Objections and MDC Responses for Two Draft American National Standards

M Computing *reports the following information verbatim as a service to the MUMPS Development Committee as it progresses toward the new standards for M.—Editor*

X11/95-26

TO: Participants in MDC X11.1 Canvass
RE: Report of Unresolved Objections to the Proposed New Standard

The MUMPS Development Committee (MDC) is seeking recognition of its standard, X11.1 M[UMPS] Language Standard, as an American National Standard under the accredited canvass method of the American National Standards Institute (ANSI). In the ANSI accredited canvass method, the Sponsor (MDC) conducts a canvass, or mail poll, of directly and materially affected persons (organizations, companies, government agencies, individuals and the like) in order to obtain evidence of consensus, which will be considered by ANSI in the approval of the standard as an American National Standard.

There was one objection raised during the canvass regarding X11.1 that could not be resolved as of this writing.

In accordance with the requirements of ANSI, MDC has reported these unresolved objections to the canvass list in order to afford each canvassee a chance to respond, reaffirm or change a vote.

[Here follow the comments by Mr. Henry Heffernan regarding the acceptance of X11.1 - M[UMPS] Language Standard as an American National Standard, in a letter dated September 16, 1994.]

"Objections to the Draft Revision of X11.1 - Programming Language M

1. Backward Incompatible Specifications

The proposed revision contains a number of changes to the X11.1-1990 specifications that are backward incompatible. Application programs coded in strict accordance with the 1990 MUMPS Standard will not be processed, or will be processed but produce unintended results, if run on a processor conforming to this draft revision.

The MDC has not forewarned the canvassees about these backward incompatibilities, and has not offered any rationale for these changes. The MDC must identify for the canvassees ALL of the backward incompatibilities that are contained in this draft revision, and explain the reason for each of these, so that the canvassees can make an informed determination of whether the purported benefits that motivated the introduction of these backward incompatible changes are worth the cost of rewriting applications programs.

Users need to assess the extent of reprogramming that may be required to avoid serious disruption of computer services for their organizations when converting to the proposed revised version of the standard. Since the canvassees have been given no indication that there are any backward incompatibilities, their evaluation of the proposed revision may well have not taken these potential problems into consideration yet.

2. Conformance Clause

The conformance clause must be rewritten to remove the circularity of reasoning and to correctly express what conformance to a standard means.

For example, a conforming implementation is defined as one that correctly executes a conforming application, and a conforming application is defined as one that is acceptable to a conforming implementation—both are defined in terms of each other.

In addition, an implementation is defined as still "conforming" to the standard even if it does not conform to some specific features or portability requirements specified in the standard, so long as a "conformance statement" declares these non-conformances. The scope of conformance is stated to include other MDC documents that have not received any public review or approval through ANSI due process, and which are not prohibited from changing or revoking features in the ANSI approved standard.

Further, the specifications for variable handling and the process-stack, which are implementation descriptions, are stated to be merely reference models, and to not require implementations to follow these specifications. This waiver of conformity requirements introduces a radical indeterminacy into the control structure of the language.

This definition of "conformance," therefore, is a blank cheque for any implementer to be able to claim conformance no matter what the implementation actually does or fails to

do with respect to the standard. All the implementer needs to do is describe the divergences from the standard's specifications in a document that is submitted to the MDC for information purposes, and then refer to this document after it is logged in as an MDC numbered document. This proposed standard's conformance requirements will allow an implementer to make any proprietary change in the implementation at any time and still claim "conformance to the ANSI standard."

Finally, a corrected conformance statement must include a discussion of conformance to the separable parts being proposed for adoption as related standards.

3. Introduction and Overview of the Standard

The section containing the overview and introduction to the standard in the ANSI X11.1-1984 standard should be updated and restored to this proposed revision of the standard. This section was removed from the 1990 revision without any honest explanation or notification to the canvassees in the November 1989 reconfirmation ballot. This section provides a very valuable overview of the standard, and should have been updated and included in the 1990 standard.

4. Security Facilities

The proposed standard does not contain features for security. This deficiency must be remedied before this proposed revision can be considered for adoption as an ANSI or Federal Information Processing Standard.

5. IF-THEN-ELSE

The proposed standard has not corrected the long-standing deficiency in the undefined semantic relationship between the ELSE command and the IF command. This deficiency is not merely a glaring problem from the perspective of programming language design principles, but becomes a very serious safety problem for applications because of the deterministic side-effects of other features of the language affecting the $T value.

This flaw must be corrected before this proposed revision can be considered for adoption as an ANSI or Federal Information Processing Standard.

6. Transaction Processing, JOB Command, Argumentless DO, and X11.2 - "Open" MUMPS Interconnect

This proposed revision, along with the associated proposed X11.2 OMI specification, introduces parallel, duplicated, yet partially inconsistent facilities for similar processes. There is no architectural consistency between these facilities. In addition, no use is made of the much clearer definition of these capabilities that have been adopted as national and international standards.

This proposed revision must be reworked to use the facilities defined in the international standards for remote data access, transaction processing, and for other services of the international open systems interconnection standards.

The "argumentless DO" facilities, introduced into the 1990 ANSI standard, must be moved into an informative deprecated features annex, as the first step in the permanent removal of this flawed construct from the language. The inadequacies of this construct for providing structured programming facilities are a matter of record in the objections submitted during the 1989-1990 ANSI canvass and the subsequent appeals, and in the technical problems identified with respect to the corresponding Federal Information Processing Standard.

7. The 45 Technical Flaw Problems Identified for NIST

This proposed revision has not resolved the technical flaws, inconsistent specifications, and logical gaps identified in the 45 problem descriptions submitted by NIST to the MDC for resolution. Adequate resolutions to these problems must be introduced into this specification before it can be considered for adoption as a revision of X11.1."

[Here follows the response of the MDC to Mr. Henry Heffernan regarding the acceptance of X11.1 - M[UMPS] Language Standard as an American National Standard in a letter dated February 6, 1995.]

"1. Backward Incompatible Specifications

Mr. Heffernan claims that the current draft standard contains backward incompatibilities with the 1990 standard, but does not provide citations of such changes. Lacking specific direction, we attempted to define all items in the new draft that could possibly be construed as backward incompatible.

To our knowledge, the only backward incompatibility in the draft 1994 standard is the removal of the function $NEXT. This backward incompatibility was announced as early as 1984.

It might be possible to consider as a backward compatibility the correction of "Issue 23" (dis-allowing the occurrence of the same *name* multiple times in a *formallist*). Since such usage was generally considered to be an error, and nobody has come forward to identify a usage problem, we do not directly see this as [an] actual problem.

Despite diligent searching, we cannot identify any other elements to which his objection might refer.

2. Conformance Clause

Mr. Heffernan claims that the conformance section contains circular definitions.

After rereading the section several times, we are of the opinion that the word "conformance" does occur many times, but never in such a way that it forms a circular definition. For example, the definition of strictly conforming application is clearly not circular. The definition is: A *strictly conforming program* shall only use the constructs specified in Section 1 of this Standard, shall not exceed the limits and restrictions specified in Section 2 of the Standard and shall not depend on extensions of an implementation or implementation-dependent features.

In particular, the definition that is quoted by Mr. Heffernan as being circular does not occur at all. We believe therefore that this matter is satisfactorily addressed.

We agree that implementers are able to claim a level of conformance with the standard even if there are exceptions. However, the section was constructed using the POSIX and C standards, together with ISO/IEC TR 10034:1990 - Guidelines for the preparation of conformity clauses in programming language standards, as a basis. It should be noted that is a requirement of the conformance statement that implementers specify for each version of their products exactly what they do not support.

We have followed these guidelines and other standards as closely as possible and we believe that providing this capability will enable users to a) gain access to new facilities specified in the Standard more speedily and b) to more easily procure M[UMPS] systems to meet their needs.

3. Introduction and Overview of the Standard

Mr. Heffernan requests that two sections that occurred in the 1984 standard and do not occur in the 1990 standard nor in the draft 1994 standard be re-introduced. Since these sections were removed in response to ANSI's style-rule to not replicate information, we cannot re-insert these items unless specifically directed to do so by ANSI.

4. Security Facilities

Mr. Heffernan requests that features for security be included in this version of the standard. Work on these features is ongoing in the MUMPS Development Committee. The current status of this work is far too premature to consider inclusion in this version of the standard. We invite Mr. Heffernan to participate in the work to prepare such features for the next version of the standard.

M[UMPS] vendors all provide implementation-specific security provisions that have served their needs and that preclude the dangers of which Mr. Heffernan speaks. The process of standardizing those elements is an arduous one that should not be hastened. We welcome Mr. Heffernan's participation in that process, should he elect to do so.

5. IF-THEN-ELSE

Mr. Heffernan requests that the semantics of the ELSE command in M[UMPS] be revised to avoid possible ambiguity, but he does not indicate the specific changes that he would consider acceptable. The MDC has considered several proposals to an effect similar to Mr. Heffernan's request. As yet, all of these proposals were rejected because of the backward incompatibilities that they would introduce. We will note Mr. Heffernan's desire to review this point. However, the current mode of operation of the language is a well known language element. It may not be to Mr. Heffernan's liking, but neither the MDC nor any other Canvass respondents appear to consider it a flaw that needs correction. In fact, most of the actual user community would be expected to voice concerns similar to those Mr. Heffernan expressed on the topic of backward incompatibility, should the MDC make this requested change as suggested by Mr. Heffernan.

6. Transaction Processing, JOB Command, Argumentless DO and X11.2 - "Open" MUMPS Interconnect

Mr. Heffernan claims that there are inconsistencies between the draft X11.1 standard and the draft X11.2 standard. Without specific citations, we are unable to respond to this statement in detail.

Mr. Heffernan claims that the "Argumentless DO" needs to be deprecated in favor of other "structured programming facilities." All proposals for other "structured programming facilities" that were quoted by Mr. Heffernan in his reactions to the 1989-1990 ANSI canvass have been discussed by the MDC and had to be rejected because of the (many) internal inconsistencies. Discussion of this topic continues within the MDC. Mr. Heffernan is welcome to join in the discussions and to submit proposals. If and when we identify a new construct that meets with the approval of the community, we will include it in a future version of the M[UMPS] language standard.

This is essentially the same point that was raised by Mr. Heffernan during the ANSI canvass process that led to acceptance of the 1990 X11.1. At that time, Mr. Heffernan's appeal was rejected. Raising the same point again risks the creation of an endless repetition of previously denied objections, each time the standard is revised and reviewed. The ANSI review and appeal process is not, in our opinion, re-

quired to revisit objections that have been formally submitted, considered, and rejected at all levels including ANSI's Board of Standards Review.

7. The 45 Technical Flaw Problems Identified for NIST

Mr. Heffernan claims that 45 technical flaws were submitted by NIST to the MDC for resolution and that the proposed revision does not resolve these. Firstly: only 42 issues were raised by NIST before the text of this draft was finalized; the additional three were not communicated to the MDC until October 19th, 1994, well after the closing date for comments on this iteration of the M[UMPS] language standard.

Of these 42:
31: were resolved by providing an explanation to NIST
10: were resolved by provision of an interpretation to NIST and appropriate rewording in the next revision
1: is resolved in the current draft standard.
Since all 42 issues are resolved to the satisfaction of NIST, we do not see a need for further action on these issues."

X11/95-27

To: Participants in MDC X11.2 Canvass Re: Report of Unresolved Objections to the Proposed New Standard

The MUMPS Development Committee (MDC) is seeking recognition of its standard, X11.2 - Open M[UMPS] Interconnect, as an American National Standard under the accredited canvass method of the American National Standards Institute (ANSI). In the ANSI accredited canvass method, the sponsor (MDC) conducts a canvass, or mail poll, of directly and materially affected persons (organizations, companies, government agencies, individuals, and so on) to obtain evidence of consensus, which will be considered by ANSI in the approval of the standard as an American National Standard.

There were two objections raised during the canvass regarding X11.2 that could not be resolved as of this writing.

In accordance with the requirements of ANSI, MDC has reported these unresolved objections to the canvass list in order to afford each canvassee a chance to respond, reaffirm or change a vote.

[Here follow the comments by Mr. Henry Heffernan dated September 16, 1994.]

"1. Conformance Clause

For this specification to be considered for adoption as an American National Standard, the normative annex on conformance must be rewritten to include explicitly all conformance-related provisions that are scattered throughout the specification. In the specification there are open-ended statements that seriously compromise the meaning of conformance to this proposed standard. The generic statements about conformance in this annex, therefore, have no meaning because of the escape clauses found in various places in the specification itself.

2. Introduction, Overview, and Rationale of the OMI Specification

This OMI document, in stark contrast to the X11.1 standard, contains excellent discussions and explanations of the intended use of the OMI and the flexibility of this capability for different user needs. These sections provide a very valuable overview of the functionality described in the specifications.

These discussions, however, make it clear that the word "open" in the title of the specification document does not have the same meaning as "open" in all of the international and national standards for open systems interconnection and open distributed processing. The title of the specification should be changed to something like "inter-MUMPS interconnect," or "MUMPS to MUMPS interconnect." This changed wording in the title would be accurate and unambiguous.

3. Security Facilities

The specifications do not contain the architectural framework of security services that would be consistent with OSI and other network security services. This deficiency must be remedied before this proposed specification can be considered for adoption as an ANSI or Federal Information Processing Standard.

4. The OMI Transaction Processing, Remote Data Access, and Other Interconnection Services

This specification introduces parts of the functionality that have been very fully defined and adopted as national and international standards in the OSI family of standards. The purpose of the OMI would be fulfilled by the MDC agreeing on a profile of OSI services, a TP API, and [an] M specialization of the international RDA standard services.

This proposed specification must be reworked to use the facilities defined in the existing international standards for remote data access, transaction processing, and for other services of the open systems interconnection standards.

5. Appropriateness of the Specification for a Consortium

The discussion of the purposes of this specification, and the very flexible conformance requirements that are scattered in various places in the specification, describe what can best be defined as a proposed consortium agreement, and not a standard. The implementers voluntarily participate in implementer agreement

development meetings, and are not obligated to implement all of the features identified in the specification. There is a registration service, but no obligation to participate. There is a discussion of likely extensions that will be introduced in the future, but no requirement that implementers agree. The so-called MUMPS Standards Interpretation Review Board is mentioned as the organization that will determine at any particular time what is in conformance with the standard and what is not; the specification document itself is not defined as normative for [the Board's] decisions. There is no specification of what will be required for this kind of facility to be testable and certifiable as conforming to the standard.

Under these circumstances, the OMI properly should be promoted as an implementation guide for the consortium of implementers interested in participating. The OMI specification is not suitable for consideration as a standard."

[Here follows the MDC response to Mr. Henry Hefferman on his objections to the draft revision of X11.2 - Open M[UMPS] Interconnect.]

"1. Conformance Clause

The purpose of the conformance annex A is not to define the standard's conformance-related provisions, the main text does that. "This annex defines levels of conformance to this standard and prescribes information that implementers shall provide to document the conformance." (Annex A) [emphasis added]

Rather than duplicate conformance-related provisions, the annex's prescription of required information, Table A.1, refers to the clauses in which those provisions are defined. The MDC believes that the conformance annex therefore clearly specifies the information that implementers shall provide to document their conformance.

2. Introduction, Overview, and Rationale

Without debating the meaning of "open," the MDC has invested substantial effort in sponsorship of this standard explicitly to afford network access to MUMPS databases by any party, regardless of [the] programming language (see the opening paragraph of the standard). This is the intent and also the effect of the draft standard: CDI Ltd. has marketed a C function library that implements an OMI client for any language that can call C functions.

If you know of any specific facets of OMI that restrict network access to MUMPS data, the MDC invites you to identify them and to participate in the next revision of the standard to remove such restrictions.

3. Security Facilities

The objection claims lack of a framework consistent with OSI and other network security services. Clause 4.5 discusses security features. It describes those that the sponsor finds appropriate for the session and presentation layers of the OSI protocol model and has therefore included in OMI. It also explicates those features that other layers of the model are expected to provide. The MDC believes that by partitioning its security features according to this model, a product including OMI can provide security concordant with the current state of commercial practice.

4. Transaction Processing, Remote Data Access, and Other Services

The MDC agrees that OMI does not specify all the functions of distributed data processing, and [it] recognize[s] that this will be a very long process. The current draft standard deals extensively with data access, a worthy object of standardization itself.

The process of standardization is an endless one, requiring the completion of small steps that are consistent with long[-] range goals. We believe that our process meets these criteria, and we do not claim that our results are "complete" in this, or many other, matters.

We are actively pursuing many other network functions. Although peripheral to the current proposal, they may be of interest to you. Some of the options under investigation include:

- Binding to other standards: process-to-process communication via TCP; remote procedure call via DCE; network management via SNMP; and transaction processing via the OSI family of distributed TP standards, which may require extension of OMI or adoption of another protocol at the session level.
- Extension of OMI: process initiation, transmission to devices, program loading, and support for national character sets.

5. Appropriateness of the Specification for a Consortium

This objection claims that the draft standard is not suitable on several points, which we address individually:

"Implementers . . . are not obligated to implement all of the features." In fact, they are required to do so. The conformance to annex A defines strict conformance: *". . . shall use only the constructs specified in this standard, shall not exceed the limits and restrictions specified, and shall not depend on extensions."* The annex also defines other levels of conformance involving two kinds of extensions:

- Those extensions publicly defined by the MDC and other standards bodies may modify the limits and restrictions of X11.2. The conformance statement shall name the documents that define these extensions.
- Those extensions defined by the implementer may not change the limits and restrictions of X11.2, but shall "execute all messages conforming to both this standard and the implementation-defined extensions." (Annex A)

"Very flexible conformance requirements." Some of the draft standard's specifications define acceptable ranges of parameters (for example, min/max length of variables), information fields (for example, implementation identification), and how to handle data access functions that may not be available on some nodes (for example, replication). While the content of these items may vary among confirming implementations, no vendor is excused from implementing them.

The MDC intends that any two conforming OMI implementations will successfully perform the prescribed functions of the protocol. If you know of any specific counter-example, you are invited to bring it forward for development of a correction to the standard.

"Voluntarily participate," "no obligation to participate," "no obligation that implementers agree." The informative annexes B and C, by definition not normative elements of the standard, contain these topics of the objections. The rationale and the discussion of planned extensions for OMI are included for the guidance and information of the interested community. The MDC believes that these annexes enhance the utility and acceptability of the standard.

". . . testable and certifiable as conforming to the standard." The MDC, like most standards-sponsoring organizations, lacks the resources for verifying compliance of implementations. Clause B.8 presents its reasons for sponsoring a standard in the absence of a formal verification process.

We would like to clarify the purpose of the MUMPS Standards Interpretation Review Board. It does not interpret standards, but "arbitrates disputed interpretations of this standard." (Clause B.8) The MDC does have an Interpretations Task Group, which develops clarifications and interpretations of its standards as necessary. The task groups' products are regular MDC documents that will either be incorporated into future versions of the standards or published as corrigenda through the ANSI standard procedures of review and acceptance."

[Here follow the comments of Mark Grzebien dated December 30, 1994, and addressed to the Secretary of the Board of Standards Review at ANSI.]

"I am writing you in reference to my objection to the MDC X11.2 Open M[UMPS] Interconnect proposal now before you.

During the canvass phase I objected to a lack of functionality in OMI to the M[UMPS] Development Committee. The MDC has informed me that the next phase of the process is to contact ANSI. (See attached copy of the letter from MDC.)

It is my understanding that the objective in designing OMI is to create a standard protocol that M[UMPS] and non-M[UMPS] systems can use for access to M[UMPS] databases, following a client-server model. Such a protocol would eliminate the need for implementation specific protocols that not every system uses or understands, and I support this.

My objection is as follows:

The OMI Standard should include cross-system jobbing NOW not later. The current non-standard but widely used data exchange protocol provides the ability to start M[UMPS] jobs in other environments. OMI provides all the same capabilities but lacks this facility for cross-system jobbing.

DSM DDP is a non-standard but widely used M[UMPS] data exchange protocol that provides almost the same functionality as OMI. Cross-system jobbing functionality has been present in DSM DDP for many years. I currently work with four flavors of M[UMPS] that implement this functionality. Since the functionality is out there and in use, there is little reason for anyone using that protocol to change to a newer "standard" protocol that offers less functionality. Those legacy systems don't offer cross-system transaction processing or process to process communication or any of the other niceties being discussed for the following OMI standard proposal, but they do allow for cross-system jobbing.

Workarounds for this lack of functionality are clumsy and involve writing "task manager" type jobs that monitor queues in order to start up jobs locally. A copy of such a "task manager" job would have to run in every environment on every machine. This is resource wasteful and by no means an elegant solution.

After a long debate, I have decided to formalize my objection to this proposal with ANSI. It will be too long to wait for the following OMI standard version to come along that may include this functionality. There is little incentive to move from a system that works, and offers the required functionality, to another system that, while standard, doesn't offer at least the same minimal functionality.

I am not inclined to use an OMI that doesn't provide at least the same functionality as is currently implemented, and doubt

that other users will be inclined to do so either. Nor do I believe that they will be "happy" with a STANDARD that does not include current capabilities.

There is little use for a standard that doesn't provide at least the minimum functionality which is in use today. What good is a standard that no one uses?

Sincerely,
//s//
Mark P. Grzebien
Sr. Systems Analyst
National Data Corporation"

[Here follows the MDC response to Mr. Grzebien's objections to the draft revision of X11.2 - Open MUMPS Interconnect, in a letter dated February 6, 1995.]

"The "current" OMI standard is the result of an iterative process, and at any moment in time, one 'snapshot' will count as the officially approved current standard, while several additions are in the process of being discussed and polished to perfection, so that these can be included in the next version of the standard. If the MUMPS Development Committee were to postpone the submission of a draft standard until all conceivable options and additions have been incorporated, we would never be able to produce a final (ideal) document.

The scope of the current draft standard is data access; however the MDC is actively pursuing many other network functions, among them starting a process on a server node, which you identified in your letter ballot. Now before our networking subcommittee, a proposal for this function is expected to become a part of the next version of the OMI standard.

If you would like to see the work in progress, you are invited to request a copy of the OMI JOB proposal from the MDC secretariat. It will be printed in December 1994. You are also invited to join in the development of the M standards. Membership in the MDC is open to any organization that has an interest in M and will participate in the meetings.

Other network functions under consideration may be of interest to you:

- By binding to other standards: process-to-process communication via TCP; remote procedure call via DCE; network management via SNMP; and transaction processing via the OSI family of distributed TP standards, which may require extension of OMI or adoption of another protocol at the session level.
- By extension of OMI: transmission to devices, program loading, and support for national character sets." M