Business To Manufacturing Markup Language

Work Performance

Version 6.0 - March 2013

B2MML-WorkPerformance

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CHANGE HISTORY

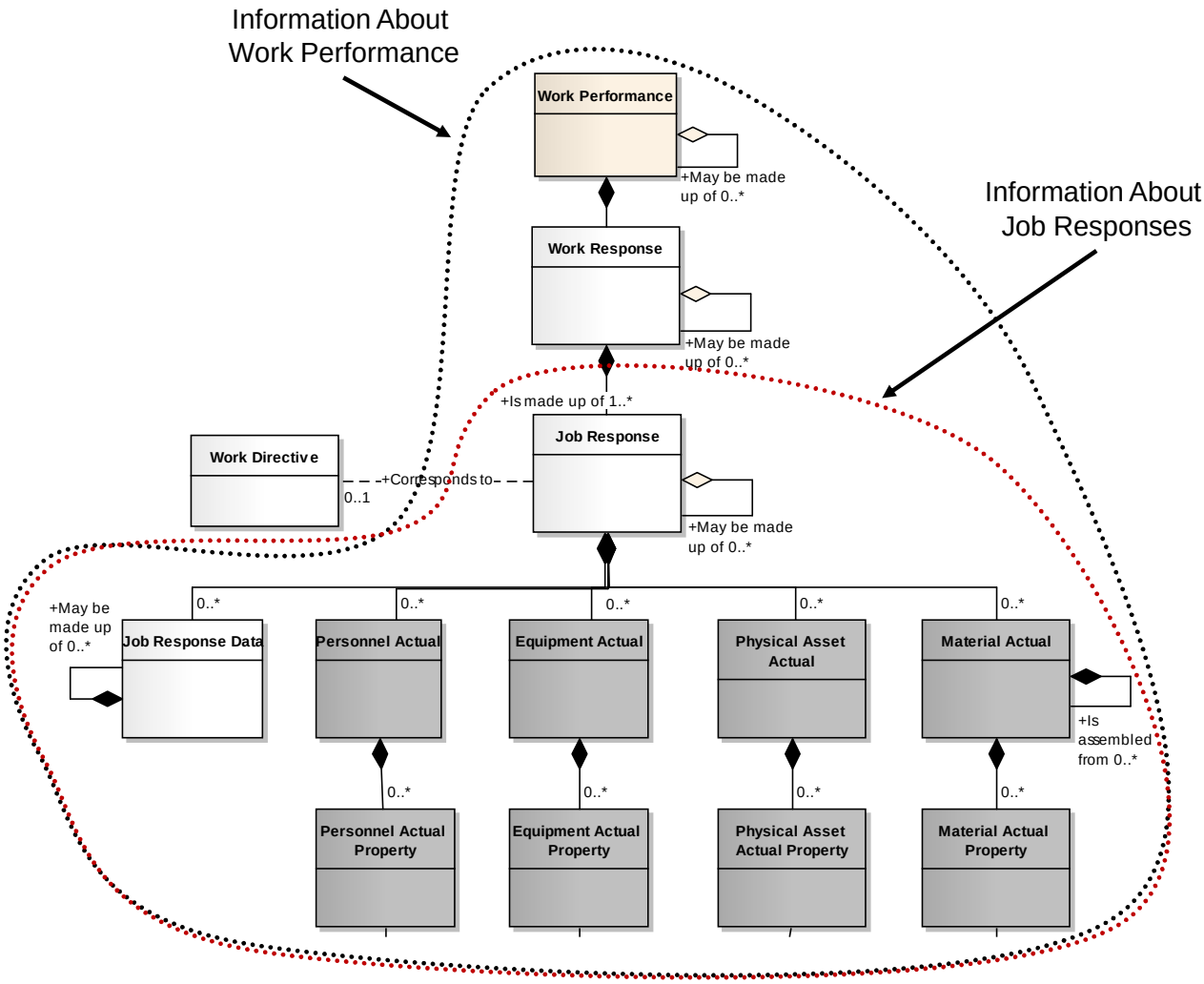
Change	Date	Person	Description
V0600	Aug 2012	D. Brandl	• Initial Version

SCHEMA SCOPE

This document defines the information about Work Performance information. This information is based on the data models and attributes defined in the ANSI/ISA 95.00.04 Enterprise/Control System Integration standard. Contact ISA (The Instrumentation, System, and Automation Society) for copies of the standard. Additional information on the standard is available at www.isa.org.

Key Information Assumptions

The data represented in these schemas is derived from the UML model below. This model is defined in the ANSI/ISA 95.00.04 standard. The information model in the figure below is hierarchical, and the assumption is that the information may be accessed by Work Response or by Job Response.



Model of Exchanged Work Performance and Job Response Information

This schema uses a common schema for definition of elements that are used in multiple schemas, such as ID, Description, and Value. See the document defining the Common schema for definition of the common elements.

Type Definitions

The XML schema uses a model that defines simple and complex data types for each element. The data types all follow the convention of a suffix of "Type" added to the element name. Elements that have the same name in other B2MML schemas are also prefixed with "Op" to uniquely identify the extension group.

Schema definition:

```
<xsd:element name = "OpPersonnelActual"  type = " OpPersonnelActualType"/>

<xsd:complexType name = "OpPersonnelActualType">
    <xsd:sequence>
      <xsd:element name = "PersonnelClassID" type = "PersonnelClassIDType"
                                             minOccurs = "0" />
     …
</xsd:complexType>
```

The method is a modification of the "Venetian Blind Model", defined in the book Professional XML Schemas, 2001, published by WROX (ISBN 1-861005-47-4). It makes all of the type names global and usable in user derived works, without a loss of context or additional information required to identify the element as of being of the same type as related B2MML elements

WorkPerformance

A Work Performance report is made up of a set of one or more work responses. The Work Performance also contains the information that defines the context of the report, such as start time, end time, location, and published date.

WorkResponse

Work responses are collections of job responses. A response may include the type of work, and the start time, end time.

JobResponse

A JobResponse is the response from operations about the execution of a job order.

EquipmentActual

An equipment actual in a Job Response identifies an equipment resource by class ID or instance ID used during execution of the job.

PersonnelActual

A personnel actual in a Job Response identifies a personnel resource by class ID or by instance ID used during execution of the job.

PhysicalAssetActual

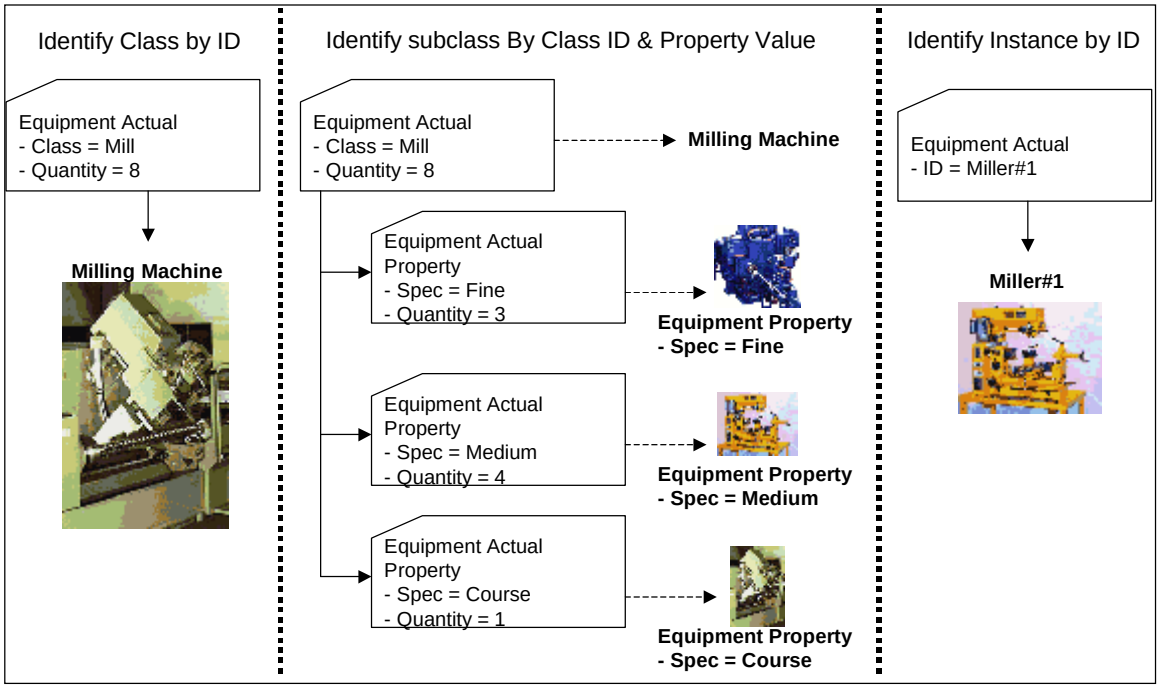
A physical asset actual in a Job Response identifies a physical asset resource by class ID or instance ID used during execution of the job.

MaterialActual

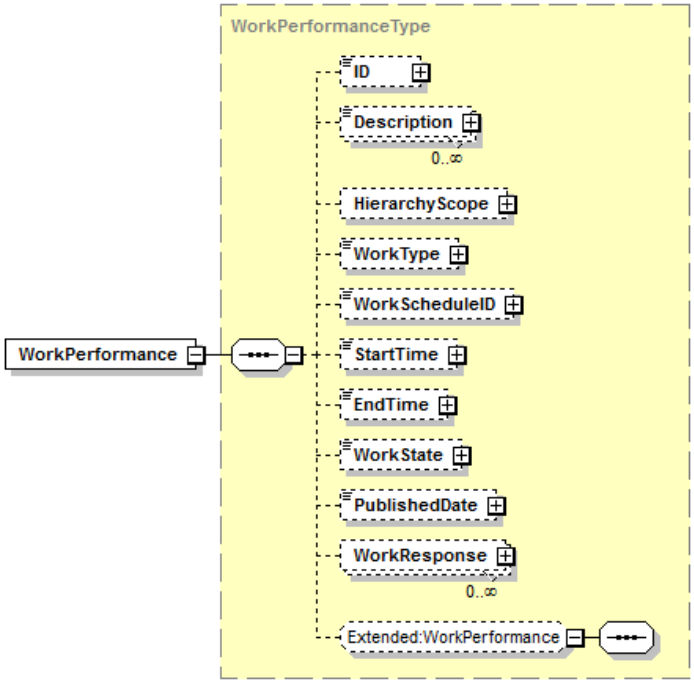
A material produced, material consumed, or consumable material actually used is identified in a MaterialActual. This identifies a material resource by class ID, definition ID, Lot ID, and/or Sublot ID produced or consumed during execution of the job.

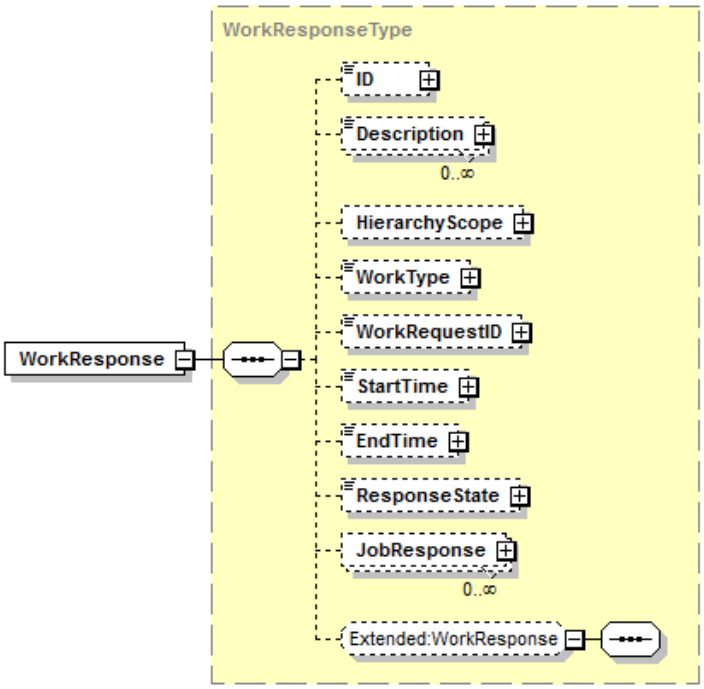
Identifying Resources

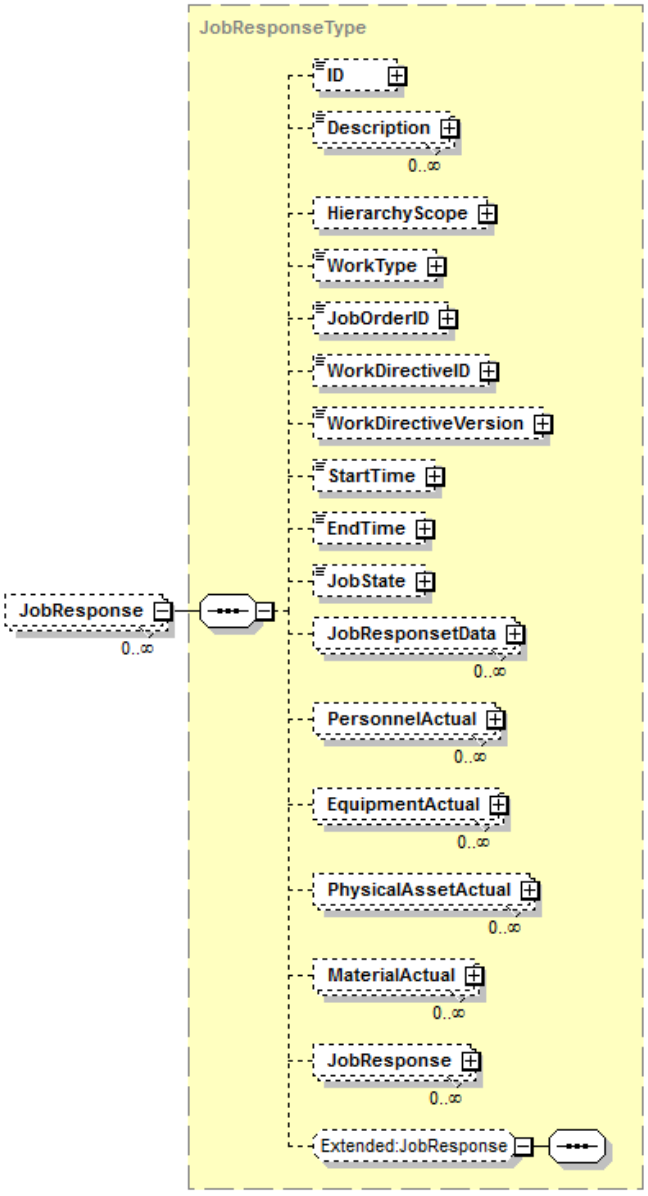
The schemas follow the ANSI/ISA-95 standard by defining resources by class ID or instance ID, or by defining them by class ID and a property value that is used to define a subset of the resource. For example, the figure below illustrates that a segment may require a certain number of milling machine, an equipment class. Other segments may require a subset of milling machine, such as "Fine" milling machines only. In the first case the class name, "Mill", is sufficient to identify the resource required. In the second case the class name, "Mill", and property name and value, "Spec" and "Fine", define the required resource. Alternately a specific resource may be identified in a Job Response report, such as specifying an actual milling machine with ID="Miller#1".

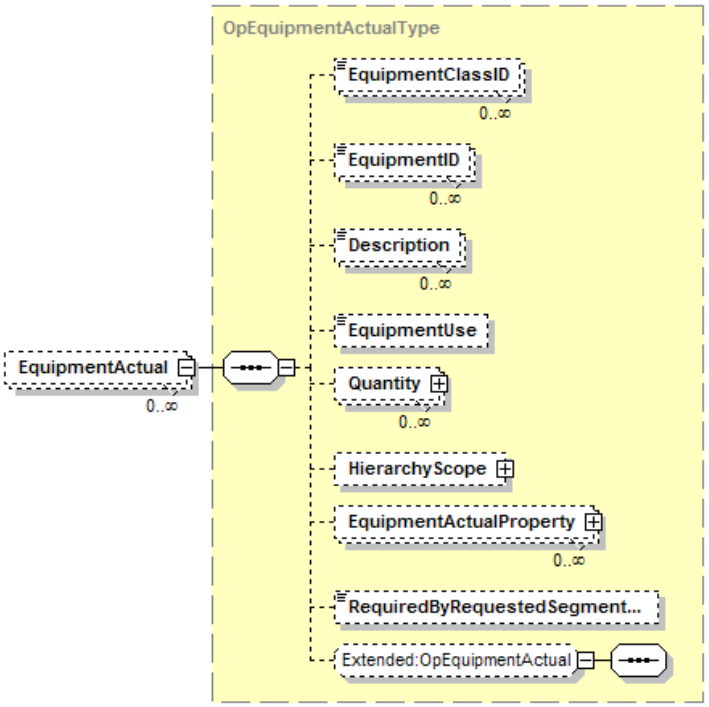


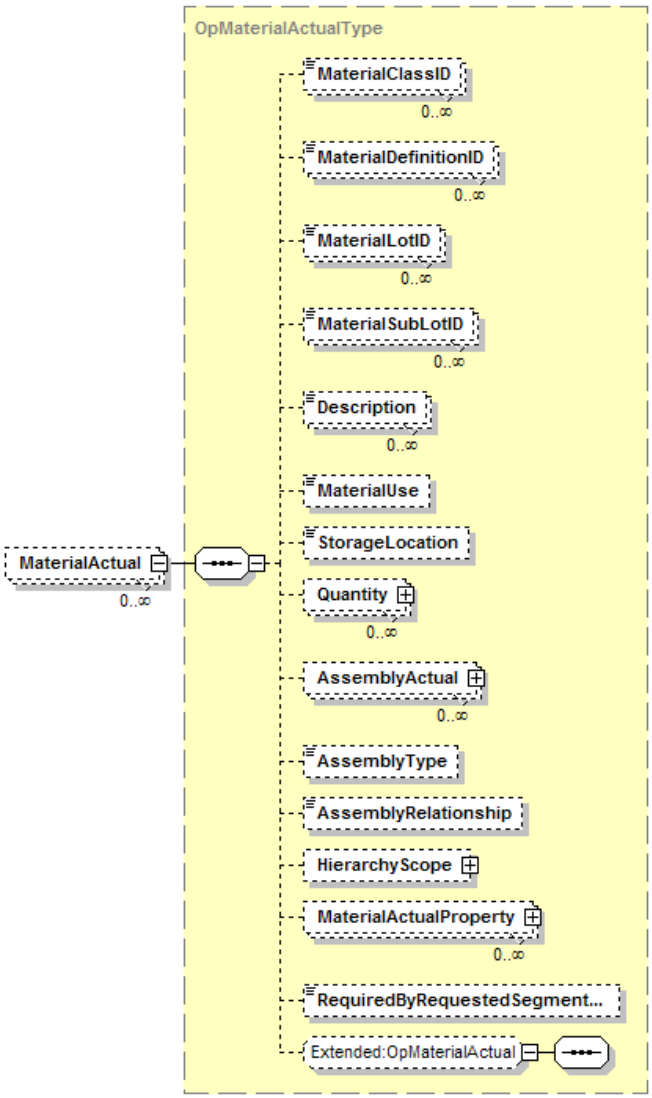
ELEMENT DEFINITIONS

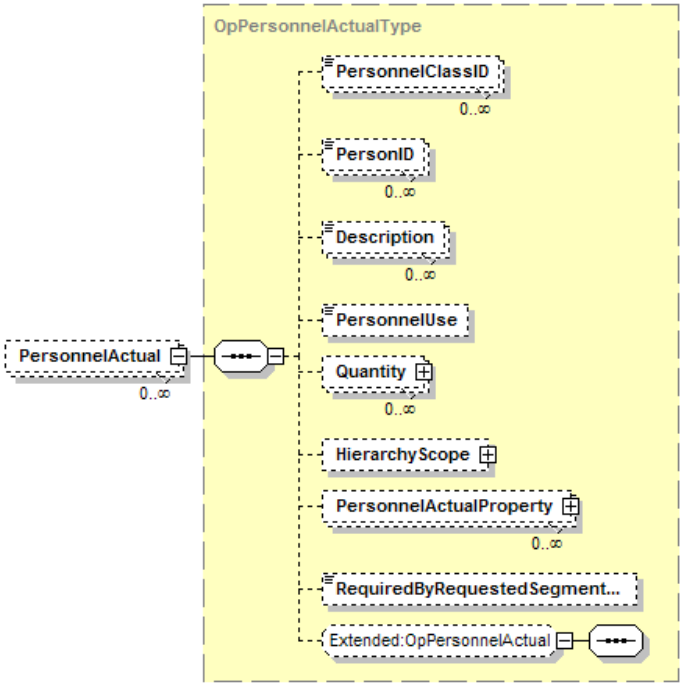
Element/Type	Description
WorkPerformance ***WorkPerformanceType***	The top level element. Contains a definition of a report on Work performance, including the hierarchy scope of the information, the work type, the publication data of the report, and the ID of the associated work schedule, the duration of the work performance. May include application specific defined elements. 

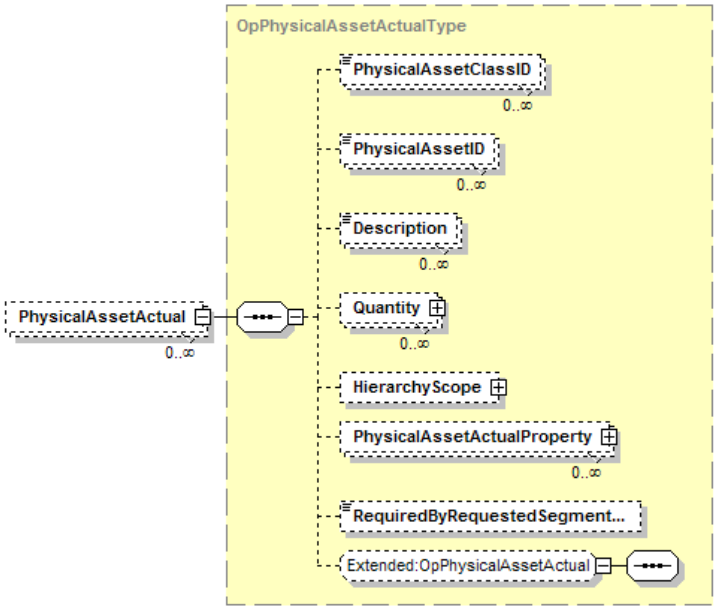
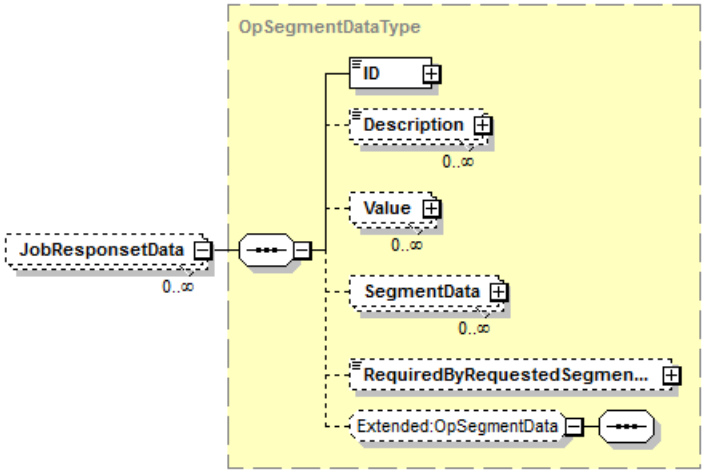
Element/Type	Description
WorkResponse ***WorkResponseType***	Contains a definition of a Work Response report, including the identification of an associated work request, the type of work (Production, Maintenance, Inventory, and Test), the duration of the report, and the response state. 

Element/Type	Description
JobResponse ***JobResponseType***	Contains a definition of a report on the result of execution of a job order. Includes the duration, work type, an ID and version of the associated Work Directive, the start and end time of job execution, personnel, equipment, physical assets, and material used in the execution of the job order. 

Element/Type	Description
EquipmentActual ***OpEquipmentActualType***	Contains a report on actual equipment resources used and use of the equipment. May define the quantity of the resource used, or may contain a list of property definitions and quantities for each property subset. [Note: The RequiredByRequestedJobResponse element is only used when this is part of an Operations Schedule schema.] 
EquipmentActualProperty ***OpEquipmentActualPropertyType***	Contains a definition of actual equipment resources used, for a subset of the resource identified by a property value. Includes the quantity of the resources used.

Element/Type	Description
MaterialActual ***OpMaterialActualType***	Contains a report on actual material resources used and use of the material. May define the quantity of the material, or may contain a list of property definitions and quantities for each property subset. A **MaterialActual** element may have a set of contained **AssemblyActual** elements to support hierarchical manufacturing bills. [Note: The RequiredByRequestedJobResponse element is only used when this is part of an Operations Schedule schema.] 
MaterialActualProperty ***OpMaterialActualPropertyType***	Contains a definition of actual material resources used, for a subset of the resource identified by a property value. Includes the quantity of the resource used.

Element/Type	Description
PersonnelActual ***OpPersonnelActualType***	Contains a report on actual personnel resources used and use. May define the quantity of the resource used, or may contain a list of property definitions and quantities for each property subset. [Note: The RequiredByRequestedJobResponse element is only used when this is part of an Operations Schedule schema.] 
PersonnelActualProperty ***OpPersonnelActualPropertyType***	Contains a definition of actual personnel resources used, for a subset of the resource identified by a property value. Includes the quantity of the resources used.

Element/Type	Description
PhysicalAssetActual ***OpPhysicalAssetActualType***	Contains a report on actual physical asset resources used and use. May define the quantity of the resource used, or may contain a list of property definitions and quantities for each property subset. [Note: The RequiredByRequestedJobResponse element is only used when this is part of an Operations Schedule schema.] 
PhysicalAssetActualProperty ***OpPhysicalAssetActualPropertyType***	Contains a definition of actual physical asset resources used, for a subset of the resource identified by a property value. Includes the quantity of the resources used.
JobResponseData ***OpSegmentDataType***	Contains a definition of a job response data element, Includes the ID of the information and the value for the date, and nested segment data elements. [Note: The RequiredByRequestedJobResponse element is only used when this is part of an Operations Schedule schema.] 

TRANSACTION ELEMENTS

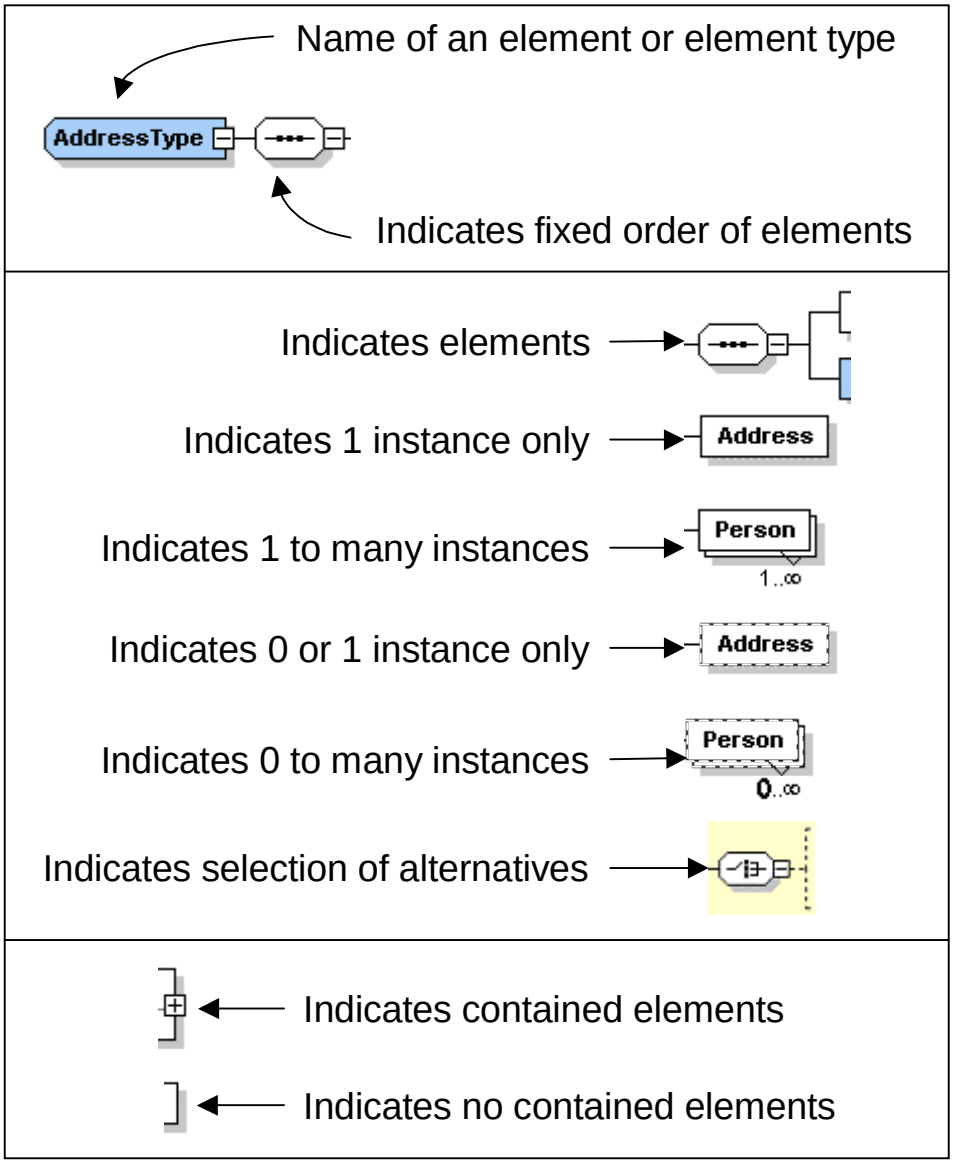
The following elements are defined to support the ISA 95 Part 5 transactions, using the transaction data types defined in the B2MML-Common.xsd schema.

Work Performance Elements	Description
GetWorkPerformance	Get *WorkPerformance* definition.
ShowWorkPerformance	Returned information from the *GetWorkPerformance* message.
ProcessWorkPerformance	Process *WorkPerformance* definition.
AcknowledgeWorkPerformance	Returned status from the *ProcessWorkPerformance* message.
ChangeWorkPerformance	Change *WorkPerformance* definition.
RespondWorkPerformance	Returned status from the *ChangeWorkPerformance* message.
CancelWorkPerformance	Cancel *WorkPerformance* definition.
SyncWorkPerformance	Published *WorkPerformance* definition.

Job Response Elements	Description
GetJobResponse	Get *JobResponse* definition.
ShowJobResponse	Returned information from the *GetJobResponse* message.
ProcessJobResponse	Process *JobResponse* definition.
AcknowledgeJobResponse	Returned status from the *ProcessJobResponse* message.
ChangeJobResponse	Change *JobResponse* definition.
RespondJobResponse	Returned status from the *ChangeJobResponse* message.
CancelJobResponse	Cancel *JobResponse* definition.
SyncJobResponse	Published *JobResponse* definition.

DIAGRAM CONVENTION

The schema diagrams using the following convention to illustrate the structure of the schema elements, the type of the elements and attributes, and the rules for optional elements and repetition.



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About the XML Committee: The XML Committe was formed within MESA to provide a forum for the development of the B2MML and BatchML specifications.