



TECHNICAL TRACK AGENDA

Conor O'Kelly
Herm Fischer
XSB

STILL HAVEN'T FOUND WHAT
YOU'RE LOOKING FOR?
HARNESS THE POWER OF
JOINED UP BUSINESS REPORTING

HOSTED BY XBRL IRELAND

TECH TRACK Panels (Thurs.)

Time	Topic
10:00-10:30	Panel 1: XSB Strategic Initiatives summary and progress; review of the API Task Force.
11:00-11:45	Panel 2: Large Instances task force, issues, technology, and performance issues.
11:45-12:30	Panel 3: Rendering in practice and rendering technology development.
2:00-2:45	Panel 4: Formula and multi-instances updates, overview of alternative formula syntaxes in project use
2:45-3:30	Panel 5: Versioning updates, overview of alternative versioning in project use
3:30-4:15	Panel 6: Validation in practice and validation technologies

PANEL 1

XSB Strategic Initiatives summary
and progress; review of the API
Task Force & Abstract model

PANEL 1 10-10:30

- XSB Strategic Initiatives summary and progress
 - Conor
- API Task Force (5+ min)
 - Victor
- Abstract model (5+ min)
 - Herm

APIs in a broader sense

- ▶ Representation of XBRL information
 - Relational model (SQL, relational databases...)
 - Multidimensional models MOLAP CWM
 - Semantic WEB (RDF, OWL)
- ▶ Classic APIs signatures
 - Definition of a set of basic operations on XBRL data
- ▶ Specification of services
 - Services are software components that implement business level functionalities
 - Web services and Service Oriented Architectures

XSB Report on the API Task Force

2013-04-15

Background

- API Task Force was formed in May 2012, and chaired by Andrew Smith
- A survey was undertaken in September 2012, but the response level was low, and the results inconclusive
- Since then, active contributions to the group have been very limited
- Andrew stepped down as chair in March 2013, citing some very reasonable concerns with the constitution of group

What is the goal of this group?

- **Standardised APIs**

An application programming interface (API) enables software applications to connect to and interact with other technologies. By standardizing the APIs created for XBRL through the use of API signatures, XII hopes to provide more choice, consistency, and interoperability in the software and tools used for XBRL-based projects.

APIs

- API = Application Programming Interface
- The interface between an application and a library
 - e.g. Between a tagging tool and an XBRL processor
- Provides separation between parts of an application
 - Let's the XBRL processor worry about syntax
 - Opens the possibility of XBRL applications backed by alternative syntax (e.g. database)

Standardised APIs: advantages

- Allows adopters to switch easily between implementations (i.e. avoids vendor lock-in)
- Implementers only need learn one API

Standardised APIs: disadvantages

- Inhibits market development of optimal APIs
- Requires significant standardisation effort

Prior Art?

- XML has the Document Object Model (DOM)
- Generally regarded as a fairly cumbersome API
- The dream of switching between different implementations is rarely realised

Cross-platform?

- An API needs translating into different languages
- Different languages have different idioms: a literal translation will work, but a native API is better

Technical Issues

- Lack of object model (definition of what is semantics and what is syntax)
- A standardised API must be complete, whereas any other API need only address market demand

Resource Issues

- XBRL vendors already have their own APIs
- Standardisation would require additional work, and remove product differentiators
- Vendors can't afford to ignore the possibility of a standard API

What next?

- Is the (perceived) lack of XBRL APIs a barrier to XBRL adoption?
- Is the lack of ***standardised*** XBRL APIs a barrier to XBRL adoption?

Abstract Model Update

Herm Fischer

AMTF

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Steps to Abstract Model

	Topic
2009-2010	XSB survey and strategic plan, calls for abstract model
2011 Jan-Sep	Chartered for: XBRL 2.1 & XDT → PWD 1.0
2011 Oct	Re-scoped: serve as basis for spec rewrites, training, APIs, include Formula, Rendering, ...
2011 Nov-Dec	Review: PWD 1.0 "too close to 2.1 syntax"
2012 Jan	Leverage aspect modeling, data points, OLAP dimensions, table views, MOF meta-modeling
2012 Jan-May	Working F2Fs in California & London
2012 April	Discussions at OMG, Adaptive, IFRS, EBA
2012 June	PWD 2.0

Since June 2012...

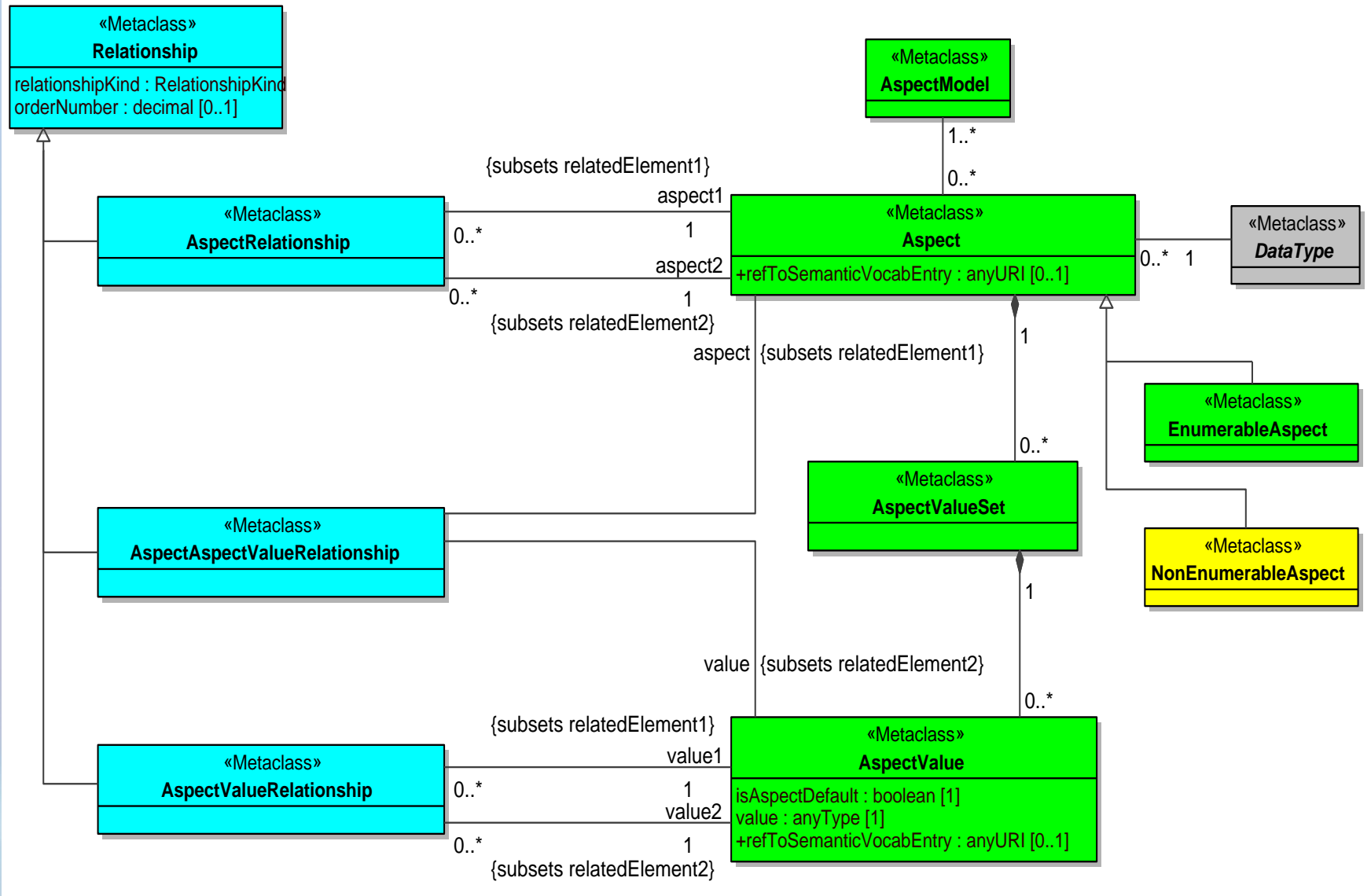
Step	Topic
...so far	Collaborate with Data Comparability TF Potential collaborations (OMG, semantics, projects) Present at conferences
The inquiries are disappointing	<ul style="list-style-type: none">•Poor understanding of an abstract model.•Weak or no knowledge of XBRL, CWM or OLAP.•Expectations of relational database schema for XBRL
Assessment	Nobody is going to do it for us, no mana from heaven.
The prototype	Building filings and validations repository based on graph database of abstract model.
Development	Update Abstract Model and Data Comparability Specifications
	Deploy working prototype

Unique contribution of XBRL

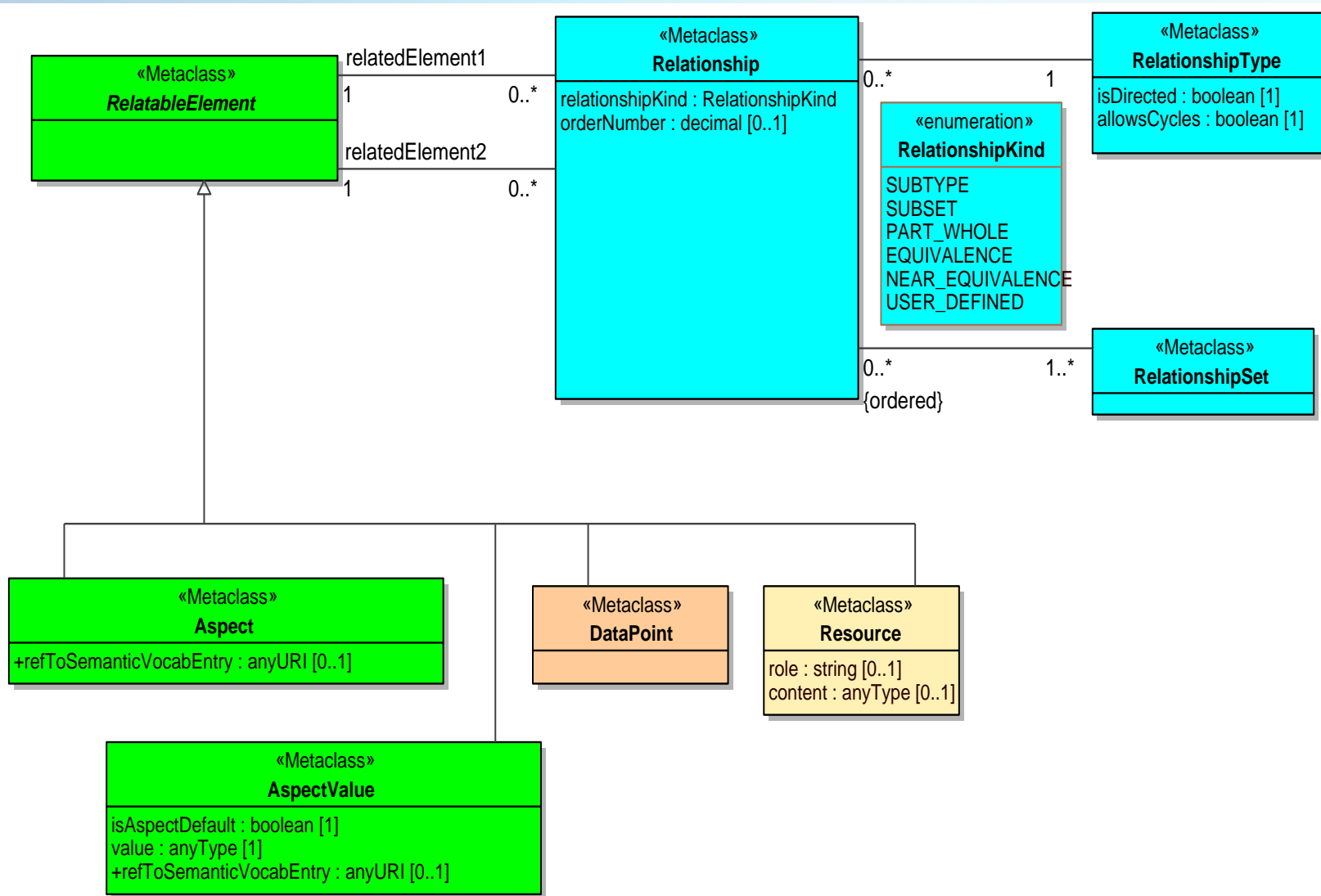
- (You know this, else why abstract model?)
 - Formalize semantics
 - Every instance accompanied by model
 - Model provides validation and views
- La trahison des models (Ceci n'est pas une ...)
 - Doesn't fit *commercial* OLAP
 - *Does* fit OMG CWM OLAP specification



Data Dict., Aspect Model



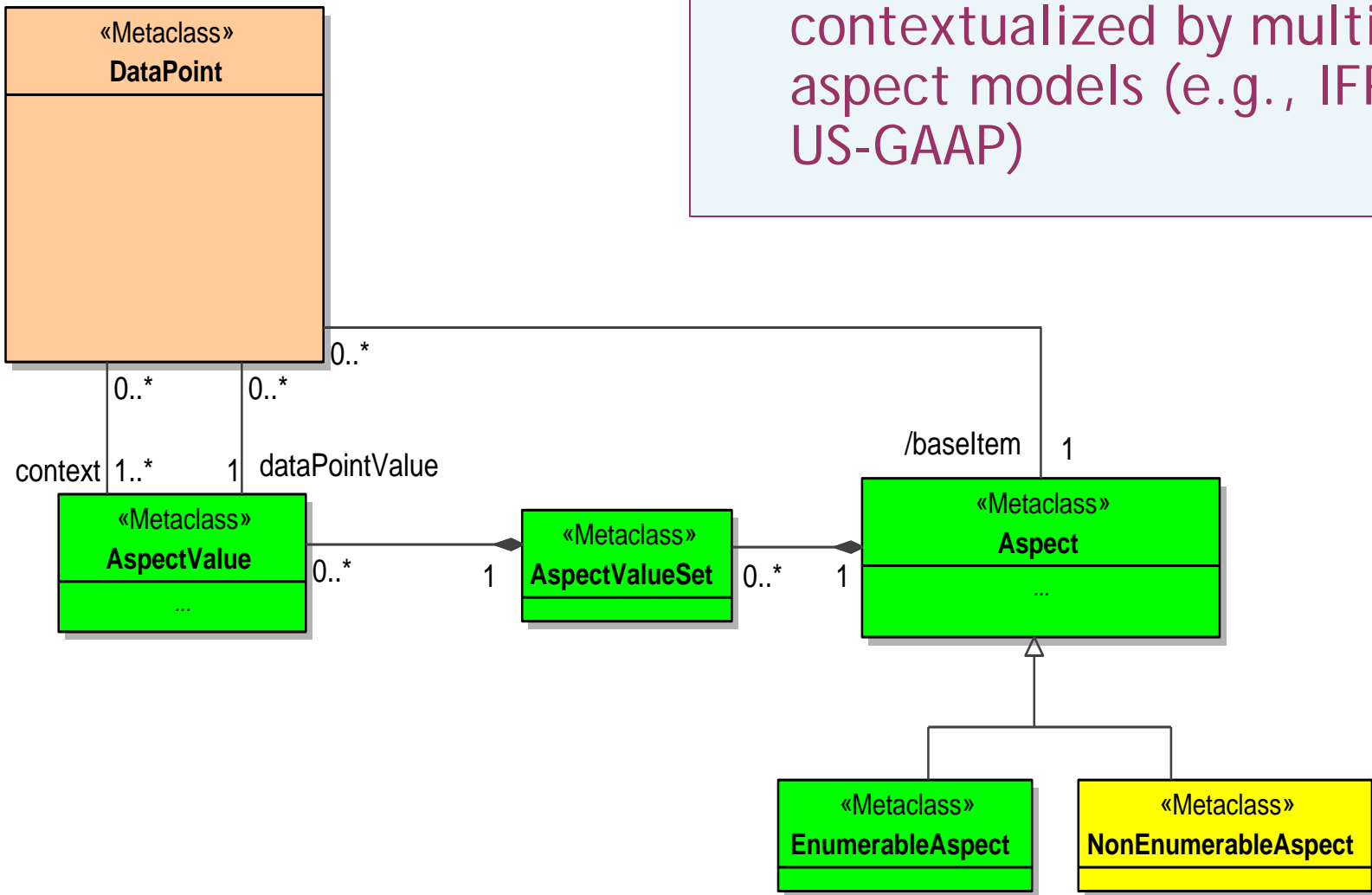
Relationships



Instances

Data points are facts

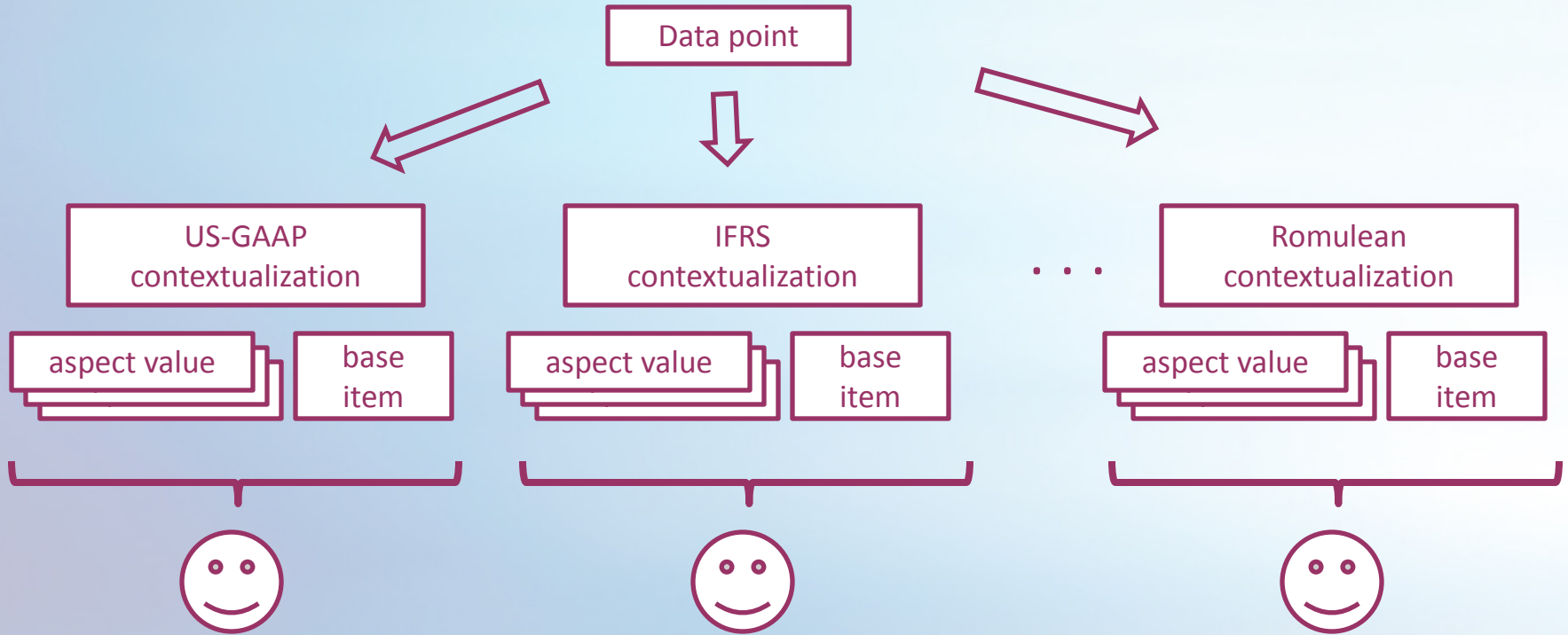
Data points may be contextualized by multiple aspect models (e.g., IFRS, US-GAAP)



Data point aspect models

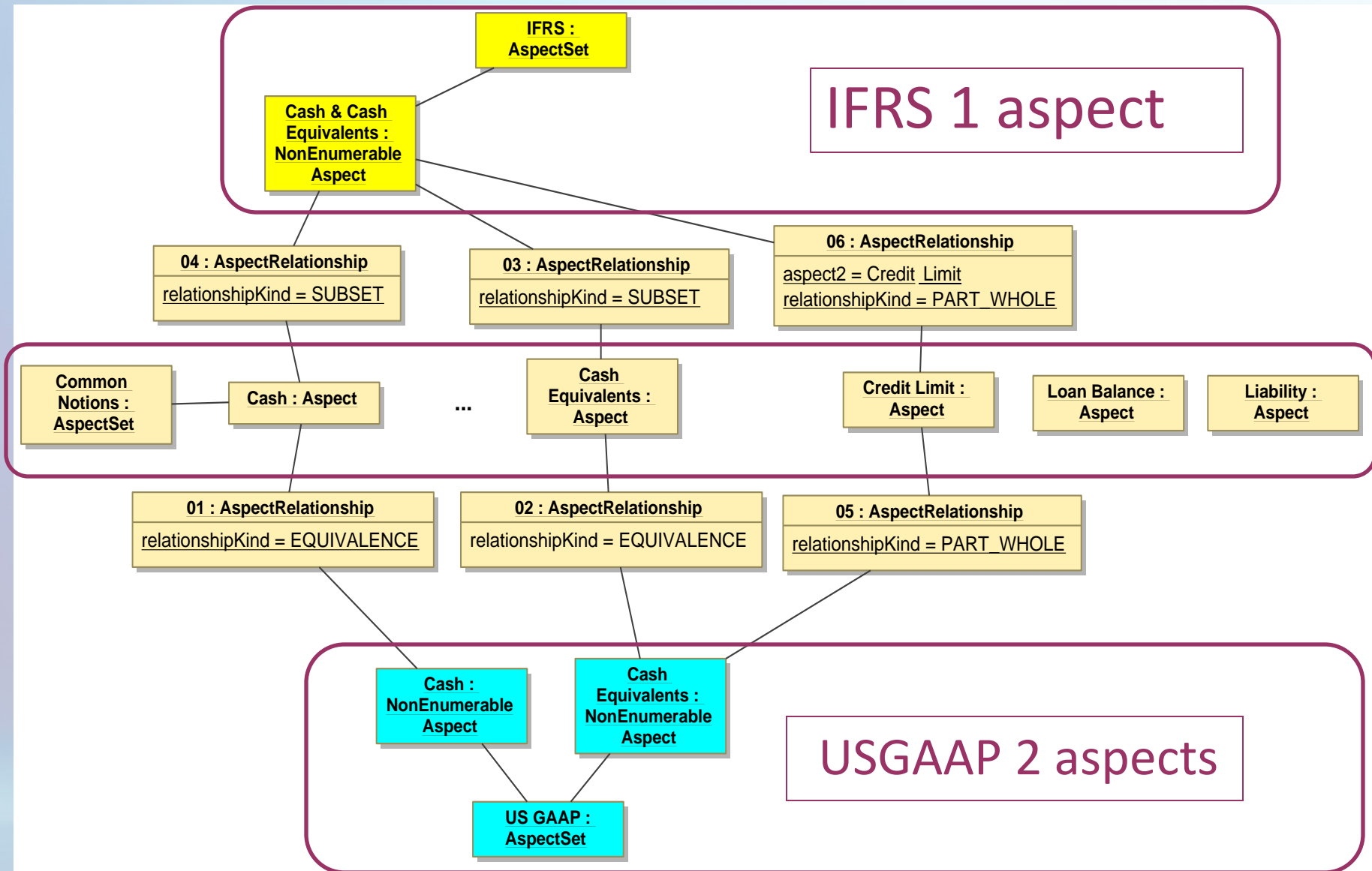
- Data points are audit item singularities
 - Like stars in the sky
 - Viewed by life forms with different contextualizations and measures
- Aspect models relate item to viewer
 - Contextualize data point for
 - Identification and reference
 - Values of data point and contextualization aspects
 - Semantic description (possibly localized)

Data point contextualization views



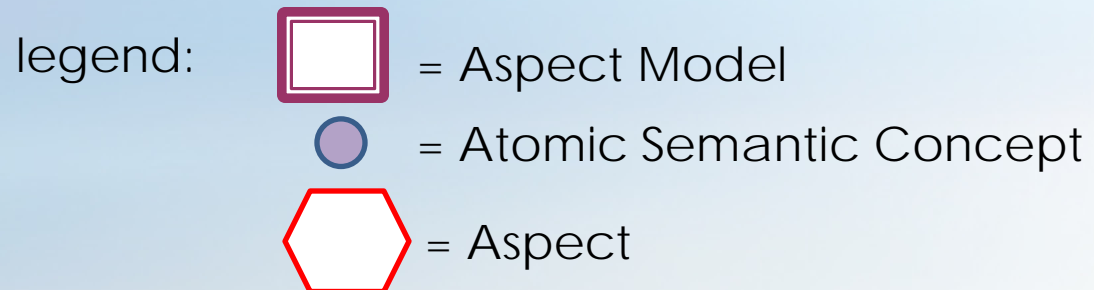
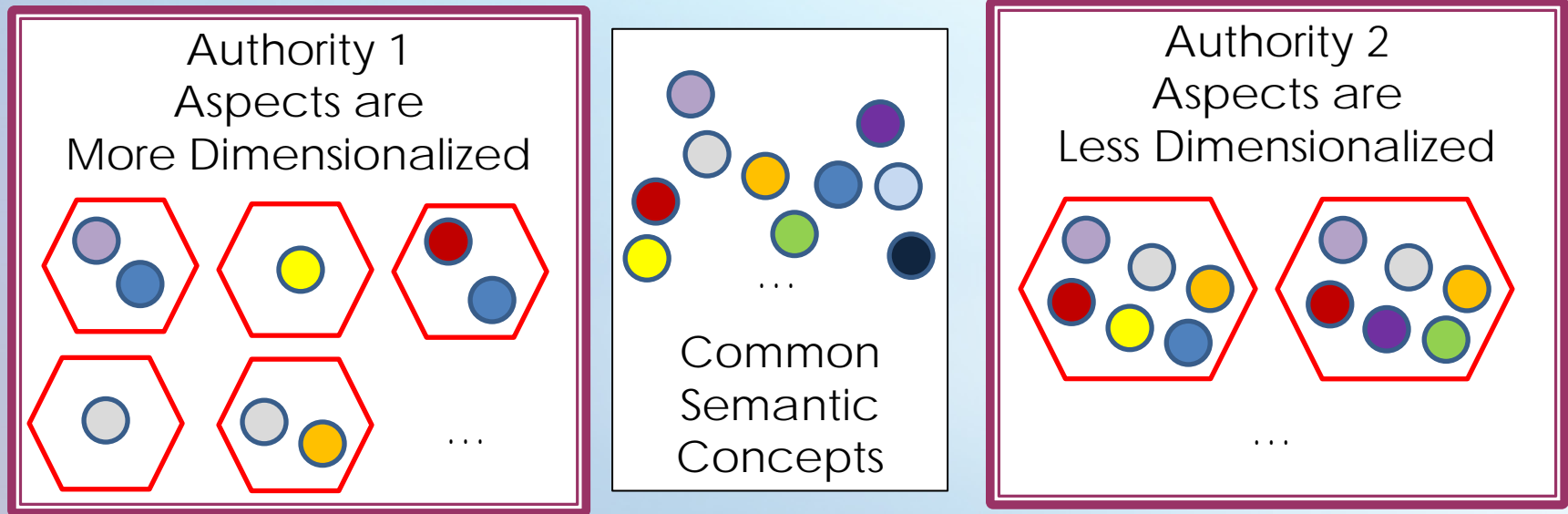
- Data points are absolute
- Aspect models can be relative to user

Aspect semantics

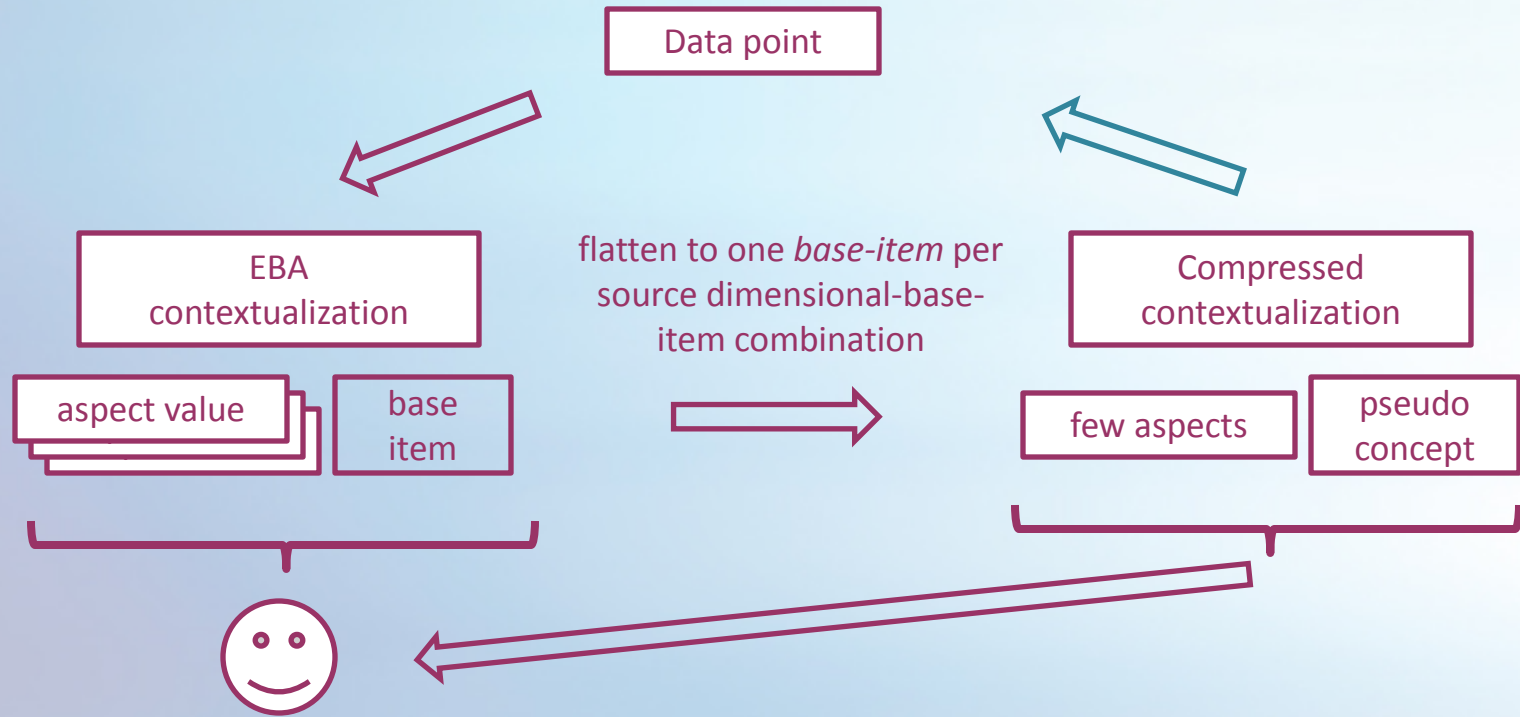


Aspect semantics composition

- ▶ Aspect is a composite of atomic semantics
- ▶ Different sets have more atomic semantics in some aspects

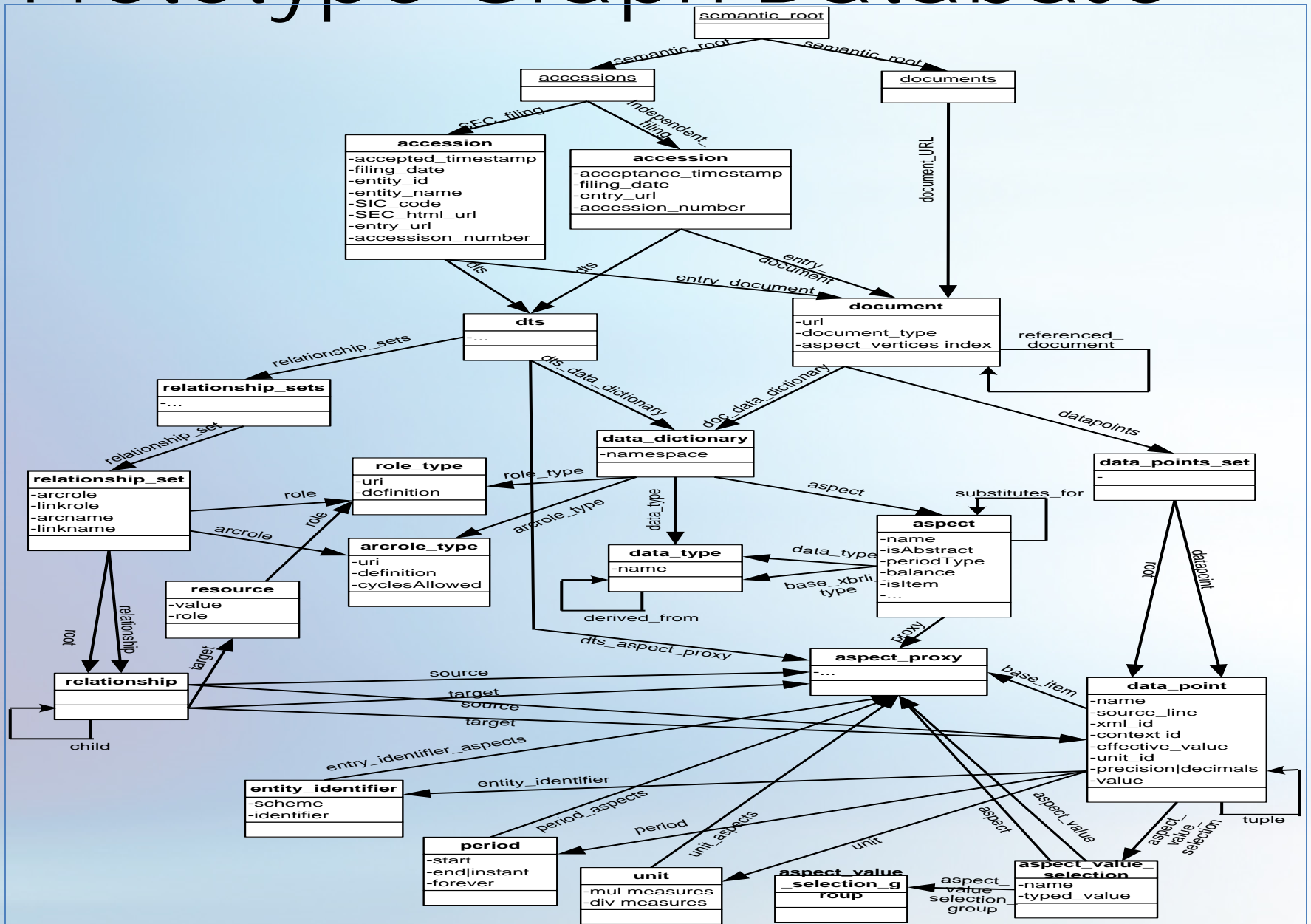


Flattened aspects isomorphic

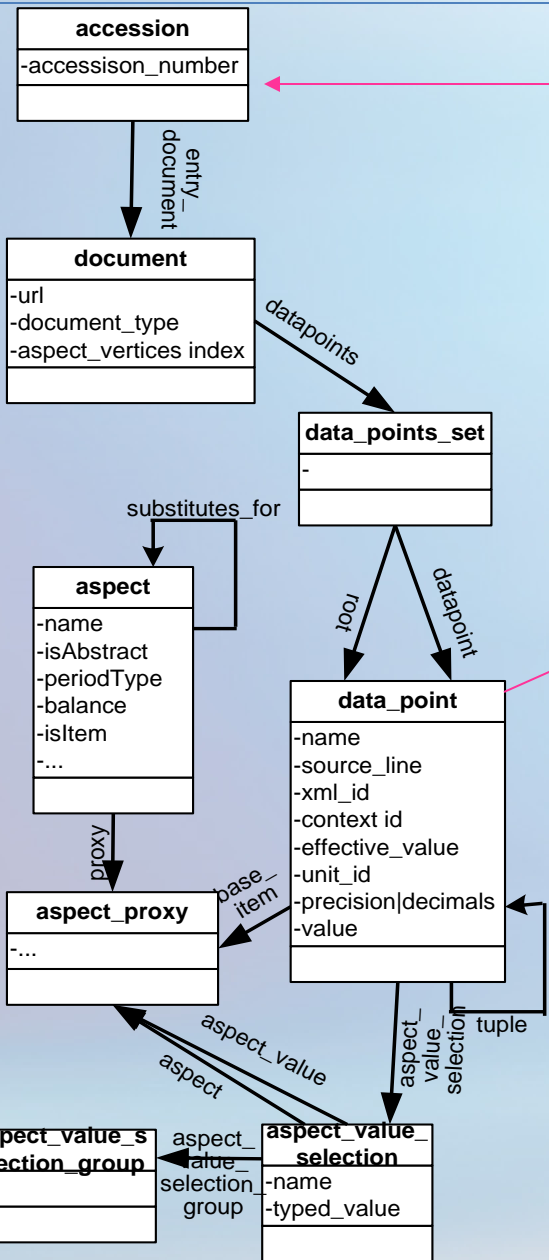


- Compress XBRL instance contexts
 - (pseudo-concept \approx URI of data point template)

Prototype Graph Database



Use case - Instances



Gremlin graph query

```

[ 'rows':g.v(132005).out('entry_document')
  .out('data_points').out('data_point')
  .order{it.a.source_line <=> it.b.source_line}
  .as('data').as('id').select{it.id}{
    [it.name,
     it.source_line,
     it.context?:'',
     it.unit?:'',
     it.effective_value?:it.value?:'']]
  ]
  
```

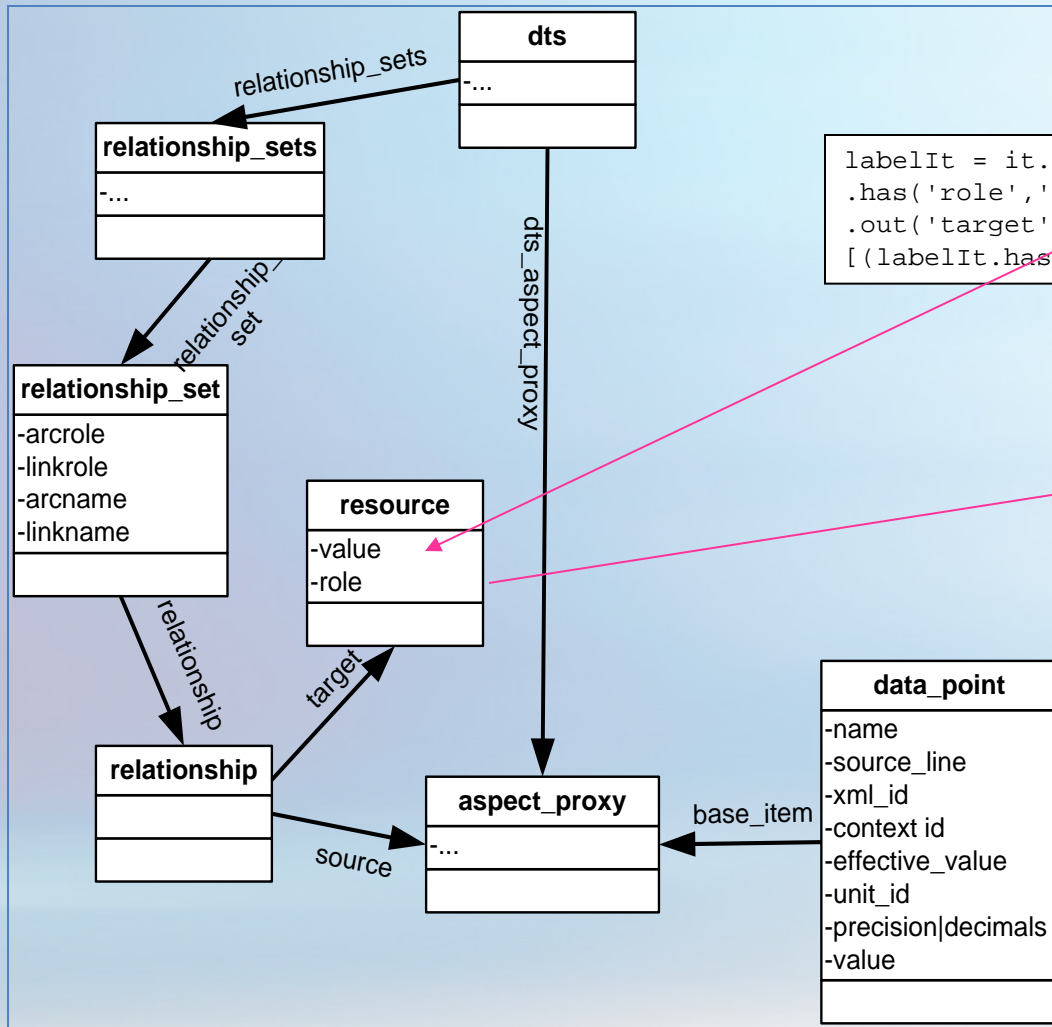
Json results

```

[{"rows":
  [{"id":"134195",
   "data":["dei:EntityCommonStockSharesOutstanding",9,
           "eol_PE9760----1310-Q0002_STD_0_20130402_0",
           "shares",
           "12,418,428"]}],
  {"id":"134197",
   "data":["us-gaap:BusinessAcquisitionCostOfAcquired...",
           10,
           "eol_PE9760----1310-Q0002_STD_0_20120131...",
           "iso4217_USD",
           "8,500,000"]}]}
  
```

Name	Line	ContextRef	Unit	Value
dei:EntityCommonStockSharesOutstanding	9	eol_PE9760----1310-Q0002_STD_0_20130402_0	shares	12,418,428
us-gaap:BusinessAcquisitionCostOfAcquiredEntityF	10	eol_PE9760----1310-Q0002_STD_0_20120131_0_!_iso4217_USD	iso4217_USD	8,500,000
penx:MaximumContractualReceivableCollectionPeri	11	eol_PE9760----1310-Q0002_STD_0_20130315_0		P45D
penx:ContractualLitigationSettlementReceivableNe	12	eol_PE9760----1310-Q0002_STD_0_20130315_0	iso4217_USD	2,100,000
us-gaap:DebtInstrumentFaceAmount	13	eol_PE9760----1310-Q0002_STD_0_20091130_0_!_iso4217_USD	iso4217_USD	1,000,000
us-gaap:AccumulatedOtherComprehensiveIncomel	14	eol_PE9760----1310-Q0002_STD_0_20120229_0	iso4217_USD	-8,272,000
us-gaap:CashAndCashEquivalentsAtCarryingValue	15	eol_PE9760----1310-Q0002_STD_0_20120229_0	iso4217_USD	595,000
us-gaap:AccumulatedOtherComprehensiveIncomel	16	eol_PE9760----1310-Q0002_STD_0_20120229_0	iso4217_USD	18,000
us-gaap:AccumulatedOtherComprehensiveIncomel	17	eol_PE9760----1310-Q0002_STD_0_20120229_0	iso4217_USD	-8,290,000

Graph query including label



Gremlin graph query

```

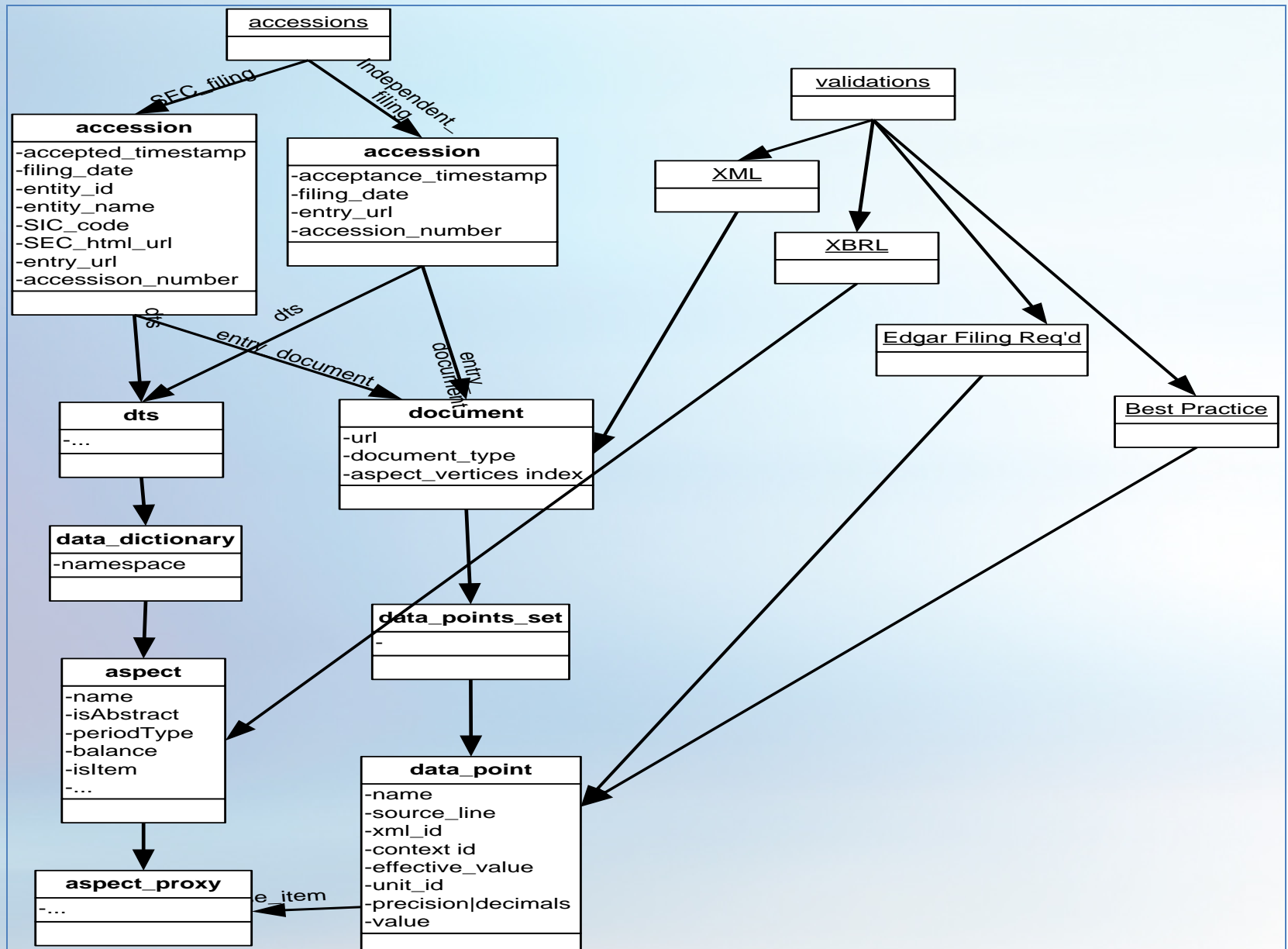
labelIt = it.out('base_item').in('source')
.has('role', 'http://www.xbrl.org/2003/role/label')
.out('target').value
[(labelIt.hasNext() ? labelIt.next() : it.name)
  
```

Name	Line	ContextRef	Unit	Value
dei:EntityCommonStockSharesOutstanding	9	eol_PE9760----1310	shares	12,418,428
Business Acquisition Cost Of Acquired Entity Purchase Price	10	eol_PE9760----1310	iso4217	8,500,000
The maximum period of time for the defendant in the settled litigation	11	eol_PE9760----1310	P45D	
Contractual Litigation Settlement Receivable Net Of Litigation Expenses	12	eol_PE9760----1310	iso4217	2,100,000
Non interest bearing loans	13	eol_PE9760----1310	iso4217	1,000,000
Accumulated Other Comprehensive Income Loss Net Of Tax	14	eol_PE9760----1310	iso4217	-8,272,000
Cash and cash equivalents, beginning of period	15	eol_PE9760----1310	iso4217	595,000
us-gaap:AccumulatedOtherComprehensiveIncomeLossCumulative	16	eol_PE9760----1310	iso4217	18,000
Gains (Losses) on Postretirement Obligations, Beginning Balance	17	eol_PE9760----1310	iso4217	-8,290,000
Total accrued liabilities	18	eol_PE9760----1310	iso4217	7,303,000

Abstract Model evolution

- Technology impacts
 - Big data, (instance size & quantity)
 - Validation mechanisms
- Table linkbase evolves
- Cross-instance support
 - Validations (dashboards)
 - Quality checks
 - Best practices checks
 - Semantics matching
 - Ratio comparisons

Adding validation to model



PANEL 2

Large Instances issues,
Streaming Extensions Working
Group, and performance.

PANEL 2 11 - 11:45

- Large Instances task force - Paul
- Performance issues – David
- Panelists Paul, David, Alexander, Timo:
 - Streaming approaches, where does it fit or not fit
 - Restriction of XPath in formula, table linkbase
 - Approaches to use of formula with streaming
 - Map/reduce potential

XBRL Streaming Extensions Progress Update

Paul Warren
CTO, CoreFiling

Working Group Note

“Notes on the Processing of Large XBRL
Instances 1.0”

<http://www.xbrl.org/WGNs>

- Issued 2012-10-31 by Base Specification
Working Group

WGN purpose

- Enumerate and separate the problems
- Proposes high-level approaches for solving them
- **Not** a specification – but will suggest where specifications can help
- Will be updated to reflect current thinking

WGN contents

- Enumerates 3 specific problems
- Proposes a specific solution to one

1. XBRL is tied to syntax

- XBRL v2.1 specification does not define an “info set”
- Processors are not free to discard irrelevant syntax detail (because there’s no agreement on what’s irrelevant)
- Barrier to alternative syntaxes

2. Not streamable

- XBRL v2.1 specification allows freedom to order facts, contexts, units and footnotes
- Efficient stream-based processing is impossible

3. Use of arbitrary XPath

- Related to previous two problems
- Specifications allow use of arbitrary XPath with instance document as context
- Most notably Formula, but also drafts of Table Linkbase
- Offers great flexibility...
- ... but usually unneeded

WGN contents

- Outlines solution for “streamable” XBRL
- New modular extension to XBRL v2.1
- **Backwards compatible:** compliant instances can be consumed with existing processors (performance issues aside)

Streamable XBRL features

- New modular extension to XBRL v2.1
- **Backwards compatible:** compliant instances can be consumed with existing processors (performance issues aside)
- **Simple solution to a simple problem**
- Forms part of the answer but **definitely not a global panacea**

XBRL Streaming Extensions Module

- Sub group of Spec WG currently being formed
- Limited, focused scope

XBRL Streaming Extensions Module - Requirements

2.1 Constant memory processing

2.2 Identification of conformant documents

2.3 Validation of conformant documents

2.4 Backwards compatibility

Call for participation and review

- Review PWD
- Spec group members – email pdw@corefiling.com
- Otherwise, XII members email WGAdmin@xbrl.org, then email me!

PANEL 3

Rendering in practice and
rendering technology
development

PANEL 3 11:45 – 12:30

- Inline and transformation developments - Philip
- Table linkbase spec developments – Jon
- Table linkbase user expectations – Victor
- Panelists Philip, Jon, Victor, Roland, Goto, Timo, Julian:
 - Inline and table LB complement/conflict?
 - Plans for document rendering linkbase
 - Support for typed dimensions and tuples
 - Entry vs Viewing (table linkbase)
 - Style and Formatting

PANEL 4

Formula, alternatives in use

PANEL 4, 2 – 2:45++

- Formula WG update (short) – Herm
- Panelists (David, Goto, Paul * 2, Victor, Bartosz, Eric, Tricia, Andy):
 - Complexity of syntax?
 - Comparison to other syntax and approaches
 - Performance issues of formula evaluation?
 - Maintainability issues of formula solution?

PANEL 5

Versioning updates, overview
of alternative versioning in
project use

PANEL 5 2:45 – 3:30

- Versioning spec status – Paul
- Panelists - Louis , Paul, Muramoto, Roland:
 - User benefits from versioning reports?
 - Integration to development workflow and tools?
 - For regulator, taxonomy author, consumer, tool vendor use cases
 - Challenges to adopt specification against own solutions.
 - How to merge own solutions?
 - Is there anything to add/delete from versioning?
 - Use cases to version:
 - Formula (XII syntax, Sphinx, others?)
 - Rendering (Table LB, Document rendering, others?)

PANEL 6

Validation in practice and validation technologies

PANEL 6 3:30 – 4:15

- Validations Louis, Andie, Herm, Paul, Tricia, Susan:
 - XII (2.1, XDT, Formula, Vers, Table LB, FRTA)?
 - Local XBRL validations (XBRL-US public best practices, XBRL-US private consistency suite)?
 - Authority validations (EFM, GFM, Staff recommendations, HMRC, all/part/none)
 - Validations by market pressures (accepted or not by authorities)?
 - Technical issues (formula and registry use)
 - Large instance validations