

Status:	Closed
Project:	PDS4 Standards Change Control Board
Component/s:	Information Model
Affects Version/s:	2.0.0.0
Fix Version/s:	1.1.0.0

Type:	Enhancement / Improvement	Priority:	Normal / Non-urgent
Reporter:	Ronald Joyner	Assignee:	Emily Law
Resolution:	Approved as Is		
Labels:	Implemented_and_Released		
Remaining Estimate:	Not Specified		
Time Spent:	Not Specified		
Original Estimate:	Not Specified		

Proposed Solution:	<p>Modify the <Axis_Array> class to delete <unit> from the list of attributes.</p> <p>The current components of <Axis_Array> follows:</p> <pre> <xs:complexType name="Axis_Array"> <xs:annotation> <xs:documentation> The Axis Array class is used as a component of the array class and defines an axis of the array. </xs:documentation> </xs:annotation> <xs:sequence> <xs:element name="axis_name" type="pds:ASCII_Short_String_Collapsed" minOccurs="1" maxOccurs="1"> </xs:element> <xs:element name="elements" type="pds:elements" minOccurs="1" maxOccurs="1"> </xs:element> <xs:element name="unit" type="pds:UTF8_Short_String_Collapsed" minOccurs="0" maxOccurs="1"> </xs:element> <xs:element name="sequence_number" type="pds:sequence_number" minOccurs="1" maxOccurs="1"> </xs:element> <xs:element name="Band_Bin_Set" type="pds:Band_Bin_Set" minOccurs="0" maxOccurs="1"> </xs:element> </xs:sequence> </xs:complexType> </pre>
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Dependencies / Contingencies:	None
Additional Information:	None
Working Group:	None
Requested Changes:	Modify the Information Model to remove the attribute "unit" from the "Axis_Array" class.
Impact Statement:	<p>Impact:</p> <ul style="list-style-type: none"> -- Information Model -- remove attribute <p>No Impact:</p> <ul style="list-style-type: none"> -- APG -- Concepts Document -- DPH -- External Agencies -- ISO Standards -- PDS Tools -- PDS Website -- PAG -- Standards Reference
Technical Assessment:	<p>Domain experts have reviewed and recommended the propose change. Technically the change is reasonable and relatively easy to make. The proposed change will involve removing the attribute <Axis_Array.unit> from the PDS4 Information Model. Even though the change is non-backwards compatible, it was common knowledge since before V1.0 that this attribute would be deprecated. Documentation should be made available to V1.0 data providers that <Axis_Array.unit> has been deprecated.</p>
System Impact:	non-backwards compatible

Description

In the current information model (v1.0.0.0) both the Element_Array and Axis_Array classes have a "unit" attribute. While the "unit" attribute of the Element_Array class makes sense (since it provides the units of the values in each element of the array), the use of the "unit" attribute in the Axis_Array class is less clear.

The Spectra Tiger Team is convinced that the purpose of the Axis_Array class is simply to describe the physical structure of the digital data object, specifically by identifying a particular axis and indicating how many "elements" or "bins" there are along that axis. Any interpretation of what those bins represent or how they are to be interpreted belongs elsewhere in the PDS label, most likely in the Discipline or Mission area. Thus, the inclusion of the "units" attribute in this class is inappropriate.

Comments

Comment by [Ronald Joyner](#) [01/Jul/13]

JS_xls_06

Comment by [Richard Simpson](#) [16/Aug/13]

If [CCB-7](#) is approved, data providers working with non-spectral axes (e.g., Array_2D_Map) will lose the ability to specify units for axes.

Unit information is already included in optional Band_Bin_Set, which has required Band_Bin, which has required band_width and center_wavelength. Both of the attribute definitions include a list of valid units. 'Unit' may be omitted from Axis_Array when Band_Bin_Set is included.

However, the Band_Bin_Set association is useful only for spectral axes (specifically, axes defined as wavelength). And it is only useful for axes with uniformly spaced elements.

The Band_Bin hierarchy will only be invoked by data providers working with spectral data (and only for their spectral axes).

[CCB-7](#) is a step backward — except possibly for spectral data providers. It should be accompanied by a generalization of the Band_Bin hierarchy which applies at least to non-spectral axes. Including axes with non-uniform spacing of elements would be more complex but also desirable.

Comment by [Elizabeth Rye \(Inactive\)](#) [16/Aug/13]

The "unit" attribute of the Axis_Array class is virtually useless for specifying units in the way you're describing. Most cartographic projections aren't going to have uniformly varying measures of units across an array; they need far more sophisticated descriptions that include an understanding of the map projection. Thus, units for maps are appropriately handled in the Cartography dictionary.

Unlike the units attribute in the Element_Array class, which are tied directly to the value stored in the pixel, units along an array axis are tied to an understanding of what the increments along that axis represent. They're not fundamentally "structural"; they're tied to interpretation, and thus deserve to be explained in a discipline or mission class.

I'd also invite input from Mark Showalter on this issue.

Comment by [Todd King \(Inactive\)](#) [20/Aug/13]

Since "units" is optional in Array_Axis it does not have to be used if axis information is supplied elsewhere. However, there are examples of data where specifying units is essential. For example, a sweeping instrument that generates a 2D array where one axis is time (units=seconds) and the other axis is viewing angle (units=degrees). Another example is a spectrum where one axis is time and the other wavelength. If "units" is removed we cannot describe such data clearly.

Comment by [Ronald Joyner](#) [20/Aug/13]

Summary posted on : <http://http://pds-engineering.jpl.nasa.gov/pds2010/ccb/2013-08-20/Minutes-08202013.pdf>

Comments:

(1) PPI - Possible hole in the model for time-series data and where to put the axis information. New SCR in preparation to handle this.

(2) RINGS - Where possible it would be good to parallel what has been done for handling spectra data by Spectra Tiger Team for the time-series data.

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