XBRL Europe Day - Rome

Error Messaging Panel Session
Monday, 5th May 2014

Panel

- Emile Bartolé – CSSF
- Eric Jarry – Banque de France
  - XII Best Practices Board and Taxonomy Architecture Task Force
- Maria Frantzi – EIOPA
- Mark Goodhand – Corefiling
  - Chairman of the XBRL Base Specification Working Group
- Piotr Malczak – GPM Systemy
- Martin DeVille – UBPartner
Error Messaging Panel

 XBRL-Europe 2

Exchanging ‘ACCURATE’ Information

- Error messaging is fundamental to XBRL
  - Part of ‘contract/protocol’ between submitter and receiver
  - Key to both parties analysing errors locally

XBRL Mechanisms for this

- Standard XBRL messages
- Generic messages
  - Only used by formula specification today
  - Enables taxonomy designer to generate meaningful messages
    - e.g. the <concept label> has the fact <y>, which is different from the calculated fact <x>
- Proposed specification enhancement – ‘severity status’
  - e.g. ‘OK’, ‘Error’, ‘Warning’
- Plus
  - Documentation
  - Reference linkbase
### Error messaging – Example 1

#### Summary

<table>
<thead>
<tr>
<th></th>
<th>Formulas Compiled</th>
<th>Formula Fired</th>
<th>Assertions Compiled</th>
<th>Assertions Fired</th>
<th>Assertions Satisfied</th>
<th>Assertions Not Satisfied</th>
<th>Contexts Created</th>
<th>Facts Created</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>703</td>
<td>210</td>
<td>12</td>
<td>10</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Assertion Report

<table>
<thead>
<tr>
<th>Value Assertions</th>
<th>id</th>
<th>satisfied</th>
<th>message</th>
</tr>
</thead>
<tbody>
<tr>
<td>eba-v0079_1</td>
<td>notSatisfied</td>
<td>The value of the element in your XBRL submission does not match the expected result of the formula.</td>
<td></td>
</tr>
<tr>
<td>eba_v0105_1</td>
<td>notSatisfied</td>
<td>The value of the element in your XBRL submission does not match the expected result of the formula.</td>
<td></td>
</tr>
<tr>
<td>eba_v0105_2</td>
<td>notSatisfied</td>
<td>The value of the element in your XBRL submission does not match the expected result of the formula.</td>
<td></td>
</tr>
<tr>
<td>eba_v0105_3</td>
<td>notSatisfied</td>
<td>The value of the element in your XBRL submission does not match the expected result of the formula.</td>
<td></td>
</tr>
<tr>
<td>eba_v0105_4</td>
<td>notSatisfied</td>
<td>The value of the element in your XBRL submission does not match the expected result of the formula.</td>
<td></td>
</tr>
<tr>
<td>eba_v0105_5</td>
<td>notSatisfied</td>
<td>The value of the element in your XBRL submission does not match the expected result of the formula.</td>
<td></td>
</tr>
<tr>
<td>eba_v0105_6</td>
<td>notSatisfied</td>
<td>The value of the element in your XBRL submission does not match the expected result of the formula.</td>
<td></td>
</tr>
<tr>
<td>eba_v0105_7</td>
<td>notSatisfied</td>
<td>The value of the element in your XBRL submission does not match the expected result of the formula.</td>
<td></td>
</tr>
<tr>
<td>eba_v0105_8</td>
<td>notSatisfied</td>
<td>The value of the element in your XBRL submission does not match the expected result of the formula.</td>
<td></td>
</tr>
<tr>
<td>eba_v0105_9</td>
<td>notSatisfied</td>
<td>The value of the element in your XBRL submission does not match the expected result of the formula.</td>
<td></td>
</tr>
<tr>
<td>eba_v0105_10</td>
<td>notSatisfied</td>
<td>The value of the element in your XBRL submission does not match the expected result of the formula.</td>
<td></td>
</tr>
</tbody>
</table>

### Error messaging – Example 2

#### Summary

<table>
<thead>
<tr>
<th></th>
<th>Formulas Compiled</th>
<th>Formula Fired</th>
<th>Assertions Compiled</th>
<th>Assertions Fired</th>
<th>Assertions Satisfied</th>
<th>Assertions Not Satisfied</th>
<th>Contexts Created</th>
<th>Units Created</th>
<th>Facts Created</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>0</td>
<td>0</td>
<td>210</td>
<td>12</td>
<td>10</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

#### Assertion Report

**Value Assertions**

Please click on the value assertion id for more detail.

<table>
<thead>
<tr>
<th>Id</th>
<th>satisfied</th>
<th>message</th>
</tr>
</thead>
<tbody>
<tr>
<td>f-corp: 2450</td>
<td>notSatisfied</td>
<td>Les rubriques dans le cadre &quot;Taille de la société au sens du Code des sociétés&quot; doivent obligatoirement être complétées. Les rubriques &quot;Nombre de travailleurs occupés, en moyenne annuelle&quot;, &quot;Chiffre d'affaires annuel, hors TVA&quot; et &quot;Total du bilan&quot; doivent obligatoirement être complétées. Si le nombre ou le montant est égal à zéro, vous devez compléter 0 (zéro).</td>
</tr>
<tr>
<td>f-corp: 2524</td>
<td>notSatisfied</td>
<td>L'annexe &quot;Rapports à l'assemblée générale et délibérations de celle-ci&quot; doit obligatoirement être ajoutée dans l'onglet &quot;Documents et relevés divers&quot;.</td>
</tr>
</tbody>
</table>
Application Level Messaging

Error messaging – observations

- Taxonomy designers do not always use the standard
  - Which often leads to developers having to create application specific code
    - e.g. EBA CRDIV – formula descriptions outside taxonomy
- Taxonomies do not make it easy to manage error messages
  - e.g. in Solvency II messages are in formula assertion definitions
  - Easier to update and manage if error messages pointed to as an independent resource
- Authors do not follow best practice or common approach
  - e.g. EBA and EIOPA both use DPM
  - But different approaches to error reporting
- As XBRL reports become larger there is a need to manage number and processing impact of error reporting
  - Error reports can become very large for simple, systematic errors
  - Producing formatted output can take up a large amount of processing resources
User Requirements

Emile Bartolé

Error messages – general requirements

• Address business oriented end user (NOT IT or XBRL specialist)
• Produce same standardized for all XBRL processors (taxonomy provider determines output, not processor vendor)
• Not depend on external information sources (e.g. DPM database)
• Multilingual
• One standard implementation (no need for re-implementation on taxonomy change)
Items to consider

<table>
<thead>
<tr>
<th>Area</th>
<th>Item</th>
<th>Restricted</th>
<th>Verbose</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Context</td>
<td>&lt;instant&gt;</td>
<td>-</td>
<td>-</td>
<td>EBA taxonomy architecture: one single reference period, some data cells may deviate from that period via a dimension, but will then be in a dedicated table position</td>
</tr>
<tr>
<td>Fact</td>
<td>Unit</td>
<td>-</td>
<td>-</td>
<td>EBA Filing Rules: one single unit</td>
</tr>
<tr>
<td>Fact</td>
<td>Value</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Formula</td>
<td>Assertion code LB</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Formula</td>
<td>Assertion label LB</td>
<td>Yes*</td>
<td>Yes*</td>
<td>* Replacement of all variables by their actual table based presentation</td>
</tr>
<tr>
<td>External</td>
<td>Business label</td>
<td>-</td>
<td>Yes</td>
<td>Explanation of the error in business terms</td>
</tr>
<tr>
<td>Formula</td>
<td>LB</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Processing</td>
<td>Pre-condition result</td>
<td>-</td>
<td>-</td>
<td>Pre-condition must evaluate to true otherwise no error could have shown up</td>
</tr>
<tr>
<td>Processing</td>
<td>Tolerance</td>
<td>-</td>
<td>-</td>
<td>No imminent advantage to add this to each error message</td>
</tr>
<tr>
<td>Processing</td>
<td>Left side result</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Processing</td>
<td>Right side result</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

Restricted 1 – detailed explanation

```
ID T1 T2  Rows Columns Sheets Formula
00102_h 40.00 050,020 (050,030) = C 40.00 (050,020) + C 40.00 (050,040) + C 40.00 (050,030)
```

Severity (Info, Warning, Error, Fatal)  
Assertion code  
Leftside results  
Rightside results
### Restricted 2 – z-dimension & generic

<table>
<thead>
<tr>
<th>ID</th>
<th>T1</th>
<th>T2</th>
<th>Rows</th>
<th>Columns</th>
<th>Sheets</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>v0147_h</td>
<td>C 18.00 (060)</td>
<td>(All)</td>
<td>{r011}</td>
<td>= +{r210} + {r020}</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Assertion ERROR v0147_h: C 18.00 (060, 011, Iceland Krona) = C 18.00 (060, 210, Iceland Krona) + C 18.00 (060, 020, Iceland Krona) with results Left = 4567, Right = 67890

Assertion ERROR v0147_h: C 18.00 (060, 011, Bulgarian Lev) = C 18.00 (060, 210, Bulgarian Lev) + C 18.00 (060, 020, Bulgarian Lev) with results Left = 1234, Right = 6644

### Restricted 3 – open table

<table>
<thead>
<tr>
<th>ID</th>
<th>T1</th>
<th>T2</th>
<th>Rows</th>
<th>Columns</th>
<th>Sheets</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>v0147_h</td>
<td>C 06.00 (120)</td>
<td>(All)</td>
<td>{c150}</td>
<td>= +{c210} +{c180}</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Assertion ERROR v0147_h: C 06.00 (120, myleicode,) = C 06.00 (210, myleicode,) + C 06.00 (180, myleicode,) with results Left = 4567, Right = 67890
Restricted 4 – Intertable inequity

<table>
<thead>
<tr>
<th>ID</th>
<th>T1</th>
<th>T2</th>
<th>Rows</th>
<th>Columns</th>
<th>Sheets</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>v0334_m</td>
<td>C 08.01.a</td>
<td>C 08.01.b</td>
<td>(130, 070)</td>
<td>Central governments and central banks with own estimates of LGD and/or conversion factors</td>
<td>C 08.01.a</td>
<td>(110, 070)</td>
</tr>
</tbody>
</table>

Example 5 – Sum on intertable

<table>
<thead>
<tr>
<th>ID</th>
<th>T1</th>
<th>T2</th>
<th>Rows</th>
<th>Columns</th>
<th>Sheets</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>v0406_m</td>
<td>C 09.01.a</td>
<td>C 07.00.a</td>
<td>sum({C 09.01.a, r160, c080, sNNN}) = {C 07.00.a, r010,c215, s017}</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Assertion ERROR v0334_m: C 08.01.b (130, 070, Central governments and central banks with own estimates of LGD and/or conversion factors) = C 08.01.a (110, 070, Central governments and central banks with own estimates of LGD and/or conversion factors) with results Left = 4567, Right = 67890

Assertion ERROR v0406_m: C 09.01.a (080, 160, Portugal) + C 09.01.a (080, 160, Romania) + C 09.01.a (080, 160, France) = C 07.00.a (215, 010, Other items) with results Left = 4567, Right = 67890
Restricted 5 – Sum on intertable

Assertion **ERROR v0406_m: C 09.01.a (080, 160, Portugal) + C 09.01.a (080, 160, Romania) + C 09.01.a (080, 160, France) = C 07.00.a (215, 010, Other items) with results Left = 4567, Right = 67890**

Verbose 5 – Sum on intertable

Assertion **ERROR v0406_m: C 09.01.a (080, 160, Portugal) [123.126] + C 09.01.a (080, 160, Romania) [89.132] + C 09.01.a (080, 160, France) [1.789.132] = C 07.00.a (215, 010, Other items) [2.556.534] with results Left = 2.001.390, Right = 2.556.534, Explanation = “Sum of countries must be equal to Other items”**
Thanks for your attention

emile.bartole@cssf.lu

Comments or questions?

More User Requirements

Eric Jarry
Error Messaging Panel

Appreciated practice

- Give to each assertion:
  - A clear label expressing the check, example: xxxx shall be equal to yyyyy
  - A code

```excel
1 [AS_D1-000010]
2 Label = "Total SII amount" shall be equal to "$quantity" * "$unit_price" = "$accrued_interest"
3 Tolerance = 5000
4 Assertion = AS_A = A2A + A3A + A30A
5
6 ; Log
7 ; (AS_D1)"Total SII amount" = (AS_D1)"quantity" * (AS_D1)"unit_price" + (AS_D1)"accrued_interest"
8
9
10 [BP_C1-AS_B4-000001]
11 Label = "Property, plant and equipment held for own use", SII value in BP_C1 shall be equal to the sum of "Total SII amount", in AS_D1, for assets with CIC corresponding to Property, plant and equipment for own use, for assets that are not held in unit-linked or index-linked funds
12 Tolerance = 5000
13 Assertion = (BP_C1)A37B = SUM((AS_D1)A15A * "..(09|95)" 44 (AS_D1)A3A == False) + (AS_D1)A2A
14
15 ; Log
16 ; (BP_C1)"Property, plant and equipment held for own use" = SUM((AS_D1)"CIC" = "..(09|95)" 44 (AS_D1)"Asset held in unit linked and index linked funds, boolean" == False) + (AS_D1)"SII Amount"
```

Error rendering in ACPR

- Regulatory templates are sent back to the filer, as Excel workbooks, completed with filed data
- A comment shows, for each cell, 1) the check(s) associated to this cell and 2) the check not satisfied (cell's background in blue)
Error Messaging Panel

Escaped XML element

 XBRL-Europe

Generic messages / labels

Error reporting in ACPR

Form-centric error reports are fine for small reporters but:

- Requirements exists for big companies that want to process error reports automatically
- Companies may use templates different from the regulatory templates (There are different kinds of template in Solvency II: Regulatory – QRTs as Quantitative Reporting Templates – and Annotated templates)
- Some evaluations are exactly the same in two different templates (with different coordinates); this case exist in COREP reporting.
- XBRL should be data-centric

There is a need for data-centric error reporting

- These data-centric feeds-backs may be translated into form-centric, if needed
- XBRL validation engines works with facts and dimensions, not coordinates in forms
- Fall-back values must be taken into account (the message should be clear even in case of fall-back values)
Error Messaging Panel

Solvency II Level 2 Reporting Line
Error handling

EIOPA Reporting Data Management Module (RDMM) is in charge of Level 2 Error Handling.

In the RDMM, there is a need for generating Notification Messages:
- Acknowledgements (Success/Failure)
- Alerts
- Errors

Data elements to be reported:
- Taxonomy version
- Assertion Id
- Impacted Template/Cell
- Message
- Language
- Severity
- Other
EIOPA is considering to adopt CWA2 specifications for Error Handling in Level 2 reporting line.

Open issues:
- Need to handle errors not directly related to ‘taxonomical validations’
Error messages – lessons learned

Business users expect that error messages will be presented using rendering layer. Messages with references to data model (DPM) are not 'user-friendly'.

This is fundamental expectations–capabilities gap: a missing link between table–linkbase and XBRL Messages.

These feature can be implemented (and actually IT IS implemented) in business applications, but this is a custom extension not standard.

Application Level Messaging (another example)
Possible extensions – discussion

- The pattern: 'A = B + C'

- The table-based user friendly formula:
  \[ C \ 40.00 \ (050, 020,) = C \ 40.00 \ (050, 040,) + C \ 40.00 \ (050, 030,) \]

\[ \text{with results Left} = 4567, \text{Right} = 67890 \]

- The implementation (XBRL Formula):
  \[
  \text{iaf:numeric-equal(} \text{$a$, iaf:sum(} (\text{$b$, $c$})) \text{)}
  \]

\[ \text{No left- nor right- side !} \]

and what about interval arithmetic?

Possible extension

In order to achieve that:

XBRL Formula generation pattern should be known and stable
Questions