The Anatomy of XBRL Instance Documents

Jim Richards
Murdoch Business School
Murdoch University
South Street
MURDOCH
Western Australia 6150

Co-Chair, Education Working Group XBRL Australia
Vice-Chair, Education Working Group, XBRL International

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Contact: j.richards@murdoch.edu.au

1. Introduction

There are three parts to this set of notes. The first two –well-formed and valid – are related to all XML-based documents. The third section looks at the content required in an XBRL document using Specification 2.0.

2. Well-Formed Documents

A well-formed document is one that meets the requirements of the XML recommendation. Gulbransen (2000, p.100) suggests there are four rules of thumb to determine if an XML document is well-formed:

- An element's start and end tags have to match
- Elements must be properly nested
- The document must contain a root element that contains all other elements
- Element names and attribute names must be legal names.

The following, using XBRL terminology, would be a well-formed XML document

```
<group>
        <bst>Balance Sheet</bst>
</group>
```

The following would not be a well-formed XML document:

```
<group>
        <bst>Balance Sheet</group>
</bst>
```

The elements <group> and <bst> are not nested correctly.

There is software available to check that an XML document is well-formed.

2. Valid Documents

This can get confusing because a well-formed document may not be valid, but all valid documents are well-formed.

In order to check that an instance document is valid you also need the schema/taxonomy. The schema/taxonomy defines the elements (and their attributes) that can be contained in an instance document. If the document is well-formed and only contains the elements and attributes in the taxonomy, then the document is valid. A different type of software checks that a document is valid.

Assume we have the following taxonomy:

```
<schema>
        <element name=”bst” type=”string”/>
        <element name=”ast” type=”decimal”/>
        <element name=”ast.cur” type=”decimal”/>
        <element name =”ast.cur.cce” type=”decimal”>
</schema>
```

The following instance document would be valid:

```
<group>
        <bst>Balance Sheet</bst>
        <ast>120000</ast>
        <ast.cur>30000</ast.cur>
        <ast.cur.cce>20000</ast.cur.cce>
</group>
```

The above instance document is valid because:

- All elements are nested correctly
- The data for each element matches it type
- All element names are contained in the schema/taxonomy.
- There is a root element that is correctly nested.

The following instance document would not be valid even though it is well-formed:

```
<group>
        <bst>
        <ast>Current Assets</ast>
        <ast.cur>30000</ast.cur>
        <ast.cur.cce>20000</ast.cur.cce>
        <ast.cur.inv>5000</ast.cur.inv>
```

This instance document is not valid for the following reasons:

- <bst> does not have a closing tag (<bst></bst>) or a null value tag (<bst/>)
- <ast> has string data rather than numeric (decimal) data
- <ast.cur.inv> is not in the taxonomy file
- <group> does not have a closing tag (</group>).

3. XBRL Instance Documents Explained

This section will first explain the minimum contents contained in an XBRL instance document that contains only one amount. It will then expand to show what is added as additional elements are added.

The explanation assumes that there is a taxonomy file called **sample.xsd**.

Here are the contents of **sampleinst.xml** - the instance document.

1	<?xml version="1.0"?>
2	<group xmlns="http://www.xbrl.org/2001/instance"
3	xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
4	xmlns:link="http://www.xbrl.org/2001/XLink/xbrllinkbase"
5	xmlns:xlink="http://www.w3.org/1999/xlink"
6	xmlns:sample="http://www.sample.org.au/xbrl/2001-06-30"
7	xsi:schemaLocation="http://www.sample.org.au/xbrl/2001-06-30 sample.xsd">
8	
9	<sample:ast.cur.cce numericContext="numCont1">1157</sample:ast.cur.cce>
10	
11	<numericContext id="numCont1" precision="18" cwa="true">
12	<entity>
13	<identifier scheme="http://www.sample.org.au/">Company A</identifier>
14	</entity>
15	<period>
16	<instant>2001-06-30</instant>
17	</period>
18	<unit><measure>ISO4217:AUD</measure></unit>
19	<scenario name="Actual values">
20	<sample:scenarioType>actual</sample:scenarioType>
21	</scenario>
22	</numericContext>
23	</group>

The line numbers are not normally contained in the instance document. They are used here to provide an easy reference to each line as it is explained.

3.1 Line 1 – XML Identifier

This line is the required beginning line for every XML document, irregardless of its type. Additional data can be inserted but this is the bare minimum. It indicates that it an XML document based on XML Recommendation 1.0. As a minimum it must be included exactly as shown.

3.2 Line 2 – Beginning of the Root element

<group> is the name of the root (first) element. This element name is required under XBRL Specification 2.0 (2001, p. 22).

The second entry indicates that this is an XBRL instance document.

3.3 Line 3 – Location of XML Schema Instance

The xmlns at the beginning of the line indicates that we are creating an XML Namespace (xsi) and that the location we are referring to is the web address found within the quotation marks. Any future reference to contents from this site will be prefixed with **xsi:** (see line 7 for an example).

A namespace reference is made up of a number of parts:

xlmns	Referring to a web location and/or document
:	Separator between xlmns and the namespace name
xxxx=	The characters before the "=" sign represent the name allocated to the namespace. All elements referring to this name space are prefixed by this name so that it is "obvious" where the element or role is defined.
"http://…	Location of the file to which the namespace reference refers.

3.4 Line 4 – Location of XBRL Link Bases

This is another namespace reference. Anything referring to the role of linkbases within XBRL is defined here and any reference to it will be prefixed with "link:".

3.4 Line 5 - Location of XML Links

Similar to the above except that it refers to the roles of link bases specified within the XLink specification.

3.5 Line 6 – Taxonomy Namespace Reference

Another namespace reference that indicates that any elements from this location are prefixed with the words "sample:". If this were not present, then all of the elements names would have no namespace prefix. (See Line 9 to see how the namespace prefix works).

If this line was omitted then line 9 would read as:

<ast.cur.cce numericContext="numC1">1157<ast.cur.cce>

3.6 Line 7 – Location and Name of the Taxonomy (.xsd) File

This line indicates where the Taxonomy/Schema file is located. the term schemaLocation is prefixed by "xsi:", which was previously defined as a a namespace in line 3. This means that this attribute/element is defined at the web site specified in line 3.

"sample.xsd" indicates the name of the file that is being used as the taxonomy/schema for this instance document. Since the file is not preceded a web address it means that the taxonomy file is located in the same directory as the instance document. If it is located on a web site, then the full http:// address would need to be included.

3.7 Line 9 – The Element Details

The details for each element consists of a number of required parts:

sample	refers to the namespace assigned to the taxonomy in line 6
ast.cur.cce	the element name
numericContext=”numCont1”	a context attribute is required for all elements. The details for this are specified further down in the document (see lines 11-23)
1157	the fact value for the element

The name assigned to the attribute numericContext (“numCont1”) is defined by the instance document creator. This could have been any name. For example, in the Specification example it simply uses “c1”.

If you were reporting values for more than one accounting period, you would need to have more than one numeric context. The numeric context contains information about the date(s) that relate to the amount. Therefore, “numCont1-1999” could be a valid name for the attribute.

3.8 Line 11 – Defining the numericContext Details

“numericContext” is an element defined in the XBRL schema and is the name that must be used for the instance document to be valid.

“id” is an attribute of numericContext and must agree with the entry on line 9 where the numericContext element is referred to in the element details for “ast.cur.cce”. Hence its name is “numCont1”.

“precision” refers to the maximum number of significant decimal digits for all elements using this numeric context. The “18” indicates that there can be up to 18 significant digits in this amount. In order to count the number of significant digits, you start with the left-most digit and count to the right. If a number in the instance document was greater than 18 digits, then the accuracy is only guaranteed for the first 18 digits.

“cwa” refers to an attribute called the Closed World Assumption. If this value is set to “true” it means that it is safe to use this number in calculations and that all the details are contained within the instance document. If it is set to false (probably a good default condition), it means that any calculations using that element (or elements) are at the risk of the user of the instance document rather than the preparer.

3.9 Lines 12-14 – The Entity Name

These 3 lines indicate the minimal details about the organisation for which the instance document has been prepared. The scheme attribute could be omitted but it is best to retain it if it is available.

Obviously “Company A” is the name of the organisation for which the instance document has been prepared. Rather than record it elsewhere, it is recorded here. As reason for this might be that a particular instance document has been prepared to compare the same elements for two different companies. There

would then need to be two numericContext entries – one for each company. The numericContext details would indicate to which company an element value belonged.

Note that the elements have been correctly nested.

3.10 Lines 15 - 17 –The Period element

The period element can contain one of 6 different elements. The one used here is the "instant" element, indicating the values using numericContext "numCont1" in this document are for one specific date.

If the document contained data for a statement of financial performance (profit and loss statement) then the "instant" element could be replaced by two required elements – startDate and endDate.

3.11 Line 18 – Unit details

This line tells the reader the unit of measure for the facts using numericContext "numC1". It takes its meaning from ISO4217 and is measured in Australian dollars.

3.12 Lines 19 – 21 – The Scenario element

Financial data can consist of many different types – actual, budget, restated, pro-forma, etc. This optional element indicates to the document reader that the value(s) stated using this numeric context are actual values. Actual and budgeted values could be used in the same document, but would require the use of an additional numeric context to indicate which items are actual values and which items are budgeted values.

3.13 Line 22 – Closing the numericContext element

This line should self-explanatory. It is the end tag of the numericContext entry.

3.14 Line 23 – Closing the Instance Document

This is the final line of the instance document. Therefore is it is the closing tag for the root element - group.

4. Expanding the Contents of the Instance Document

All of the other values for the sample balance sheet for Company A could be added without any other additional data. All you would need to do would be to copy the single element shown in the sample file and replace the element name and value for each additional element.

As mentioned previously, if items were added that related to the statement of financial performance then you would need to add an additional numeric context as the statement of financial performance requires one of the following:

- a begin date and an end date, or
- a start date and a period of time, or
- an end date and a period of time.

Statement of Financial Position items and Statement of Financial Performance items cannot use the same numeric context.