

SV-9 : Systems Technology Forecast

This document defines the mapping between the DODAF SV-9 Systems Technology Forecast and the ISO 10303 AP233 Systems Engineering information model. This mapping is defined for the purpose of enabling data exchange between computer applications supporting the ISO AP233 standard and those supporting the US DoDAF CADM format, specifically CADM 1.02.

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1. Introduction

The SV-9 Systems Technology Forecast Product Description in the DoDAF Volume II: Product Descriptions document defines SV-9 as follows.

The Systems Technology Forecast defines the underlying current and expected supporting technologies. It is not expected to include predictions of technologies as with a crystal ball. Expected supporting technologies are those that can be reasonably forecast given the current state of technology and expected improvements. New technologies should be tied to specific time periods, which can correlate against the time periods used in SV-8 milestones.

2. SV-9 AP233 Mapping Issues

Warning:

At the time this document was written, AP233 was still undergoing development.

This section describes the issues in mapping between SV-9 Systems Technology Forecast and ISO AP233 as of the date of publication of this document. These issues may be addressed in future work by the DoDAF Working Group, the ISO AP233 development team or others.

1. CADM Technology, Technical Service, Technology Forecast are all mapped into AP233 Products. These do seem to represent a future product description. However, extensions to better support these concepts should be considered for inclusion in AP233.

3. Mapping SV-9 CADM XML to AP233 XML

This section defines the mapping from the CADM XML representation of SV-9 Systems Technology Forecast into an ISO AP233 XML representation of that same data. The mapping is defined at the detailed level of the XML elements and attributes themselves as it is aimed at implementors. See AP233 for more information on the AP233 XML Schema and the AP233 EXPRESS schema.

Please review the rules for AP233 XML data production as they are applicable to all implementations.

3.1. SV-9 Systems Technology Forecast Mapping

This section describes the mapping for the CADM SV-9 Systems Technology Forecast itself.

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SV-9 is an instance of DOCUMENT in the subtype SYSTEM-TECHNOLOGY-FORECAST, which is defined by one or more instances of SYSTEM-TECHNOLOGY-FORECAST-PROFILE. The latter contains the identifiers for a specific SYSTEM, a specific TECHNICAL-SERVICE, a TECHNOLOGY-COUNTERMEASURE, a TECHNOLOGY-FORECAST, and a PERIOD. The PERIOD is the same entity used to characterize a TECHNICAL-STANDARD-FORECAST-ELEMENT, TECHNICAL-STANDARD-FORECAST, and TECHNOLOGY-FORECAST.

The following table documents the CADM SYSTEM-TECHNOLOGY-FORECAST (SYS_TECH_FCST) mapping.

| CADM XML Element(s) | AP233 XML Element(s) or Attributes(s) |
|------------------------------------|---|
| SYS_TECH_FCST | An AP233 Document with related version and definition, as specified in the AP233 approach to documents each classified as an SYSTEM-TECHNOLOGY-FORECAST . See the mapping for CADM Document for more detail. |
| SYS_TECH_FCST / SYSTECH_FRC_DOC_ID | The identifier for the Document representing the CADM Systems Technology Forecast assigned by the owning organization. |

Table 1: Within the SYS_TECH_FCST_TBL CADM XML Element

3.2. Systems Technology Forecast Profile Mapping

The following table documents the CADM SYS_TECH_FCST_PRF Element mapping

| CADM XML Element(s) | AP233 XML Element(s) or Attributes(s) |
|--|--|
| SYS_TECH_FCST_PRF | An AP233 Document with related version and definition, as specified in the AP233 approach to documents each classified as an SYSTEM-TECHNOLOGY-FORECAST-PROFILE . |
| SYS_TECH_FCST_PRF / SYS_ID | An AP233 Document_assignment relating the AP233 representation of the CADM System to the AP233 Document representing the profile. |
| SYS_TECH_FCST_PRF / SYSTECH_FRC_DOC_ID | An AP233 Document_definition_relationship where the AP233 representation of the CADM System Technology Forecast is referenced by the Relating_document_definition and the AP233 representation of the CADM System Technology Forecast Profile is referenced by the |

| | |
|---------------------------------------|---|
| | <p>Related_document_definition. The AP233 Document_definition_relationship is classified as SYSTEM-TECHNOLOGY-FORECAST-PROFILE.</p> |
| SYS_TECH_FCST_PRF / SYS_TFP_ID | <p>The identifier of the AP233 representation the CADM System Technology Forecast Profile.</p> |
| SYS_TECH_FCST_PRF / TECHS_ID | <p>An AP233 Document_assignment relating the AP233 representation of the CADM Technical Service to the AP233 Document representing the profile.</p> |
| SYS_TECH_FCST_PRF / TECH_ID | <p>An AP233 Document_assignment relating the AP233 representation of the CADM Technology to the AP233 Document representing the profile.</p> |
| SYS_TECH_FCST_PRF / TECHN_CM_ID | <p>An AP233 Document_assignment relating the AP233 representation of the CADM Technology Countermeasure to the AP233 Document representing the profile.</p> |
| SYS_TECH_FCST_PRF / TECHF_ID | <p>An AP233 Document_assignment relating the AP233 representation of the CADM Technology Forecast to the AP233 Document representing the profile.</p> |
| SYS_TECH_FCST_PRF / TIME_FRAME_PRD_ID | <p>An AP233 Time_interval and related Time_interval_assignment, with its Items child element containing a reference to the AP233 Document representing the CADM profile, as specified in AP233 Dates and times with the assignment classified as a SystemTechnologyForecastProfileTimeFramePeriod. The CADM Period concept is mapped to the AP233 Time_interval or Time_interval_with_bounds as appropriate.</p> |

Table 1: Within the SYS_TECH_FCST_PRF_TBL CADM XML Element

3.3. Technology Forecast Mapping

The following table documents the CADM TECHNOLOGY FORECAST (TECH_FORECAST) Element mapping

| CADM XML Element(s) | AP233 XML Element(s) or Attributes(s) |
|---------------------|---------------------------------------|
|---------------------|---------------------------------------|

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|------------------------------------|--|
| TECH_FORECAST | An AP233 Document classified as TECHNOLOGY FORECAST . |
| TECH_FORECAST / TECHS_ID | An AP233 Document_assignment relating the AP233 representation of the CADM Technical Service to the AP233 Document representing the forecast. |
| TECH_FORECAST / TECH_ID | An AP233 Document_assignment relating the AP233 representation of the CADM Technology to the AP233 Document representing the forecast. |
| TECH_FORECAST / TECHF_CNFLVLDES_TX | An AP233 Description_text and related assignment to the AP233 representation of the CADM Technology Forecast as specified in with the assignment classified as a TECHNOLOGY-FORECAST CONFIDENCE LEVEL . |
| TECH_FORECAST / TECHF_DESCR_TX | The Description of the AP233 Document. |
| TECH_FORECAST / TECHF_ID | The identifier of the AP233 representation the CADM Technology Forecast. |
| TECH_FORECAST / TECHF_NM | An identifier for the Document representing the CADM Systems Technology Forecast classified as Name . |
| TECH_FORECAST / TECHF_PRDAV_CAT_NM | The classification of the AP233 representation of the CADM Technology Forecast where the name of the AP233 External_class is the name of this attribute. The TECHNOLOGY-FORECAST PRODUCT AVAILABILITY CATEGORY is represented as part of the AP233/CADM taxonomy. |
| TECH_FORECAST / TECHF_PROD_AV_TX | An AP233 Description_text and related assignment to the AP233 representation of the CADM Technology Forecast as specified in with the assignment classified as a TECHNOLOGY-FORECAST PRODUCT AVAILABILITY COMMENT . |
| TECH_FORECAST / TIME_FRAME_PRD_ID | An AP233 Time_interval and related Time_interval_assignment, with its Items child element containing a reference to the AP233 Document representing the CADM Technology Forecast, as specified in AP233 |

| | |
|--|---|
| | <p>Dates and times with the assignment classified as a TechnologyForecastTimeFramePeriod.</p> <p>The CADM Period concept is mapped to the AP233 Time_interval or Time_interval_with_bounds as appropriate.</p> |
|--|---|

Table 1: Within the TECH_FORECAST_TBL CADM XML Element

3.4. Technical Service Mapping

The following table documents the CADM TECHNICAL-SERVICE (TECH_SVC) Element mapping

| CADM XML Element(s) | AP233 XML Element(s) or Attributes(s) |
|-------------------------------|--|
| TECH_SVC | An AP233 Product classified as TECHNICAL-SERVICE . |
| TECH_SVC / TECHS_AVAIL_STA_CD | <p>The classification of the AP233 representation of the CADM Technology depending on the following values.</p> <ul style="list-style-type: none"> • when 01, GENERALLY ACCEPTED IN COMMERCIAL PRODUCTS • when 02, IMPLEMENTED IN ONLY A FEW COMMERCIAL PRODUCTS • when 03, IMPLEMENTED IN JUST ONE COMMERCIAL PRODUCT • when 04, NO KNOWN COMMERCIAL IMPLEMENTATIONS • when 05, AT LEAST ONE GOVERNMENT OWNED PRODUCT • when 08, AVAILABILITY NOT SPECIFIED • when 09, AVAILABILITY NOT KNOWN |
| TECH_SVC / TECHS_DESCR_TX | The Description of the AP233 Product. |
| TECH_SVC / TECHS_ID | The identifier of the AP233 representation the CADM Technical Service. |
| TECH_SVC / TECHS_NM | An identifier for the Product representing the CADM Systems Technical Service classified as Name . |
| TECH_SVC / TECHSA_ID | <p>The classification of the AP233 representation of the CADM Technical Service depending on the value of the Technical Service Area.</p> <p>The CADM TECHNICAL-SERVICE-AREA is not mapped directly. It is mapped as part of the</p> |

AP233/CADM Taxonomy so each area is a class.

Table 1: Within the TECH_SVC_TBL CADM XML Element

3.5. Technology Mapping

The following table documents the CADM TECHNOLOGY (TECH) Element mapping

| CADM XML Element(s) | AP233 XML Element(s) or Attributes(s) |
|---------------------------|--|
| TECH | An AP233 <code>Product</code> classified as TECHNOLOGY . |
| TECH / TECH_DESCR_TX | The <code>Description</code> of the AP233 <code>Product</code> . |
| TECH / TECH_DEV_STATUS_CD | The classification of the AP233 representation of the CADM Technology depending on the following values. 01 = EXISTING, 02 = EMERGING, 03 = PLANNED, 04 = CONCEPTUAL, 08 = NOT SPECIFIED, 09 = NOT KNOWN. |
| TECH / TECH_ID | The identifier of the AP233 representation the CADM Technology. |
| TECH / TECH_NM | The identifier classified as Name of the AP233 representation the CADM Technology |
| TECH / TECH_SCI_AREA_CD | The classification of the AP233 representation of the CADM Technology depending on the following values. <ul style="list-style-type: none"> • when 01, classified as TELECOMMUNICATIONS • when 02, classified as SECURITY • when 03, classified as TECHNOLOGY MANAGEMENT • when 04, classified as COMPUTERS • when 05, classified as ELECTRONIC DOCUMENTS • when 06, classified as ELECTRONIC COMMERCE • when 07, classified as DATABASE TECHNOLOGY • when 08, classified as DATA TRANSFER MECHANISMS • when 09, classified as ARTIFICIAL INTELLIGENCE • when 10, classified as SENSING • when 11, classified as SENSOR FUSION |

| | |
|-----------------------------------|--|
| | <ul style="list-style-type: none"> when 12, classified as SPEECH RECOGNITION when 13, classified as FRACTALS when 14, classified as FIBER OPTICS when 98, classified as TECHNOLOGY NOT SPECIFIED when 99, classified as TECHNOLOGY NOT KNOWN |
| TECH / TECHFTECH_TIM_FR_CAT_CD_ID | <p>The classification of the AP233 representation of the CADM Technology depending on the following values.</p> <ul style="list-style-type: none"> when 1, classified as TECHNOLOGY TIME FRAME BASELINE when 2, classified as TECHNOLOGY TIME FRAME INTERMEDIATE when 3, classified as TECHNOLOGY TIME FRAME OBJECTIVE when 8, classified as TECHNOLOGY TIME FRAME NOT SPECIFIED when 9, classified as TECHNOLOGY TIME FRAME NOT KNOWN |

Table 1: Within the TECH_TBL CADM XML Element

3.6. Technology Countermeasure Mapping

The following table documents the CADM TECHNOLOGY-COUNTERMEASURE (TECH_CM) Element mapping

| CADM XML Element(s) | AP233 XML Element(s) or Attributes(s) |
|-----------------------------|--|
| TECH_CM | An AP233 <code>Product</code> classified as TECHNOLOGY-COUNTERMEASURE . |
| TECH_CM / TECH_ID | An AP233 <code>Product_relationship</code> with the <code>Relating_product</code> referring to the AP233 <code>Product</code> representing the CADM Technology and the <code>Related_product</code> referring to the AP233 <code>Product</code> representing the CADM Technology Countermeasure. The AP233 <code>Product_relationship</code> is classified as TECHNOLOGY-COUNTERMEASURE . |
| TECH_CM / TECHN_CM_DESCR_TX | The <code>Description</code> of the AP233 <code>Product</code> . |
| TECH_CM / TECHN_CM_ID | The identifier of the AP233 representation the CADM Technology Countermeasure. |

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|-----------------------|--|
| TECH_CM / TECHN_CM_NM | The identifier classified as Name of the AP233 representation the CADM Technology Countermeasure. |
|-----------------------|--|

Table 1: Within the TECH_CM_TBL CADM XML Element

4. Example SV-9 CADM XML Data

This section contains example SV-9 CADM XML data.

4.1. Example SYS_TECH_FCST

```
<SYS_TECH_FCST>
  <SYSTECH_FRC_DOC_ID>99990021</SYSTECH_FRC_DOC_ID>
</SYS_TECH_FCST>
<DOC>
  <DOC_ID>99990021</DOC_ID>
  <DOC_NM>SAMPLE SYSTEM TECHNOLOGY FORECAST {SV-9}</DOC_NM>
  <CSC_ID>20000001</CSC_ID>
  <TIME_FRAME_PRD_ID>20102341</TIME_FRAME_PRD_ID>
  <DOC_APP_CALDT>20031126</DOC_APP_CALDT>
  <DOC_ARCHPROD_TY_CD>41</DOC_ARCHPROD_TY_CD>
  <DOC_CRTN_CALDT>20031203</DOC_CRTN_CALDT>
  <DOC_CAT_CD>J</DOC_CAT_CD>
  <DOC_VER_ID>VERSION 1.0</DOC_VER_ID>
</DOC>
```

5. Example SV-9 AP233 XML Data

This section contains example SV-9 AP233 XML data.

5.1. Example Document

```
<ap233:Document id="id-doc12771" />
<ap233:Identification_assignment id="id-doc12771-idassign">
  <Identifier>99990021</Identifier>
  <Items>
    <ap233:Document ref="id-doc12771" xsi:nil="true" />
  </Items>
</ap233:Identification_assignment>
<ap233:Classification_assignment
id="id-docall12771-classification_assignment">
  <Items>
    <ap233:Document ref="id-doc12771" xsi:nil="true" />
    <ap233:Document_version ref="id-docver12771" xsi:nil="true" />
    <ap233:Document_definition ref="id-docdef12771" xsi:nil="true" />
  </Items>
  <Assigned_class>
    <ap233:External_class ref="id-SYSTEM-TECHNOLOGY-FORECAST"
```

```

xsi:nil="true" />
  </Assigned_class>
</ap233:Classification_assignment>

<ap233:Document_version id="id-docver12771">
  <Of_product>
    <ap233:Document ref="id-doc12771" xsi:nil="true" />
  </Of_product>
</ap233:Document_version>

<ap233:Document_definition id="id-docdef12771">
  <Defined_version>
    <ap233:Document_version ref="id-docver12771" xsi:nil="true" />
  </Defined_version>
  <Initial_context>
    <ap233:View_definition_context ref="id-sv9" xsi:nil="true" />
  </Initial_context>
</ap233:Document_definition>

```

5.2. Example Product

```

<ap233:Product id="id-prod12999" />

<ap233:Identification_assignment id="id-prod12999-idassign">
  <Identifier>99994400</Identifier>
  <Items>
    <ap233:Product ref="id-prod12999" xsi:nil="true" />
  </Items>
</ap233:Identification_assignment>

<ap233:Classification_assignment
id="id-prod12999-idassign-classification_assignment">
  <Items>
    <ap233:Identification_assignment ref="id-prod12999-idassign"
xsi:nil="true" />
  </Items>
  <Assigned_class>
    <ap233:External_class ref="id-TECHNOLOGY" xsi:nil="true" />
  </Assigned_class>
</ap233:Classification_assignment>

```

5.3. Example Document_assignment

```

<ap233:Document id="id-doc12771" />

<ap233:Identification_assignment id="id-doc12771-idassign">
  <Identifier>99990079</Identifier>
  <Items>
    <ap233:Document ref="id-doc12771" xsi:nil="true" />
  </Items>
</ap233:Identification_assignment>

<ap233:Classification_assignment
id="id-doc12771-idassign-classification_assignment">

```

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```
<Items>
  <ap233:Identification_assignment ref="id-doc12771-idassign"
xsi:nil="true" />
</Items>
  <Assigned_class>
    <ap233:External_class ref="id-Document_identification_code"
xsi:nil="true" />
  </Assigned_class>
</ap233:Classification_assignment>

<ap233:Document_version id="id-docver12771">
  <Of_product>
    <ap233:Document ref="id-doc12771" xsi:nil="true" />
  </Of_product>
</ap233:Document_version>

<ap233:Document_definition id="id-docdef12771">
  <Defined_version>
    <ap233:Document_version ref="id-docver12771" xsi:nil="true" />
  </Defined_version>
  <Initial_context>
    <ap233:View_definition_context ref="id-sv9" xsi:nil="true" />
  </Initial_context>
</ap233:Document_definition>

<ap233:Classification_assignment
id="id-docall12771-classification_assignment">
  <Items>
    <ap233:Document ref="id-doc12771" xsi:nil="true" />
    <ap233:Document_version ref="id-docver12771" xsi:nil="true" />
    <ap233:Document_definition ref="id-docdef12771" xsi:nil="true" />
  </Items>
  <Assigned_class>
    <ap233:External_class ref="id-TECHNOLOGY-FORECAST" xsi:nil="true" />
  </Assigned_class>
</ap233:Classification_assignment>

<ap233:Document_assignment id="id-prod12999-doc12771" >
  <Is_assigned_to>
    <ap233:Product ref="id-prod12999" xsi:nil="true"/>
  </Is_assigned_to>
  <Assigned_document>
    <ap233:Document ref="id-doc12771" xsi:nil="true" />
  </Assigned_document>
</ap233:Document_assignment>
```