Variable Representation and Question Response Domain

All structures that populate the substitutions for ValueRepresentation or ResponseDomain are reusable. These reusable structures are described by delineations for each type and maintained within a delineation scheme for each type. This supports both reusability of the structure (i.e. the TextDelineation for a U.S. 5-digit ZIP Code) and the creation of comparison maps between different delineation types. Note that Missing Values are considered separately from other valid response values or representation values used in analyzing the data.

A ValueRepresentation within a Variable or a ResponseDomain within a Question is the applied use of a delineation type. For example, a CodeList describing a full occupational classification code structure may be represented by a number of CodeDelineations, one for the full structure, another containing only a specific level, and a third containing only a sub-range of the codes. Each CodeDelineation would reference the CodeList and provide the subset information if relevant. A Question using a CodeDomain references the CodeDelineation and adds information regarding the ResponseCardinality, the ContentDateOffset, and OutParameter related to its specific use with the Question. A Variable using a CodeRepresentation references the CodeDelineation and adds information the RecommendedDataType, GenericOutputFormat, ContentDateOffset, and classificationLevel (CategoryRelationCode) related to its specific use in the Variable.

ValueRepresentation (abstract)

As the abstract head of a substitution group ValueRepresentation provides the following structural objects for all members of the substitution group.

```
ValueRepresentationType
  RecommendedDataType   (0..1)
  GenericOutputFormat   (0..1)
  ContentDateOffset     (0..1)
  @classificationLevel  optional
                        [Nominal|Ordinal|Interval|Ratio|Continuous]
```

All ValueRepresentations contain a base set of objects describing its applied use. The RecommendedDataType is of type CodeValue and should contain a value reflecting a data type value (recommended: W3C XML Schema Part 2, but excluding string sub-types, QNAME, and NOTATION). The actual data type of the stored data content may vary (for example be of a broader type), but the purpose of this element is to capture the data type intended by the originator of the data. Likewise GenericOutputFormat allows the originator to provide guidance regarding the displayed format of the variable content. ContentDateOffset provides an alternate referent date for the variable content. For example, in a population survey the data may generally be collected for a particular date but some items such as the response to “Where did you live 5 years ago?” refers to a negative offset of 5 years from the

general referent date. The attribute classificationLevel allows for definition of the variable content as Nominal, Ordinal, Interval, Ratio, or Continuous in nature.

ResponseDomain (abstract)

As the abstract head of a substitution group ResponseDomain provides the following structural objects for all members of the substitution group.

```
ResponseDomainType
  r:OutParameter          (0..1)
  ResponseCardinality     (0..1)
     @maxResponses
     @minResponses
  r:ContentDateOffset     (0..1)
```

All Response Domains can designate the intended cardinality of responses as a statement of minimum and maximum number of allowed responses. The OutParameter provides an ID for the response (or response array) so that it can be bound to the InParameter of an instruction or command (see Input/Output Parameters and Command Code for usage details). ContentDateOffset provides an alternate referent date for the question response content.

Delineations

A range of delineation types are available. Each delineation type is described within a maintainable delineation scheme (published in a StudyUnit or ResourcePackage) which supports grouping of delineations for metadata management purposes. The following delineations are available:

DelineationType	Usage options
CodeDelineation	VariableRepresentation or ResponseDomain
DateTimeDelineation	VariableRepresentation or ResponseDomain
GeographicStructureCodeDelineation	VariableRepresentation or ResponseDomain
GeographicLocationCodeDelineation	VariableRepresentation or ResponseDomain
NumericDelineation	VariableRepresentation or ResponseDomain
TextDelineation	VariableRepresentation or ResponseDomain
CategoryDelineation	ResponseDomain only
DistributionDelineation	ResponseDomain only
GeographicDelineation	ResponseDomain only
LocationDelineation	ResponseDomain only
NominalDelineation	ResponseDomain only
RankingDelineation	ResponseDomain only
ScaleDelineation	ResponseDomain only
MissingValuesDelineation	MissingValueRepresentation or ResponseDomain

ResponseDomain substitutions

All response domain substitutions contain the basic ResponseDomain objects plus a reference to one or more of the specific delineation of the same type. Note that if multiple domains are referenced they must not have duplicated values. These include:

- TextDomain
- DateTimeDomain
- NumericDomain
- CodeDomain
- CategoryDomain
- GeographicDomain
- NominalDomain
- ScaleDomain
- LocationDomain
- RankingDomain
- DistributionDomain
- GeographicStructureDomain
- GeographicLocationDomain
- MissingValuesDomain

GeographicLocationDomain also provides a LimitedCodeSegmentCapture which is used to identify the segment of a Geographic Location Code which is captured in this domain. For example, a County's unique location code may be a composite of a State code (2 characters) + County code (3 characters). LimitedcodeSegmentCapture provides a description of the code segment captured in the response and specifies it through the following attributes: arrayBase (clarifying the array based used when determining the start position in the code), startPosition (the first character of the captured code), and the length (the number of characters making up the captured code). Using the above example this would be expressed as:

```
<LimitedCodeSegmentCapture arrayBase="1" startPosition="3"
length="3">
      <Description><Content xml:lang="eng">Unique code is a
      composite of a 2 character State code and 3 character
      Country code. This response domain captures ONLY the county
      code portion of the unique code</Content></Description>
</LimitedCodeSegmentCapture>
```

ValueRepresentation substitutions

All value representation substitutions contain the basic ValueRepresentation objects plus a reference to one or more of the specific delineation of the same type. Note that if multiple representations are referenced they must not have duplicated values. These include:

- TextRepresentation
- DateTimeRepresentation
- NumericRepresentation
- CodeRepresentation
- GeographicStructureRepresentation
- GeographicLocationRepresentation

Within a Variable the representation of missing values is handled separately as a direct reference to a MissingValuesDelineation structure. This may also be declared as a default MissingValues within a LogicalRecord or within a PhysicalInstance.

GeographicLocationRepresentation also provides a LimitedCodeSegmentCapture which is used to identify the segment of a Geographic Location Code which is captured in this domain. See Response Domain section above for description of its use.

Delineations

GeographicLocationCodeDelineation

Delineation for the direct use of a GeographicLocationCode as a GeographicLocationRepresentation or a GeographicLocationDomain. This relieves the user of creating a secondary Code List reflecting the same information and retains contextual information in the use of Geographic Locations as response domains or representations. References the GeographicLocation used, identifies which code is being used based on the AuthorizationSouce and allows specifying which codes to exclude from a set, similar to specific object exclusion from a Scheme Reference.

```
GeographicLocationCodeDelineation
   Extension base: VersionableType
   GeographicLocationCodeDelineationName    (0..n)
   Label                                    (0..n)
   Description                              (0..1)
   IncludedGeographicLocationCodes          (0..1)
      AuthorizedSourceReference             (0..1)
      GeographicLocationReference           (0..1)
      ExcludedLocationValueReference        (0..n)
```

Note that the delineation references a single location type. If multiple location types are possible they would use a StructuredMixedResponseDomain in a Question. Mixing multiple location types is not possible within a Variable. The use of the delineation as a response domain or value representation may include the complete code or a component segment of the complete code.

EXAMPLE:

```
<r:GeographicLocationCodeDelineation isVersionable="true"
typeOfIdentifier="Canonical" scopeOfUniqueness="Agency">
   <r:URN>urn:ddi:us.mpc:GLocDel:2</r:URN>
```

```
   <r:GeographicLocationCodeDelineationName><r:String xml:lang="en">US
Contiguous County Codes for
States</r:String></r:GeographicLocationCodeDelineationName>
   <r:Label><r:String xml:lang="en">Contiguous County Codes for States
- FIPS</r:String></r:Label>
   <r:Description><r:Content xml:lang="en">Contains FIPS County Codes
for the contiguous U.S. Counties (exludes Alaska and Hawaii). Does not
include Territories.</r:Content></r:Description>
   <r:IncludedGeographicLocationCodes>
      <r:AuthorizedSourceReference isReference="true" isExternal="true"
lateBound="false" typeOfIdentifier="Canonical">
   <r:URN>urn:ddi:us.mpc:FIPS:1.0</r:URN>
   <r:TypeOfObject>AuthorizedSource</r:TypeOfObject>
      </r:AuthorizedSourceReference>
      <r:GeographicLocationReference isReference="true"
isExternal="true" lateBound="false" typeOfIdentifier="Canonical">
   <r:URN>urn:ddi:us.mpc:CNTY:1.0</r:URN>
   <r:TypeOfObject>GeographicLocation</r:TypeOfObject>
      </r:GeographicLocationReference>
      <r:ExcludedLocationValueReference isReference="true"
isExternal="true" lateBound="false" typeOfIdentifier="Canonical">
   <r:URN>urn:ddi:us.mpc:ALASKA_CNTY:1.0</r:URN>
   <r:TypeOfObject>LocationValue</r:TypeOfObject>
      </r:ExcludedLocationValueReference>
      <r:ExcludedLocationValueReference isReference="true"
isExternal="true" lateBound="false" typeOfIdentifier="Canonical">
   <r:URN>urn:ddi:us.mpc:HAWAII_CNTY:1.0</r:URN>
   <r:TypeOfObject>LocationValue</r:TypeOfObject>
      </r:ExcludedLocationValueReference>
   </r:IncludedGeographicLocationCodes>
</r:GeographicLocationCodeDelineation>
```

GeographicStructureCodeDelineation

Delineation for the direct use of a GeographicStructureCode as a GeographicStructureRepresentation or GeographicStructureDomain. This relieves the user of creating a secondary Code List reflecting the same information and retains contextual information in the use of Geographic Structures as response domains or representations. References the GeographicStructure used, identifies which code is being used based on the AuthorizationSouce and allows specifying which codes to exclude from a set, similar to specific object exclusion from a Scheme Reference.

```
GeographicStructureCodeDelineation
   Extension base: VersionableType
   GeographicStructureCodeDelineationName   (0..n)
   Label                                    (0..n)
   Description                              (0..1)
   IncludedGeographicStructureCodes         (0..1)
      AuthorizedSourceReference             (0..1)
      GeographicStructureReference          (0..1)
      ExcludedGeographicLevelReference      (0..n)
```

Note that a single value representation or response domain can contain only a single code set for the structure which is identified by its Authorization Source. If a single agency manages several code types they should be clearly differentiated with separate Authorization Source identifiers (i.e., specified down to the specific coding list).

EXAMPLE:

```
<r:GeographicStructureCodeDelineation isVersionable="true"
typeOfIdentifier="Canonical" scopeOfUniqueness="Agency">
   <r:URN>urn:ddi:us.mpc:GLocDel:2</r:URN>
   <r:GeographicStructureCodeDelineationName><r:String xml:lang="en">US
Geographic Structure
Codes</r:String></r:GeographicStructureCodeDelineationName>
   <r:Label><r:String xml:lang="en">US Geographic Structure Codes from
the 1990 U.S. Census</r:String></r:Label>
   <r:Description><r:Content xml:lang="en">Contains geographic
structure codes used by the U.S. Census Bureau in compiling the 1990
Census of Population and Housing. Includes only US, State and County
level structures. Excludes Regions and
Divisions.</r:Content></r:Description>
   <r:IncludedGeographicStructureCodes>
      <r:AuthorizedSourceReference isReference="true" isExternal="true"
lateBound="false" typeOfIdentifier="Canonical">
         <r:URN>urn:ddi:us.mpc:US_Census:1.0</r:URN>
         <r:TypeOfObject>AuthorizedSource</r:TypeOfObject>
      </r:AuthorizedSourceReference>
      <r:GeographicStructureReference isReference="true"
isExternal="true" lateBound="false" typeOfIdentifier="Canonical">
         <r:URN>urn:ddi:us.mpc:US_1990:1.0</r:URN>
         <r:TypeOfObject>GeographicStructure</r:TypeOfObject>
      </r:GeographicStructureReference>
      <r:ExcludedGeographicLevelReference isReference="true"
isExternal="true" lateBound="false" typeOfIdentifier="Canonical">
         <r:URN>urn:ddi:us.mpc:REGION:1.0</r:URN>
         <r:TypeOfObject>GeographicLevel</r:TypeOfObject>
      </r:ExcludedGeographicLevelReference>
      <r:ExcludedGeographicLevelReference isReference="true"
isExternal="true" lateBound="false" typeOfIdentifier="Canonical">
         <r:URN>urn:ddi:us.mpc:DIVISION:1.0</r:URN>
         <r:TypeOfObject>GeographicLevel</r:TypeOfObject>
      </r:ExcludedGeographicLevelReference>
   </r:IncludedGeographicStructureCodes>
</r:GeographicStructureCodeDelineation>
```

TextDelineation

Defines a TextDelineation used by a TextRepresentation or TextDomain, describing the maximum and minimum length of the text string, and providing a regular expression to further constrain the content.

```
TextDelineation
```

```
   Extension base: VersionableType
   TextDelineationName                  (0..n)
   Label                                (0..n)
   Description                          (0..1)
   @maxLength                           optional
   @minLength                           optional
   @regExp                              optional
```

Text allows for the definition of a minimum and maximum length of the text object as well as constraining the allowed content through use of a regular expression.

EXAMPLE:

```
<r:TextDelineation isVersionable="true" scopeOfUniqueness="Agency"
typeOfIdentifier="Canonical" minLength="5" maxLength="5" regExp="[0-
9]{5}">
   <r:URN>urn:ddi:us.icpsr:TD_1.1</r:URN>
   <r:TextDelineationName isPreferred="true"><r:String
xml:lang="en">ZIPCode</r:String></r:TextDelineationName>
   <r:Label><r:String xml:lang="en">United States 5-digit ZIP
Code</r:String></r:Label>
   <r:Description><r:Content isPlain="true" xml:lang="en">The base 5-
digit ZIP Code used by the United States Postal Service for mail
delivery.</r:Content></r:Description>
</r:TextDelineation>
```

DateTimeDelineation

Defines a DateTimeDelineation by prescribing its structure and content coverage.

```
DateTimeDelineation
   Extension base: VersionableType
   DateTimeDelineationName              (0..n)
   Label                                (0..n)
   Description                          (0..1)
   DateTimeFieldFormat                  (0..1)
   DateTimeCode                         (1..1)
```

The DateTimeFieldFormat is a CodeValue which describes the format of the date field, in formats such as YYYY/MM or MM-DD-YY, etc. If this element is omitted, then the format is assumed to be the XML Schema format corresponding to the type attribute value. The use of an external controlled vocabulary is strongly recommended. The DateTimeCode is a CodeValue and is required. This is a standard XML date type code for example date, dateTime, gYearMonth, gYear, and duration. The use of an external controlled vocabulary is strongly recommended.

EXAMPLE:

```
<r:DateTimeDelineation isVersionable="true"
typeOfIdentifier="Canonical" scopeOfUniqueness="Agency"
regExp="((01|02|03)/[0-9]{4})">
   <r:URN>urn:ddi:us.mpc:Dates_1stQTR:1</r:URN>
   <r:DateTimeDelineationName><r:String xml:lang="en">Dates for First
Quarter</r:String></r:DateTimeDelineationName>
   <r:Label><r:String xml:lang="en">Dates (mm/yyyy) covering the First
Quarter</r:String></r:Label>
   <r:Description><r:Content xml:lang="en">Defines the allowed content
for Dates covering the first quarter of the
year.</r:Content></r:Description>
   <r:DateFieldFormat>MM/YYYY</r:DateFieldFormat>
   <r:DateTypeCode>gYearMonth</r:DateTypeCode>
</r:DateTimeDelineation>
```

NumericDelineation

Defines a NumericDelineation by describing the valid numeric range, expressing top or bottom codes, and the valid type for the content.

```
NumericDelineation
   Extension base: VersionableType
   NumericDelineationName              (0..n)
   Label                               (0..n)
   Description                         (0..1)
   NumericRange                        (0..1)
   NumericTypeCode                     (1..1)
```

Provides the valid numeric range in terms of a High and Low number, TopCode or Bottom code, as well as constraining the content through use of a controlled vocabulary. The NumericTypeCode provides definition of the W3C XML numeric type such as integer, decimal, etc.

EXAMPLE:

```
<r:NumericDelineation isVersionable="true"
typeOfIdentifier="Canonical" scopeOfUniqueness="Agency" scale="1"
decimalPostions="0" interval="1">
   <r:URN>urn:ddi:us.mpc:NumRange_1_10:1</r:URN>
   <r:NumericDelineationName><r:String xml:lang="en">Range 1-
10+</r:String></r:NumericDelineationName>
   <r:Label><r:String xml:lang="en">Number Range covering 1 through 10
plus</r:String></r:Label>
   <r:Description><r:Content xml:lang="en">Defines the allowed content
for a number range of 1 - 10 where 10 is topcoded to imply 10 or
more</r:Content></r:Description>
   <r:NumberRange>
      <r:Low isInclusive="true">1</r:Low>
      <r:High isInclusive="true">10</r:High>
      <r:TopCode>10</r:TopCode>
   </r:NumberRange>
```

```
   <r:NumericTypeCode>Integer</r:NumericTypeCode>
</r:NumericDelineation>
```

CodeDelineation

Defines a CodeDelineation by referencing a CodeList and describing the valid code subset used. For example, the complete CodeList, a specified level or range, or only the most discrete codes in the list.

```
CodeDelineation
   Extension base: VersionableType
   CodeDelineationName                  (0..n)
   Label                                (0..n)
   Description                          (0..1)
   CodeListReference                    (0..1)
   CodeSubsetInformation                (0..1)
      IncludedLevel                     (0..n)
      IncludedCode                      (0..1)
         CodeReference                  (0..n)
         Range                          (0..n)
            RangeUnit                   (0..1)
            MinimumValue                (0..1)
            MaximumValue                (0..1)
      DataExistence                     (0..1)
         CHOICE                         (1..1)
            LevelNumber
            DiscreteCategory            fixed=”true”
         ENDCHOICE
```

References the CodeList used by the delineation and defines the portion of the CodeList used by the CodeSubsetInformation. CodeSubsetInformation allows for the specification of a level number from the CodeList to be included in the delineation, included codes defined as a range, or the specification of the just the most discrete data codes. The Range specifies the unit of the range specification as well as a minimum and maximum value. Note that these values use and extended form of Value which allows for the declaration of significant leading or trailing white space within the value as well an attribute noting if the value is inclusive (i.e., included as a valid value in the range specification). DataExistence is specified by the lowest level number for regular hierarchies or by selecting those Code items with the attribute isDiscrete=”true” from the CodeList for irregular hierarchies.

```
EXAMPLE:

<r:CodeDelineation isVersionable="true" typeOfIdentifier="Canonical"
scopeOfUniqueness="Agency">
   <r:URN>urn:ddi:us.mpc:SIC_Code:1</r:URN>
   <r:CodeDelineationName><r:String xml:lang="en">Standard Industrial
Classification Code</r:String></r:CodeDelineationName>
   <r:Label><r:String xml:lang="en">US Standard Industrial
Classification Code</r:String></r:Label>
```

```
   <r:Description><r:Content xml:lang="en">Covers the US Standard
Industrial Classification Codes allowing for data capture only at the
most descrete codes.</r:Content></r:Description>
   <r:CodeListReference isReference="true" isExternal="true"
lateBound="false" typeOfIdentifier="Canonical">
      <r:URN>urn:ddi:us.mpc:SIC:1.0</r:URN>
      <r:TypeOfObject>CodeList</r:TypeOfObject>
   </r:CodeListReference>
   <r:CodeSubsetInformation>
      <r:DataExistence>
         <r:DiscreteCategory>true</r:DiscreteCategory>
      </r:DataExistence>
   </r:CodeSubsetInformation>
</r:CodeDelineation>
```

CategoryDelineation

Defines a CategoryDelineation by specifying the Category Scheme used.

```
CategoryDelineation
   Extension base: VersionableType
   CategoryDelineationName            (0..n)
   Label                              (0..n)
   Description                        (0..1)
   CategorySchemeReference            (0..1)
```

References a CategoryScheme allowing for the exclusion of any specified object within the scheme.

EXAMPLE:

```
<r:CategoryDelineation isVersionable="true"
typeOfIdentifier="Canonical" scopeOfUniqueness="Agency">
   <r:URN>urn:ddi:us.mpc:PresCandidates:2</r:URN>
   <r:CategoryDelineationName><r:String xml:lang="en">Presidential
Candidates 2000</r:String></r:CategoryDelineationName>
   <r:Label><r:String xml:lang="en">U.S. Presidential Candidates
2000</r:String></r:Label>
   <r:Description><r:Content xml:lang="en">Includes all candidates for
the office of US President listed on any ballot in the United States
in the 2000 National Election.</r:Content></r:Description>
   <r:CatagorySchemeReference isReference="true" isExternal="true"
lateBound="false" typeOfIdentifier="Canonical">
      <r:URN>urn:ddi:us.mpc:PRES2000:1.0</r:URN>
      <r:TypeOfObject>CatagorySchemeReference</r:TypeOfObject>
   </r:CatagorySchemeReferenceReference>
</r:CategoryDelineation>
```

GeographicDelineation

A specialized delineation that contains the basic information required to collect geographic information from a GIS or similar system. Provides default values as well as fields to capture case specific deviations from the default.

```
GeographicDelineation
   Extension base: VersionableType
   GeographicDelineationName          (0..n)
   Label                              (0..n)
   Description                        (0..1)
   Datum                              (1..1)
   CoordinateSytem                    (1..1)
   CoordinateZone                     (1..1)
   CoordinateSource                   (1..1)
   ErrorCorrection                    (1..1)
   Offset                             (1..1)
   GeoreferenceObject                 (1..1)
   AddressMatchType                   (0..1)
   CoordinatePairs                    (1..n)
   AlternateOffset                    (0..1)
   AlternateObject                    (0..1)
   AlternateCoordinateSystem          (0..1)
   @pointFormat                       required
   @spatialPrimitive                  required
                                      (Point|Polygon|Line|LinearRing)
```

The following objects define the default values defined for the response domain: Datum identifies the geographic datum type of the object (recommend use of controlled vocabulary), CooridnateSystem identifies the coordinate system used by the response domain, CoordinateZone specifies the geographic coordinate zone used, the source of the coordinate reading is supplied in CoordinateSource, the standard offset is given in Offset, and the object used for identifying the point of the coordinate being collected is listed in the GeoreferenceObject (i.e., front door or centroid). If an address match is used AddressMatchType specifies the type of matching used. CoordinatePairs provides the capture structure for the case content. The attributes pointFormat and spatial primitive specify the format structure of the point and the spatial type being captured (Point, Polygon, Line, or Linear Ring). AltenateOffset, AlternateObject, and AlternateCoordinateSystem provide capture points for case specific information when the default values are not used.

EXAMPLE:

```
<r:GeographicDelineation isVersionable="true"
typeOfIdentifier="Canonical" scopeOfUniqueness="Agency"
pointFormat="DecimalDegrees" spatialPrimitive="point">
   <r:URN>urn:ddi:us.mpc:GPS_1:1</r:URN>
   <r:CategoryDelineationName><r:String xml:lang="en">GPS Front
Door</r:String></r:GeographicDelineationName>
   <r:Label><r:String xml:lang="en">GPS for Front Door
Positioning</r:String></r:Label>
```

```
   <r:Description><r:Content xml:lang="en">A standard collection set
for GPS positions taken at the front door in the United
States.</r:Content></r:Description>
   <r:Datum>NAD83</r:Datum>
   <r:CoordinateSystem>SPCS</r:CoordinateSystem>
   <r:CoordinateZone>2203</r:CoordinateZone>
-->   <r:ErrorCorrection></r:ErrorCorrection>
   <r:Offset>0</r:Offset>
   <r:GeoreferencedObject>Residential Front
Door</r:GeoreferencedObject>
   <r:CoordinatePairs isVersionable="true" typeOfIdentifier="Canonical"
scopeOfUniqueness="Agency" maxArray="2" arraySeparator="|">
      <r:URN>urn:ddi:us.mpc:CoordPrs:1</r:URN>
      <r:TypeOfObject>TextDelineation</r:TypeOfObject>
   </r:CoordinatePairs>
   <r:AlternateOffset maxLength="15">
      <r:URN>urn:ddi:us.mpc:AltOffset:1</r:URN>
   </r:AlternateOffset>
   <r:AlternateCoordinateSystem maxLength="25">
      <r:URN>urn:ddi:us.mpc:AltCoord:1</r:URN>
   </r:AlternateCoordinateSystem>
</r:GeographicDelineation>
```

NominalDelineation

Defines a nominal response that is not coded or related to a particular category scheme. Used primarily by QuestionGrid, this defines a response where there is a simple check or other demarcation expressing a binary “yes | no” or “true | false” response.

```
NominalDelineation
   Extension base: VersionableType
   NominalDelineationName              (0..n)
   Label                               (0..n)
   Description                         (0..1)
   @regExp                             (0..1)
```

A simple description of a nominal response which may be constrained by a regular express to a specified mark.

```
EXAMPLE:

<r:NominalDelineation isVersionable="true"
typeOfIdentifier="Canonical" scopeOfUniqueness="Agency" regExp="[Xx]">
   <r:URN>urn:ddi:us.mpc:NomDel_1:2</r:URN>
   <r:NominalDelineationName><r:String xml:lang="en">Nominal X
only</r:String></r:NominalDelineationName>
   <r:Label><r:String xml:lang="en">Nominal X only</r:String></r:Label>
   <r:Description><r:Content xml:lang="en">A nominal response that
accepts ONLY an X mark.</r:Content></r:Description>
</r:NominalDelineation>
```

ScaleDelineation

Defines a range of scale based responses varying by display, number of dimensions, and anchors.

```
ScaleDelineation
   Extension base: VersionableType
   ScaleDelineationName                (0..n)
   Label                               (0..n)
   Description                         (0..1)
   ScaleDimension                      (0..1)
      Label                            (0..n)
      CHOICE                           (0..1)
         NumberRange
         Range
      ENDCHOICE
      Anchor                           (0..n)
         CategoryReference             (0..1)
         @value
      MarkedIncrement                  (0..1)
      ValueIncrement                   (0..1)
   DimensionIntersect                  (0..n)
   DisplayLayout                       (0..1)
```

Scale layouts may affect the validity and comparability of the data captured. ScaleDelineation allows a specific definition of each dimension of the scale, the DimensionIntersect for multi-dimensional scales, and the specific of the scale layout. The ScaleDimension indicates the complete numeric range or textual range, the anchor for the scale expressed as a category and/or value, a label for the dimension, the marked increments of the scale, and the value increment. Both MarkedIncrement and ValueIncrement are described by the attributes increment, startValue, and endValue. The DimensionIntersect is used when the scale contains more than one dimension. In its simplest form the attribute forAllDimensions is left at its default setting of "true" and the intersect point is defined by the attribute intersectValue. DisplayLayout is of CodeValueType and contains a definition of the type of scale such as scale line, value list, outline, etc.

EXAMPLES:

Sample question using the phrase completion method

I am aware of the presence of God or the Divine

Never **Continually**

0 1 2 3 4 5 6 7 8 9 10

This display has labels at the terminal anchors only and each increment is a Value Increment

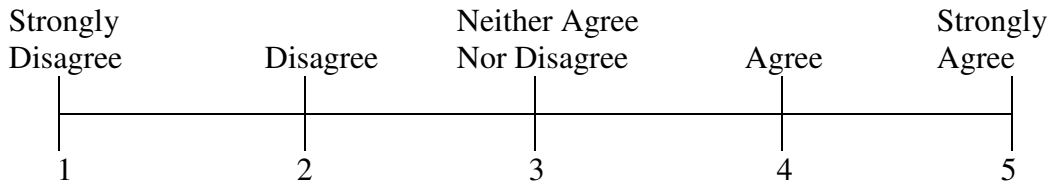
```
<Scale isVersionable=”true” typeOfIdentifier=”Canonical”
scopeOfUniquenes=”Maintainable”>
  <URN>urn:ddi:us.mpc:ScaleScheme_1.Scale_1:1</URN>
  <ScaleName><String xml:lang=”en”>Simple Scale</String></ScaleName>
  <Label><Content xml:lang=”en”>Simple Scale</Content></Label>
  <Description><Content xml:lang=”en”>Example 1</Content></Description>
  <ScaleDimension dimensionNumber="1" degreeSlopeFromHorizontal=”0”>
    <NumberRange>
      <Low included="true">0</Low>
      <High included="true">10</High>
    </NumberRange>
    <Anchor value="0">
      <CategoryReference>
        <URN>urn:ddi:us.mpc:CatScheme_1.Never:1</URN>
      <CategoryReference>
    </Anchor>
    <Anchor value="10">
      <CategoryReference>
        <URN> urn:ddi:us.mpc:CatScheme_1.Continually:1</URN>
      <CategoryReference>
    </Anchor>
    <ValueIncrement increment="1" startValue="0" endValue="10"/>
  </Dimension>
  <DisplayLayout>ScaleLine</DisplayLayout>
</Scale>
```

Likert Item

The format of a typical five-level Likert item is:

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree

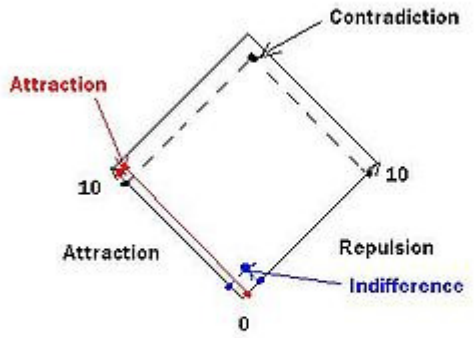
The above Likert Item is described and displayed as a CodeScheme. However if the display is scalar it could be described by a Scale.



This display has labels at all anchors and each increment is both a Marked Increment AND a Value Increment

```
<Scale isVersionable=”true” typeOfIdentifier=”Canonical”
scopeOfUniquenes=”Maintainable”>
  <URN>urn:ddi:us.mpc:ScaleScheme_1.Scale_2:1</URN>
  <ScaleName><String xml:lang=”en”>Likert Scale</String></ScaleName>
  <Label>><Content xml:lang=”en”>Likert Scale as scale</Content></Label>
  <Description>><Content xml:lang=”en”>Example 2</Content></Description>
  <ScaleDimension dimensionNumber="1" degreeSlopeFromHorizontal="0">
    <NumberRange>
      <Low included="true">1</Low>
      <High included="true">5</High>
    </NumberRange>
    <Anchor value="1">
      <CategoryReference>
        <URN> urn:ddi:us.mpc:CatScheme_1.StronglyDisagree:1</URN>
      <CategoryReference>
    </Anchor>
    <Anchor value="2">
      <CategoryReference>
        <URN> urn:ddi:us.mpc:CatScheme_1.Disagree:1</URN>
      <CategoryReference>
    </Anchor>
    <Anchor value="3">
      <CategoryReference>
        <URN> urn:ddi:us.mpc:CatScheme_1.NeitherAgreeNorDisagree:1</URN>
      <CategoryReference>
    </Anchor>
    <Anchor value="4">
      <CategoryReference>
        <URN> urn:ddi:us.mpc:CatScheme_1.Agree:1</URN>
      <CategoryReference>
    </Anchor>
    <Anchor value="5">
      <CategoryReference>
        <URN> urn:ddi:us.mpc:CatScheme_1.StronglyAgree:1</URN>
      <CategoryReference>
    </Anchor>
    <MarkedIncrement increment="1" startValue="1" endValue="5"/>
    <ValueIncrement increment="1" startValue="1" endValue="5"/>
  </ScaleDimension>
  <DisplayLayout>ScaleLine</DisplayLayout>
</Scale>
```

Diamond of Opposites



This particular display is an outline where the ends of the two intersecting scales form the corner points of the outline.

```
<Scale isVersionable=”true” typeOfIdentifier=”Canonical”
scopeOfUniquenes=”Maintainable”>
  <URN>urn:ddi:us.mpc:ScaleScheme_1.Scale_3:1</URN>
  <ScaleName><String xml:lang=”en”>Diamond</String></ScaleName>
  <Label><Content xml:lang=”en”>Dimond of Opposites</Content></Label>
  <Description><Content xml:lang=”en”>Describes an area within which response
is collected against opposing scales. </Content></Description>
  <ScaleType>AnchoredScale</ScaleType>
  <ScaleDimension dimensionNumber="1" degreeSlopeFromHorizontal="45">
    <Label>Repulsion</Label
    <NumberRange>
      <Low included="true">0</Low>
      <High included="true">10</High>
    </NumberRange>
    <MarkedIncrement increment="10" startValue="0" endValue="10"/>
    <ValueIncrement increment="10" startValue="0" endValue="10"/>
  </ScaleDimension>
  <ScaleDimension dimensionNumber="2" degreeSlopeFromHorizontal="135">
    <Label>Attraction</Label
    <NumberRange>
      <Low included="true">0</Low>
      <High included="true">10</High>
    </NumberRange>
    <MarkedIncrement increment="10" startValue="0" endValue="10"/>

    <ValueIncrement increment="10" startValue="0" endValue="10"/>
```

```
  </ScaleDimension>
  <DimensionIntersect forAllDimensions="true" IntersectValue="0">
    <IncludeDimension>1</IncludeDimension>
    <IncludeDimension>2</IncludeDimension>
  </DimensionIntersect>
  <DisplayLayout>Outline</DisplayLayout>
</Scale>
```

LocationDelineation

Defines a mark and the region within an object (i.e., image, text, etc.) where the mark should occur. Primarily used as a response domain within a QuestionBlock.

```
LocationDelineation
   Extension base: VersionableType
   LocationDelineationName              (0..n)
   Label                                (0..n)
   Description                          (0..1)
   Object                               (0..1)
   Action                               (0..n)
      RegionOfAction                    (0..1)
         Texutal                        (0..n)
         Audio                          (0..n)
         Video                          (0..n)
         XML                            (0..n)
         ImageArea                      (0..n)
      Description                       (0..1)
```

Object specifies the object upon which the action takes place. Action describes the action(s) which take place. Action specifies the region within which the action takes place described in terms of a start, stop, or region definition appropriate to each type as well as a description of the action itself.

EXAMPLE:

```
<r:LocationDelineation isVersionable="true"
typeOfIdentifier="Canonical" scopeOfUniqueness="Agency">
   <r:URN>urn:ddi:us.mpc:LocDel_1:2</r:URN>
   <r:LocationDelineationName><r:String xml:lang="en">Location on
Image_1</r:String></r:LocationDelineationName>
   <r:Label><r:String xml:lang="en">Location on
Image</r:String></r:Label>
   <r:Description><r:Content xml:lang="en">A location response that
requires the letter "D" to be marked on an
image.</r:Content></r:Description>
   <r:Object>Image</r:Object>
   <r:Action regExp="[Dd]">
      <r:RegionOfAction>
         <r:ImageArea>
            <r:Shape>Rectangle</r:Shape>
            <r:Coordinates>5,-5 5,-2 2,-2 2,-5</r:Coordinates>
         </r:ImageArea>
```

```
      </r:RegionOfAction>
      <r:Description><r:Content xml:lang="en">Mark the letter D (upper
or lower case accepted) in the upper left (3x3) section of the 10x10
gridded image.</r:Content></r:Description>
   </r:Action>
</r:LocationDelineation>
```

RankingDelineation

Defines a ranking structure used as a response domain, indicating the ordering options for the response.

```
RankingDelineation
   Extension base: VersionableType
   RankingDelineationName              (0..n)
   Label                               (0..n)
   Description                         (0..1)
   RankingRange                        (1..1)
      RangeUnit                        (0..1)
      MinimumValue                     (0..1)
      MaximumValue                     (0..1)
      @maximumRepetitionOfSingleValue  (default=”1”)
```

The RankingRange is an extension of Range adding the attribute maximumRepetitionOfSingleValue. The RankingRange specified the unit used for expressing the rank, provides a minimum and maximum value for the rank, and specifies how many items may have the same rank (default=”1”). The Range specifies the unit of the range specification as well as a minimum and maximum value. Note that these values use and extended form of Value which allows for the declaration of significant leading or trailing white space within the value as well an attribute noting if the value is inclusive (i.e., included as a valid value in the range specification).

```
EXAMPLE:

<r:RankingDelineation isVersionable="true"
typeOfIdentifier="Canonical" scopeOfUniqueness="Agency">
   <r:URN>urn:ddi:us.mpc:RankDel_1:1</r:URN>
   <r:RankingDelineationName><r:String xml:lang="en">Unique Five Point
Ranking</r:String></r:RankingDelineationName>
   <r:Label><r:String xml:lang="en">Five Point Ranking with no
repetition</r:String></r:Label>
   <r:Description><r:Content xml:lang="en">Allows for the ranking of 5
items in order where no two items can be of the same
rank.</r:Content></r:Description>
   <r:RankingRange maximumRepetitionOfSingleValue="1">
      <r:RangeUnit>Integer</r:RangeUnit>
      <r:MinimumValue>1</r:MinimumValue>
      <r:MaximumValue>5</r:MaximumValue>
   </r:RankingRange>
</r:RankingDelineation>
```

DistributionDelineation

Defines a distribution structure used as a response domain, indicating the total amount to be distributed among the response objects.

```
DistributionDelineation
   Extension base: VersionableType
   DistributionDelineationName         (0..n)
   Label                               (0..n)
   Description                         (0..1)
   DistributionValue                   (1..1)
   @decimalPositions
```

The DistributionValue provides the total value (xs:decimal) to be distributed among the response objects. The decimalPositions attribute clarifies the level of detail allowed in terms of the number of decimals accepted within a response.

EXAMPLE:

```
<r:DistributionDelineation isVersionable="true"
typeOfIdentifier="Canonical" scopeOfUniqueness="Agency"
decimalPositions="1">
   <r:URN>urn:ddi:us.mpc:DistDel_1:1</r:URN>
   <r:DistributionDelineationName><r:String xml:lang="en">Distribution
100</r:String></r:DistributionDelineationName>
   <r:Label><r:String xml:lang="en">100%
Distribution</r:String></r:Label>
   <r:Description><r:Content xml:lang="en">Distribute percentage of
total over the allowed items with a .1
precesion.</r:Content></r:Description>
   <r:DistributionValue>100</r:DistributionValue>
</r:DistributionDelineation>
```

MissingValuesDelineation

Defines missing values as a numeric or code delineation which can be used with any other response domain or value representation. When combining a MissingValueDelineation with valid responses or representations the user must take care not to replicate any valid response or representation. This structure allows for specifying missing values, specific definition of missing values through the use of a CodeDelineation, and the definition of a blank (null) as a missing value.

```
MissingValuesDelineation
   Extension base: VersionableType
   MissingValueDelineationName         (0..n)
   Label                               (0..n)
   Description                         (0..1)
   CHOICE                              (0..n)
      CodeDelineation
      NumericDelineation
      TextDelineation
   ENDCHOICE
   GenerationInstructionReference      (0..1)
```

```
   @isBlankMissingValue                default="true"
```

MissingValueDelineation provides multiple means of describing missing values. They may contain any combination of a CodeDelineation, NumericDelineation, or TextDelineation. In addition, the process of determining the how the missing value is assigned (generation instruction) may be referenced.

EXAMPLE:

A Missing Value Delineation containing a set of coded missing value types, a numeric unlabeled value and information on how to treat a blank (white space).

```
<r:MissingValuesDelineation isVersionable="true"
typeOfIdentifier="Canonical" scopeOfUniqueness="Agency"
versionDate="2012-10-16" isBlankMissing="true">
  <r:URN>urn:ddi:us.mpc:MVD1:1</r:URN>
  <r:MaintainableObject>
  <r:TypeOfObject>MissingValuesDelineationScheme</r:TypeOfObject>
    <r:MaintainableID>MVDS_1</r:MaintainableID>
    <r:MaintainableVersion>1</r:MaintainableVersion>
  </r:MaintainableObject>
  <r:MissingValuesDelineationName isPreferred="true"
context="ANES"><r:String xml:lang="en-US">ANES standard missing
values</r:String></r:MissingValuesDelineationName>
  <r:CodeDelineation isVersionable="true" typeOfIdentifier="Canonical"
scopeOfUniqueness="Agency" versionDate="2012-10-16">
    <r:URN>urn:ddi:us.mpc:MVD1:1</r:URN>
    <r:MaintainableObject>
      <r:TypeOfObject>MissingValuesDelineationScheme</r:TypeOfObject>
      <r:MaintainableID>MVDS_1</r:MaintainableID>
      <r:MaintainableVersion>1</r:MaintainableVersion>
    </r:MaintainableObject>
    <r:CodeListReference isReference="true">
      <URN>urn:ddi:CodeList_X:1</URN>
    </r:CodeListReference>
  </r:CodeDelineation>
  <r:NumericDelineation isVersionable="true"
typeOfIdentifier="Canonical" scopeOfUniqueness="Agency"
versionDate="2012-10-16">
    <r:URN>urn:ddi:us.mpc:MVD1:1</r:URN>
    <r:MaintainableObject>
      <r:TypeOfObject>MissingValuesDelineationScheme</r:TypeOfObject>
      <r:MaintainableID>MVDS_1</r:MaintainableID>
      <r:MaintainableVersion>1</r:MaintainableVersion>
    </r:MaintainableObject>
  </r:NumericDelineation>
</r:MissingValueDelineation>
```