



# Outline

- XBRL - eXtensible Business Reporting Language
- Relationship between XBRL and QB
- Use Cases
- Challenges
- Discussion

# What is XBRL?

- XBRL allows stakeholders, e.g., technicians and end users, who adopt it as a specification to enhance the *creation, exchange, and comparison of business reporting information*, e.g., financial statements and non-financial information. [XBRL SPEC]
- Financial information, e.g., yearly balance sheets, in *XML*
- **Example:** RAYONIER INC had a sales revenue net of 377,515,000 USD from 2010-07-01 to 2010-09-30 [XBRL example]

# Why is it interesting?

- XBRL format is more machine-readable than HTML/PDF
- Large amounts of interesting statistics:
  - Since 2009, the U.S. Securities and Exchange Commission forces companies traded at the stock market to publish financial information as XBRL.
  - July 2012: 100% of SEC companies publish XBRL
  - *[2012-01-27 13:48:40] @mhausenblas says: Dear @NeelieKroesEU how comes US companies must publish XBRL openly whilst not in the EU? Can we change this, please? /CC @ccbuhr #opendata*
- However: XBRL challenges regarding interoperability
  - e.g., due to extensibility of XBRL, and flexibility of publishers to represent their financial numbers [DEBRECENY]
  - Although financial data is published in XBRL, it is still difficult to integrate XBRL data using different taxonomies or taxonomy versions.
  - It is still difficult to integrate XBRL with other data sources (Open Data!).
  - Linked Data may help here.

# Relationship between XBRL and QB (1)

- Based on: XBRL Abstract Model [XBRL AM]
- qb:Observation <-> Fact (e.g., disclosure of RAYONIER INC about sales in third quarter 2010)
- qb:DataSet <-> Fact Collection (e.g., filing with SEC Accession No. 0001193125-10-238973 and CIK no 52827) / Concept (e.g., SalesRevenueNet)

## ■ qb:Dimensions

- Period (e.g., from 2010-07-01 to 2010-09-30)
- Entity - Segment (e.g., RAYONIER INC)
- Scenario (e.g., planned)
- TypedAxis Value (e.g., geo location)
- ExplicitAxis Value (e.g., certain product

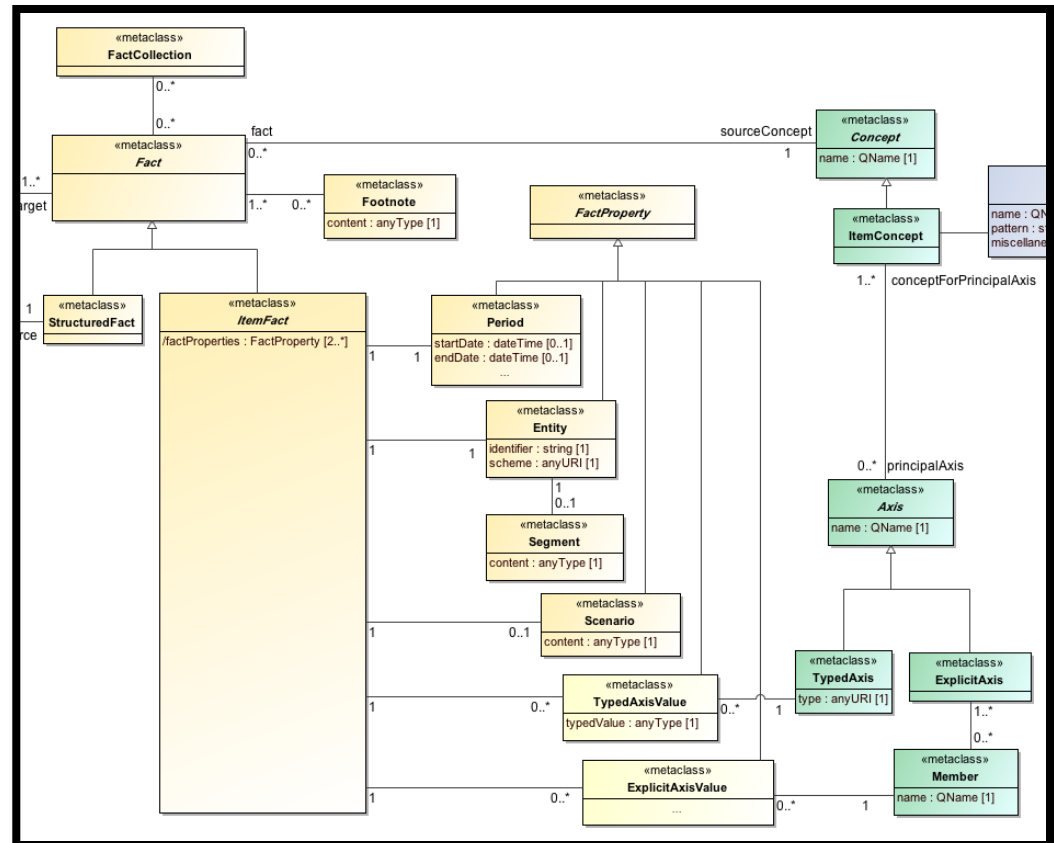
from product catalog)

## ■ qb:Measure

- numerator/denominator
- value (e.g., integer, date, string)

## ■ qb:Attribute

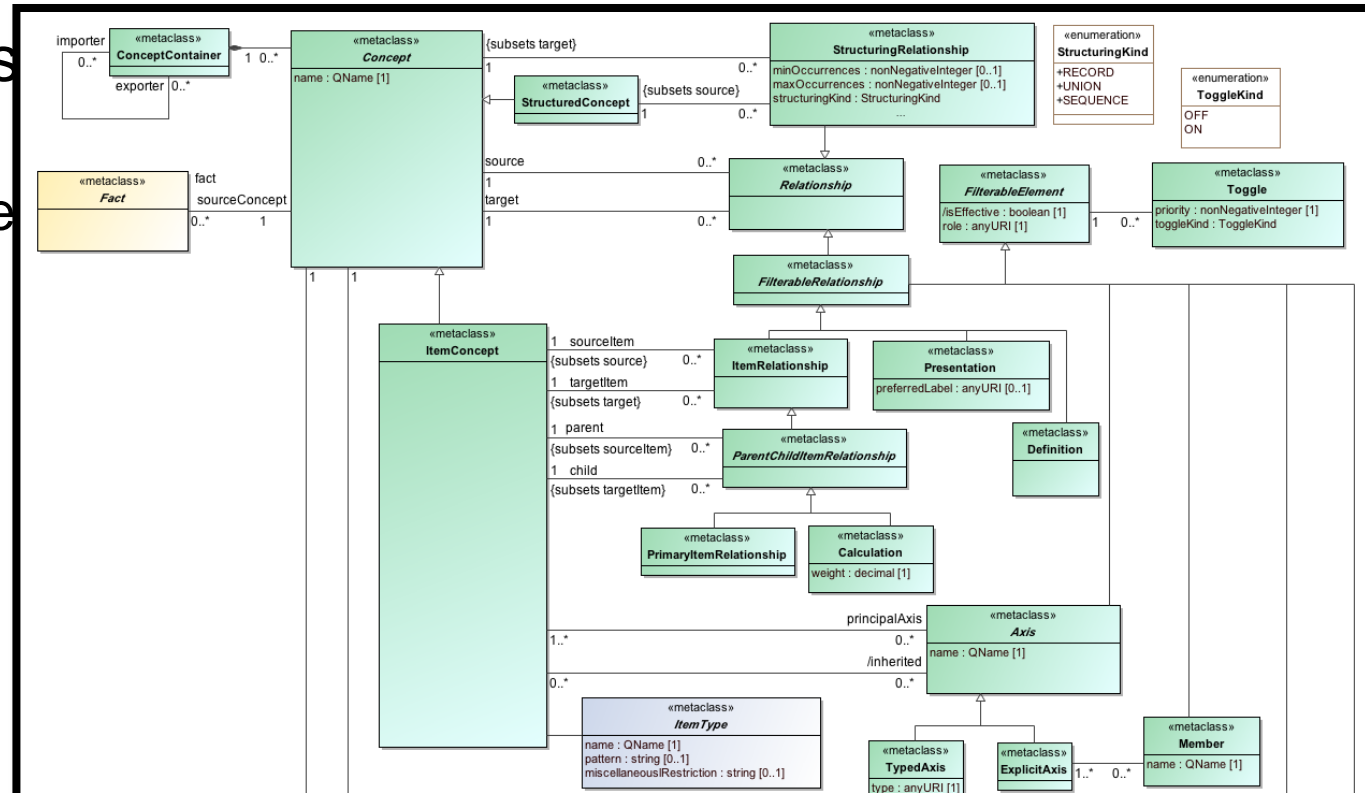
- unit



# Relationship between XBRL and QB (2)

- qb:DataStructureDefinition <-> Concept
- qb:Dimension <-> Axis
- skos:Concept <-> Member

■ Relationships between qb:DataStructure Definitions <-> Relationships (e.g., Sales Texas „part of“ Sales)



# Relationship between XBRL and QB (3)

- Ontology for Digital Financial Report:  
<http://www.xbrlsite.com/DigitalFinancialReporting/Ontologies/2012-04-15/DigitalFinancialReport.xml>
- Ontology for Multidimensional Model:  
<http://www.xbrlsite.com/DigitalFinancialReporting/Ontologies/MultidimensionalModel.xml>
- Future work:
  - How to relate taxonomies and filings? XBRL uses URIs but not in the way Linked Data does.
  - Once semantics of XBRL becomes clear, a mapping to Linked Data reusing QB should be possible.
  - XBRL community interested in Linked Data, but they need support.

## Use Case (1): Publishing XBRL from SEC as Linked Data reusing QB, for data interoperability

- SEC Edgar Linked Data Wrapper: Translates XBRL information from the SEC on-the-fly to RDF and makes it available as Linked Data reusing QB [EDGAR].
- Example: Rayonier filing [EDGAR RAY].
- EDGAR is used in Financial Information Observation System to load the data into a triple store and run OLAP analyses on it [FIOS].
- Allows integration with other data sources (Freebase, DBPedia), or other XBRL data (other taxonomies, taxonomy versions).



# FIOS

The screenshot shows the FIOS web interface. The browser address bar is `vmdeb18.der.iie:8080/saiku-ui-2.2.RC/#logout`. The page title is "Financial Information Observation System (FIOS)". The interface includes a navigation bar with icons for home, folders, power, and information. Below the navigation bar, there is a section for "Cubes" with a dropdown menu set to "SEC-Cube-Gross-Profit-Margin". The "Dimensions" section is expanded to show a tree structure: Issuer (Issuer root level), Segment, Data set (Data set root level), Business business operation industry, Dtend (Dtend root level), and Dtstart (Dtstart root level). The "Measures" section is also expanded, showing "Cost of goods sold" and "Sales revenue net". The main content area displays a table with columns for "Dtend root level", "Dtstart root level", "RAYONIER INC", "FIRSTCITY FINANCIAL CORP", and "INTERVAL LEISURE GROUP, INC.". The "Filter" section is set to "Sales revenue net". The table data is as follows:

Dtend root level	Dtstart root level	RAYONIER INC	FIRSTCITY FINANCIAL CORP	INTERVAL LEISURE GROUP, INC.
2010-09-30	2010-07-01	377515000	998000	100488000
2011-09-30	2010-07-01			
2011-03-31	2010-07-01			
2010-03-31	2010-07-01			
2011-06-30	2010-07-01			
2010-06-30	2010-07-01			
2011-10-01	2010-07-01			
2010-10-02	2010-07-01			
2009-06-30	2010-07-01			
2009-03-31	2010-07-01			
2008-12-31	2010-07-01			
2009-09-30	2010-07-01			
2009-12-31	2010-07-01			
2010-12-31	2010-07-01			
2007-12-31	2010-07-01			
2008-09-30	2010-07-01			

Example query for Rayonier Inc Sales from EDGAR [EDGAR RAY]

## Use Case (2): Transforming statistical Linked Data reusing QB to XBRL

- DERI use case to deliver sustainable IT information as XBRL to the Global Reporting Initiative [UC10].
- Sustainable IT information represented using QB.

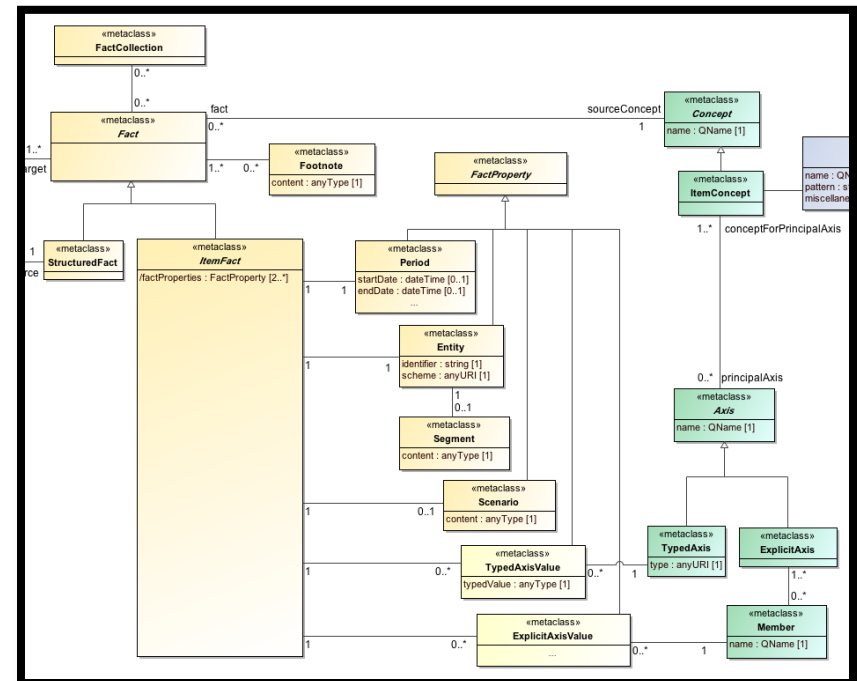
# Challenges

- Why are these use cases non-trivial, and should be somehow considered in GLD deliverables: Linked Data Cookbook, QB Use Case Document, or even in the core QB vocabulary?
  - Relationships between taxonomies and filings
  - Relationships between qb:DataStructureDefinitions: Aggregations, (more complex) slices, complex measures/formulas.
  - Business rules (Charles Hofmann): How to do consistency checks and automatic inferencing of additional statistics on QB?
    - There have been solutions proposed, but the GLD may give hints.
  - More complicated multidimensional elements
    - E.g., default values for dimensions
  - Extensibility and versioning

# Discussion

- Use cases and challenges in- or out-of-scope?
- How to proceed? E.g., one could write a similar document for XBRL SEC data as for [COINS], this could then be linked from an XBRL use case for QB.

Thanks!



# References

- [XBRL SPEC] <http://www.xbrl.org/Specification/XBRL-RECOMMENDATION-2003-12-31+Corrected-Errata-2008-07-02.htm>
- [XBRL example] <http://www.sec.gov/Archives/edgar/data/52827/000119312510238973/0001193125-10-238973-index.htm>
- [DEBRECENY] [http://web.ku.edu/~eycarat/myssi/\\_pdf/2-Debreceeny-XBRL%20Ratios%2020101213.pdf](http://web.ku.edu/~eycarat/myssi/_pdf/2-Debreceeny-XBRL%20Ratios%2020101213.pdf)
- [XBRL AM] <http://xbrl.org/Specification/abstractmodel-primary/PWD-2011-10-19/abstractmodel-primary-PWD-2011-10-19.html>
- [EDGAR] <http://edgarwrap.ontologycentral.com/>
- [FIOS] <http://xbrl.us/research/appdev/pages/275.aspx#>
- [EDGAR RAY] <http://edgarwrap.ontologycentral.com/archive/52827/0001193125-10-238973#ds>
- [UC10] <http://dvcs.w3.org/hg/gld/raw-file/default/data-cube-ucr/index.html#transforming-published-statistics-into-xbrl--uc-10>
- [COINS] <http://data.gov.uk/resources/coins>