

ECHO Model Evolution (Legacy)

ECHO Model Evolution

The ECHO model includes two mechanisms for describing attributes that are not included in the base model: characteristics and additional attributes. Characteristics are used to provide specific information about platforms, instruments and sensors. Characteristics include four attributes (column 1 in Table 1). Additional attributes are unclassified metadata elements that include eight attributes (column 2 in Table 1) which are a superset of the characteristic properties.

Table 1. ECHO Characteristic and Additional Attribute Properties

Characteristic Properties	Additional Attribute Properties
Name	Name
DataType	DataType
Description	Description
	MeasurementResolution
	ParameterRangeBegin
	ParameterRangeEnd
Units	ParameterUnitsOfMeasure
	ParameterValueAccuracy
	ValueAccuracyExplanation

Current ECHO collection metadata includes a rather small number of unique characteristics (Table 2) and over 300 unique additional attributes.

Table 2. Existing Platform, Instrument, and Sensor Characteristics

Characteristic Type	Existing Values
Platform Characteristics	EquatorCrossingTime
	OrbitalPeriod
	OrbitInclination
Instrument Characteristics	SwathWidth
	ScanAngle
	ScanPeriod
	MaximumBrightnessTemperature
	MinimumBrightnessTemperature
	Resolution1
	Resolution2
	Resolution3
	Resolution4
	Resolution5
Sensor Characteristics	Wavelength
	Transmission
	Waveform

Given the overlap between characteristic and additional attribute properties, and the small number of unique platform, instrument, and sensor characteristics, it may make sense to convert the characteristics to additional attributes and to add a type property to the additional attributes in order to allow classification of the additional attributes and translation into appropriate ISO classes. Possible types and appropriate ISO classes are shown in Table 3.

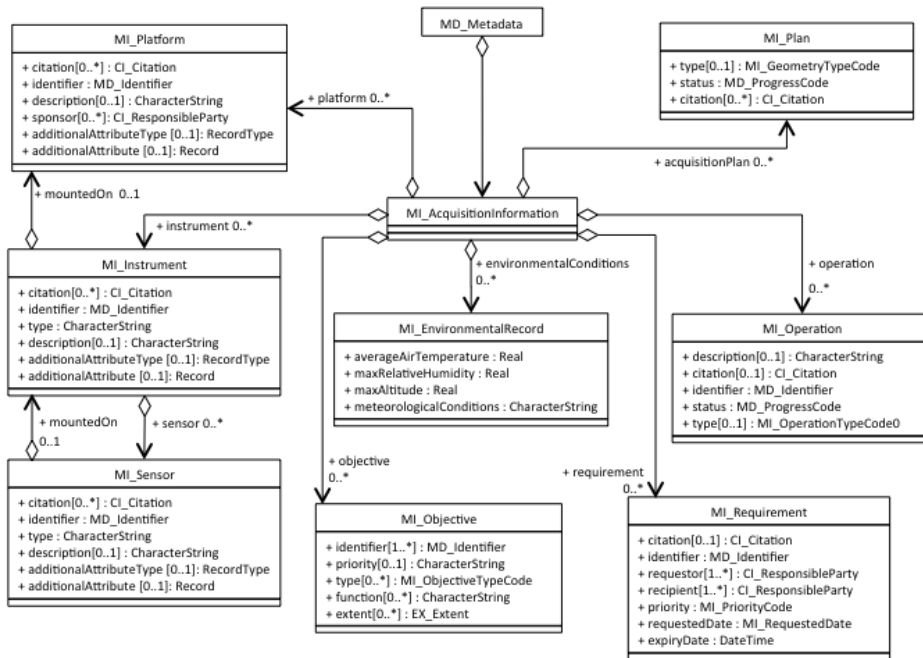
Table 3. Additional Attribute Types and Appropriate ISO Classes

Additional Attribute Type	Appropriate ISO Class	Additional Attribute Type	Appropriate ISO Class
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platformCharacteristic	MI_Platform (with extensions)	algorithmParamater	LE_Processing (with extensions)
instrumentCharacteristic	MI_Instrument (with extensions)	additionalAttribute	MD_SampleDimension (ISO 19115-1)
sensorCharacteristic	MI_Sensor (new class)	qualityInformation	DQ_QualityMeasure (ISO 19157)

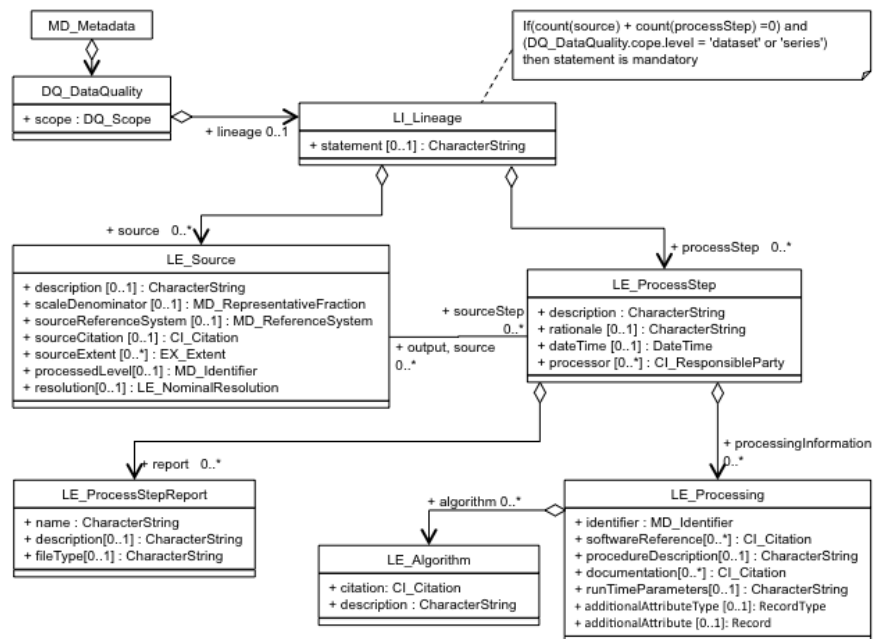
ISO Extensions

Acquisition Information



esdis:MI_AcquisitionInformation

Lineage



esdis:DQ_Lineage

Several of the ISO classes listed in Table 3 require extensions in order to be able to hold lists of arbitrary attributes. This is done in the ISO standards using a combination of roles with type = RecordType and Record. The RecordType is usually implemented as an xlink to a fragment of an XML schema that defines an object. The Record is an instance of that object with values. The Figures show a first draft idea of how this might look in UML.