UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

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ACCOUNTING AND FINANCIAL MANAGEMENT DIVISION

B-203143

The Honorable Fortney H. Stark
House of Representatives

Dear Mr. Stark:

In your letter of April 29, you asked us for general comments on the suitability of the MUMPS (Massachusetts General Hospital Utility Multi-Programming System) language for Government agencies. Although we do not use MUMPS here at the General Accounting Office, based on our knowledge of the language it seems to have a place in certain medical areas. However, we do not consider it suitable for generalized use in the Government.

Under the aegis of the National Center for Health Services Research, MUMPS was developed in 1966 at Massachusetts General Hospital for use on Digital Equipment Corporation minicomputers, primarily as a means for building data bases and querying hospital medical records. In 1972, the American National Standards Institute began a process which led to the approval of a standard for the language. MUMPS is one of ten American National Standard languages.

In 1976, the MUMPS Users Group asked the National Bureau of Standards to form a task force for the purpose of making MUMPS a Federal Information Processing Standard. As you know, the Brooks Act (PL 89-306) gave the Department of Commerce responsibility for approving standards for the Federal Government. The Bureau gives its official seal of approval to languages that (1) have areas of application for which there is a Government-wide requirement, (2) have portable code, (3) are maintainable, (4) have an assured supply of interpreters/compilers, and (5) require minimal training costs because they are well specified and widely known. When Government agencies do not adhere to the Federal standard, they are supposed to request a waiver from the Bureau.

At the time of the MUMPS request, only one language (COBOL) had been designated as a Federal standard. The Bureau's position was, in brief, that making MUMPS a Federal standard would not be feasible because of changing nature of data base systems, and

because recognizing MUMPS as a separate entity would do a dis-service to users of other similar based products in the Federal community. Their position on MUMPS has not changed to date. Meanwhile, two other languages with wide applications have become Federal standards (FORTRAN and BASIC).

The MUMPS Users Group seems to find the language a very useful tool. Many of the users apply the language at the Veterans Administration in the specialized hospital environment for which MUMPS was developed. However, we do not consider MUMPS suitable as a Government standard for several reasons, the principal one being that because of the wide diversity of applications used in Federal agencies, no one data base/query language could meet enough general needs.

A second reason is that competition would be reduced initially, and perhaps permanently, for both hardware and software. Languages not originally designed to work on a wide variety of machines frequently suffer in efficiency when modified to run on other equipment. To date, MUMPS has been adapted to run on a number of microcomputers and minicomputers and on at least one large computer. It has not, however, been adapted to a majority of the large computer brands, and thus some vendors would be precluded from bidding on Government contracts if MUMPS capability were specified. In addition, software firms currently offering their own packages would have difficulty competing for Government business.

A third reason for not designating MUMPS as a standard for Federal use is that, although MUMPS was an innovative language when it was developed, today several newer languages can perform the same functions and are easier to use. To illustrate this point, we have enclosed an example of a MUMPS program that performs the simple function of printing an inventory file. For contrast, we have also enclosed an example of a newer "fourth generation" language (RAMIS II) that prints a sales report of greater complexity. The newer language is more like English and therefore more easily and quickly understood. Although we have selected RAMIS II as an example, there are many other "friendly" languages which perform data base/query functions and are available for use by Government agencies. A partial list is enclosed.

We hope this discussion has answered your question. Should you like us to provide you with more technical information, we will be glad to do so.

Sincerely yours,

/s/ Walter L. Anderson

Walter L. Anderson
Senior Associate Director

Enclosures - 3

bc: Index & Files
Director, AFMD
Ms. Tara, AFMD
GAO Documents Services
Mr. Reed, IM&TD

Enclosure 1

This MUMPS program lists items and quantities from an inventory file, preceded by quantity totals.

INSTRUCTIONS:

```
INVPRT  ;PRINT INVENTORY FILE
        K  W !,"INVENTORY",!!,"ITEM",?35,"QUANTITY",! S A=-1
ACY     S A=$N(^INVTRY(A)) G:A=-1 END
        I ($D(^INVTRY(A))=1)!($D(^INVTRY(A))=11) W !,A,?32,^INVTRY(A)
        S B=-1 D BCY G ACY
BCY     S B=$N(^INVTRY(A,B)) Q:B=-1
        I ($D(^INVTRY(A,B))=1)!($D(^INVTRY(A,B))=11) W !,A,?$X+2,B,?35,^INVTRY(A,B)
        S C=-1 D CCY G BCY
CCY     S C=$N(^INVTRY(A,B,C)) Q:C=-1
        I ($D(^INVTRY(A,B,C))=1)!($D(^INVTRY(A,B,C))=11) W !,A,?$X+2,B,?$X+2,C,
?35,^INVTRY(A,B,C)
        S D=-1 D DCY G CCY
DCY     S D=$N(^INVTRY(A,B,C,D)) Q:D=-1
        I ($D(^INVTRY(A,B,C,D))=1)!($D(^INVTRY(A,B,C,D))=11) W !,A,?$X+2,B,
?$X+2,C,?$X+2,D,?35,^INVTRY(A,B,C,D)
        G DCY
END     W !!,"INVENTORY PRINT FINISHED" Q
```

OUTPUT:

```
INVENTORY

ITEM                                        QUANTITY

PAPER                                       20 REAMS,72 PADS
PAPER  LEGAL  WHITE                            48 REAMS
PAPER  LEGAL  YELLOW                           24 PADS
PAPER  LETTER  BOND                            12 REAMS
PAPER  LETTER  STANDARD                        60 REAMS
PAPER  LETTER  YELLOW                          48 PADS
PENS                                        36 DOZEN
PENS  BLACK                                    8 DOZEN
PENS  BLUE  BALLPOINT                          15 DOZEN
PENS  BLUE  BALLPOINT  CAPPED                  10 DOZEN
PENS  BLUE  BALLPOINT  RETRACTABLE             5 DOZEN
PENS  BLUE  FINETIP                            5 DOZEN
PENS  RED                                      8 DOZEN
```

Enclosure 2

This RAMIS II data base system program prints a report from a sales file. It sums the units by customer number for each quarter of 1975.

INSTRUCTIONS:

```
TABLE
FILE SALES
SUM UNITS ACROSS CUSTNUM
BY MONTH IN GROUPS OF 3 ORIGIN 1
IF YEAR IS 1975
END
```

OUTPUT:

	CUSTNUM 1710	3403	7208	7936	8952
MONTH	UNITS	UNITS	UNITS	UNITS	UNITS
1	3269	934	1520	0	4338
4	8205	219	1723	0	7511
7	12694	776	1550	1502	4293
10	4624	1142	853	1257	6002

Enclosure 3

"English-like" Data Base/Query Languages

Accent R

ADABAS

Create

Culprit

DG/DBMS

Focus

INTAC

Model 204

Plus 20

RAMIS II

System 2000