increases. Because many systems already face a two-year backlog in bringing up desirable applications, it is quite common for users to seek multiple sources for applications programs. And as the proprietary software industry increases in maturity and sophistication, "packaged" software becomes a desirable adjunct to in-house development.

We asked the users how they acquired their applications software. First on their list was in-house personnel. The preparation of software by in-house personnel is often a highly desirable route because of in-house management control plus, ideally, the total tailorability of the software to the user's operational requirements. Software from independent suppliers was ranked second by the users, followed by packaged programs from the manufacturer, contract programming, and programs prepared by the manufacturer's personnel. The 1986 results on this question were identical to the 1985 and 1984 results.

"Which programming language should I use?" is a question that often results in a long debate among programmers and computer scientists. Because most studies show that it takes about the same amount of time to code an instruction, whatever the language, the answer would appear to be: "Whichever language will result in the fastest possible documented implementation of the application."

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Acquisition Plans—1986	Acquisition Plans—1985
1. Expansion to Data Communications Facilities (68%)	1. Expansions to Present Hardware (67%)
2. Expansion to Present Hardware (65%)	2. Expansions to Data Communications Facilities (65%)
3. Additional Proprietary Software (62%)	3. Additional Proprietary Software (61%)
4. Additional Software from Mfgr. (53%)	4. Additional Software from Mfgr. (52%)
5. Laser Printers (26%)	5. Business Graphics (14%)

Chart 5. User rankings of planned acquisitions.

For mainframe users, the most frequently used language was Cobol (77 percent), followed distantly by Assembler (8 percent), PL/1 (2 percent), and Fortran (1.6 percent).

Acquisition Plans

We asked how users were planning to spend their enhancement/acquisition dollars in 1986. Chart 5 shows the user rankings of planned acquisitions. This year the top priority with users in the mainframe class is to expand their data communications facilities, closely followed by expansions to their present hardware and additions to their proprietary software. Expansion to data communications facilities was in second place last year, but data communications and hardware seem to take turns in first place; the 1984 results were identical to the 1986 results.

On the 1986 questionnaire we added laser printers to our checklist, and found that 26 percent of the survey respondents planned to acquire laser printers this year.

Disaster recovery is of critical importance to computer installations, so we asked the users if they had implemented a disaster recovery plan. More than 55 percent said they had done so, compared with 50 percent in the 1985 survey. This year 18 percent reported that a disaster recovery plan was on their agenda, while 22 percent reported such intentions last year.

Information centers have been a hot topic in recent months, so we also asked the users if they had established an information center. Forty percent said that they had an information center, and 9 percent said they planned to add one this year.

User Satisfaction Ratings

Consistent with our belief that what users think is extremely important, we asked users to rate their computer systems and the associated software and vendor support by assigning a rating of Excellent, Good, Fair, or Poor to each of 14 factors: ease of operation, reliability of mainframe, reliability of

peripherals, maintenance service (responsiveness and effectiveness), technical support (troubleshooting, education, and documentation), manufacturer's software (operating system, compilers and assemblers, and applications programs), ease of programming, ease of conversion, and overall satisfaction. All ratings are expressed in terms of Weighted Averages, which were calculated by assigning a weight of 4 to each user rating of Excellent, 3 to Good, 2 to Fair, and 1 to Poor, and then dividing the sum by the number of users who rated each factor.

The individual responses by vendor appear in Table 1. In analyzing the ratings, we decided to see how many systems could meet the following criteria for special merit: a minimum of 20 user responses, an overall satisfaction rating of at least 3.20, and a rating of no less than 2.80 in all other system rating categories. Last year, two systems (the IBM 4381 and 3083) met these criteria. This year, *not one* of the systems met our criteria.

For a number of other categories, we picked out those systems that received at least 20 responses and a rating of at least 3.50. Chart 6 shows the systems that met those criteria for ease of operation, reliability of mainframe, reliability of peripherals, and operating system. This year the number of systems meeting those criteria increased over the previous survey. In 1985, only one

	Weighted Average	No. of Responses
Ease of Operation		
Burroughs B 4900/B 5900	3.76	45
Burroughs B 6900/B 7900	3.71	28
NAS Advanced Systems	3.67	21
Burroughs B 2900/B 3900	3.66	82
Honeywell DPS 7	3.53	30
Reliability of Mainframe		
NAS Advanced Systems	4.00	21
IBM 3090 Series	3.84	25
IBM 4381	3.83	219
IBM 308X Series	3.80	289
IBM 4361	3.74	120
Honeywell DPS 7	3.60	30
Burroughs B 4900/B 5900	3.58	45
Sperry 1100/70	3.51	57
Sperry 1100/60	3.50	26
Reliability of Peripherals		
NAS Advanced Systems	3.71	21
IBM 3090 Series	3.68	25
IBM 308X Series	3.55	289
IBM 4381	3.52	219
Operating System		
Burroughs B 6900/B 7900	3.86	28
Burroughs B 4900/B 5900	3.78	45
Burroughs B 2900/B 3900	3.74	82

Chart 6. Systems with the highest ratings in key categories.

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system each made the grade in the ease of operation, reliability of peripherals, and operating system categories, while five systems met our criteria in the reliability of mainframe category.

Vendor service and support are key areas when considering a computer system. Although users have no control over the effectiveness of maintenance service, they can influence promptness of maintenance service by spelling out their requirements in their contract with the vendor.

We checked the survey results to see which vendors had received the highest overall ratings for maintenance service and technical support. To be listed in our chart, the vendor had to have a minimum of 20 user responses and a rating of at least 3.5 for maintenance service and 3.0 for technical support. Through the years that Datapro has been conducting this survey, we have found that the area of technical support usually receives the lowest ratings. We felt, therefore, that any vendor receiving a 3.0 rating in technical support was deserving of special mention. Chart 7 lists the vendors that met our criteria in these service categories.

These results show a significant improvement in user satisfaction over the 1985 survey, in which *none* of the vendors met our requirements for maintenance, although IBM came close with a weighted average of 3.47 for both maintenance responsiveness and maintenance effectiveness. IBM was also the only vendor last year to receive at least a 3.0 in any of the technical support categories.

Expectations and Recommendations

We asked the computer system users "Did the system do what you expected it to do?" This year, 95 percent answered "Yes," 2 percent said "No," and 3 percent said "Haven't decided." Last year, 96 percent answered "Yes."

The final question we asked users was whether they would recommend the computer system to another user in their situation. Ninety-two percent said "Yes,"

Maintenance Service:	Weighted Average	No. of Responses
Responsiveness		
NAS	3.81	21
Burroughs B 6900/B 7900	3.61	28
Effectiveness		
NAS	3.81	21
IBM	3.52	708
Technical Support:		
Troubleshooting		
NAS	3.67	21
IBM	3.20	708
Burroughs B 4900/B 5900	3.07	45
Education		
IBM	3.13	708
Documentation		
NAS	3.10	21

Chart 7. Systems with the highest ratings for service and support.

3 percent answered "No," and 5 percent said they "Haven't decided." In 1985, the numbers were 92 percent, 4 percent, and 4 percent, respectively.

The vendors that received the highest overall percentages of user recommendations were:

NAS	100%
IBM	95%
Amdahl	94%

THANK YOU

Datapro extends a sincere thanks to all for responding to our 1986 survey of user experiences with computer systems. Without your participation it could not have been the success it is, and we hope that this compendium of the opinions of user colleagues will be of significant value to you. We look forward to hearing from you again next year.

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Survey Item / Manufacturer and Model	Amdahl	Burroughs	Control Data	Honeywell	IBM	NAS	NCR
No. of User Responses	17	186	9	64	708	21	178
Average Life of System (months)	29.50	40.86	42.88	42.18	30.41	27.47	50.96
Acquisition Method (%)							
Purchase	47.06	61.83	77.78	62.50	47.18	42.86	71.91
Rental or Lease from Manufacturer	23.53	17.74	22.22	12.50	11.16	19.04	14.04
Lease from Third Party	29.41	20.43	0.00	25.00	41.24	38.10	14.04
Principal Applications (%)							
Accounting/Billing	82.35	65.59	33.33	84.38	75.28	80.95	58.99
Banking—Check Processing/Loans/Savings	11.76	28.49	0.00	1.56	13.14	23.81	35.96
Construction/Architecture	17.65	2.69	0.00	3.13	2.54	14.29	2.81
Education—Scheduling/Administration	23.53	10.22	77.78	15.63	12.99	14.29	11.24
Engineering/Scientific	47.06	4.84	66.67	10.94	17.23	19.05	2.25
Health Care/Medical	11.76	10.75	22.22	4.69	10.88	4.76	5.06
Insurance	35.29	8.06	0.00	12.50	14.27	14.29	1.12
Manufacturing	29.41	17.20	0.00	29.69	24.01	28.57	11.80
Mathematics/Statistics	11.76	5.91	44.44	7.81	11.44	38.10	1.69
Order Processing/Inventory Control	47.06	39.78	0.00	53.13	49.15	42.86	37.08
Payroll/Personnel	70.59	54.84	33.33	64.06	62.57	57.14	57.30
Petroleum/Fuel Analysis	11.76	0.54	11.11	1.56	2.54	14.29	3.93
Process Control	47.06	1.61	11.11	9.38	4.52	19.05	1.69
Purchasing	41.18	28.49	11.11	37.50	43.64	42.86	26.40
Sales/Distribution	41.18	25.81	0.00	39.06	30.79	33.33	21.91
Other	17.65	12.90	0.00	14.06	10.73	28.57	9.55
Source of Applications Programs (%)							
In-house Personnel	100.00	92.47	100.00	98.44	93.79	80.95	85.96
Contract Programming	64.71	22.58	0.00	31.25	38.70	33.33	26.97
Manufacturer's Personnel	0.00	8.60	22.22	6.25	6.36	4.76	8.99
"Packaged" Programs from Manufacturer	70.59	35.48	66.67	31.25	45.20	42.86	55.62
Independent Suppliers	41.18	46.24	66.67	42.19	56.64	28.57	51.69
Location of Computer (%)							
Departmental System	0.00	4.84	0.00	1.56	5.93	0.00	3.37
Organizational System	100.00	94.62	100.00	98.44	93.79	100.00	94.94
Use Third-Party Maintenance (%)							
Yes	11.76	2.15	0.00	0.00	7.63	19.05	2.25
No	88.24	97.31	100.00	100.00	92.09	80.95	97.75
Have a Disaster Recovery Plan (%)							
Yes	82.35	48.92	77.78	51.56	57.77	52.38	57.30
Plan to in 1986	5.88	17.74	0.00	10.94	19.35	23.81	19.66
Have an Information Center (%)							
Yes	58.82	27.42	33.33	18.75	48.31	61.90	25.28
Plan to in 1986	0.00	7.53	0.00	14.06	10.17	9.52	7.30
Planned Acquisitions/Implementations for 1986 (%)							
Additional Software from the Manufacturer	52.94	40.86	77.78	46.88	62.29	47.62	32.02
Proprietary Software from Other Suppliers	82.35	43.01	44.44	34.38	72.60	80.95	59.55
Expansions to Present Hardware	88.24	56.99	88.89	70.31	70.06	61.90	52.25
Expansions to Data Communications Facilities	94.12	55.38	77.78	73.44	71.47	71.43	61.24
Unix-based Operating System	11.76	1.61	11.11	1.56	1.69	0.00	4.49
Laser Printers	41.18	18.82	44.44	17.19	30.79	42.86	12.92
Power Conditioning Systems	35.29	8.06	11.11	7.81	14.27	28.57	13.48
Optical Disk Devices	0.00	1.08	0.00	0.00	2.97	0.00	1.69

Table 1. Mainframe vendor summaries

User Ratings of Mainframe Systems

Survey Item	Amdahl	Burroughs	Control Data	Honeywell	IBM	NAS	NCR
System Ratings (4.0-1.0)							
Ease of Operation	3.47	3.68	3.22	3.44	3.27	3.67	3.31
Reliability of Mainframe	3.65	3.50	3.67	3.50	3.79	4.00	3.43
Reliability of Peripherals	3.50	3.09	3.44	3.30	3.53	3.71	3.32
Manufacturer's Maintenance Service:							
Responsiveness	3.71	3.47	3.89	3.42	3.48	3.81	3.34
Effectiveness	3.53	3.23	3.67	3.17	3.52	3.81	3.20
Manufacturer's Technical Support:							
Troubleshooting	3.59	2.92	3.50	2.97	3.20	3.67	2.78
Education	3.12	2.76	3.25	2.81	3.13	2.81	2.98
Documentation	3.24	2.54	3.50	2.67	2.99	3.10	2.77
Manufacturer's Software:							
Operating System	3.10	3.78	3.22	3.41	3.25	3.09	3.28
Compilers & Assemblers	2.88	3.46	3.56	3.39	3.27	3.09	3.08
Applications Programs	2.86	2.75	3.25	2.49	2.75	3.18	2.55
Ease of Programming	2.91	3.49	3.11	3.21	2.91	3.08	2.95
Ease of Conversion	2.60	3.34	3.13	3.08	2.75	3.00	3.10
Overall Satisfaction	3.00	3.42	3.33	3.24	3.14	3.08	3.08
Additional Ratings (4.0-1.0)							
Timeliness of Hardware Installation	3.82	3.39	3.75	3.48	3.66	4.00	3.30
Timeliness of Software Installation	3.20	3.33	3.50	3.38	3.25	3.33	3.10
Ease of Expansion	3.53	3.54	3.38	3.44	3.31	3.75	3.52
Compatibility of Hardware Carried Over from Other Systems	3.53	3.27	3.50	2.98	3.25	3.71	3.28
Compatibility of Programs/Data Carried Over from Other Systems	3.31	3.31	3.25	3.14	3.16	3.76	3.32
Power/Energy Efficiency	3.18	3.30	3.13	3.15	3.20	3.24	2.97
Productivity Aids Help Keep Programming Costs Low	2.79	2.88	2.88	2.69	2.58	2.40	2.63
Software Support Delivered by Vendor	3.13	2.69	3.13	2.81	2.88	3.05	2.44
Keeping Up with & Implementing Vendor Changes to Hardware/Software (Very Easy=4.0; Very Difficult=1.0)	3.24	3.27	2.75	3.14	2.81	3.10	3.11
Did the system do what you expected it to do? (%)							
Yes	94.12	93.55	100.00	98.44	96.47	100.00	94.94
No	5.88	1.61	0.00	1.56	0.99	0.00	1.69
Undecided	0.00	4.84	0.00	0.00	2.12	0.00	3.37
Would you recommend system to another user? (%)							
Yes	94.12	89.78	88.89	85.94	95.48	100.00	84.83
No	5.88	3.23	0.00	3.13	0.99	0.00	5.06
Undecided	0.00	6.45	11.11	10.93	3.11	0.00	9.55

Table 1. Mainframe vendor summaries

User Ratings of Mainframe Systems

Survey Item	Sperry	Other Mainframes					
No. of User Responses	88	31					
Average Life of System (months)	43.89	58.52					
Acquisition Method (%)							
Purchase	44.32	67.74					
Rental or Lease from Manufacturer	30.68	6.45					
Lease from Third Party	23.86	25.81					
Principal Applications (%)							
Accounting/Billing	81.82	58.06					
Banking—Check Processing/Loans/Savings	2.27	6.45					
Construction/Architecture	1.14	3.23					
Education—Scheduling/Administration	18.18	22.58					
Engineering/Scientific	14.77	35.48					
Health Care/Medical	3.41	6.45					
Insurance	2.27	9.68					
Manufacturing	26.14	19.35					
Mathematics/Statistics	11.36	22.58					
Order Processing/Inventory Control	67.05	41.94					
Payroll/Personnel	64.77	58.06					
Petroleum/Fuel Analysis	3.41	6.45					
Process Control	0.00	19.35					
Purchasing	53.41	19.35					
Sales/Distribution	47.73	25.81					
Other	15.91	29.03					
Source of Applications Programs (%)							
In-house Personnel	95.45	93.55					
Contract Programming	37.50	32.26					
Manufacturer's Personnel	28.41	16.13					
"Packaged" Programs from Manufacturer	38.64	54.84					
Independent Suppliers	43.18	61.29					
Location of Computer (%)							
Departmental System	4.55	9.68					
Organizational System	95.45	90.32					
Use Third-Party Maintenance (%)							
Yes	0.00	12.90					
No	98.86	87.10					
Have a Disaster Recovery Plan (%)							
Yes	40.91	61.29					
Plan to in 1986	22.73	3.23					
Have an Information Center (%)							
Yes	34.09	48.39					
Plan to in 1986	9.09	6.45					
Planned Acquisitions/Implementations for 1986 (%)							
Additional Software from the Manufacturer	50.00	54.84					
Proprietary Software from Other Suppliers	39.77	45.16					
Expansions to Present Hardware	60.23	64.52					
Expansions to Data Communications Facilities	65.91	70.97					
Unix-based Operating System	5.68	3.23					
Laser Printers	22.73	22.58					
Power Conditioning Systems	13.64	29.03					
Optical Disk Devices	2.27	9.68					

Table 1. Mainframe vendor summaries

User Ratings of Mainframe Systems

Survey Item	Sperry	Other Mainframes						
System Ratings (4.0-1.0)								
Ease of Operation	3.13	3.32						
Reliability of Mainframe	3.51	3.45						
Reliability of Peripherals	3.21	2.94						
Manufacturer's Maintenance Service:								
Responsiveness	3.40	3.37						
Effectiveness	3.21	3.20						
Manufacturer's Technical Support:								
Troubleshooting	2.83	3.13						
Education	2.59	3.03						
Documentation	2.41	2.84						
Manufacturer's Software:								
Operating System	3.24	3.31						
Compilers & Assemblers	3.26	3.31						
Applications Programs	2.63	2.50						
Ease of Programming	2.99	3.10						
Ease of Conversion	2.45	3.07						
Overall Satisfaction	3.06	3.20						
Additional Ratings (4.0-1.0)								
Timeliness of Hardware Installation	3.28	3.53						
Timeliness of Software Installation	3.09	3.28						
Ease of Expansion	3.41	3.04						
Compatibility of Hardware Carried Over from Other Systems	2.57	2.90						
Compatibility of Programs/Data Carried Over from Other Systems	2.47	3.03						
Power/Energy Efficiency	2.90	2.35						
Productivity Aids Help Keep Programming Costs Low	2.56	2.66						
Software Support Delivered by Vendor	2.65	2.69						
Keeping Up with & Implementing Vendor Changes to Hardware/Software (Very Easy=4.0; Very Difficult=1.0)	2.73	3.00						
Did the system do what you expected it to do? (%)								
Yes	86.36	96.77						
No	5.68	0.00						
Undecided	5.68	0.00						
Would you recommend system to another user? (%)								
Yes	84.09	83.87						
No	6.82	12.90						
Undecided	6.82	0.00						

Table 1. Mainframe vendor summaries