Getting value from XBRL data

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DeNederlandsche**Bank**

EUROSYSTEEM

Content

1. Speaker
2. Data at the De Nederlandsche Bank
3. Use of XBRL for internal and external purposes
4. Making XBRL data usable
5. Summary

Goal is to show how De Nederlandsche Bank get value from using XBRL.

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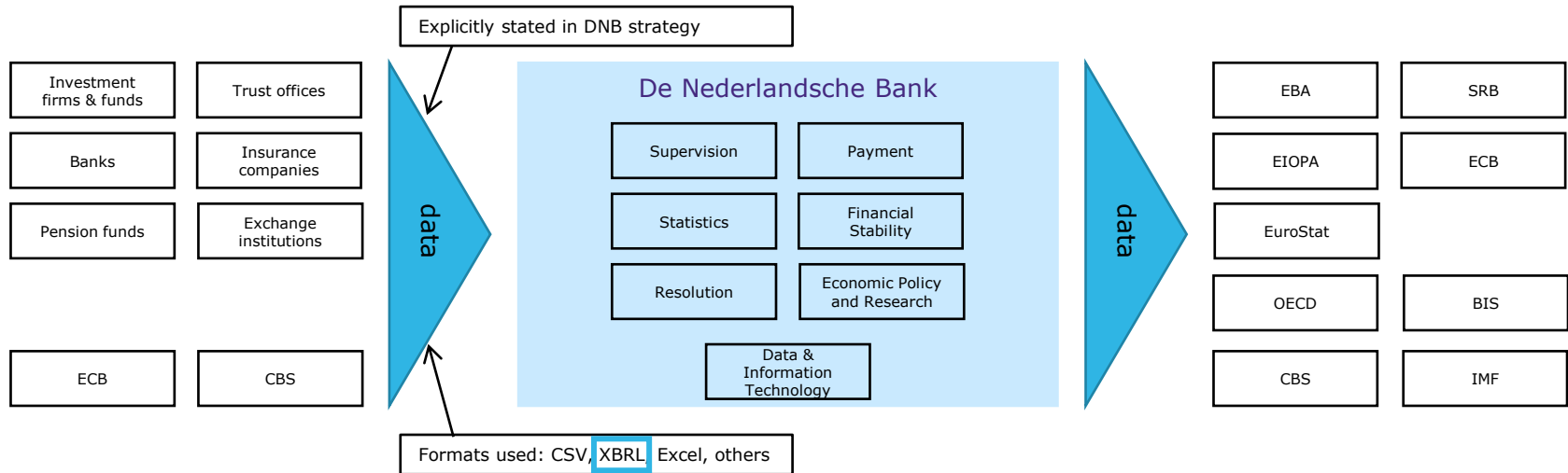EUROSYSTEEM

Speaker

Paul Hulst
- Architect for the process collecting, validating, exposing and dissemination structured data at De Nederlandsche Bank (DNB)
- Member of XII BPB - Taxonomy Architecture Guidance Task Force
- Member of XII XSB – Open Information Model Working Group
- Chair of XII BPB – LEI working group (on hold)
- Board member XBRL Netherlands & Eurofiling foundation
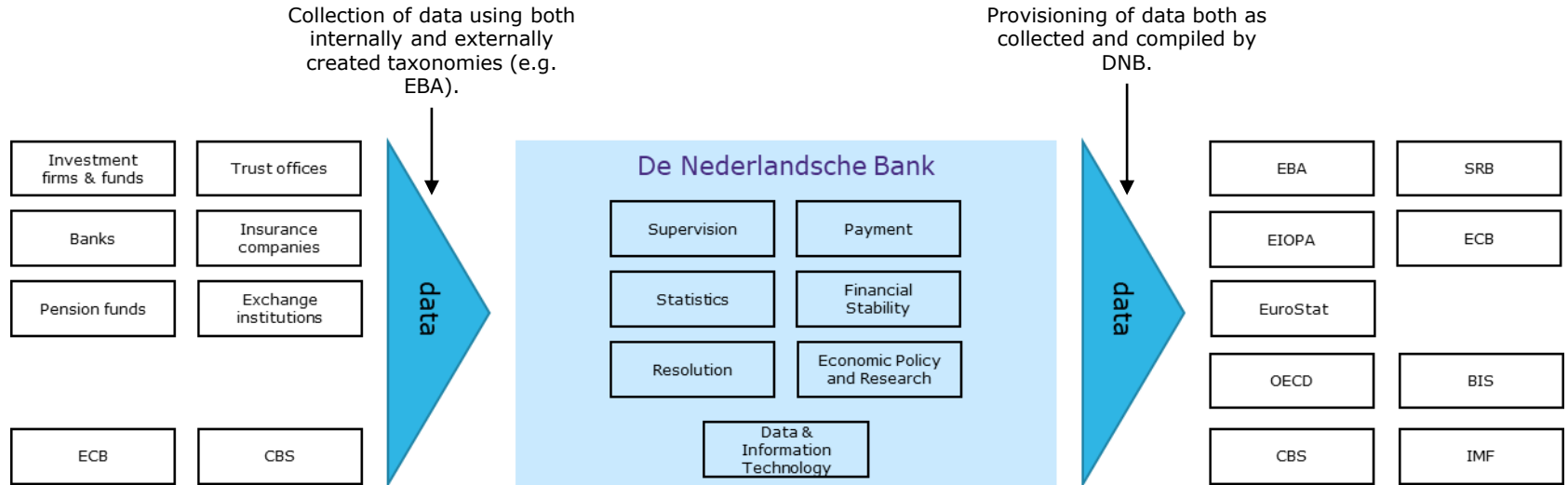
Note:
This presentation contains the views and opinions of the speaker and is not an official position of De Nederlandsche Bank.

De Nederlandsche Bank (DNB)

DNB is the (1) central bank, (2) supervisor for the financial sector. (3) resolution authority for the Netherlands and (4) advisor to the Dutch government on economic matters.

Investment firms & funds	Trust offices		
Banks	Insurance companies		
Pension funds	Exchange institutions		
ECB	CBS		

Explicitly stated in DNB strategy

data

De Nederlandsche Bank

Supervision	Payment
Statistics	Financial Stability
Resolution	Economic Policy and Research

Data & Information Technology

Formats used: CSV, XBRL, Excel, others

data

EBA	SRB
EIOPA	ECB
EuroStat	
OECD	BIS
CBS	IMF

XBRL at DNB

Collection of data using both internally and externally created taxonomies (e.g. EBA).

Provisioning of data both as collected and compiled by DNB.

Investment firms & funds	Trust offices
Banks	Insurance companies
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data

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data

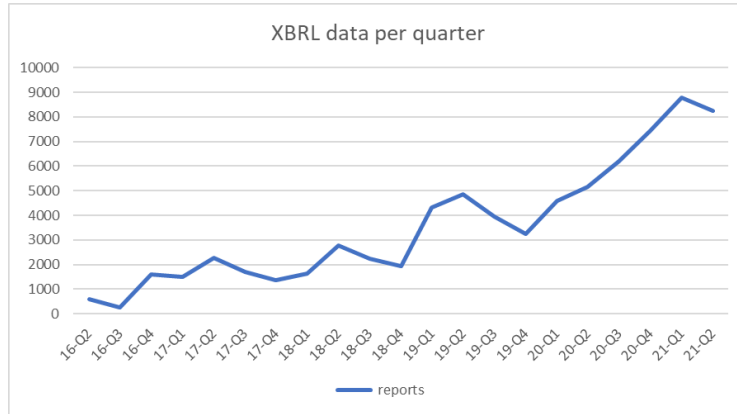|	
EBA	SRB
EIOPA	ECB
EuroStat	
OECD	BIS
CBS	IMF

XBRL numbers

Taxonomies:

DNB created 288 modules in 39 versions of 23 taxonomies, starting in 2016.

Data:
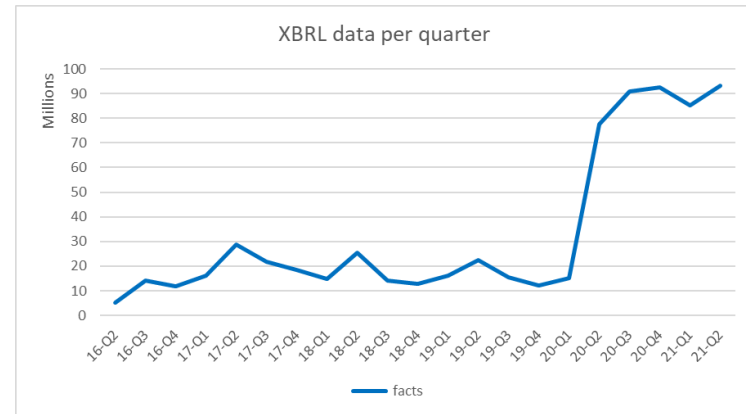
For 2022 we expect a 100% increase in number of reports and small increase in facts.
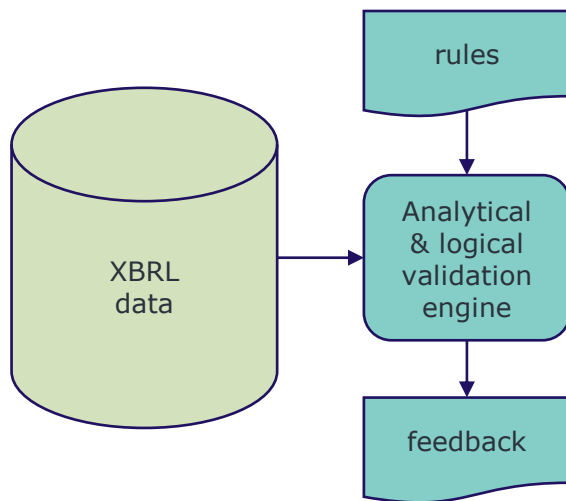
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Internal use

Internal use of XBRL data
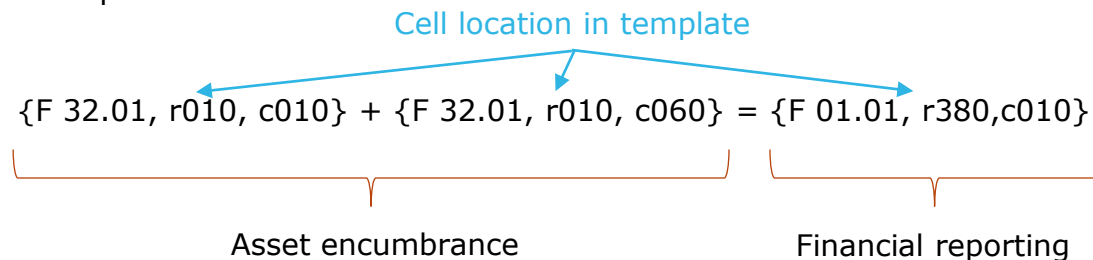
Purely internal use:

1. Additional validation
2. Analysis supporting the 4 tasks of DNB
   1. Browsing reported data, e.g. CRDIV-browser
   2. Derived data (ratio's)
   3. Input for BI-tooling
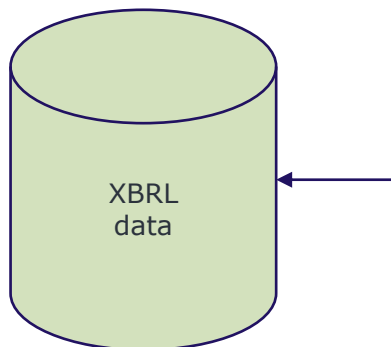
Internal use of XBRL – additional validation

rules

XBRL data

Analytical & logical validation engine

feedback

Requirements:

- rules defined by domain experts, no IT involvement necessary

- support cross report checks

- Example:

Cell location in template

$\{F\ 32.01,\ r010,\ c010\} + \{F\ 32.01,\ r010,\ c060\} = \{F\ 01.01,\ r380, c010\}$

Asset encumbrance

Financial reporting

Internal use of XBRL – browser

Data by template

XBRL data

Internal use of XBRL – automatic ratio calculation
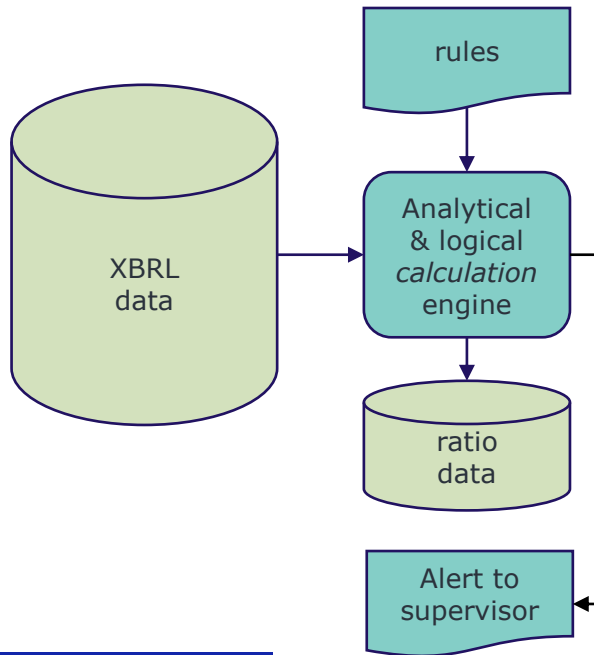
Requirements:

- rules defined by domain experts
- Mathmethical and logical operations, ratio's on ratio's
- Example:

rules

XBRL data

Analytical & logical *calculation* engine

ratio data

Alert to supervisor

Range of cells template

r1234 = ABS(SUM({F 18.00.b,(r070,r191,r221),c150}))

r2345 = r1234 / r2222

Internal use of XBRL – BI - tooling
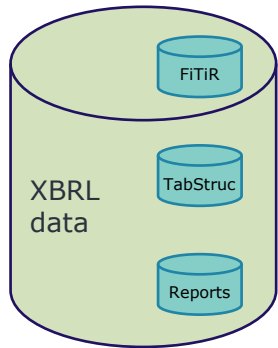
Requirements:

- Data available through tools like SAS Enterprise Guide

- Easy to use data sets:

  - Fact in Table in Report

  - Table Structures

  - Submitted Reports

XBRL data

FiTiR

TabStruc

Reports

External use

External use of XBRL – forwarding to EU for supervision

```
┌─────────────┐        ┌──────────────┐
│             │        │  Analytical  │
│             │───────▶│  & logical   │
│             │        │ calculation  │
│    XBRL     │        │   engine     │
│    data     │        └──────────────┘
│             │               │
│             │               ▼
│             │        ┌──────────────┐
│             │        │   Review     │
└─────────────┘        │    and       │
       ▲               │ decision to  │
       │               │  forward     │
┌─────────────┐        └──────────────┘
│             │               │
│    XBRL     │               ▼
│   report    │────▶   ┌──────────────┐
│             │        │ Forward to   │
└─────────────┘        │    ESA       │
                       └──────────────┘
```
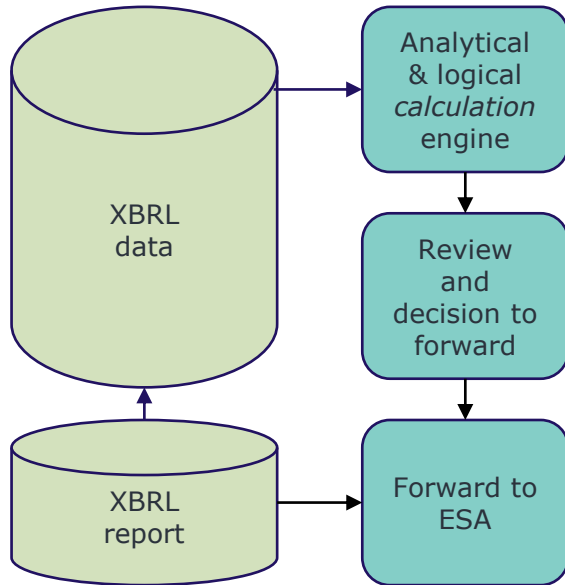
DNB forwards the XBRL report received from banks, insurers, pensions funds and other supervised entities to European Supervisory Authorities like EBA and EIOPA.

DNB checks validity:

- Compliance with technical requirements on the XBRL report
- Compliance with additional technical requirements
- Plausibility

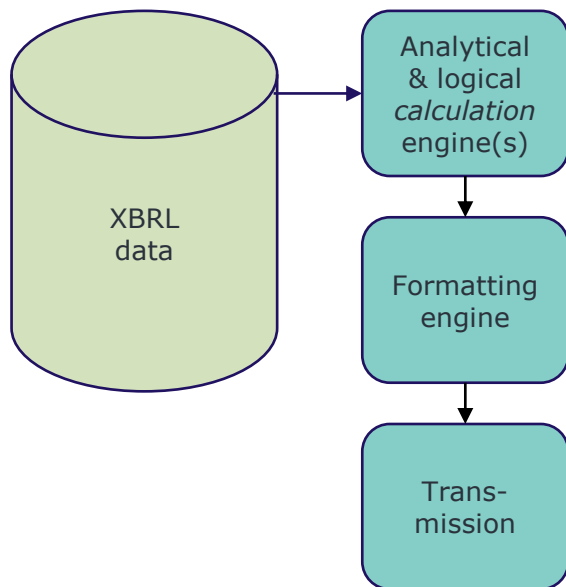# External use of XBRL – compiling new reports

XBRL data → Analytical & logical *calculation* engine(s) → Formatting engine → Trans-mission

DNB provides data to many (inter)national agencies like

- the Central Bureau of Statistics in The Netherlands,

- Eurostat and ECB in Europe

- IMF, OECD and BIS at the multinational level.

DNB process:

- XBRL data is selected, corrected and calculated.

- Calculated data is "formatted" to structure requested (e.g. XBRL, SMDX) using an XSLT-based engine.

- The report is transmitted (including compression, encryption, ..)

Summary of XBRL data use at DNB

Many different use cases:

- Additional validation
- Viewing the facts in the report for a given institution
- Querying the facts from reports across time, sector or peer group
- Calculation of performance or risk indicators
- Input for the derivation of new facts

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Making XBRL data usable

Getting value from XBRL data

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XBRL processing at DNB: parties & roles

Domain specific applications

Data & Information Technology provides general use functionality.

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Supervision	Payment
Statistics	Financial Stability
Resolution	Economic Policy and Research

Data & Information Technology

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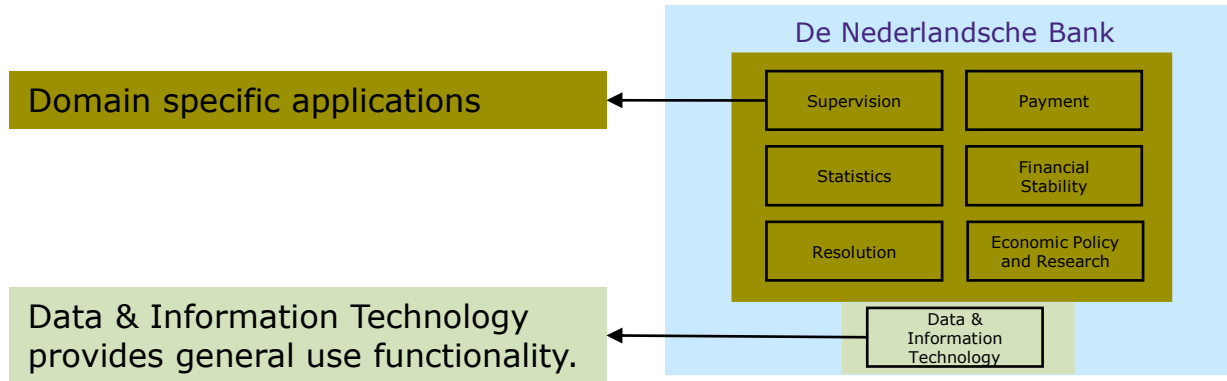
DIT: XBRL validation and processing

XBRl 2.1 specification
XBRL dimensions

Filing Rules
Formula Rules
- Taxonomy
- External files
  - Generic
  - Specific

```
┌──────────┐   ┌──────────┐   ┌──────────┐   ┌──────────┐   ┌──────────┐   ┌──────────┐
│  Report  │──▶│  Report  │──▶│  Report  │──▶│  Report  │──▶│   Fact   │╌╌│ Database │
│ matches  │   │structure │   │ content  │   │acceptance│   │derivation│  │ storage  │
│obligation│   │validation│   │validation│   │          │   │          │  │          │
└──────────┘   └──────────┘   └──────────┘   └──────────┘   └──────────┘  └──────────┘
```

Problem: report doesn't contain positional information

```
┌──────────┐                                 ┌──────────┐   ┌──────────┐
│  Bought  │                                 │ Taxonomy │──▶│ Database │
│application│                                │Positional│   │ storage  │
│    or    │                                 │information│  │          │
│component │                                 │extraction│   │          │
└──────────┘                                 └──────────┘   └──────────┘
```

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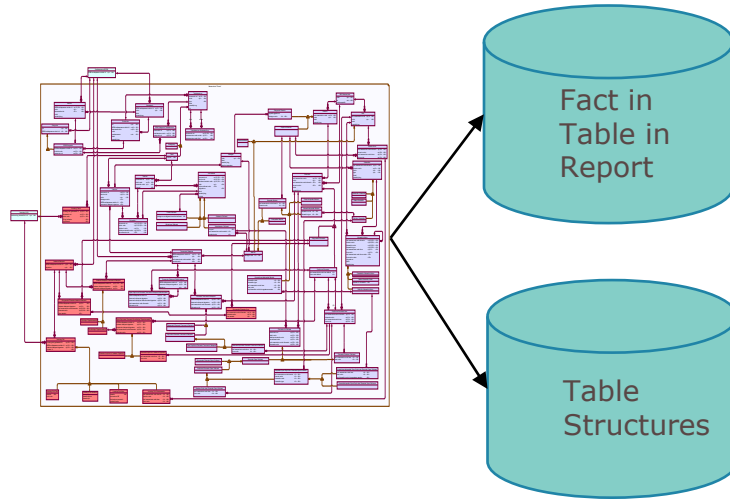De NederlandscheBank
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DIT: XBRL database storage - model
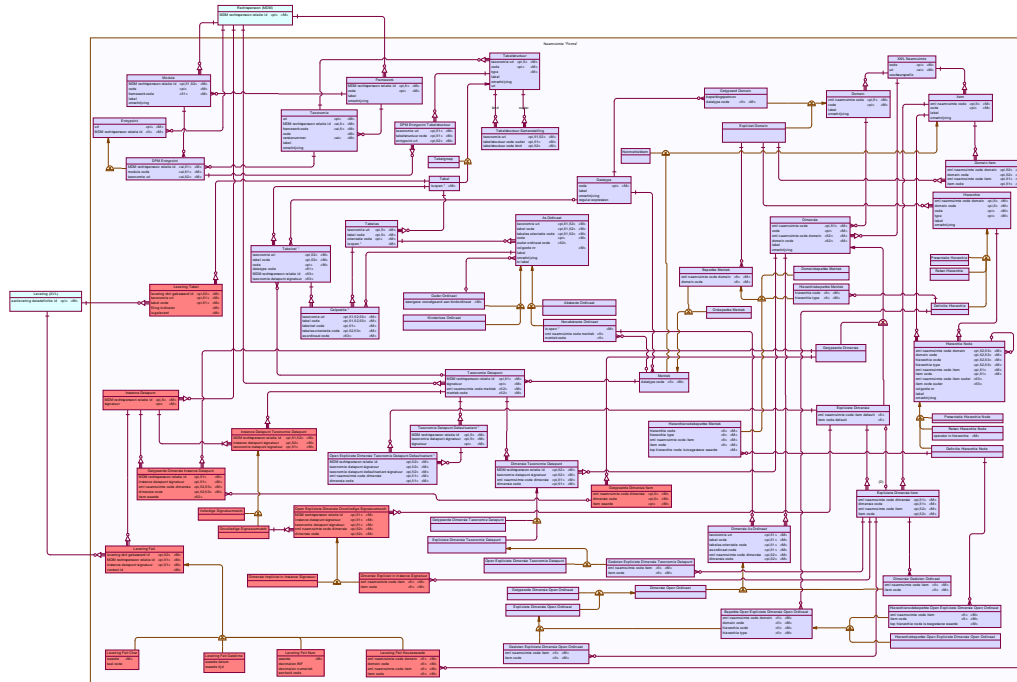
DNB XBRL database:
- Model of XBRL following data point modelling approach
- Data Vault technique used
- Is basis for user oriented data sets, not meant for direct data retrieval
- Central aspect is the datapoint signature that links facts to the taxonomy
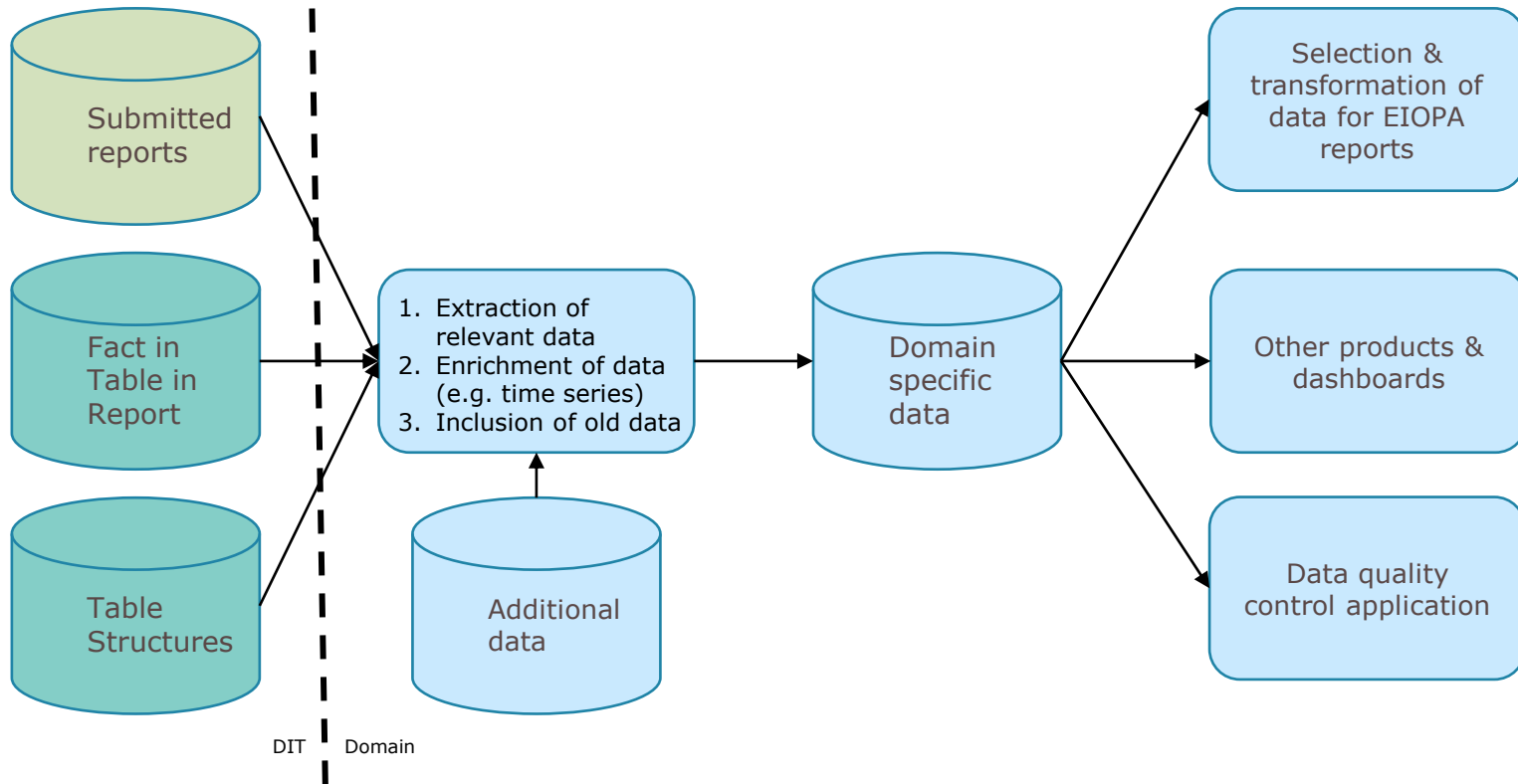
DIT: XBRL data sets

Fact in Table in Report

Fact value and properties
Position (table, sheet, row, column id)
Labels for table, sheet, row and column
Report datapoint signature
Report ID

Table Structures

Taxonomy datapoint signature
Position (table, sheet, row, column id)
Table, sheet, row, column labels and properties
Datatype
Data properties (e.g. enumeration values)

Domain using XBRL data - example

Submitted reports

Fact in Table in Report

Table Structures

DIT | Domain

1. Extraction of relevant data
2. Enrichment of data (e.g. time series)
3. Inclusion of old data

Additional data

Domain specific data

Selection & transformation of data for EIOPA reports

Other products & dashboards

Data quality control application

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Summary

Summary

The value of XBRL comes from having high volumes of high quality data that is easy to use.

XBRL allows DNB to:
- use a single (although complex) process for data collection, validation, storage and dissemination that supports a form based view that many users want,
- allows domain teams to develop their own applications using a common structure without concerns about data quality and structure,
- leverage existing knowledge, skills and software (e.g. validation, taxonomy parser).