GAO

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MAINFRAME PROCUREMENTS

Statistics Showing How and What the Government Is Acquiring

GAO

Information Management and
Technology Division

B-241387

December 27, 1990

The Honorable John Conyers, Jr.
Chairman, Committee on Government Operations
House of Representatives

The Honorable Frank Horton
Ranking Minority Member, Committee on
    Government Operations
House of Representatives

This report responds to your February 1989 request for a comprehensive review of federal agencies' compatible computer procurements.[1] In your initial requests and in subsequent discussions with your offices, we were asked to answer several specific questions about agencies' procurements of mainframe computers and mainframe peripheral equipment. Your questions focused on identifying the extent to which agencies' procurements of mainframe computers and mainframe peripherals required compatibility with International Business Machines (IBM) or any other computer manufacturer. You were also interested in knowing details such as the identification of manufacturers whose equipment was acquired by each agency and the procurement methods used to obtain equipment.

This report contains consolidated statistics on governmentwide mainframe computer procurements totaling $1.9 billion for the 3-1/2 fiscal years ending in March 1989. These statistics provide information on vendors and types of procurement actions for 35 federal agencies. See appendix I for the number and amount of mainframe procurements reported by each of the 35 agencies. In addition to this governmentwide report, we previously issued a series of 10 reports that provide specific information on those agencies that obligated $50 million or more for mainframe computers and mainframe peripheral acquisitions. (See page 32 for a list of these reports.)

We found that agencies obligated $1,943.1 million for mainframe and mainframe peripheral procurements during the 3-1/2 fiscal years ending

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[1] A compatible procurement requires hardware or software that functions like specified or existing hardware or software, with little or no modification. Competition in such procurements may occur between manufacturers and marketers—such as system developers and system integrators—to supply equipment that meets the compatible requirements. Because of the potential for competition between manufacturers and marketers, a compatible procurement does not necessarily result in the award of a sole source contract.

in March 1989. Eighty-two percent ($1,587.8 million) of all the procurements required compatibility with existing systems. IBM-compatible procurements comprised 64 percent of the compatibility-limited procurements ($1,013.5 million of $1,587.8 million) and 52 percent of all procurements ($1,013.5 million of $1,943.1 million). IBM was the single largest vendor with a 47 percent share ($922.9 million) of the total federal market. Unisys was the next largest vendor with a 20 percent share ($382.6 million).
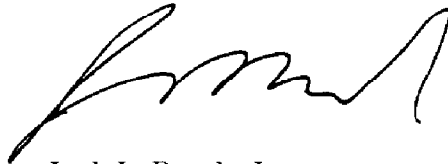
Almost 60 percent of the total value of all procurements involved only one vendor. Specifically, Modifications to Existing Contracts was the most popular procurement method used, and accounted for 44 percent ($859.1 million). Other single vendor methods, New Contract—Sole Source and New Contract—One Offeror accounted for 10 percent ($186.1 million) and 5 percent ($109.1 million), respectively.

When we used the number of procurements as the measure—instead of dollars—we found that the agencies had a total of 3,225 procurements for mainframe and mainframe peripherals and over 90 percent (2,948) required some type of compatibility. The agencies required IBM compatibility 60 percent of the time (1,769 of the 2,948 compatible procurements). When IBM compatibility was required, IBM equipment was supplied 68 percent of the time (1,201 of the 1,769 IBM-compatible procurements).

During discussions with your offices you asked additional detailed questions. Your questions and our answers are summarized in appendix II. Appendix III contains the tables with detailed statistics that are the basis for our answers to your questions.

We are reporting information for the 3-1/2 fiscal years from October 1, 1985 through March 31, 1989. All the information is based on the responses to a questionnaire we devised and distributed to the 35 federal agencies. We did not independently validate the information, which agencies supplied, nor did we evaluate any documentation related to individual agencies' procurements. However, we checked the agencies' information for consistency with the instructions for our questionnaire and made appropriate revisions. At your request, we did not solicit or obtain comments from the agencies on this report. Appendix IV contains additional details on the objective, scope, and methodology of our work.

As arranged with your offices, unless you publicly announce this report's contents earlier, we plan no further distribution of it until 30 days after the date of this letter. We will then send copies to the 35 agencies and will also make copies available to others upon request. Should you have any questions about this report or require additional information, please contact me at (202) 275-3195. Major contributors to this report are listed in appendix V.

Jack L. Brock, Jr.
Director, Government Information and
  Financial Management

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Abbreviations

ADP	automated data processing
GAO	General Accounting Office
GSA	General Services Administration
IMTEC	Information Management and Technology Division
IBM	International Business Machines

Governmentwide Mainframe Procurement Statistics

Table I.1: The Government's Mainframe Procurement Statistics

Dollars in millions

Agencies		Number of procurements		Dollars obligated
Agriculture		208		$64.6
Air Force		795		384.5
Army		489		269.1
Commerce		114		61.6
DOD (excluding DLA)	113		$48.4	
DLA	42	155	33.7	82.1
Education		0		0
Energy		30		16.8
EPA		21		22.8
EOP		14		1.8
FEMA		16		6.9
GSA		74		31.4
HHS (excluding HCFA, NIH and SSA)	60		5.5	
HCFA	35		17.3	
NIH	42		139.0	
SSA	8	145	31.7	193.5
HUD		8		5.0
Interior		43		30.1
Justice (excluding FBI)	14		37.9	
FBI	27	41	47.4	85.3
Labor		0		0
NASA		187		104.4
Navy (excluding Marine Corps)	449		224.2	
Marine Corps	3	452	52.7	276.9
OPM		20		14.2
SEC		35		5.6
State		18		5.6
Transportation (excluding Coast Guard and FAA)	25		3.9	
Coast Guard	0		0	
FAA	11	36	5.3	9.2
Treasury (excluding Customs, INS and IRS)	49		28.5	
Customs	4		41.5	
INS	0		0	
IRS	270	323	200.9	270.9
VA		1		0.8
Total Procurements Governmentwide		**3,225**		**$1,943.1**

Questions and Answers About Government Mainframe and Mainframe Peripheral Procurements

What are the numbers and dollar amounts of the government's mainframe and mainframe peripheral procurements? And, what is the distribution of compatible procurements?

The 35 federal agencies had 3,225 procurements and obligated $1,943.1 million for mainframe computers and mainframe peripherals during the 3-1/2 fiscal years ending in March 1989. Compatible procurements comprised 2,948 of the total 3,225 total procurements (over 90 percent) and represented $1,587.8 million of the $1,943.1 obligated (over 80 percent).

Figure II.1: Number of the Government's
Mainframe and Mainframe Peripheral
Procurements (3,225)

Unisys-Compatible (794)

1%
Other Compatible (24)

8%
Non-Compatible (277)

2%
Control Data Corporation- Compatible
(69)

9%
Honeywell Bull-Compatible (292)

25%

55%   IBM-Compatible (1,769)
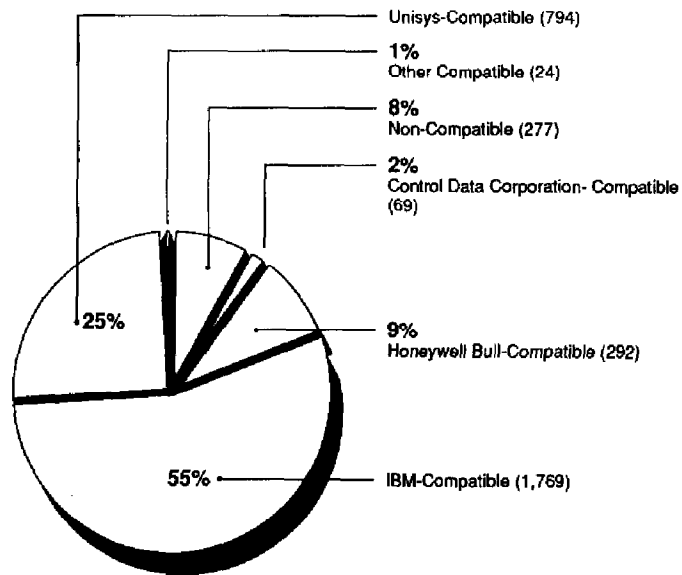
Adjustment made due to rounding.

Figure II.2: Dollars Obligated for the
Government's Mainframe and Mainframe
Peripheral Procurements ($1,943.1M)

Unisys-Compatible ($387.3M)

1%
Other compatible ($10.1M)

18%   Non-Compatible ($355.3M)

20%

3%
Control Data Corporation- Compatible
($53.9M)

52%

6%
Honeywell Bull-Compatible ($123M)

IBM-Compatible ($1,013.5M)
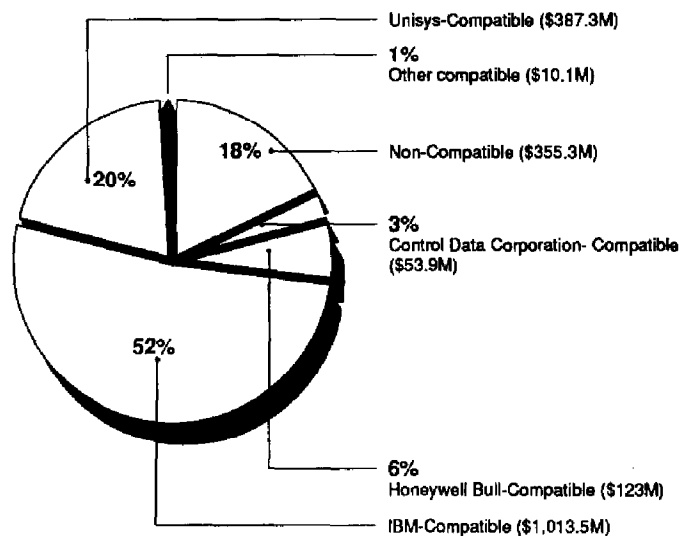
Compatible procurements represent $1,587.8 million (82 percent) of the total acquisitions.

What is the distribution of the government's compatible mainframe and mainframe peripheral procurements according to type of compatibility?

Those procurements the 35 government agencies identified as having a compatible requirement were primarily for either Control Data Corporation, Honeywell Bull, IBM, or Unisys compatibility. IBM and Unisys comprised the largest share of the compatible requirements. Specifically, 1,769 of the 2,948 procurements (60 percent) were to satisfy IBM-compatible requirements representing $1,013.5 million of $1,587.8 million obligated for all compatible procurements (64 percent). Unisys-compatible requirements were second largest. Unisys-compatible requirements represented 794 procurements (27 percent) and $387.3 million (24 percent).

Figure II.3: Number of the Government's Compatible Procurements According to Type of Compatibility (2,948)

Unisys-Compatible (794)

1%
Other Compatible (24)

2%
Control Data Corporation- Compatible (69)

Honeywell Bull-Compatible (292)

10%

27%

60% — IBM-Compatible (1,769)
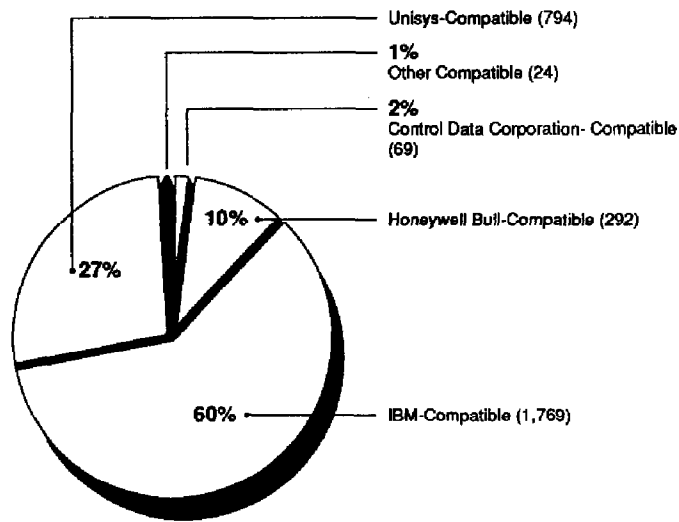
Figure II.4: Dollars Obligated for the Government's Compatible Procurements According to Type of Compatibility ($1,587.8M)
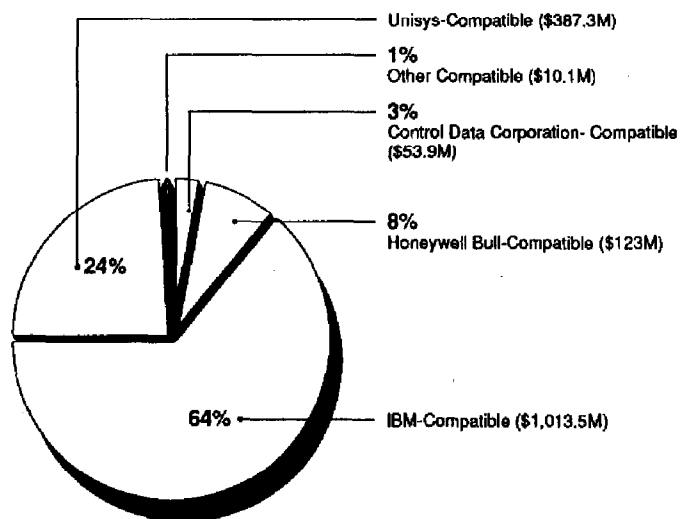
Unisys-Compatible ($387.3M)

1%
Other Compatible ($10.1M)

3%
Control Data Corporation- Compatible ($53.9M)

8%
Honeywell Bull-Compatible ($123M)

24%

64% — IBM-Compatible ($1,013.5M)

What equipment manufacturers are involved in the government's IBM-compatible mainframe and mainframe peripheral procurements?

During the 3-1/2 fiscal years ending in March 1989, IBM equipment was obtained in the majority of the government's IBM-compatible procurements. Of the 1,769 IBM-compatible procurements during the 3-1/2 year period, 1,201 (68 percent) resulted in agencies obtaining IBM equipment. Similarly, of the $1,013.5 million obligated to IBM-compatible procurements, $662.5 million (65 percent) was for procurements involving IBM equipment. In addition to IBM, other manufacturers involved in IBM-compatible procurements included Amdahl, Memorex, National Advanced Systems, NCR Comten, and Storage Technology Corporation.

Figure II.5: Number of the Government's IBM-Compatible Procurements According to Manufacturer of Equipment (1,769)

4%
Memorex (65)

4%
National Advanced Systems (67)

3%
NCR Comten (48)

8%
Storage Technology Corporation (141)

7%
Other (140)

6%
Amdahl (107)

68%
IBM (1,201)
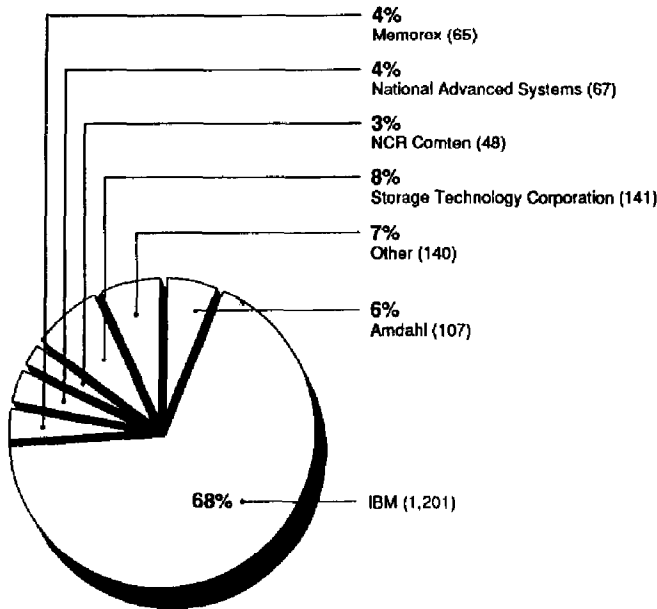
Adjustment made due to rounding.

Figure II.6: Dollars Obligated for the Government's IBM-Compatible Procurements According to Manufacturer of Equipment (1,013.5M)

1%
Memorex ($9.5M)

National Advanced Systems ($102.5M)

1%
NCR Comten ($12.7M)

6%
Storage Technology Corporation ($54M)

2%
Other ($20.4M)

15%
Amdahl ($151.9M)

10%

65%
IBM ($662.5M)
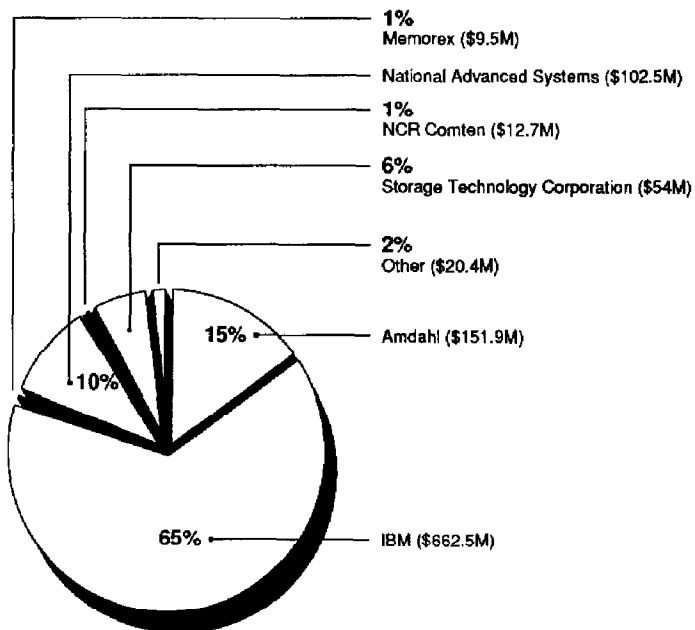
Adjustment made due to rounding.

What procurement methods did the government use to obtain all types of compatible mainframe computers and mainframe peripheral equipment? And, did the government frequently use new contracts with 8(a) contractors to obtain compatible mainframes and mainframe peripherals?

Modifications to Existing Contracts was the most frequently used method of obtaining equipment when the government agencies identified compatible requirements. Also, more dollars were obligated to Modifications to Existing Contracts than to any other procurement method during the 3-1/2 fiscal years. These contract modifications accounted for 1,296 of the 2,948 compatible procurements and $780.9 of the $1,587.8 million obligated. The agencies did not frequently use the New Contract—8(a) Firms method to obtain compatible mainframes or peripherals. This method accounted for only 24 of the 2,948 compatible procurements and $17.4 million of the $1,587.8 million obligated.

Figure II.7: Number of the Government's Compatible Procurements According to Procurement Method (2,948)

GSA Schedule Purchases (811)

7%
Other (196)

4%
New Contract-Sole Source (127)

4%
New Contract-One Offeror (132)

7%
New Contract-More Than One Offeror (219)

5%
New Contract- Developer or Integrator (143)

28%

1%
New Contract-8(a) Firm (24)

44%

Modifications to Existing Contracts (1,296)
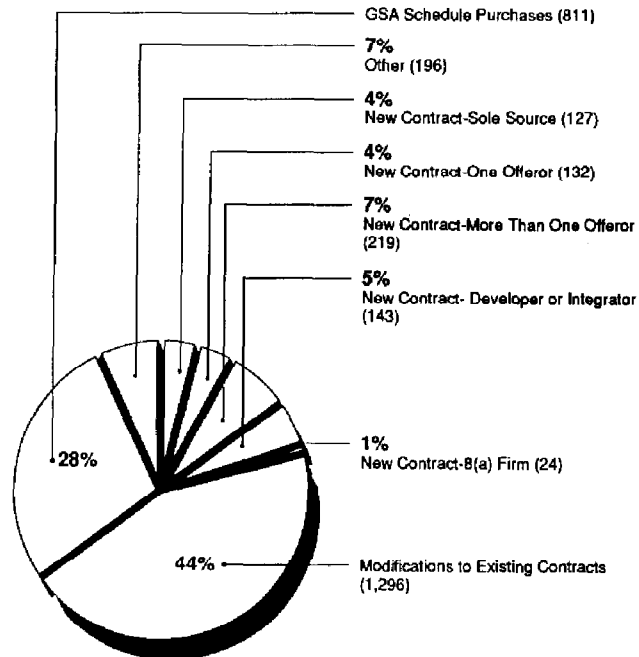
Figure II.8: Dollars Obligated for the Government's Compatible Procurements According to Procurement Method ($1,587.8M)

5%
GSA Schedule Purchases ($72.5M)

2%
Other ($30.1M)

New Contract-Sole Source ($165.4M)

10%

7%
New Contract-One Offeror ($103.9M)

13% New Contract-More Than One Offeror ($213.8M)

49%

13% New Contract- Developer or Integrator ($203.8M)

1%
New Contract-8(a) Firm ($17.4M)

Modifications to Existing Contracts ($780.9M)
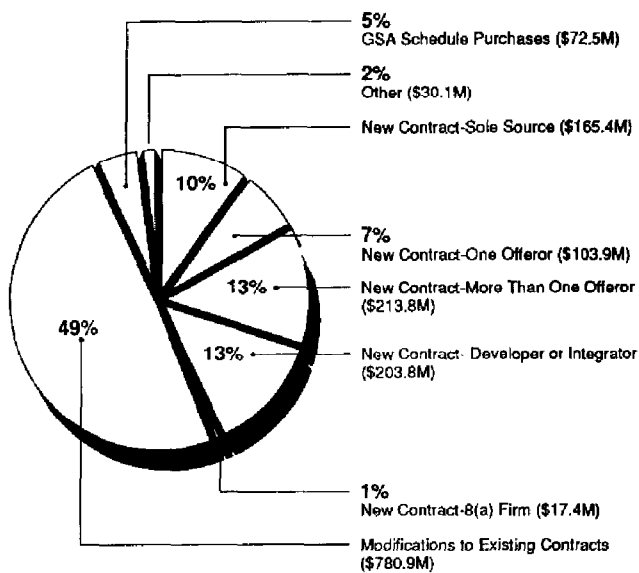
What procurement methods did the government use to obtain IBM-compatible mainframe computers and mainframe peripheral equipment? And, did the government frequently use new contracts with 8(a) contractors to obtain IBM-compatible mainframes and mainframe peripherals?

GSA Schedule Purchases was the most frequently used procurement method for obtaining IBM-compatible equipment (707 of 1,769 procurements). However, using total dollars obligated as the measure, Modifications to Existing Contracts was the most favored procurement method. Of the $1,013.5 million obligated for IBM-compatible procurements, Modifications to Existing Contracts accounted for $459.7 million in dollar obligations. New Contracts—8(a) Firms represented 22 of the government's IBM-compatible procurements and accounted for $17.0 million in obligated dollars during the 3-1/2 fiscal years.

Figure II.9: Number of the Government's IBM-Compatible Procurements According to Procurement Method (1,769)

8%
Other (136)

4%
New Contract-Sole Source (67)

4%
New Contract-One Offeror (65)

9%
New Contract-More Than One Offeror (167)

7%
New Contract- Developer or Integrator (131)

1%
New Contract-8(a) Firm (22)

27%
Modifications to Existing Contracts (474)

40%

GSA Schedule Purchases (707)
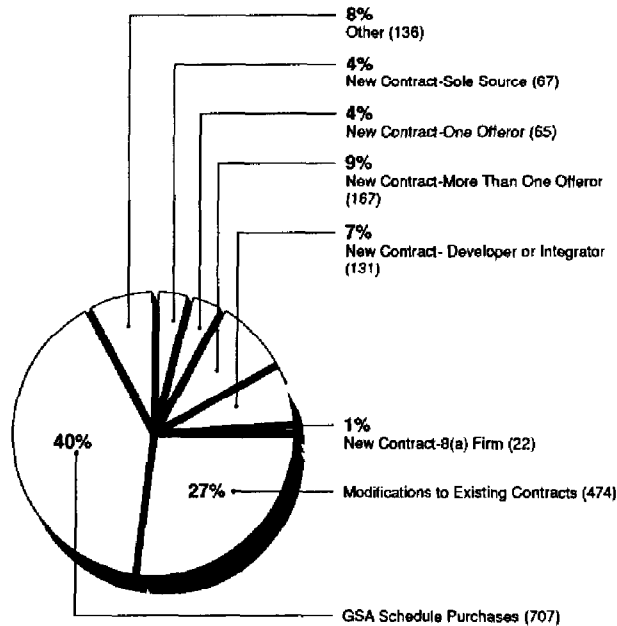
Figure II.10: Dollars Obligated for the Government's IBM-Compatible Procurements According to Procurement Method ($1,013.5M)
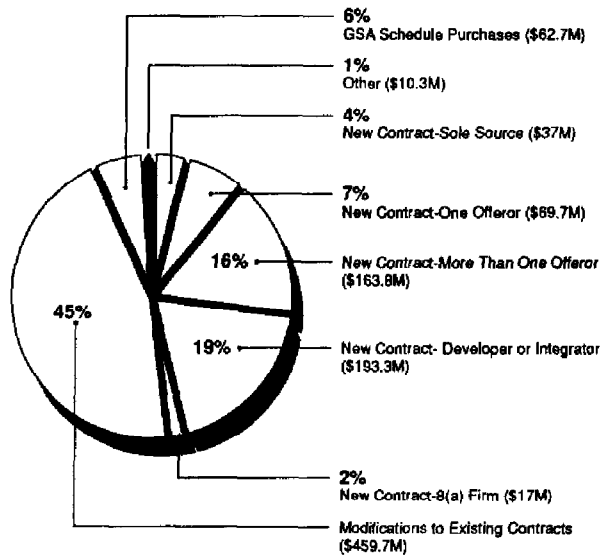
6%
GSA Schedule Purchases ($62.7M)

1%
Other ($10.3M)

4%
New Contract-Sole Source ($37M)

7%
New Contract-One Offeror ($69.7M)

16%
New Contract-More Than One Offeror ($163.8M)

19%
New Contract- Developer or Integrator ($193.3M)

45%

2%
New Contract-8(a) Firm ($17M)

Modifications to Existing Contracts ($459.7M)

What equipment manufacturers are involved in the government's mainframe and mainframe peripheral procurements, including both procurements where compatibility is required and procurements with no compatibility requirement?

IBM equipment was supplied to the government more frequently than any other manufacturer's for mainframe and mainframe peripheral procurements for the 3-1/2 fiscal years ending in March 1989, with 1,339 out of 3,225 total procurements. Additionally, using obligated dollars as a measure, government obligations for procurements involving IBM equipment during the same period were $922.9 million (47 percent) of a total of $1,943.1 million. When measured using either numbers or dollars, Unisys equipment was next most frequently supplied—772 of 3,225 procurements (24 percent) and $382.6 million of $1,943.1 million obligated (20 percent). Other equipment manufacturers included Amdahl, Control Data Corporation, Honeywell Bull, Memorex, National Advanced Systems, NCR Comten, and Storage Technology Corporation.

Figure II.11: Number of the Government's Mainframe and Mainframe Peripheral Procurements According to Manufacturer of Equipment (3,225)

Unisys (772)

Other (372)

4%
Amdahl (116)

3%
Control Data Corporation (100)

11%

24%

9%
Honeywell Bull (304)

42%

IBM (1,339)

2%
National Advanced Systems (69)

5%
Storage Technology Corporation (153)
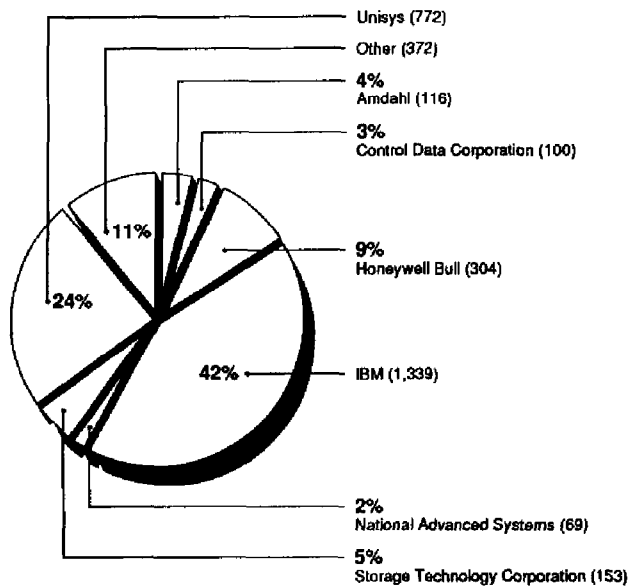
Memorex and NCR Comten are among the manufacturers included in the "other" category.

Adjustment made due to rounding.

Figure II.12: Dollars Obligated for the Government's Mainframe and Mainframe Peripheral Procurements According to Manufacturer of Equipment ($1,943.1M)

Unisys ($382.6M)

4%
Other ($76M)

8%
Amdahl ($157.6M)

5%
Control Data Corporation ($98.9M)

20%

8%
Honeywell Bull ($147.6M)

47%

IBM ($922.9M)

5%
National Advanced Systems ($102.8M)

3%
Storage Technology Corporation ($54.7M)
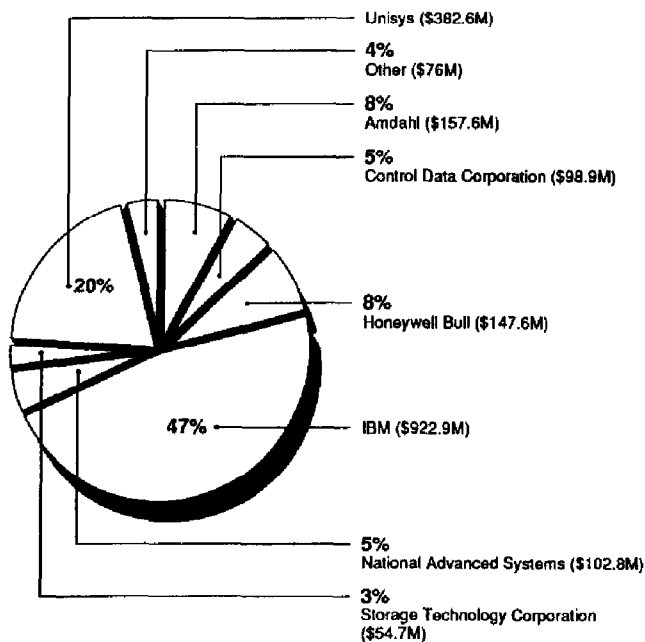
Memorex and NCR Comten are among the manufacturers included in the "other" category.

Detailed Statistics on the Government's Procurements

Table III.1: The Government's Mainframe and Mainframe Peripheral Procurements

Dollars in millions

	Number	Percent of number	Dollars	Percent of dollars
Compatible				
Control Data Corporation-Compatible	69	2	$53.9	3
Honeywell Bull-Compatible	292	9	123.0	6
IBM-Compatible	1,769	55	1,013.5	52
Unisys-Compatible	794	25	387.3	20
Other-Compatible	24	1	10.1	1
Total Compatible	2,948	92%	$1,587.8	82%
Total Non-Compatible	277	8%	355.3	18%
Total Procurements	**3,225**	**100%**	**$1,943.1**	**100%**

(Adjustment made due to rounding.)

Table III.2: The Government's Compatible Procurements According to Type of Compatibility

Dollars in millions

	Number	Percent of number	Dollars	Percent of dollars
Control Data Corporation-Compatible	69	2	$53.9	3
Honeywell Bull-Compatible	292	10	123.0	8
IBM-Compatible	1,769	60	1,013.5	64
Unisys-Compatible	794	27	387.3	24
Other-Compatible	24	1	10.1	1
Total Compatible	**2,948**	**100%**	**$1,587.8**	**100%**

Table III.3: The Government's IBM-Compatible Procurements According to Manufacturer of Equipment

Dollars in millions

	Number	Percent of number	Dollars	Percent of dollars
Amdahl	107	6	$151.9	15
IBM	1,201	68	662.5	65
Memorex	65	4	9.5	1
National Advanced Systems	67	4	102.5	10
NCR Comten	48	3	12.7	1
Storage Technology Corporation	141	8	54.0	6
Other	140	7	20.4	2
Total IBM-Compatible	**1,769**	**100%**	**$1,013.5**	**100%**

(Adjustment made due to rounding.)

Table III.4: The Government's Procurements According to Procurement Method

Dollars in millions

Methods	Number					Dollars				
	Com-patible	Percent of com-patible	Other	Total	Percent of total	Com-patible	Percent of com-patible	Other	Total	Percent of total
New Contract—Sole Source	127	4	26	153	5	$165.4	10	$20.7	$186.1	10
New Contract—One Offeror	132	4	21	153	5	103.9	7	5.2	109.1	5
New Contract—More Than One Offeror	219	7	25	244	7	213.8	13	29.3	243.1	13
New Contract—Developer Or Integrator	143	5	24	·167	5	203.8	13	214.8	418.6	22
New Contract—8(a) Firm	24	1	1	25	1	17.4	1	1.0	18.4	1
Modifications to Existing Contracts	1,296	44	119	1,415	44	780.9	49	78.2	859.1	44
GSA Schedule Purchases	811	28	34	845	26	72.5	5	4.7	77.2	4
Other	196	7	27	223	7	30.1	2	1.4	31.5	1
Total Procurements	**2,948**	**100%**	**277**	**3,225**	**100%**	**$1,587.8**	**100%**	**$355.3**	**$1,943.1**	**100%**

(Adjustment made due to rounding.)

Table III.5: The Government's IBM-Compatible Procurements According to Procurement Method

Dollars in millions

	Number	Percent of number	Dollars	Percent of dollars
New Contract—Sole Source	67	4	$37.0	4
New Contract—One Offeror	65	4	69.7	7
New Contract—More Than One Offeror	167	9	163.8	16
New Contract—Developer or Integrator	131	7	193.3	19
New Contract—8(a) Firm	22	1	17.0	2
Modifications to Existing Contracts	474	27	459.7	45
GSA Schedule Purchases	707	40	62.7	6
Other	136	8	10.3	1
Total Compatible	**1,769**	**100%**	**$1,013.5**	**100%**

Table III.6: The Government's Mainframe and Mainframe Peripheral Procurements According to Manufacturer of Equipment

Dollars in millions

	Number	Percent of number	Dollars	Percent of dollars
Amdahl	116	4	$157.6	8
Control Data Corporation	100	3	98.9	5
Honeywell Bull	304	9	147.6	8
IBM	1,339	42	922.9	47
Memorex	66	2	9.6	1
National Advanced Systems	69	2	102.8	5
NCR Comten	64	2	17.6	1
Storage Technology Corporation	153	5	54.7	3
Unisys	772	24	382.6	20
Other	242	7	48.8	2
Total Procurements	**3,225**	**100%**	**$1,943.1**	**100%**

(Adjustment made due to rounding.)

Objective, Scope, and Methodology

In February 1989, the Chairman and the Ranking Minority Member, House Committee on Government Operations, asked us to perform a review of the government's use of IBM-compatible automated data processing (ADP) procurements. In response to these requests and in discussions with the Chairman's and Ranking Minority Member's offices, we agreed that procurements of mainframe and mainframe peripherals would be included in our review, with emphasis on compatible procurements. Our review covered procurements at 35 federal agencies, during the 3-1/2 fiscal years ending in March 1989.

Our objective for this report was to focus on governmentwide statistics collected from the 35 agencies and present the number and aggregate dollar value of the government's mainframe-related contracts, the distribution of procurements among equipment manufacturers, and a breakdown of the various procurement methods agencies used to obtain mainframe-related equipment. Previous reports describe the specific aspects of the ADP-related procurements of individual agencies.

We used the following mutually exclusive procurement methods to group the government's procurements. The first three methods represent specific types of new contracts with mainframe and peripheral equipment manufacturers. These consist of sole source new contracts, new contracts that resulted from competitive procedures where only one offeror remained in the procurement at the time the awardee was selected, and new contracts that resulted from competitive procedures where the awardee was selected from among multiple competitors. We also included a category for new contracts with system developers and integrators—except any contracts separately categorized as awarded to 8(a) firms. We also obtained and analyzed data the agencies provided on modifications to existing contracts, the use of GSA's multiple award schedule contracts, and other miscellaneous procurement methods.

To obtain governmentwide statistics we designed a questionnaire, which when properly completed by the 35 agencies provided us with the necessary information. Our questionnaire included several charts and provided detailed instructions, with definitions and examples, to help agencies identify and report the relevant information. Our questionnaire instructions cited pertinent federal regulations to ensure consistency in understanding of the terms used and to identify key definitions.

In preparing instructions for our questionnaire, we recognized the need to clearly and consistently identify mainframe computers, as opposed to

superminicomputers and supercomputers. Because technology changes, criteria such as storage capacity, processing speed, physical size, cooling requirements, and cost do not provide an adequate basis for clear and consistent identification of mainframes. Therefore, after consulting with computer vendors, GSA, other federal agency officials, and Datapro,[2] we considered vendor marketing strategy—in addition to computer architecture and performance—as the basis for classifying particular computers as superminicomputers, mainframes, or supercomputers. Like Datapro, we classified as mainframes some smaller and less expensive models if they belong to a product line, or family, of mainframes sharing a common architecture or operating system. However, models with similar performance characters that do not belong to a mainframe family and are manufactured by companies that are not traditionally recognized as mainframe manufacturers were not classified as mainframes. We provided a list of mainframe manufacturers and models in the instructions for our questionnaire as examples of computers that agencies should include in completing the questionnaire.

We obtained comments on preliminary copies of our questionnaire from information resources management officials at the Departments of Agriculture and Transportation, to aid in ensuring the questionnaire's clarity. After modifying the questionnaire based on comments received from officials at the Departments of Agriculture and Transportation, we asked senior information resources management officials at the agencies to complete the questionnaire.

Our questionnaire was furnished to the 35 agencies in mid-April 1989. Upon receiving individual agency responses, the information was reviewed to determine if the instructions were followed correctly and if the information was clear and consistent. Although we did not independently validate the information supplied in the various agency responses, our questionnaire contained several internal checks to determine if inconsistencies were present. In some situations we modified the data on the basis of discussion with agency officials. In other cases we excluded inappropriate data. For example, we directed the agencies to include only procurement data for mainframe-related equipment. However, in a few instances agencies included procurements for computers other than mainframes. In order to maintain consistency in the statistics across the 35 federal agencies, any procurements reported by the agencies for equipment other than mainframes and related peripherals were

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[2]Datapro is a trade publication that provides detailed information on computers, peripheral equipment, and software.

deleted from our analysis. Our work did not include solicitation or evaluation of documents related to the agencies' individual procurements. The figures and tables in appendixes I through III were developed from our analysis.

We did not solicit or obtain comments from the agencies about this report, however, we discussed our scope and methodology with individual agency officials through the course of our review. Our work was conducted from February 1989 through September 1990 in accordance with generally accepted government auditing standards.

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