TECHNICAL METADATA FOR DIGITAL STILL IMAGES *(AKA "ANSI/NISO Z39.87")*

Oh, Ricky, isn't it great how secure we can feel, knowing that NISO Z39.87 helps with digital preservation?

What IS this 'Z39' Lucy's talking about? …she has some explaining to do!!!

Photo retrieved 3/30/2011 from: http://en.wikipedia.org/wiki/Desi_Arnaz

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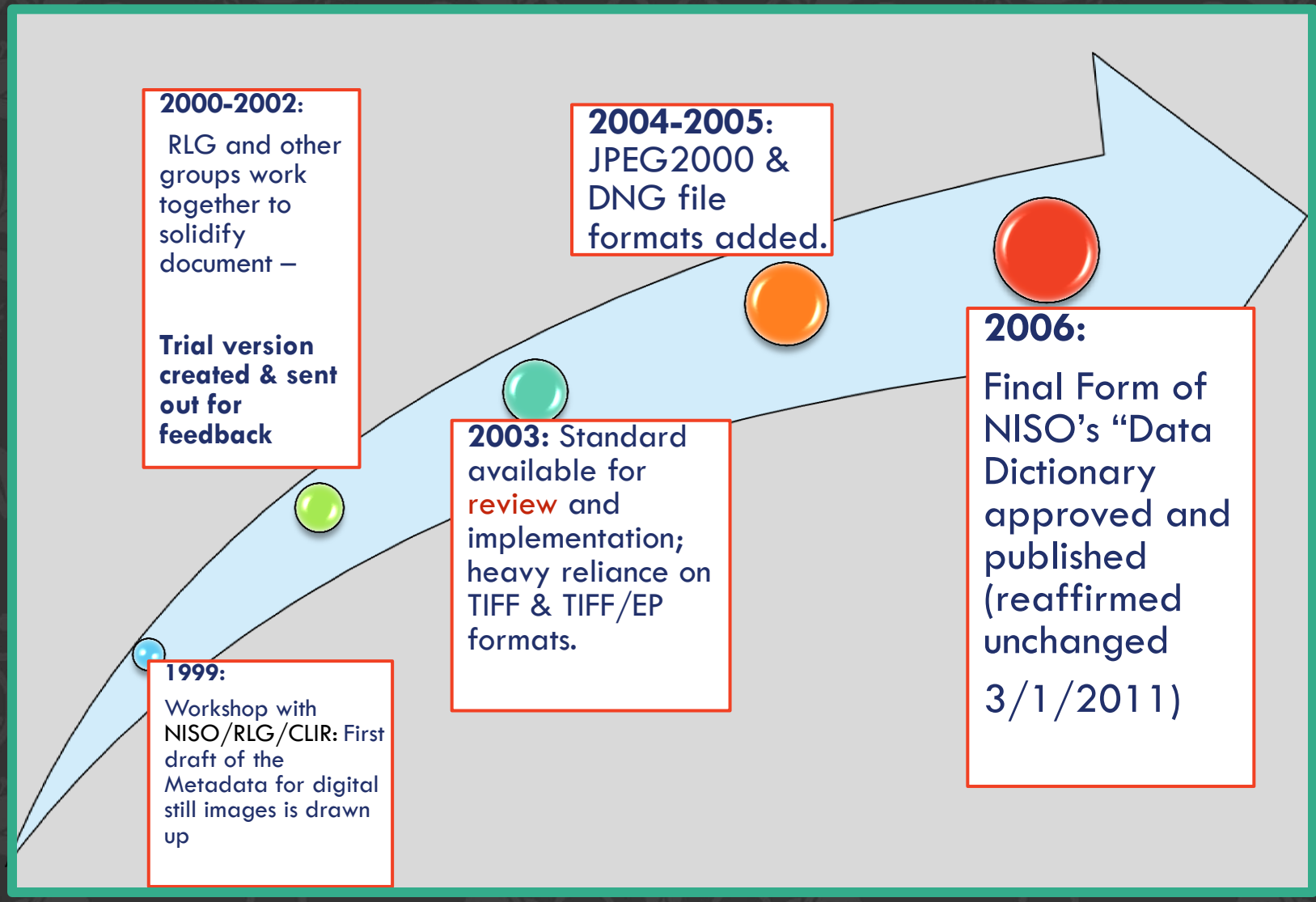
LS566 -- Metadata
Schema Presentation May 3, 2011

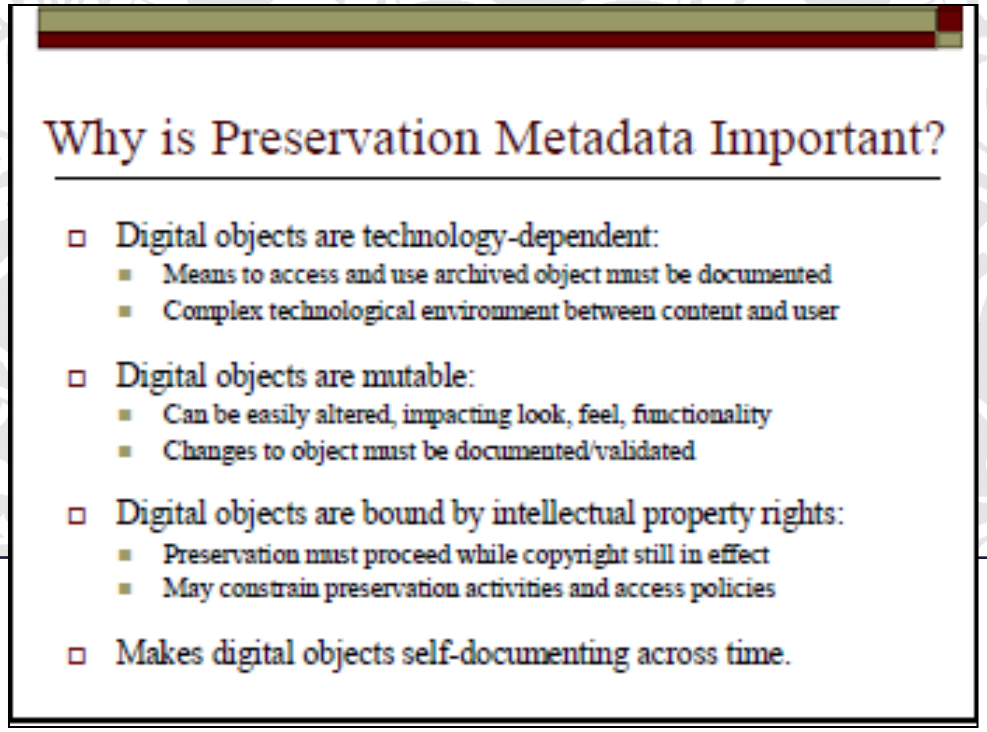
http://mckenziedriftboat.com/wp-content/uploads/2008/11/16ft-rowboat.jpg

A VERITABLE SEA OF ACRONYMS…THESE ARE DEFINED IN YOUR HANDOUT…

NISO TIMELINE



ONCE UPON A TIME, IN A WIMBA CLASSROOM FAR, FAR AWAY…
(WELL, NOT SO LONG AGO AND NOT FAR AWAY AT ALL)



Courtesy of Lecture Notes, Dr. MacCall, 2/15/2011

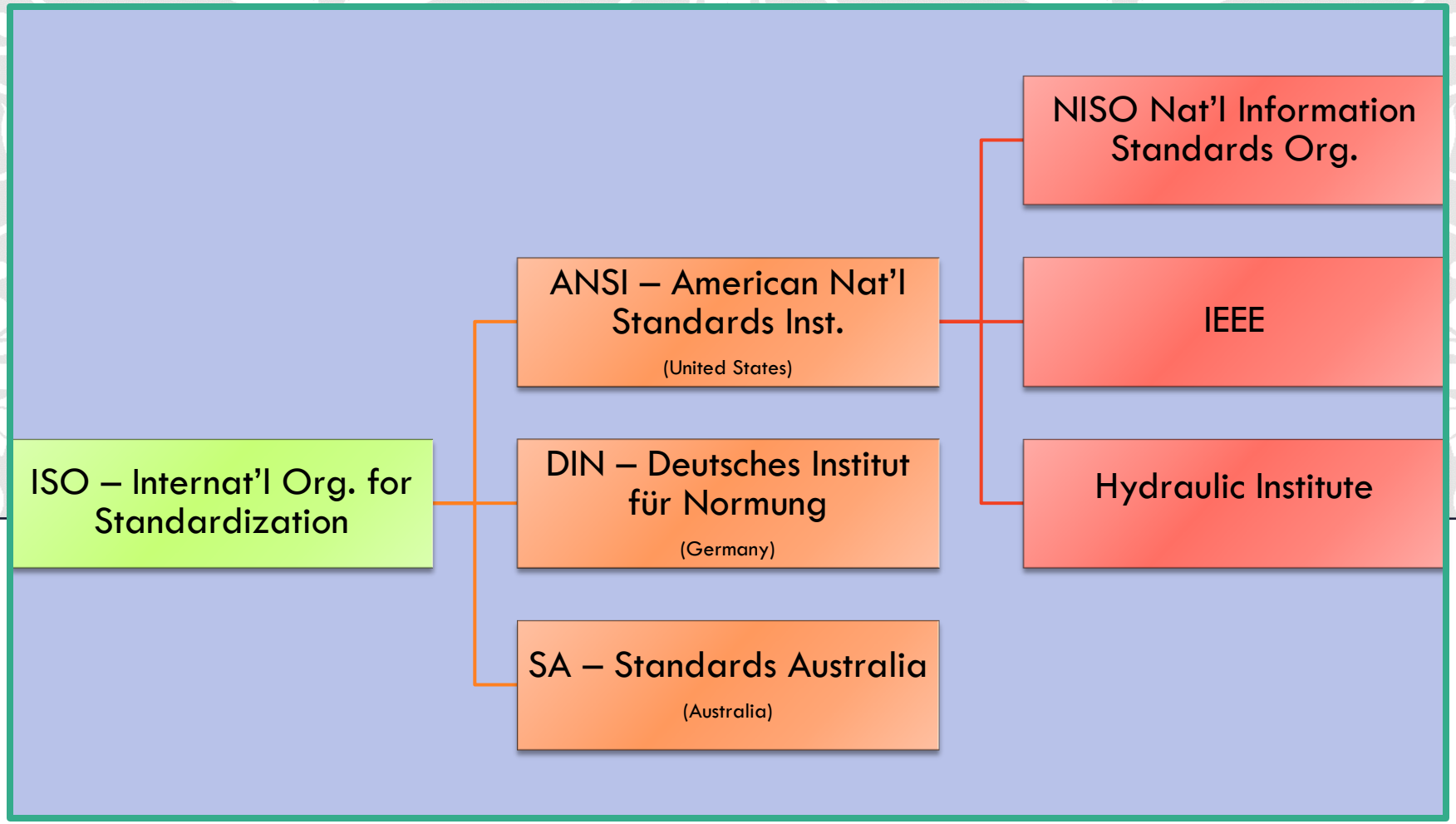
NISO Z39.87 IN A NUTSHELL

Like the PREMIS schema from last week, ***NISO Z39.87* is a "*Data Dictionary*"**: a list of elements that help ensure reliable Digital Preservation specifically **for raster (bitmap -- BMP) digital still images.**

Why needed: because, as we discussed in our in our 2/15 lecture, "Digital objects are useless if we can't locate, relocate/migrate, display them". Instead of just needing to save an artifact, we now need to save the artifact + ancillary material & documentation.

→ NISO Z39.87 is a set of technical elements that ensures achievement of interoperability among systems, software, and access to/long-term management of digital image collections.

Data Dictionary Controlling parties:



The Elements of NISO Z39.87:

There are 111 elements, 33 of which are required.
There are 2 types of elements:

- **Containers/subcontainers** (logically related groups)
- **elements** (component parts of the data dictionary)

AREAS COVERED

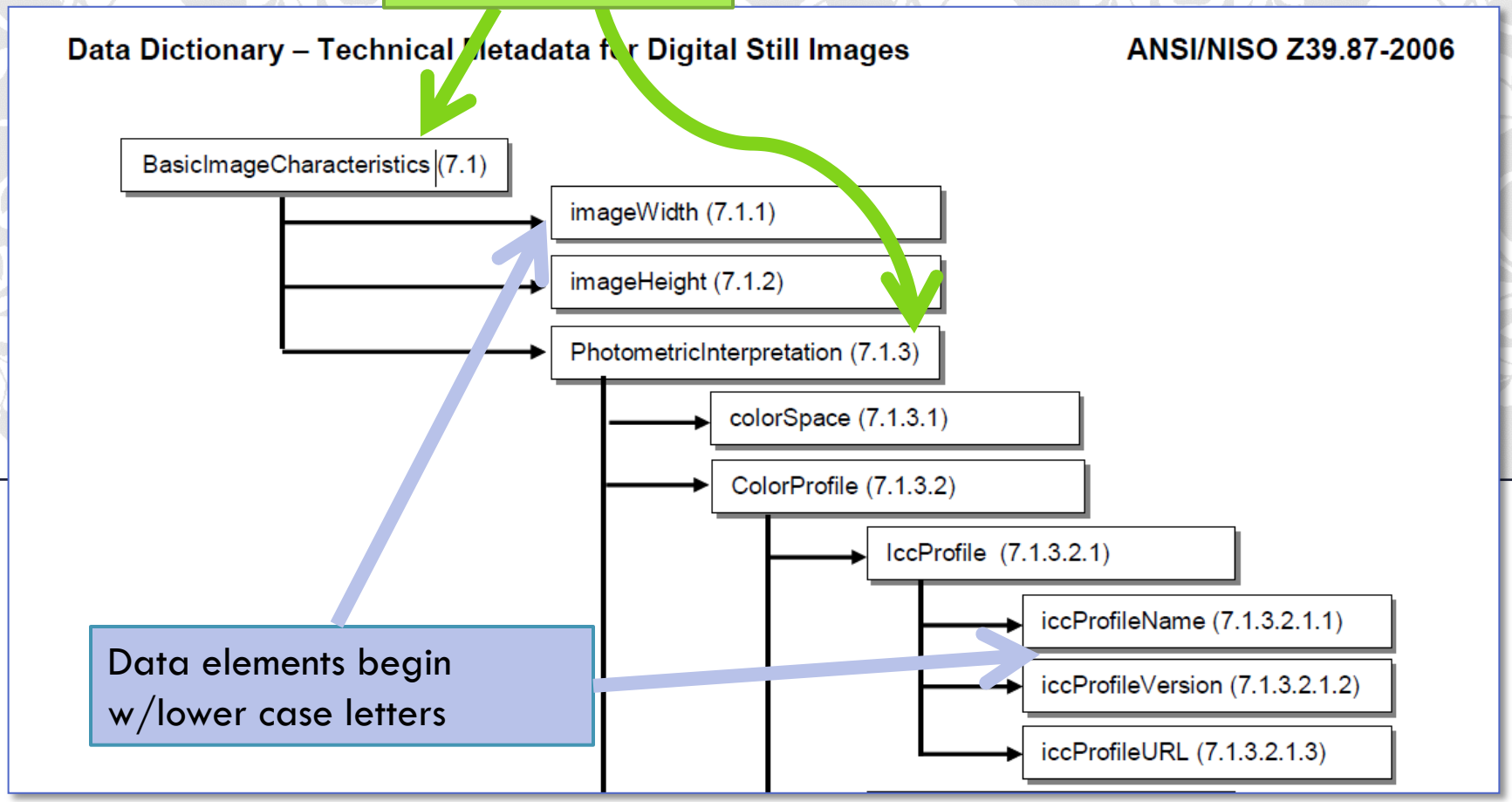
Basic Image Parameters: data types necessary for interpreting file as a viewable image; with just this information alone a programmer should be able to build a viewing application for the image from scratch.

Image Creation: describe conditions & environment under which the image was created

Image Performance Assessment: recording metrics related to image capture and output to ensure accurate data interpretation has been achieved)

Change History: tracks processes applied to an image throughout it lifecycle; includes refreshing as well as migration

Containers start w/ capital letters



Data elements begin w/lower case letters

BUT WHERE DOES THIS TECHNICAL METADATA ORIGINATE?

"…Ideally, capture devices should record all of the Z39.87 elements automatically, or make manual recording simple and quick."
http://aabc.ca/newsletter/14_2_3/report_of_society_for_imaging_science.htm

Products (scanner & digital cameras) automatically create/store most of the data when they create the image. If they aren't automatically created, there are strict guidelines for entering the values.

Metadata is stored in these automatically created files, and is retrieved from those files via specialized software programs, much like an XML parser is needed to read and XML file.

LET'S PLAY A LITTLE MIX 'EM UP!

Metadata for **I**mages in **X**ML Schema

The use of the Z39.87 Data Dictionary is accomplished **primarily through the XML schema language of the WWW consortium** (since it's **technical data,** and not descriptive data (like Dublin Core).

XML schema for NISO Z39.87 is known as **MIX**…the LOC's Network Development and MARC Standards Office (NOT NISO) maintains MIX.

* You need a dedicated program, like Harvard's "JHove", to read the XML file & enter any missing desired data; most data is located in the header.

Part of a MIX header documenting change history (prior to element listing)

```
<?xml version="1.0" encoding="UTF-8" ?>
- <!-- MIX Version 2.0  -->
- <!-- created by Morgan Cundiff  -->
- <!-- Library of Congress  -->
- <!-- Network Development and MARC Standards Office  -->
- <!-- May 12, 2008  -->
- <!-- Change History Version 1.0 to Version 2.0  -->
- <!-- changed abbreviation of millemetre from "mm." to "mm" and centimetre from "cm." to "cm"  -->
- <!-- Fixed typo: SHA512 to SHA-512 (5-5-08)  -->
- <!-- Fixed typo: removed trailing space from LightSourceType value "Standard light A" (5-5-08)  -->
- <!-- Changed cardinality requirements so all elements (except for <mix>) are optional  -->
- <!-- added "unknown" to list of permitted values for messageDigestAlgorithm element  -->
- <!-- Changed yCbCrCoefficients a container element, YCbCrCoefficients, with three sub-elements, lumaRed, lumaGreen,
lumaBlue, each of type rational.  -->
- <!-- referenceBlackWhite a container element, ReferenceBlackWhite, with a repeatable container sub-element,
Component, each with three sub-elements, componentPhotometricInterpretation, of a restricted enumerated type with values
"R", "G", "B", "Y", "Cb", "Cr", and footroom and headroom, both of type rational.  -->
- <!-- Added MonochromeArea, OneChipColourArea, TwoChipColorArea, ThreeChipColorArea, and ColorSequentialArea to
list of allowable values for scannerSensor element (8.3.4)  -->
- <!-- exifVersion (8.4.4.1.7) element allowable value "0220" changed to xs:string datatype  -->
- <!-- subjectDistance (8.4.4.1.13) element has been changed to a container element, SubjectDistance, that contains distance,
MinMaxDistance, or both as follows: <SubjectDistance> <distance>5</distance> <MinMaxDistance>
<minDistance>4.9</minDistance> <maxDistance>5.3</maxDistance> </MinMaxDistance> </SubjectDistance>  -->
- <!-- gpsLatitude (8.4.4.2.3), gpsLongitude (8.4.4.2.5), gpsDestLatitude (8.4.4.2.21) and gpsDestLongitude (8.4.4.2.23)
elements have been changed to container elements (GpsLatitude, GpsLongitude, GpsDestLatitude, and GpsDestLongitude
respectively) , with three sub-elements, degrees, minutes, seconds, each of type rational.  -->
- <!-- added wrapper element GrayResponse to contain GrayResponseCurve and grayResponseUnit  -->
- <!-- The grayResponseCurve (9.2.5) element has been made repeatable and the datatype for value has been changed to
nonNegativeInteger.  -->
- <!-- whitePointXValue (9.2.7.1), whitePointYValue (9.2.7.2), primaryChromaticitiesRedX (9.2.8.1) ,
primaryChromaticitiesRedY (9.2.8.2) , primaryChromaticitiesGreenX (9.2.8.3) , primaryChromaticitiesGreenY (9.2.8.4) ,
primaryChromaticitiesBlueX (9.2.8.5) , and primaryChromaticitiesBlueY (9.2.8.6) elements have been changed to
rationalType.  -->
- <!-- targetType (9.3.1) element allowable enumerated type values changed to 0 and 1.  -->
- <!-- fileSize (6.2) element has been changed to nonNegativeIntegertype  -->
- <!-- byteOrder (6.5) element allowable values have been changed to "big endian" and "little endian".  -->
- <!-- compressionRatio (6.6.4) element has been changed to rationalType  -->
```

http://www.loc.gov/standards/mix/mix20/mix20.xsd

It's a small world, after all…

We now have a global economy dealing in analog-to-digital (scanned) and digital-born (cameras) objects created anywhere!!!

Some organizations using ANSI/NISO Z39.87:

- National Library of New Zealand
- Harvard University Library
- Irish Virtual Research Library and Archive
- Digital University Repository at the Charles University in Prague
- The International Research on Permanent Authentic Records in Electronic Systems (Canada)
- Texas Heritage Digitization Initiative
- University of Basel, Switzerland

Please visit my screencast to see:

1. **How NISO Z39.87 fits in with OAIS**
2. **Samples of Technical Metadata from digital images using ADOBE LIGTHROOM**

THANK YOU FOR LISTENING!