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User Ratings of Minicomputers and Small Business Computers

To determine the current level of user satisfaction with specific minicomputer systems and with minicomputers in general, Datapro Research Corporation recently conducted an extensive user survey. A Reader Survey Form was mailed to a sample of approximately 10,000 subscribers to *DATAPRO 70* and *DATAPRO REPORTS ON MINICOMPUTERS* in June 1976.

By September 1, usable responses had been received from 758 users with a total of 1738 installed minicomputers and small business computer systems.

The users were asked to answer a number of questions designed to characterize their method of acquisition and their applications environment. The results are presented in Table 1, organized in terms of the responses for 65 popular minicomputer models from 26 vendors.

The users reported that their minicomputers are being used in a predictably broad spectrum of applications, which can be broadly categorized as follows:

	No. of Users	% of Total
Business data processing	469	62
Scientific/engineering computations	152	20
Real-time control	110	15
Data communications	167	22
Data base management	93	12
Other applications	144	19

The percentage figures add up to well over 100 percent because many of the respondents were using their systems in multiple applications. The comparatively high incidence of business data processing usage is due in part to the inclusion in our survey of small business computer systems such as the IBM System/3 and System/32, Burroughs B 1700, and NCR Century Models 50 through 151.

The users were asked how they acquired their systems, and the overall results were as follows:

	No. of Users	% of Total
Outright purchase	421	55.3
Rental from manufacturer	277	36.4
Third-party lease	63	8.3

The great majority of users of "classical" minicomputers such as those produced by DEC and Data General had purchased their machines outright, while users of small business computers from companies such as IBM and NCR were predominantly oriented toward rental from the manufacturer. The figures make it clear that third-party leasing is not widely practiced in the minicomputer field at this time.

This report presents the results of an extensive Datapro survey and summarizes the experience of 758 users representing 1738 installed minicomputers and small business computers. Extensive tables show how these users assessed the strengths and weaknesses of all the popular systems and their vendors.

The users were also asked who wrote the programs for their applications, with the following overall results:

	No. of Users	% of Total
In-house personnel	634	84
Computer manufacturer's personnel	121	16
Used "ready-made" programs from manufacturer	157	21
Used proprietary packages	118	16
Contract programming house	128	17

Here again, the percentage figures total well over 100 percent because numerous respondents called upon two or more sources for their applications programs.

Of the 758 survey respondents, 91 reported that they were using remote batch terminals and 379 said they were using interactive terminals with their systems. Here's a breakdown of the totals:

Type of Terminal	No. of Users	Total No. of Terminals in Use	Average No. of Terminals per User
Batch	91	1207	13
Interactive	379	8258	22

The users were asked to report the extent of their usage of various types of "independent" peripheral devices from sources other than the minicomputer manufacturers. The overall results were as follows:

	No. of Users	% of Total
Using independent disk drives	229	30
Using independent tape drives	122	16
Using independent main memory	71	9
Using other types of independent peripherals	104	14

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TABLE 1. PROFILE OF SURVEY RESPONDENTS

Manufacturer and Model	Number of user replies	Number of computers represented	Acquisition Method			Applications						Source of Applications Programs					Use of Terminals		Use of Independent Peripherals			
			Outright purchase	Rental from mfr.	Third-party lease	Business data processing	Scientific/engineering	Real-time control	Data communications	Data base management	Other applications	Written by user	Written by mfr.	Packages from mfr.	Proprietary packages	Contract prog. house	Batch	Interactive	Disk drives	Tape drives	Main memory	Other peripherals
Basic/Four (all models)	10	12	9	0	2	10	0	0	0	1	0	7	1	2	0	5	0	30	2	1	0	1
Burroughs:																						
L Series	6	6	4	2	0	6	0	0	0	0	0	1	3	2	1	4	0	0	0	1	0	0
B 700 Series	7	7	2	4	1	7	0	0	0	0	1	5	0	2	1	2	2	0	2	0	0	0
B 1700 Series	27	27	10	16	1	26	0	0	4	1	4	26	2	9	8	6	11	909	9	5	0	0
Burroughs Totals	40	40	16	22	2	39	0	0	4	1	5	32	5	13	10	12	13	909	11	6	0	0
Computer Automation Alpha 16	2	4	0	1	1	0	0	1	0	0	1	2	0	2	0	0	0	2	1	0	0	0
Control Data:																						
Control Data 1700	3	3	2	1	0	0	1	2	1	0	1	3	1	0	1	0	30	1	0	0	0	1
System 17	2	2	1	1	0	0	0	0	2	0	0	2	1	1	0	0	0	6	0	0	0	1
Control Data Totals	5	5	3	2	0	0	1	2	3	0	1	5	2	1	1	0	30	7	0	0	0	2
Data General:																						
Nova 2 and 2/10 Series	18	68	18	0	0	11	5	4	5	4	3	14	0	0	4	7	3	64	15	3	2	5
Nova 3 Series	1	1	1	0	0	1	0	0	0	1	0	1	0	0	0	1	0	3	1	0	0	0
Nova 800 Series	8	39	7	0	1	4	3	2	4	2	3	6	2	2	2	3	1	41	3	3	1	4
Nova 1200 Series	12	23	10	0	2	4	6	4	3	2	1	11	0	3	2	2	0	59	6	5	4	1
Nova Series, unspecified	2	6	2	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Nova Totals	41	137	38	0	3	20	14	11	12	9	7	33	2	5	8	11	4	167	25	11	7	10
Eclipse S/200	6	12	6	0	0	4	0	0	1	1	2	4	1	1	1	3	1	196	2	0	0	2
Eclipse C/300	2	3	1	0	1	2	0	0	1	1	0	2	0	0	1	0	0	53	0	0	0	0
Data General Totals	49	152	45	0	4	26	14	11	14	11	9	39	3	6	10	14	5	416	27	11	7	12
Datapoint:																						
Datapoint 1100	8	23	1	7	0	8	0	0	3	2	0	8	1	0	1	0	3	4	1	0	0	1
Datapoint 2200	11	103	7	5	1	8	1	0	6	1	3	9	2	6	1	1	1	22	2	0	0	3
Datapoint 5500	5	7	2	3	0	5	0	0	4	1	1	4	0	0	0	1	1	48	0	0	0	0
Datapoint Totals	24	133	10	15	1	21	1	0	13	4	4	21	3	6	2	2	5	74	3	0	0	4
Digital Computer Controls D-116	3	8	3	0	0	2	0	0	0	0	2	3	0	0	0	0	0	43	3	1	2	3
Digital Equipment Corp.:																						
PDP-8 Series	32	157	31	0	1	9	8	6	5	3	10	23	1	4	7	4	1	129	7	8	5	5
PDP-11/03 thru 11/35	44	90	38	1	4	14	16	12	11	5	10	36	6	4	2	9	62	344	15	9	13	11
PDP-11/40 thru 11/70	63	96	49	2	12	29	25	11	17	19	18	56	9	10	12	10	132	657	21	10	9	9
PDP-11, unspecified	11	32	10	1	1	3	3	5	1	1	1	11	1	2	2	4	1	37	5	3	3	1
PDP-15 Series	5	10	5	0	0	3	1	3	0	2	2	5	0	0	1	1	0	68	4	4	1	0
PDP Totals	155	385	133	4	18	58	53	37	34	30	41	131	17	20	24	28	196	1235	52	34	31	26
Datasystem 300 Series	11	13	7	0	4	11	0	0	0	1	2	8	0	0	2	3	0	9	1	0	0	1
Digital Equipment Totals	166	398	140	4	22	69	53	37	34	31	43	139	17	20	26	31	196	1244	53	34	31	27
Four-Phase Systems (all models)	19	71	3	17	0	7	0	2	8	2	11	15	4	9	1	3	72	193	7	6	0	0
General Automation:																						
SPC-16 Series	13	41	11	0	2	8	2	2	3	2	3	10	3	1	2	2	0	178	6	4	2	2
System 18/30	10	12	9	0	1	5	4	0	0	3	3	9	0	0	3	0	0	50	4	3	0	1
Gen. Automation Totals	23	53	20	0	3	13	6	2	3	5	6	19	3	1	5	2	0	228	10	7	2	3
Harris Slash Series	3	254	3	0	0	1	2	1	0	1	1	3	0	0	0	1	0	12	2	2	1	1
Hewlett-Packard:																						
HP 2000 Series	11	14	11	1	0	4	2	0	4	2	5	7	3	5	2	1	32	237	4	4	1	1
HP 2100 Series	13	62	12	1	0	2	9	6	3	2	2	9	0	2	1	2	1	39	4	4	0	6
HP 21MX Series	6	6	5	1	0	0	5	3	1	2	1	6	0	1	0	0	0	29	0	0	0	3
HP 3000 Series	12	12	11	0	1	8	6	1	8	7	4	12	2	3	4	1	22	134	4	4	0	3
HP 9830 Series	5	6	4	2	0	2	4	1	1	1	0	5	1	2	0	1	0	1	1	0	0	1
Hewlett-Packard Totals	47	100	43	5	1	16	26	11	17	13	12	39	6	13	7	5	55	440	13	12	1	14
Honeywell:																						
Honeywell 316	4	11	3	1	0	1	1	1	0	0	2	4	1	1	3	0	0	4	0	1	0	2
Honeywell 700 Series	6	11	4	2	0	2	0	1	5	0	1	5	0	0	1	0	125	2236	1	1	0	0
Other models	3	4	0	3	0	3	0	1	0	1	0	3	0	1	1	1	0	186	0	0	0	0
Honeywell Totals	13	26	7	6	0	6	1	3	5	1	3	12	1	2	5	1	125	2426	1	2	0	0

User Ratings of Minicomputers and Small Business Computers

TABLE 1. PROFILE OF SURVEY RESPONDENTS (Continued)

Manufacturer and Model	Number of user replies	Number of computers represented	Acquisition Method			Applications						Source of Applications Programs					Use of Terminals		Use of Independent Peripherals			
			Outright purchase	Rental from mfr.	Third-party lease	Business data processing	Scientific/engineering	Real-time control	Data communications	Data base management	Other applications	Written by user	Written by mfr.	Packages from mfr.	Proprietary packages	Contract prog. house	Batch	Interactive	Disk drives	Tape drives	Main memory	Other peripherals
IBM:																						
System/3—																						
Model 6	4	4	1	3	0	4	0	0	0	0	0	2	2	1	0	1	0	0	1	0	0	0
Model 8	8	8	0	8	0	8	1	1	0	0	0	7	3	3	0	1	0	7	2	0	0	1
Model 10	42	46	5	37	0	40	1	0	8	1	3	42	4	6	9	6	10	4	15	0	13	8
Model 12	5	5	1	5	0	5	0	0	0	0	0	5	0	2	0	0	2	2	2	0	0	1
Model 15	29	29	6	24	0	28	3	0	11	4	2	29	5	7	8	6	25	54	10	6	2	3
Unspecified	9	17	0	9	0	8	0	0	1	0	0	8	2	1	1	3	0	3	1	0	0	3
System/3 Totals	97	109	13	82	0	93	5	1	20	5	5	93	16	20	18	17	37	70	31	6	15	16
System/7	30	38	5	26	0	3	2	16	9	0	10	20	13	8	3	2	11	130	7	1	0	0
System/32	28	48	1	26	0	27	1	0	5	3	2	17	2	10	3	9	1	0	1	0	0	1
System/360 Model 20	12	14	3	7	2	11	0	0	0	0	2	12	0	1	2	0	0	0	4	0	0	0
IBM 1130	19	19	6	11	1	10	9	0	3	1	7	18	3	5	5	2	2	8	4	1	2	1
IBM 1800	8	11	4	4	1	1	2	4	1	0	4	8	1	1	3	0	0	81	1	1	1	1
IBM 5100	4	5	3	0	0	3	1	0	1	1	1	4	0	1	0	0	0	1	0	0	0	0
IBM Totals	198	244	35	156	4	148	20	21	39	10	31	172	35	46	34	30	51	290	48	9	18	19
Interdata:																						
Interdata Model 70	6	13	5	0	1	0	3	4	1	0	0	6	1	1	0	0	1	24	3	3	2	1
Interdata 7/16	3	6	3	0	0	0	1	2	1	0	0	3	0	0	0	0	0	25	2	0	0	1
Interdata 7/32	3	3	2	0	1	2	2	0	1	2	0	3	0	0	1	0	1	42	2	2	1	0
Interdata 8/32	2	2	2	0	0	0	2	1	1	1	1	2	0	1	0	0	0	3	1	0	0	0
Other models	3	19	2	0	1	1	0	0	2	0	0	2	0	0	0	0	0	581	0	1	0	1
Interdata Totals	17	43	14	0	3	3	8	7	6	3	1	16	1	2	1	0	2	675	8	6	3	3
Litton 1241	3	4	2	0	1	3	0	0	0	0	0	2	2	0	0	1	0	0	0	0	0	1
Lockheed (all models)	4	6	3	0	1	4	1	0	1	0	0	4	0	0	0	1	0	9	2	1	1	1
Microdata REALITY	10	13	8	0	3	9	0	1	4	6	0	8	1	2	3	2	1	77	4	3	2	2
NCR:																						
Century 50 & 100	6	6	3	3	0	6	0	0	0	0	0	4	0	5	1	1	0	1	1	1	0	0
Century 101	15	21	1	14	0	14	0	0	0	0	2	11	6	6	1	1	7	23	5	2	0	1
Century 151	5	5	0	4	1	5	1	0	3	0	0	4	2	5	1	1	10	4	0	0	0	1
Century Totals	26	32	4	21	1	25	1	0	3	0	2	19	8	16	3	3	17	28	6	3	0	2
NCR 399	6	7	5	1	0	6	0	0	1	0	1	2	6	2	0	0	1	1	1	1	0	1
NCR 8200	8	8	3	4	1	7	0	0	0	0	1	4	3	5	0	1	2	18	3	0	0	1
NCR Totals	40	47	12	26	2	38	1	0	4	0	4	25	17	23	3	4	20	47	10	4	0	4
Olivetti (all models)	2	4	2	0	0	2	0	0	0	0	0	2	1	0	0	0	0	1	1	0	0	0
Prime Computer (all models)	6	7	5	0	1	3	5	0	0	1	2	6	0	1	1	0	2	38	3	1	1	2
Singer System 10	9	18	5	3	2	6	0	2	3	0	0	8	3	3	1	0	411	663	2	2	0	0
Systems Engineering Labs (all models)	3	5	2	0	1	1	1	1	0	1	0	3	1	0	0	1	2	9	1	1	1	0
Univac:																						
9200	5	5	2	3	0	4	0	0	0	0	1	5	2	0	0	1	0	0	0	0	0	0
9300	11	11	4	5	1	10	0	0	2	0	1	11	2	1	0	2	0	1	1	1	0	0
90/30	9	9	2	6	1	9	2	0	1	0	0	9	2	1	1	4	3	7	4	2	0	0
Univac Totals	25	25	8	14	2	23	2	0	3	0	2	25	6	2	1	7	3	8	5	3	0	0
Varian Data Machines:																						
620 Series	1	4	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
V 70 Series	5	6	4	1	0	3	1	1	2	1	1	4	0	1	1	1	0	324	3	2	0	1
Varian Totals	6	10	5	1	0	3	1	2	2	1	1	5	0	1	1	1	0	324	3	2	0	1
Wang Labs. 2200 Series	7	7	5	2	0	5	4	0	0	0	0	7	0	2	0	0	0	5	1	2	0	0
All Other Manufacturers	24	49	13	3	7	11	5	6	4	1	5	15	9	0	6	5	214	88	8	6	1	2
GRAND TOTALS	758	1738	421	277	63	469	152	110	167	93	144	634	121	157	118	128	1207	8258	229	122	71	104

User Ratings of Minicomputers and Small Business Computers

TABLE 2. USER RATINGS

Manufacturer and Model	No. of User Replies	No. of Computers Represented	Average Length of Time in Use, Months	Average Memory Size, Words or Bytes	Weighted Average User Ratings*											
					Ease of operation	Reliability of mainframe	Reliability of peripherals	Responsiveness of maintenance service	Effectiveness of maintenance service	Technical support	Operating system	Compilers and assemblers	Applications programs	Ease of programming	Ease of conversion	Overall satisfaction
Basic/Four (all models)	10	12	22	29KB	3.7	3.7	3.2	3.4	3.4	2.9	3.7	3.8	2.9	3.9	2.9	3.5
Burroughs:																
L Series	6	6	15	14KB	3.0	3.0	3.0	3.3	3.0	1.8	2.8	2.3	2.5	1.8	2.3	2.5
B 700 Series	7	7	13	35KB	3.9	3.4	2.7	2.9	2.4	1.8	3.0	2.9	2.5	2.8	2.7	2.9
B 1700 Series	27	27	15	78KB	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 Totals	40	40	15	64KB	3.6	3.0	2.6	2.9	2.5	2.1	3.3	3.1	2.4	3.1	2.9	2.8
Computer Automation Alpha 16	2	4	27	18KW	3.5	3.0	3.0	3.5	3.0	3.0	3.0	3.0	2.0	2.5	3.0	3.5
Control Data:																
Control Data 1700	3	3	71	29KW	3.7	4.0	3.0	3.5	3.0	3.0	2.5	3.0	3.0	3.5	2.0	3.0
System 17	2	2	24	48KW	3.5	3.5	2.5	3.5	3.0	2.5	3.0	2.0	1.5	2.5	2.0	3.0
Control Data Totals	5	5	52	37KW	3.6	3.8	2.8	3.5	3.0	2.7	2.8	2.3	2.0	3.0	2.0	3.0
Data General:																
Nova 2 and 2/10 Series	18	68	17	29KW	3.2	3.4	3.0	2.8	2.8	2.3	3.4	2.9	2.4	3.3	2.8	3.2
Nova 3 Series	1	1	1	32KW	4.0	4.0	3.0	3.0	3.0	3.0	4.0	—	—	4.0	3.0	3.0
Nova 800 Series	8	39	31	33KW	3.7	3.7	2.7	3.1	3.3	2.2	3.3	2.9	2.3	3.1	2.8	3.4
Nova 1200 Series	12	23	32	21KW	3.1	3.1	2.8	2.2	2.7	2.1	2.9	3.2	2.9	2.7	2.4	2.8
Nova Series, unspecified	2	6	20	32KW	3.0	3.0	3.0	2.0	2.0	1.0	3.0	3.0	2.0	3.0	2.0	3.0
Nova Totals	41	137	24	26KW	3.3	3.4	2.9	2.7	2.8	2.2	3.2	3.0	2.5	3.1	2.7	3.1
Eclipse S/200	6	12	11	146KB	3.2	3.0	2.8	2.7	2.8	2.2	2.8	2.2	2.2	3.0	3.3	3.0
Eclipse C/300	2	3	4	192KB	3.5	3.5	4.0	3.0	3.0	3.0	2.0	2.0	—	4.0	3.0	3.5
Data General Totals	49	152	21	56KW	3.3	3.3	2.9	2.7	2.8	2.2	3.2	2.8	2.5	3.1	2.8	3.1
Datapoint:																
Datapoint 1100	8	23	8	20KB	4.0	3.6	3.1	3.1	2.8	2.6	3.5	3.3	3.0	2.9	2.5	3.3
Datapoint 2200	11	103	21	17KB	3.4	3.3	2.8	2.7	2.8	2.4	3.2	3.2	2.9	2.9	2.1	3.1
Datapoint 5500	5	7	7	58KB	3.8	3.4	3.6	3.0	3.2	2.8	3.6	3.6	3.3	3.8	3.3	3.4
Datapoint Totals	24	133	14	26KB	3.7	3.4	3.1	2.9	2.9	2.6	3.4	3.3	3.0	3.1	2.5	3.2
Digital Computer Controls D-116	3	8	18	53KB	3.7	3.7	2.7	1.5	1.5	1.7	2.0	2.0	1.0	3.3	2.0	3.3
Digital Equipment Corp.:																
PDP-8 Series	32	157	38	16KW	3.3	3.5	3.0	3.0	3.0	2.6	3.0	3.1	2.6	2.8	2.6	3.3
PDP-11/03 thru 11/35	44	90	17	32KW	3.3	3.3	2.9	2.7	2.7	2.6	3.1	3.1	2.7	3.2	2.9	3.0
PDP-11/40 thru 11/70	63	96	19	88KW	3.4	3.4	2.9	2.8	2.8	2.3	3.2	3.2	2.5	3.3	2.8	3.2
PDP-11, Unspecified	11	32	27	33KW	3.1	3.6	3.2	2.8	2.8	2.6	2.9	2.9	2.6	3.0	2.8	3.2
PDP-15 Series	5	10	53	43KW	3.4	3.2	2.8	3.4	3.0	3.3	3.0	2.7	2.0	2.8	2.7	3.2
PDP Totals	155	385	24	52KW	3.4	3.4	3.0	2.8	2.8	2.5	3.1	3.1	2.6	3.1	2.8	3.2
Datasystem 300 Series	11	13	8	18KW	3.7	4.0	3.6	3.4	3.5	2.9	3.6	3.7	2.3	3.7	3.4	3.6
Digital Equipment Totals	166	398	23	50KW	3.4	3.4	3.0	2.9	2.8	2.5	3.1	3.1	2.6	3.2	2.8	3.2
Four-Phase Systems (all models)	19	71	24	77KB	3.5	3.7	3.5	3.2	3.1	2.8	3.3	3.1	3.0	3.3	2.9	2.9
General Automation:																
SPC-16 Series	13	41	18	31KW	3.2	3.0	2.5	3.0	2.4	2.0	2.5	2.9	2.0	3.0	3.3	2.7
System 18/30	10	12	40	25KW	3.4	3.5	3.0	3.1	2.8	2.2	3.1	2.9	2.8	3.3	3.5	3.2
Gen. Automation Totals	23	53	29	28KW	3.3	3.2	2.7	3.0	2.6	2.1	2.7	2.9	2.3	3.1	3.3	2.8
Harris Slash Series	3	254	36	57KW	3.0	3.0	3.0	3.0	3.5	3.0	4.0	4.0	—	4.0	4.0	3.0
Hewlett-Packard:																
HP 2000 Series	11	14	12	43KW	3.1	3.3	3.0	2.4	2.8	2.3	3.1	3.1	2.9	3.2	2.9	3.1
HP 2100 Series	13	62	28	23KW	3.3	3.8	3.2	3.0	3.4	2.8	3.3	3.0	2.6	3.3	2.6	3.4
HP 21MX Series	6	6	8	35KW	3.5	3.6	3.0	3.5	2.8	2.5	3.6	3.0	2.6	3.3	3.3	3.2
HP 3000 Series	12	12	14	76KW	3.4	2.5	3.1	2.8	3.1	2.6	3.4	3.3	2.2	3.4	3.1	3.0
HP 9830 Series	5	6	21	7KW	3.8	4.0	3.8	4.0	4.0	3.0	3.5	3.3	2.8	3.8	4.0	3.8
Hewlett-Packard Totals	47	100	17	39KW	3.4	3.6	3.1	3.0	3.2	2.6	3.4	3.1	2.6	3.4	3.0	3.2
Honeywell:																
Honeywell 316	4	11	37	37KW	3.5	4.0	3.0	2.7	2.7	2.5	2.7	2.7	1.5	2.7	3.0	3.3
Honeywell 700 Series	6	11	24	35KW	3.2	3.5	3.2	3.0	3.0	1.8	2.7	2.5	2.0	2.6	2.8	3.2
Other models	3	4	12	24KW	3.3	3.7	2.7	4.0	3.7	2.3	3.0	3.3	2.7	3.3	2.5	2.7
Honeywell Totals	13	26	25	33KW	3.3	3.7	3.0	3.2	3.1	2.2	2.8	2.8	2.1	2.8	2.8	3.1

*Weighted Average User Ratings are calculated on a scale of 4.0 for each user response of Excellent, 3 for Good, 2 for Fair, and 1 for Poor.

User Ratings of Minicomputers and Small Business Computers

TABLE 2. USER RATINGS (Continued)

Manufacturer and Model	No. of User Replies	No. of Computers Represented	Average Length of Time in Use, Months	Average Memory Size, Words or Bytes	Weighted Average User Ratings*											
					Ease of operation	Reliability of mainframe	Reliability of peripherals	Responsiveness of maintenance service	Effectiveness of maintenance service	Technical support	Operating system	Compilers and assemblers	Applications programs	Ease of programming	Ease of conversion	Overall satisfaction
IBM:																
System/3—																
Model 6	4	4	55	13KB	2.8	3.3	3.3	3.5	3.5	3.0	2.8	3.0	2.3	2.8	2.3	3.0
Model 8	8	8	9	26KB	3.6	3.9	3.8	3.8	3.6	3.6	3.4	3.6	2.9	3.6	3.1	3.4
Model 10	42	46	41	25KB	3.4	3.8	3.2	3.5	3.2	2.7	3.2	3.3	2.6	3.2	3.0	3.3
Model 12	5	5	13	42KB	3.8	4.0	3.8	3.6	3.6	3.0	3.5	3.4	4.0	3.4	3.4	3.6
Model 15	29	29	22	108KB	3.6	3.8	3.6	3.7	3.5	3.1	3.3	3.2	2.9	3.5	3.1	3.5
Unspecified	9	17	29	39KB	3.4	3.9	3.3	3.4	3.4	2.9	3.3	3.1	3.0	3.3	3.1	3.3
System/3 Totals	97	109	30	57KB	3.5	3.8	3.4	3.6	3.4	3.0	3.3	3.3	2.8	3.3	3.2	3.3
System/7	30	38	20	21KW	3.0	3.5	3.1	3.1	2.9	2.4	2.8	2.6	2.6	2.3	2.0	2.9
System/32	28	48	9	20KB	3.7	3.8	3.5	3.5	3.5	2.6	3.2	3.1	2.7	3.3	3.1	3.2
System/360 Model 20	12	14	75	12KB	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 1130	19	19	90	11KW	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 1800	8	11	72	41KW	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 5100	4	5	6	37KB	3.8	3.5	3.0	3.3	2.8	2.3	3.0	3.0	2.3	3.7	3.3	3.5
IBM Totals	198	244	37	42KB	3.4	3.7	3.3	3.4	3.3	2.7	3.1	3.1	2.7	3.1	2.9	3.2
Interdata:																
Interdata Model 70	6	13	41	49KB	3.0	2.8	3.0	2.0	2.5	1.5	2.5	2.2	1.7	2.3	2.0	2.4
Interdata 7/16	3	6	15	32KW	3.7	3.7	3.0	2.7	2.7	2.7	3.7	3.7	3.0	3.0	2.5	3.3
Interdata 7/32	3	3	10	85KW	3.0	3.7	3.0	2.7	3.0	2.7	2.0	2.0	1.0	3.3	3.3	3.3
Interdata 8/32	2	2	7	114KW	4.0	3.5	3.0	2.0	4.0	2.5	4.0	3.5	—	4.0	3.0	3.5
Other models	3	19	27	32KW	3.0	2.7	3.0	2.5	2.5	2.0	2.5	2.5	2.5	3.0	3.0	2.7
Interdata Totals	17	43	26	48KW	3.3	3.4	3.0	2.3	2.7	2.1	2.8	2.7	2.0	2.9	2.6	2.9
Litton 1241	3	4	48	2KW	2.7	2.7	2.0	2.7	2.7	1.3	2.7	1.0	2.0	2.0	2.0	2.7
Lockheed (all models)	4	6	26	58KB	3.0	3.0	3.3	2.0	2.7	2.0	2.0	3.7	2.0	3.0	3.5	3.0
Microdata REALITY	10	13	13	45KB	4.0	3.6	3.2	3.4	3.0	2.7	3.6	3.3	3.0	3.9	3.4	3.6
NCR:																
Century 50 & 100	6	6	44	27KB	3.5	3.5	3.2	3.3	3.2	2.5	3.3	3.3	2.7	3.2	2.8	3.3
Century 101	15	21	31	37KB	3.5	3.8	3.1	3.3	3.1	2.4	3.3	3.2	2.5	3.2	3.3	3.3
Century 151	5	5	3	102KB	3.6	3.6	3.0	3.8	3.3	2.2	3.0	3.0	2.8	3.4	3.6	3.0
Century Totals	26	32	28	47KB	3.5	3.7	3.1	3.4	3.2	2.4	3.2	3.2	2.6	3.2	3.2	3.3
NCR 399	6	7	24	19KB	3.5	3.3	3.0	3.5	3.2	3.0	3.0	3.3	3.0	3.3	3.2	3.3
NCR 8200	8	8	21	70KB	3.1	3.4	3.3	3.1	3.1	2.4	2.9	2.7	2.4	2.7	2.7	2.8
NCR Totals	40	47	16	29KB	3.4	3.6	3.1	3.4	3.2	2.5	3.1	3.1	2.7	3.2	3.1	3.2
Olivetti (all models)	2	4	46	1KB	4.0	3.5	3.0	3.5	3.5	2.5	3.0	3.0	2.0	2.0	2.0	3.5
Prime Computer (all models)	6	7	14	89KW	3.7	3.2	2.3	2.8	2.7	3.0	3.5	3.2	2.5	3.3	2.8	2.4
Singer System 10	9	18	25	54KB	3.6	3.8	3.4	3.3	3.4	2.8	3.3	2.7	2.6	2.8	2.3	3.3
Systems Engineering Labs (all models)	3	5	29	32KW	3.0	3.0	2.7	3.0	3.0	2.3	3.0	3.0	2.7	2.7	2.3	3.0
Univac:																
9200	5	5	68	18KB	3.2	3.2	1.8	3.0	2.8	2.6	2.0	2.0	1.5	3.0	2.8	2.8
9300	11	11	52	27KB	2.7	3.2	2.5	3.0	2.7	2.1	2.6	2.1	2.0	2.9	2.8	2.7
90/30	9	9	7	101KB	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 Totals	25	25	32	52KB	3.0	3.2	2.6	3.2	2.9	2.5	2.8	2.5	2.3	3.0	2.8	2.9
Varian Data Machines:																
620 Series	1	4	68	10KW	2.0	2.0	3.0	2.0	2.0	1.0	1.0	2.0	—	2.0	—	2.0
V 70 Series	5	6	14	56KW	3.0	3.0	2.8	3.0	3.0	2.6	3.5	3.5	3.3	2.6	2.8	2.8
Varian Totals	6	10	25	26KW	2.8	2.8	2.8	2.8	2.8	2.3	3.0	3.2	3.3	2.5	2.8	2.7
Wang Labs. 2200 Series	7	7	25	19KB	3.7	3.6	2.9	2.6	2.7	2.2	3.3	3.3	2.2	3.6	2.7	3.5
All Other Manufacturers	24	49	30	66KB	3.3	3.3	2.9	2.7	2.9	2.3	3.1	2.9	2.4	2.8	2.6	2.8
GRAND TOTALS	758	1738	27	70KB	3.4	3.5	3.1	3.1	3.0	2.5	3.1	3.1	2.6	3.1	2.9	3.2

*Weighted Average User Ratings are calculated on a scale of 4.0 for each user response of Excellent, 3 for Good, 2 for Fair, and 1 for Poor.

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▷ In this case, of course, the percentage figures total less than 100 percent because many of the respondents were not using any independent peripheral devices on their systems.

Finally, and most importantly, the users were asked to rate their minicomputers and the associated software and vendor support by assigning a rating of Excellent, Good, Fair, or Poor to each of 12 factors: ease of operation, reliability of mainframe, reliability of peripherals, responsiveness of maintenance service, effectiveness of maintenance service, technical support, operating system, compilers and assemblers, applications programs, ease of programming, ease of conversion, and overall satisfaction.

The resulting user ratings of 65 popular minicomputers and small business computers from 26 vendors are reported in Table 2. 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.

Prospective buyers should note that the small sample sizes for some of the minicomputer models make it unwise to draw firm conclusions from the indicated ratings. Rather, the ratings should be used as guides to potential product strengths and weaknesses that may call for further investigation in selecting the most suitable equipment for your needs. A minicomputer user's degree of satisfaction may depend heavily upon his specific application, the overall system in which the minicomputer is incorporated, and the quality of support and service provided by the vendor's nearest branch office. Also, as this survey clearly shows, many minicomputer users get their software, technical support, and/or peripheral equipment from sources other than the minicomputer makers.

The ratings assigned by all of the responding users can be combined to form the following overall picture of user satisfaction with the current minicomputers and small business computers:

	Weighted Average User Ratings
Ease of operation	3.4
Reliability of mainframe	3.5
Reliability of peripherals	3.1
Responsiveness of maintenance service	3.1
Effectiveness of maintenance service	3.0
Technical support	2.5
Manufacturer's software:	
Operating system	3.1
Compilers and assemblers	3.1
Applications programs	2.6
Ease of programming	3.1
Ease of conversion	2.9
Overall satisfaction	3.2

Thus, it is clear that minicomputer users in general are fairly well pleased with their equipment and the associated software and maintenance service. The only significant weaknesses are in the areas of applications programs and technical support—and these are precisely the areas that have been neglected by many of the minicomputer vendors until quite recently.□