Summary of Work Performed for Mapping Cedara AIM to Official AIM 3.0

Cedara I-Response supports AIM 2.0 with several customizing modifications. However, NBIA and ClearCanvas have moved on to support AIM 3.0. This task is to analyze the possibility of mapping Cedara Aim to official AIM 3.0 and developing a script as prototype to perform the mapping task.

There are several significant changes between AIM 2.0 and 3.0 but none of them affects the AIM Cedara AIM to 3.0 transformation. Here is the list of AIM 3.0 changes from AIM 2.0:

1. Remove "isPresent" attribute from AnatomicEntityCharacteristic and ImagingObservationCharacteristic.

2. Remove Rating class.

3. Add the following class to replace Rating with enhanced information capturing

- CharacteristicQuantification that associates with

- Interval class

- Numerical class

- Quantile class

- Scale class that assoicates with

- OrdinalLevel class

- NonQuantifyable

4. Remove "segmentationType" from Segmentation class since SOPClassUID represents the same information.

5. Add "referencedPreviousAnnotationUID" to Annotation class. It is a Digital Imaging and Communication in Medicine (DICOM) (style)

unique identifier for referencing earlier instance of AIM annotation.

6. Add an association between Annotation and ReferencedAnnotation, This is used to contain different version of annotations.

7. Add AIMStatus class. It is used to capture a status of an annotation instance using coded term, a version of annotation

instance and update authorization (authorizedBy).

8. Remove SegmentationType in value domain (caDSR Value Domain)

9. Add an association between ImagingObservation and ReferencedGeometricShape.

Since Cedara I-Response does not support recording image observation so there is no related information needs to be transformed. Also no segmentation info was kept in Cedara AIM markup, so no information will be lost due to Cedara AIM 2.0 to AIM 3.0 transformation.

Since Cedara I-Response uses its own way to store the information, the main task of transforming Cedara AIM to 3.0 is to map the info kept in certain attributes of some data elements to different attributes even different elements.

The remapped data elements/attributes include ImageAnnotation/aimVersion, ImageAnnotation/comment, ImageAnnotation/uniqueIdentifier and User/name. The detailed mapping info can be found in map.mfd.

While there are not a lot of elements/attributes need to be remapped, there is a challenge because Cedara AIM file is not valid xml file. So some customer code is written to transform the Cedara AIM to a valid xml file than perform the transformation to split them and then remap some attributes into valid xml files fitting into AIM 3.0 schema.

One import issue is noticed during this mapping process: Cedara I-Response supports the virtual 3D markup and the markup info is stored into Cedara AIM in a very specific way. The official AIM 2.0 and 3.0 only support the DICOM image based markup so all virtual 3D markup stored into Cedara AIM will lose since there is no document to guild the interpretation of the 3D virtual markup information storage in Cedara AIM files and the official AIM schema also need to be expanded to support these types of info. So before the new improved schema is released, the mapping program will ignore all virtual 3D markup info.