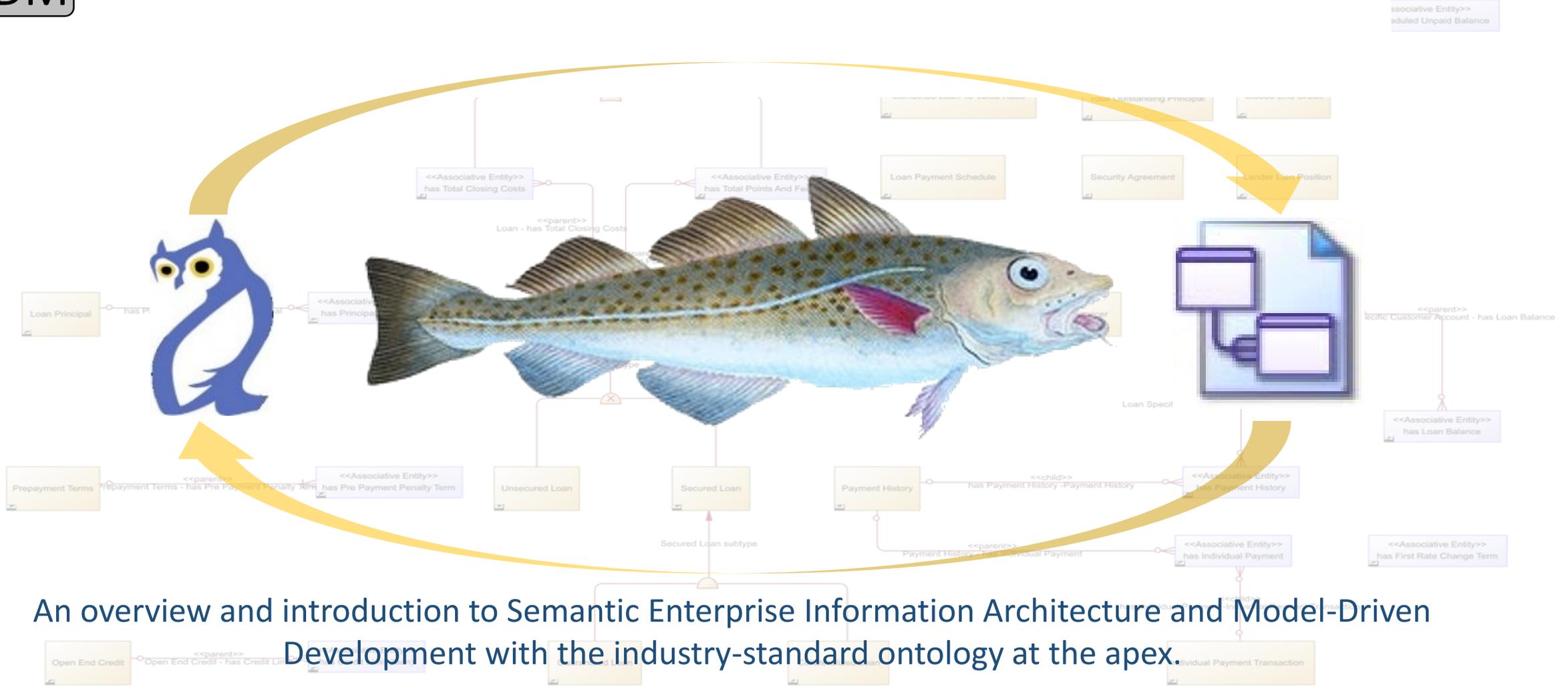


# Semantics for Extra Large Banks

## The Configurable Ontology to Data Model Transformation (CODT)



An overview and introduction to Semantic Enterprise Information Architecture and Model-Driven Development with the industry-standard ontology at the apex.

# Your institution embraces RDF/OWL and the FIBO



You have, or are moving towards, a Semantic Technologies Center of Excellence (COE) and RDF (Triple) Stores.



You use and support the development of the industry-standard ontology.



You have licensed or downloaded and evaluated the FIBO data model.

ATLANTIC CODT



**The CODT Patent (US12038939) enables full disclosure of the transformation technology.**



# Semantic Center of Excellence (CoE) challenges

Many global banks already implemented, extended, and customized the industry-standard ontology.

They have highly qualified ontologists and data scientists.



However, 95% of the bank still runs on relational databases, using data models

Data Architects have the FIBO Data Model but can't leverage their Semantic CeO colleagues' work.

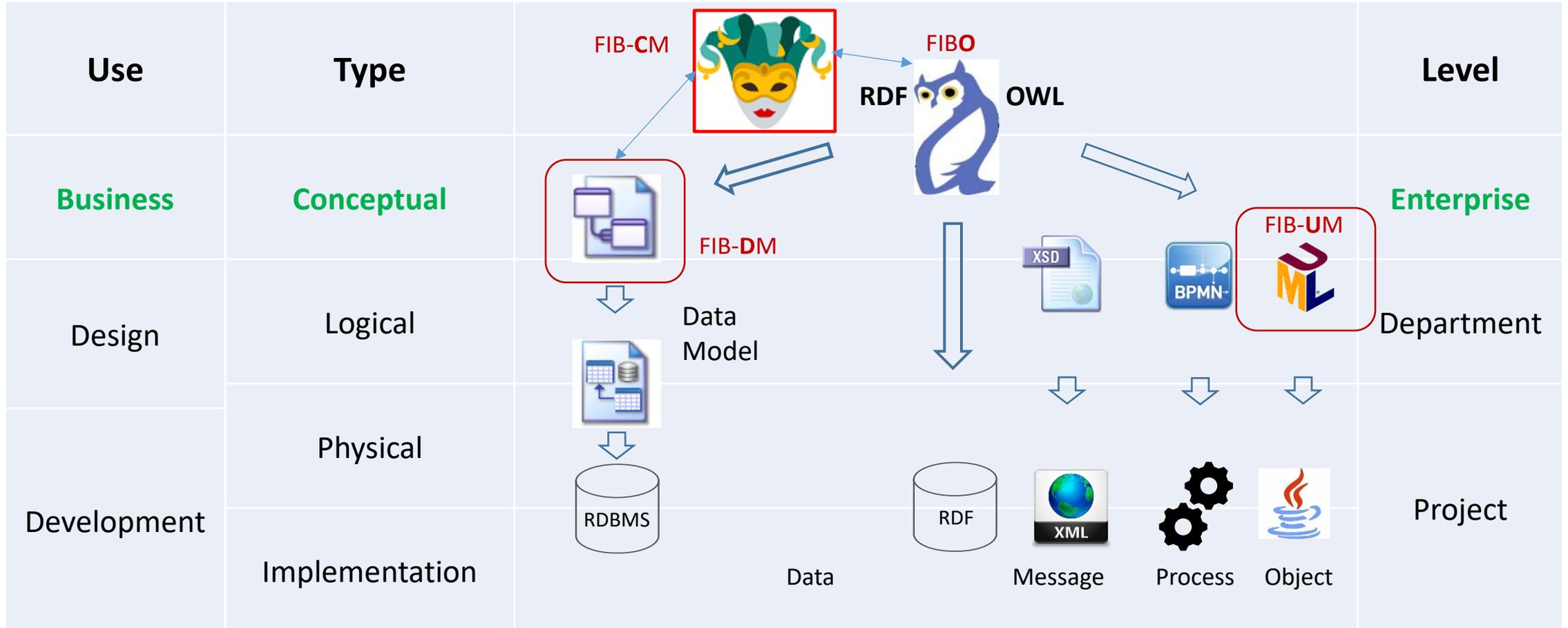


**The risk is that Semantic implementations become yet another data silo, using a different language than the rest of the organization, impeding integration.**



The Vision:

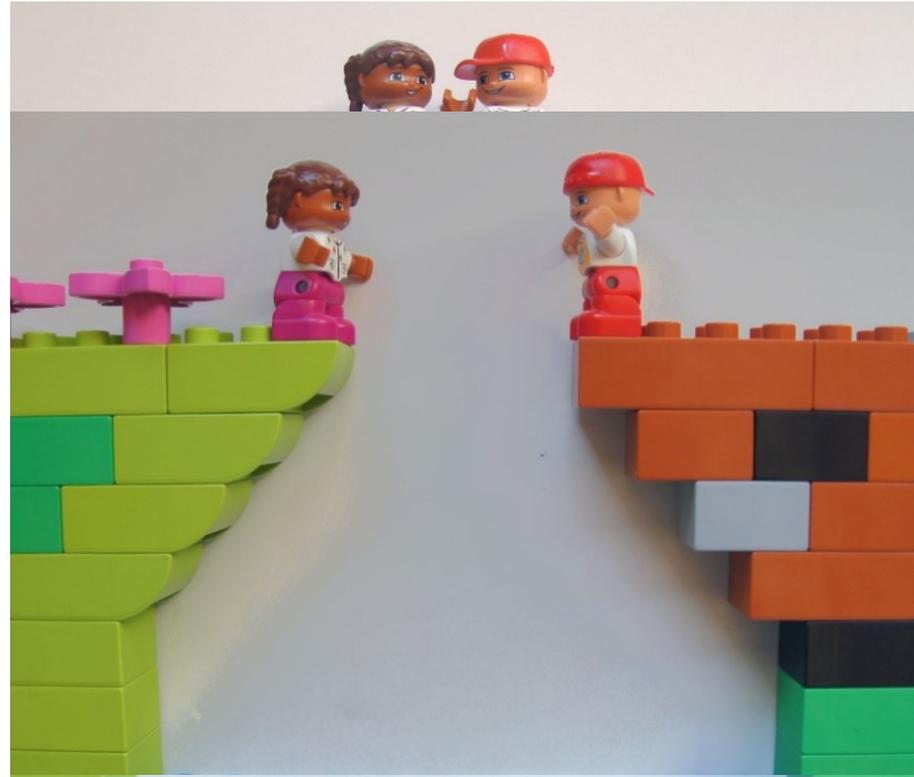
# Semantic Enterprise Information Architecture (SEIA)



# FIB-DM and CODT are the bridge across the chasm.



*in*

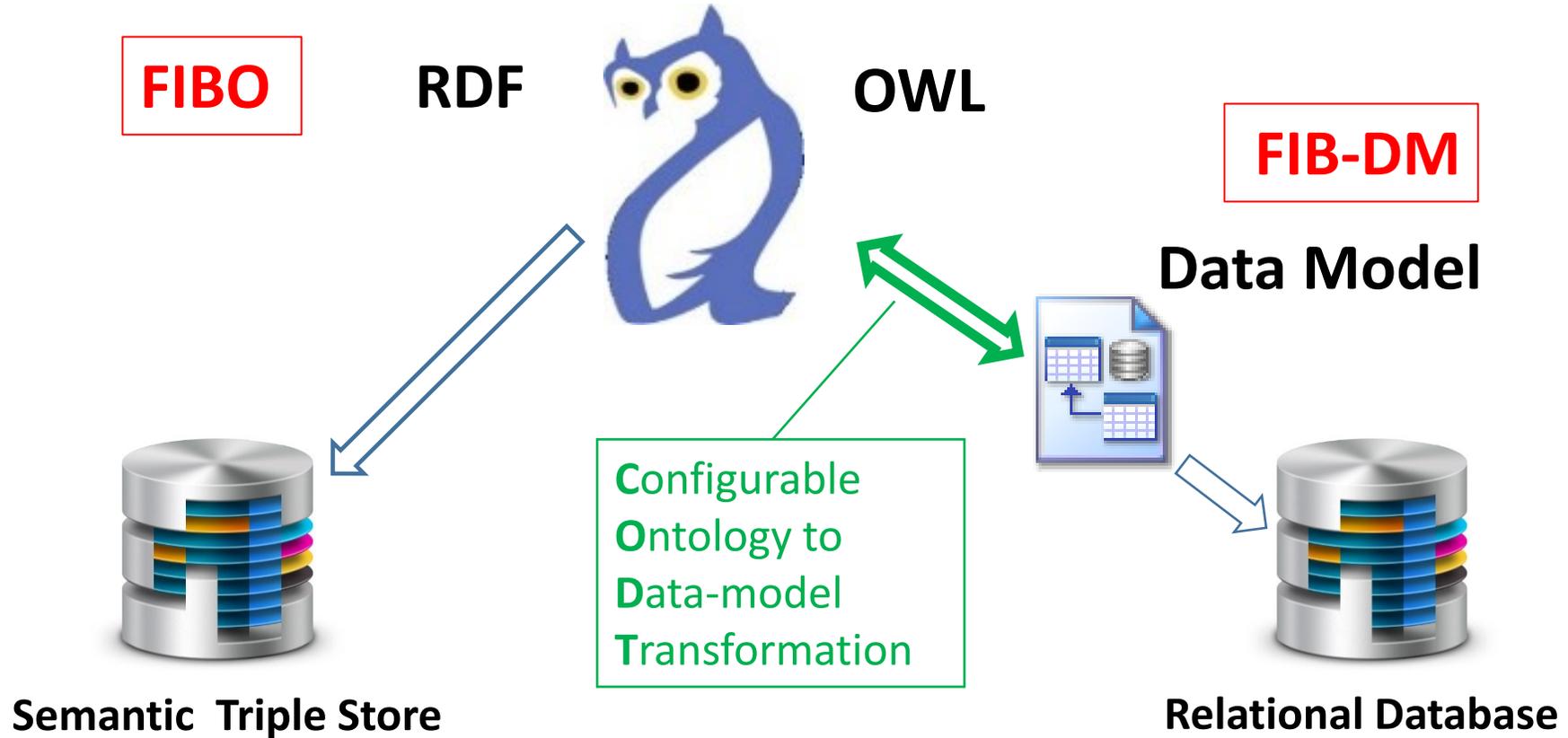


The Industry Standard is available in your Data Modeling tool.



The way:

# Semantic Model-Driven Development (SMMD)



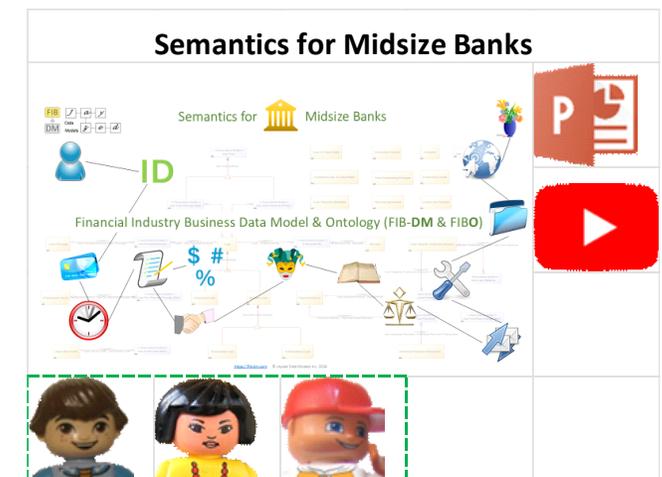
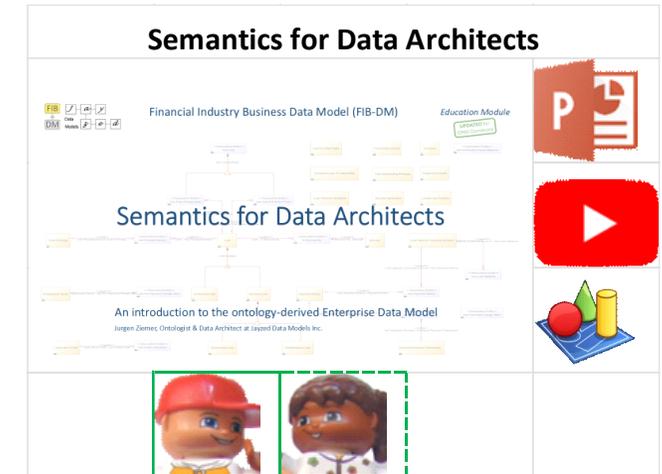
# Asset size is a poor proxy for semantic sophistication

*Semantics for Data Architects*, the name of the first FIB-DM education resource, became a catchphrase.

FIB-DM on the EDMC website was for financial institutions with less than \$200 billion in assets, hence *Semantics for Midsize Banks*.

However, some financial institutions, such as hedge funds, for example, are very advanced. Many midsize banks on FIB-DM are now building out ontology capabilities.

CODT is for Financial Institutions that use and extend FIBO; many, but not all, are very large banks.



# Intended Audience & POC Team



**Finance**, management, or business stakeholder who has a working knowledge of Entity-Relationship and Ontology diagrams. You are authorized to sign non-disclosure and license agreements.



**Ontologist** with an in-depth understanding of the FIBO and in-house ontologies. You want to spread adaptation across your enterprise. You are well-versed in RDF/OWL and SPARQL.



**Data Architect, with** experience in Enterprise Reference models. You evaluated and want the industry-standard, FIB-DM. You are an expert in your Data Modeling Tool and its import functionality.



**Developer / MS-Excel Power User** experienced in VBA, Power Query, and the M-Language.

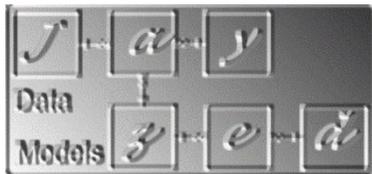


# Inventor and Presenter



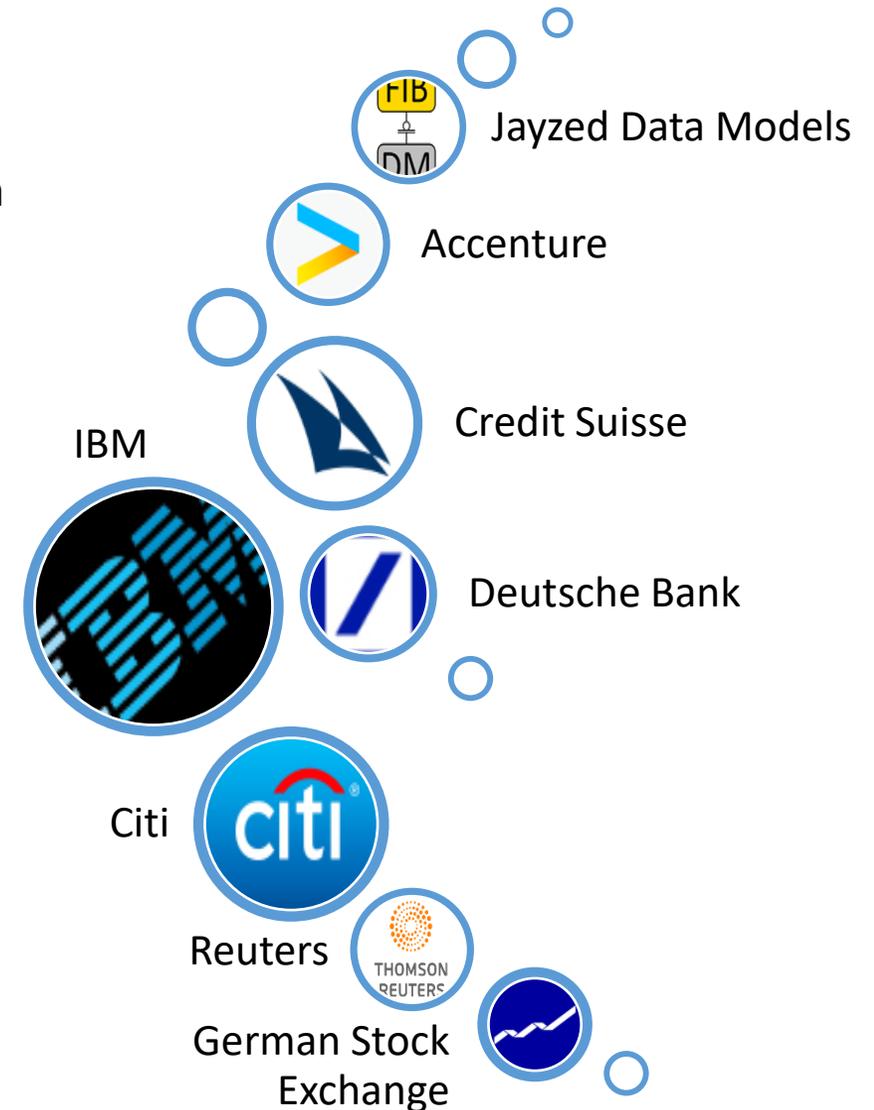
Jurgen Ziemer has 20 years of industry experience as a data architect and ontologist at leading Financial Institutions and service providers.

- Seven years as an IBM Software Group Consultant for the Banking and Financial Markets Data Warehouse (BFMDW) model at 45 banks in North America, Europe, and Asia.
- Implementing BFMDW at Citi and Deutsche Bank.
- Contributor, reviewer, and speaker at FIBO conferences



Jayzed Data Models Inc. is a US consulting company incorporated in 1999.

Jayzed holds the FIB-DM copyrights and is the designated assignee of the CODT Patent.



# Atlantic is the way to Semantic EIA and MDD

FIB

2025/Q4

Full

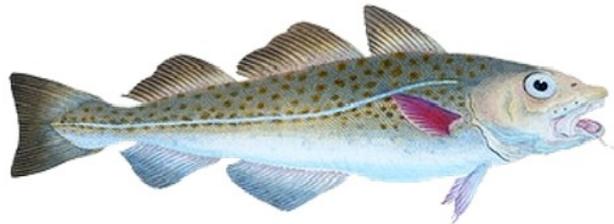
DM

release

3,173 entities

The world's largest data model.

ATLANTIC CODT



Configurable Ontology to Data model Transformation (CODT)



# EDMC and OMG collaborate closely



EDM Association is the member-driven trade association dedicated to elevating data management and analytics as a strategic business priority. Founded in 2005 as the EDM Council, we provide best practices, standards and education to data and business professionals in our data-driven world. <https://edmcouncil.org/about/>



The Object Management Group® Standards Development Organization (OMG® SDO) is a global, open membership, non-profit consortium. Our members collaborate to craft technology standards that offer measurable value to a diverse range of vertical industries. <https://www.omg.org/>



# FIBO and OMG Commons



The Financial Industry Business Ontology (FIBO) defines the sets of things that are of interest in financial business applications and the ways that those things can relate to one another. In this way, FIBO can give meaning to any data (e.g., spreadsheets, relational databases, XML documents) that describe the business of finance.

<https://edmcouncil.org/financial-industry-business-ontology/>



## Commons

The Commons Ontology Library provides a set of small ontologies designed to provide a useful set of modeling constructs that are reusable in different modeling and data deployment environments with minimal commitments.

OMG Commons is designed as a foundational or upper ontology, independent of the domain or industry.

The FIBO imports the OMG Commons ontologies, deprecating foundational classes in the Foundation module.



# FIBO is more than a Knowledge Graph



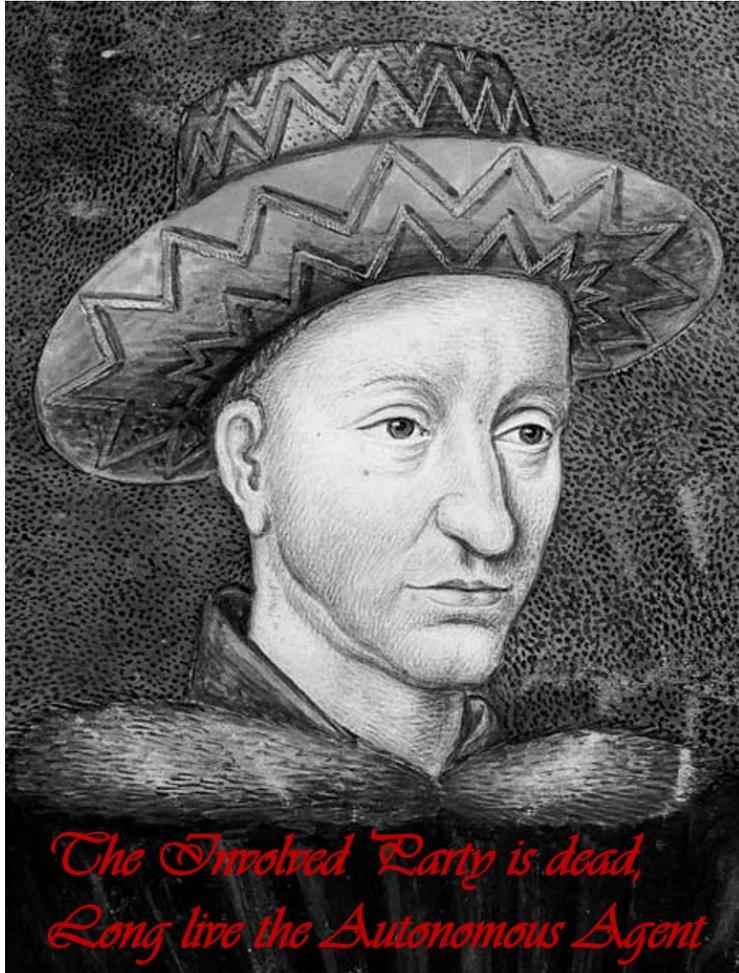
The Council and its members correctly decided to define the business conceptual model in the Ontology Web Language (OWL) because of its superior semantics.

FIBO Conceptualization and Relations are **fully applicable for** lower-semantic taxonomies, concept maps, object-, and **data models**. FIB-DM is a perfect conceptual data model.

(<https://fib-dm.com/ontology-class-and-data-model-entity-hierarchy/> and <https://fib-dm.com/ontology-object-property-data-model-associative-entities/>)



# The FIBO is superior to vendor data models



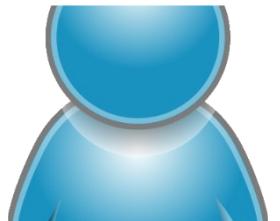
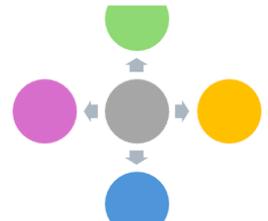
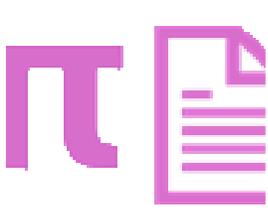
Almost six hundred years ago, Robert II d'Uzès proclaimed Charles VII King of France. Yet the *"Involved Party"* is still an ultimate supertype in numerous reference models and databases.

OMG Commons breaks the comingled entity into two fundamental concepts:

1. Agent (person or legal entity)
2. Role (customer, counterparty, borrower, employee ...). One Agent, many Roles



# The 15 concept mnemonic icons, and abbreviations

 <p><b>SIT</b> Situation</p>	 <p><b>R</b> Role</p>	 <p><b>D</b> Designation</p>	 <p><b>CST</b> Constituent</p>	 <p><b>COL</b> Collection</p>
 <p><b>A</b> Agent</p>	 <p><b>ASP</b> Aspect</p>	 <p><b>SP</b> Specification</p>	 <p><b>ARR</b> Arrangement</p>	 <p><b>M</b> Measure</p>
 <p><b>OCC</b> Occurrence</p>	 <p><b>TE</b> Temporal Entity</p>	 <p><b>DOC</b> Document</p>	 <p><b>SQ</b> Scalar Quantity</p>	 <p><b>ACT</b> Account</p>

The Fundamental concepts define the Open Banking scope: Registry (ARR), Network locations (LOC), new products and services, customer agreements, documents, accounts, an of course the API request (OCC) and their timestamps (TI).

The concepts are ultimate supertypes in the data model.

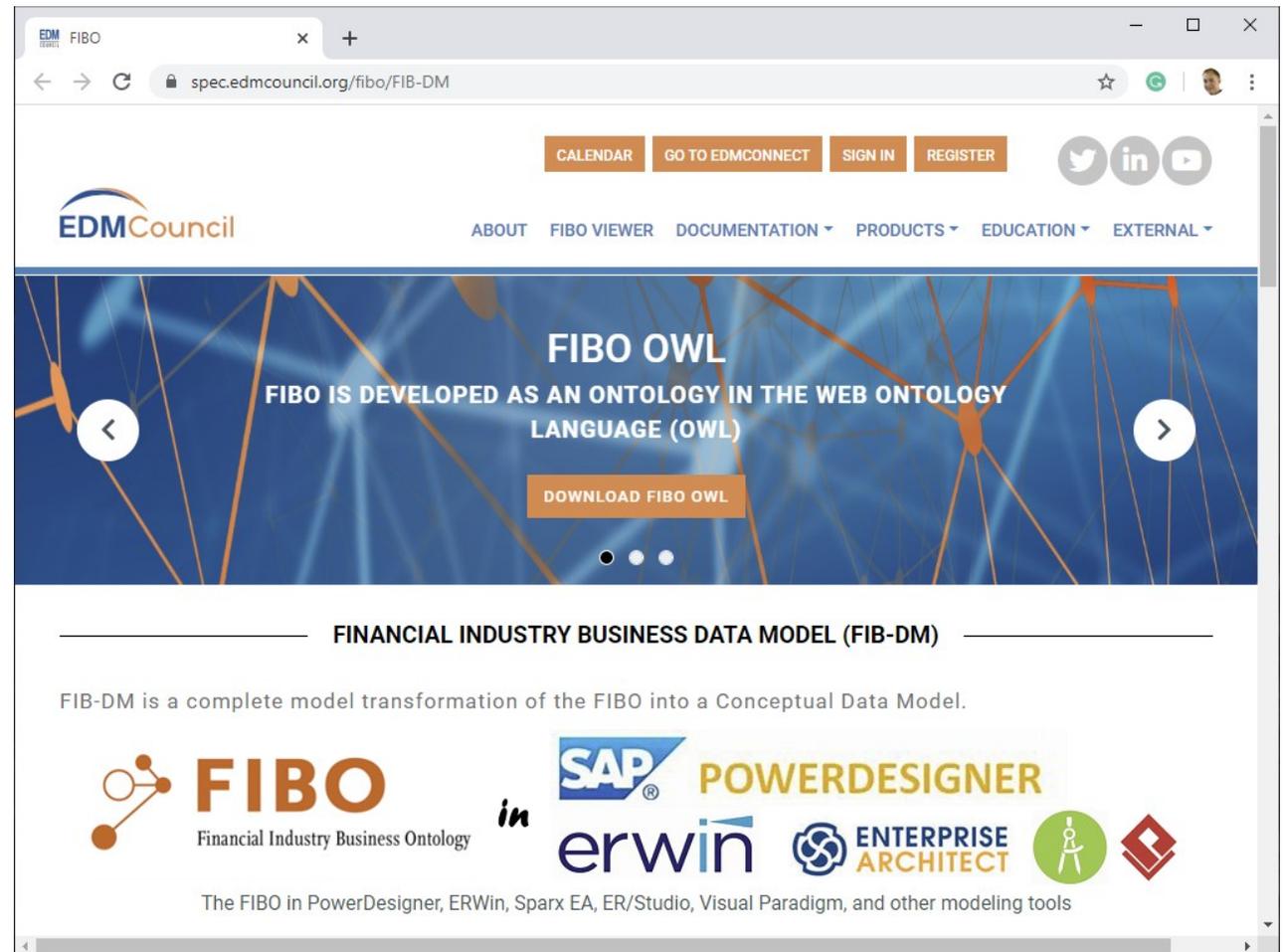
# EDMC support and 3,500 data model downloads

“Many midsize EDMC members want to leverage the industry standard, but don’t have ontology tooling, databases, and the human expertise inhouse yet.”

(<https://spec.edmcouncil.org/fibo/FIB-DM>)

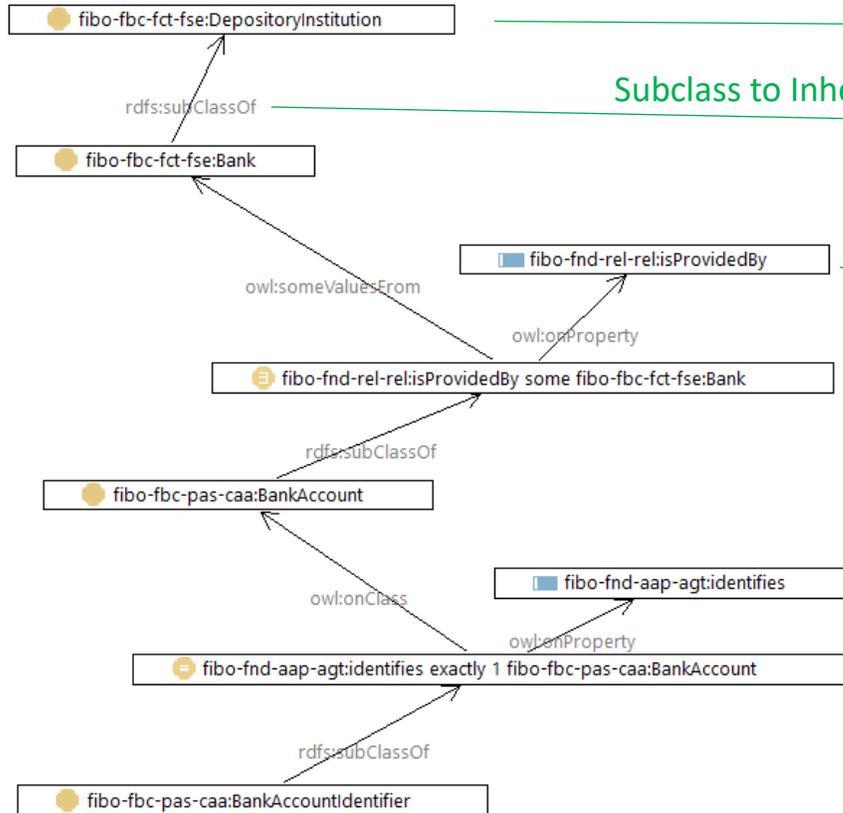
With FIB-DM, Data Architects no longer manually transcribe ontology graphs and copy and paste definitions. Three thousand five hundred users downloaded the Open-Source version of the FIBO Data Model.

However, even with FIB-DM, Architects at larger Financial Institutions must still c&p their FIBO customizations and extensions manually.



# Ontology-derived Data Model

## Ontology graph



## Transformation/mapping

Class to Entity

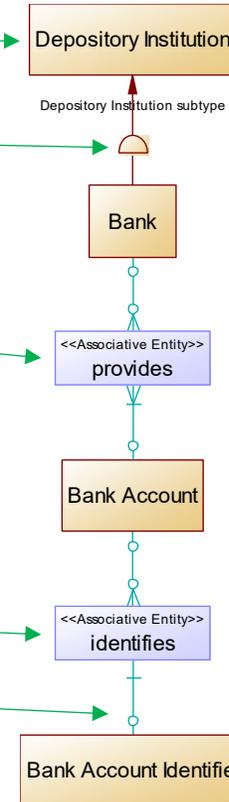
Subclass to Inheritance (subtype)

Object Property to Associative Entity

Object Property to Association

Class Restrictions, domain and range determine Relationships and cardinalities

## Conceptual Data Model



CODT patent drawing FIG.1 System (removed numerals and added colors)



Data Architect



Ontologist

<https://fib-dm.com> <https://codt.net>

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# Current tooling imports are not fit for purpose

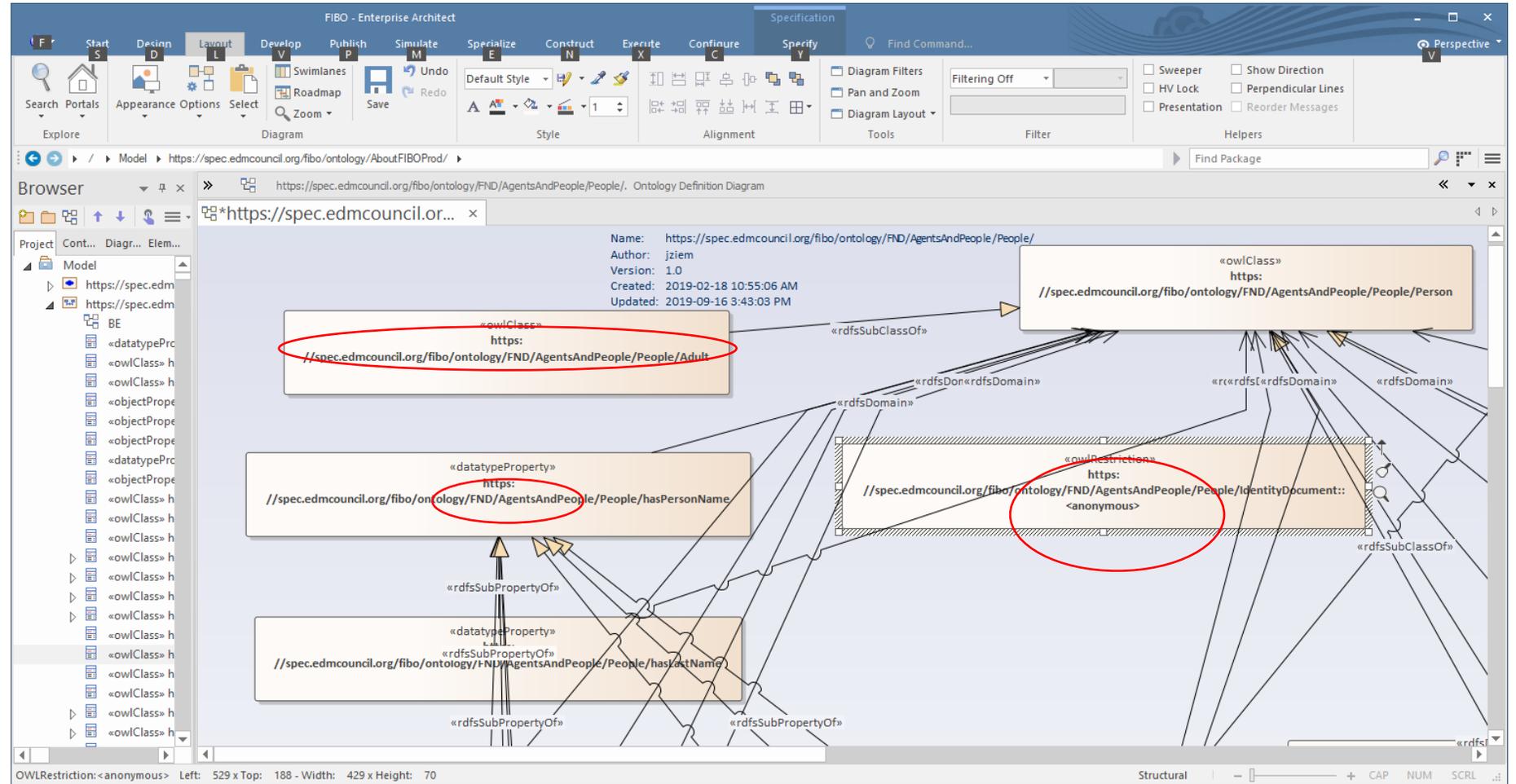
Data Modeling tools, such as Sparx EA and IBM IDA, have rudimentary import capabilities for RDF/OWL files. The imports are a one-click black box with no options or diagnostics.

URIs as entity names

Datatype properties become classes

Class restrictions become anonymous pseudo classes

No import of annotation properties



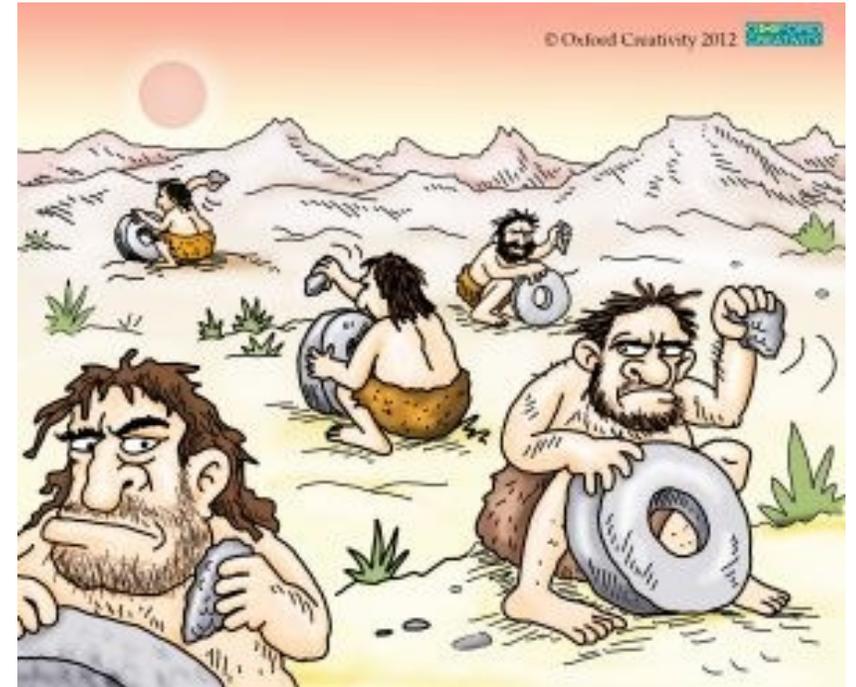
# The parsing approach is not scalable

Traditional transformations parse ontology files. They encounter elements of the ontology and create elements of the data model as they process the source files. The parsing approach reaches its limits with very large ontologies like the FIBO.

Per default, ontology object properties transform into data model relationships. This transformation loses Metadata for object properties with particular design patterns.

XLB and other large Financial Institution developed rudimentary transformations.

**Compare FIB-DM to a vendor or in-house transformations of the FIBO and see the difference!**



**License the technology that created the industry-standard rather than DIY!**



Data Architect



Ontologist

<https://fib-dm.com> <https://codt.net>

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# Outcome of the transformation: Package Properties

The Package Name is the rightmost string in the ontology namespace.

CODT transforms the ontology prefix as the unique code of the package.

Note: All ontology classes, properties with the prefix `fibonfdagr-agr` become model objects of the Agreements package.

The URI is the Uniform Resource Identifier of the ontology. It is a traceability link to the source of the model object.

The screenshot shows a dialog box titled "Package Properties - Loans (fibonfdagr-agr)". It has several tabs: "General", "Definition", "Rules", "Traceability Links", "Related Diagrams", and "Version Info". The "General" tab is active. The fields are as follows:

- Name:** Loans
- Code:** fibonfdagr-agr
- Comment:** The package for data model objects derived from the Loans ontology module. This ontology is the top-level, and most fundamental ontology for the LOAN module, extending the Debt ontology to define concepts common to all loans. It includes the primary obligations to fund the loan and to pay it back according to payment schedules. Kinds of loans covered in this ontology include open and closed end, secured and unsecured.
- Stereotype:** (empty)
- Default diagram:** Diagram\_1
- Use parent namespace
- Keywords:** (empty)
- URI:** <https://spec.edmouncil.org/fibo/ontology/LOAN/LoansGeneral/Loans/>

Buttons at the bottom: << Less, OK, Cancel, Apply, Help.

The second part of this overview shows how CODT extracts properties, transforms and add them to the data model.



Data Architect



Ontologist

# Package Annotations

Package annotations derive from FIBO / OMG ontology annotation properties.

The CODT table shows annotation properties and the number of ontologies (i.e., FIB-DM packages) with documentation.

annotation_property	Count
dcterms:license	191
rdfs:label	191
skos:changeNote	182
dcterms:abstract	179
cmns-av:copyright	179
fibo-fnd-utl-av:hasMaturityLevel	155
dcterms:contributor	22
skos:note	15
rdfs:seeAlso	14
sm:contentLanguage	12
sm:copyright	12
skos:scopeNote	12
sm:filename	12
sm:fileAbbreviation	11
dcterms:issued	9
sm:fileAbstract	8

We see that most packages have a label.

OMG Commons Parties & SiOMG Commons Parties & Situations also provides the contributors with a note.

License, change note, copyright, and maturity level are on the Lineage tab.

Package Properties - Parties And Situations (cmns-pts)

Extended Attributes | Dependencies | Traceability Links | Version Info

General | Annotations | Lineage | Definition | Rules | Related Diagrams

Label: Commons Parties and Situations Ontology

Issued:

Modified:

Contributor: Dean Allemang, Working Ontologist, Elisa Kendall, Thematrix Partners LLC

Publication Date:

Filename:

File Abbreviation:

Note: This ontology was originally designed for use in the Financial Industry Business Ontology

Content Language:

Scope Note:

Source:

See Also:

Depends On:

Related Specification:

<< Less | OK | Cancel | Apply | Help



# Package Lineage

The ontology namespace provides the Resource Name of the data model package, which is configured as a prefix for all entities in the package.

All OMG Commons packages have an abstract.

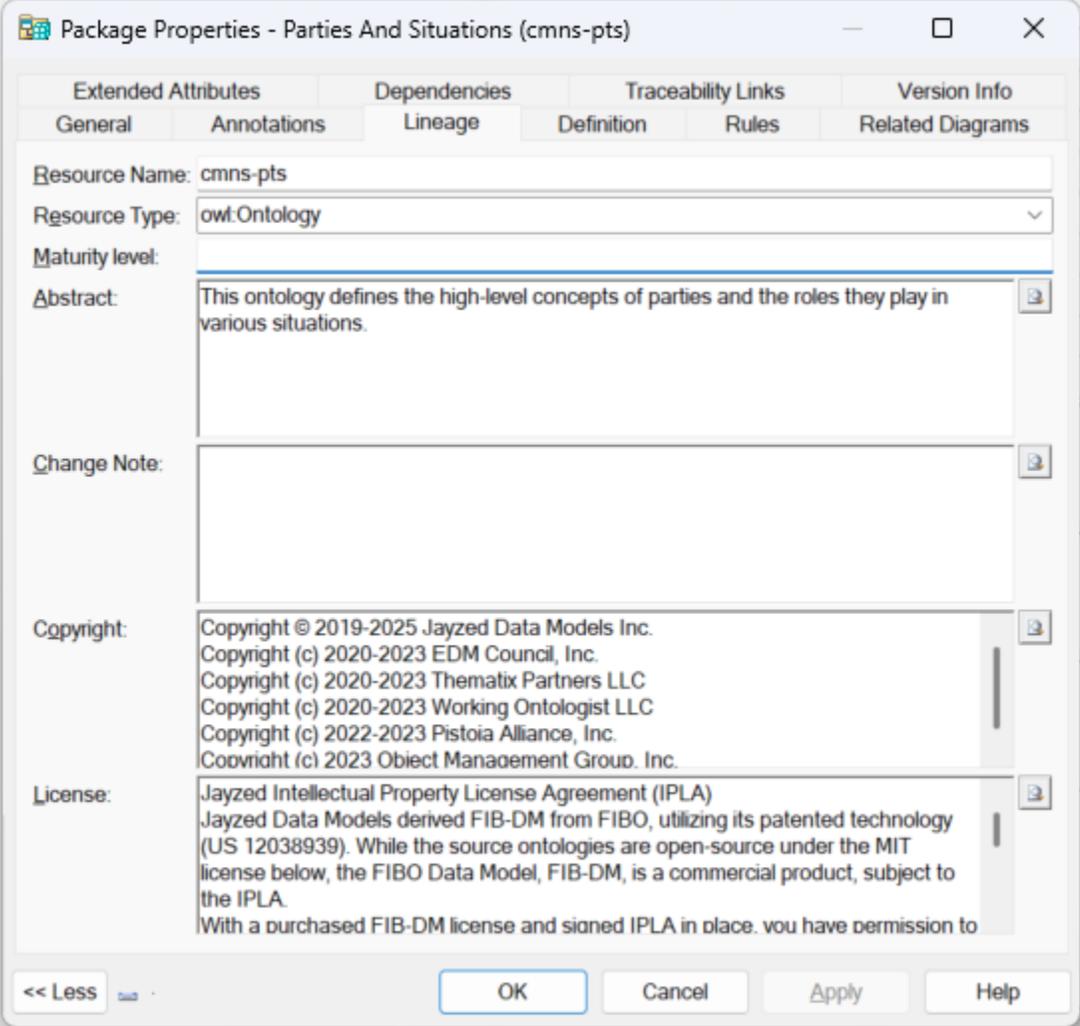
The copyright box lists the Jayzed FIB-DM copyright and all copyright notices in the source ontology.

The depicted data model license for the full commercial version is your IPLA. The open-source version is licensed under the GPL 3.0. The ontologies are licensed under the MIT open-source License (scroll down).

<https://jayzed.com/license-agreement/>  
<https://opensource.org/licenses/GPL-3.0>  
<https://opensource.org/licenses/MIT>

**The open-source licenses and the Jayzed IPLA require that all derived works include the license and copyright notices.**

In other words, please make sure to include the notes in your FIB-DM migrations to other tools, generated logical, physical, object models, and all metadata extracts.



Package Properties - Parties And Situations (cmns-pts)

Extended Attributes	Dependencies	Traceability Links	Version Info		
General	Annotations	Lineage	Definition	Rules	Related Diagrams
Resource Name:	cmns-pts				
Resource Type:	owl:Ontology				
Maturity level:					
Abstract:	This ontology defines the high-level concepts of parties and the roles they play in various situations.				
Change Note:					
Copyright:	Copyright © 2019-2025 Jayzed Data Models Inc. Copyright (c) 2020-2023 EDM Council, Inc. Copyright (c) 2020-2023 Thematrix Partners LLC Copyright (c) 2020-2023 Working Ontologist LLC Copyright (c) 2022-2023 Pistoia Alliance, Inc. Copyright (c) 2023 Object Management Group, Inc.				
License:	Jayzed Intellectual Property License Agreement (IPLA) Jayzed Data Models derived FIB-DM from FIBO, utilizing its patented technology (US 12038939). While the source ontologies are open-source under the MIT license below, the FIBO Data Model, FIB-DM, is a commercial product, subject to the IPLA. With a purchased FIB-DM license and signed IPLA in place, you have permission to				

<< Less    OK    Cancel    Apply    Help



Data Architect



Ontologist

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22

# Entity properties

The Name is the ontology class *Localname*, converted from Camel Case to LDM naming convention (capitalized with space between words).

The Code transforms from the ontology class *Prefix: Localname*.

The Comment populates from the class annotation RDFS comment and SKOS definition.

There are two particular tabs for ontology derived data models, Annotations and Lineage.

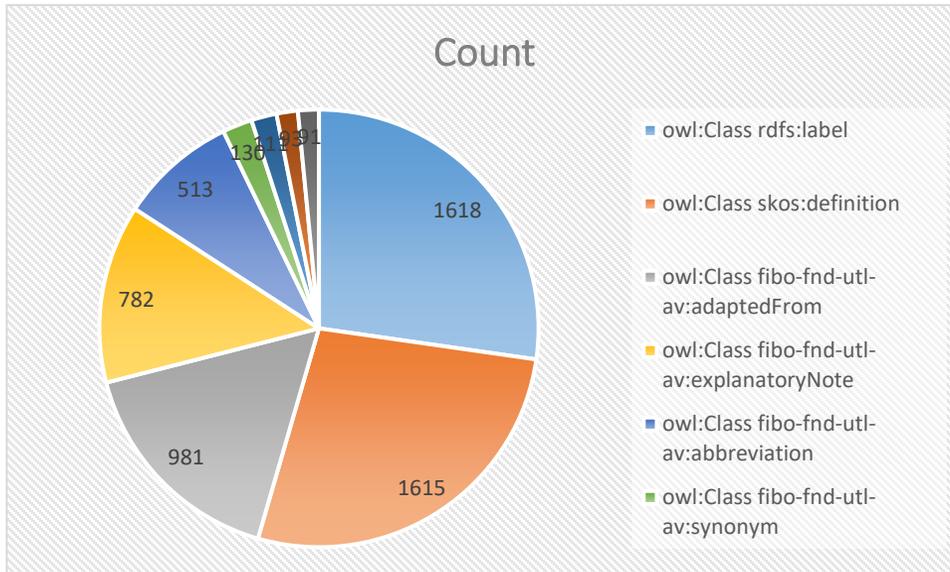
The screenshot shows the 'Entity Properties' dialog box for the entity 'Payment Obligation' (fibonacci-fnd-pas-psch:PaymentObligation). The dialog has several tabs: 'General', 'Attributes', 'Data Protection', 'Identifiers', 'Mapping', 'Annotations', 'Lineage', 'Definition', and 'Rules'. The 'Annotations' and 'Lineage' tabs are circled in red. The 'Name' field contains 'Payment Obligation', the 'Code' field contains 'fibonacci-fnd-pas-psch:PaymentObligation', and the 'Comment' field contains the text: 'a legally enforceable duty to pay a sum of money, or agree to do something (or not to do something), according to the terms stated in a contract'. Other fields include 'Stereotype', 'Number' (with a 'Generate' checkbox), 'Parent entity' (set to 'Commitment'), and 'Keywords'. The dialog also has 'OK', 'Cancel', 'Apply', and 'Help' buttons at the bottom.



# Entity annotations

FIBO has extensive documentation captured in annotation properties.

The chart shows the number of classes with annotated documentation.



The screenshot shows the "Entity Properties - Payment Obligation (fibo-fnd-pas-psch:PaymentObligation)" dialog box. The "Annotations" tab is selected, showing various annotation properties and their values. The "Source" field is empty. The "Abbreviation" field is empty. The "Adapted From" field contains "Barron's Dictionary of Business and Economics Terms, Fifth Edition, 2012". The "Definition Origin" field is empty. The "Explanatory Note" field is empty. The "Synonym" field is empty. The "Usage Note" field is empty. The "Deprecated" checkbox is unchecked. The "RDFS Comment" field is empty. The "Defined By" field is empty. The "Label" field contains "payment obligation". The "See Also" field is empty. The "Alt. Label" field is empty. The "SKOS Definition" field contains "a legally enforceable duty to pay a sum of money, or agree to do something (or not to do something), ac". The "Editorial Note" field is empty. The "Example" field contains "the duty of a borrower to repay a loan, and the legal right of a lender to enforce payment". The "Note" field is empty. The "Pref. Label" field is empty. The "Scope Note" field is empty. The "Direct Source" field is empty. The "Related Specification" field is empty. The dialog box has buttons for "<< Less", "OK", "Cancel", "Apply", and "Help".



# Entity lineage

The Lineage tab captures ontology metadata of the source class. The extended attributes provide traceability into the ontology and preserve semantics beyond the entity-relationship model.

The Resource Name is class *Prefix* and *Localname*. FIB-DM uses the resource name as the entity code, but you can generate your codes in the modeling tool.

The Localname is the rightmost string in the Resource Name and URI.

The Prefix is an abbreviation of the URI defined in the ontology.

The Uniform Resource Identifier of the class is a link to the FIBO source ontology.

Restriction and Equivalent class axioms formulate OWL semantics.

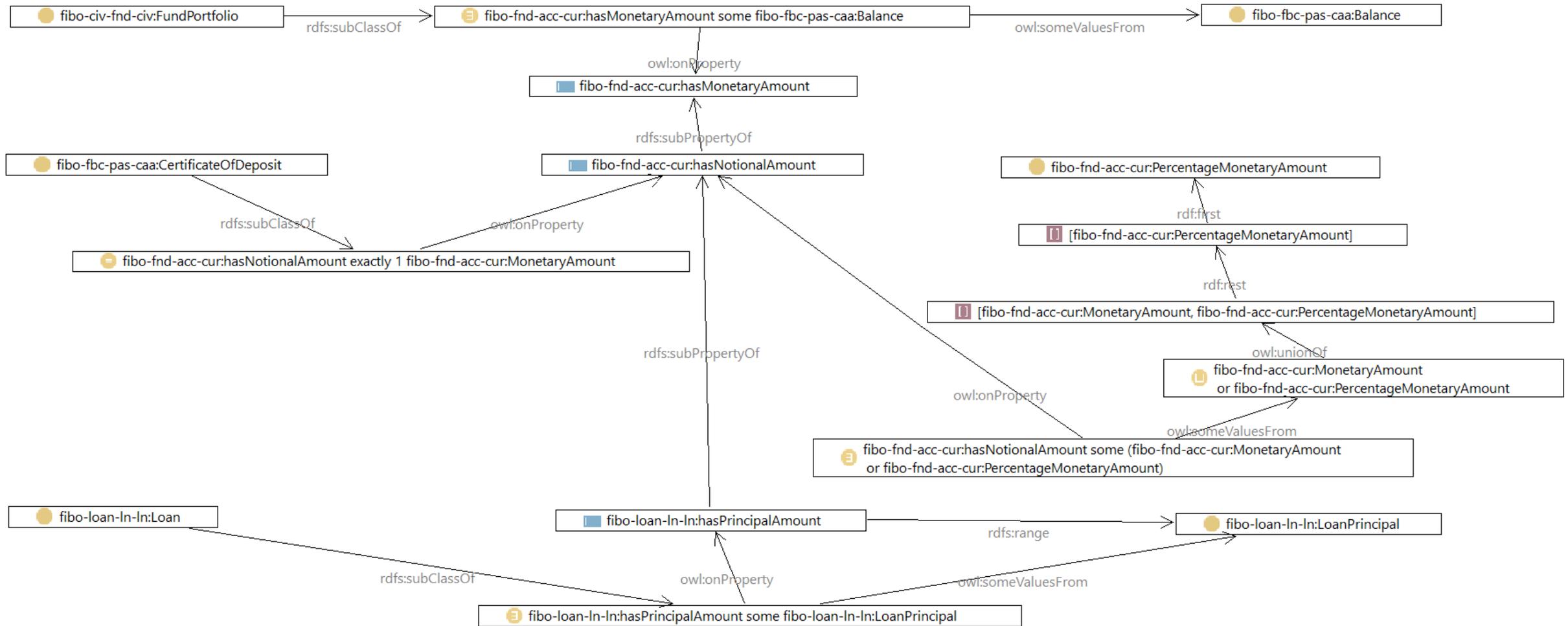
The screenshot shows a dialog box titled "Entity Properties - Obligor (fibo-fnd-agr-agr:Obligor)". It has several tabs: "Related Diagrams", "Extended Attributes", "Dependencies", "Traceability Links", and "Version Info". The "Lineage" tab is selected. The dialog contains the following fields:

- Resource Name: fibo-fnd-agr-agr:Obligor
- Local Name: Obligor
- Prefix: fibo-fnd-agr-agr
- Resource Type: owl:Class
- URI: https://spec.edmouncil.org/fibo/ontology/FND/Agreements/Agreements/Obligor
- Equivalent: (empty)
- Restriction: fibo-fnd-pty-rl.isPlayedBy some (fibo-fnd-pty-pty.isAPartyTo min 0 fibo-fnd-agr-agr:Agreement)  
fibo-fnd-agr-agr.hasObligation some fibo-fnd-agr-agr:Commitment

At the bottom, there are buttons for "<< Less", "OK", "Cancel", "Apply", and "Help".

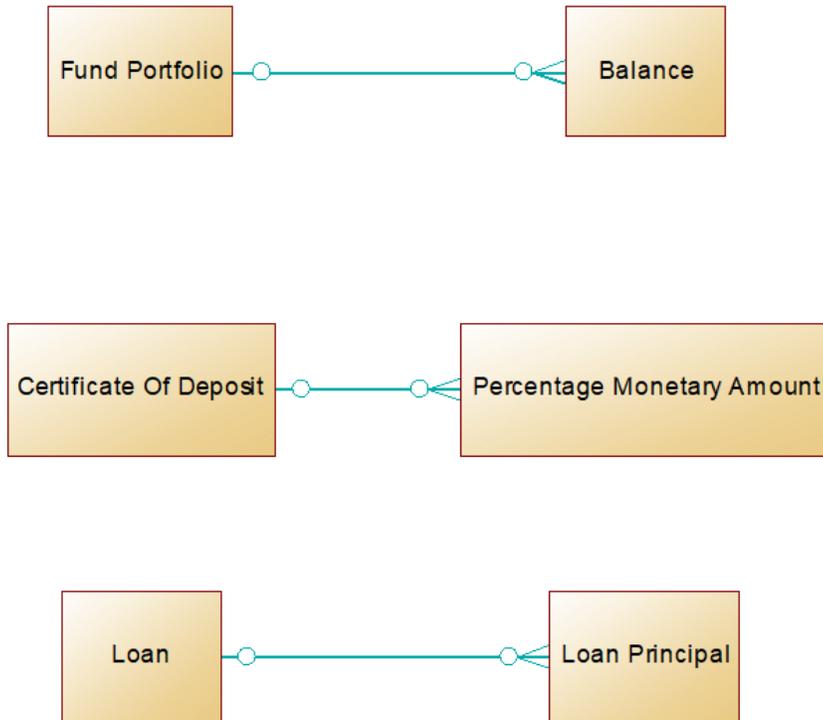


# Complex FIBO patterns (e.g. sub-properties) ...

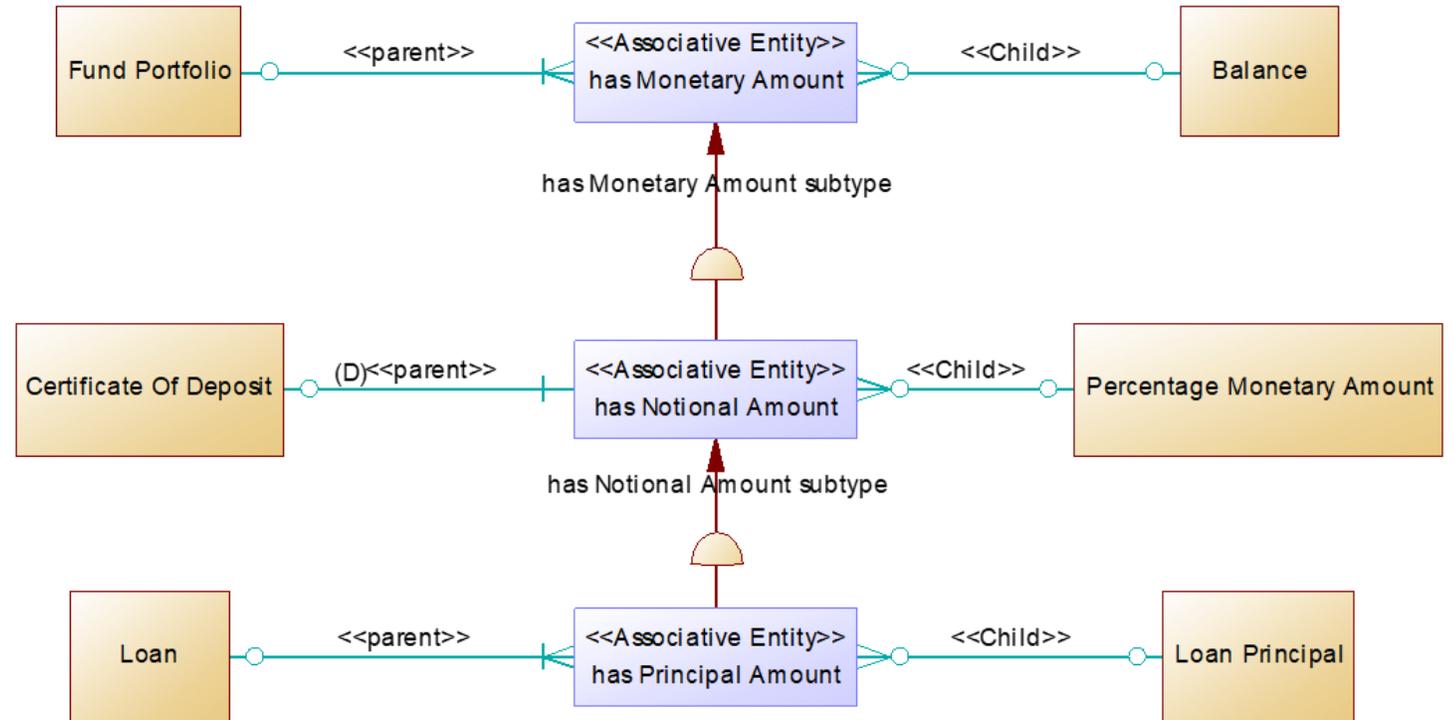


# Require a sophisticated data model transformation

**X Wrong**



**✓ Correct**

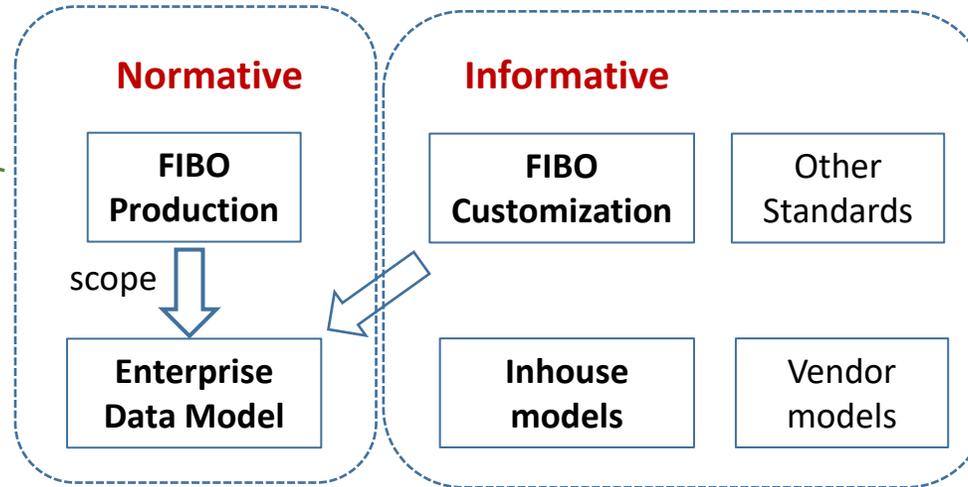


See the article of issues resolved for many-to-many relationships, closure axioms, hierarchies, incomplete and inverse object properties. (<https://fib-dm.com/ontology-object-property-data-model-associative-entities/>)



# FIBO, vendor and in-house models for SEIA

We adhere to the industry-standard



We consult other models

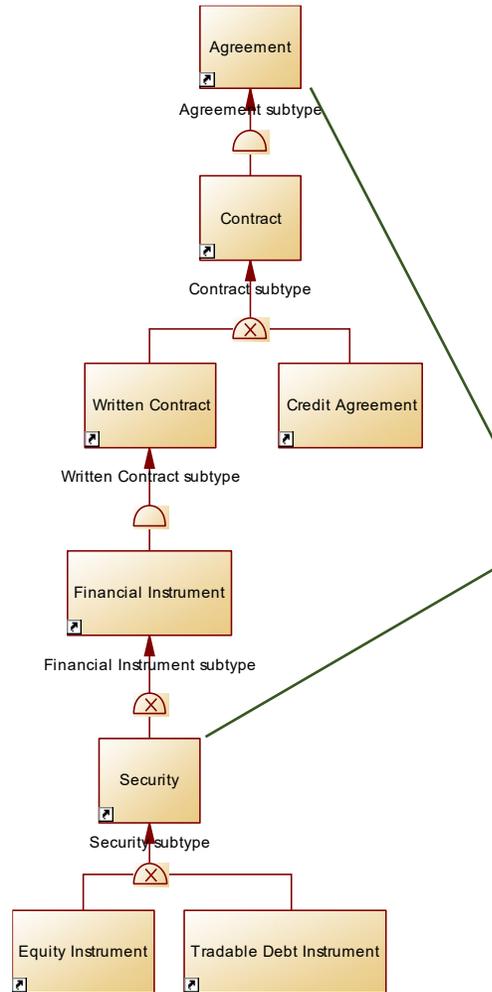
derive

Our method is to derive

Our goal is leverage



# DAs, merge in your vendor and inhouse models



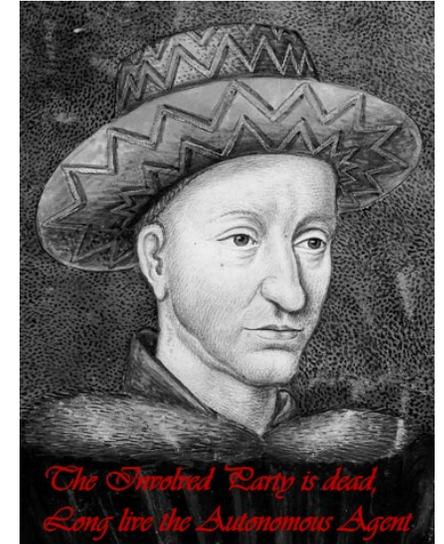
Your vendor model has excellent value. Keep it and harvest the content!

Adhere to the industry-standard 15 concepts and their subtype hierarchies

Adopt the FIBO/FIB-DM names and definitions

1. Identify indirect entity matches, synonyms
2. Identify direct entity matches, beware of homonyms
3. Merge entities that are not already in FIB-DM, identify the appropriate supertype.
4. Merge attributes from your vendor model.

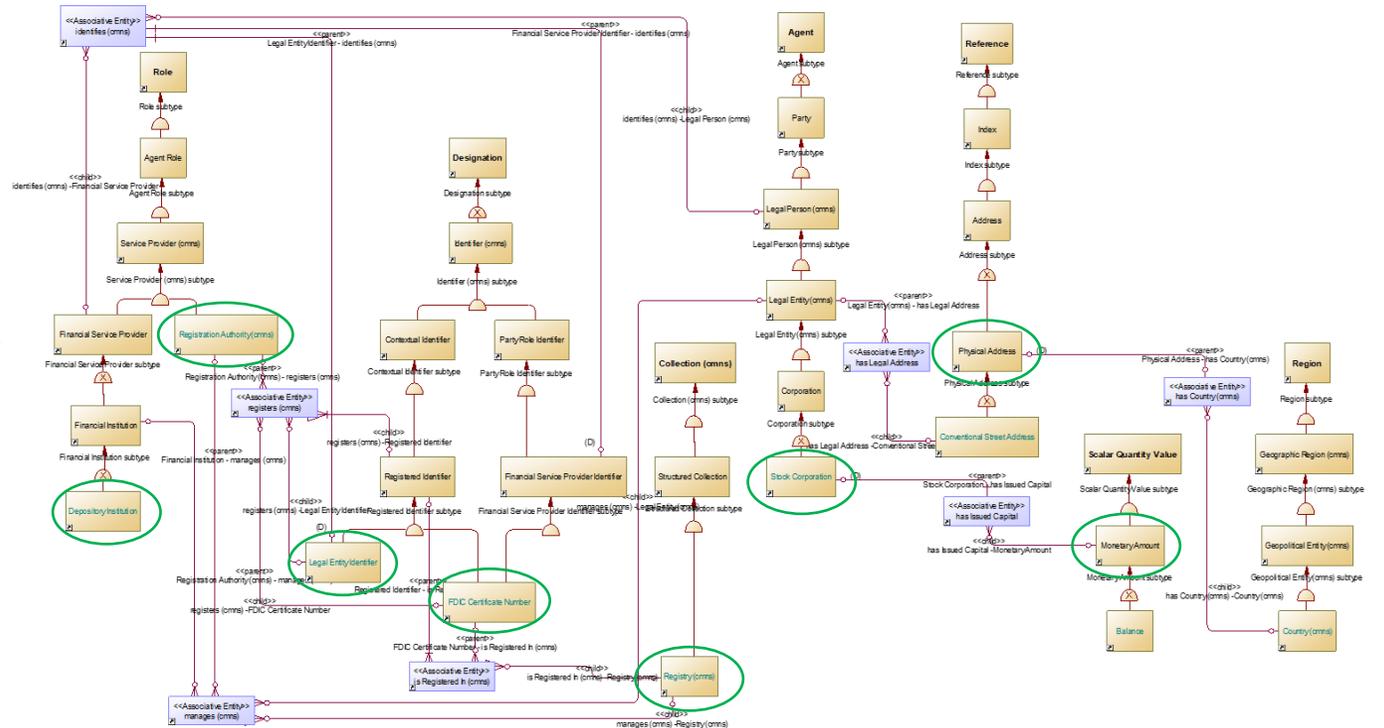
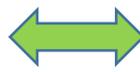
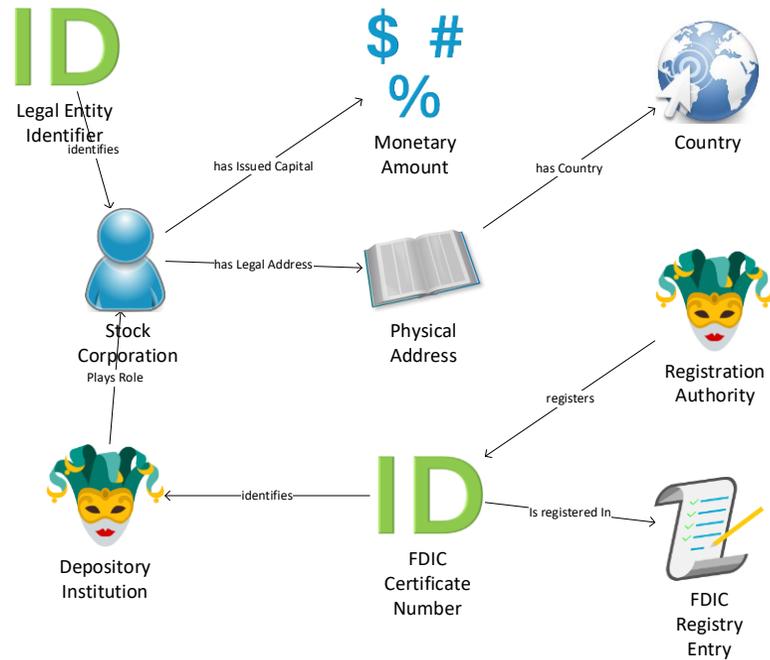
Note that the FIBO Data Model correctly defines Financial Instruments as a subtype of the Contract, an Agreement – not a Product as some Vendor model do.



Robert's advice



# The concept maps, FIB-CM, link to the data model.



<https://fib-dm.com/semantics-for-finance-users/>





# FIB-DM General Public 3.0 vs. Customer License

Topic	Detail	Your current General Public License 3.0	Your upgrade Jayzed Customer License	
FIBO Release		2018/Q4	2024/Q4	
Domain		Public	Private	
Distribution	Original FIB-DM	encouraged	prohibited	
	Your FIB-DM derived works	Open Source	Private, not applicable	
Number of Entities		1029	3,173	
Normative	Foundation	✓	✓	
	Business Entities	✓	✓	
	Finance, Business & Commerce	✓	✓	
	Securities	✗	✓	
	Derivatives	✗	✓	
	Indexes & Indicators	✗	✓	
	Informative	LOANS	✗	✓
		Funds	✗	✓
Corporate Actions		✗	✓	
Market Data		✗	✓	
Business Processes		✗	✓	
Resources	PowerPoints	✗	✓	
	Videos	✗	✓	
	Whitepapers	✗	✓	

Open Source license requires you, to **copyleft**, that is to license your derived models to the **public**.

With a commercial license, you keep FIB-DM extensions **private**.

Likewise, for the public, **all Education materials are subject to copyright**

With a commercial license, you are **free to modify, translate, edit, and even lift off images and diagrams** as long as they remain within your organization.

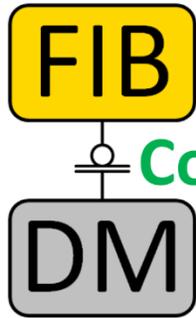


# Financial Industry Business Data Model - summary

- Most comprehensive Enterprise Reference model with 3,173 entities
- Superior Design of a Semantic Data Model
- Extensive documentation of the industry-standard ontology
- Full lineage to the ontology
- Semantic Enterprise Information Architecture
  - Same names, definitions, and design patterns across the enterprise
  - The ontology at the apex includes business-friendly concept maps, derived data, and object models.
  - Unifies semantic and conventional data management



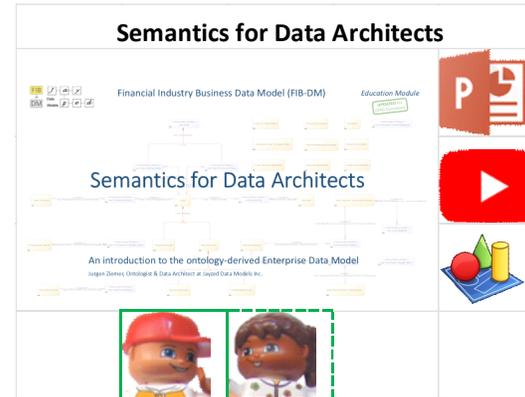
# Transparency for your FIB-DM evaluation



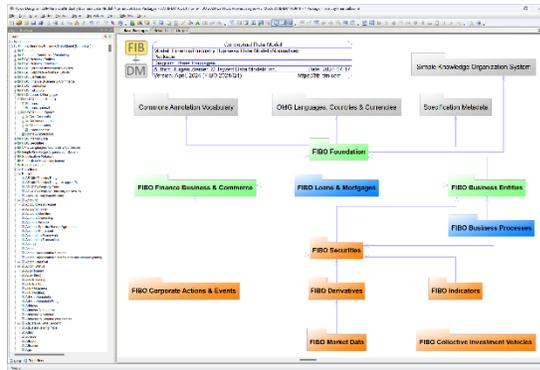
Open Source



Explore the PowerDesigner Model



Study the Education resources



Examine the 2024/Q4 Full Model content



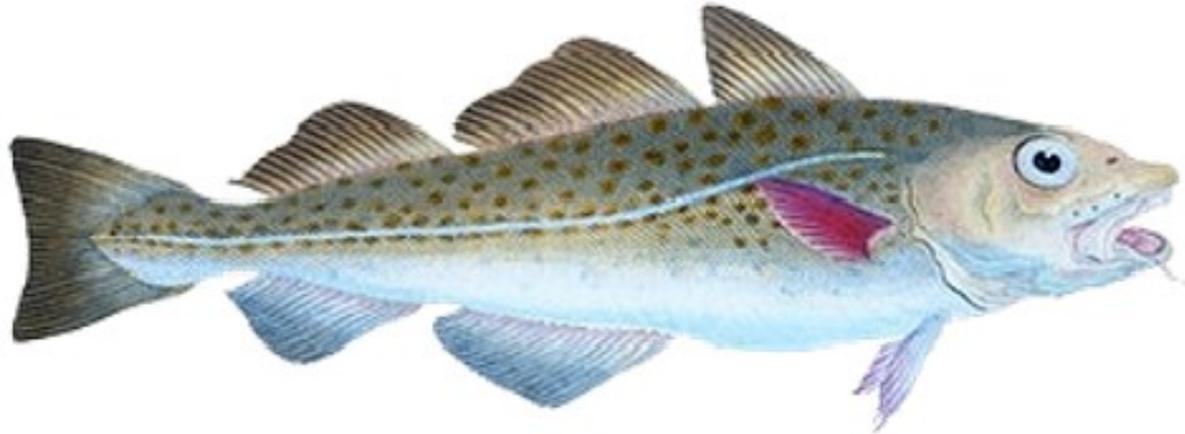
Review license, maintenance, and pricing



Finance key point

# Version 1.0 Atlantic: CODT meets MS-PowerQuery

ATLANTIC CODT



MS-Excel, PowerQuery,  
and the M-language



Data Architect



Ontologist

<https://fib-dm.com> <https://codt.net>

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# The patented technology that created the FIBO Data Model



The old OWL file-parsing-approach doesn't produce usable data models. It can't cope with very large ontologies.

The new ETL approach creates high-quality models. The technology is fully scalable and configurable.



Metadata Sets (MDS) are keyed records that hold properties for all objects in a model.

- Ontology metadata sets hold the record **extracted** from the ontology platform
- Entity-Relationship metadata sets **transform** ontology into ER.
- PowerDesigner (or another tool) metadata sets are ready to **load** into the data modeling tool.



Data Architect

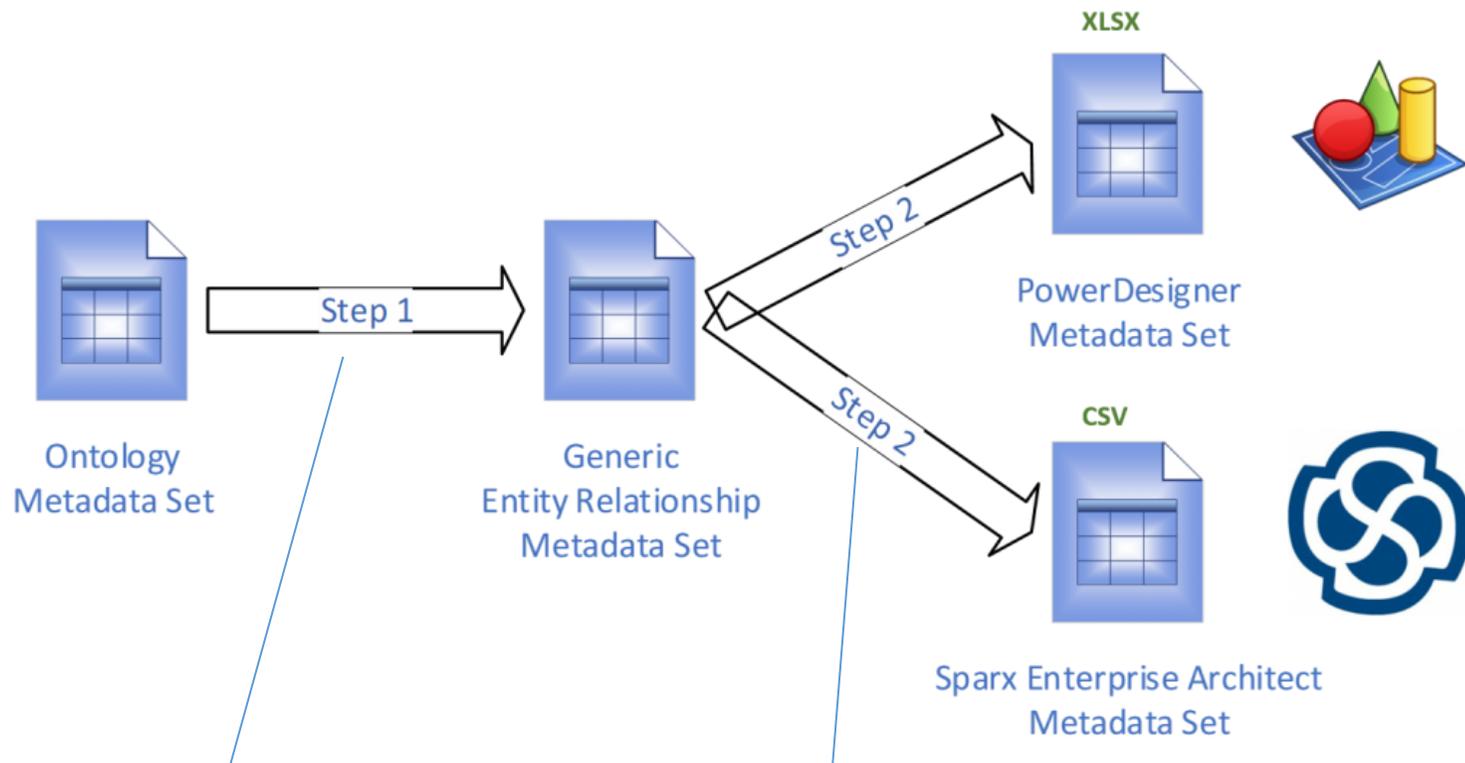


Ontologist

<https://fib-dm.com> <https://codt.net>

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# Metadata sets are the novel approach.



Transform Ontology Metadata into generic Entity-Relationship metadata

Transform the Generic ER into Tool specific metadata.

The same generic ER Metadata Set is the source for both PowerDesigner and Sparx EA metadata sets.

Metadata Sets are metadata stored in data sets.

Similar to system tables on a relational database, CODT metadata sets are isomorphic representations of ontology, entity-relationship, and data modeling tool-specific metadata.

The transformation is a two-step process:

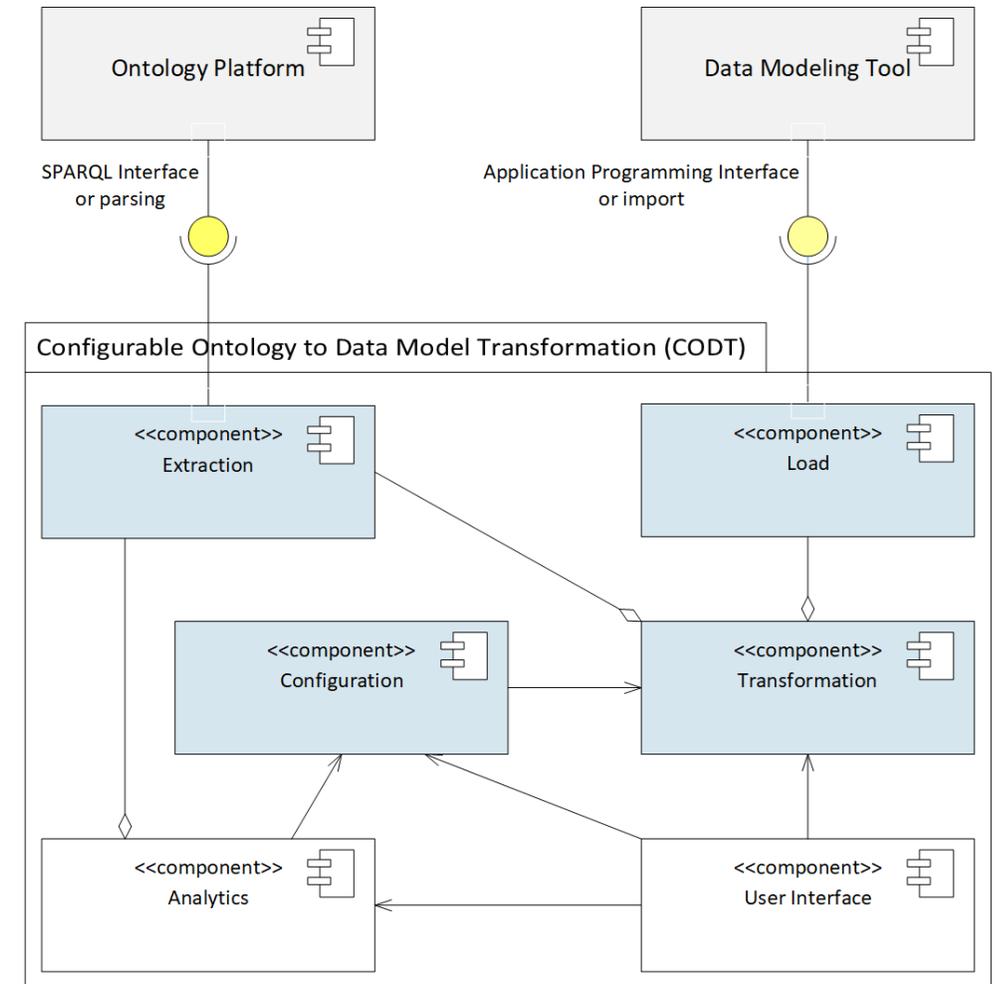


# System overview

Microsoft Excel is the tool of choice to view and analyze tabular data, and every data architect has Excel and knows how to use it. Hence, MS-Excel is not only a fast prototyping tool for the CODT Metadata Sets but also makes the transformation easy to deploy.

Component	Metadata Set	Excel Workbook
Extraction	Ontology Metadata	Ontology MDS.xlsx
Transformation	Generic ER Metadata	Entity Relationship MDS.xlsx
Load	PowerDesigner	PowerDesigner MDS.xlsx

**Any platform and programming language can implement the system, metadata sets, and method.**



CODT patent drawing FIG.2, System (in color, numerals removed for clarity)



# Ontology class to data model entity – a journey

Ontology MDS - Excel

class	qname	namespace	skos_definition	Prefix	Localname	URI
dct:LicenseDocument	dct:LicenseDocument	http://purl.org/dc/terms/		dct	LicenseDocument	ht
fib-be-corp-corp:BoardAgreement	fib-be-corp-corp:BoardAgreement	https://spec.edmcouncil.org/fibo/ontology/BE/Corporations/Corporations/	a formal, legally binding agreement between members of fib-be-corp-corp	fib-be-corp-corp	BoardAgreement	ht
fib-be-corp-corp:JointStockCompany	fib-be-corp-corp:JointStockCompany	https://spec.edmcouncil.org/fibo/ontology/BE/Corporations/Corporations/	1. In the UK, the original (17th century) name for a corporat fib-be-corp-corp	fib-be-corp-corp	JointStockCompany	ht
fib-be-corp-corp:PrivatelyHeldCompany	fib-be-corp-corp:PrivatelyHeldCompany	https://spec.edmcouncil.org/fibo/ontology/BE/Corporations/Corporations/	A firm whose issued shares are all held by a family or a sm2 fib-be-corp-corp	fib-be-corp-corp	PrivatelyHeldCompany	ht
fib-be-corp-corp:PubliclyHeldCompany	fib-be-corp-corp:PubliclyHeldCompany	https://spec.edmcouncil.org/fibo/ontology/BE/Corporations/Corporations/	a company whose shares are traded and held publicly	fib-be-corp-corp	PubliclyHeldCompany	ht
fib-be-corp-corp:RegistrationIdentifier	fib-be-corp-corp:RegistrationIdentifier	https://spec.edmcouncil.org/fibo/ontology/BE/Corporations/Corporations/	an identifier that is officially allocated to an organization at fib-be-corp-corp	fib-be-corp-corp	RegistrationIdentifier	ht
fib-be-corp-corp:RegistrationIdentifierScheme	fib-be-corp-corp:RegistrationIdentifierScheme	https://spec.edmcouncil.org/fibo/ontology/BE/Corporations/Corporations/	the scheme that defines the registration identifier per the fib-be-corp-corp	fib-be-corp-corp	RegistrationIdentifierScheme	ht
fib-be-corp-corp:ReligiousCorporation	fib-be-corp-corp:ReligiousCorporation	https://spec.edmcouncil.org/fibo/ontology/BE/Corporations/Corporations/	a not for profit organization whose objective is specific to s fib-be-corp-corp	fib-be-corp-corp	ReligiousCorporation	ht
fib-be-fct-fct:Business	fib-be-fct-fct:Business	https://spec.edmcouncil.org/fibo/ontology/BE/FunctionalEntities/FunctionalEntities/	An organization or economic system where goods and serv fib-be-fct-fct	fib-be-fct-fct	Business	ht
fib-be-fct-fct:Commerce	fib-be-fct-fct:Commerce	https://spec.edmcouncil.org/fibo/ontology/BE/FunctionalEntities/FunctionalEntities/	the commercial activity of buying and selling goods	fib-be-fct-fct	Commerce	ht

PowerDesigner MDS - Excel

Code	Comment	Prefix	Localname	URI	Name
dct:LicenseDocument		dct	LicenseDocument	http://purl.org/dc/terms/LicenseDocument	License Document
fib-be-corp-corp:BoardAgreement	a formal, legally binding agreement between members of the Board	fib-be-corp-corp	BoardAgreement	https://spec.edmcouncil.org/fibo/ontology/BE/Corporations/Corporations/BoardAgreement	Board Agreement
fib-be-corp-corp:JointStockCompany	1. In the UK, the original (17th century) name for a corporation in whii fib-be-corp-corp	fib-be-corp-corp	JointStockCompany	https://spec.edmcouncil.org/fibo/ontology/BE/Corporations/Corporations/JointStockComp	Joint Stock Company
fib-be-corp-corp:PrivatelyHeldCompany	A firm whose issued shares are all held by a family or a small group of fib-be-corp-corp	fib-be-corp-corp	PrivatelyHeldCompany	https://spec.edmcouncil.org/fibo/ontology/BE/Corporations/Corporations/PrivatelyHeldCc	Privately Held Company
fib-be-corp-corp:PubliclyHeldCompany	a company whose shares are traded and held publicly	fib-be-corp-corp	PubliclyHeldCompany	https://spec.edmcouncil.org/fibo/ontology/BE/Corporations/Corporations/PubliclyHeldCor	Publicly Held Company
fib-be-corp-corp:RegistrationIdentifier	an identifier that is officially allocated to an organization at the time	fib-be-corp-corp	RegistrationIdentifier	https://spec.edmcouncil.org/fibo/ontology/BE/Corporations/Corporations/RegistrationIdei	Registration Identifier
fib-be-corp-corp:RegistrationIdentifierScheme	the scheme that defines the registration identifier per the issuing ref	fib-be-corp-corp	RegistrationIdentifierScheme	https://spec.edmcouncil.org/fibo/ontology/BE/Corporations/Corporations/RegistrationIdei	Registration Identifier Scheme
fib-be-corp-corp:ReligiousCorporation	a not for profit organization whose objective is specific to some fundi	fib-be-corp-corp	ReligiousCorporation	https://spec.edmcouncil.org/fibo/ontology/BE/Corporations/Corporations/ReligiousCorpor	Religious Corporation
fib-be-fct-fct:Business	An organization or economic system where goods and services are ex	fib-be-fct-fct	Business	https://spec.edmcouncil.org/fibo/ontology/BE/FunctionalEntities/FunctionalEntities/Busin	Business
fib-be-fct-fct:Commerce	the commercial activity of buying and selling goods	fib-be-fct-fct	Commerce	https://spec.edmcouncil.org/fibo/ontology/BE/FunctionalEntities/FunctionalEntities/Comr	Commerce

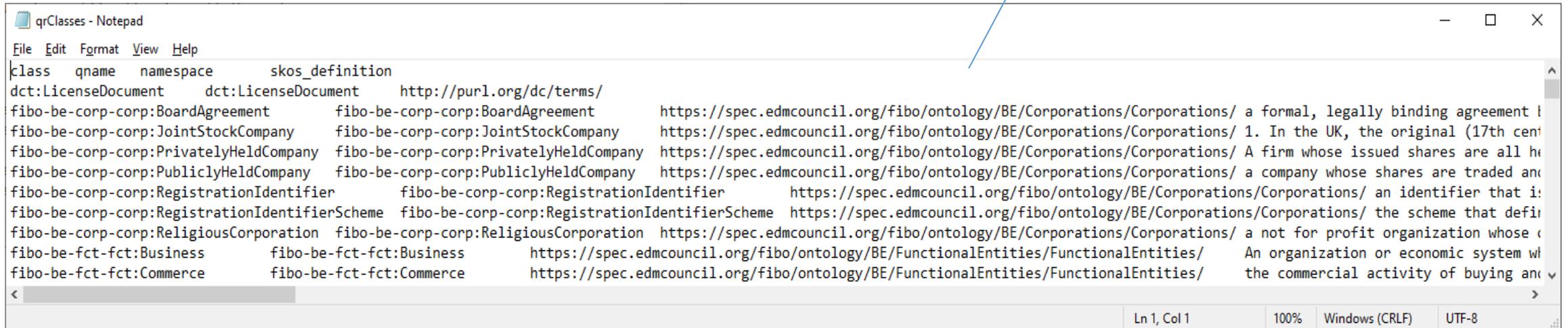


# Extraction with SPARQL queries

```
# Owl Classes.rq
SELECT ?class ?qname ?namespace ?skos_definition
WHERE {
  ?class a owl:Class .
  BIND(afn:namespace(?class) AS ?namespace)
  FILTER (smf:isBound(?namespace) ).
  BIND (smf:qname(?class) AS ?qname ) .
  OPTIONAL { ?class skos:definition ?skos_definition}
  FILTER (?class NOT IN (owl:Nothing, owl:Thing))
}
```

The SPARQL query selects Class, qualified name, namespace, and definition, filtering out unnamed classes.

The result set is a CSV file..



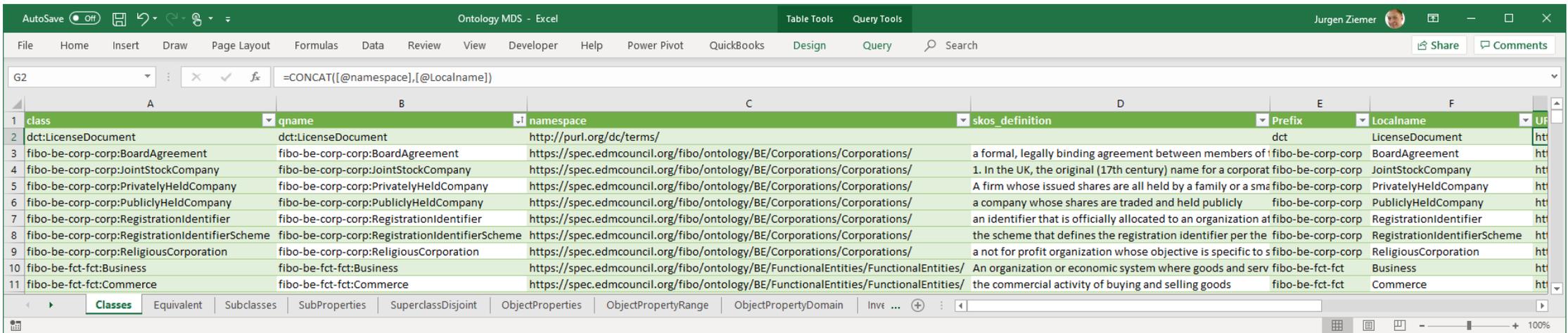
The screenshot shows a Notepad window titled 'qrClasses - Notepad'. The content is a CSV file with the following columns: 'class', 'qname', 'namespace', and 'skos\_definition'. The rows list various classes from the FIBO ontology, such as 'BoardAgreement', 'JointStockCompany', and 'Business', along with their namespaces and definitions.

class	qname	namespace	skos_definition
dct:LicenseDocument	dct:LicenseDocument	http://purl.org/dc/terms/	
fib-be-corp-corp:BoardAgreement	fib-be-corp-corp:BoardAgreement	https://spec.edmcouncil.org/fibo/ontology/BE/Corporations/Corporations/	a formal, legally binding agreement l
fib-be-corp-corp:JointStockCompany	fib-be-corp-corp:JointStockCompany	https://spec.edmcouncil.org/fibo/ontology/BE/Corporations/Corporations/	1. In the UK, the original (17th cent
fib-be-corp-corp:PrivatelyHeldCompany	fib-be-corp-corp:PrivatelyHeldCompany	https://spec.edmcouncil.org/fibo/ontology/BE/Corporations/Corporations/	A firm whose issued shares are all he
fib-be-corp-corp:PubliclyHeldCompany	fib-be-corp-corp:PubliclyHeldCompany	https://spec.edmcouncil.org/fibo/ontology/BE/Corporations/Corporations/	a company whose shares are traded and
fib-be-corp-corp:RegistrationIdentifier	fib-be-corp-corp:RegistrationIdentifier	https://spec.edmcouncil.org/fibo/ontology/BE/Corporations/Corporations/	an identifier that i:
fib-be-corp-corp:RegistrationIdentifierScheme	fib-be-corp-corp:RegistrationIdentifierScheme	https://spec.edmcouncil.org/fibo/ontology/BE/Corporations/Corporations/	the scheme that defin
fib-be-corp-corp:ReligiousCorporation	fib-be-corp-corp:ReligiousCorporation	https://spec.edmcouncil.org/fibo/ontology/BE/Corporations/Corporations/	a not for profit organization whose (
fib-be-fct-fct:Business	fib-be-fct-fct:Business	https://spec.edmcouncil.org/fibo/ontology/BE/FunctionalEntities/FunctionalEntities/	An organization or economic system wh
fib-be-fct-fct:Commerce	fib-be-fct-fct:Commerce	https://spec.edmcouncil.org/fibo/ontology/BE/FunctionalEntities/FunctionalEntities/	the commercial activity of buying and



# Extraction: CSV result set into Ontology MDS

The ontology metadata workbook imports the raw extract and performs simple format conversions from the raw result set.

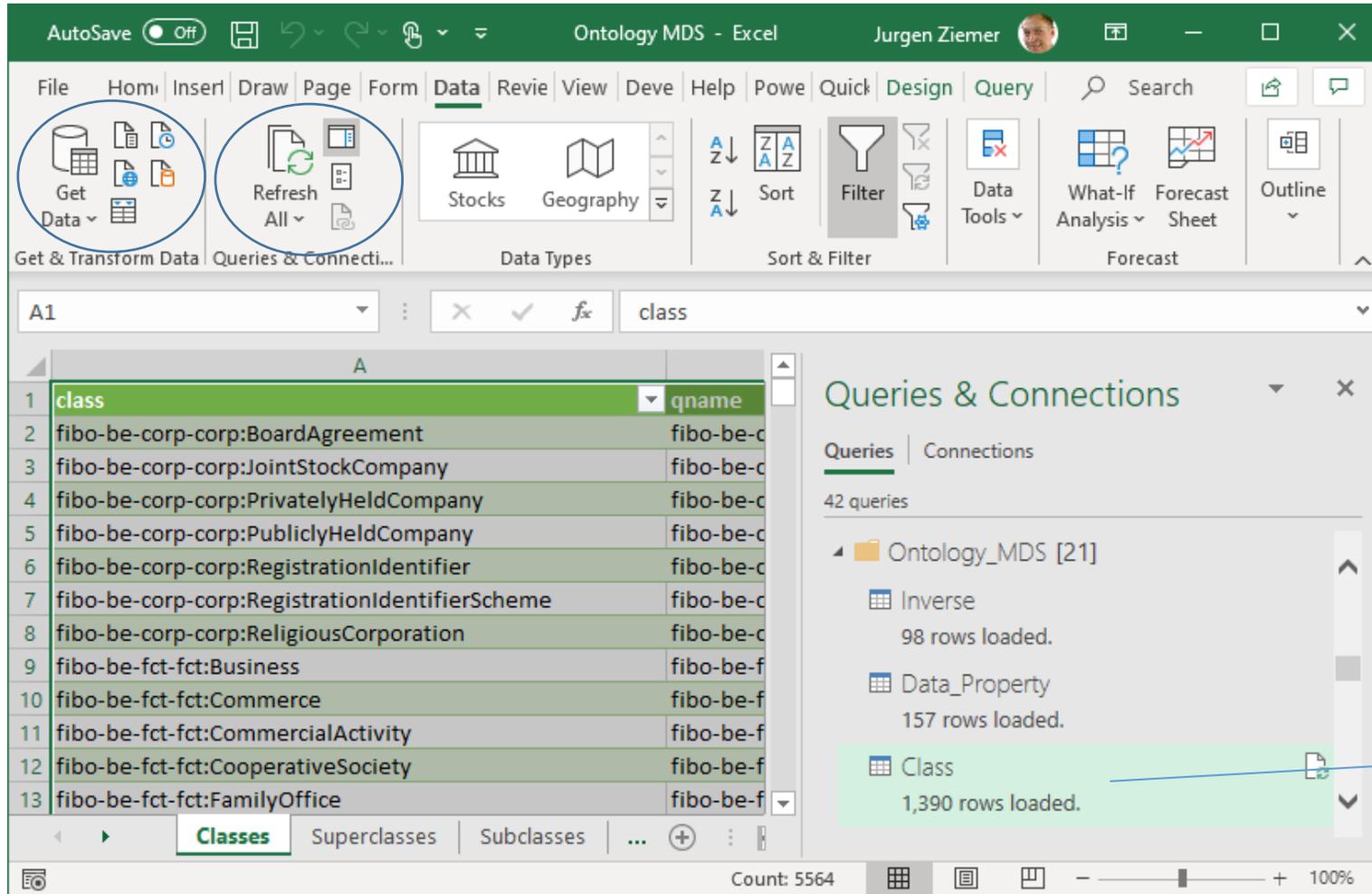


class	qname	namespace	skos_definition	Prefix	Localname	URI
dct:LicenseDocument	dct:LicenseDocument	http://purl.org/dc/terms/		dct	LicenseDocument	ht
fib-be-corp-corp:BoardAgreement	fib-be-corp-corp:BoardAgreement	https://spec.edmcouncil.org/fibo/ontology/BE/Corporations/Corporations/	a formal, legally binding agreement between members of fibo-be-corp-corp		BoardAgreement	ht
fib-be-corp-corp:JointStockCompany	fib-be-corp-corp:JointStockCompany	https://spec.edmcouncil.org/fibo/ontology/BE/Corporations/Corporations/	1. In the UK, the original (17th century) name for a corporat fibo-be-corp-corp		JointStockCompany	ht
fib-be-corp-corp:PrivatelyHeldCompany	fib-be-corp-corp:PrivatelyHeldCompany	https://spec.edmcouncil.org/fibo/ontology/BE/Corporations/Corporations/	A firm whose issued shares are all held by a family or a sme fibo-be-corp-corp		PrivatelyHeldCompany	ht
fib-be-corp-corp:PubliclyHeldCompany	fib-be-corp-corp:PubliclyHeldCompany	https://spec.edmcouncil.org/fibo/ontology/BE/Corporations/Corporations/	a company whose shares are traded and held publicly fibo-be-corp-corp		PubliclyHeldCompany	ht
fib-be-corp-corp:RegistrationIdentifier	fib-be-corp-corp:RegistrationIdentifier	https://spec.edmcouncil.org/fibo/ontology/BE/Corporations/Corporations/	an identifier that is officially allocated to an organization at fibo-be-corp-corp		RegistrationIdentifier	ht
fib-be-corp-corp:RegistrationIdentifierScheme	fib-be-corp-corp:RegistrationIdentifierScheme	https://spec.edmcouncil.org/fibo/ontology/BE/Corporations/Corporations/	the scheme that defines the registration identifier per the fibo-be-corp-corp		RegistrationIdentifierScheme	ht
fib-be-corp-corp:ReligiousCorporation	fib-be-corp-corp:ReligiousCorporation	https://spec.edmcouncil.org/fibo/ontology/BE/Corporations/Corporations/	a not for profit organization whose objective is specific to s fibo-be-corp-corp		ReligiousCorporation	ht
fib-be-fct-fct:Business	fib-be-fct-fct:Business	https://spec.edmcouncil.org/fibo/ontology/BE/FunctionalEntities/FunctionalEntities/	An organization or economic system where goods and serv fibo-be-fct-fct		Business	ht
fib-be-fct-fct:Commerce	fib-be-fct-fct:Commerce	https://spec.edmcouncil.org/fibo/ontology/BE/FunctionalEntities/FunctionalEntities/	the commercial activity of buying and selling goods	fib-be-fct-fct	Commerce	ht

We have the Class, Qualified Name, Namespace, the CODT configured main descriptive annotation property, Prefix, Localname, and FIBO URI. Other Excel tabs, ontology metadata sets for Object Properties, Domain, Range, Sub-class, and Sub-property.



# Excel Power Queries extract into the MDS



Get Data opens Excel Power Query Ribbon.

The Metadata Sets are self-populating - every worksheet has query.

We can refresh (=load) individual or all metadata sets.

The Queries & Connections pane shows the load status (any errors) and the number of records in the MDS.



# Transparent transformation rules

The screenshot shows the Power Query Editor interface. The formula bar contains the M code: `= Table.RenameColumns("#Promoted Headers",{{"[class]", "class"}})`. Below the formula bar is a table with 11 rows and 3 columns: `class`, `qname`, and `namespace`. The table contains 10 rows of data representing various classes and their namespaces. To the right, the 'Query Settings' pane is open, showing the 'APPLIED STEPS' list with 'Renamed Columns' selected. The 'PROPERTIES' section shows the query name 'csvClass'.

	class	qname	namespace
1	dct:LicenseDocument	dct:LicenseDocument	http://purl.org/dc/term
2	fib-be-corp-corp:BoardAgreement	fib-be-corp-corp:BoardAgreement	https://spec.edmouncil
3	fib-be-corp-corp:JointStockCompany	fib-be-corp-corp:JointStockCompany	https://spec.edmouncil
4	fib-be-corp-corp:PrivatelyHeldCompany	fib-be-corp-corp:PrivatelyHeldCompany	https://spec.edmouncil
5	fib-be-corp-corp:PubliclyHeldCompany	fib-be-corp-corp:PubliclyHeldCompany	https://spec.edmouncil
6	fib-be-corp-corp:RegistrationIdentifier	fib-be-corp-corp:RegistrationIdentifier	https://spec.edmouncil
7	fib-be-corp-corp:RegistrationIdentifierScheme	fib-be-corp-corp:RegistrationIdentifierScheme	https://spec.edmouncil
8	fib-be-corp-corp:ReligiousCorporation	fib-be-corp-corp:ReligiousCorporation	https://spec.edmouncil
9	fib-be-fct-fct:Business	fib-be-fct-fct:Business	https://spec.edmouncil
10	fib-be-fct-fct:Commerce	fib-be-fct-fct:Commerce	https://spec.edmouncil
11			

Metadata preview

Transformation rules



# 4GL Query and transformation language

The data source is the raw SPARQL query result set.



Advanced Editor

csvClass Display Options ?

```
let
Source = Csv.Document(File.Contents(CODT_HOME & "\Ontology Source\qrClasses.txt"),[Delimiter=" ", Columns=4, Encoding=1252, QuoteStyle=QuoteStyle.None]),
#"Changed Type" = Table.TransformColumnTypes(Source,{{"Column1", type text}, {"Column2", type text}, {"Column3", type text}, {"Column4", type text}}),
#"Promoted Headers" = Table.PromoteHeaders("#Changed Type", [PromoteAllScalars=true]),
#"Renamed Columns" = Table.RenameColumns("#Promoted Headers",{{"[class]", "class"}})
in
#"Renamed Columns"
```

✓ No syntax errors have been detected.

Done Cancel



# Transformation (1): Entity-Relationship MDS

Entity Code is the Class  
QName

A formula transforms the Localname into an  
entity name per the naming convention:  
`=UnCamel ([@Localname])`

Prefix and Localname  
split the code

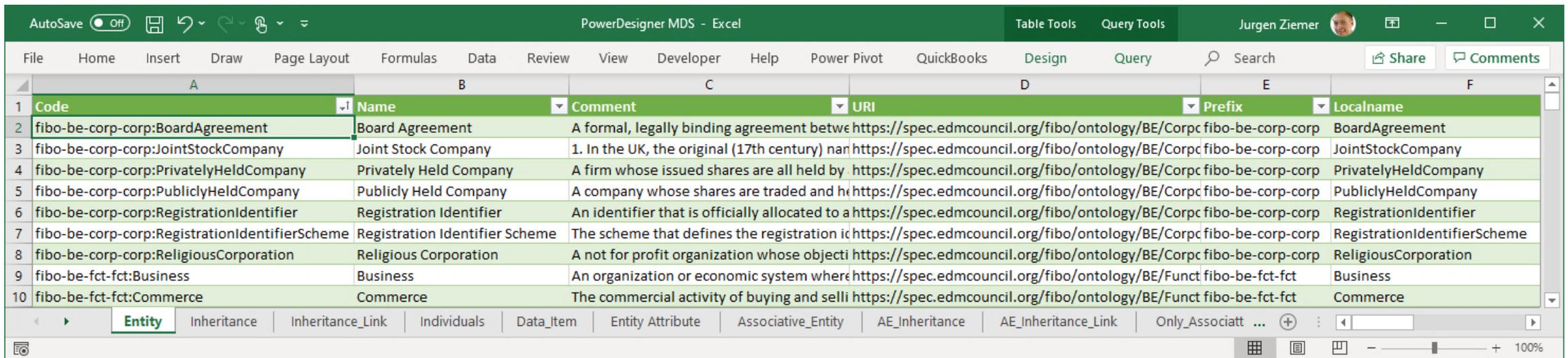
Code	Name	Comment	URI	Prefix	Localname
fibo-be-corp-corp:BoardAgreement	Board Agreement	A formal, legally binding agreement betw	https://spec.edmcouncil.org/fibo/ontolog	fibo-be-corp-corp	BoardAgreement
fibo-be-corp-corp:JointStockCompany	Joint Stock Company	1. In the UK, the original (17th century) na	https://spec.edmcouncil.org/fibo/ontolog	fibo-be-corp-corp	JointStockCompany
fibo-be-corp-corp:PrivatelyHeldCompany	Privately Held Company	A firm whose issued shares are all held by	https://spec.edmcouncil.org/fibo/ontolog	fibo-be-corp-corp	PrivatelyHeldCompany
fibo-be-corp-corp:PubliclyHeldCompany	Publicly Held Company	A company whose shares are traded and h	https://spec.edmcouncil.org/fibo/ontolog	fibo-be-corp-corp	PubliclyHeldCompany
fibo-be-corp-corp:RegistrationIdentifier	Registration Identifier	An identifier that is officially allocated to	https://spec.edmcouncil.org/fibo/ontolog	fibo-be-corp-corp	RegistrationIdentifier
fibo-be-corp-corp:RegistrationIdentifierScheme	Registration Identifier Scheme	The scheme that defines the registration	https://spec.edmcouncil.org/fibo/ontolog	fibo-be-corp-corp	RegistrationIdentifierScheme
fibo-be-corp-corp:ReligiousCorporation	Religious Corporation	A not for profit organization whose object	https://spec.edmcouncil.org/fibo/ontolog	fibo-be-corp-corp	ReligiousCorporation
fibo-be-fct-fct:Business	Business	An organization or economic system wher	https://spec.edmcouncil.org/fibo/ontolog	fibo-be-fct-fct	Business
fibo-be-fct-fct:Commerce	Commerce	The commercial activity of buying and sell	https://spec.edmcouncil.org/fibo/ontolog	fibo-be-fct-fct	Commerce

A Power Query with the Ontology MDS as its source populates metadata.



# Transformation (2): Tool-specific MDS

The second transformation step converts the generic Entity-Relationship into a data modeling tool-specific metadata set. In this case, PowerDesigner can directly import this MDS.



Code	Name	Comment	URI	Prefix	Localname
fibonacci-be-corp-corp:BoardAgreement	Board Agreement	A formal, legally binding agreement between two or more parties.	https://spec.edmcouncil.org/fibo/ontology/BE/Corp	fibonacci-be-corp-corp	BoardAgreement
fibonacci-be-corp-corp:JointStockCompany	Joint Stock Company	1. In the UK, the original (17th century) name for a company whose shares are traded and held by many investors.	https://spec.edmcouncil.org/fibo/ontology/BE/Corp	fibonacci-be-corp-corp	JointStockCompany
fibonacci-be-corp-corp:PrivatelyHeldCompany	Privately Held Company	A firm whose issued shares are all held by a small number of individuals.	https://spec.edmcouncil.org/fibo/ontology/BE/Corp	fibonacci-be-corp-corp	PrivatelyHeldCompany
fibonacci-be-corp-corp:PubliclyHeldCompany	Publicly Held Company	A company whose shares are traded and held by many investors.	https://spec.edmcouncil.org/fibo/ontology/BE/Corp	fibonacci-be-corp-corp	PubliclyHeldCompany
fibonacci-be-corp-corp:RegistrationIdentifier	Registration Identifier	An identifier that is officially allocated to a specific entity.	https://spec.edmcouncil.org/fibo/ontology/BE/Corp	fibonacci-be-corp-corp	RegistrationIdentifier
fibonacci-be-corp-corp:RegistrationIdentifierScheme	Registration Identifier Scheme	The scheme that defines the registration identifier.	https://spec.edmcouncil.org/fibo/ontology/BE/Corp	fibonacci-be-corp-corp	RegistrationIdentifierScheme
fibonacci-be-corp-corp:ReligiousCorporation	Religious Corporation	A not for profit organization whose objects are exclusively religious or charitable.	https://spec.edmcouncil.org/fibo/ontology/BE/Corp	fibonacci-be-corp-corp	ReligiousCorporation
fibonacci-be-fct-fct:Business	Business	An organization or economic system where individuals or firms engage in exchange of goods and services.	https://spec.edmcouncil.org/fibo/ontology/BE/Funct	fibonacci-be-fct-fct	Business
fibonacci-be-fct-fct:Commerce	Commerce	The commercial activity of buying and selling goods and services.	https://spec.edmcouncil.org/fibo/ontology/BE/Funct	fibonacci-be-fct-fct	Commerce

For entities, the transformation is a simple copy of the Entity-Relationship MDS.



# Load: The data modeling tool imports the MDS

The screenshot displays the PowerDesigner interface. On the left, the 'Object Browser' shows a tree structure under 'Excel Imports' with 24 sub-items, including '1.1 Entities', '1.2 Inheritances', '1.3 Inheritance Links', '1.4 Individuals', '2.1 Data Items', '2.2 Entity Attribute', '3.1 Associative Entities', '3.2 Associative Entity Inheritance', '3.3 Associative Inheritance Links', '3.4 Only Associative Entities', '3.5 Only Associative Inheritance', '3.6 Only Associative Entity Inheritance Link', '4.1 Relationships.Parent', '4.2 Relationships Child', '4.3 Relationship Dual', '4.4 Relationship Only Parent', '4.5 Relationships Only Child', '5.1 Packages', '5.2 Package Hierarchy', '6.1 Annotations Entity', '6.2 Annotations Data Item', and '6.3 Annotations Associative Entity'. The 'Excel Import Properties' dialog box is open, showing the 'Import Options' tab. The 'Name' field is '1.1 Entities'. The 'Imported file' is 'D:\Local Documents\Financial Regulation Ontology\Data Model\CODT Home FIBO Q2 PROD\PowerDesigner\PowerDesigner MDS 1. Entities.xlsx'. The 'Mapping description' field contains: 'Table Entity=Entity: Code=Code, Name=Name, Comment=Comment, URI=Local Extensions.URI, Prefix=Local Extensions.Prefix, Localname=Local Extensions.LocalName, Restriction=Local Extensions.owl:Restriction, Equivalent=Local Extensions.owl:equivalentClass, Stereotype=Stereotype, Resource Name=Local Extensions.ResourceName, Resource Type=Local Extensions.ResourceType', 'Table Inheritance=Inheritance (Skipped)', 'Table Inheritance\_Link=? (Skipped)', and 'Table Individuals=? (Skipped)'. The 'Extensions file for new extended attributes' is set to '<None>'. The 'Comment' field is empty. The 'Output' window at the bottom shows the 'General' tab selected.

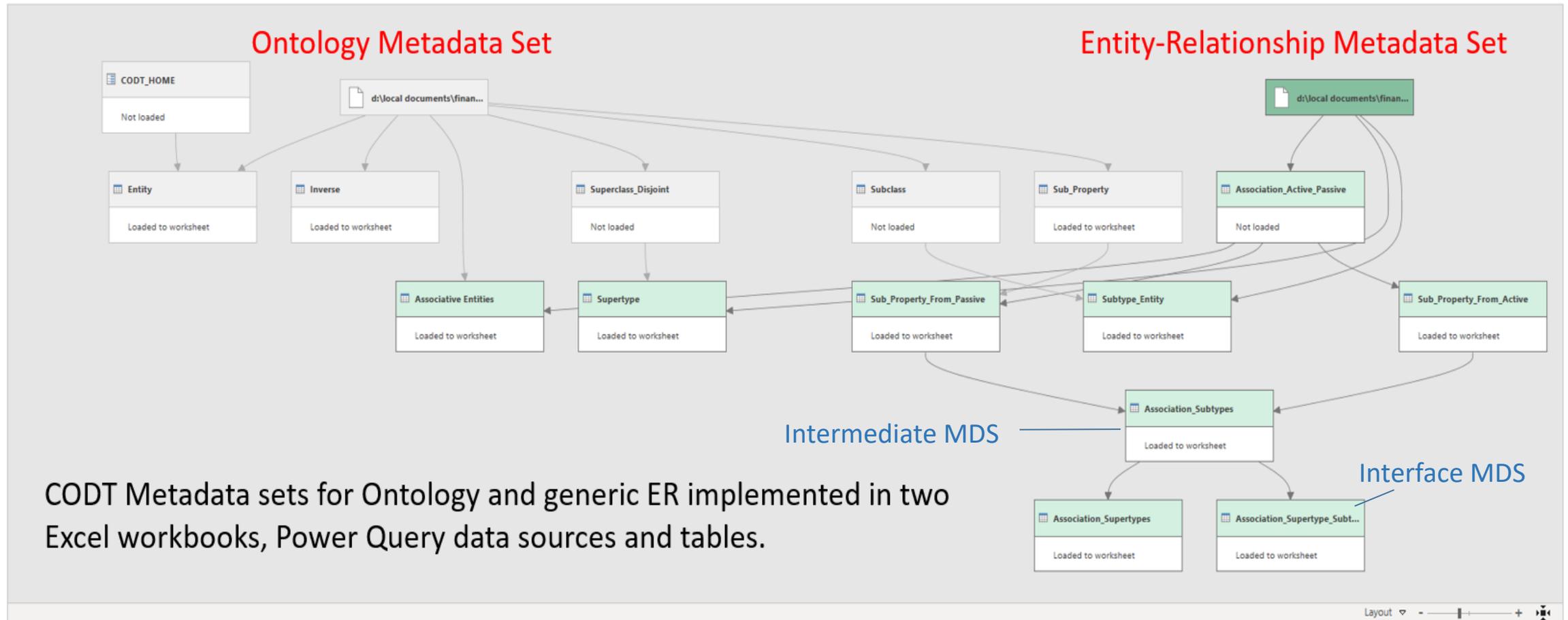
There are 24 MDS for PowerDesigner Excel imports

MDS columns map to metamodel objects

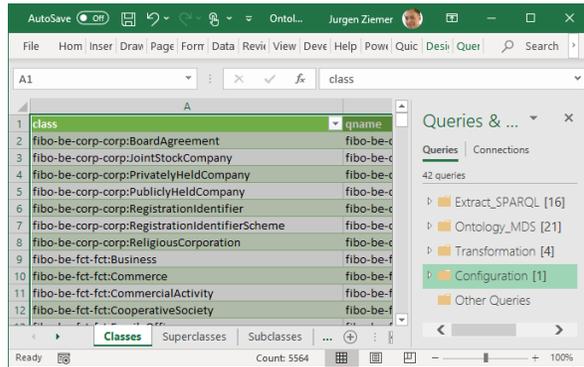


# Stacked queries and ETL master the complexity

Query Dependencies



# CODT Excel Power Query Statistics



The MDS folder holds queries that provide the interface for metadata sets in the next transformation step.

MS Excel	Worsheets	Power Queries
Ontology MDS	36	44
Entity Relationship MDS	80	84
PowerDesigner MDS	26	30
<b>Total</b>	<b>142</b>	<b>158</b>

<b>SPARQL queries</b>	<b>18</b>
<b>PowerDesigner Excel imports</b>	<b>25</b>

CODT is a white box, an open book. The Excel version software fully discloses all worksheets, queries, and VBA code.

New users and operators can generate with a single click, using default configuration settings. As a Data Architect, you use CODT as an ETL and development platform, diagnosing results and tweaking transformation rules for your modeling and naming standards.

VBA developers may secure the data sheets, fully automate Extract and Load, or port the application to the ETL environment.



# CODT Embodiments

The CODT license includes the right to use protected intellectual property, metadata sets, and algorithms. For full production SEIA, you can automate interfaces, and encode the patented embodiments below.

Implementation Embodiments								
Ontology Source			Transformation System			Data Model		
Type	Subtype	Extraction	OS	Application type	User Interface	Data Model Type	Modeling Tool	Tool Interface
Ontology platform	Development Platform	SPARQL	MS Windows	MS-Excel	White Box	Conceptual	Power Designer	Import
	RDF Store, Semantic Endpoint					Logical	Sparx EA	
RDF/OWL files	Local	Parser	Unix	ETL	Guided	Physical	Other	API
	World Wide Web			Program		Object		

CODT patent Table 14, Embodiments (color added for clarity)

Create a connection to your RDF Store and run the queries in a batch.

Move CODT server-side.

Hold the metadata sets on your RDBMS. Transform with your ETL tooling rather than M.

Create a UI for operators and configuration wizards

Generate other models

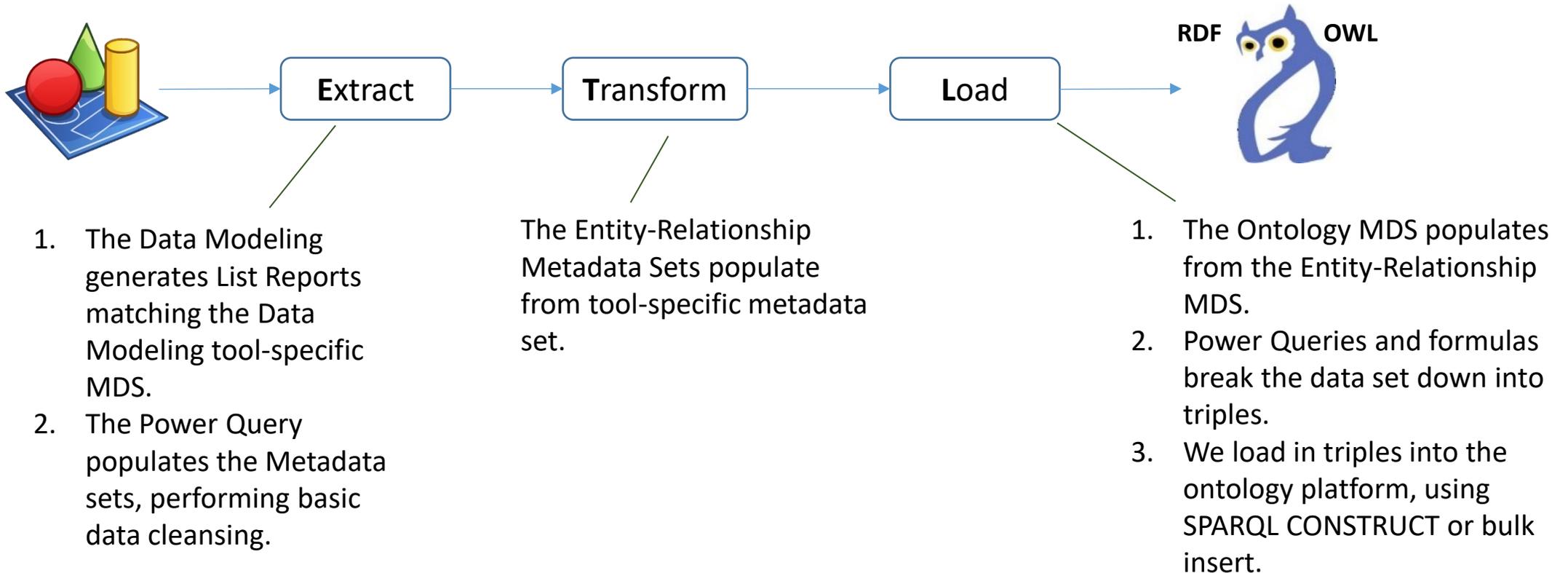
Load directly using your data modeling tool or repository API



# Reverse mode embodiment, claims 10 & 16

The CODT Metadata Sets are bi-directional.

CODT can reverse-engineer ontologies from Data Models!



# Reverse example: Extract from PowerDesigner

Our example is Logical Data Model created from the New York Stock Exchange's OpenMAMA messaging API.

The PowerDesigner Entity list report has Code, Name, and Comment. The PowerDesigner MDS sources the list report

The screenshot shows the PowerDesigner interface. On the left is the Object Browser with a tree view of the Logical Data Model. The main workspace displays six entity icons: Auction, Order Book, Quote, Referential, Security Status, and Trade. A 'List Report Properties' dialog is open in the foreground, showing a table with the following data:

	Code	Name	Comment
1	AUCTION	Auction	Data disseminated during the auction period, i.e. th
2	ORDER_BOO	Order Book	Represents the state of the order book.
3	QUOTE	Quote	The most current bid or ask prices and quantities a
4	REFERENTIAL	Referential	Represents standing data such as symbol, commo
5	SECURITY_ST	Security Status	Data that indicates the current market trading con
6	TRADE	Trade	Information that belongs to a transaction that invol

The screenshot shows the PowerDesigner MDS interface. The main window displays an Excel report with the following data:

	A	B	
1	Code	Name	Comment
2	AUCTION	Auction	Data disseminated during the
3	ORDER_BOOK	Order Book	Represents the state of the or
4	QUOTE	Quote	The most current bid or ask pri
5	REFERENTIAL	Referential	Represents standing data such
6	SECURITY_STATUS	Security Status	Data that indicates the current
7	TRADE	Trade	Information that belongs to a t
8			
9			

The 'Queries & Connections' pane on the right shows a query named 'Entity\_List\_Report' with 6 rows loaded.



# Transform in the Entity-Relationship MDS

The Metadata Set **populates** from the PowerDesigner Entity MDS

Code	Name	Comment	Prefix	Localname	URI	Resource Name
AUCTION	Auction	Data disseminated during the auction pe	fib-omds	Auction	https://fib-dm.com/OpenMDS/Auction	fib-omds:Auction
ORDER_BOOK	Order Book	Represents the state of the order book.	fib-omds	OrderBook	https://fib-dm.com/OpenMDS/OrderBook	fib-omds:OrderBook
QUOTE	Quote	The most current bid or ask prices and qu	fib-omds	Quote	https://fib-dm.com/OpenMDS/Quote	fib-omds:Quote
REFERENTIAL	Referential	Represents standing data such as symbol	fib-omds	Referential	https://fib-dm.com/OpenMDS/Referential	fib-omds:Referential
SECURITY_STATUS	Security Status	Data that indicates the current market tr:	fib-omds	SecurityStatus	https://fib-dm.com/OpenMDS/SecurityStatus	fib-omds:SecurityStatus
TRADE	Trade	Information that belongs to a transaction	fib-omds	Trade	https://fib-dm.com/OpenMDS/Trade	fib-omds:Trade

Prefix and URI are configuration settings matching the designated prefix and namespace of the ontology

The Entity Name transforms to Localname with a Camel Code string function

The Resource Name is a concatenation of Prefix, delimiter, and Localname



# Load into ontology

A query populates the Class metadata set from the Entity MDS

The screenshot shows an Excel spreadsheet titled "Ontology MDS - Excel" with a table containing class metadata. The table has three columns: "class", "namespace", and "skos\_definition". The data rows are as follows:

class	namespace	skos_definition
fib-omds:Auction	https://fib-dm.com/OpenMDS/Auction	Data disseminated during the auction period, i.e. the period of time when there is no automatic execution on an order book. This also includes indicative data and, where relevant, imbalance data sent during the process that matches orders at the end of an auction and determines the final auction price
fib-omds:OrderBook	https://fib-dm.com/OpenMDS/OrderBook	Represents the state of the order book.
fib-omds:Quote	https://fib-dm.com/OpenMDS/Quote	The most current bid or ask prices and quantities at which the instruments can be bought or sold. The bid quote shows the price and quantity at which a current buyer is willing to purchase the instruments, while the ask shows what a current participant is willing to sell the instruments for.
fib-omds:Referential	https://fib-dm.com/OpenMDS/Referential	Represents standing data such as symbol, commodity, and exchange information and any pertinent information about the contract terms. Prior trading period closing/settlement prices can also be disseminated in this event type. Typically this represents static data.
fib-omds:SecurityStatus	https://fib-dm.com/OpenMDS/SecurityStatus	Data that indicates the current market trading condition of an individual security, for example, if trading in the security is suspended. This identifies phase transitions in the venue's market model.
fib-omds:Trade	https://fib-dm.com/OpenMDS/Trade	Information that belongs to a transaction that involves the selling and purchasing of a tradable instrument

On the right side of the Excel window, the "Queries" pane is visible, showing a list of queries. The "T\_skos\_definition" query is highlighted in green and indicates "6 rows loaded".

Triple, "T\_" metadata sets break down the class record into subject, predicate, and object.



# The triple match the SPARQL SELECT joins

subject	predicate	object
fib-omds:Auction	rdf:type	owl:Class
fib-omds:OrderBook	rdf:type	owl:Class
fib-omds:Quote	rdf:type	owl:Class
fib-omds:Referential	rdf:type	owl:Class
fib-omds:SecurityStatus	rdf:type	owl:Class
fib-omds:Trade	rdf:type	owl:Class

```
# Owl Classes.rq
SELECT ?class ?qname ?namespace
?skos_definition
WHERE {
  ?class a owl:Class .

OPTIONAL {
  ?class skos:definition ?skos_definition}
}
```

subject	predicate	skos_definition
		Data disseminated during the auction period, i.e. the period of time when there is no automatic execution on an order book. This also includes indicative data and, where relevant, imbalance data sent during the process that matches orders at the end of an auction and determines the final auction price
fib-omds:Auction	skos:definition	
fib-omds:OrderBook	skos:definition	Represents the state of the order book.
		The most current bid or ask prices and quantities at which the instruments can be bought or sold. The bid quote shows the price and quantity at which a current buyer is willing to purchase the instruments, while the ask shows what a current participant is willing to sell the instruments for.
fib-omds:Quote	skos:definition	
		Represents standing data such as symbol, commodity, and exchange information and any pertinent information about the contract terms. Prior trading period closing/settlement prices can also be disseminated in this event type. Typically this represents static data.
fib-omds:Referential	skos:definition	
		Data that indicates the current market trading condition of an individual security, for example, if trading in the security is suspended. This identifies phase transitions in the venue's market model.
fib-omds:SecurityStatus	skos:definition	
fib-omds:Trade	skos:definition	Information that belongs to a transaction that involves the selling and purchasing of a tradable instrument



# Assert the triple in the Ontology Platform

Loaded Classes

Definitions

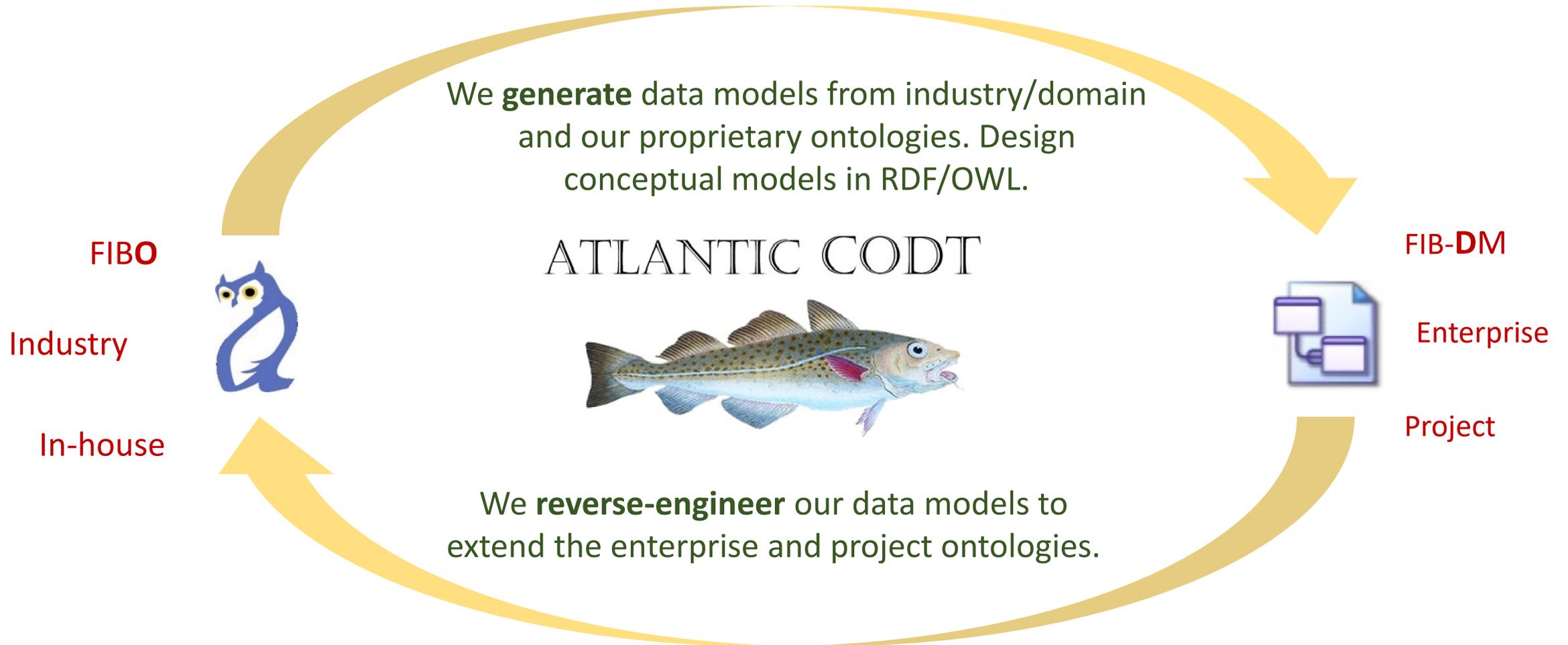
The screenshot displays the TopBraid Composer ME interface. On the left, the 'Classes' panel shows a tree of loaded classes, with 'fib-omds:Auction' selected. The main area shows the 'Class Form' for 'fib-omds:Auction', including its 'skos:definition' and 'rdfs:subClassOf' relationships. The bottom panel shows a 'Query Editor' with a SPARQL CONSTRUCT query and a table of results.

SPARQL CONSTRUCT

[Subject]	Predicate	Object
fib-omds:Auction	skos:definition	Data disseminated during the auction period, i.e. the period of time when there is no automatic execution on an order book. This also includes indicative data and, where relevant, imbalance data sent during the process that matches orders at the end of an auction and determines the final auction price
fib-omds:OrderBook	skos:definition	Represents the state of t
fib-omds:Quote	skos:definition	The most current bid or
fib-omds:Referential	skos:definition	Represents standing dat
fib-omds:SecurityStatus	skos:definition	Data that indicates the c
fib-omds:Trade	skos:definition	Information that belong



# Bi-directional model transformation enables SEIA

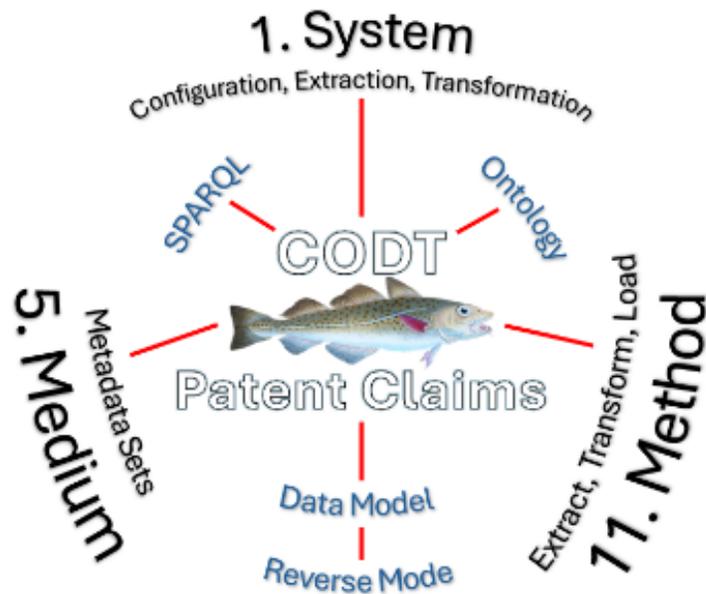


# US Patent & Trademark Office publication

With 23 drawings, 19 tables, and 35 pages of specification, the patent fully discloses the invention.



<https://fib-dm.com/patent/>



Sixteen claims comprehensively cover the method, system, non-transitory storage medium, and all embodiments.

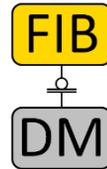
**The patent protects CODT licensees and generated models, including FIB-DM.**



# License Agreement

- FIB-DM licensees can purchase CODT as an add-on.
- New users can license the FIB-DM + CODT bundle.

- (There is no standalone CODT license.)
- Jayzed already holds the copyright to the FIBO Data Model.



- Software deliverables are the MS-Excel CODT Workbooks.
- The site license doesn't limit the number of users.



- You are free to modify the software and to create new models for internal use.
- Just like your FIB-DM license, you must keep derived models confidential.

- Educational resources are included.
- You are free to modify, translate, edit, and even lift off images and diagrams as long as they remain within your organization.



- The license covers the intellectual property.
- You are free to leverage metadata sets, queries, formulas and algorithms disclosed in source code, and the specification for internal development.
- You must not share CODT embodiments.



# Pricing

Licenses are priced for institution size, using your EDM Council membership tier as a segment.

Line of Business	Metric	Tier A	Tier B	Tier C
Sell Side	Consolidated Capital	\$10B+	\$500M-\$10B	<\$500M
Buy Side	Assets under Management	\$200B+	\$50B-\$200B	<\$50B
Custody	Assets under Custody	\$1,000B+	\$100B-\$1,000B	<\$100B

<https://fib-dm.com/full-data-model-upgrade/>

The add-on price for existing FIB-DM licensees is two-thirds of the price of your data model license, around \$40,000 for a Tier B bank. The bundle price for new users is 1.5 times the standalone FIB-DM.

Central Banks, Multilateral Lenders, and other qualifying financial institutions get the Tier C price irrespective of asset size.



# Proof of Concept (POC) - overview

**The Proof of Concept is an offer to try, test, and evaluate CODT**

## Scope

SEIA is a significant enterprise transformation.

FIB-DM already proves that CODT creates the superior data model.

## Objective

To prove that CODT works for your FIBO extensions.

Test the application

Evaluate the Intellectual Property

## Materials

MS-Excel Workbooks

Education materials

Patent (for Legal and Compliance to assess)

## Training & Support

Two Days Training (online video conference)

Three Days support (emails and calls)



# Assemble your Proof of Concept Team



**Management, Finance,** or business sponsor. You are authorized to sign non-disclosure and license agreements.



**Ontologist** with an in-depth understanding of the FIBO and in-house ontologies. You adapt the queries to your SPARQL dialect and produce the raw ontology metadata .



**Data Architect, with** experience in Enterprise Reference models. You configure CODT to match your naming standards, and load metadata sets into the data modeling tool



**Developer / MS-Excel Power User** experienced in VBA, Power Query, and the M-Language. You can troubleshoot complex formulas and queries, and explore technical embodiments.



Finance key point

# Proof of Concept – technical preparation



- Power PC (32 GB Ram), Windows 10 (64 bit), MS Excel, and MS PowerQuery
- Ontology Platform with SPARQL Query User interface: Topbraid Composer, Protégé, or RDF-Store/Semantic Endpoint.
- SAP PowerDesigner (PD) data modeling tool. If you have ERWin or other modeling tools, use PD trial first and import the data model. Later, you may customize CODT to import into your tool.
- The FIBO is loaded in your Ontology Platform. Before the POC, try the Entity Query and reproduce the raw metadata extract.
- Your proprietary ontology should be an extension of the FIBO. Make sure to include FIBO modules and to define a prefix for your namespaces.  
E.g.: @prefix br-bank-model: <[http://bankontology.com/br/Bank\\_model.ttl#](http://bankontology.com/br/Bank_model.ttl#)>
- The Entity Query must return FIBO alongside your classes with a prefix.



# Proof of Concept typical six-week timeline

ID	Task Name	Start	Finish	Duration	Apr 2026				May 2026					
					4-5	4-12	4-19	4-26	5-3	5-10				
1	<b>CODT POC</b>	<b>2026-04-06</b>	<b>2026-05-28</b>	<b>39d</b>	[Gantt bar for 39 days]									
2	Preparation	2026-04-06	2026-04-17	10d	[Gantt bar for 10 days]									
3	Lick-off	2026-04-20	2026-04-20	0d	[Diamond dependency]									
4	<b>Hands-on training</b>	<b>2026-04-20</b>	<b>2026-04-28</b>	<b>7d</b>	[Gantt bar for 7 days]									
5	Entity end-to-end	2026-04-20	2026-04-21	2d	[Gantt bar for 2 days]									
6	Associations	2026-04-22	2026-04-23	2d	[Gantt bar for 2 days]									
7	Data Property	2026-04-24	2026-04-24	1d	[Gantt bar for 1 day]									
8	Packages	2026-04-27	2026-04-27	1d	[Gantt bar for 1 day]									
9	Annotations	2026-04-28	2026-04-28	1d	[Gantt bar for 1 day]									
10	<b>Transform FIBO</b>	<b>2026-04-29</b>	<b>2026-05-05</b>	<b>5d</b>	[Gantt bar for 5 days]									
11	Extract Ontology Metadata	2026-04-29	2026-04-30	2d	[Gantt bar for 2 days]									
12	Transform E/R Metadata	2026-05-01	2026-05-04	2d	[Gantt bar for 2 days]									
13	Load into DM tool	2026-05-05	2026-05-05	1d	[Gantt bar for 1 day]									
14	Transform Your Extensions	2026-05-06	2026-05-11	4d	[Gantt bar for 4 days]									
15	Explore Configurations	2026-05-12	2026-05-14	3d	[Gantt bar for 3 days]									
16	Explore embodiments	2026-05-15	2026-05-19	3d	[Gantt bar for 3 days]									
17	Wrap-up	2026-05-20	2026-05-21	2d	[Gantt bar for 2 days]									
18	POC Complete	2026-05-22	2026-05-22	0d	[Diamond dependency]									

Two weeks are for introduction into CODT and transforming the FIBO as a POC.

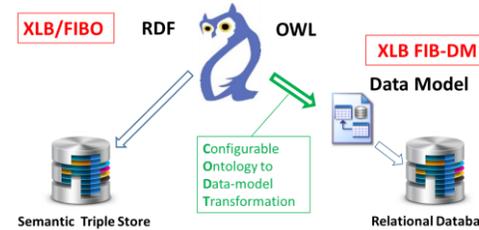
We repeat the transformation exercise, adding your proprietary ontologies.

You can explore configuration changes and other embodiments



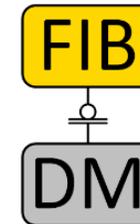
# Summary and conclusion

The Semantic COE must not become another silo.



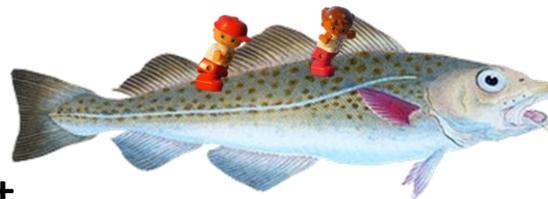
Our vision is Semantic Enterprise Information Architecture (SEIA).

The FIBO is the industry standard.



FIB-DM is the superior industry-standard Data Model.

CODT leverages the ontology for Data Management



Copyrights and Patents protect your investment.

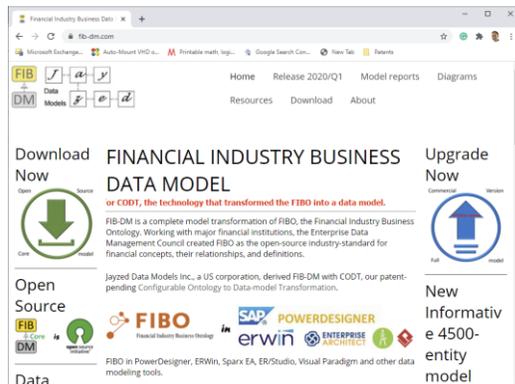


# Next step: Discuss a CODT POC

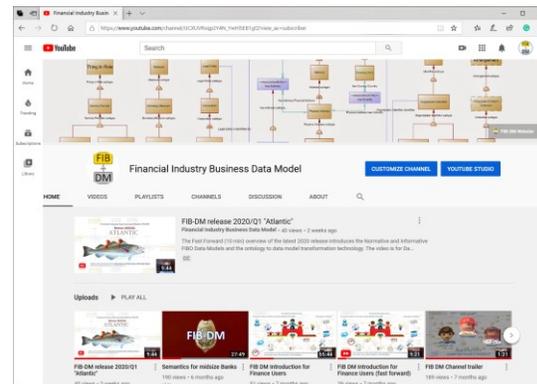


Send an email to [jziemer@jayzed.com](mailto:jziemer@jayzed.com), “CODT POC” to have an overview and discussion with your Q&A. You need a team and executive sponsor to sign off on NDAs.

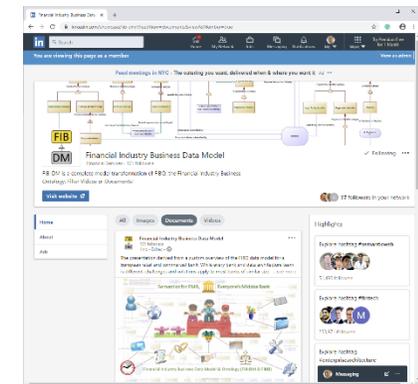
Find further resources on the FIB-DM website, the YouTube Education Channel and follow the LinkedIn showcase for news, updates, and discussion.



<https://fib-dm.com/>



<https://www.youtube.com/c/fibdm>



<https://www.linkedin.com/showcase/fib-dm/>

