data amplified™

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THE FUTURE OF BUSINESS REPORTING

Navigating the Labyrinth: Writing Business Rules for the DQC

Campbell Pryde

CEO XBRL US

DQC Validation Rules

- Written in Python as Arelle Plugin
- Separate Plugin for each rule
- Publically available on Github
- Open source so Regulators can run them
- Share resource files

Problems

- Python is hard to understand
- Lots of duplication of core processing
- Lots of testing required (really really lots)
- Cannot use taxonomies as a database
- Updating for each new taxonomy release

Requirements

- Read taxonomies on evaluation
- Reuse functions and constants
- Ability to maintain alignment
- Easy to write rules
    - Should be able to develop and test a rule in less than a day.

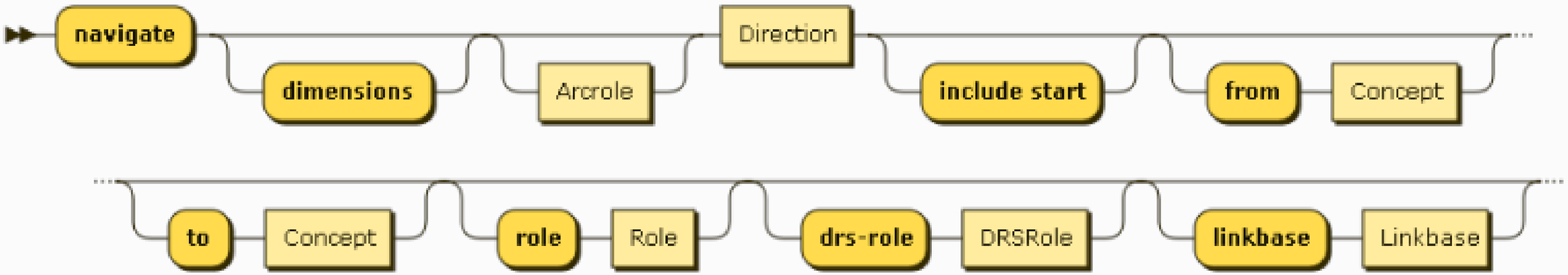
Requirements

- Needs to be open source
- Needs to work on all XBRL taxonomies
- Lay person must be able to read a rule
    - Rule must be as close to the semantic meaning as possible with minimal encoding syntax.
- Align formula language with OIM.

Requirements

- Ability to navigate relationships
- Ability to navigate dimensional structures
  - Give me all line on a hypercube
  - Give me all members on a hypercube

Navigation


navigate
dimensions
Arcrole
Direction
include start
from
Concept
to
Concept
role
Role
drs-role
DRSRole
linkbase
Linkbase

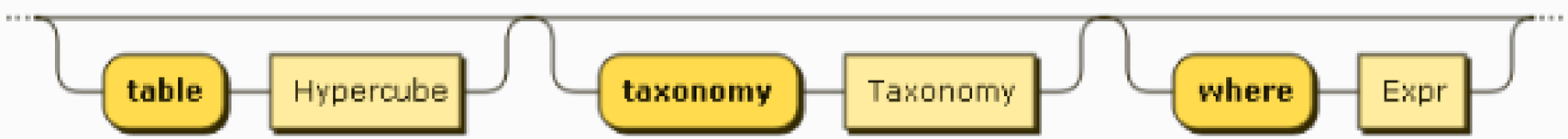
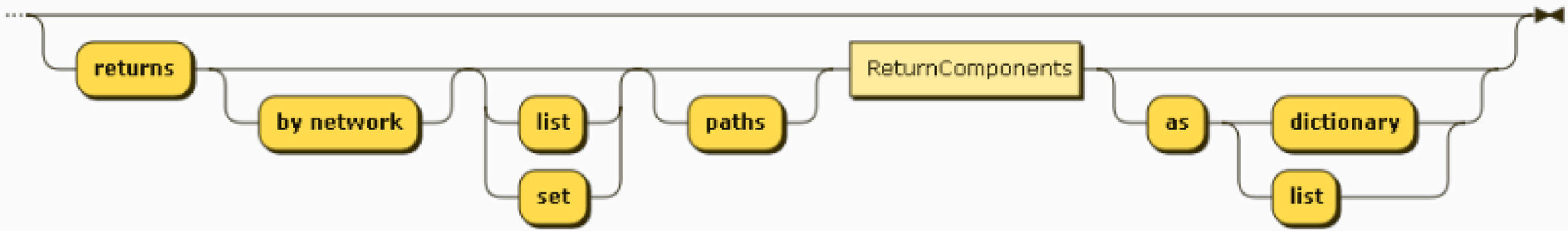


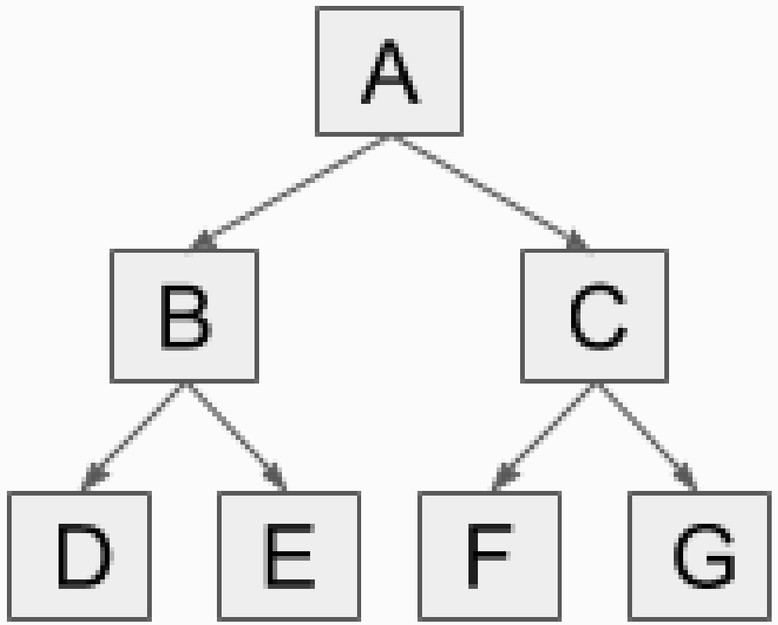
table
Hypercube
taxonomy
Taxonomy
where
Expr


returns
by network
list
set
paths
ReturnComponents
as
dictionary
list

Navigation -return values

- Source
- source-name
- Target
- target-name
- Order
- Weight
- preferred-label
- Relationship
- Role
- role-uri
- role-description
- Arcrole
- arcrole-uri
- ……

Returning Paths



What is a path

navigate *parent-child* ***descendants include start from*** *A* ***returns paths***

This will return the following lists:

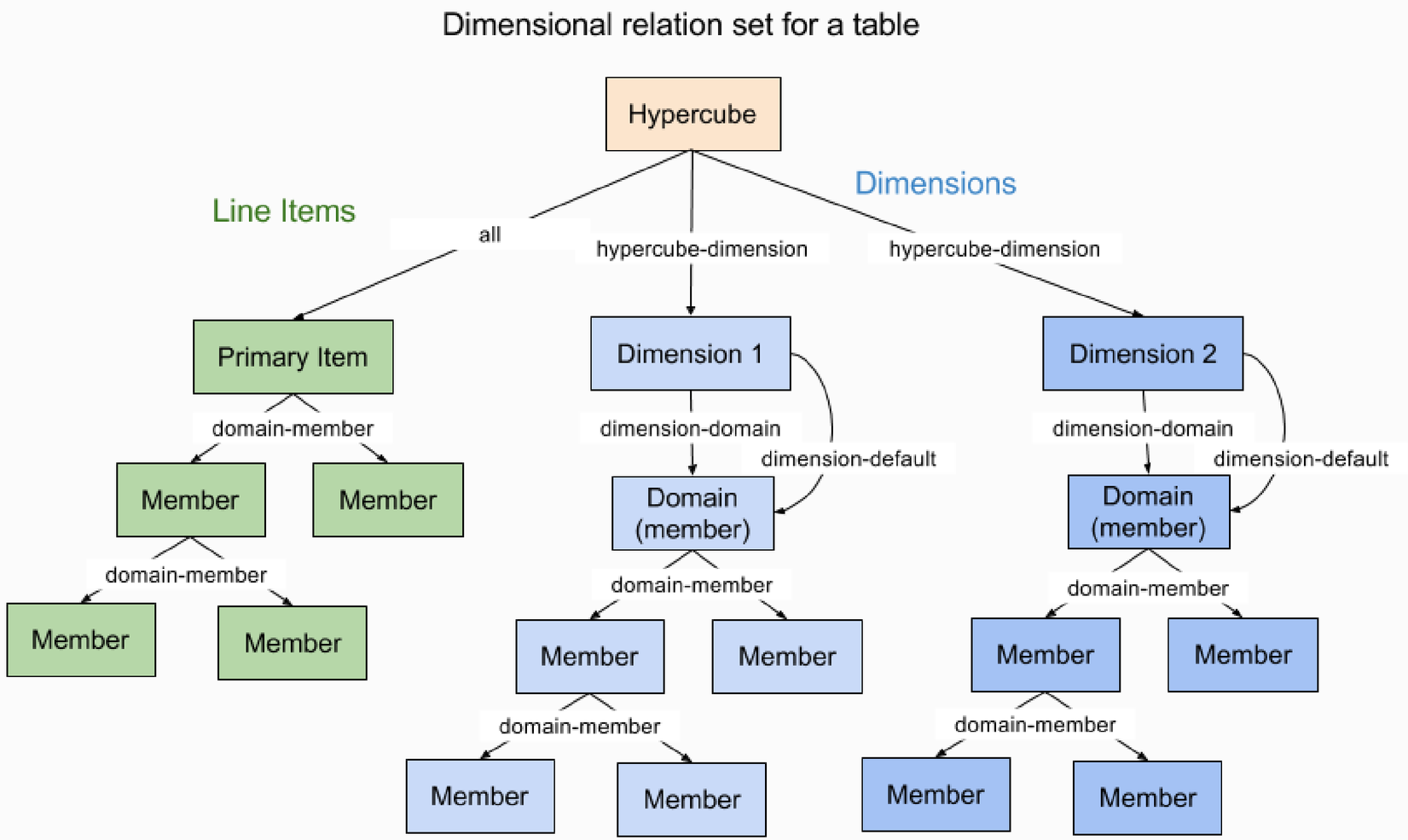
- *(A,B,D)*
- *(A,B,E)*
- *(A,C,F)*
- *(A,C,G)*

Real DQC Example

navigate summation-item ***descendants from*** IncomeLossAttributableToParent ***to*** IncomeTaxBenefit ***returns by network paths*** weight

This will return a set of weights between the two elements which can be evaluated.

Navigating Hypercubes



Dimensional

Dimension navigation is used to navigate dimensional relationship sets (DRS).

DRS includes relationships from multiple arc roles and extended link roles to form a model of the dimensional tables defined in the taxonomy.

Dimensional

navigate dimensions descendants from
dei:LegalEntityAxis

This will return all the dimension members of the Legal Entity Axis (dimension). If the dei:LegalEntityAxis dimension is used in multiple tables with a different set of members, this will traverse each version of the dimension.

Dimensional

navigate dimensions descendants from *dei:LegalEntityAxis* ***hypercube*** *us-gaap:StatementTable*

This will return all the dimension members of the Legal Entity Axis (dimension) in the us-gaap:StatementTable.