Technical White Paper – ACR Assist

Proposed Format for Specifying Point-of-Care Computer-Assisted Reporting/Decision Support Modules for Radiologists

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# INTRODUCTION

## Purpose

Explains the following

Schema structure

Description about each elements and attributes with their datatypes

Usage with samples

# Representation

## Colour patterns

Here is the representation style for each component in the schema.

Attributes: sample

Elements: sample

Optional: sample (optional)

## Datatypes

xsd:token - <https://www.w3.org/TR/xmlschema-2/#token>

xsd:anyURI - <https://www.w3.org/TR/xmlschema-2/#anyURI>

xsd:nonNegativeInteger - <https://www.w3.org/TR/xmlschema-2/#nonNegativeInteger>

xsd:integer - <https://www.w3.org/TR/xmlschema-2/#integer>

xsd:ID - <https://www.w3.org/TR/xmlschema-2/#ID>

xsd:Boolean - <https://www.w3.org/TR/xmlschema-2/#boolean>

xsd:decimal - <https://www.w3.org/TR/xmlschema-2/#decimal>

xsd: IDREF - <https://www.w3.org/TR/xmlschema-2/#IDREF>

xsd:positiveInteger - <https://www.w3.org/TR/xmlschema-2/#positiveInteger>

xsd:duration - <https://www.w3.org/TR/xmlschema-2/#duration>

# Schema structure

## Metadata

The metadata section contains general information about a CAR/DS guideline which may or may not be used by any given implementation.

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Name** | **Data Type** | **Description** |
| 1 | Label | text | Name of the XML |
| 2 | ID | text | XML module’s unique identifier |
| 3 | SchemaVersion | text | Schema version |
| 4 | RuleVersion | text | Module version. This can be updated each time when the xml has modified. |
| 5 | Info(optional)   |  |  |  |  | | --- | --- | --- | --- | | 5.1 | Description (optional) | text | Human readable description about the module. | | 5.2 | References (optional)  Contains one or more Citations.  Citation   |  |  |  |  | | --- | --- | --- | --- | | 5.2.1 | PubmedId (optional) | xsd:token | Pubmed reference Identifier  <https://www.ncbi.nlm.nih.gov/pubmed> | | 5.2.2 | URI (optional) | xsd:anyURI | Any Reference URI (for e.g: link to abstract on journal website) | | 5.2.3 | Text |  | citation text ( for e.g. : a bibliographic reference to the citation) | | | | | 5.3 | Diagrams (optional)  Contains different diagrams related to the module.  Diagram   |  |  |  |  | | --- | --- | --- | --- | | 5.3.1 | KeyDiagram  (optional) | "true" |"false" | Is it the key diagram (I.e the diagram which summaries whether this is the overall clinical diagram) | | 5.3.2 | Displaysequence  (optional) | Integer | Image display sequence number. Images can be displayed in Displaysequence order | | 5.3.3 | ImageElements     |  |  |  |  | | --- | --- | --- | --- | | 5.3.3.1 | imageElements | URI | Image URI | | 5.3.3.2 | Label  (optional) | text | Image Label | | | | | | | | 5.4 | HelpText(optional) | text | Help text about the module. | | 5.5 | Contact(optional)   |  |  |  |  | | --- | --- | --- | --- | | 5.5.1 | Name | text | Author/Contact Name | | 5.5.2 | Email | text | Contact Email | | 5.5.3 | Institution(optional) | text | Contact Institution | | | | | | |
| 6 | ReportCitationText | text | Citation for the report text |
| 7 | Ontology(optional)  Specify body part and modality ( like CT-Chest, MR-abdomen) of the imaging exams for which this module can be used   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 7.1 | AnatomicRegions  AnatomicRegions for which this module can be applicable  e.g. :  <AnatomicRegions codingSystemAttr="RADLEX">    <Region Code="RID88">Adrenal gland</Region>  <Region Code="RID89">Limb of adrenal gland</Region>    <Region Code="RID90">Medulla of adrenal gland</Region>  </AnatomicRegions>     |  |  |  |  | | --- | --- | --- | --- | | 7.1.1 | codingSystemAttr  (optional) | text | the source of coding system used. This should be a URL | | 7.1.2 | Region   |  |  |  |  | | --- | --- | --- | --- | | 7.1.2.1 | Code | xsd:token | Author/Contact Name | | 7.1.2.2 | Text |  | Region text | | | | | | 7.2 | PossibleDiagnoses  For e.g. :  <PossibleDiagnoses>  <Diagnosis CodingSystem="ICD-10" Code="E27.9">Disorder of adrenal gland, unspecified</Diagnosis>   <Diagnosis CodingSystem="RADLEX" Code="RID4211">Adenoma</Diagnosis>   <Diagnosis CodingSystem="RADLEX" Code="RID4353">Myelolipoma</Diagnosis>   <Diagnosis CodingSystem="RADLEX" Code="RID3890">Cyst</Diagnosis>   <Diagnosis CodingSystem="RADLEX" Code="RID4700">Hemorrhage</Diagnosis>   <Diagnosis CodingSystem="RADLEX" Code="RID5231">Metastasis</Diagnosis>  </PossibleDiagnoses>       |  |  |  |  | | --- | --- | --- | --- | | 7.2.1 | CodingSystem  (optional) | text | the source of coding system used | | 7.2.2 | Diagnosis  can contain one or more diagnosis   |  |  |  |  | | --- | --- | --- | --- | | 7.2.2.1.1 | CodingSystem (optional) | text | The source of coding system used. This should be a URL | | 7.2.2.1.2 | Code | xsd:token | Code in coding system | | | | | | | |
| 8 | ApplicableExams(optional)  contains one or more ApplicableExamCategory  <ApplicableExams>  <ApplicableExamCategory Axis="Modality">CT</ApplicableExamCategory>  <ApplicableExamCategory Axis="Anatomy">Chest</ApplicableExamCategory>  <ApplicableExamCategory Axis="Anatomy">Abdomen</ApplicableExamCategory>  </ApplicableExams>     |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 8.1 | ApplicableExamCategory   |  |  |  |  | | --- | --- | --- | --- | | 8.1.1 | Axis | "Modality" | "Anatomy" | Value can either Modality or Anatomy | | 8.1.2 | text |  | Applicable category text | | | | |
| 9 | ApplicableSexes   |  |  |  |  | | --- | --- | --- | --- | | 9.1 | Value | "Male"| "Female"|"Both" | Applicable sex | | | |
| 10 | ApplicableAgeGroups(optional)   |  |  |  |  | | --- | --- | --- | --- | | 10.1 | MinimumAge(optional) | xsd:nonNegativeInteger | applicable age min | | 10.2 | MaximumAge(optional) | xsd:nonNegativeInteger | applicable age max | | | |
| 11 | TextCues   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | 11.1 | ContextPhrases(optional)  Context phrases used to identify parts of the radiology reports where this module may be applicable.   |  |  |  |  | | --- | --- | --- | --- | | 11.1.1 | ContextPhrase | text | phrase to find out the xml | | | | | 11.2 | KeyWords  Keywords to find the module   |  |  |  |  | | --- | --- | --- | --- | | 11.2.1 | Keyword | text | Keywords to find out module | | | | | 11.3 | NegationPhrases(optional)  Contains text markers which indicate the parts of a report to which the module is not applicable (even though it may contain markers that make it look like it is).   |  |  |  |  | | --- | --- | --- | --- | | 11.3.1 | NegationPhrase |  | Keywords to find out xml | | | | | 11.4 | Regex(optional) | text | Regex matches with test | | | |
| 12 | VoiceActivation(optional)  Contains phrases intended to be used as triggers for the module to find by voice recognition systems.   |  |  |  |  | | --- | --- | --- | --- | | 12.1 | VoiceCommandPhrase | text | The voice activation phrase for the voice recognition system to find the module. | | | |

Sample

<?xml version="1.0" encoding="UTF-8"?>  
<Metadata xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"  
 xsi:noNamespaceSchemaLocation="ACRAssist\_xml\_schema\_v1\_0.xsd">  
 <Label>Label0</Label>  
 <ID>ID0</ID>  
 <SchemaVersion>SchemaVersion0</SchemaVersion>  
 <RuleVersion>RuleVersion0</RuleVersion>  
 <Info>  
 <Description>Description0</Description>  
 <References>  
 <Citation PubmedId="PubmedId0" Url="http://www.oxygenxml.com/">  
 </Citation>  
 <Citation PubmedId="PubmedId1" Url="http://www.oxygenxml.com/">  
 </Citation>  
 <Citation PubmedId="PubmedId2" Url="http://www.oxygenxml.com/">  
 </Citation>  
 <Citation PubmedId="PubmedId3" Url="http://www.oxygenxml.com/">  
 </Citation>  
 </References>  
 <Diagrams>  
 <Diagram KeyDiagram="true" DisplaySequence="0">  
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 <Label>Label1</Label>  
 </Diagram>  
 <Diagram KeyDiagram="true" DisplaySequence="0">  
 <imageElements>http://www.oxygenxml.com/</imageElements>  
 <Label>Label2</Label>  
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 </Diagrams>  
 <HelpText>HelpText0</HelpText>  
 <Contact>  
 <Name>Name0</Name>  
 <Email>Email0</Email>  
 <Institution>Institution0</Institution>  
 </Contact>  
 </Info>  
 <ReportCitationText>ReportCitationText0</ReportCitationText>  
 <Ontology>  
 <AnatomicRegions codingSystemAttr="codingSystemAttr0">  
 <Region Code="Code0">  
 </Region>  
 <Region Code="Code1">  
 </Region>  
 </AnatomicRegions>  
 <AnatomicRegions codingSystemAttr="codingSystemAttr1">  
 <Region Code="Code2">  
 </Region>  
 <Region Code="Code3">  
 </Region>  
 </AnatomicRegions>  
 <PossibleDiagnoses CodingSystem="CodingSystem0">  
 <Diagnosis CodingSystem="CodingSystem1" Code="Code4">  
 </Diagnosis>  
 <Diagnosis CodingSystem="CodingSystem2" Code="Code5">  
 </Diagnosis>  
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 <PossibleDiagnoses CodingSystem="CodingSystem3">  
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 <Diagnosis CodingSystem="CodingSystem5" Code="Code7">  
 </Diagnosis>  
 </PossibleDiagnoses>  
 </Ontology>  
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 </ApplicableExamCategory>  
 </ApplicableExams>  
 <ApplicableSexes Value="Male"/>  
 <ApplicableAgeGroups>  
 <MinimumAge>50</MinimumAge>  
 <MaximumAge>50</MaximumAge>  
 </ApplicableAgeGroups>  
 <TextCues>  
 <ContextPhrases>  
 <ContextPhrase>ContextPhrase0</ContextPhrase>  
 <ContextPhrase>ContextPhrase1</ContextPhrase>  
 </ContextPhrases>  
 <KeyWords>  
 <KeyWord>KeyWord0</KeyWord>  
 <KeyWord>KeyWord1</KeyWord>  
 </KeyWords>  
 <NegationPhrases>  
 <NegationPhrase>NegationPhrase0</NegationPhrase>  
 <NegationPhrase>NegationPhrase1</NegationPhrase>  
 </NegationPhrases>  
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 </TextCues>  
 <VoiceActivation>  
 <VoiceCommandPhrase>VoiceCommandPhrase0</VoiceCommandPhrase>  
 <VoiceCommandPhrase>VoiceCommandPhrase1</VoiceCommandPhrase>  
 </VoiceActivation>  
</Metadata>

## DataElements

The data element definitions specify the input values used to drive a decision tree, the constant values, and possibly intermediate or output values associated with an algorithm. Three main types of data elements can be described using the data format: external and fixed values, user-provided data, and results of computation. Schema supports the following DataElements.

Following are the different DataElements supported by the schema

* ChoiceDataElement : can be used when there is a pre-defined set of answers are available
* NumericDataElement : represents a number
* IntegerDataElement : represents an integer value
* MultiChoiceDataElement : can be used when there is a pre-defined set of answers and can have one or more answers.
* GlobalValue : similar to constants in any programming language that can be referred to elsewhere in the guideline. These are intended to be used to define threshold values or parameters in a linear regression.
* ComputedElement: effective when it comes to reusing the logic

### ChoiceDataElement

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Name** | **Data Type** | **Description / Usage** |
|  | Id | xsd:ID | DataElement identifier (can be referenced in other parts of module as well as by external systems) |
| 2 | CdeId (optional) | xsd:token | Common Data Element Id ( intend to refer a standard definition in the ACR/RSNA CDE repository, [radelement.org](http://www.radelement.org) ) |
| 3 | IsRequired | "true" | "false" | Whether the data element is Required or not. |
| 4 | DisplaySequence (optional)     |  |  |  |  | | --- | --- | --- | --- | | 4.1 | DisplaySequence | xsd:integer | Suggested order in which this dataelement is displayed together with the other dataelements | | | |
| 5 | Label | text | Choice data element label ( I,e prompt text/display question for entering the value ) |
| 6 | Hint (optional) | text | Optionally displayed more detailed text for the user describing how the dataelement needs to be filled in. |
| 7 | diagrams(optional)  Contains one or more diagrams which offer additional information to the user ( e.g: illustrations of how the measurements are to be taken)   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 7.1 | diagram     |  |  |  |  | | --- | --- | --- | --- | | 7.1.1 | Location | text | Image location | | 7.1.2 | Label | text | Image Label | | 7.1.3 | DisplaySequence(optional) | xsd:integer | Image display sequence if the dataelement contains more than one diagram | | 7.1.4 | KeyDiagram(optional) | "true" | "false" | Whether this is the key diagram | | | | |
| 8 | VoiceCommand (optional) | text | Voice command to find/activate the data element |
| 9 | ChoiceInfo  Contains all the possible values for the dataelement, only one value can be selected for a choice data element ( for questions with multiple choice please use the MultiChoiceDataElement)   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 9.1 | Choice     |  |  |  |  | | --- | --- | --- | --- | | 9.1.1 | Value | xsd:token | Choice value | | 9.1.2 | Label | text | Choice label (how the choice is intended to be displayed for the user in the GUI) | | 9.1.3 | Hint (optional) | text | Further information on the choice which can be optional ( e.g.: as a tooltip) | | 9.1.4 | VoiceCommand (optional) | text | Voice command to select this choice as the value for the dataelement | | 9.1.5 | Default | "true" | "false" | Is this the default choice ( if no other choice selected, this will be the value for the dataelement) | | 9.1.6 | ReportText (optional) | text | Text to be inserted into the report when the dataelement value is being inserted into the report. | | | | |
| 10 | ImageMap (optional)  Includes a pointer to the image that can be displayed as an interactive choice/multi choice question. Areas of the images which radiologist click should select one of the given choices. Image must be provided within the assets of the module.   |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 10.1 | imageElements  Details about one single image   |  |  |  |  | | --- | --- | --- | --- | | 10.1.1 | imageElements | xsd:anyURI | Image url pointing to the actual image location | | 10.1.2 | Label(optional) | text | Image Label, text used to referring the image. | | | 10.2 | DrawStyle (optional)  draw style used in the image.   |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | imageMapStyleAttributes   |  |  |  |  | | --- | --- | --- | --- | | 10.2.1 | Outline(optional) | text | Default area outline color specified as hexcode | | 10.2.2 | HoverFill(optional) | text | Default area fill color when hovering specified as hexcode | | 10.2.3 | SelectedFill(optional) | text | Default area fill color when selected specified as hexcode | | | | 10.3 | Map   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 10.3.1 | Area  Specifies region of the image to be which when selected activates a choice automatically. This has same concept as html imagemap, refer : <http://www.w3schools.com/TAGS/tag_map.asp>   |  |  |  |  | | --- | --- | --- | --- | | 10.3.1.1 | Shape | "rect" | "poly" | "circle" | Supports three different shapes. | | 10.3.1.2 | Coords | text | Image map coordinates | | 10.3.1.3 | ChoiceValue | xsd:token | Choice value for this image map, which will activated when user clicks within the specified coordinates | | 10.3.1.4 | imageMapStyleAttributes   |  |  |  |  | | --- | --- | --- | --- | | 10.3.1.4.1 | Outline(optional) | text | Area outline color specified as hexcode, which overrides the default defined in drawstyle | | 10.3.1.4.2 | HoverFill(optional) | text | area fill color when hovering specified as hexcode, which overrides the default defined in drawstyle | | 10.3.1.4.3 | SelectedFill(optional) | text | area fill color when selected specified as hexcode, which overrides the default defined in drawstyle | | | | | | | | |

Sample

<ChoiceDataElement xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"  
 xsi:noNamespaceSchemaLocation="ACRAssist\_xml\_schema\_v1\_0.xsd" Id="ID000" CdeId="CdeId0" IsRequired="true" DisplaySequence="50">  
 <Label>Label0</Label>  
 <Hint>Hint0</Hint>  
 <Diagrams>  
 <Diagram DisplaySequence="0" KeyDiagram="true">  
 <Location>Location0</Location>  
 <Label>Label1</Label>  
 </Diagram>  
 <Diagram DisplaySequence="0" KeyDiagram="true">  
 <Location>Location1</Location>  
 <Label>Label2</Label>  
 </Diagram>  
 </Diagrams>  
 <VoiceCommand>VoiceCommand0</VoiceCommand>  
 <ChoiceInfo>  
 <Choice Default="true">  
 <Value>Value0</Value>  
 <Label>Label3</Label>  
 <Hint>Hint1</Hint>  
 <VoiceCommand>VoiceCommand1</VoiceCommand>  
 <ReportText>ReportText0</ReportText>  
 </Choice>  
 <Choice Default="true">  
 <Value>Value1</Value>  
 <Label>Label4</Label>  
 <Hint>Hint2</Hint>  
 <VoiceCommand>VoiceCommand2</VoiceCommand>  
 <ReportText>ReportText1</ReportText>  
 </Choice>  
 <Choice Default="true">  
 <Value>Value2</Value>  
 <Label>Label5</Label>  
 <Hint>Hint3</Hint>  
 <VoiceCommand>VoiceCommand3</VoiceCommand>  
 <ReportText>ReportText2</ReportText>  
 </Choice>  
 </ChoiceInfo>  
 <ImageMap>  
 <imageElements>http://www.oxygenxml.com/</imageElements>  
 <Label>Label6</Label>  
 <DrawStyle Outline="Outline0" HoverFill="HoverFill0" SelectedFill="SelectedFill0"/>  
 <Map>  
 <Area Shape="rect" Coords="Coords0" ChoiceValue="ChoiceValue0" Outline="Outline1" HoverFill="HoverFill1" SelectedFill="SelectedFill1"/>  
 <Area Shape="rect" Coords="Coords1" ChoiceValue="ChoiceValue1" Outline="Outline2" HoverFill="HoverFill2" SelectedFill="SelectedFill2"/>  
 </Map>  
 </ImageMap>  
</ChoiceDataElement>

### NumericDataElement

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Name** | **Data Type** | **Description / Usage** |
| 1 | Id | xsd:ID | DataElement identifier (can be referenced in other parts of module as well as by external systems) |
| 2 | CdeId (optional) | xsd:token | Common Data Element Id ( intend to refer a standard definition in the ACR/RSNA CDE repository, [radelement.org](http://www.radelement.org) ) |
| 3 | IsRequired | "true" | "false" | Whether the data element is Required or not. |
| 4 | DisplaySequence (optional)     |  |  |  |  | | --- | --- | --- | --- | | 4.1 | DisplaySequence | xsd:integer | Suggested order in which this dataelement is displayed together with the other dataelements | | | |
| 5 | Label | text | Numeric data element label ( I,e prompt text/display question for entering the value ) |
| 6 | Hint (optional) | text | Optionally displayed more detailed text for the user describing how the dataelement needs to be filled in. |
| 7 | diagrams(optional)  Contains one or more diagrams which offer additional information to the user ( e.g: illustrations of how the measurements are to be taken)   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 7.1 | diagram     |  |  |  |  | | --- | --- | --- | --- | | 7.1.1 | Location | text | Image location | | 7.1.2 | Label | text | Image Label | | 7.1.3 | DisplaySequence(optional) | xsd:integer | Image display sequence if the dataelement contains more than one diagram | | 7.1.4 | KeyDiagram(optional) | "true" | "false" | Whether this is the key diagram | | | | |
| 8 | VoiceCommand (optional) | text | Voice command to find/activate the data element |
| 9 | Minimum(optional) | xsd:decimal | Minimum allowed value |
| 10 | Maximum(optional) | xsd:decimal | Maximum allowed value |

Sample

<NumericDataElement xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"  
 xsi:noNamespaceSchemaLocation="ACRAssist\_xml\_schema\_v1\_0.xsd" Id="ID000" CdeId="CdeId0" IsRequired="true" DisplaySequence="50">  
 <Label>Label0</Label>  
 <Hint>Hint0</Hint>  
 <Diagrams>  
 <Diagram DisplaySequence="0" KeyDiagram="true">  
 <Location>Location0</Location>  
 <Label>Label1</Label>  
 </Diagram>  
 <Diagram DisplaySequence="0" KeyDiagram="true">  
 <Location>Location1</Location>  
 <Label>Label2</Label>  
 </Diagram>  
 </Diagrams>  
 <VoiceCommand>VoiceCommand0</VoiceCommand>  
 <Minimum>0</Minimum>  
 <Maximum>0</Maximum>  
</NumericDataElement>

### IntegerDataElement

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Name** | **Data Type** | **Description / Usage** |
|  | Id | xsd:ID | DataElement identifier (can be referenced in other parts of module as well as by external systems) |
| 2 | CdeId (optional) | xsd:token | Common Data Element Id ( intend to refer a standard definition in the ACR/RSNA CDE repository, [radelement.org](http://www.radelement.org) ) |
| 3 | IsRequired | "true" | "false" | Whether the data element is Required or not. |
| 4 | DisplaySequence (optional)     |  |  |  |  | | --- | --- | --- | --- | | 4.1 | DisplaySequence | xsd:integer | Suggested order in which this dataelement is displayed together with the other dataelements | | | |
| 5 | Label | text | Integerdataelement label ( I,e prompt text/display question for entering the value ) |
| 6 | Hint (optional) | text | Optionally displayed more detailed text for the user describing how the dataelement needs to be filled in. |
| 7 | diagrams(optional)  Contains one or more diagrams which offer additional information to the user ( e.g: illustrations of how the measurements are to be taken)   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 7.1 | diagram     |  |  |  |  | | --- | --- | --- | --- | | 7.1.1 | Location | text | Image location | | 7.1.2 | Label | text | Image Label | | 7.1.3 | DisplaySequence(optional) | xsd:integer | Image display sequence if the dataelement contains more than one diagram | | 7.1.4 | KeyDiagram(optional) | "true" | "false" | Whether this is the key diagram | | | | |
| 8 | VoiceCommand (optional) | text | Voice command to find/activate the data element |
| 9 | Minimum(optional) | xsd:decimal | Minimum allowed value |
| 10 | Maximum(optional) | xsd:decimal | Maximum allowed value |

Sample

<IntegerDataElement xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"  
 xsi:noNamespaceSchemaLocation="ACRAssist\_xml\_schema\_v1\_0.xsd" Id="ID000" CdeId="CdeId0" IsRequired="true" DisplaySequence="50">  
 <Label>Label0</Label>  
 <Hint>Hint0</Hint>  
 <Diagrams>  
 <Diagram DisplaySequence="0" KeyDiagram="true">  
 <Location>Location0</Location>  
 <Label>Label1</Label>  
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 </Diagrams>  
 <VoiceCommand>VoiceCommand0</VoiceCommand>  
 <Minimum>0</Minimum>  
 <Maximum>0</Maximum>  
</IntegerDataElement>

### GlobalValue

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Name** | **Data Type** | **Description / Usage** |
| 1 | Id | xsd:ID | identifier |
| 2 | text |  | Value |

Sample

<GlobalValue xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"  
 xsi:noNamespaceSchemaLocation="ACRAssist\_xml\_schema\_v1\_0.xsd" Id="ID000">  
</GlobalValue>

### MultichoiceElement

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Name** | **Data Type** | **Description / Usage** |
| 1 | Id | xsd:ID | DataElement identifier (can be referenced in other parts of module as well as by external systems) |
| 2 | CdeId (optional) | xsd:token | Common Data Element Id ( intend to refer a standard definition in the ACR/RSNA CDE repository, [radelement.org](http://www.radelement.org) ) |
| 3 | IsRequired | "true" | "false" | Whether the data element is Required or not. |
| 4 | DisplaySequence (optional)     |  |  |  |  | | --- | --- | --- | --- | | 4.1 | DisplaySequence | xsd:integer | Suggested order in which this dataelement is displayed together with the other dataelements | | | |
| 5 | Label | text | Choice data element label ( I,e prompt text/display question for entering the value ) |
| 6 | Hint (optional) | text | Optionally displayed more detailed text for the user describing how the dataelement needs to be filled in. |
| 7 | diagrams(optional)  Contains one or more diagrams which offer additional information to the user ( e.g: illustrations of how the measurements are to be taken)   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 7.1 | diagram     |  |  |  |  | | --- | --- | --- | --- | | 7.1.1 | Location | text | Image location | | 7.1.2 | Label | text | Image Label | | 7.1.3 | DisplaySequence(optional) | xsd:integer | Image display sequence if the dataelement contains more than one diagram | | 7.1.4 | KeyDiagram(optional) | "true" | "false" | Whether this is the key diagram | | | | |
| 8 | VoiceCommand (optional) | text | Voice command to find/activate the data element |
| 9 | ChoiceInfo  Contains all the possible values for the dataelement, only one value can be selected for a choice data element ( for questions with multiple choice please use the MultiChoiceDataElement)   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 9.1 | Choice     |  |  |  |  | | --- | --- | --- | --- | | 9.1.1 | Value | xsd:token | Choice value | | 9.1.2 | Label | text | Choice label (how the choice is intended to be displayed for the user in the GUI) | | 9.1.3 | Hint (optional) | text | Further information on the choice which can be optional ( e.g.: as a tooltip) | | 9.1.4 | VoiceCommand (optional) | text | Voice command to select this choice as the value for the dataelement | | 9.1.5 | Default | "true" | "false" | Is this the default choice ( if no other choice selected, this will be the value for the dataelement) | | 9.1.6 | ReportText (optional) | text | Text to be inserted into the report when the dataelement value is being inserted into the report. | | | | |
| 10 | ImageMap (optional)  Includes a pointer to the image that can be displayed as an interactive choice/multi choice question. Areas of the images which radiologist click should select one of the given choices. Image must be provided within the assets of the module.   |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 10.1 | imageElements  Details about one single image   |  |  |  |  | | --- | --- | --- | --- | | 10.1.1 | imageElements | xsd:anyURI | Image url pointing to the actual image location | | 10.1.2 | Label(optional) | text | Image Label, text used to referring the image. | | | 10.2 | DrawStyle (optional)  draw style used in the image.   |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | imageMapStyleAttributes   |  |  |  |  | | --- | --- | --- | --- | | 10.2.1 | Outline(optional) | text | Default area outline color specified as hexcode | | 10.2.2 | HoverFill(optional) | text | Default area fill color when hovering specified as hexcode | | 10.2.3 | SelectedFill(optional) | text | Default area fill color when selected specified as hexcode | | | | 10.3 | Map   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 10.3.1 | Area  Specifies region of the image to be which when selected activates a choice automatically. This has same concept as html imagemap, refer : <http://www.w3schools.com/TAGS/tag_map.asp>   |  |  |  |  | | --- | --- | --- | --- | | 10.3.1.1 | Shape | "rect" | "poly" | "circle" | Supports three different shapes. | | 10.3.1.2 | Coords | text | Image map coordinates | | 10.3.1.3 | ChoiceValue | xsd:token | Choice value for this image map, which will activated when user clicks within the specified coordinates | | 10.3.1.4 | imageMapStyleAttributes   |  |  |  |  | | --- | --- | --- | --- | | 10.3.1.4.1 | Outline(optional) | text | Area outline color specified as hexcode, which overrides the default defined in drawstyle | | 10.3.1.4.2 | HoverFill(optional) | text | area fill color when hovering specified as hexcode, which overrides the default defined in drawstyle | | 10.3.1.4.3 | SelectedFill(optional) | text | area fill color when selected specified as hexcode, which overrides the default defined in drawstyle | | | | | | | | |

Sample  
<MultiChoiceDataElement xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"  
 xsi:noNamespaceSchemaLocation="ACRAssist\_xml\_schema\_v1\_0.xsd" Id="ID000" CdeId="CdeId0" IsRequired="true" DisplaySequence="50">  
 <Label>Label0</Label>  
 <Hint>Hint0</Hint>  
 <Diagrams>  
 <Diagram DisplaySequence="0" KeyDiagram="true">  
 <Location>Location0</Location>  
 <Label>Label1</Label>  
 </Diagram>  
 <Diagram DisplaySequence="0" KeyDiagram="true">  
 <Location>Location1</Location>  
 <Label>Label2</Label>  
 </Diagram>  
 </Diagrams>  
 <VoiceCommand>VoiceCommand0</VoiceCommand>  
 <ChoiceInfo>  
 <Choice Default="true">  
 <Value>Value0</Value>  
 <Label>Label3</Label>  
 <Hint>Hint1</Hint>  
 <VoiceCommand>VoiceCommand1</VoiceCommand>  
 <ReportText>ReportText0</ReportText>  
 </Choice>  
 <Choice Default="true">  
 <Value>Value1</Value>  
 <Label>Label4</Label>  
 <Hint>Hint2</Hint>  
 <VoiceCommand>VoiceCommand2</VoiceCommand>  
 <ReportText>ReportText1</ReportText>  
 </Choice>  
 <Choice Default="true">  
 <Value>Value2</Value>  
 <Label>Label5</Label>  
 <Hint>Hint3</Hint>  
 <VoiceCommand>VoiceCommand3</VoiceCommand>  
 <ReportText>ReportText2</ReportText>  
 </Choice>  
 </ChoiceInfo>  
 <ImageMap>  
 <imageElements>http://www.oxygenxml.com/</imageElements>  
 <Label>Label6</Label>  
 <DrawStyle Outline="Outline0" HoverFill="HoverFill0" SelectedFill="SelectedFill0"/>  
 <Map>  
 <Area Shape="rect" Coords="Coords0" ChoiceValue="ChoiceValue0" Outline="Outline1" HoverFill="HoverFill1" SelectedFill="SelectedFill1"/>  
 <Area Shape="rect" Coords="Coords1" ChoiceValue="ChoiceValue1" Outline="Outline2" HoverFill="HoverFill2" SelectedFill="SelectedFill2"/>  
 </Map>  
 </ImageMap>  
</MultiChoiceDataElement>

### ComputedElement

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Name** | **Data Type** | **Description / Usage** |
| 1 | Id | xsd:ID | DataElement identifier (can be referenced in other parts of module as well as by external systems) |
| 2 | DisplaySequence(optional)   |  |  |  |  | | --- | --- | --- | --- | | 2.1 | DisplaySequence | xsd:integer | Suggested order in which this dataelement is displayed together with the other dataelements | | | |
| 3 | ShowValue(optional) | xsd:boolean | If true, then the couputed value of the computedelement should be displayed in the interface of the reporting framework. |
| 4 | Label(optional) | Text | Computed data element label |
| 5 | Hint(optional) | text | Optionally displayed more detailed text for the user describing more details about the dataelement. |
| 6 | Diagrams(optional)  Contains one or more diagrams which offer additional information to the user ( e.g: illustrations of how the measurements are to be taken     |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 6.1 | diagram     |  |  |  |  | | --- | --- | --- | --- | | 6.1.1 | Location | text | Image location | | 6.1.2 | Label | text | Image Label | | 6.1.3 | DisplaySequence(optional) | xsd:integer | Image display sequence if the dataelement contains more than one diagram | | 6.1.4 | KeyDiagram(optional) | "true" | "false" | Whether this is the key diagram | | | | |
| 7 | ComputedValue  Specifies the output of the computed data element. This contains either Arithmetic Expression or Text expression which will be evaluated to produce the output.   |  |  |  |  | | --- | --- | --- | --- | | 7.1 | ArithmeticExpression | text | Arithmetic expression which will be evaluated to produce the output. This can be basic arithmetic expression or a function | | 7.2 | TextExpression  Text expression can be written as simple text expression, which will be returned as the value of the computed element. It is also possible to insert any Dataelement value in the expression.   |  |  |  |  | | --- | --- | --- | --- | | 7.1.1 | text |  | Text Expression. | | 7.1.2 | InsertValue  Can be used to insert the value of a Dataelement   |  |  |  |  | | --- | --- | --- | --- | | 1.2.2.1.1 | DataElementId | xsd:IDREF | The value of this Dataelement will be inserted | | 1.2.2.1.2 | SignificantDigits(optional) | xsd:integer | This is applicable if the DataElement referred is a NumericDataElement. This defines the number of decimal points can be inserted into the report text. | | | | | | | | | |
| 8 | valueDecisionPoint  Holds the conditions inside the ComplutedDataElement.   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 8.2 | valueBranches  Text expression can be written as simple text expression, which will be returned as the value of the computed element. It is also possible to insert any Dataelement value in the expression. Contains different Braches each meets a unique condition.  Branch   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 8.2.1 | ConditionType  Below are the possible conditions in a branch. Condition type enable comparing dataelements to one another to fixed values, operators allows combination of conditions itself   |  |  |  |  | | --- | --- | --- | --- | | 8.2.1.1 | AndCondition |  | It contains conditions if all of those evaluate to true then it evaluates to true | | 8.2.1.2 | OrCondition |  | It contains conditions if any of those evaluate to true then it evaluates to true | | 8.2.1.3 | NotCondition |  | It contains conditions if all of those evaluate to false then it evaluates to true. | | 8.2.1.4 | EqualCondition  Compare a data element to a given value and evaluated to “true” if they are equal  comparisonConditionContents   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | 8.2.1.4.1 | dataElementIdAttribute  Data element used for comparison   |  |  |  |  | | --- | --- | --- | --- | | 3.34.1.1 | DataElementId | xsd:IDREF | DataelementId to be compared | | | | | 8.2.1.4.2 | ComparisonValue | xsd:token | Comparison value. Could be an id of a dataelement or a constant value. | | | | | 8.2.1.5 | GreaterThanCondition  Checks whether dataelement value is greater than given value and evaluated to “true” if so.   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | 8.2.1.5.1 | dataElementIdAttribute  Data element used for comparison   |  |  |  |  | | --- | --- | --- | --- | | 3.3.5.1.1 | DataElementId | xsd:IDREF | DataelementId to be compared | | | | | 8.2.1.5.2 | ComparisonValue | xsd:token | Comparison value. Could be an id of a dataelement or a constant value. | | | | | 8.2.6 | LessThanCondition  Checks whether dataelement value is lesser than given value and evaluated to “true” if so   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | 8.2.6.1 | dataElementIdAttribute  Data element used for comparison   |  |  |  |  | | --- | --- | --- | --- | | 8.2.6.1.1 | DataElementId | xsd:IDREF | DataelementId to be compared | | | | | 8.2.6.2 | ComparisonValue | xsd:token | Comparison value. Could be an id of a dataelement or a constant value. | | | | | 8.2.7 | GreaterThanOrEqualsCondition  Checks whether dataelement value is greater than or equal to given value and evaluated to “true” if so   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | 8.2.7.1 | dataElementIdAttribute  Data element used for comparison   |  |  |  |  | | --- | --- | --- | --- | | 3.3.1.1.1 | DataElementId | xsd:IDREF | DataelementId to be compared | | | | | 8.2.7.2 | ComparisonValue | xsd:token | Comparison value. Could be an id of a dataelement or a constant value. | | | | | 8.2.8 | LessThanOrEqualsCondition  Checks whether dataelement value is lesser than or equal to given value and evaluated to “true” if so   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | 8.2.8.1 | dataElementIdAttribute  Data element used for comparison   |  |  |  |  | | --- | --- | --- | --- | | 8.2.8.1.1 | DataElementId | xsd:IDREF | DataelementId to be compared | | | | | 8.2.8.2 | ComparisonValue | xsd:token | Comparison value. Could be an id of a dataelement or a constant value. | | | | | 8.2.9 | ContainsCondition  Checks whether any part of the dataelement matches with the given value and evaluated to “true” if so   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | 8.2.9.1 | dataElementIdAttribute  Data element used to check contains condition   |  |  |  |  | | --- | --- | --- | --- | | 8.2.9.1.1 | DataElementId | xsd:IDREF | DataelementId to be checked | | | | | 8.2.9.2 | ComparisonValue | xsd:token | Comparison value. Could be a constant value. | | | | | 8.2.10 | HasAnyNChoicesCondition  This can be used to compare the number of choices selected from a multichoice dataelement and evaluated to “true” if so   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | 8.2.10.1 | dataElementIdAttribute  Data element used to check contains condition   |  |  |  |  | | --- | --- | --- | --- | | 8.2.10.1.1 | DataElementId | xsd:IDREF | Multichoice DataelementId to be checked | | | | | 8.2.10.2 | MinimumChoices | xsd:positiveInteger | Constant value which can be compared with the number of choices selected. | | | | | | 8.2.2 | InsertValue  Can be used to insert the value of a Dataelement   |  |  |  |  | | --- | --- | --- | --- | | 8.2.2.1 | DataElementId | xsd:IDREF | The value of this Dataelement will be inserted | | 8.2.2.2 | SignificantDigits(optional) | xsd:integer | This is applicable if the DataElement referred is a NumericDataElement. This defines the number of decimal points can be inserted into the report text. | | | 8.2.3 | ComputedValue  Specifies the output of the computed data element. This contains either Arithmetic Expression or Text expression which will be evaluated to produce the output.   |  |  |  |  | | --- | --- | --- | --- | | 8.2.3.1 | ArithmeticExpression | text | Arithmetic expression which will be evaluated to produce the output. This can be basic arithmetic expression or a function | | 8.2.3.2 | TextExpression  Text expression can be written as simple text expression, which will be returned as the value of the computed element. It is also possible to insert any Dataelement value in the expression.   |  |  |  |  | | --- | --- | --- | --- | | 8.2.3.2.1 | text |  | Text Expression. | | 8.2.3.2.2 | InsertValue  Can be used to insert the value of a Dataelement   |  |  |  |  | | --- | --- | --- | --- | | 8.2.3.2.2.1 | DataElementId | xsd:IDREF | The value of this Dataelement will be inserted | | 8.2.3.2.2.1.2 | SignificantDigits(optional) | xsd:integer | ?? | | | | | | | | | 8.2.4 | valueDecisionPoint  recurssive |   DefaultBranch   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 8.3 | ComputedValue  Specifies the output of the computed data element. This contains either Arithmetic Expression or Text expression which will be evaluated to produce the output.   |  |  |  |  | | --- | --- | --- | --- | | 8.3.1 | ArithmeticExpression | text | Arithmetic expression which will be evaluated to produce the output. This can be basic arithmetic expression or a function | | 8.3.2 | TextExpression  Text expression can be written as simple text expression, which will be returned as the value of the computed element. It is also possible to insert any Dataelement value in the expression.   |  |  |  |  | | --- | --- | --- | --- | | 8.3.2.1 | text |  | Text Expression. | | 8.3.2.2 | InsertValue  Can be used to insert the value of a Dataelement   |  |  |  |  | | --- | --- | --- | --- | | 8.3.2.2.1 | DataElementId | xsd:IDREF | The value of this Dataelement will be inserted | | 8.3.2.2.2 | SignificantDigits(optional) | xsd:integer | This is applicable if the DataElement referred is a NumericDataElement. This defines the number of decimal points can be inserted into the report text. | | | | | | | | | 8.3.1 | valueDecisionPoint  recurssive | | | | |

Sample:

<ComputedElement xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"  
 xsi:noNamespaceSchemaLocation="ACRAssist\_xml\_schema\_v1\_0.xsd" Id="ID000" DisplaySequence="50" ShowValue="false">  
 <Label>Label0</Label>  
 <Hint>Hint0</Hint>  
 <Diagrams>  
 <Diagram DisplaySequence="0" KeyDiagram="true">  
 <Location>Location0</Location>  
 <Label>Label1</Label>  
 </Diagram>  
 <Diagram DisplaySequence="0" KeyDiagram="true">  
 <Location>Location1</Location>  
 <Label>Label2</Label>  
 </Diagram>  
 </Diagrams>  
 <DecisionPoint>  
 <Branch>  
 <AndCondition>  
 <LessThanCondition DataElementId="ID000" ComparisonValue="ComparisonValue0"/>  
 <NotCondition>  
 </NotCondition>  
 <GreaterThanCondition DataElementId="ID000" ComparisonValue="ComparisonValue1"/>  
 </AndCondition>  
 <DecisionPoint/>  
 </Branch>  
 <Branch>  
 <LessThanCondition DataElementId="ID000" ComparisonValue="ComparisonValue2"/>  
 <DecisionPoint/>  
 </Branch>  
 <DefaultBranch>  
 <ArithmeticExpression>ArithmeticExpression0</ArithmeticExpression>  
 </DefaultBranch>  
 </DecisionPoint>  
</ComputedElement>

## Rules

The Rules section consists of a root DecisionPoint element containing multiple Branch elements, each of which consists of a condition which if true leads to a DecisionPoint element or to an EndPointRef element.

todo: flowchart diagram showing decisionpoint/ label/ branches/endpoints.

Show snippet of xml and how it’s being rendered as diagram.

#### Root DecisionPoint

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Name** | **Data Type** | **Description / Usage** |
| 1 | Label | text | Decision point label. |
| 2 | Description(optional) | text | Decision point description |
| 3 | Branch  A branch either ends on an endpoint or on a decision point. The decision point can contain one more branches based on different conditions.   |  |  |  |  | | --- | --- | --- | --- | | 3.1 | Label(optional) | text |  | | 3.2 | BranchModifiers   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | 3.2.1 | NotRelevantDataElements(optional)  this property can be used to specify the list the data elements which are not relevant down this branch. It is suggested that nonrelevantdataelements been either deactivated or hide on this branch.     |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | 3.2.1.1 | DataElementRef   |  |  |  |  | | --- | --- | --- | --- | | 3.2.1.1 | DataElementId | xsd:IDREF | Dataelement identifier which is nonrelevant | | | | | | | 3.3 | ConditionType  Below are the possible conditions in a branch. Condition type enable comparing dataelements to one another to fixed values, operators allows combination of conditions itself   |  |  |  |  | | --- | --- | --- | --- | | 3.3.1 | AndCondition |  | It contains conditions if all of those evaluate to true then it evaluates to true | | 3.3.2 | OrCondition |  | It contains conditions if any of those evaluate to true then it evaluates to true | | 3.3.3 | NotCondition |  | It contains conditions if all of those evaluate to false then it evaluates to true. | | 3.3.4 | EqualCondition  Compare a data element to a given value and evaluated to “true” if they are equal  comparisonConditionContents   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | 3.3.4.1 | dataElementIdAttribute  Data element used for comparison   |  |  |  |  | | --- | --- | --- | --- | | 3.34.1.1 | DataElementId | xsd:IDREF | DataelementId to be compared | | | | | 3.3.4.2 | ComparisonValue | xsd:token | Comparison value. Could be an id of a dataelement or a constant value. | | | | | 3.3.5 | GreaterThanCondition  Checks whether dataelement value is greater than given value and evaluated to “true” if so.   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | 3.3.5.1 | dataElementIdAttribute  Data element used for comparison   |  |  |  |  | | --- | --- | --- | --- | | 3.3.5.1.1 | DataElementId | xsd:IDREF | DataelementId to be compared | | | | | 3.3.5.2 | ComparisonValue | xsd:token | Comparison value. Could be an id of a dataelement or a constant value. | | | | | 3.3.6 | LessThanCondition  Checks whether dataelement value is lesser than given value and evaluated to “true” if so   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | 3.3.6.1 | dataElementIdAttribute  Data element used for comparison   |  |  |  |  | | --- | --- | --- | --- | | 3.3.6.1.1 | DataElementId | xsd:IDREF | DataelementId to be compared | | | | | 3.3.6.2 | ComparisonValue | xsd:token | Comparison value. Could be an id of a dataelement or a constant value. | | | | | 3.3.7 | GreaterThanOrEqualsCondition  Checks whether dataelement value is greater than or equal to given value and evaluated to “true” if so   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | 3.3.7.1 | dataElementIdAttribute  Data element used for comparison   |  |  |  |  | | --- | --- | --- | --- | | 3.3.1.1.1 | DataElementId | xsd:IDREF | DataelementId to be compared | | | | | 3.3.7.2 | ComparisonValue | xsd:token | Comparison value. Could be an id of a dataelement or a constant value. | | | | | 3.3.8 | LessThanOrEqualsCondition  Checks whether dataelement value is lesser than or equal to given value and evaluated to “true” if so   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | 3.3.8.1 | dataElementIdAttribute  Data element used for comparison   |  |  |  |  | | --- | --- | --- | --- | | 3.3.8.1.1 | DataElementId | xsd:IDREF | DataelementId to be compared | | | | | 3.3.8.2 | ComparisonValue | xsd:token | Comparison value. Could be an id of a dataelement or a constant value. | | | | | 3.3.9 | ContainsCondition  Checks whether any part of the dataelement matches with the given value and evaluated to “true” if so   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | 3.3.9.1 | dataElementIdAttribute  Data element used to check contains condition   |  |  |  |  | | --- | --- | --- | --- | | 3.3.9.1 | DataElementId | xsd:IDREF | DataelementId to be checked | | | | | 3.3.9.2 | ComparisonValue | xsd:token | Comparison value. Could be a constant value. | | | | | 3.3.10 | HasAnyNChoicesCondition  This can be used to compare the number of choices selected from a multichoice dataelement and evaluated to “true” if so   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | 3.3.10.1 | dataElementIdAttribute  Data element used to check contains condition   |  |  |  |  | | --- | --- | --- | --- | | 3.3.10.1.1 | DataElementId | xsd:IDREF | Multichoice DataelementId to be checked | | | | | 3.3.10.2 | MinimumChoices | xsd:positiveInteger | Constant value which can be compared with the number of choices selected. | | | | | | | | 3.4 | EndpointRef  Reference to the endpoint which is the output of the rule set.   |  |  |  |  | | --- | --- | --- | --- | | 3.4.1 | EndPointId | xsd:IDREF | The endpoint id reference. | | 3.4.2 | Label(optional) | text | Endpoint reference label, which can be used in reference documentation and/or graphical representations. | | 3.5.3 | Description(optional) | text | Endpoint reference description | | | | | 3.5 | DecisionPoint  Recursive, starts another decisionpoint | | | | | |
| 4 | DefaultBranch(optional)  Default branch if no other branch in the decision point that evaluates to true   |  |  |  |  | | --- | --- | --- | --- | | 4.1 | Label(optional) | text | Default branch label, which can be used in reference documentation and/or graphical representations. | | 4.2 | BranchModifiers   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | 4.2.1 | NotRelevantDataElements(optional)  This property can be used to specify the list the data elements which are not relevant down this branch. It is suggested that nonrelevantdataelements been either deactivated or hide on this branch.     |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | 4.2.1.1 | DataElementRef   |  |  |  |  | | --- | --- | --- | --- | | 4.2.1.1 | DataElementId | xsd:IDREF | DataelementId which is not relevant | | | | | | | 4.3 | EndpointRef  Reference to the endpoint which is the output of the rule set   |  |  |  |  | | --- | --- | --- | --- | | 4.3.1 | EndPointId | xsd:IDREF | The endpoint id reference. | | 4.3.2 | Label(optional) | text | Endpoint reference label, which can be used in reference documentation and/or graphical representations | | 4.3.3 | Description(optional) | text | Endpoint reference description | | | | | 4.4 | DecisionPoint  Recursive, starts another decisionpoint | | | | | |

Sample:

<?xml version="1.0" encoding="UTF-8"?>  
<Rules xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"  
 xsi:noNamespaceSchemaLocation="file:/C:/Sujith/Work/ACR%20Assist/acr\_assist\_documents/XML%20Schema/ACRAssist\_xml\_schema\_v1\_0.xsd">  
 <DecisionPoint>  
 <Label>Label0</Label>  
 <Description>Description0</Description>  
 <Branch>  
 <Label>Label1</Label>  
 <NotRelevantDataElements>  
 <DataElementRef DataElementId="ID000"/>  
 <DataElementRef DataElementId="ID001"/>  
 </NotRelevantDataElements>  
 <EqualCondition DataElementId="ID002" ComparisonValue="ComparisonValue0"/>  
 <DecisionPoint/>  
 </Branch>  
 <Branch>  
 <Label>Label2</Label>  
 <NotRelevantDataElements>  
 <DataElementRef DataElementId="ID003"/>  
 <DataElementRef DataElementId="ID004"/>  
 </NotRelevantDataElements>  
 <OrCondition>  
 <AndCondition>  
 </AndCondition>  
 <GreaterThanOrEqualsCondition DataElementId="ID005" ComparisonValue="ComparisonValue1"/>  
 <ContainsCondition DataElementId="ID006" ComparisonValue="ComparisonValue2"/>  
 </OrCondition>  
 <DecisionPoint/>  
 </Branch>  
 <DefaultBranch>  
 <Label>Label3</Label>  
 <NotRelevantDataElements>  
 <DataElementRef DataElementId="ID007"/>  
 <DataElementRef DataElementId="ID008"/>  
 </NotRelevantDataElements>  
 <DecisionPoint/>  
 </DefaultBranch>  
 </DecisionPoint>  
</Rules>

## Endpoints

This section contains all the defined endpoints together with the reusable text fragments (TemplatePartial elements). Each EndPoint element specifies the repot text to be inserted and other actions to be taken when the logic tree leads to a particular endpoint.

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Name** | **Data Type** | **Description / Usage** |
| 1 | TemplatePartial  TemplatePartial elements define a reusable text fragment or macro that once defined can be repeatedly used in all endpoints.   |  |  |  |  | | --- | --- | --- | --- | | 1.1 | id | xsd:id | Template partial identifier, which can be referred in the report text | | 1.2 | Template definition includes the text mixed with the template elements as described below.   |  |  |  |  | | --- | --- | --- | --- | | 1.2.1 | text |  |  | | 1.2.2 | templateTags  templateTags can be any of the following   * InsertValue * InsertPartial * SectionIf * SectionIfNot * SectionIfValue * SectionIfValueNot  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 1.2.2.1 | InsertValue  Insert the value of a Dataelement   |  |  |  |  | | --- | --- | --- | --- | | 1.2.2.1.1 | DataElementId | xsd:IDREF | The value of this Dataelement will be inserted | | 1.2.2.1.2 | SignificantDigits(optional) | xsd:integer | This is applicable if the DataElement referred is a NumericDataElement. This defines the number of decimal points can be inserted into the report text. | | | 1.2.2.2 | InsertPartial  Insert the contents of a TemplatePartial to be inserted   |  |  |  |  | | --- | --- | --- | --- | | 1.2.2.2.1 | PartialId | xsd:IDREF | The dynamic value of this TemplatePartial will be inserted. | | | 1.2.2.3 | SectionIf  Insert the contained template text if the given DataElement has any value.   |  |  |  |  | | --- | --- | --- | --- | | 1.2.2.3.1 | DataElementId | xsd:IDREF | Dataelement to be tested | | 1.2.2.3.2 | TextTemplateContent  Recursive, can contain TextTemplateContent itself | | | | | 1.2.2.4 | SectionIfValue  Insert the contained template text if the given DataElement matches with the comparison value.   |  |  |  |  | | --- | --- | --- | --- | | 1.2.2.4.1 | DataElementId | xsd:IDREF | Dataelement to be tested | | 1.2.2.4.2 | ComparisonValue | xsd:token | Comparison value | | 1.2.2.4.3 | TextTemplateContent  Recursive, can contain TextTemplateContent itself | | | | | 1.2.2.5 | SectionIfNot  Insert the contained template text if the given DataElement has no value.   |  |  |  |  | | --- | --- | --- | --- | | 1.2.2.5.1 | DataElementId | xsd:IDREF | Dataelement to be tested | | 1.2.2.5.2 | TextTemplateContent  Recursive, can contain TextTemplateContent itself | | | | | 1.2.2.6 | SectionIfValueNot  Insert the contained template text if the given DataElement doesn’t matches with the comparison value   |  |  |  |  | | --- | --- | --- | --- | | 1.2.2.6.1 | DataElementId | xsd:IDREF | Dataelement to be tested | | 1.2.2.6.2 | ComparisonValue | xsd:token | Comparison value | | 1.2.2.6.3 | TextTemplateContent  Recursive, can contain TextTemplateContent itself | | | | | | | | | | | | |
| 2 | Endpoint     |  |  |  |  | | --- | --- | --- | --- | | 2.1 | Id | xsd:ID | Endpoint identifier. This will be referred to be in the logic tree. | | 2.2 | Label  (optional) | text | Brief summary of the endpoints to be used in the documentation and in diagrams | | 2.3 | Diagnosis(optional)  can contain one or more diagnosis   |  |  |  |  | | --- | --- | --- | --- | | 2.3.1.1 | CodingSystem  (optional) | text | The source of coding system used. This should be a URL | | 2.3.1.2 | Code | xsd:token | Code in coding system | | | | | 2.4 | ReportTexts  Specifies blocks of text to be inserted in the report at various points. Can have one or more ReportText  ReportText   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | 2.4.1 | SectionId  Specifies texts to be inserted at different points in the report. The supported sections are listed below   |  |  |  |  | | --- | --- | --- | --- | | 2.4.1.1 | SectionId | "findings" | "impression" | "recommendation" | "impressionRecommendation" | "citation" | **Findings**: Text to be inserted into the body of the report, typically at the point where the radiologist is currently working  **Impression**: Text to be inserted into the impression section of the report, typically at the bottom of the report  **Recommendation**: Text to be inserted into a recommendation section of a report, if applicable  **ImpressionRecommendation**: When a recommendation section is not available, text which includes a recommendation to be inserted into the impression section of the report.  **Citation**: Text to be added at the bottom of a report which provides citation information about the recommendations. See also the “Citation” tag in the Metadata section; the text in this tag should be inserted in place of that global citation when given for a particular EndPoint. | | | 2.4.2 | TextTemplateContent   |  |  |  |  | | --- | --- | --- | --- | | 2.4.2.1 | text |  |  | | 2.4.2.1.2 | templateTags  templateTags can be any of the following   * InsertValue * InsertPartial * SectionIf * SectionIfNot * SectionIfValue * SectionIfValueNot  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 2.4.2.1.2.1 | InsertValue  Insert the value of a Dataelement   |  |  |  |  | | --- | --- | --- | --- | | 2.4.2.1.2.1.1 | DataElementId | xsd:IDREF | The value of this Dataelement will be inserted | | 2.4.2.1.2.1.2 | SignificantDigits(optional) | xsd:integer | This is applicable if the DataElement referred is a NumericDataElement. This defines the number of decimal points can be inserted into the report text. | | | 2.4.2.1.2.2 | InsertPartial  Insert the contents of a TemplatePartial to be inserted   |  |  |  |  | | --- | --- | --- | --- | | 2.4.2.1.2.2.1 | PartialId | xsd:IDREF | The dynamic value of this TemplatePartial will be inserted. | | | 2.4.2.1.2.3 | SectionIf  Insert the contained template text if the given DataElement has any value.   |  |  |  |  | | --- | --- | --- | --- | | 2.4.2.1.2.3.1 | DataElementId | xsd:IDREF | Dataelement to be tested | | 2.4.2.1.2.3.2 | TextTemplateContent  Recursive, can contain TextTemplateContent itself | | | | | 2.4.2.1.2.4 | SectionIfValue  Insert the contained template text if the given DataElement matches with the comparison value.   |  |  |  |  | | --- | --- | --- | --- | | 2.4.2.1.2.4.1 | DataElementId | xsd:IDREF | Dataelement to be tested | | 2.4.2.1.2.4.2 | ComparisonValue | xsd:token | Comparison value | | 2.4.2.1.2.4.3 | TextTemplateContent  Recursive, can contain TextTemplateContent itself | | | | | 2.4.2.1.2.5 | SectionIfNot  Insert the contained template text if the given DataElement has no value.   |  |  |  |  | | --- | --- | --- | --- | | 2.4.2.1.2.5.1 | DataElementId | xsd:IDREF | Dataelement to be tested | | 2.4.2.1.2.5.2 | TextTemplateContent  Recursive, can contain TextTemplateContent itself | | | | | 2.4.2.1.2.6 | SectionIfValueNot  Insert the contained template text if the given DataElement doesn’t matches with the comparison value   |  |  |  |  | | --- | --- | --- | --- | | 2.4.2.1.2.6.1 | DataElementId | xsd:IDREF | Dataelement to be tested | | 2.4.2.1.2.6.2 | ComparisonValue | xsd:token | Comparison value | | 2.4.2.1.2.6.3 | TextTemplateContent  Recursive, can contain TextTemplateContent itself | | | | | | | | | | | | 2.5. | ActionableFinding(optional)   |  |  |  |  | | --- | --- | --- | --- | | 2.5.1 | Category | text |  | | | | | 2.6 | ImagingFollowup(optional)  Specifies the parameters around recommended imaging follow-up   |  |  |  |  | | --- | --- | --- | --- | | 2.6.1 | ClinicalCondition | text | If the recommended follow-up has a clinical condition such as a patient has high risk for cancer | | 2.6.2 | References(optional)  Reference to the evidence base for the recommendation.  Citation   |  |  |  |  | | --- | --- | --- | --- | | 2.6.2.1 | PubmedId (optional) | xsd:token | Pubmed reference Identifier  <https://www.ncbi.nlm.nih.gov/pubmed> | | 2.6.2.2 | URI (optional) | xsd:anyURI | Any Reference URI (for e.g: link to abstract on journal website) | | 2.6.2.3 | Text |  | citation text ( for e.g. : a bibliographic reference to the citation) | | | | | 2.6.3 | EvidenceLevel  Contains information to encode the strength of the evidence behind the recommendation   |  |  |  |  | | --- | --- | --- | --- | | 2.6.3.1 | CodingSystem | text | The source of coding system used. This should be a URL | | 2.6.3.2 | Code | xsd:token | Code in coding system | | 2.6.3.3 | xsd:token |  |  | | | | | 2.6.4 | PreferredImagingExam   |  |  |  |  | | --- | --- | --- | --- | | 2.6.4.1 | CodingSystem (optional) | text | The source of coding system used. This should be a URL | |  | Code | xsd:token | Code in coding system | | | | | 2.6.5 | AcceptableImagingExams  Exam   |  |  |  |  | | --- | --- | --- | --- | | 2.6.5.1 | code | text | Code in coding system | | 2.6.5.2 | CodeSystem | text | The source of coding system used. This should be a URL | | 2.6.5.3 | Modality | text | modality | | 2.6.5.4 | BodyRegion | text | Body region | | 2.6.5.5 | text |  |  | | | | | 2.6.6 | IndicationForFollowup   |  |  |  |  | | --- | --- | --- | --- | | 2.6.6.1 | CodingSystem (optional) | text | The source of coding system used. This should be a URL | | 2.6.6.2 | Code | xsd:token | Code in coding system | | 2.6.6.3 | text |  |  | | | | | 2.6.7 | RecommendedTimeFrame   |  |  |  |  | | --- | --- | --- | --- | | 2.6.7.1 | Earliest | text | Endpoint reference label | | 2.6.7.2 | Latest | text |  | | 2.6.7.3 | empty |  |  | | | | | | | | | |

Sample

<EndPoint xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:noNamespaceSchemaLocation="ACRAssist\_xml\_schema\_v1\_0.xsd" Id="ID000">  
 <Label>Label0</Label>  
 <Diagnosis CodingSystem="CodingSystem0" Code="Code0">  
 </Diagnosis>  
 <ReportTexts>  
 <ReportText SectionId="findings">  
 <SectionIf DataElementId="ID000">  
 </SectionIf>  
 <SectionIfValueNot DataElementId="ID000" ComparisonValue="ComparisonValue0">  
 </SectionIfValueNot>  
 </ReportText>  
 <ReportText SectionId="findings">  
 <SectionIfValue DataElementId="ID000" ComparisonValue="ComparisonValue1">  
 </SectionIfValue>  
 <InsertValue DataElementId="ID000" SignificantDigits="0"/>  
 </ReportText>  
 <ReportText SectionId="findings">  
 <InsertValue DataElementId="ID000" SignificantDigits="0"/>  
 <InsertValue DataElementId="ID000" SignificantDigits="0"/>  
 </ReportText>  
 <ReportText SectionId="findings">  
 <SectionIfNot DataElementId="ID000">  
 </SectionIfNot>  
 <InsertValue DataElementId="ID000" SignificantDigits="0"/>  
 </ReportText>  
 </ReportTexts>  
 <ActionableFinding Category="Category0"/>  
 <ImagingFollowup>  
 <Exam Code="Code1" CodeSystem="CodeSystem0" Modality="Modality0" BodyRegion="BodyRegion0">  
 </Exam>  
 <Exam Code="Code2" CodeSystem="CodeSystem1" Modality="Modality1" BodyRegion="BodyRegion1">  
 </Exam>  
 </ImagingFollowup>  
</EndPoint>