



doc. nr.	ISO/IEC JTC 1/SGFS N 533	
date	1992-05-07	total pages
item nr.		supersedes document

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ISO/IEC JTC 1/SGFS
Title: ISO/IEC JTC 1 Special Group on Functional Standardization
Secretariat: NNI (Netherlands)

Title : EWOS Liaison to ISO/TC 184/SC5 and to ISO/IEC/JTC1/SGFS from EWOS/EG MMS and OIW MMS SIG: EWOS and OIW Joint Position Paper on MMS profiles (EWOS/TA/91/171 attached)

Source : EWOS

Status : for discussion during the SGFS Plenary Meeting June 15-19, 1992, Washington DC, USA

Note :

To: Chairman of ISO/TC 184/SC 5
Chairman of ISO/IEC/JTC 1/SGFS

From: EWOS EG MMS Chairperson, G. Carry
OIW MMS SIG Chairperson, H. Falk

The attached position paper "Profiles for MMS" has been developed and agreed between EWOS EGMMS and OIW MMS SIG and represents a harmonized position within the two workshops. Liaison with an equivalent AOW group has not been possible since AOW has no MMS work item.

The document:

- A. proposes a taxonomy in alignment with the TR10000 structure, for MMS based profiles,
- B. proposes an initial document structure which could be used for drafting ISP's in this area,
- C. will be ratified by the EWOS Technical Assembly as a liaison statement to ISO/IEC/JTC 1/SGFS,
- D. has been reviewed and balloted by the OIW MMS SIG and is the basis for the reformatting of the OIW MMS SIG Stable Agreements.

In recognition of the importance of standardized OSI profiles in the area of manufacturing, the need for integration with "office" based applications and the significance of the JTC1 SGFS initiative, EWOS and OIW MMS SIG make the following proposals:

1. that MMS be recognised by JTC1 as an application layer standard and that appropriate entries be made in the following documents:
 - ISO/IEC/TR 10000-2. Information Technology - Framework and taxonomy of International Standardized Profiles - Part 2: Taxonomy,
 - JTC1/SGFS N100. Information Technology - Framework and taxonomy of International Standardized Profiles - Directory of ISP's and Profiles contained therein.
2. that it is now appropriate to begin drafting ISP's for manufacturing applications based on ISO/IEC 9506. Such drafts would be developed in an appropriate workshop and will be submitted to ISO/IEC/JTC 1/SGFS and ISO/TC184/SC 5 as pDISP.

In performing the ISP development work, EWOS EGMMS and OIW MMS SIG recognize the need to continue liaison and harmonization activities, including liaison with Common Upper Layer issues.



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Herbert FÄlk

EWOS AND OIW JOINT POSITION PAPER :

P R O F I L E S F O R M M S

Version 2.3

Date : 23 June 1991

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1. INTRODUCTION

The Manufacturing Message Specification (MMS) is an OSI protocol that allows interworking of various computers and programmable devices, from different vendors, in the manufacturing environment. It resides in layer 7 of OSI Reference Model and uses an object modelling approach for the description of manufacturing applications. The MMS specification defines a set of messages suitable for the manipulation of the real devices found in these manufacturing applications.

MMS has evolved into a multi-part ISO/IEC standard, ISO/IEC 9506. Parts 1 and 2, known as the core, describe the modelling approach, the syntax and semantics of the services and the protocol. Additional parts, known as companion standards, describe the extensions of the core for specific application areas, for example numerical controllers, robot controllers and process control systems.

Within each application area, a range of functionality can be identified e.g. for attended or unattended operation, for simple or complex devices. To satisfy these functional needs, a range of conformance can be specified within a companion standard.

Companion standards describe the application of MMS concepts to the real devices in that application area. A Companion Standard also specifies extensions to the MMS core services.

Each of the parts of MMS are being progressed by different committees and are in various states of development. The following table shows some of the parts of MMS and their status :

ISO/IEC 9506 PART NO:	DOCUMENT CONTENT	STATUS
1	MMS Service Definitions	IS
2	MMS Protocol Specification	IS
3	Robot Controller Message Specification	IS
4	Numerical Controller Message Specification	2nd CD
5	Programmable Controller Message Specification	CD
6	Process Industries Message Specification	CD
	Production Management Message Specification	

As in many other areas, manufacturing applications need to be able to mix equipment from a range of vendors. The equipment must be able to interoperate in order to create the required distributed environment. OSI is recognised as the solution to the communications problem for interworking; in particular MMS is recognised as a required technology in the manufacturing environment.

Thus, OSI International Standardized Profiles (ISP's) incorporating MMS are needed to define the implementation requirements for manufacturing equipment. Such profiles shall incorporate MMS. An ISP provides more information than the identification of which MMS service subsets are to be implemented; Companion Standards perform that function. An ISP defines the complete OSI requirements for implementations to achieve multi-vendor interoperability, which protocol version and subsets are needed to support MMS in session, presentation and ACSE.

The current ISP taxonomy requires extension to include ISP's that use MMS. The following section presents the OSI taxonomy for MMS profiles as recommended by EWOS and OIW.

2. JOINT PROPOSAL FOR THE MMS TAXONOMY

This section presents the proposed MMS taxonomy.

The taxonomy is for a series of Application-profiles (A-profiles) using MMS. An A-profile specifies the requirements for layers 5 to 7 of the OSI Reference Model. Transport-profiles (T-profiles) specify the OSI requirements for layers 1 to 4. Any real device implements at least one A and one T-profile.

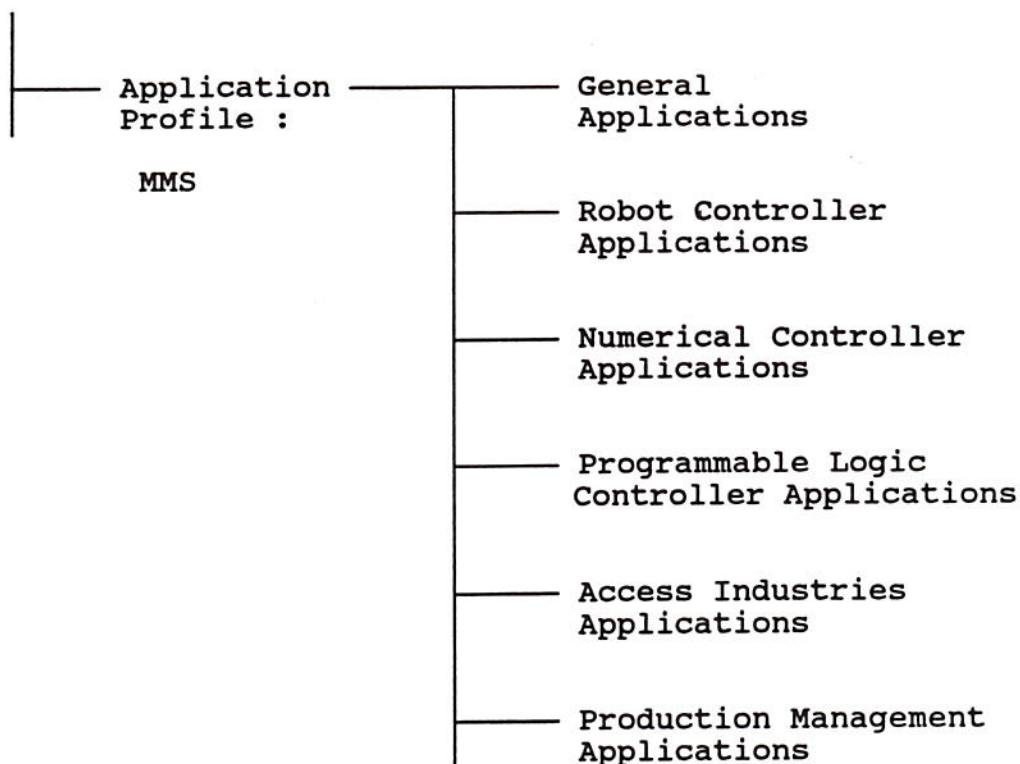
From the structure of MMS, briefly reviewed in the previous section, it can be seen that the OSI profiles for MMS need to be classified according to application area and functionality i.e. the profiles structure should follow the organisation of the companion standards. The taxonomy also needs to be extendable to permit the inclusion of additional application areas in the future e.g. vision systems or printed circuit board manufacture.

The first subsection shows this structure diagrammatically. The second subsection uses the notation for Application Profiles, in TR 10000, to define the taxonomy for inclusion in section 5.3 of part 2 of TR 10000¹.

Note that an application area titled General Applications is shown. The intention of this classification is to cover devices used in application areas that do not require companion standards yet still need to be identified in an MMS ISP. A specification for this classification will only make use of the MMS core context, as identified in parts 1 and 2 of ISO/IEC 9506.

¹ Currently, JTC-1 procedures do not allow the inclusion of MMS based profiles in the taxonomy. The intent of this proposal is for inclusion of MMS in TR 10000 in whatever clause and part is deemed appropriate by the procedures when developed. There is a preference for TR 10000-2 5.3

2.1 TAXONOMY ORGANISATION



This structure is intended to be easily extendable to accommodate additional application areas as necessary. The new areas would be added in parallel to the ones shown above.

Further refinement of the structure, to increase the granularity of the profile classification, is fur further study. A deeper structuring of the classification may be needed to identify the functional groupings within an application area.

For example, there maybe a number of groupings for supporting Programmable Logic Controller Applications to reflect different application requirements : Data Acquisition and Parametric Control or Program Management. If such groupings are needed, they can be incorporated into the structure by introducing additional branches below the Programmable Logic Controller node.

2.2 TR 10000 NOTATION

This section proposes the taxonomy structure for MMS Application profiles to be included in section 5.3 of part 2 of TR 10000². The scheme is based on the structure introduced in the previous section and uses the TR 10000 notation for Application Profiles.

The profiles are named AMM - Application profiles for Manufacturing Messages.

This taxonomy does not show or limit the structuring of the ISP specifications, it is a classification scheme to identify the whole ISP. Indeed, as proposed in the following section, the multipart approach to ISP development is preferred. A multipart ISP contains a number of independent parts each of which defines some particular aspect of the ISP. This document structure is not apparent in the taxonomy.

MANUFACTURING SERVICES

AMM Manufacturing Messaging

abc	Substructure
1	General Applications
2	Robot Controller Applications
3	Numerical Controller Applications
4	Programmable Logic Controller Applications
5	Process Industries Applications
6	Production Management Applications

Further refinement of the substructure, beneath this level, to increase the granularity of the profile classification, is for further study. A deeper structuring of the classification may be needed to identify the functional groupings within an application area.

² Currently, JTC-1 procedures do not allow the inclusion of MMS based profiles in the taxonomy. The intent of this proposal is for inclusion of MMS in TR 10000 in whatever clause and part is deemed appropriate by the procedures when developed. There is a preference for TR 10000-2 5.3.

3. MMS AS A MULTI-PART ISP

EWOS and OIW believe that a multi-Part approach (as described in TR 10000) is appropriate to ISP development for MMS profiles. It enables uniqueness of specifications common to a number of ISP's to be achieved and reuses the efforts of others. An added benefit of this approach is that not all base standards have to be available before meaningful ISP's can be progressed. Each part can be separately developed and approved. Hence a session to ACSE Part can be progressed before companion standards are ready. This is of benefit for MMS, where companion standards are developing at different rates.

In situations where different profiles make identical use of base standards or where profiles are related, it is convenient that profiles share common text. This maintains consistency, ensures interworking and avoids errors and duplication of text. The common text is documented in discrete Parts of an ISP.

Using this multi-Part approach, any Part of an ISP can be referred to by another ISP. The procedure is that if an ISP (ISP A) is structured into a number of document Parts, another ISP (ISP B) can cross reference (point to) one of the Parts in ISP A for that section of ISP B's definition.

For example, all of the MMS profiles for NC's, RC's etc. could share the same session to ACSE specification. This definition could be detailed in a part of one ISP and the other ISP's refer to it or all the MMS profiles could refer to an appropriate part of an FTAM profile or other appropriate A-profile to share it's session, presentation and ACSE requirements. Similarly there will be some aspects of using ISO/IEC 9506 part 1 and 2 that will apply to all uses of MMS. Again one MMS ISP (e.g. General Applications) could detail these requirements as one of its parts and the other ISP's could point to that part.

An ISP with only one Part cannot contain the definition of more than one profile. However a multi-Part profile can define one complete profile OR a family of related profiles. So the profiles for MMS could all be documented in one, multi-Part ISP or in a number of separate ISP's.

EWOS and OIW propose that each application area has its own ISP, each having a similar structure.

EWOS and OIW propose the following structure for the MMS ISP document structure, an ISP for the General Applications is used as an example.

ISP Outline Structure	
Part No.	Content
1	ACSE, Presentation, ASN.1 and Session requirements
2	Common MMS requirements
3	General Application requirements

Notes :

1. As mentioned above, the content of some of these parts may be very small since it may only need to refer the reader to a part in another ISP where the detailed specification can be found.

For example, part 1 of the above document is anticipated to refer to a common upper layer agreements' ISP part currently being developed within EWOS and OIW. Hence there would not be any detailed specification in part 1.

2. Note that conformance requirements are specified for every part.

EWOS and OIW further propose that the ISP "General Applications" is an appropriate ISP in which to document the detailed technical agreements for the Common MMS requirements. All other MMS ISP's would then refer to part 2 of the "General Applications" ISP for that part of their ISP.

Similarly, it is proposed that part 1 of all MMS ISP's should refer to the appropriate ISP part that contains the common upper layer agreements' mentioned in note 1 above.

As an example, the following table shows the document structure for a single Numerical Controller Application Class, taking advantage of the ability to use the detailed technical specifications contained in other ISP's :

ISP Outline Structure		
Part No.	Content	Description
1	ACSE, Presentation, ASN.1 and Session requirements	See ISP 'Z' Part 'N' "Common Upper Layer Agreements" for the detailed definition
2	Common MMS requirements	See ISP "General Applications" Part 2 for the detailed definition
3	Numerical Controller requirements	Detailed definition contained in this document

Using one ISP for each application area allows the option for the requirements of different functional groupings to be documented in separate Parts. This simplifies the maintenance of the ISP by not causing changes to existing Parts if additional functional groupings need to be defined. In this case it is only necessary to add an extra Part. For example in the example given above, Part 3 could be the requirements for a simple class of NC and a new part could be written, part 4, to document the requirements of a more complex class of NC.

Thus simple and complex functionalities could be documented in different profile Parts. These Parts can then be progressed and STABILISED at different rates, depending on companion standard development. This approach presents more timely and stable specifications to the market place.