User Ratings of General-Purpose Computer Systems

As Datapro's subscribers keep telling us, a summary of users' evaluations of the pros and cons of the myriad products offered to the data processing community can be a valuable tool in selecting the product that will best meet each computer user's needs. That kind of information is often hard to come by, however, which accounts for the increasing popularity of the "User Reaction" sections of Datapro's reports on computer systems, proprietary software, and peripheral products.

This 1977 survey of user ratings of general-purpose computer systems summarizes the opinions of Datapro subscribers about their currently installed computers and presents weighted averages of the ratings assigned to each computer system for its performance in 12 important categories that cover hardware, software, and the supporting services provided by the computer manufacturers. These ratings provide a quick and easy-to-use method for prospective computer purchasers to determine what other users think are the most attractive characteristics, as well as the disadvantages, of the computer systems they are now using. Datapro solicited these views in an extensive questionnaire that was mailed on a postpaid reply form to a sample of approximately 10,000 Datapro subscribers in June 1977. By September 1, when the monumental task of tabulating the returned questionnaires was begun, a total of 1,790 responses had been received.

All general-purpose computer systems of any vintage were grouped and included in the tabulated listings if they were rated in two or more user responses. Single responses describing a particular model of a computer manufacturer's product line were incorporated into the totals for the appropriate computer family under the category of "others."

In the case of questionnaires that described two or more computer systems representing two or more distinct models within a product line, each set of ratings was counted as one response. However, when only one set of ratings was given for multiple computer systems of the same model or series, that set of ratings was counted as a single response in order to avoid skewing of the final ratings by one installation reporting on a large number of identical computer systems. As a result, our 1977 survey summarizes the ratings supplied in 1,790 responses evaluating a total of 2,253 computer systems.

This year, four important systems are represented in the survey for the first time. These are the Burroughs B 7700, the Itel AS/4 and AS/5 IBM plug-compatible systems, and the Univac 90/80. (We found it interesting to note that the two responses received from Itel Advanced Systems users represented 20 percent of the systems that had been installed when the survey questionnaire was mailed.) In addition, several models that were previously grouped with other family members are listed separately this year. Specifically, Honeywell's Series 60 family is presented in three model groups—Level 62, Level 64, and Level 66—and the various models of IBM's System/3 family are tabulated individually.

In addition to the 1,790 responses tabulated in this report, Datapro's 1977 computer survey also attacted

This report conveys the results of Datapro's 1977 survey of general-purpose computer users. Extensive tables summarize the experience of 1,790 users with a total of 2,253 computer systems. The users' ratings pinpoint the strengths and weaknesses of each mainframe manufacturer's equipment, software, and support, yielding information that should be of great value in computer acquisition.

responses from 816 users of minicomputers and small business computers with a total of 2,362 installed systems. The usage patterns and equipment ratings of these users are presented in a separate DATAPRO 70 report, *User Ratings of Minicomputers and Small Business Computers* (Report 70C-010-40).

The Results for 1977

Our comprehensive questionnaire asked each Datapro subscriber to describe his computer installation in considerable detail. Each respondent was asked to identify the manufacturer and model number of the computer system, the number of systems installed, the main memory size, the operating system in use, and the number of months the system has been installed.

Another question asked whether the user acquired his system by outright purchase, rental from the manufacturer, or through a third-party leasing arrangement. The results, summarized in Table 1 and detailed in Table 6, represent the percentages of the total number of responses for each manufacturer or model that reported each method of acquisition. Some respondents failed to supply an answer to the question, while others had used more than one method of acquisition. As a result, the percentages do not always add up to 100 percent.

We then asked our subscribers to describe the major functions of each computer system by indicating the principal application, or applications, performed by each system. The results are summarized in Table 2 and detailed in Table 6. Here the percentages nearly always ▷

TABLE 1: METHOD OF ACQUISITION

Manufacturer	Purchase	Rental from Manufacturer	Third-Party Lease
Amdahl	71%	—	29%
Burroughs	32%	50%	5%
Control Data	39%	48%	17%
DEC	74%	—	22%
Honeywell	47%	35%	18%
IBM	36%	31%	34%
Itel	50%	—	50%
NCR	21%	57%	23%
Univac	42%	53%	5%
Xerox	69%	38%	—
Totals	37%	34%	28%

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TABLE 2: PRINCIPAL APPLICATIONS

Manufacturer	Business Data Processing	Scientific and Engineering	Real-Time Control	Data Communications	Data Base Management	Program Development
Amdahl	100%	71%	0%	43%	43%	71%
Burroughs	90%	15%	2%	42%	31%	40%
Control Data	57%	78%	0%	30%	30%	70%
DEC	78%	56%	4%	37%	41%	67%
Honeywell	92%	22%	5%	36%	25%	45%
IBM	92%	17%	7%	37%	30%	46%
Itel	100%	50%	0%	50%	50%	50%
NCR	100%	4%	1%	16%	9%	21%
Univac	83%	28%	8%	37%	27%	53%
Xerox	69%	50%	19%	31%	38%	44%
Totals	91%	19%	6%	36%	29%	45%

far exceed 100 percent, indicating that most of the computer systems represented in the survey perform a variety of functions. Corresponding closely to the market emphasis claimed by the respective manufacturers, computers made by Amdahl, Burroughs, Honeywell, IBM, Itel, NCR, and Univac were used mainly for business data processing, while those made by Control Data, Digital Equipment Corporation, and Xerox showed greater emphasis on scientific and engineering applications. The second highest usage category, after business data processing, was development, followed by data communications and data base management in third and fourth place, respectively. Data base management applications advanced from 24 percent of all the responding users in the 1976 survey to 29 percent this year.

The next question we asked the computer users was "Who wrote the programs for your applications?" Table 3 summarizes their replies. Although the vast majority of users maintain in-house programming staffs, most have also turned to other sources for programming assistance. Hence, the figures in Table 3 also total more than 100 percent in most cases.

Computer users represented in the survey relied most often on software packages supplied by independent software houses to supplement their in-house programming efforts. These results underscore the growing importance of the proprietary software industry in the computer marketplace. The percentages listed in Table 3, however, probably underestimate the full extent of the utilization of proprietary software packages by computer users; our question specified application programs only, and many of the popular proprietary software programs supplement the services performed by the computer manufacturers' systems software.

The percentages of computer users in the survey who were using remote batch and/or interactive terminals varied widely. But all of the manufacturers had some representation in both categories, as shown in Table 4. Overall, over one-third of the computer systems represented in this survey were equipped with remote batch terminals, and over one-half of the systems included interactive terminals in their configurations. Although the number of each type of terminal installed per system naturally varied widely with the size of the computer system and the data processing environment, the averages were almost 6 remote batch terminals and 34 interactive terminals per system.

The next question relating to the description of each configuration asked the users to specify what types of peripheral devices, if any, they had obtained from sources other than their mainframe manufacturer. The results are shown in Table 5. An entry line was left blank for users to indicate any other types of "foreign" devices that were included in their systems, and the answers included graphic plotters, MICR devices, and various types of remote terminals and front-end communications processors. As expected, the use of "foreign" peripheral devices is most common among users of IBM, Amdahl, and Itel computers, who can choose from a wide variety of plug-compatible devices. But the figures also make it clear that many users of other makes of computers are now looking to alternative sources for some of their peripheral equipment.

The answers to many of our questions concerning the size, longevity, method of acquisition, and principal applications of each computer system are detailed in Table 6. The responses for each computer system and the totals for each manufacturer are tabulated to help establish a proper frame of reference for the users' ratings which appear in a similar format in Table 7.

Table 6 also indicates that some of the computer hardware represented in this survey has had a far longer life expectancy than might have been predicted in view of the rapid pace of technological innovation and the regular arrival of new families offering ever more attractive price/performance ratios and more appealing processing facilities. The durable IBM System/360 still constitutes nearly 12 percent of the computers represented in this survey, with an average of 56 months of service, although its numbers declined from 383 systems in last year's survey to 262 this year. Other systems with notable longevity include the IBM 1130, with an average of 102 months, or over 8 years, of use, and 8 IBM 1401 systems that have been in use for over a decade. The overall average number of months in use for all systems was 38 months, the same as in last year's survey.

Finally and most importantly, in order to determine the level of the users' satisfaction with their computer systems, we asked each respondent to judge his system in 12 distinct categories of performance by assigning ratings of Excellent, Good, Fair, or Poor. These responses were grouped by computer model, and a weighted average based on the number of responses for each category was ▷

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TABLE 3: SOURCES OF APPLICATIONS PROGRAMS

Manufacturer	In-House Personnel	Computer Manufacturer's Personnel	Used "Ready-Made" Programs from Manufacturer	Used Proprietary Software Packages	Used Contract Programming House
Amdahl	100%	14%	14%	57%	29%
Burroughs	99%	19%	27%	38%	21%
Control Data	100%	22%	22%	70%	35%
DEC	100%	15%	19%	48%	30%
Honeywell	97%	24%	23%	27%	15%
IBM	97%	10%	25%	52%	24%
Itel	100%	0%	0%	50%	0%
NCR	97%	29%	50%	24%	16%
Univac	99%	24%	23%	37%	24%
Xerox	100%	6%	6%	25%	0%
Totals	97%	13%	25%	47%	23%

▷ computed. To calculate the weighted averages, each Excellent response was weighted as 4, Good as 3, Fair as 2, and Poor as 1. The total numbers of responses were multiplied by their corresponding weights, and the sums of these products were then divided by the total number of responses in each category. The results for each computer model that was rated by two or more users and the totals for each mainframe manufacturer are presented in Table 7.

Some Mixed Emotions

In order to establish a base line or standard of performance, the ratings received by all computer systems in this survey are summarized in the Grand Totals row at the end of Table 7. These averages have been calculated to form an overall picture of user satisfaction, and in some cases dissatisfaction, with the currently installed computer equipment.

In the important "bottom line" category of Overall Satisfaction, the respondents to the Datapro 1977 survey bestowed an overall rating of 3.1, or slightly better than Good, upon all the computer systems evaluated this year. In fact, average ratings of Good (3.0) or better were achieved in 9 out of the 12 performance categories. However, not one mainframe manufacturer drew average ratings above the 3.0 level in all 12 categories, indicating that, according to these computer users, the products and services offered by all of the computer manufacturers could stand improvement.

TABLE 4: REMOTE TERMINAL USAGE

Manufacturer	Remote Batch Terminals	Interactive Terminals
Amdahl	100%	100%
Burroughs	34%	63%
Control Data	61%	70%
DEC	44%	96%
Honeywell	31%	48%
IBM	42%	53%
Itel	50%	100%
NCR	19%	27%
Univac	37%	77%
Xerox	31%	81%
Total	39%	55%

The highest level of satisfaction was achieved in the category of Reliability of Mainframe. Two other categories in which relatively high ratings were achieved were Ease of Operation and Responsiveness of Maintenance Service, categories which also scored well in 1976.

The major sources of user grievances also haven't changed substantially since last year. Technical support for software is probably the cause for more discontent than any other area of interaction between mainframe suppliers and computer users, as expressed in both this annual survey and in the telephone interviews that are conducted in association with the preparation of individual computer system reports for DATAPRO 70. Users frequently cite deficiencies in terms of a lack of personnel and/or inadequate training of the available people, particularly in the case of newly released software. Very few mainframe vendors have been immune from criticism of some aspect of their software support services; in this survey the highest average user rating earned by any manufacturer for the quality of its technical services was 3.0, and that score was shared by Amdahl and Itel, both newcomers to the mainframe business.

Other categories in which these computer users expressed displeasure with the mainframe vendors were the quality and selection of Application Programs and the Reliability of Peripherals category. ▷

TABLE 5: USAGE OF "FOREIGN" PERIPHERALS*

Mainframe Manufacturer	Disk Drives	Magnetic Tape Drives	Add-On Main Memory	Line Printers
Amdahl	71%	86%	14%	57%
Burroughs	7%	8%	1%	18%
Control Data	13%	9%	9%	26%
DEC	15%	15%	11%	26%
Honeywell	10%	11%	2%	13%
IBM	35%	25%	29%	13%
Itel	50%	50%	0%	100%
NCR	14%	11%	3%	13%
Univac	12%	10%	8%	10%
Xerox	31%	13%	6%	25%
Totals	29%	21%	22%	14%

*Peripheral devices obtained from sources other than the mainframe manufacturer.

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TABLE 6: DETAILED COMPUTER ACQUISITION AND APPLICATION DATA

Manufacturer and Model	No. of User Replies	No. of Computers Represented	Average Main Memory Size, Words or Bytes	Average Length of Time in Use, Months	Method of Acquisition, %			Principal Applications, %					
					Purchase	Rental from Manufacturer	Third-Party Lease	Business Data Processing	Scientific/ Engineering	Real-Time Control	Data Communications	Data Base Management	Program Development
Amdahl 470V/6	7	7	3940KB	9	5	0	2	7	5	0	3	3	5
Burroughs B 1700 Series	30	34	137KB	23	11	17	2	29	4	0	10	10	12
Burroughs B 2700 Series	21	22	186KB	40	10	10	1	19	1	1	11	8	9
Burroughs B 3500 Series	15	18	219KB	68	9	6	0	14	0	2	6	1	4
Burroughs B 3700 Series	19	22	272KB	33	7	10	2	17	2	0	3	4	7
Burroughs B 4700 Series	31	44	326KB	36	15	14	2	27	0	0	15	8	10
Burroughs B 5700 Series	3	4	32KW	84	2	1	0	3	3	0	1	0	0
Burroughs B 6700 Series	21	28	1618KB	34	10	12	0	19	10	0	14	13	13
Burroughs B 7700 Series	2	2	3894KB	18	1	1	0	0	0	0	1	1	1
Burroughs, others	4	4	235KB	48	2	2	0	4	2	0	1	0	2
BURROUGHS TOTALS	146	178	—	37	47	73	7	132	22	3	62	45	58
Control Data Cyber 70 & 170	5	6	131KW	26	0	3	3	3	5	0	2	2	4
Control Data 3000 Series	6	7	153KW	72	4	2	0	4	3	0	3	1	4
Control Data 6000 Series	10	11	104KW	141	5	4	1	6	8	0	2	4	6
Control Data 7600 Series	2	2	64KW	25	0	2	0	0	2	0	0	0	2
CONTROL DATA TOTALS	23	26	119KW	84	9	11	4	13	18	0	7	7	16
Digital Equip. DECsystem-10	22	23	264KW	43	17	0	5	17	13	1	8	8	15
Digital Equip. DECsystem-20	5	5	211KW	7	3	0	1	4	2	0	2	3	3
DIGITAL EQUIP. TOTALS	27	28	254KW	36	20	0	6	21	15	1	10	11	18
Honeywell Model 58	3	3	10KB	41	0	3	0	3	0	0	0	0	0
Honeywell Level 62	7	7	137KB	18	2	5	0	7	0	0	2	0	1
Honeywell Level 64	10	11	193KB	10	0	9	1	10	1	0	2	1	3
Honeywell Level 66	24	28	297KW	20	14	5	7	21	11	4	15	14	16
Honeywell Series 2000	29	30	161KB	46	12	11	5	29	1	0	6	5	10
Honeywell Series 6000	20	46	308KW	53	5	8	6	17	8	0	13	10	14
Honeywell Series 200	28	42	115KB	82	19	5	4	28	1	0	4	0	10
Honeywell Series 600	2	4	160KW	90	2	0	0	2	2	1	2	2	2
Honeywell G-400 Series	3	4	43KW	138	3	0	0	2	1	0	0	0	1
Honeywell, others	4	4	1050KB	75	4	0	0	1	3	1	3	1	2
HONEYWELL TOTALS	130	179	—	48	61	46	23	120	28	6	47	33	59
IBM 360/20	5	5	25KB	78	2	2	1	5	1	0	0	0	1
IBM 360/30	59	64	110KB	73	29	1	29	50	4	0	5	4	20
IBM 360/40	60	65	264KB	47	30	0	30	58	5	3	7	5	20
IBM 360/44	3	3	128KB	110	1	0	1	2	2	0	0	0	1
IBM 360/50	53	55	472KB	44	26	1	28	47	7	3	12	14	22
IBM 360/65	46	51	1360KB	48	23	2	22	37	13	5	19	22	23
IBM 360/67	5	6	1402KB	83	4	1	0	4	4	1	2	2	4
IBM 360/75	2	2	1762KB	55	1	0	1	1	0	0	0	0	1
IBM System/360, others	9	11	370KB	84	5	2	3	8	5	2	2	3	5
IBM System/360 Totals	242	262	516KB	56	121	9	115	212	41	14	47	50	97
IBM 370/115	36	37	176KB	27	5	27	4	33	4	0	6	6	6
IBM 370/125	51	55	252KB	38	16	32	6	50	8	2	9	11	15
IBM 370/135	118	259	333KB	43	35	55	32	108	17	5	47	31	52
IBM 370/138	59	61	734KB	7	11	32	16	56	4	1	24	21	32
IBM 370/145	181	199	664KB	41	70	45	66	166	19	8	81	62	82
IBM 370/148	49	49	1122KB	5	16	14	19	46	6	3	22	19	23
IBM 370/155	56	72	1733KB	44	25	9	24	52	15	7	34	24	35
IBM 370/158	224	266	2250KB	28	78	37	113	214	56	19	123	104	120
IBM 370/165	15	20	4103KB	65	10	0	5	14	8	4	7	6	11
IBM 370/168	67	103	4804KB	24	24	12	33	62	24	9	45	38	47
IBM System/370, unspecified	8	9	1225KB	38	5	2	1	8	1	1	3	4	4
IBM System/370 Totals	864	1130	1469KB	32	295	265	319	809	162	59	401	326	442
IBM System/3 Model 6	5	5	16KB	64	2	3	0	5	1	1	1	0	1
IBM System/3 Model 8	10	11	27KB	16	3	7	0	10	0	0	2	0	2
IBM System/3 Model 10	31	32	26KB	56	10	20	1	29	1	0	2	1	9
IBM System/3 Model 12	21	22	54KB	19	1	19	1	21	3	0	1	0	4

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TABLE 6: DETAILED COMPUTER ACQUISITION AND APPLICATION DATA (Continued)

Manufacturer and Model	No. of User Replies	No. of Computers Represented	Average Main Memory Size, Words or Bytes	Average Length of Time in Use, Months	Method of Acquisition, % Purchase	Rental from Manufacturer	Third-Party Lease	Principal Applications, % Business Data Processing	Scientific/ Engineering	Real-Time Control	Data Communications	Data Base Management	Program Development
IBM System/3 Model 15	43	45	165KB	27	7	33	3	42	1	3	14	8	19
IBM System/3, unspecified	9	10	79KB	22	1	6	2	8	0	0	2	0	2
IBM System/3 Totals	119	125	85KB	19	24	88	7	115	6	4	22	9	37
IBM System/32	36	93	22KB	16	4	32	0	34	0	0	2	3	8
IBM 1130	14	15	16KW	102	9	4	1	9	8	1	5	1	5
IBM 1401	8	8	12KB	123	8	0	0	7	0	0	0	0	1
IBM 1800	8	14	26KW	91	7	1	0	3	2	7	1	0	1
IBM TOTALS	1291	1647	—	36	468	399	442	1189	219	85	478	389	591
Itel AS/4 and AS/5	2	2	2000KB	5	1	0	1	2	1	0	1	1	1
NCR Century 50 & 100	7	8	27KB	73	3	2	2	7	1	0	0	0	2
NCR Century 101	19	24	54KB	48	3	12	5	19	1	0	1	0	4
NCR Century 151	6	6	120KB	17	0	5	1	6	0	0	1	1	1
NCR Century 200	6	6	80KB	77	3	3	0	6	1	0	2	1	0
NCR Century 201	13	14	172KB	54	2	7	4	13	0	1	2	1	2
NCR Century 251	6	7	352KB	18	1	5	0	6	0	0	2	0	1
NCR Century 300	5	8	461KB	52	3	0	2	5	0	0	1	0	0
NCR Century Totals	30	35	238KB	50	9	15	6	30	1	1	7	2	3
NCR 8500 Series	8	8	347KB	4	0	7	1	8	0	0	2	2	4
NCR TOTALS	70	75	171KB	42	15	40	16	70	3	1	11	6	15
Univac Series 70	19	26	415KB	76	13	6	0	17	2	1	8	5	10
Univac 9200	3	3	11KB	61	2	1	0	2	0	0	0	0	0
Univac 9300	4	4	20KB	70	3	1	0	3	0	0	0	0	0
Univac 9400 & 9480	9	9	177KB	49	4	5	0	7	0	2	2	0	2
Univac 9000 Series Totals	16	16	107KB	57	9	7	0	12	0	2	2	0	2
Univac 90/30	15	16	218KB	15	2	12	1	13	4	0	4	3	8
Univac 90/60, 90/70, 90/80	8	8	768KB	15	2	4	2	8	4	0	4	2	5
Univac Series 90 Totals	23	24	409KB	15	4	16	3	21	8	0	8	5	13
Univac 1100/10	1	1	131KW	10	0	1	0	1	1	0	1	0	1
Univac 1100/42	2	2	358KW	—	0	1	1	2	1	1	2	2	2
Univac 1106	6	6	260KW	48	2	4	0	6	3	1	2	2	5
Univac 1108	9	11	267KW	42	3	5	0	5	5	0	6	5	7
Univac 1110	2	3	425KW	44	2	1	0	1	2	1	0	2	1
Univac 1100 Series Totals	20	23	283KW	42	7	12	1	15	12	3	11	11	16
UNIVAC TOTALS	78	89	—	39	33	41	4	65	22	6	29	21	41
Xerox Sigma Series	16	22	556KB	80	11	6	0	11	8	3	5	6	7
RECAP OF TOTALS BY MANUFACTURER													
Amdahl	7	7	3940KB	9	5	0	2	7	5	0	3	3	5
Burroughs	146	178	—	37	47	73	7	132	22	3	62	45	58
Control Data	23	26	119KW	84	9	11	4	13	18	0	7	7	16
Digital Equipment	27	28	254KW	36	20	0	6	21	15	1	10	11	18
Honeywell	130	179	—	48	61	46	23	120	28	6	47	33	59
IBM	1291	1647	—	36	468	399	442	1189	219	85	478	389	591
Itel	2	2	2000KB	5	1	0	1	2	1	0	1	1	1
NCR	70	75	171KB	42	15	40	16	70	3	1	11	6	15
Univac	78	89	—	39	33	41	4	65	22	6	29	21	41
Xerox	16	22	556KB	80	11	6	0	11	8	3	5	6	7
Totals for manufacturers other than IBM	499	606	—	58	380	217	63	441	122	20	175	133	220
GRAND TOTALS	1790	2253	—	38	670	616	505	1630	341	105	653	522	811

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TABLE 7: USERS' RATINGS

Manufacturer and Model	No. of User Replies	No. of Computers Represented	Ease of Operation	Reliability of Mainframe	Reliability of Peripherals	Responsiveness of Maintenance Service	Effectiveness of Maintenance Service	Technical Support	Operating Systems	Compilers and Assemblers	Applications Programs	Ease of Programming	Ease of Conversion	Overall Satisfaction
Amdahl 470V/6	7	7	3.3	3.6	3.0	3.6	3.4	3.0	3.0	3.0	3.0	2.8	3.7	3.4
Burroughs B 1700 Series	30	34	3.8	3.0	2.4	2.6	2.3	2.2	3.6	3.4	2.9	3.5	3.2	3.0
Burroughs B 2700 Series	21	22	3.8	3.2	2.4	2.7	2.6	2.1	3.9	3.5	2.4	3.5	3.2	3.2
Burroughs B 3500 Series	15	18	3.4	3.7	2.3	2.7	2.5	2.2	3.7	3.3	2.4	3.5	3.3	3.1
Burroughs B 3700 Series	19	22	3.7	3.2	2.4	2.6	2.1	2.2	3.7	3.7	2.5	3.5	2.9	2.9
Burroughs B 4700 Series	31	44	3.8	3.3	2.2	2.7	2.4	2.0	3.7	3.4	2.4	3.5	2.9	3.0
Burroughs B 5700 Series	3	4	4.0	2.3	2.3	2.3	1.7	1.3	4.0	3.3	2.7	3.3	2.7	2.7
Burroughs B 6700 Series	21	28	3.6	3.0	2.5	2.8	2.5	2.6	3.8	3.4	2.5	3.5	3.2	3.1
Burroughs B 7700 Series	2	2	4.0	3.5	2.5	3.0	3.0	3.0	4.0	4.0	3.5	4.0	4.0	4.0
Burroughs, others	4	4	3.5	3.8	2.5	3.3	3.3	2.5	3.7	3.5	1.0	3.3	3.0	3.0
BURROUGHS TOTALS	146	178	3.7	3.2	2.4	2.7	2.4	2.2	3.7	3.5	2.5	3.5	3.1	3.0
Control Data Cyber 70 & 170	5	6	3.6	3.2	2.8	3.8	3.3	2.6	2.8	3.2	3.0	3.2	3.0	3.6
Control Data 3000 Series	6	7	2.7	2.7	2.7	3.3	2.8	2.5	2.6	2.7	2.2	2.5	2.3	2.8
Control Data 6000 Series	10	11	3.0	3.0	2.7	3.0	3.0	2.7	3.1	3.2	2.8	2.8	2.7	3.1
Control Data 7600 Series	2	2	2.5	3.0	2.0	3.0	3.0	2.5	2.5	3.5	3.0	3.0	3.0	3.0
CONTROL DATA TOTALS	23	26	3.0	3.0	2.7	3.3	3.0	2.6	2.9	3.1	2.6	2.8	2.7	3.1
Digital Equip. DECsystem-10	22	23	3.6	3.3	2.9	3.1	3.1	2.4	3.5	3.2	2.4	3.6	3.4	3.3
Digital Equip. DECsystem-20	5	5	3.6	4.0	3.2	3.0	3.2	2.6	3.8	2.8	2.0	3.8	3.6	3.6
DIGITAL EQUIP. TOTALS	27	28	3.6	3.4	3.0	3.1	3.1	2.5	3.5	3.1	2.4	3.7	3.4	3.3
Honeywell Model 58	3	3	3.3	3.3	2.7	3.0	2.7	2.0	2.0	2.0	2.0	3.3	3.0	2.3
Honeywell Level 62	7	7	3.4	3.7	3.4	3.9	3.6	2.9	2.9	3.1	3.3	3.3	2.6	3.4
Honeywell Level 64	10	11	3.3	3.1	2.4	2.7	2.4	2.2	3.0	2.9	1.8	2.9	2.8	2.6
Honeywell Level 66	24	28	3.5	3.6	3.0	3.1	2.8	2.6	3.5	3.2	2.6	3.2	2.7	3.3
Honeywell Series 2000	29	30	3.1	3.1	3.0	2.8	2.7	2.3	2.9	2.9	2.5	3.0	2.8	2.9
Honeywell Series 6000	20	46	3.4	3.2	2.7	3.0	2.9	2.7	3.7	3.4	2.8	3.3	3.0	3.1
Honeywell Series 200	28	42	2.9	2.7	2.4	2.8	2.6	2.1	2.5	2.6	2.2	2.9	2.5	2.8
Honeywell Series 600	2	4	2.5	2.5	2.5	2.5	2.0	2.0	3.0	3.0	2.5	2.5	2.0	2.0
Honeywell G-400 Series	3	4	2.7	3.3	2.3	2.0	2.3	1.7	3.3	3.3	2.3	4.0	2.3	3.0
Honeywell, others	4	4	3.3	3.5	2.8	3.3	3.0	1.8	2.8	2.8	2.3	2.8	2.3	3.0
HONEYWELL TOTALS	130	179	3.2	3.2	2.7	2.9	2.7	2.4	3.0	3.0	2.9	3.1	2.7	2.9
IBM 360/20	5	5	3.2	3.4	3.2	3.4	3.4	3.0	3.4	3.4	2.8	3.2	3.2	3.4
IBM 360/30	59	64	3.1	3.4	3.1	3.3	3.1	2.7	3.0	3.1	2.9	3.1	2.9	3.1
IBM 360/40	60	65	3.2	3.4	3.0	3.1	2.9	2.6	3.0	3.0	2.7	2.9	2.8	3.1
IBM 360/44	3	3	2.7	3.0	3.0	3.3	2.7	2.5	3.0	3.0	2.0	3.0	2.0	3.5
IBM 360/50	53	55	3.1	2.8	2.9	3.0	2.9	2.6	2.9	3.0	2.6	2.9	2.8	2.8
IBM 360/65	46	51	3.3	3.2	2.8	3.2	2.9	2.9	3.3	3.2	2.6	3.0	2.9	3.1
IBM 360/67	5	6	3.0	2.6	3.5	3.4	3.6	2.8	2.8	2.8	1.5	3.0	2.5	3.0
IBM 360/75	2	2	2.5	3.5	2.0	4.0	3.5	2.0	3.0	3.5	3.5	3.0	2.5	3.0
IBM System/360, others	9	11	3.6	3.4	3.3	2.9	2.5	2.6	3.0	3.1	2.8	3.3	2.9	3.3
IBM System/360 Totals	242	262	3.2	3.2	3.0	3.2	3.0	2.7	3.0	3.1	2.7	3.0	2.8	3.0
IBM 370/115	36	37	3.4	3.7	3.4	3.4	3.2	2.8	2.8	3.0	2.7	3.4	2.7	3.1
IBM 370/125	51	55	3.2	3.7	3.5	3.3	3.3	3.0	2.9	3.1	2.9	3.0	3.0	3.2
IBM 370/135	118	259	3.2	3.7	3.3	3.3	3.2	3.0	2.9	3.1	2.8	3.0	2.8	3.1
IBM 370/138	59	61	3.2	3.7	3.2	3.2	3.1	3.0	2.9	3.1	2.8	3.0	3.0	3.1
IBM 370/145	181	199	3.3	3.5	3.2	3.3	3.2	3.0	2.9	3.1	2.7	2.9	2.8	3.1
IBM 370/148	49	49	3.2	3.6	3.3	3.4	3.3	3.1	2.9	3.1	2.7	3.0	2.9	3.1
IBM 370/155	56	72	3.3	3.5	3.1	3.3	3.2	2.8	2.9	3.1	2.7	2.9	2.7	3.1
IBM 370/158	224	266	3.3	3.6	3.3	3.4	3.2	3.0	3.1	3.1	2.8	3.0	2.8	3.2
IBM 370/165	15	20	3.3	3.4	2.9	3.1	3.1	2.9	2.9	3.3	2.9	3.2	3.0	3.1
IBM 370/168	67	103	3.2	3.3	3.2	3.4	3.1	3.1	3.0	3.2	2.8	3.0	2.8	3.1
IBM System/370, unspecified	8	9	3.3	3.8	3.4	3.6	3.4	3.4	2.6	2.8	3.1	3.1	2.6	3.4
IBM System/370 Totals	864	1130	3.3	3.6	3.3	3.3	3.2	3.0	3.0	3.1	2.8	3.0	2.8	3.1
IBM System/3 Model 6	5	5	3.6	3.6	3.6	3.6	3.8	3.4	3.2	3.4	3.3	3.4	3.5	3.4
IBM System/3 Model 8	10	11	3.3	3.8	3.6	3.2	3.2	2.9	3.3	3.2	2.7	3.2	2.8	3.5
IBM System/3 Model 10	31	32	3.4	3.7	3.4	3.5	3.4	2.9	3.4	3.4	2.7	3.4	2.9	3.3
IBM System/3 Model 12	21	22	3.7	4.0	3.5	3.4	3.5	3.0	3.2	3.2	3.0	3.5	3.5	3.4

*Basis is 4 for each user rating of Excellent, 3 for Good, 2 for Fair, and 1 for Poor.

User Ratings of General-Purpose Computer Systems

TABLE 7: USERS' RATINGS (Continued)

Manufacturer and Model	No. of User Replies	No. of Computers Represented	Ease of Operation	Reliability of Mainframe	Reliability of Peripherals	Responsiveness of Maintenance Service	Effectiveness of Maintenance Service	Technical Support	Operating Systems	Compilers and Assemblers	Applications Programs	Ease of Programming	Ease of Conversion	Overall Satisfaction
IBM System/3 Model 15	43	45	3.4	3.7	3.4	3.4	3.4	3.0	3.1	3.2	2.8	3.3	3.1	3.2
IBM System/3, unspecified	9	10	3.4	3.7	3.4	3.2	3.0	2.7	3.2	3.1	2.4	3.4	2.8	3.1
IBM System/3 Totals	119	125	3.5	3.8	3.4	3.4	3.4	3.0	3.2	3.2	2.8	3.4	3.1	3.3
IBM System/32	36	93	3.6	3.8	3.6	3.6	3.5	3.1	3.3	3.2	2.7	3.3	3.1	3.3
IBM 1130	14	15	3.1	3.7	3.0	3.4	2.9	2.3	2.5	2.5	2.4	2.8	2.4	3.0
IBM 1401	8	8	2.9	2.9	2.3	2.9	2.4	2.7	3.0	3.7	4.0	2.3	1.6	2.6
IBM 1800	8	14	2.9	3.8	2.9	3.0	3.3	2.6	3.4	3.1	3.2	2.9	2.3	3.3
IBM TOTALS	1291	1647	3.3	3.5	3.2	3.3	3.2	2.9	3.0	3.1	2.8	3.0	2.8	3.1
Itel AS/4 and AS/5	2	2	4.0	4.0	3.0	3.5	4.0	3.0	3.0	3.0	3.0	3.0	—	3.5
NCR Century 50 & 100	7	8	3.1	2.4	2.6	3.4	2.7	2.1	2.9	2.6	2.5	2.9	2.7	2.7
NCR Century 101	19	24	3.4	3.6	2.8	3.3	2.9	2.2	3.2	3.1	2.9	3.3	3.3	3.2
NCR Century 151	6	6	3.2	3.2	2.7	3.2	2.7	2.7	3.0	3.0	2.4	3.0	3.2	3.0
NCR Century 200	6	6	2.7	3.2	2.5	3.0	3.0	1.3	2.3	2.5	1.8	3.2	3.0	2.8
NCR Century 201	13	14	3.3	3.8	3.1	3.4	2.6	2.2	3.5	3.3	3.4	3.4	3.4	3.2
NCR Century 251	6	7	3.3	3.5	3.0	3.8	3.3	2.7	3.0	3.0	2.3	3.0	3.0	2.8
NCR Century 300	5	8	3.3	3.0	2.4	2.8	2.6	2.2	2.8	2.6	3.0	2.8	2.2	2.8
NCR Century Totals	30	35	3.2	3.4	2.8	3.3	2.8	2.1	3.0	3.0	2.8	3.2	3.0	3.0
NCR 8500 Series	8	8	3.4	3.6	3.3	3.6	3.1	3.1	3.1	3.1	3.1	3.5	3.6	3.2
NCR TOTALS	70	75	3.3	3.4	2.8	3.3	2.9	2.3	3.1	3.0	2.8	3.2	3.2	3.1
Univac Series 70	19	26	3.2	3.4	2.8	3.2	3.2	2.7	3.3	3.2	2.7	3.1	2.8	3.1
Univac 9200	3	3	3.3	3.3	2.5	2.3	2.3	2.3	—	2.5	—	3.5	—	3.0
Univac 9300	4	4	3.3	3.5	2.8	3.5	3.5	3.3	3.0	2.5	3.0	3.3	3.0	3.3
Univac 9400 & 9480	9	9	3.1	3.1	2.9	3.2	2.7	2.3	3.1	3.0	2.1	3.0	2.9	2.8
Univac 9000 Series Totals	16	16	3.2	3.3	2.8	3.1	2.8	2.6	3.1	2.8	2.2	3.1	2.9	2.9
Univac 90/30	15	16	3.3	3.3	2.9	3.3	3.1	2.7	3.5	3.4	3.0	3.3	3.1	3.3
Univac 90/60, 90/70, 90/80	8	8	3.4	3.4	3.1	3.4	3.4	2.7	3.4	3.5	3.3	3.4	3.3	3.3
Univac Series 90 Totals	23	24	3.3	3.3	3.0	3.3	3.2	2.7	3.5	3.4	3.1	3.3	3.2	3.3
Univac 1100/10	1	1	3.0	3.0	3.0	4.0	3.0	—	3.0	3.0	2.0	3.0	3.0	3.0
Univac 1100/42	2	2	3.2	3.2	3.2	4.0	3.0	2.5	3.0	3.0	4.0	2.0	2.0	3.0
Univac 1106	6	6	3.7	3.2	3.5	3.0	2.8	3.0	3.5	3.5	3.5	3.5	2.7	3.2
Univac 1108	9	11	2.8	2.7	2.7	2.9	2.9	2.1	3.1	3.1	2.5	3.1	2.6	2.7
Univac 1110	2	3	4.0	4.0	3.5	4.0	4.0	4.0	4.0	4.0	3.0	4.0	3.0	4.0
Univac 1100 Series Totals	20	23	3.3	3.1	3.1	3.2	3.0	2.7	3.3	3.2	2.9	3.2	2.6	3.0
UNIVAC TOTALS	78	89	3.3	3.2	2.9	3.2	3.1	2.7	3.3	3.2	2.8	3.2	2.9	3.1
Xerox Sigma Series	16	22	3.7	3.6	2.8	2.9	2.9	2.4	3.7	3.3	2.4	3.2	3.0	3.5
RECAP OF TOTALS BY MANUFACTURER														
Amdahl	7	7	3.3	3.6	3.0	3.6	3.4	3.0	3.0	3.0	3.0	2.8	3.7	3.4
Burroughs	146	178	3.7	3.2	2.4	2.7	2.4	2.2	3.7	3.5	2.5	3.5	3.1	3.0
Control Data	23	26	3.0	3.0	2.7	3.3	3.0	2.6	2.9	3.1	2.6	2.8	2.7	3.1
Digital Equipment	27	28	3.6	3.4	3.0	3.1	3.1	2.5	3.5	3.1	2.4	3.7	3.4	3.3
Honeywell	130	179	3.2	3.2	2.7	2.9	2.7	2.4	3.0	3.0	2.9	3.1	2.7	2.9
IBM	1291	1647	3.3	3.5	3.2	3.3	3.2	2.9	3.0	3.1	2.8	3.0	2.8	3.1
Itel	2	2	4.0	4.0	3.0	3.5	4.0	3.0	3.0	3.0	3.0	3.0	—	3.5
NCR	70	75	3.3	3.4	2.8	3.3	2.9	2.3	3.1	3.0	2.8	3.2	3.2	3.1
Univac	78	89	3.3	3.2	2.9	3.2	3.1	2.7	3.3	3.2	2.8	3.2	2.9	3.1
Xerox	16	22	3.7	3.6	2.8	2.9	2.9	2.4	3.7	3.3	2.4	3.2	3.0	3.5
Totals for manufacturers other than IBM	499	606	3.4	3.3	2.7	3.0	2.8	2.4	3.3	3.2	2.7	3.3	3.0	3.1
GRAND TOTALS	1790	2253	3.3	3.4	3.1	3.2	3.1	2.8	3.1	3.1	2.8	3.1	2.9	3.1

*Basis is 4 for each user rating of Excellent, 3 for Good, 2 for Fair, and 1 for Poor.

User Ratings of
General-Purpose Computer Systems

TABLE 8: MANUFACTURERS' RANKINGS ACCORDING TO
WEIGHTED AVERAGE USER RATINGS

	Amdahl	Burroughs	Control Data	Digital Equipment	Honeywell	IBM	Itel	NCR	Univac	Xerox
Ease of operation	4*	2*	6	3	5	4*	1*	4*	4*	2*
Reliability of mainframe	2*	5*	6	4*	5*	3	1	4*	5*	2*
Reliability of peripherals	2*	4	3*	2*	3*	1	2*	4*	3	4*
Responsiveness of maintenance service	1	7	3*	5	6*	3*	2	3*	4	6*
Effectiveness of maintenance service	2	8	5	4*	7	3	1	6*	4*	6*
Technical support	1*	8	4	5	6*	2	1*	7	3	6*
Operating systems	5*	1*	6	2	5*	5*	5*	4	3	1*
Compilers and assemblers	5*	1	4*	4*	5*	4*	5*	5*	3	2
Applications programs	1*	5	4	6*	2	3*	1*	3*	3*	6*
Ease of programming	6*	2	6*	1	4	5*	5*	3*	3*	3*
Ease of conversion	1	4	8*	2	8*	7	—	3	6	5
Overall satisfaction	2	5	4*	3	6	4*	1*	4*	4*	1*

*Tie

▷ The Accolades for 1977

The relative rankings of the 10 mainframe manufacturers in all 12 rating categories, as determined by the weighted average user ratings, are listed in Table 8 to help you pinpoint the relative strengths and weaknesses of the various manufacturers as judged by their own users. Please keep in mind that these rankings are necessarily based on widely varying sample sizes, ranging from 1,291 user responses for IBM down to two responses for Itel.

Although only two Itel users responded, they were so well pleased with the products and services of this newcomer to the mainframe field that Itel ranked first in three of our 12 rating categories and tied for first place in three others. While the very small sample size makes it unwise to attach undue significance to Itel's strong showing, it certainly augurs well for the firm's future in the mainframe business.

In the "bottom line" category of Overall Satisfaction, Xerox and Itel tied for first place with weighted average user ratings of 3.5, while Amdahl followed closely with 3.4. It struck us as ironic that the three firms which appear to be doing the best jobs of satisfying their users include one that has withdrawn from the mainframe marketplace (Xerox) and two that have only recently entered it. Among the established mainframe manufacturers, Digital Equipment Corporation was the only one that earned an Overall Satisfaction rating above the industry average of 3.1.

Burroughs won the software laurels with first place in Compilers and Assemblers and a tie for first (with Xerox) in Operating Systems. The Operating Systems from DEC and Univac were also rated well above average.

Since IBM computer systems comprised some 73 percent of the total computer systems represented in our survey this year, their users' responses naturally had a strong effect on the overall ratings for all computer systems. In order to see how all the non-IBM computer systems stacked up against the manufacturer that controls the largest section of the general-purpose computer market, we calculated a set of weighted averages that exclude the IBM users' responses (the second last line in Table 7). Non-IBM systems were collectively rated higher than IBM systems in the following five categories: Ease of Operation, Operating Systems, Compilers and Assemblers, Ease of Programming, and Ease of Conversion. This year's results indicate improvement in the users' opinions of IBM's Responsiveness of Maintenance Service and Technical Support, since these two categories were also rated higher for the non-IBM systems in last year's survey. In terms of overall satisfaction, the non-IBM computers' 3.1 average rating matched IBM's, as it did in the 1976 survey.

Just what constitutes overall user satisfaction is a subject we haven't explored, but factors such as attractive price/performance, sophisticated software, industry expertise, and specialized computing facilities are often cited as reasons for selecting a given computer system and staying with it.

Thank You

Datapro wishes to thank all of our subscribers for responding so enthusiastically to our fourth major survey of user experience with general-purpose computer systems. Without your participation, it could not have been a success, and we hope that this compendium of the opinions of your colleagues will be of significant value to you. We look forward to hearing from you again next year.□