

RW 12/77

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 1976 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 on 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 (in this case, DATAPRO 70 subscribers) 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 1976. By August 1, when the monumental task of tabulating the returned questionnaires was begun, a total of 1,765 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 1976 survey summarizes the ratings supplied in 1,765 responses evaluating a total of 2,095 computer systems.

Important systems represented in the 1976 survey for the first time include the Amdahl 470V/6, the DECsystem-20, and the Univac 90/30. A particularly interesting aspect of this year's survey was the fact that six responses were received from users of the large-scale Amdahl 470V/6 system. At the time the survey forms were mailed there were only 15 Amdahl systems in use at customer sites. Thus, the six responses represented 40 percent of the systems then in use—a very significant sample for a survey of this kind.

In addition to the 1,765 responses tabulated in this report, Datapro's 1976 computer survey also attracted responses from 758 users of minicomputers and small business computers with a total of 1,738 installed

This report conveys the results of Datapro's 1976 survey of general-purpose computer users. Extensive tables summarize the experience of 1,765 users with a total of 2,095 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.

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 1976

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 far exceed 100 percent, indicating that most of the computer systems represented in the survey perform a variety of

TABLE 1: METHOD OF ACQUISITION

Manufacturer	Purchase	Rental from Manufacturer	Third-Party Lease
Amdahl	80%	—	20%
Burrroughs	35%	63%	5%
Control Data	44%	44%	16%
DEC	86%	9%	18%
Honeywell	42%	47%	15%
IBM	34%	39%	29%
NCR	27%	68%	3%
Univac	48%	50%	4%
Xerox	71%	41%	6%
Totals	37%	42%	23%

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TABLE 2: PRINCIPAL APPLICATIONS

Manufacturer	Business Data Processing	Scientific and Engineering	Real-Time Control	Data Commu- cations	Data Base Management	Others
Amdahl	83%	50%	0%	50%	50%	33%
Burroughs	93%	12%	4%	46%	27%	11%
Control Data	51%	70%	9%	37%	21%	23%
DEC	64%	73%	27%	50%	32%	36%
Honeywell	96%	13%	3%	32%	19%	9%
IBM	90%	17%	5%	39%	24%	9%
NCR	90%	2%	2%	20%	3%	10%
Univac	89%	23%	7%	35%	27%	10%
Xerox	71%	53%	24%	35%	35%	12%
Totals	89%	19%	6%	38%	24%	10%

functions. Not surprisingly, with the exception of the computers made by Control Data and Digital Equipment Corporation, the emphasis is still heavily in the area of business data processing. The next highest activity is represented by data communications, with data base management ranking third. The high percentages in the "Others" category for Control Data and Digital Equipment are comprised mainly of entries for instruction, research, and administration in educational institutions.

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. Responses in the "Other Devices" category included printers, 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 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 the 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 18 percent of the computers represented in this survey, with an average of 59 months of service. Other systems with notable longevity include the IBM 1130, with an average of 90 months, or over 7 years, of use, and 10 IBM 1401 systems that have been in use for nearly a decade. The overall average number of months in use for all systems was 38 months, or just over three years.

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 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

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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%	17%	17%	67%	50%
Burroughs	96%	12%	25%	34%	15%
Control Data	100%	30%	26%	42%	19%
DEC	109%	14%	23%	41%	23%
Honeywell	98%	15%	18%	18%	17%
IBM	99%	11%	22%	44%	21%
NCR	82%	28%	52%	13%	13%
Univac	100%	20%	14%	18%	20%
Xerox	100%	6%	35%	35%	24%
Totals	98%	17%	26%	35%	22%

▷ 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 1976 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 scored 3.0 or better 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.

The highest level of satisfaction was achieved in the category of Ease of Operation. Two other categories in which relatively high ratings were achieved were

Reliability of Mainframe and Responsiveness of Maintenance Service, categories which also scored well in 1975.

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 both in 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 support was 3.3, and that score was achieved by Amdahl Corporation, a newcomer 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, where none of the vendors earned a "Good" average user rating of 3.0 or better, and the Reliability of Peripherals category, in which only Digital Equipment, IBM, and Amdahl (which doesn't make peripheral equipment) scored 3.0 or better. ▷

TABLE 4: REMOTE TERMINAL USAGE

Manufacturer	Remote Batch Terminals	Interactive Terminals
Amdahl	83%	100%
Burroughs	21%	58%
Control Data	74%	67%
DEC	54%	91%
Honeywell	21%	38%
IBM	38%	50%
NCR	18%	38%
Univac	30%	40%
Xerox	29%	71%
Total	39%	61%

TABLE 5: USAGE OF "FOREIGN" PERIPHERALS*

Mainframe Manufacturer	Disk Drives	Magnetic Tape Drives	Add-On Main Memory	Other Devices
Amdahl	100%	83%	17%	50%
Burroughs	21%	20%	0%	7%
Control Data	28%	23%	14%	12%
DEC	36%	27%	18%	36%
Honeywell	26%	25%	1%	5%
IBM	43%	35%	29%	14%
NCR	22%	17%	7%	3%
Univac	27%	27%	5%	3%
Xerox	59%	53%	18%	12%
Totals	40%	34%	12%	16%

*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	Other Applications
Amdahl 470V/6	6	6	3723KB	7	4	0	1	5	3	0	3	3	2
Burroughs B 300 & B 500	5	11	15KB	57	2	3	0	5	0	0	0	0	1
Burroughs B 1700	27	27	78KB	15	10	16	1	26	0	0	4	1	4
Burroughs B 2700	19	19	174KB	27	5	15	0	18	0	0	13	7	3
Burroughs B 3500	12	17	188KB	26	8	5	0	12	2	1	6	2	2
Burroughs B 3700	18	20	229KB	23	3	14	2	17	0	0	9	5	1
Burroughs B 4700	23	27	276KB	17	7	13	3	22	1	2	12	8	1
Burroughs B 5500 & B 5700	5	7	32KW	62	5	0	0	4	5	0	3	0	0
Burroughs B 6700	18	22	316KW	24	5	15	1	15	8	2	12	11	1
Burroughs, others	3	6	-	-	1	1	0	2	0	0	1	1	1
BURROUGHS TOTALS	130	156	-	31	46	82	7	121	16	5	60	35	14
Control Data 3000 Series	14	36	125KW	27	5	7	2	10	7	2	1	4	14
Control Data 6000 Series	17	20	108KW	47	8	6	4	8	14	2	7	5	4
Control Data Cyber Series	8	11	95KW	20	2	5	1	3	7	0	1	2	1
Control Data 7600	2	3	48KW	-	2	1	0	1	2	0	1	1	0
Control Data, others	2	2	-	-	2	0	0	0	0	0	1	0	1
CONTROL DATA TOTALS	43	72	94KW	31	19	19	7	22	30	4	16	9	10
Digital Equip. DECsystem-10	20	24	155KW	30	17	2	4	12	14	5	10	5	8
Digital Equip. DECsystem-20	2	2	128KW	3	2	0	0	2	2	1	1	2	0
DIGITAL EQUIP. TOTALS	22	26	142KW	17	19	2	4	14	16	6	11	7	8
Honeywell Series 200	32	37	106KB	47	17	10	7	32	0	0	8	1	3
Honeywell Series 2000	37	40	97KB	31	8	23	4	35	1	0	6	3	3
Honeywell Series 60	18	20	215KW	10	2	13	4	16	3	1	8	6	1
Honeywell Series 600	4	4	185KW	44	3	1	2	4	1	0	2	2	0
Honeywell Series 6000	15	22	272KW	21	8	7	1	15	6	2	10	8	4
Honeywell G-400 Series	7	9	40KW	64	7	0	0	6	3	1	2	2	0
Honeywell, others	4	6	11KW	100	4	1	0	4	1	0	1	0	0
HONEYWELL TOTALS	117	138	-	45	49	55	18	112	15	4	37	22	11
IBM 360/20	12	14	12KB	75	3	7	2	11	0	0	0	0	2
IBM 360/22	3	3	54KB	58	0	3	0	0	0	0	0	0	2
IBM 360/30	81	100	79KB	61	33	6	42	74	6	2	3	7	9
IBM 360/40	87	106	224KB	35	35	4	40	83	4	3	21	11	6
IBM 360/50	73	78	517KB	38	31	3	39	63	16	3	17	12	6
IBM 360/65	51	64	1252KB	43	19	4	30	42	15	4	21	16	8
IBM 360/67	3	3	802KB	20	2	0	1	2	1	0	1	0	0
IBM 360/75	6	7	1840KB	88	5	0	2	4	6	0	4	3	0
IBM 360/91	3	3	2699KB	92	2	0	0	0	2	0	2	1	1
IBM System/360, others	5	5	42KB	81	0	1	4	4	1	0	0	0	1
IBM System/360 Totals	324	383	396KB	59	130	28	160	283	51	12	69	51	35
IBM 370/115	35	36	144KB	14	1	32	2	34	5	0	9	5	3
IBM 370/125	57	58	207KB	22	10	42	2	53	5	2	17	13	5
IBM 370/135	142	153	289KB	30	31	85	31	120	20	10	69	37	9
IBM 370/145	214	242	517KB	30	78	91	52	208	25	12	99	57	14
IBM 370/155	62	78	1341KB	39	32	7	23	53	19	4	36	26	5
IBM 370/158	173	236	2079KB	17	71	48	63	163	41	11	112	66	11
IBM 370/165	21	24	2419KB	32	9	3	7	17	7	3	11	7	1
IBM 370/168	59	80	2773KB	18	26	17	21	56	23	8	39	32	4
IBM System/370, others	4	5	942KB	35	1	1	2	4	0	0	3	2	0
IBM System/370 Totals	767	912	995KB	26	259	356	203	708	145	50	395	245	52

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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, %			Principal Applications, %					
					Purchase	Rental from Manufacturer	Third-Party Lease	Business Data Processing	Scientific/Engineering	Real-Time Control	Data Communications	Data Base Management	Other Applications
IBM System/3	96	109	46KB	25	13	82	0	93	5	1	20	5	5
IBM System/32	28	48	12KB	7	1	26	0	27	1	0	5	3	2
IBM 1130	19	19	11KB	90	6	11	1	10	9	0	3	1	7
IBM 1401	9	10	12KB	114	8	1	0	9	0	0	0	1	1
IBM 1800	8	11	41KB	72	4	4	1	1	2	4	1	0	4
IBM, others	6	7	40KB	160	6	0	0	4	1	0	0	1	1
IBM TOTALS	1257	1449	194KB	69	427	488	365	1135	214	67	493	307	107
NCR Century 50 & 100	6	6	27KB	44	3	3	0	6	0	0	0	0	0
NCR Century 101	15	21	27KB	31	1	14	0	14	0	0	0	0	2
NCR Century 151	5	5	102KB	3	0	4	1	5	1	0	3	0	0
NCR Century 200	10	10	53KB	47	4	6	0	8	0	1	1	1	1
NCR Century 201	11	12	141KB	33	3	8	0	11	0	0	5	1	0
NCR Century 251	8	9	284KB	13	2	5	1	6	0	0	3	0	2
NCR Century 300	3	4	512KB	21	2	1	0	3	0	0	0	0	1
NCR Century Totals	58	67	164KB	27	15	41	2	53	1	1	12	2	6
NCR 315	2	4	119KB	40	1	0	0	1	0	0	0	0	0
NCR TOTALS	60	71	158KB	29	16	41	2	54	1	1	12	2	6
Univac Series 70 (ex-RCA)	22	32	402KB	74	14	8	0	20	5	1	8	7	3
Univac 9200	5	5	18KB	68	2	3	0	4	0	0	0	0	1
Univac 9300	11	11	27KB	52	4	5	1	10	0	0	2	0	1
Univac 9400 & 9480	12	13	167KB	33	5	6	2	12	0	1	6	3	1
Univac 9000 Series Totals	50	61	154KB	57	25	22	3	46	5	2	16	10	6
Univac 90/30	9	9	101KB	7	2	6	1	9	2	0	1	0	0
Univac 90/60 & 90/70	8	10	427KB	19	2	6	0	8	0	1	4	2	0
Univac Series 90 Totals	17	19	264KB	13	4	12	1	17	2	1	5	2	0
Univac 1106	9	10	232KW	34	2	6	0	8	5	0	5	4	0
Univac 1108	3	3	292KW	86	1	1	0	1	2	1	0	1	0
Univac 1110	4	7	379KW	18	2	4	0	4	5	2	2	4	2
Univac 1100 Series Totals	16	20	301KW	46	5	11	0	13	12	3	7	9	2
Univac, others	8	14	122KW	83	6	3	0	5	2	1	4	3	0
UNIVAC TOTALS	113	146	—	55	54	56	4	101	26	8	40	31	11
Xerox Sigma Series	17	31	114KW	55	12	7	1	12	9	4	6	6	2
RECAP OF TOTALS BY MANUFACTURER													
Amdahl	6	6	3723KB	7	4	0	1	5	3	0	3	3	2
Burroughs	130	156	—	31	46	82	7	121	16	5	60	35	14
Control Data	43	72	94KW	31	19	19	7	22	30	4	16	9	10
Digital Equipment	22	26	142KW	17	19	2	4	14	16	6	11	7	8
Honeywell	117	138	—	45	49	55	18	112	15	4	37	22	11
IBM	1257	1449	194KB	69	427	488	365	1135	214	67	493	307	107
NCR	60	71	158KB	29	16	41	2	54	1	1	12	2	6
Univac	113	146	—	55	54	56	4	101	26	8	40	31	11
Xerox	17	31	114KW	55	12	7	1	12	9	4	6	6	2
Totals for manufacturers other than IBM	508	646	—	34	219	262	44	441	116	32	185	115	64
GRAND TOTALS	1765	2095	—	38	646	750	409	1576	330	99	678	422	171

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TABLE 7: USERS' RATINGS

Manufacturer and Model	No. of User Replies	No. of Computers Represented	Weighted Average User Ratings*												
			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	6	6	3.8	3.2	3.0	3.8	3.7	3.3	2.6	2.6	-	3.2	3.4	3.2	
Burroughs B 300 & B 500	5	11	3.8	3.6	2.6	2.8	2.8	1.8	3.0	2.8	1.5	3.8	3.0	2.8	
Burroughs B 1700	27	27	3.7	2.9	2.5	2.9	2.4	2.2	3.4	3.3	2.4	3.4	3.1	2.9	
Burroughs B 2700	19	19	3.7	3.3	2.5	2.8	2.8	2.2	3.9	3.4	2.6	3.6	3.2	3.3	
Burroughs B 3500	12	17	3.8	3.6	2.1	2.8	2.3	2.4	3.8	3.3	2.8	3.7	3.0	3.1	
Burroughs B 3700	18	20	3.8	3.5	2.4	2.8	2.7	2.7	3.8	3.3	2.8	3.4	3.3	3.2	
Burroughs B 4700	23	27	3.7	3.7	2.6	2.9	2.7	2.2	4.0	3.5	2.3	3.6	3.1	3.2	
Burroughs B 5500 & B 5700	5	7	3.8	2.8	2.4	3.0	2.8	2.0	3.6	3.0	2.6	3.4	3.0	3.0	
Burroughs B 6700	18	22	3.8	3.1	2.5	3.3	2.6	2.4	3.8	3.8	2.7	3.5	3.3	3.2	
Burroughs, others	3	6	2.7	3.5	2.7	3.0	2.5	3.0	3.0	2.5	3.0	3.5	2.0	2.3	
BURROUGHS TOTAL	130	156	3.6	3.0	2.5	2.9	2.6	2.3	3.6	3.2	2.5	3.5	3.0	3.0	
Control Data 3000 Series	14	36	3.3	2.4	2.6	3.5	2.9	2.9	3.1	3.0	2.8	2.9	2.5	2.7	
Control Data 6000 Series	17	20	3.5	3.1	2.4	3.1	2.9	2.2	2.8	2.6	2.6	3.1	2.5	2.9	
Control Data Cyber Series	8	11	3.5	3.4	2.9	3.5	3.4	2.9	3.1	3.1	3.0	2.8	2.9	3.4	
Control Data 7600	2	3	4.0	2.5	2.5	3.5	3.5	3.0	3.0	3.0	3.0	3.5	3.0	3.5	
Control Data, others	2	2	2.5	2.5	2.5	3.5	3.5	3.0	-	3.0	-	1.5	-	2.5	
CONTROL DATA TOTALS	43	72	3.4	2.8	2.6	3.4	3.2	2.8	3.0	2.9	2.9	2.8	2.7	3.0	
Digital Equip. DECsystem-10	20	24	3.7	3.5	3.0	3.0	3.0	2.6	3.6	3.1	2.4	3.7	3.3	3.4	
Digital Equip. DECsystem-20	2	2	4.0	4.0	4.0	4.0	3.5	3.5	3.5	3.5	-	4.0	4.0	4.0	
DIGITAL EQUIP. TOTALS	22	26	3.9	3.8	3.5	3.5	3.3	3.1	3.6	3.3	2.4	3.9	3.7	3.7	
Honeywell Series 200	32	37	3.1	3.2	2.9	2.8	2.7	2.3	2.8	3.5	2.3	3.0	2.7	2.8	
Honeywell Series 2000	37	40	3.3	3.5	3.0	3.0	3.0	2.9	2.9	2.9	2.4	3.1	3.0	3.0	
Honeywell Series 60	18	20	3.3	3.4	3.1	3.3	2.9	2.8	3.6	3.4	2.3	3.3	3.1	3.3	
Honeywell Series 600	4	4	3.3	2.5	2.0	2.5	2.3	2.0	3.0	2.8	2.5	2.8	2.3	2.5	
Honeywell Series 6000	15	22	3.6	3.8	3.2	3.3	3.1	2.9	3.8	3.6	2.8	3.4	3.1	3.5	
Honeywell G-400 Series	7	9	2.9	3.4	2.9	2.9	2.6	2.2	2.7	2.6	2.8	2.6	2.2	2.7	
Honeywell, others	4	6	2.5	3.3	2.3	3.3	3.3	2.0	2.3	2.3	2.7	2.8	2.0	2.5	
HONEYWELL TOTALS	117	138	3.1	3.3	2.8	3.0	2.8	2.7	3.0	3.0	2.5	3.0	2.6	2.9	
IBM 360/20	12	14	2.8	3.5	3.0	3.4	3.1	2.7	3.0	3.5	3.5	3.1	2.9	3.1	
IBM 360/22	3	3	3.7	3.7	3.0	2.7	3.3	3.0	3.7	3.3	3.3	3.7	3.0	3.3	
IBM 360/30	81	100	3.2	3.4	3.0	3.2	3.1	2.5	3.0	3.0	2.7	3.0	2.7	3.0	
IBM 360/40	87	106	3.3	3.5	3.1	3.2	3.1	2.5	2.9	3.1	2.5	3.1	2.8	3.1	
IBM 360/50	73	78	3.3	2.8	2.9	3.2	3.0	2.5	2.8	3.0	2.7	3.1	2.8	3.0	
IBM 360/65	51	64	3.3	3.2	3.0	3.2	3.0	2.7	2.9	2.9	2.5	3.1	2.7	3.1	
IBM 360/67	3	3	3.7	4.0	3.0	3.7	3.7	2.7	3.3	3.7	3.5	3.3	3.7	3.3	
IBM 360/75	6	7	3.3	3.1	2.9	3.4	2.9	3.0	3.0	3.3	3.0	3.3	2.8	3.0	
IBM 360/91	3	3	3.0	3.0	3.0	2.7	2.5	2.7	2.3	3.3	3.0	2.3	2.0	2.7	
IBM System/360, others	5	5	3.6	3.6	3.2	3.2	3.0	2.6	3.4	3.4	3.0	3.2	2.8	3.2	
IBM System/360 Totals	324	383	3.2	3.3	3.0	3.2	3.1	2.6	2.9	3.1	2.7	3.1	2.8	3.0	
IBM 370/115	35	36	3.4	3.7	3.4	3.4	3.3	3.1	3.0	3.3	2.8	3.2	3.0	3.3	
IBM 370/125	57	58	3.5	3.6	3.3	3.1	3.2	3.0	3.1	3.3	3.0	3.2	3.0	3.2	
IBM 370/135	142	153	3.3	3.7	3.4	3.3	3.2	2.9	2.9	3.1	2.7	3.0	2.9	3.2	
IBM 370/145	214	242	3.3	3.6	3.3	3.3	3.2	2.9	2.4	3.0	2.7	3.0	2.8	3.1	
IBM 370/155	62	78	3.2	3.3	3.1	3.3	3.1	3.0	3.0	3.1	2.7	3.0	2.9	3.1	
IBM 370/158	173	236	3.3	3.6	3.2	3.4	3.3	3.0	3.0	3.1	2.7	3.0	2.7	3.1	
IBM 370/165	21	24	2.9	3.2	2.9	2.9	2.8	2.7	2.6	3.0	2.7	2.8	2.4	2.9	
IBM 370/168	59	80	3.3	3.4	3.2	3.3	3.2	3.1	2.8	3.0	2.9	3.1	2.8	3.1	
IBM System/370, others	4	5	3.5	3.8	2.8	3.5	3.0	3.0	2.8	3.3	2.7	3.0	2.5	3.5	
IBM System/370 Totals	767	912	3.3	3.6	3.3	3.3	3.2	3.0	2.9	3.1	2.7	3.0	2.8	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 7: USERS' RATINGS (Continued)

Manufacturer and Model	No. of User Replies	No. of Computers Represented	Weighted Average User Ratings*											
			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	96	109	3.5	3.8	3.4	3.6	3.4	3.0	3.3	3.3	2.8	3.3	3.2	3.3
IBM System/32	28	48	3.7	3.8	3.5	3.5	3.5	2.6	3.2	3.1	2.7	3.3	3.1	3.2
IBM 1130	19	19	3.5	3.7	3.3	3.2	3.2	2.5	3.1	2.9	2.8	3.0	2.7	3.2
IBM 1401	9	10	3.1	3.3	2.5	3.0	2.7	2.5	2.6	2.8	2.6	2.4	2.9	2.8
IBM 1800	8	11	3.1	3.3	3.1	3.5	3.1	2.3	3.5	2.9	2.2	2.8	2.2	3.1
IBM, others	6	7	3.3	3.0	2.7	3.2	3.2	1.7	2.5	2.7	2.7	2.6	1.0	3.0
IBM TOTALS	1257	1449	3.3	3.5	3.1	3.3	3.3	2.5	3.0	3.0	2.7	2.9	2.6	3.1
NCR Century 50 & 100	6	6	3.5	3.5	3.2	3.3	3.2	2.5	3.3	3.3	2.7	3.2	2.8	3.3
NCR Century 101	15	21	3.5	3.8	3.1	3.3	3.1	2.4	3.3	3.2	2.5	3.2	3.3	3.3
NCR Century 151	5	5	3.6	3.6	3.0	3.8	3.3	2.2	3.0	3.0	2.8	3.4	3.6	3.0
NCR Century 200	10	10	3.3	3.5	2.9	3.3	2.8	2.1	3.0	3.0	2.5	3.1	3.1	3.1
NCR Century 201	11	12	3.4	3.6	2.9	3.3	3.0	2.5	3.3	3.1	3.4	3.8	3.7	3.3
NCR Century 251	8	9	3.1	3.3	3.0	3.4	3.4	3.2	3.5	3.1	2.6	3.1	3.2	3.1
NCR Century 300	3	4	2.3	2.0	1.7	2.7	2.0	1.7	2.7	2.0	2.7	2.0	3.3	2.0
NCR Century Totals	58	67	3.2	3.3	2.8	3.3	3.0	2.4	3.2	3.0	2.7	3.1	3.3	3.0
NCR 315	2	4	4.0	3.5	3.0	4.0	4.0	2.5	3.5	3.0	2.5	2.5	2.0	2.5
NCR TOTALS	60	71	3.6	3.4	2.9	3.7	3.5	2.5	3.4	3.0	2.6	2.8	2.7	2.8
Univac Series 70 (ex-RCA)	22	32	3.4	3.6	3.0	3.5	3.3	2.5	3.1	3.0	2.9	3.3	3.1	3.0
Univac 9200	5	5	3.2	3.2	1.8	3.0	2.8	2.6	2.0	2.0	1.5	3.0	2.8	2.8
Univac 9300	11	11	2.7	3.2	2.5	3.0	2.7	2.1	2.6	2.1	2.0	2.9	2.8	2.7
Univac 9400 & 9480	12	13	3.0	3.2	2.8	3.1	2.4	2.3	2.8	3.1	2.0	2.9	2.9	2.7
Univac 9000 Series Totals	50	61	3.1	3.3	2.5	3.2	2.8	2.4	2.6	2.6	2.1	3.0	2.9	2.8
Univac 90/30	9	9	3.2	3.2	3.0	3.7	3.1	2.9	3.3	3.1	2.7	3.2	2.9	3.1
Univac 90/60 & 90/70	8	10	2.4	2.7	2.8	3.5	2.9	3.0	2.1	2.4	2.2	2.6	2.8	2.4
Univac Series 90 Totals	17	19	2.8	3.0	2.9	3.6	3.0	3.0	2.7	2.8	2.5	2.9	2.9	2.8
Univac 1106	9	10	3.6	3.2	2.7	3.1	2.9	2.8	3.8	3.0	2.8	3.3	2.8	3.3
Univac 1108	3	3	4.0	3.3	3.0	3.5	3.5	3.0	3.3	3.3	2.0	3.7	3.5	3.7
Univac 1110	4	7	3.6	3.6	2.8	3.4	3.4	3.2	3.6	3.2	2.8	3.6	3.3	3.4
Univac 1100 Series Total	16	20	3.7	3.4	2.8	3.3	3.3	3.0	3.6	3.2	2.5	3.5	3.2	3.5
Univac, others	8	14	3.0	3.1	2.8	3.1	3.0	2.8	3.1	3.0	3.1	2.6	2.7	3.0
UNIVAC TOTALS	113	146	3.3	3.3	2.8	3.3	3.1	2.8	3.1	3.0	2.7	3.1	3.0	3.1
Xerox Sigma Series	17	31	3.8	3.8	2.9	3.3	3.2	2.6	3.7	3.4	2.3	3.2	3.0	3.4
RECAP OF TOTALS BY MANUFACTURER														
Amdahl	6	6	3.8	3.2	3.0	3.8	3.7	3.3	2.6	2.6	—	3.2	3.4	3.2
Burroughs	130	156	3.6	3.0	2.5	2.9	2.6	2.3	3.6	3.2	2.5	3.5	3.0	3.0
Control Data	43	72	3.4	2.8	2.6	3.4	3.2	2.8	3.0	2.9	2.9	2.8	2.7	3.0
Digital Equipment	22	26	3.9	3.8	3.5	3.5	3.3	3.1	3.6	3.3	2.4	3.9	3.7	3.7
Honeywell	117	138	3.1	3.3	2.8	3.0	2.8	2.7	3.0	3.0	2.5	3.0	2.6	2.9
IBM	1257	1449	3.3	3.5	3.1	3.3	3.3	2.5	3.0	3.0	2.7	2.9	2.6	3.1
NCR	60	71	3.6	3.4	2.9	3.7	3.5	2.5	3.4	3.0	2.6	2.8	2.7	2.8
Univac	113	146	3.3	3.3	2.8	3.3	3.1	2.8	3.1	3.0	2.7	3.1	3.0	3.1
Xerox	17	31	3.8	3.8	2.9	3.3	3.2	2.6	3.7	3.4	2.3	3.2	3.0	3.4
Totals for manufacturers other than IBM	508	646	3.6	3.3	2.9	3.4	3.2	2.8	3.3	3.1	2.6	3.2	3.0	3.1
GRAND TOTALS	1765	2095	3.5	3.3	2.9	3.3	3.2	2.7	3.2	3.0	2.6	3.2	3.0	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	NCR	Univac	Xerox
Ease of operation	2*	3*	4	1	6	5*	3*	5*	2*
Reliability of mainframe	5	6	7	1*	4*	2	3	4*	1*
Reliability of peripherals	3	7	6	1	5*	2	4*	5*	4*
Responsiveness of maintenance service	1	7	4	3	6	5*	2	5*	5*
Effectiveness of maintenance service	1	7	4*	3*	6	3*	2	5	4*
Technical support	1	7	3*	2	4	6*	6*	3*	5
Operating systems	6	2*	5*	2*	5*	5*	3	4	1
Compilers and assemblers	6	3	5	2	4*	4*	4*	4*	1
Applications programs	—	4*	1	5	4*	2*	3	2*	6
Ease of programming	3*	2	7*	1	5	6	7*	4	3*
Ease of conversion	2	3*	4*	1	5*	5*	4*	3*	3*
Overall satisfaction	3	5*	5*	1	6	4*	4*	4*	2

*Tie

➤ Amdahl (which doesn't make peripheral equipment) scored 3.0 or better.

The Accolades for 1976

Digital Equipment achieved the most impressive overall ratings in this year's survey, followed by newcomer Amdahl Corporation. Digital was ranked first in 5 of the 12 categories and tied for first in another, while Amdahl was ranked first in three categories. Two first-place rankings, and a tie for a third, were achieved by Xerox, a company no longer in the mainframe business.

Three manufacturers were given ratings above the industry average in Overall Satisfaction, with Digital Equipment leading the others for the third year in a row with an impressive 3.7 rating.

This year Xerox—despite its withdrawal from the mainframe business—leads the list for its software, scoring a top rating of 3.7 in the Operating Systems category and 3.4 for its Compilers and Assemblers. Digital Equipment and Burroughs again received ratings well above the average in these two important software categories.

The relative rankings of the 9 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 1,257 user responses for IBM down to 6 responses for Amdahl.

Since IBM computer systems comprised some 69 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 seven categories: Ease of Operation, Responsiveness of Maintenance Service, Technical Support, Operating Systems, Compilers and Assemblers, Ease of Programming, and Ease of Conversion. In terms of overall satisfaction, the non-IBM computers' 3.1 average rating matched IBM's.

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 third 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. □