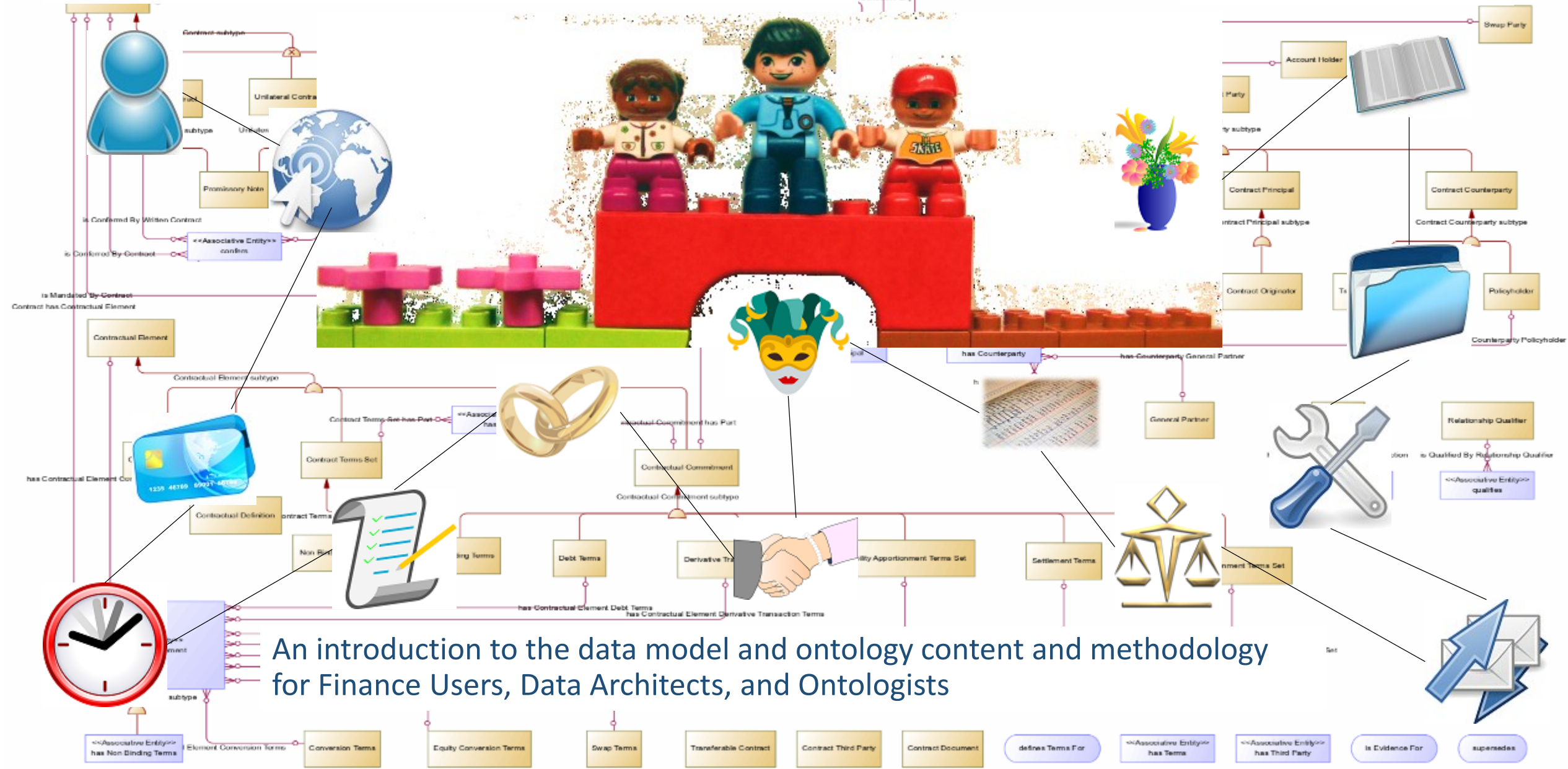


Financial Industry Business Data Model (FIB-DM)

Education Module



The Fundamental Concepts are the bridge to understanding the design and content.

Concept Maps are the bridge between Data Architect and Finance Business user.



- All Fundamental concepts are ultimate supertypes defined in FIBO Foundation, a package in the Open Source FIB-DM Core.
- Some subtype entities for Securities, Swaps, and Indices are in the commercial version.



The Fundamental Concepts are for all audiences.



As a **Data Architect** or **Modeler**, you want to understand the FIB-DM design and content to scope and customize the model.
You want to use Concept Maps for reviews and joint design with your Business clients.



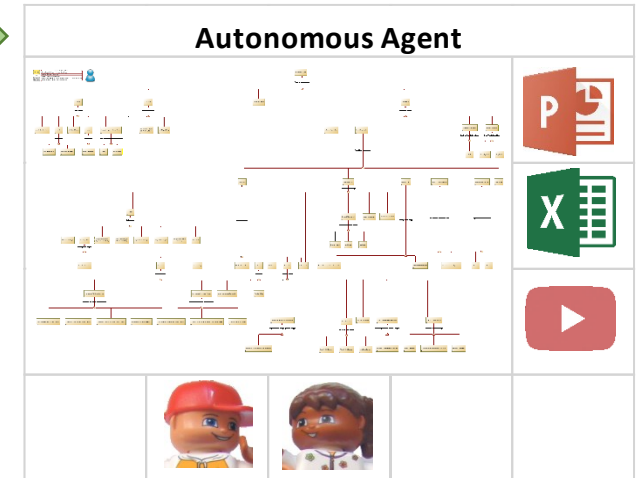
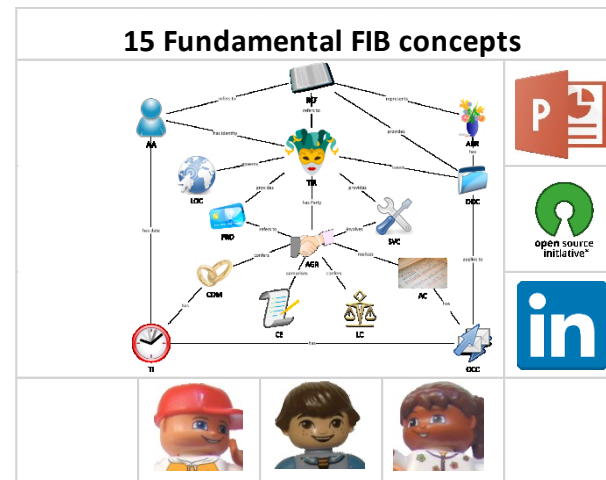
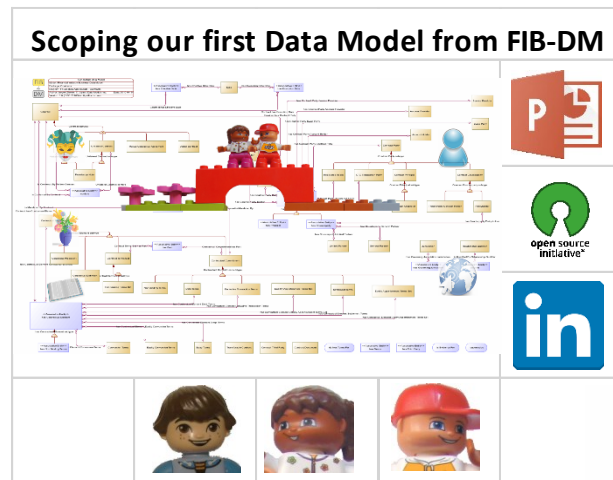
As a **Finance** user and subject matter expert, you find 15 concepts and their icon diagrams easy, non-technical business notation. The fifteen concept charts are for business users.



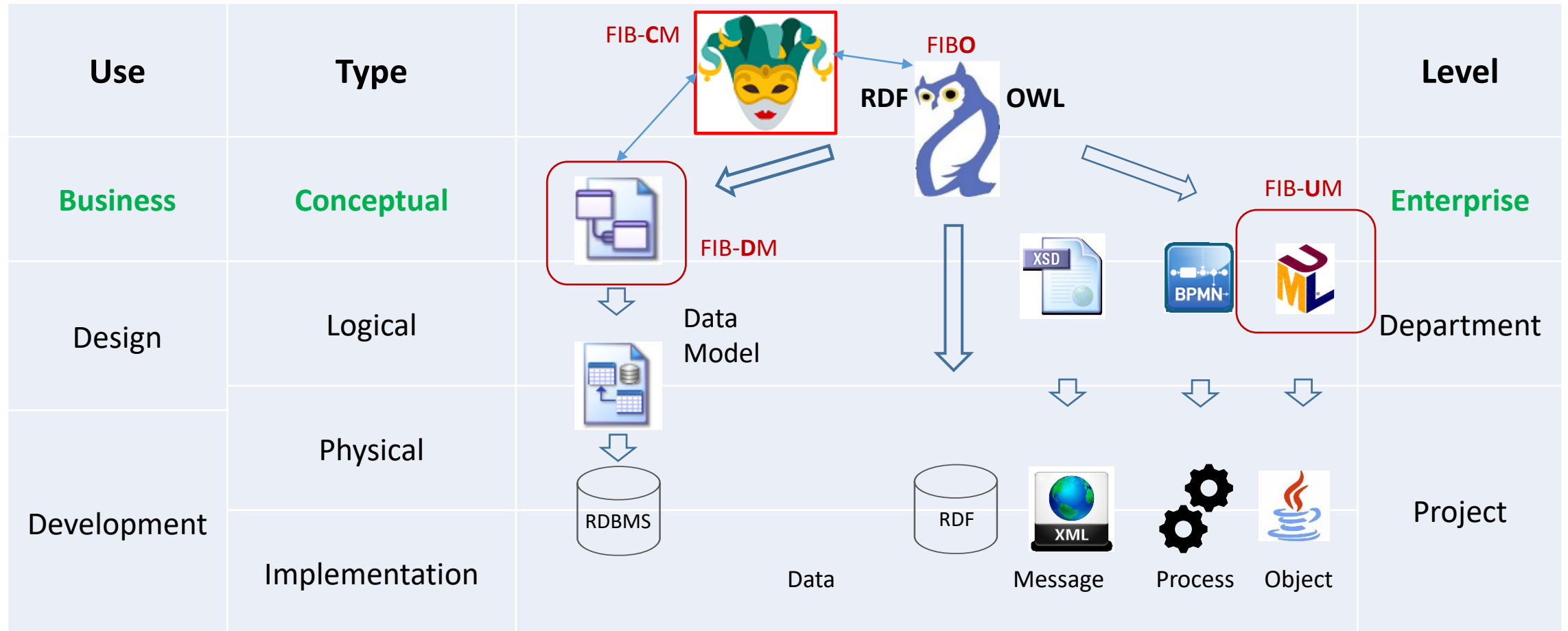
As an **Ontologist** can use the very same FIB concepts to understand, scope and customize the FIBO. Just like the DA, you can use the concept maps, rather than complex graphs to work with the business.



This lesson within the education path

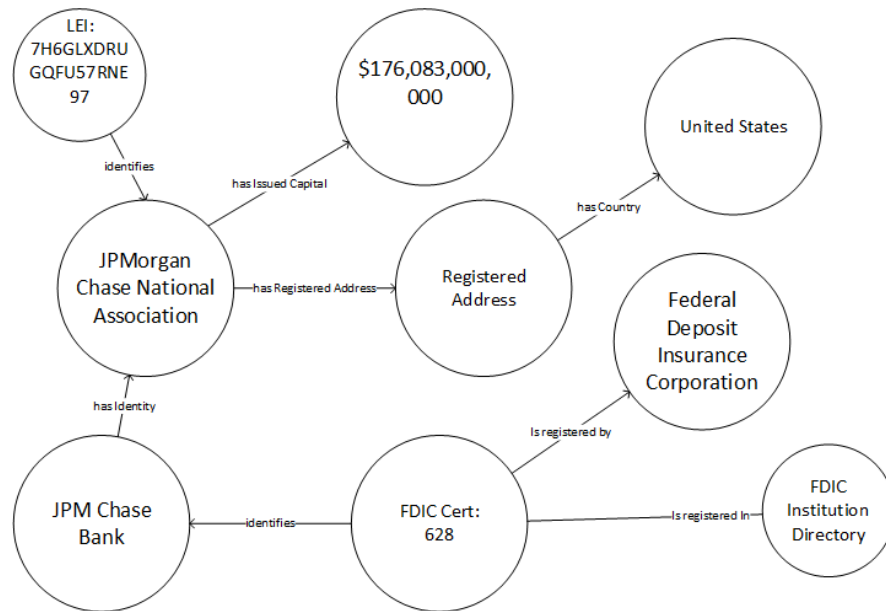


Semantic Enterprise Information Architecture

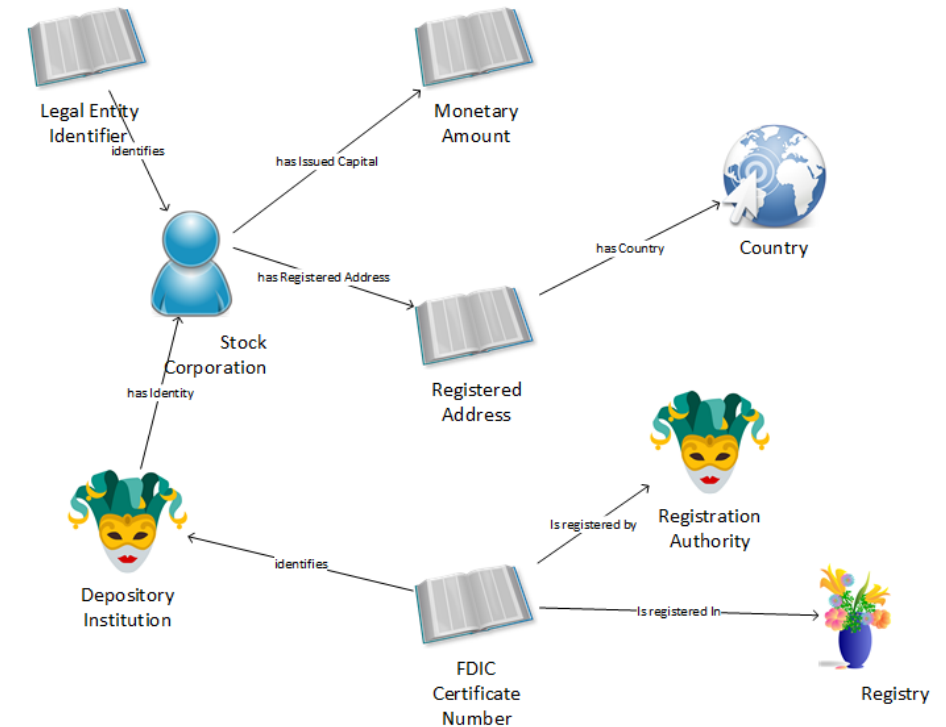


Finance key point

FIB concept maps have an agreed vocabulary



A concept map is a diagram that depicts suggested relationships [arrows] between concepts [circles]. https://en.wikipedia.org/wiki/Concept_map

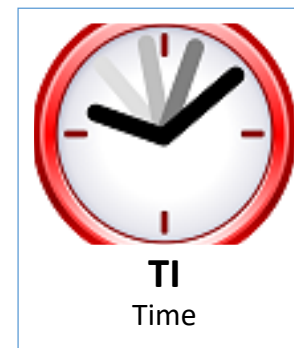
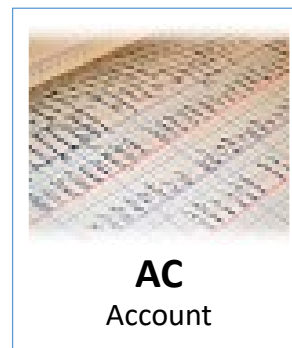
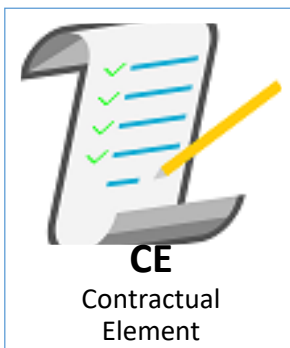
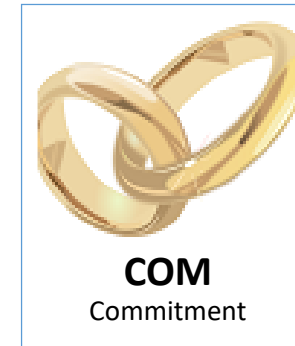
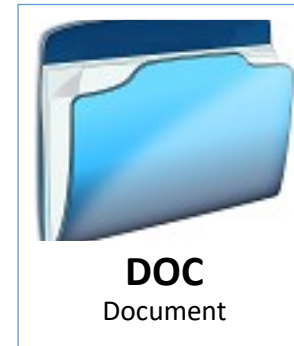
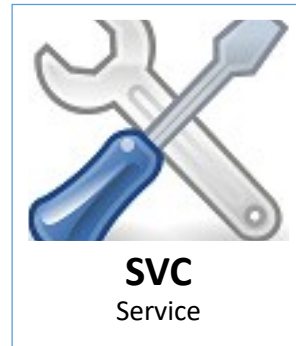
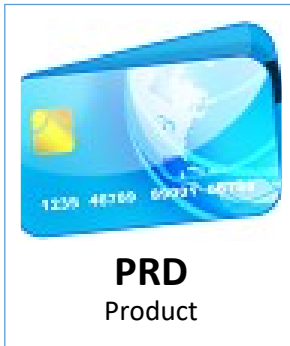
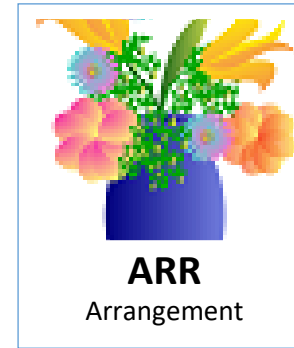
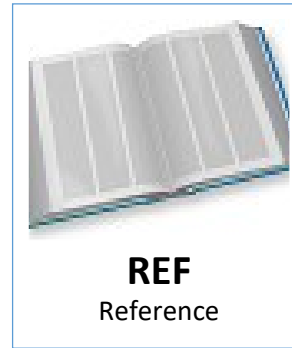
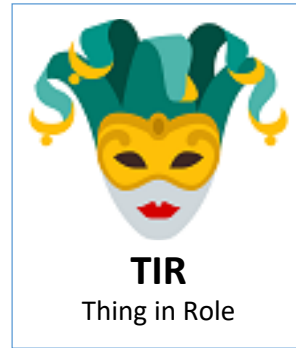


The Financial Industry Business (FIB) concept map has standardized icons for concepts and an agreed vocabulary for labels.





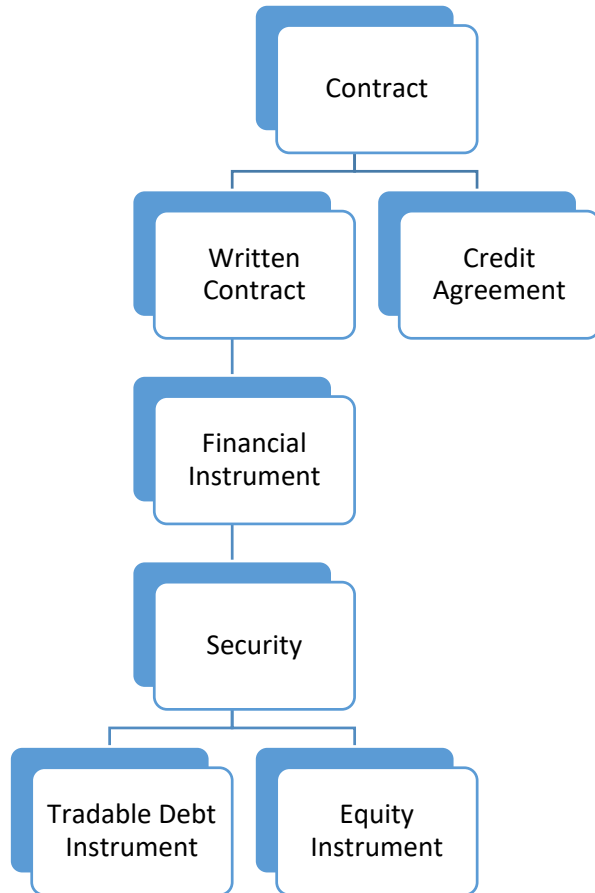
The 15 concept mnemonic icons, and abbreviations



Each FIB concept is an in-depth business taxonomy



Agreement taxonomy, for example, has 79 classification items.



You use the MS-Excel workbook or other representations and visualizations to research the taxonomies:

Identify items that fit your business requirements.

Do not create synonyms!

Work with your Data or Business Architect to extend the taxonomy as needed.

	Subtype name	Taxonomy name
8	Account Specific Service Agreement	Agreement
19	Agency Agreement	Agreement
66	Basis Swap	Agreement
76	Best Efforts Offering	Agreement
82	Board Agreement	Agreement
88	Body Limited By Guarantee Principals Agreement	Agreement
142	Cash Instrument	Agreement
151	Certificate Of Deposit	Agreement
186	Commodity Instrument	Agreement
191	Common Share	Agreement
210	Contract	Agreement
246	Convertible Preferred Share	Agreement
247	Convertible Security	Agreement
263	Credit Agreement	Agreement
272	Cross Currency Interest Rate Swap	Agreement
273	Cumulative Preferred Share	Agreement
279	Currency Instrument	Agreement
317	Debt Instrument	Agreement
319	Debt Offering	Agreement
337	Derivative Instrument	Agreement



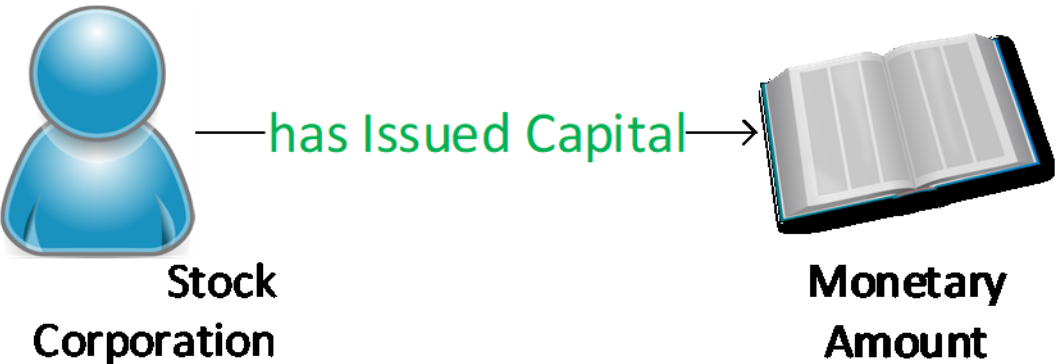
FIB-CM Relationships come from the vocabulary of more than agreed 200 names.

Our first data model Bank, the Bank Call Report had:

JPM Chase		\$176 billion
Stock Corporation	has Issued Capital	Monetary Amount
Autonomous Agent (AA)		Reference (REF)

Use the MS-Excel workbook to research relationship names.

Concept Map Relationship
has Guarantor
has Headquarters Address
has Holding Period
has Identity
has Indicator Value
has Inforce
has Initial Interest Accrual Date
has Initial Interest Payment Date
has Initial Principal Payment Date
has Initial Stub
has Interest Calculation Schedule
has Interest Payment Day
has Interest Payment Frequency
has Interest Payment Terms
has Interest Rate
has Interest Rate Reset Schedule
has Issued Capital
has Jurisdiction
has Legal Form
has Lender
has Lifecycle
has Listing Date
has Majority Controlling Interest Party
has Market Identifier Code Status
has Measurement Unit
has Nominal Capital



A search for “Capital” finds has Issued and Nominal Capital



Relationships pertain to designated concepts

The Pivot of Relationships and Fundamental FIB Concepts confirms that has Issued Capital has at least one connection from Autonomous Agent to Reference.

AutoSave

Relationships - Excel

PivotTable Tools

Jurgen Ziemer

FileHomeInsertDrawPage LayoutFormulasDataReviewViewDeveloperHelpQuickBooksAnalyzeDesignTell meShareComments

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	Count of Code	Column Labels															
2	Row Labels	0	AA	AC	AGR	ARR	CE	COM	DOC	LC	LOC	OCC	PRD	REF	SVC	TI	TiR
19	fibo-fnd-rel-rel:has	47	5	35	37	1	45	27	8	11	6	109	65	123			
20	has	1															
21	has Accrual Basis						1										
22	has Acquisition Price												1			1	
23	has Address	2								1		1					1
69	has Holding Period								2							1	
70	has Identity	12		2	3			2					2				65
71	has Indicator Value												19				
72	has Initial Interest Accrual Date							1								1	
73	has Initial Interest Payment Date							1								1	
74	has Initial Principal Payment Date							1								1	
81	has Issued Capital	1											1				
82	has Legal Form	1											1				
83	has Lender				1												1
84	has Listing Date				1											1	

RelationshipsVocabularyMatrix

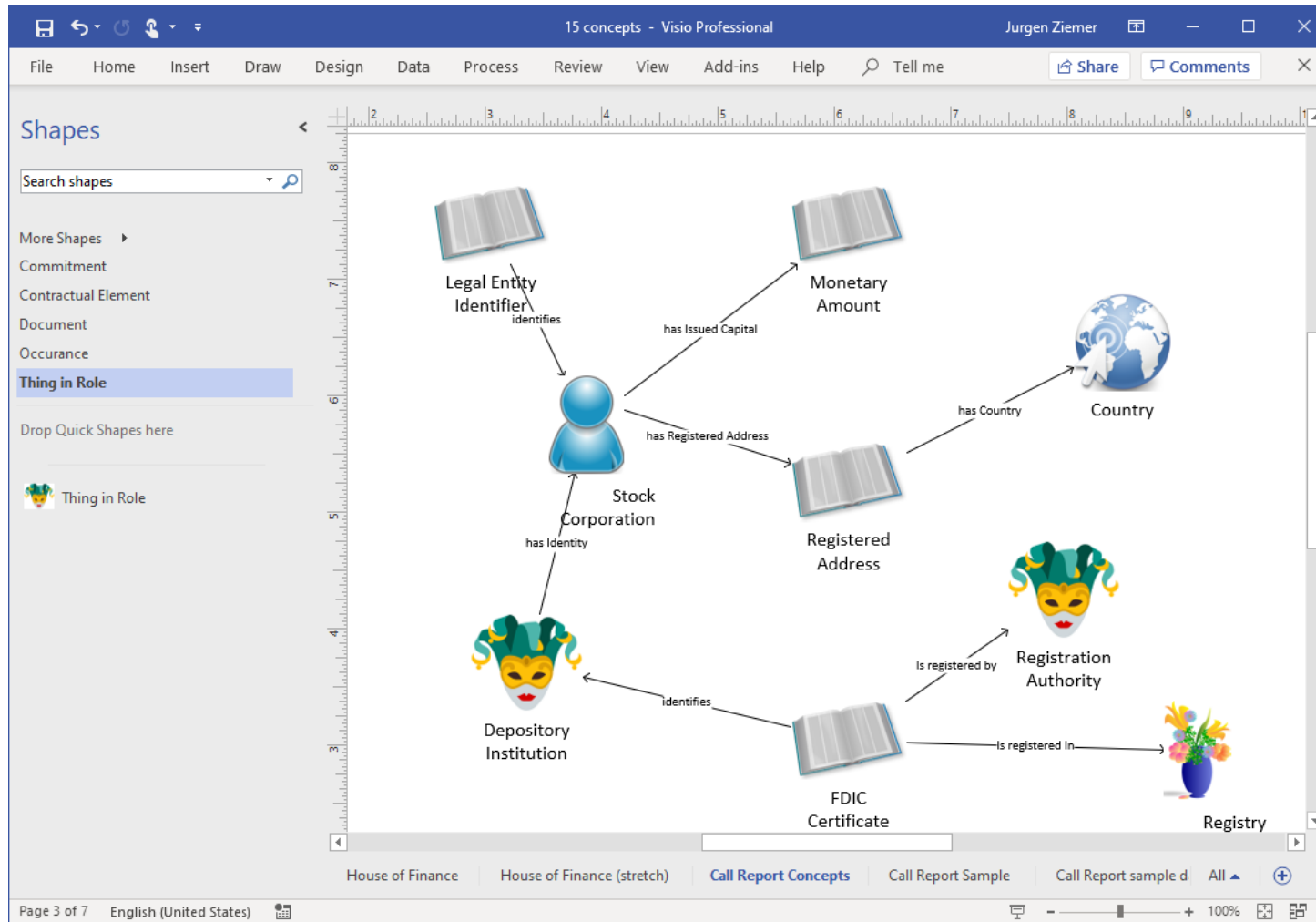
Count: 0Sum: 0

150%



Finance key point

Complete the conformed Concept Map



Use the MS-Visio template with the FIB Concept stencils or any Concept Map diagramming tool.

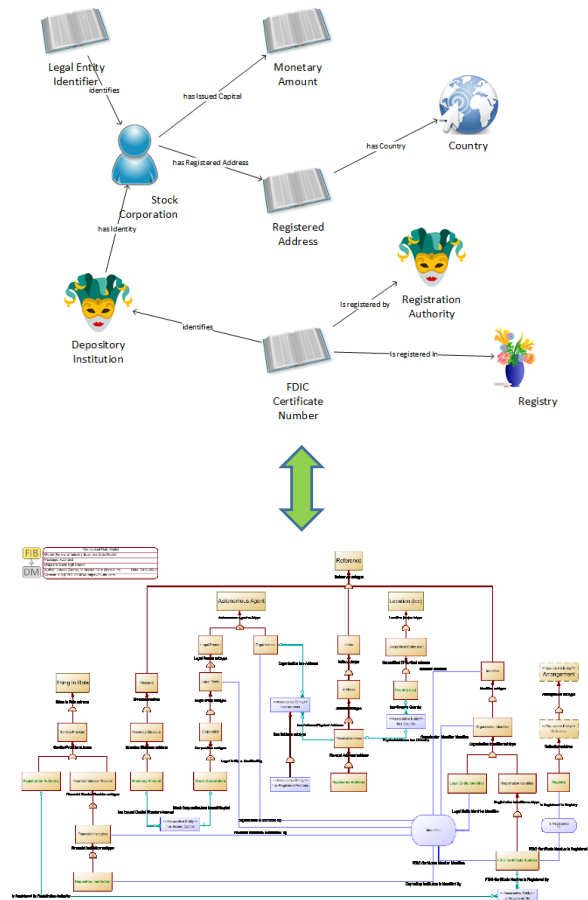
Some PowerDesigner modelers create a custom model and map to the FIB-DM conceptual data model.

Who does this, the Business Analyst, Data Modeler, or Finance user depends on your organization and the people on the project.

15 Concepts, their taxonomies, and relationships express 80% of the business, data requirements, and high-level design.



Data Model and Concept Map



The business introduction stated a direct correspondence between the FIB Concept Map and FIB Data Model.

The Semantic Enterprise Architecture called the FIB-CM a simplified conceptual data model in sync with FIB-DM.

Indeed, just like we derive a Physical Data Model (PDM) from a Logical Data Model (LDM), we can derive the Conceptual Data Model (CDM) from the Concept Map (CM). And we should reflect CDM changes in the CM.

The controlled vocabulary of the FIB-CM comprises of FIB-DM base, and associative entities, and associations.

The MS-Excel workbook derived from Data Model list reports!



Fundamental Concepts are Ultimate Supertypes

In the data model, the 15 Fundamental Concepts are entities that are not subtype of any other entity.

They are the most important supertypes, ranked by their number of subtype entities.*

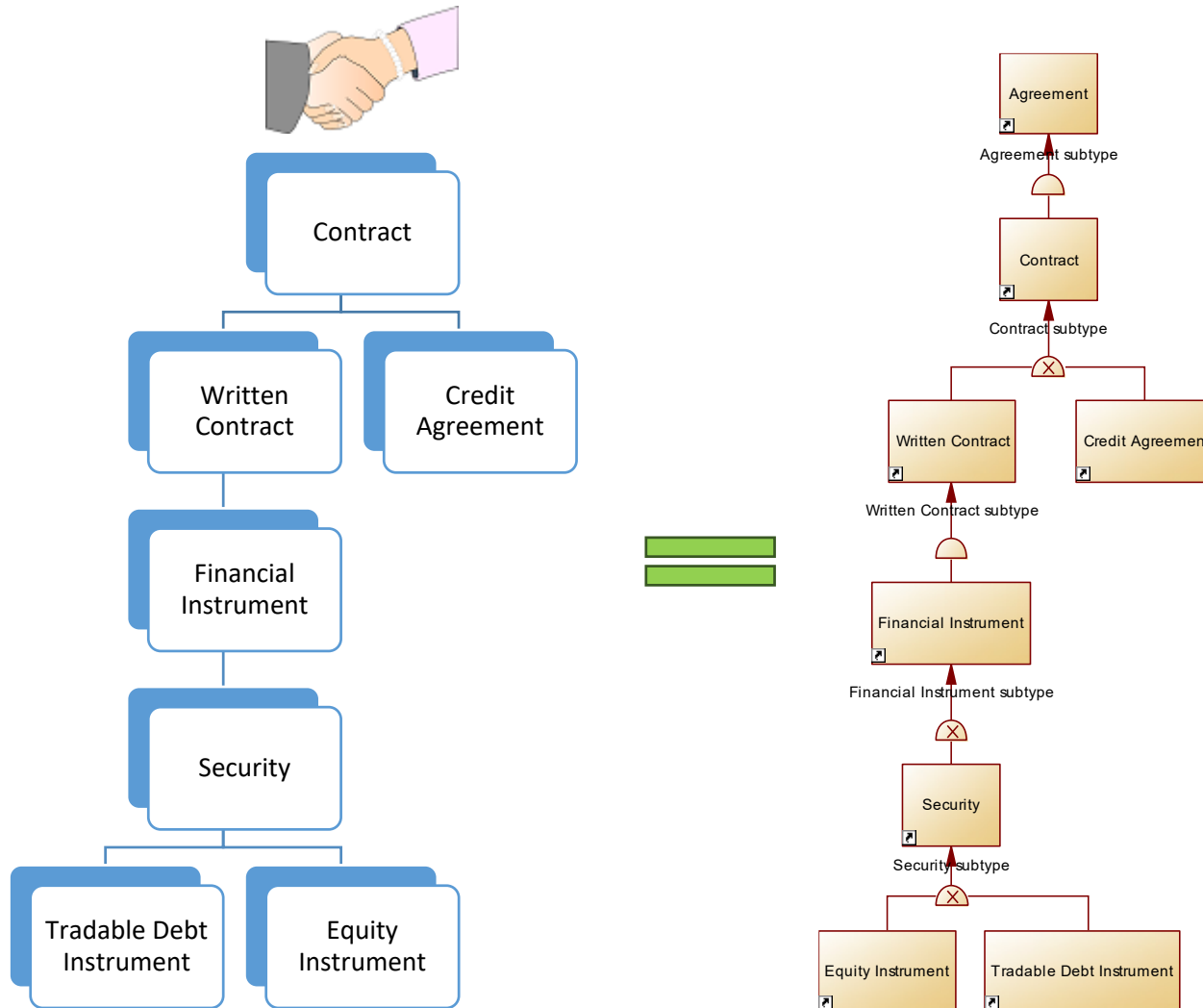
70% of FIB-DM base entities (non-associative) are a subtype of the 15 concepts.

* Astute observers notice that Time Interval and Time Instant are combined into one concept although they don't have a common supertype. Language and Convention didn't make FIB-CM, although they have more subtypes than account. Also, the metrics will change with model customizations and the next FIB-DM release. The list of 15 concepts is qualitative judgment.

Row Labels	Count of Subtype	CM
fibo-fnd-pty-rl:ThingInRole	278	TIR
fibo-fnd-rel-rel:Reference	235	REF
fibo-fnd-arr-arr:Arrangement	85	ARR
fibo-fnd-aap-agt:AutonomousAgent	81	AA
fibo-fnd-agr-agr:Agreement	79	AGR
fibo-fnd-agr-agr:Commitment	58	COM
fibo-fnd-arr-doc:Document	53	DOC
fibo-fnd-law-lcap:LegalConstruct	49	LC
fibo-fnd-agr-ctr:ContractualElement	42	CE
fibo-fnd-dt-oc:OccurrenceKind	26	OCC
lcc-cr:Location	24	LOC
fibo-fnd-pas-pas:Service	18	SVC
fibo-fnd-dt-fd:TimeInterval	17	TI
fibo-fnd-dt-fd:TimeInstant	17	TI
fibo-fnd-pas-pas:Product	15	PRD
fibo-fbc-pas-caa:Account	13	AC
fibo-fnd-dt-oc:Occurrence	11	OCC



The FIB Taxonomy is the subtype hierarchy



The business user sees a taxonomy depicted as a diagram, a list or pivot in MS-Excel, or any other taxonomy visualization tool.

That taxonomy derived from the data model.

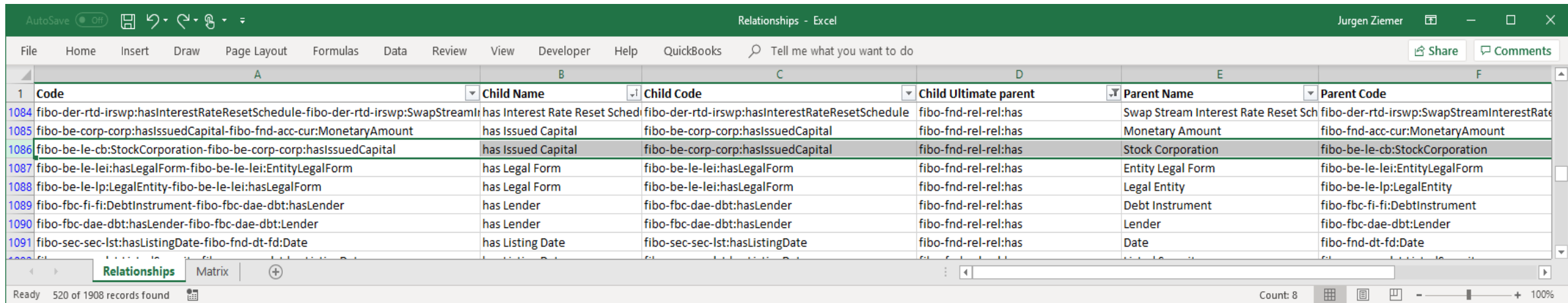
It is OK to omit entities from the user taxonomy. For example, we may remove the Written Contract, if it adds no explanatory value.

However, we must not add classification items to the taxonomy, unless we also add them to FIB-DM



FIB Concept Map Relationships are data model Associations and Associative Entities

The Excel tab below is the data underlying the business user matrix for the controlled relationship vocabulary.



	A	B	C	D	E	F
1	Code	Child Name	Child Code	Child Ultimate parent	Parent Name	Parent Code
1084	fiboder-rtd-irswp:hasInterestRateResetSchedule-fiboder-rtd-irswp:SwapStreamInterestRateResetSchedule	has Interest Rate Reset Schedule	fiboder-rtd-irswp:hasInterestRateResetSchedule	fibofnd-rel-rel:has	Swap Stream Interest Rate Reset Schedule	fiboder-rtd-irswp:SwapStreamInterestRateResetSchedule
1085	fibobe-corp-corp:hasIssuedCapital-fibofnd-acc-cur:MonetaryAmount	has Issued Capital	fibobe-corp-corp:hasIssuedCapital	fibofnd-rel-rel:has	Monetary Amount	fibofnd-acc-cur:MonetaryAmount
1086	fibobe-le-cb:StockCorporation-fibobe-corp-corp:hasIssuedCapital	has Issued Capital	fibobe-corp-corp:hasIssuedCapital	fibofnd-rel-rel:has	Stock Corporation	fibobe-le-cb:StockCorporation
1087	fibobe-le-lei:hasLegalForm-fibobe-le-lei:EntityLegalForm	has Legal Form	fibobe-le-lei:hasLegalForm	fibofnd-rel-rel:has	Entity Legal Form	fibobe-le-lei:EntityLegalForm
1088	fibobe-le-lp:LegalEntity-fibobe-le-lei:hasLegalForm	has Legal Form	fibobe-le-lei:hasLegalForm	fibofnd-rel-rel:has	Legal Entity	fibobe-le-lp:LegalEntity
1089	fibofbc-fi-fi:DebtInstrument-fibofbc-dae-dbt:hasLender	has Lender	fibofbc-dae-dbt:hasLender	fibofnd-rel-rel:has	Debt Instrument	fibofbc-fi-fi:DebtInstrument
1090	fibofbc-dae-dbt:hasLender-fibofbc-dae-dbt:Lender	has Lender	fibofbc-dae-dbt:hasLender	fibofnd-rel-rel:has	Lender	fibofbc-dae-dbt:Lender
1091	fibosec-sec-lst:hasListingDate-fibofnd-dt-fd:Date	has Listing Date	fibosec-sec-lst:hasListingDate	fibofnd-rel-rel:has	Date	fibofnd-dt-fd:Date

It is a combination of data model relationship and entity subtype list reports.

The user doesn't need concept or relationship hierarchies in the FIB Concept Map notation. You, the data modeler, resolve the intricacies of how and where concepts associate in the data model.

Additions to the controlled vocabulary of concept map relationships must reflect in the data model as new associations.



Approaching an extensive model

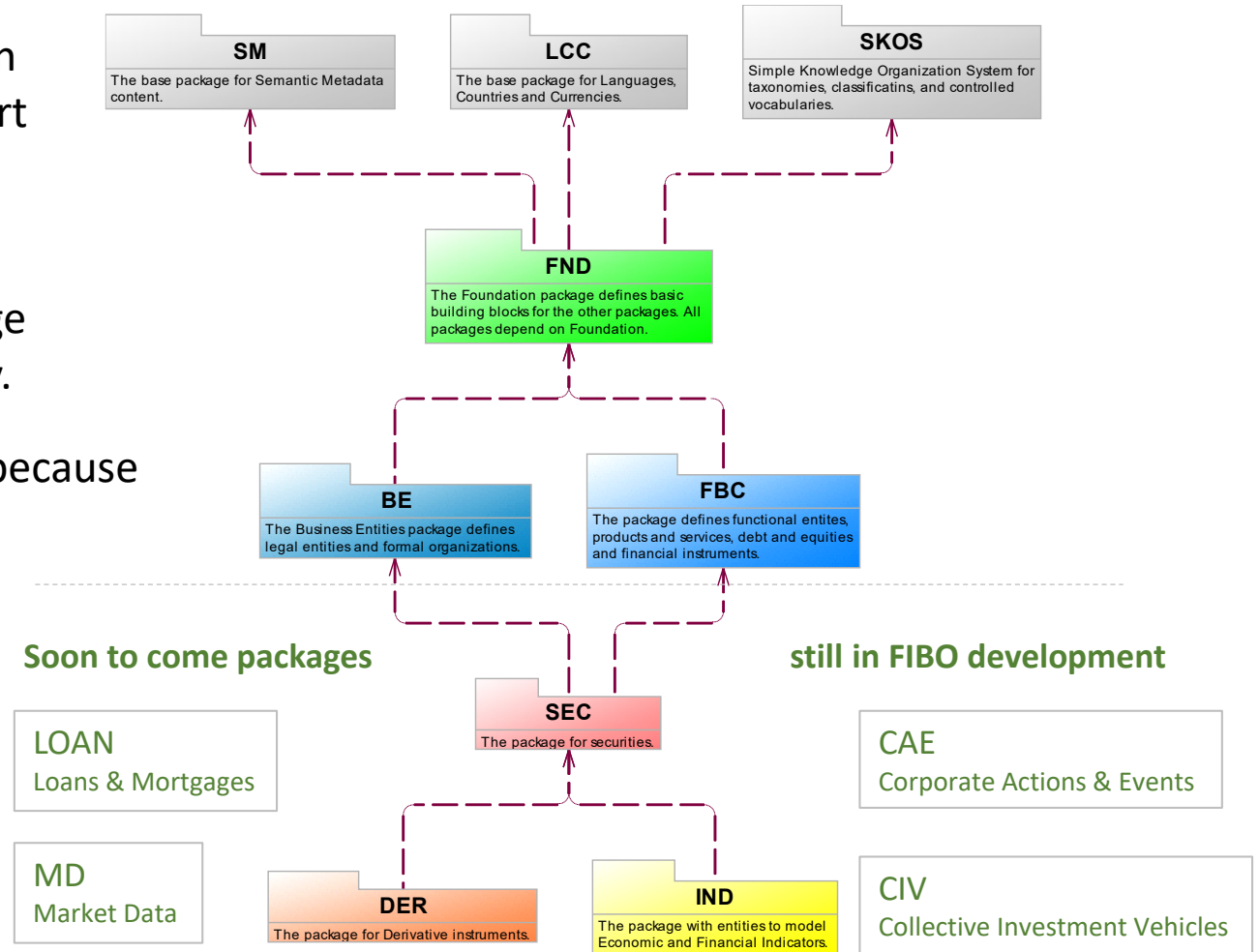
A common approach is middle-out. Working on a specific requirement, like the Bank Call Report exercise, we investigate the subject up the subtype hierarchy.

Or we follow the FIBO module, FIB-DM package structure, and with it the development history.

BTW, the Ontologist has it more comfortable because she can examine and query sample data.

The Fundamental Concept approach is top-down. We examine the concept

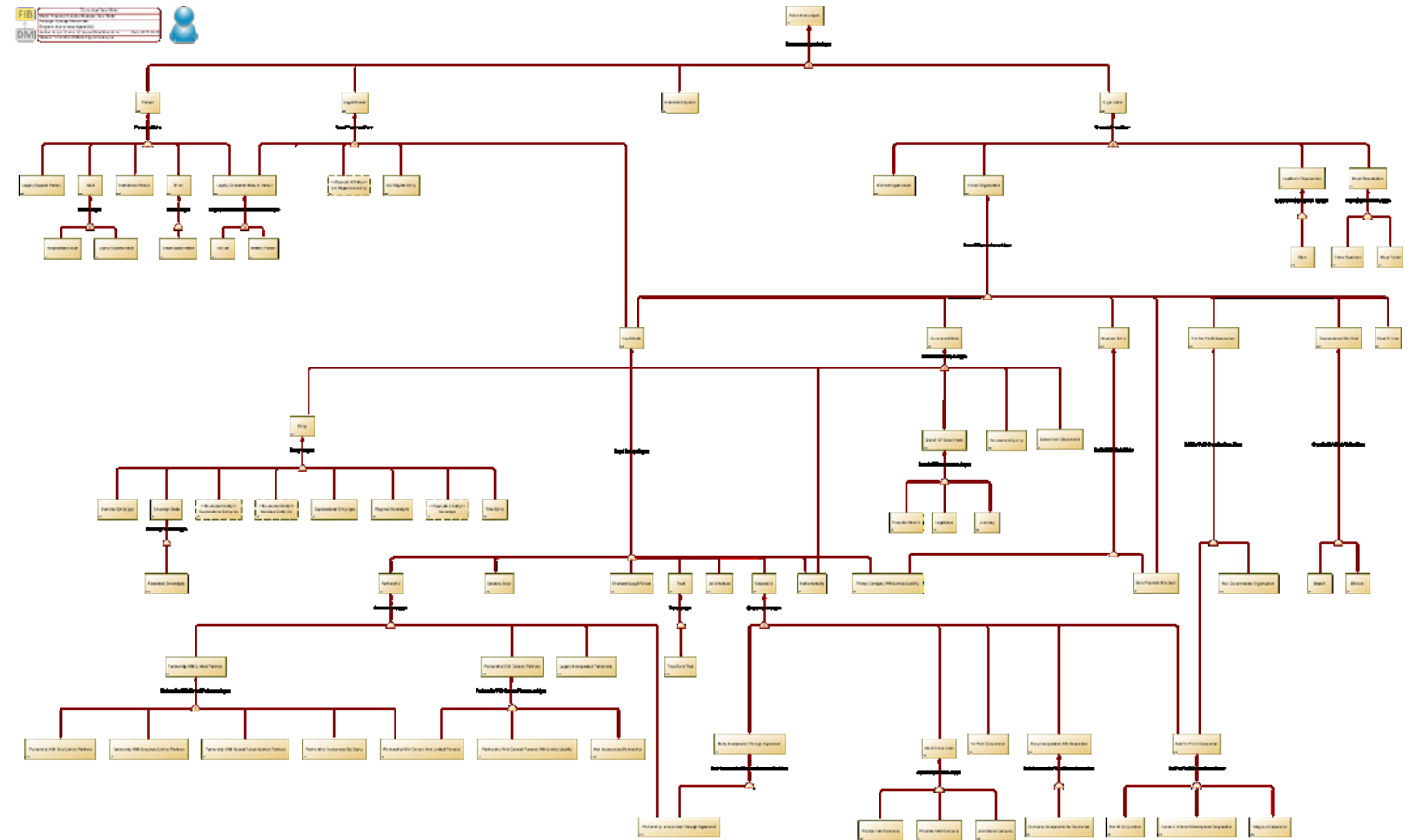
- **Business content**
- **Subtype hierarchy**
- **Associations**



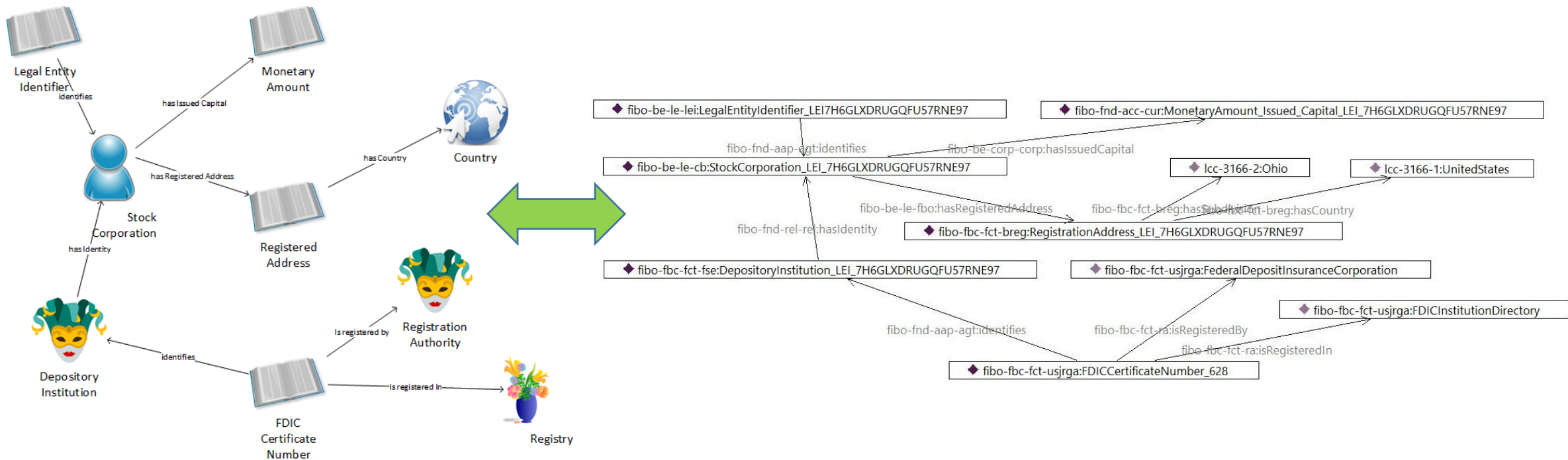
Ontology and Data Model hierarchies are the same

The only difference is in the diagram notation.

FIB-DM concept diagrams can help you to understand the FIBO `rdfs:subClassOf`, Class hierarchies.



The concepts and vocabulary directly correspond to the ontology graph.



Concept relations derive from FIBO `rdfs:range`, `rdfs:domain`, and `owl:Restriction`.

Create concept maps to communicate your design with Finance users!





Icon

Guide to the Reference Sheets

Concept Name (Abbr.)

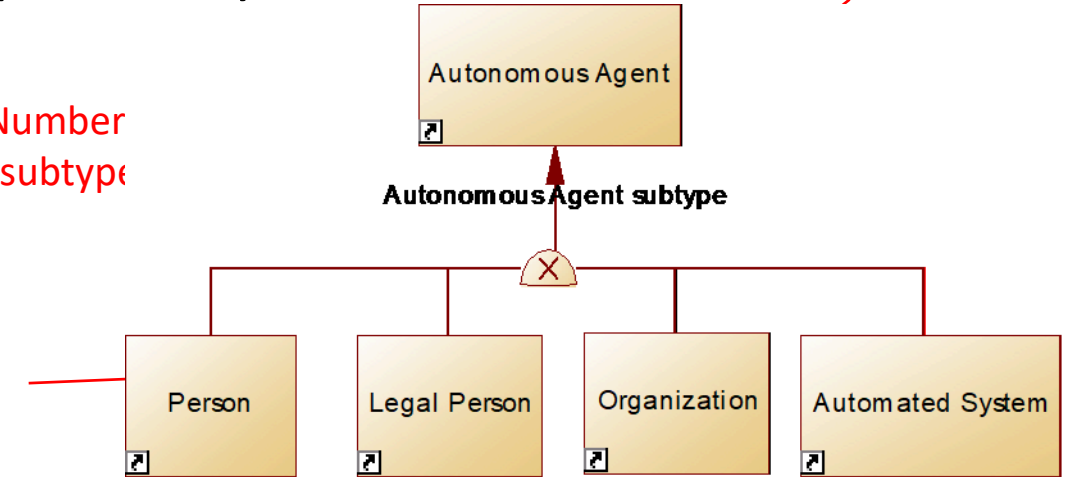
FIBO definition (cursive)

Explanation, examples and most important subtypes

Note: The FIB-DM website has fully scalable diagrams of the complete subtype hierarchies. Download the SVG files here:

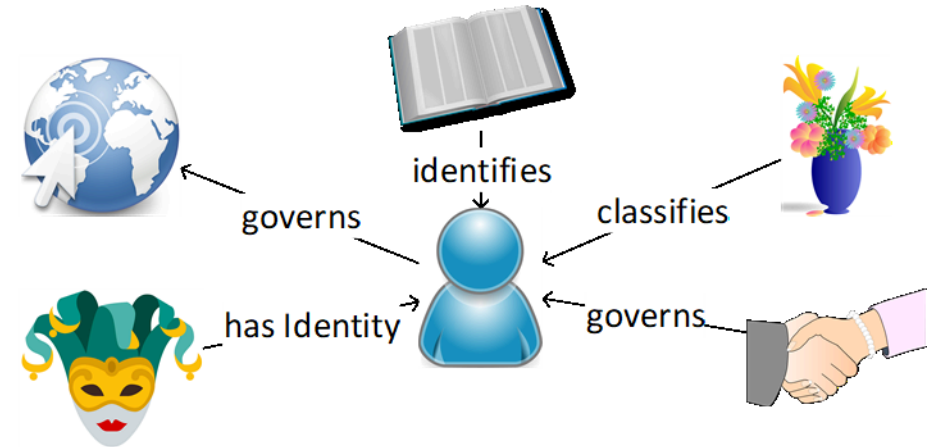
<https://fib-dm.com/financial-industry-business-concept-diagrams/>

Number
subtype



important
Subtypes

Explanation and examples of concept relationships



significant **Concept Relationships**



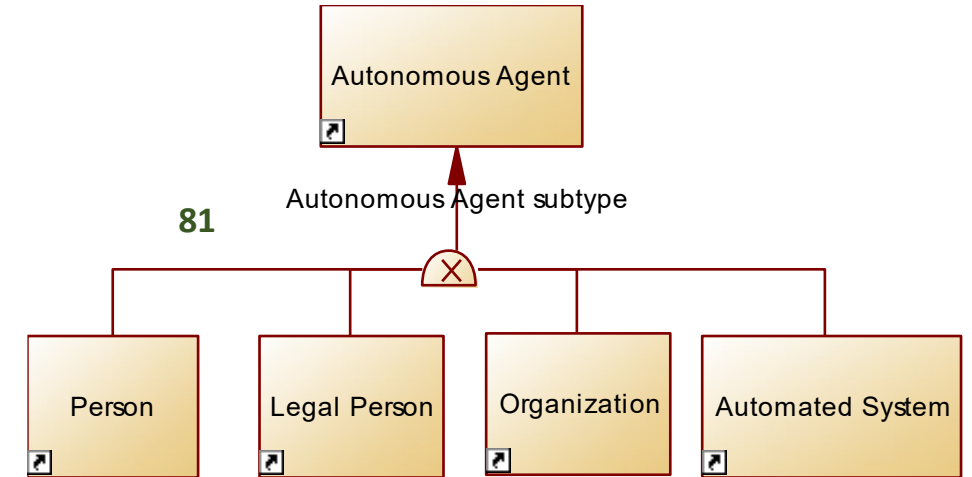
Finance key point



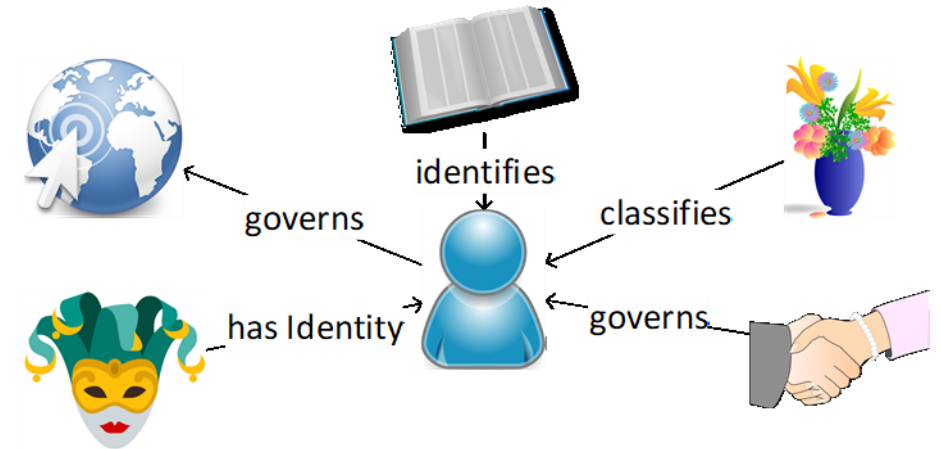
Autonomous Agent (AA)

An agent is an autonomous individual that can adapt to and interact with its environment.

- The Person is an intuitive subtype of an autonomous Agent. There can only be one record of You in an Autonomous Agent table.
- Likewise, there must be only one record of Legal Person with its subtype Legal Entity, Organization and Automated System.



- Foremost, the Autonomous Agent is the identity for Things in Role. Your roles as an investor, borrower, guarantor, all converge to one person.
- IDs identify the AA.
- Various Arrangements classify the AA.
- Government Entities govern Locations, such as a country or municipality.
- In turn, Agreements govern certain Legal Entities and Organizations.

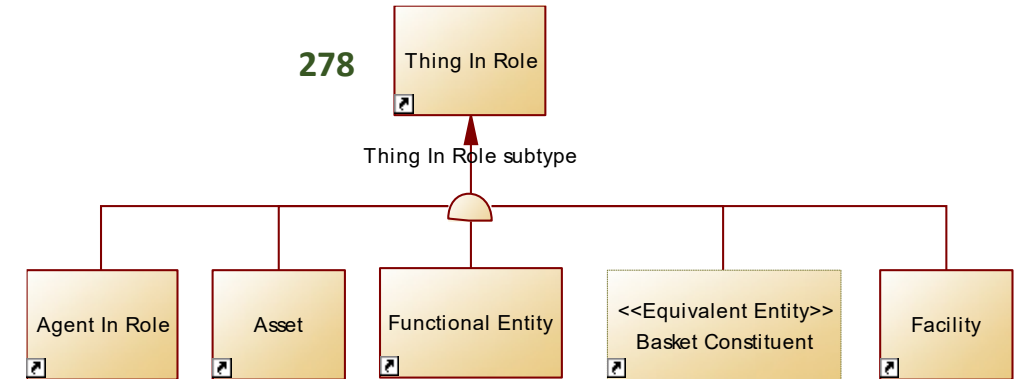




Thing in Role (TIR)

A thing-in-role is a relative concept that ties some thing to a role it plays in a given situational context

- Agent in Role are Client, Contract/Controlling/Reporting Party, Obligor, and Manager.
- Assets are things of values, in the context of Financial Asset or Collateral.
- Functional Entity has rich taxonomies for Government and (Financial) Service Providers.
- Pool and Basket Constituents model indices and pooled investments.
- Facilities and Venues cover financial market places.



- As a Services Provider and Functional entity, the TIR provides Products and Services.
- It is a Party in Role or Contract Party in Agreements.
- The TIR issues Documents and as a Registry or Agency issues Identifiers.
- The Identifiers, in turn, identify other Functional Entities or Service Providers.

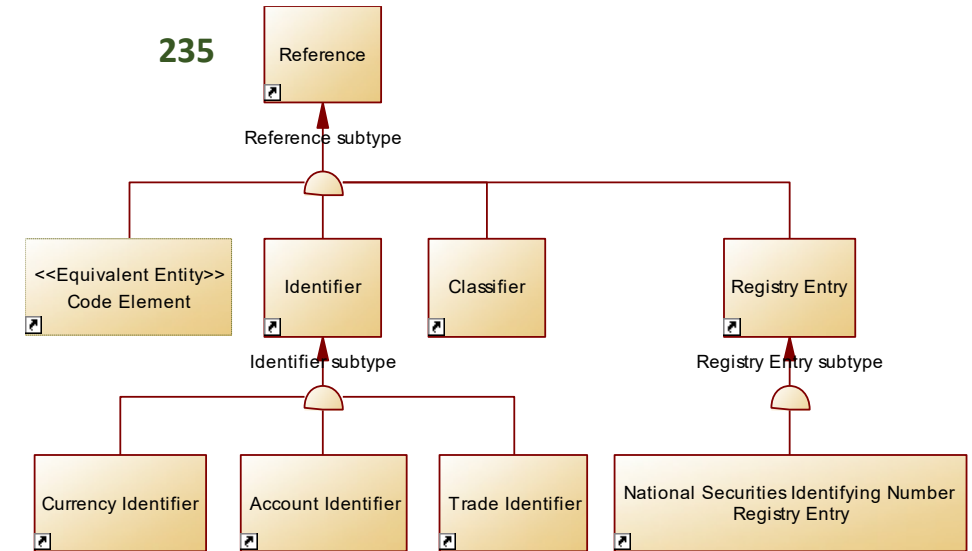




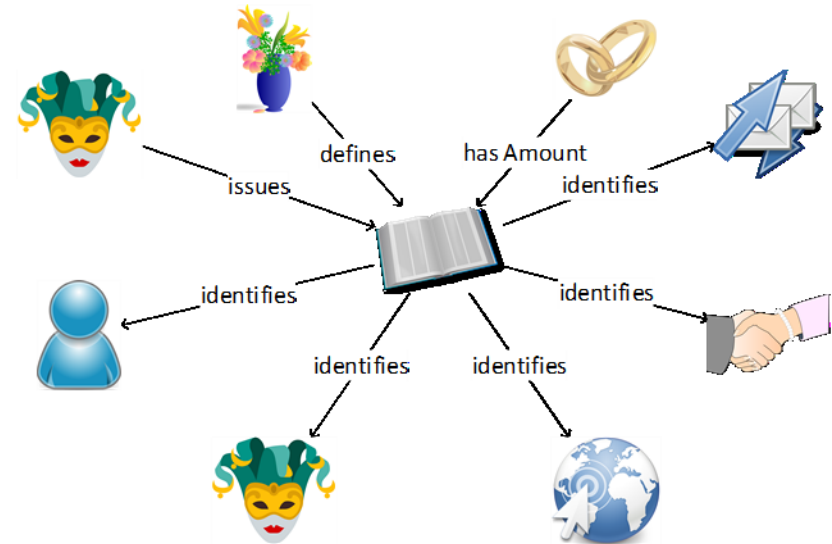
Reference (REF)

A concept that refers to (or stands in for) another concept.

- Identifiers are the most critical subtype of REF. We find Currency codes, and various system-generated IDs for accounts, trades, and everything else.
- Registry Entries perform a similar function, but a Registrar issues the IDs. Securities ID Numbers, Bank Identifiers, and the LEI and FDIC from the Call Report example.
- Codes and Classifiers, categorize things. Note that some codes like currency are also a subtype of Identifier. REF subtypes also support Expressions, Formulas, Variables, and Measures (amounts are measures!).



- The Reference identifies instances of other concepts: Autonomous Agents, Things in Role (i.e., a Broker ID), Locations, Agreements, and Occurrences (i.e., Transactions).
- Various concepts have Monetary Amounts, a Reference.
- Arrangements may define References, typically in a classification.
- Things in Role, such as Registrars issue Reference IDs.

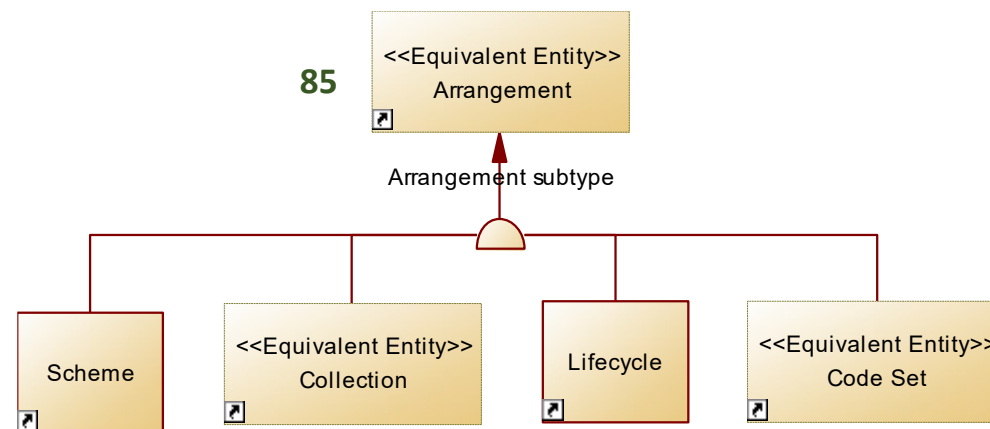




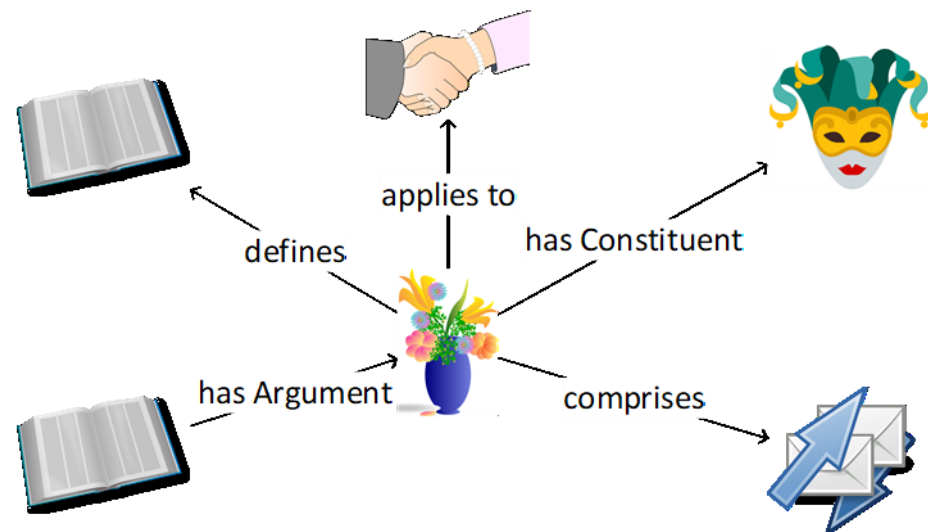
Arrangement (ARR)

An organizing structure for something.

- Indexing, Identification, and Classification Schemes can arrange things multi-level.
- Collections are groupings for Baskets, Pools, Portfolios, Registries, etc.
- Trade and Product Lifecycle are specializations of Lifecycle.
- Well known examples of Code Sets are Industry codes, like NAIC and SIC.



- Arrangements define References. Some References, like Indexes, can also be arguments for a Reference.
- An Arrangement may apply to a contract, AGR.
- A Basket has Constituents, TIR. The role is Basket Constituent, played by a Financial Instrument an Agreement.
- Schedules comprise of Occurrence Kinds.

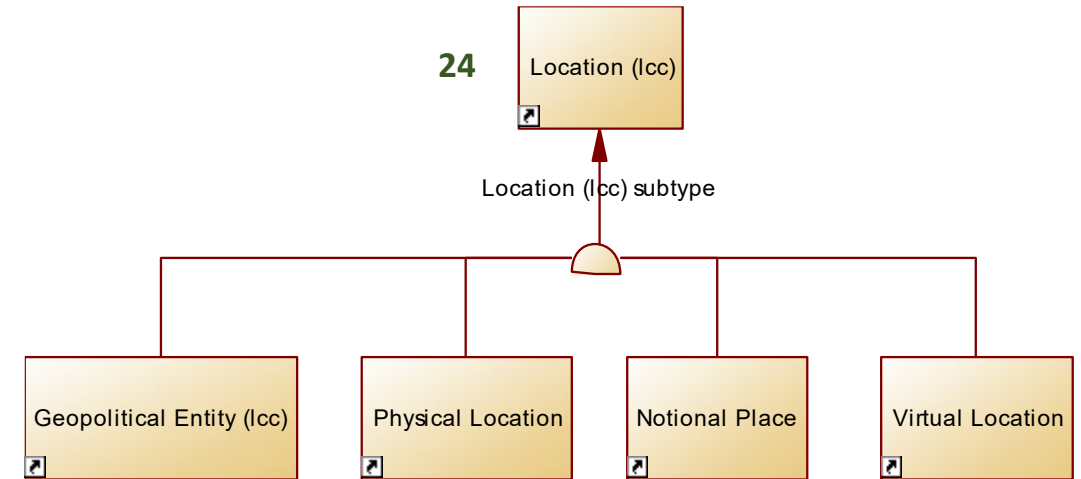




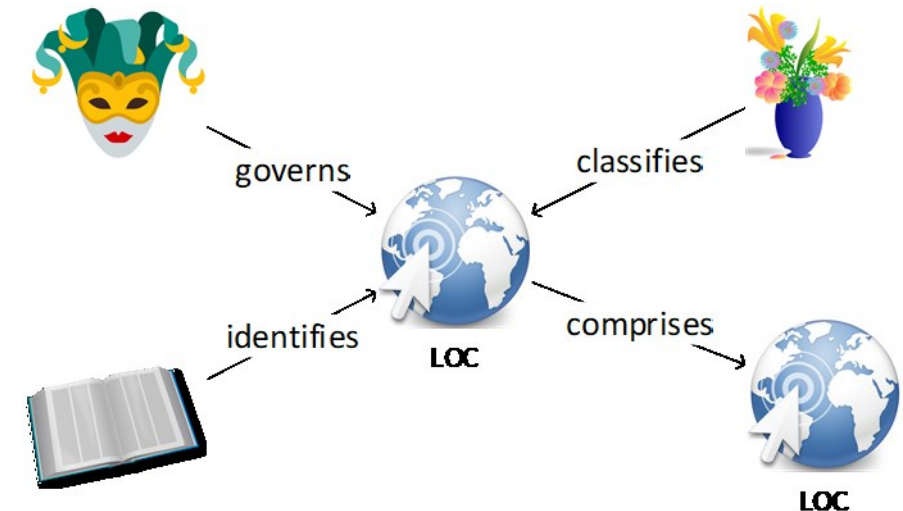
Location (LOC)

A named geographic place.

- Geopolitical Entities are physical Locations with a political identity, such as Country, Subdivision, Municipality, or Tribal Area.
- Physical Locations are Housing Units, Post Code and Statistical Areas, or any other Populated Places.
- Notional Places are abstract locations. Notional Financial Marketplaces are an important subtype.
- Virtual Locations are in the net. E.g. URLs and E-Mail addresses.



- A Reference identifies a Location. (e.g. ISO Country Codes)
- A Government Thing in Role governs the Location.
- Locations can comprise other Locations. This hierarchy may be formally supported by an Arrangement classifying the Locations. For example, Country, State, County.

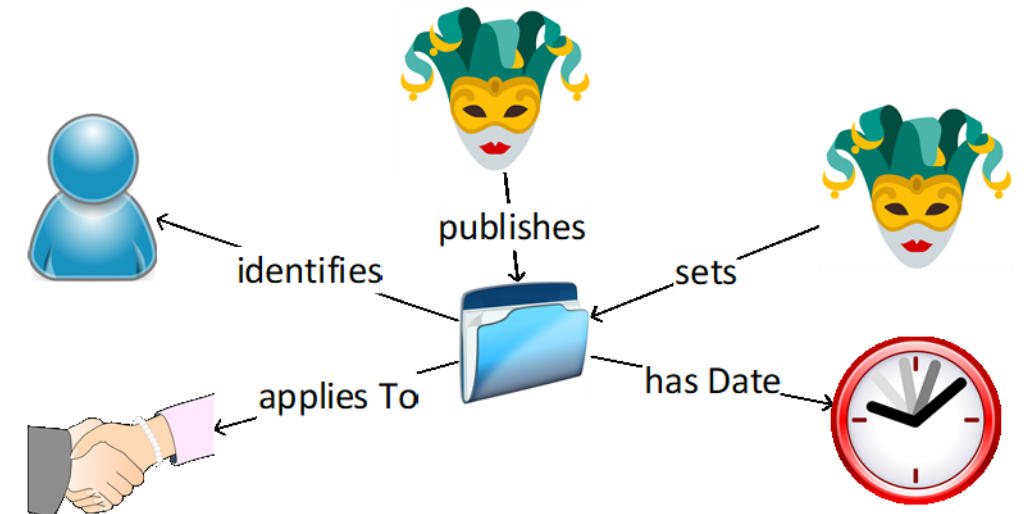
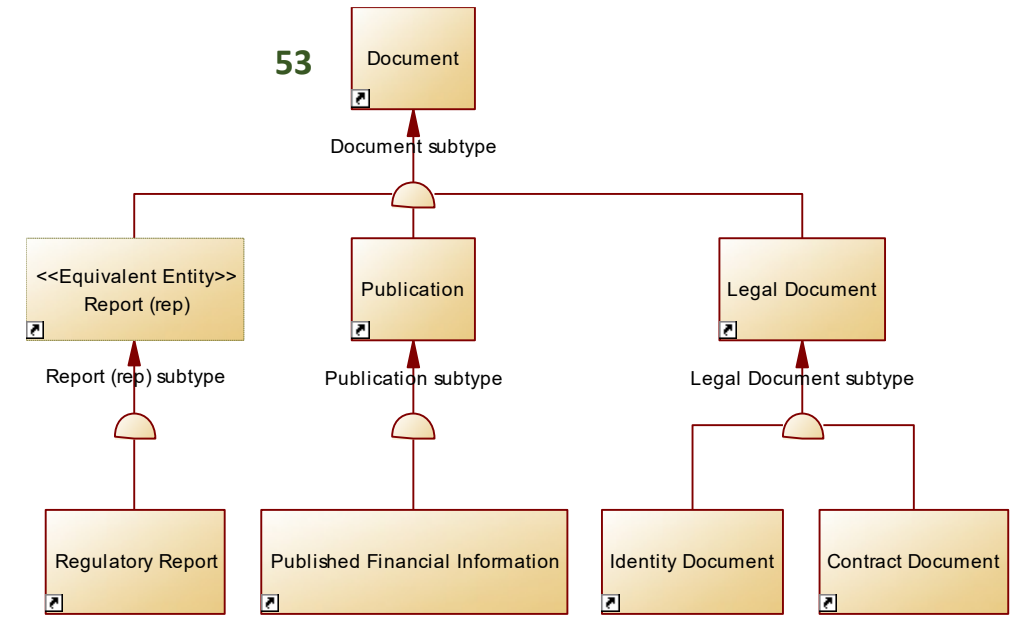




Document (DOC)

Something tangible that records something, such as a recording or a photograph, or a writing that can be used to furnish evidence or information

- Important subtypes of DOC are (Regulatory) Reports and Legal Documents, like Contract, Identity Documents, and Transaction Confirmations.
 - Published Financial Information has subtypes for Market Rates and Quotes.
-
- Documents apply to Agreements. They are the written contract.
 - Identity Documents and Business Licenses identify Legal Persons.
 - Documents have various Dates and Time Intervals.
 - Things in Role, publish or issue Documents.
 - Rate Authorities (AA Central Banks) set Market Rates.

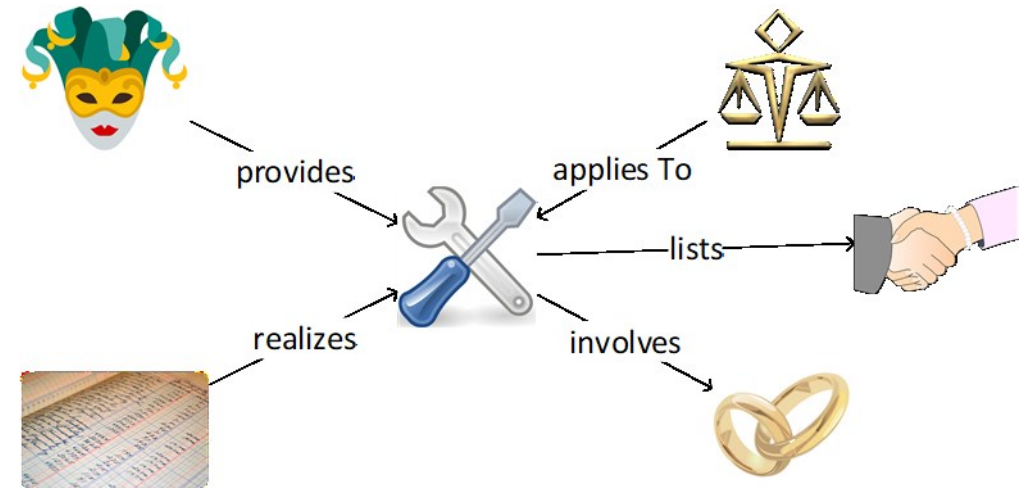
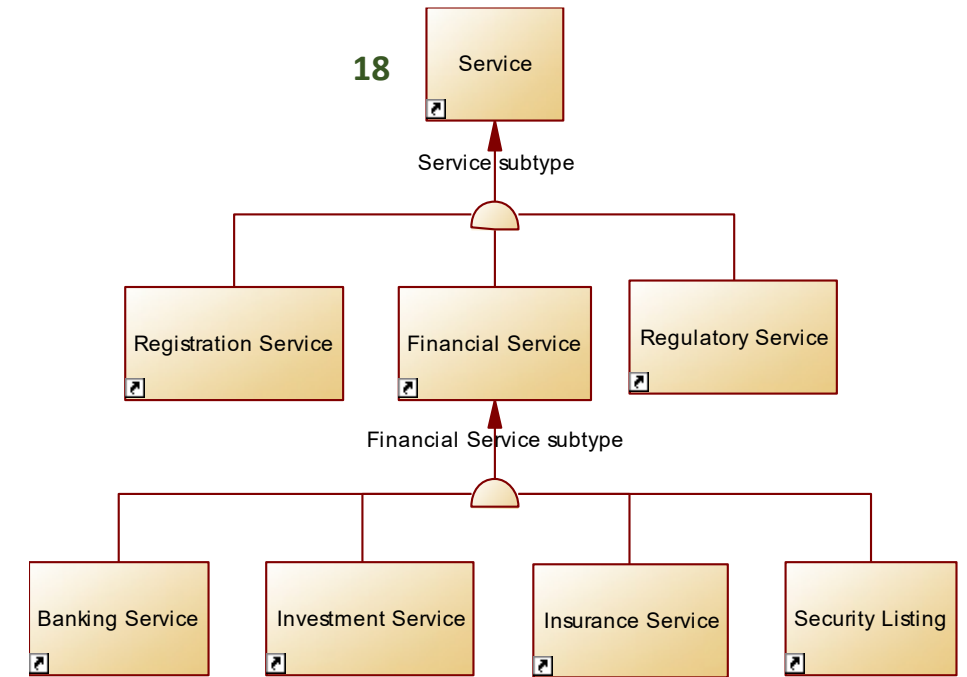




Service (SVC)

A type of economic activity that is intangible, is not stored and does not result in ownership; a service is consumed at the point of sale.

- Subtypes of Services are Regulatory, Registration, and Financial Service.
 - The major financial services are Banking, Investment, Insurance and Capital Market related.
-
- Things in Role, provide services.
 - The Account realizes the service.
 - An agreement may specify services, for example, a Listing Service may list Securities, Agreements.
 - A Payment Service involves the Payment Obligation, a Commitment.
 - Some Legal Constructs apply to Services.

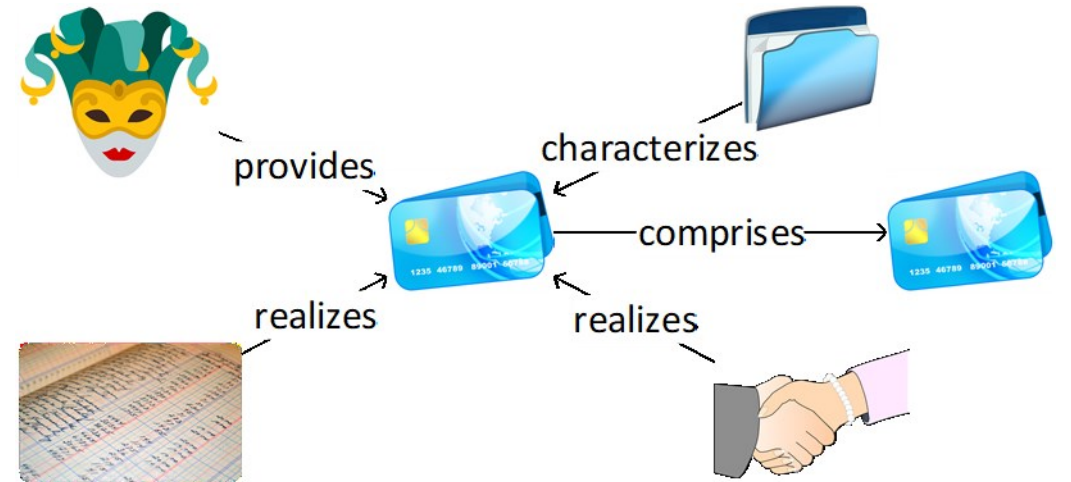
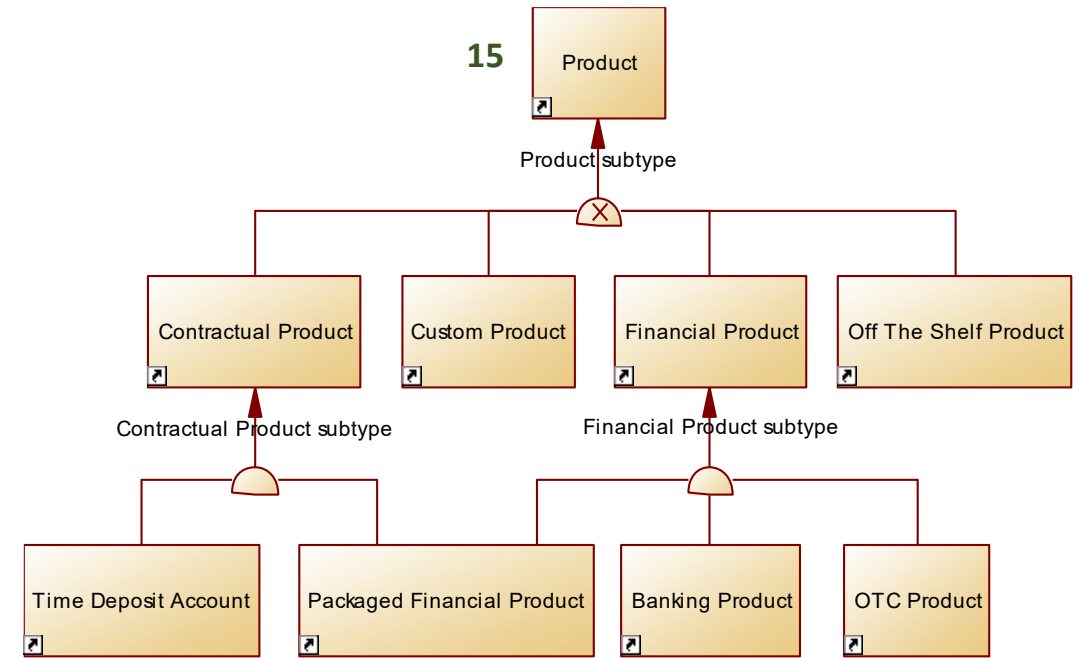




Product (PRD)

A commercially distributed good that is (1) tangible property, (2) the output or result of a fabrication, manufacturing, or production process, or (3) something that passes through a distribution channel before being consumed or used.

- Most significant subtypes are Contractual and Financial Products.
 - The Time Deposit is an example of an Account Product
 - There are many Financial Products for Banking and Over The Counter.
 - Packaged Products are both Financial and Contractual Products.
-
- Service Providers, Things in Role, provide Products.
 - Agreements realize the Product. The Contract is to buy the Product and may specify details and conditions.
 - Documents characterize or specify the Product.
 - A Packaged Product comprises of other Products.
 - The Account also realized or implements the Product.

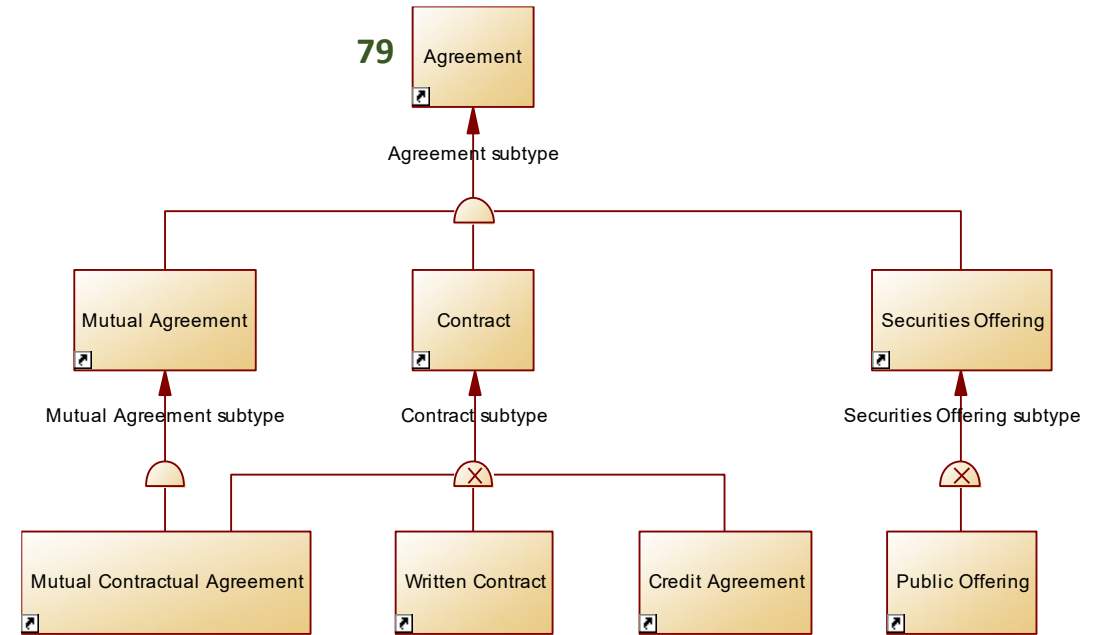




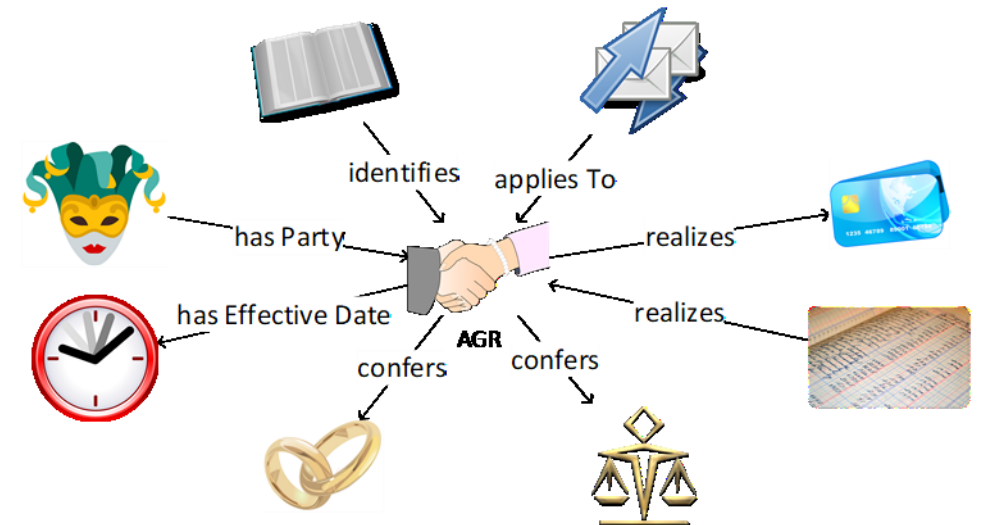
Agreement (AGR)

A negotiated and usually legally enforceable understanding between two or more legally competent parties.

- Agreements break down into three subtypes, Mutual, Contracts, and Securities Offerings.
- Mutual Agreements are not transferable without the other party's consent.
- Credit Agreements are all forms of loans and lending.
- The Written Contract is supertype Service Agreements, Organization Covering Agreements, and Financial Instruments, among others.



- Agreements have TIR, Contract Parties or Parties in Role.
- Various Dates set terms for the Agreement.
- Agreements confer Commitments and Legal Elements.
- Accounts realize the Agreement, and in turn, Agreements realize Products and Services.
- Financial Instruments are Agreements and Transactions are Occurrence Kind. Hence, a REF, Security ID identifies the Security and Transactions apply to the Instrument.

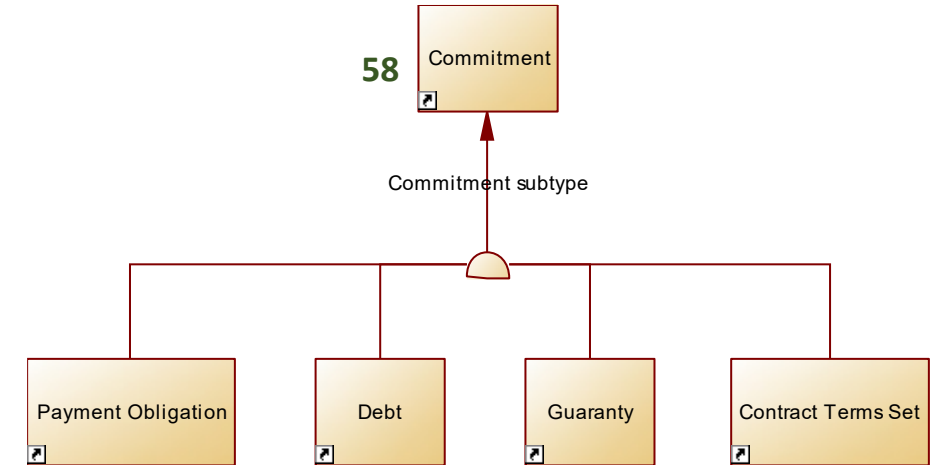




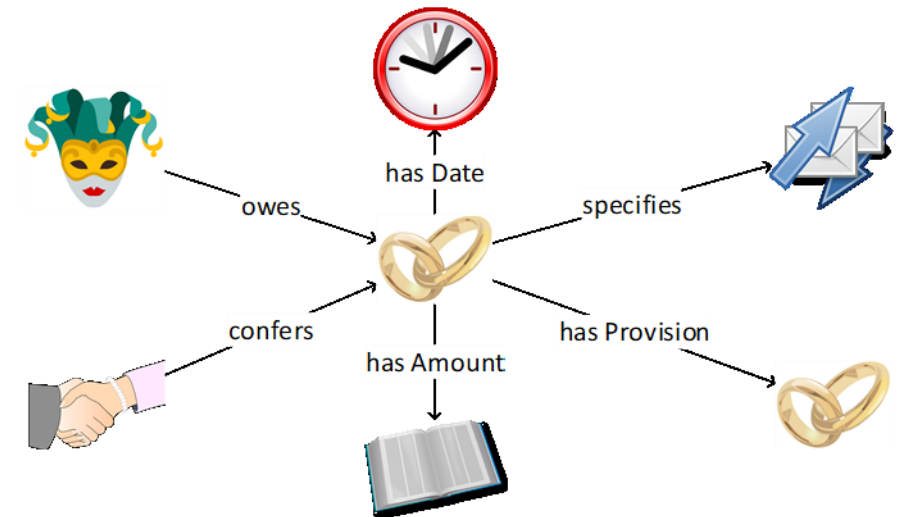
Commitment (COM)

A legal construct which represents the undertaking on the part of some party to act or refrain from acting in some manner.

- The financial subtypes of Commitment, Payment Obligation, Debt and Guaranty are self explaining.
- The Contract Terms Set should be used for other commitments specified in a contract.



- Contracts confer Commitments.
- A debtor, TIR owes or is owed Debt.
- Commitments have various dates and often References, such as Amount, Rate, and Interest.
- Commitments specify Occurrence Kinds, such as payments, interest calculations in loans and swaps.
- A Commitment can be broken down into sub commitments

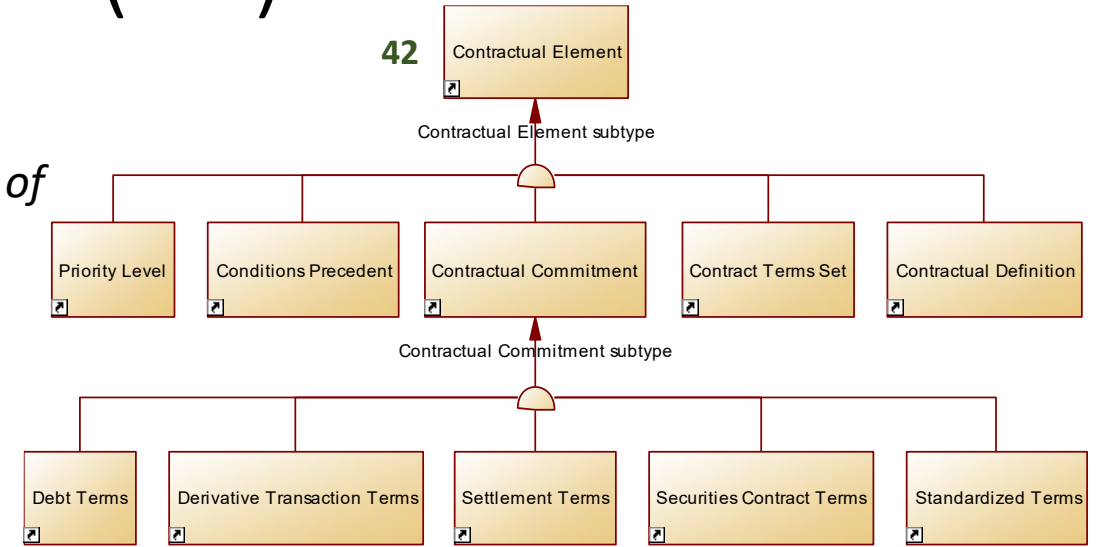




Contractual Element (CE)

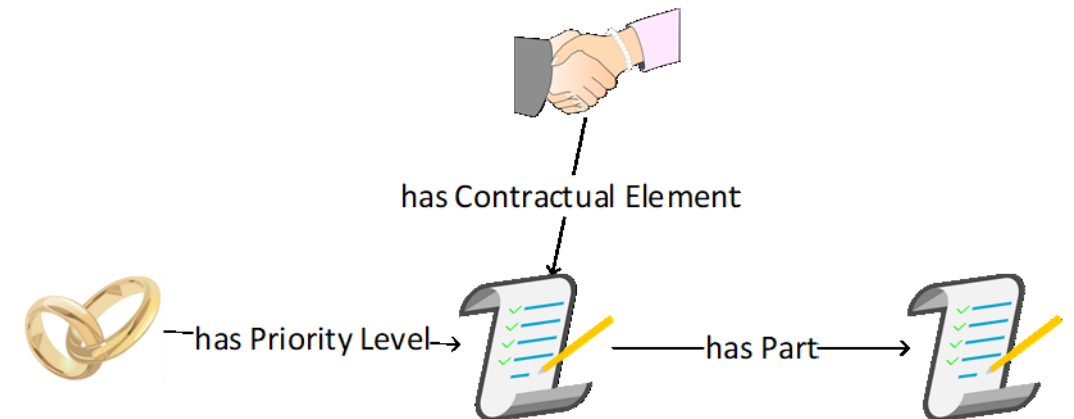
General and special arrangements, provisions, requirements, rules, specifications, and standards that form an integral part of an agreement or contract.

- Contractual Elements can be Priority, as in Loans, Conditions, Terms and the Definition of the Contract.
- We mainly use the Contractual Commitment in Financial Markets for Debt Terms, Settlement, and Derivatives.



Note that the Contractual Commitment is also a subtype of the Mutual Commitment, a COM, which handles most relationships.

- Agreements, Contracts have Contractual Elements.
- The CE can have Parts that are (sub) Contractual Elements.
- Commitments can have Priority Level. For example, Debt priority in case of bankruptcy.

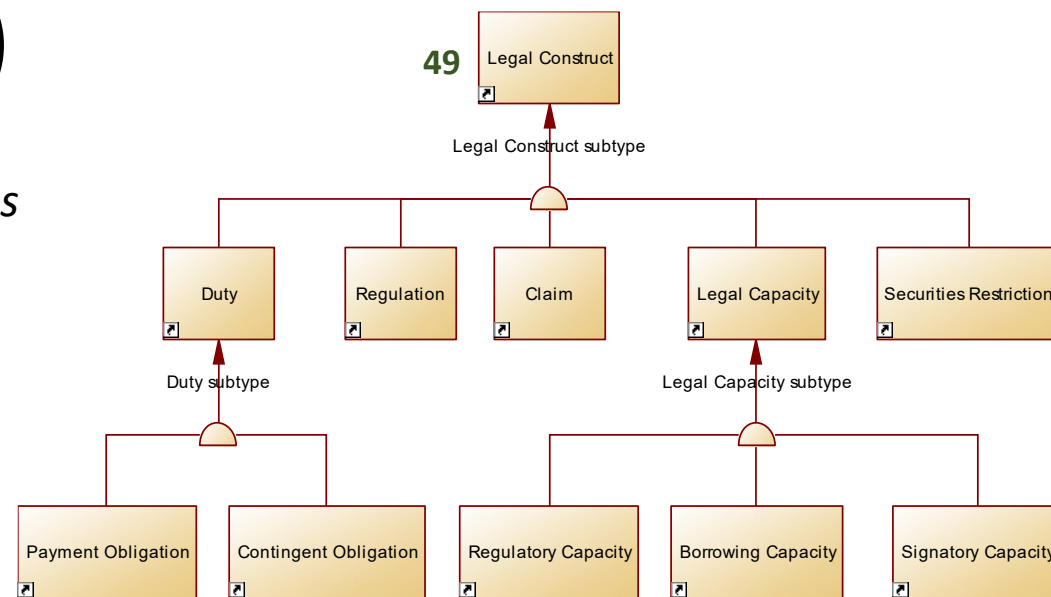




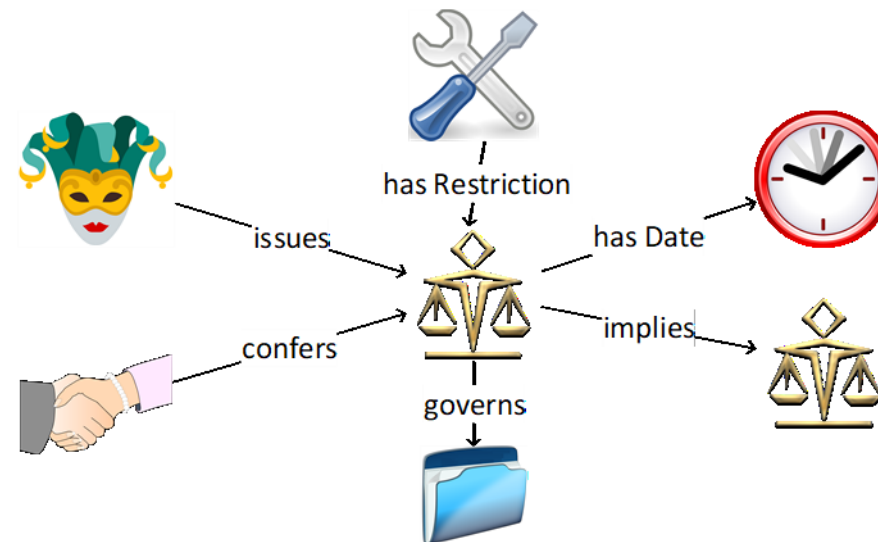
Legal Construct (LC)

Something which is conferred by way of law or contract, such as a right.

- Legal Constructs break down into Duty to pay or fulfill a contractual obligation, Regulations, Claims, Securities Restrictions and Legal Capacity.
- The Signatory Capacity defines, who can sign on behalf of a Legal Person. Borrowing Capacity is the amount you can borrow under a credit facility.



- Things in Role, for example Regulatory Authorities issue Regulations, Legal Constructs.
- Agreements may confer Legal Constructs.
- Services and Products may have Restrictions
- A Legal Construct may imply, mandate, or apply to other Legal Constructs.
- Th LC governs Documents and may have effective Dates.



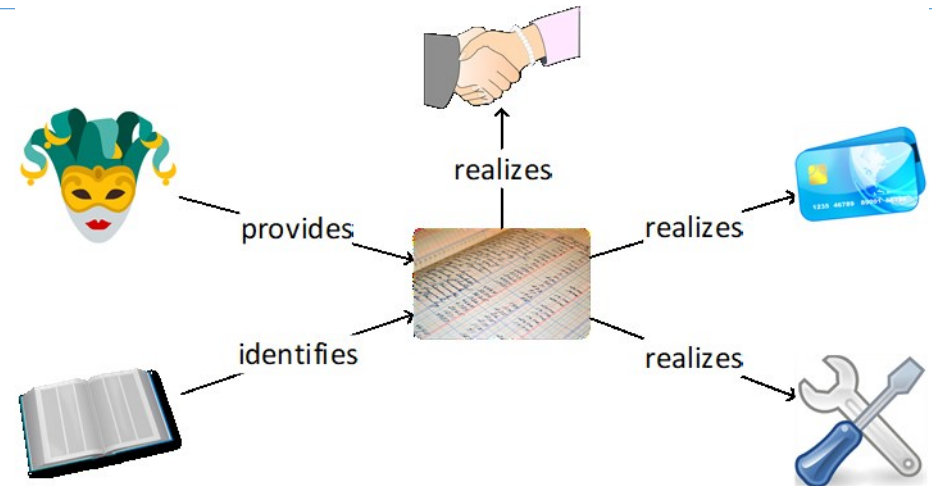
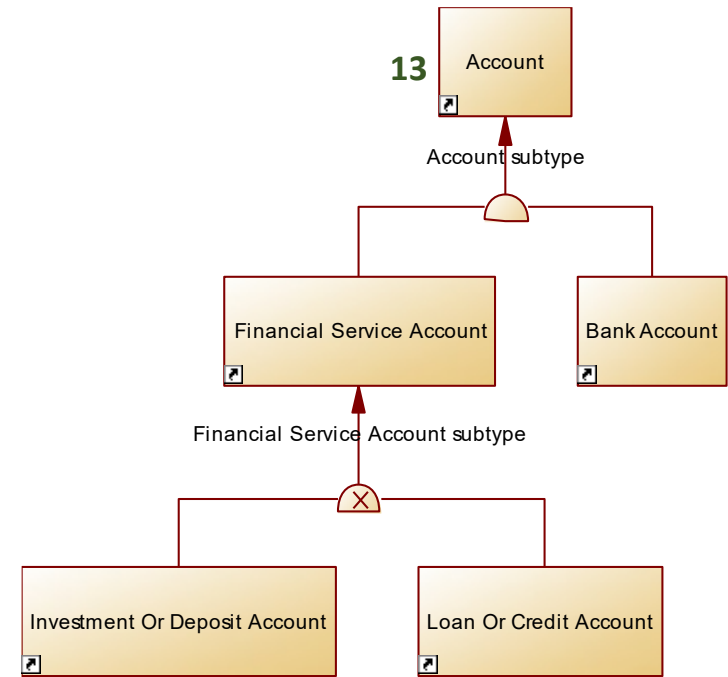


Account (AC)

A container for records associated with a business arrangement for regular dealings or services (such as personal or professional services, banking).

- Accounts currently have Financial Service and Bank Accounts as subtypes.
- Financial Services Accounts are Investment, Deposits, Loans, Credits, and other services.
- Expect General Ledger Accounts in the future.

- Things in Role, Financial Service Providers, Things in Role provide accounts to their customers.
- The Account realizes a Financial Services Agreements, and in turn, the underlying Product or Service.
- The Account number to identify an Account is a Reference.



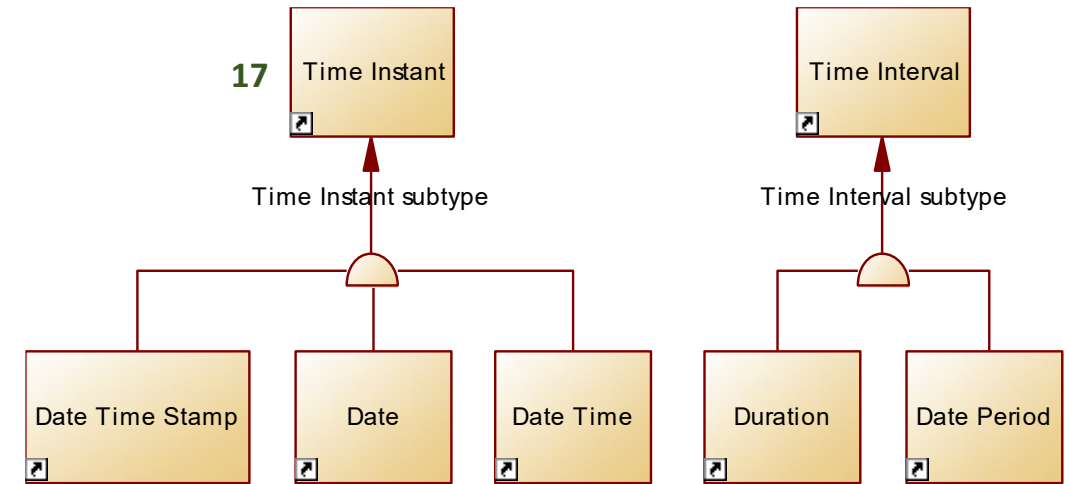


Time (TI)

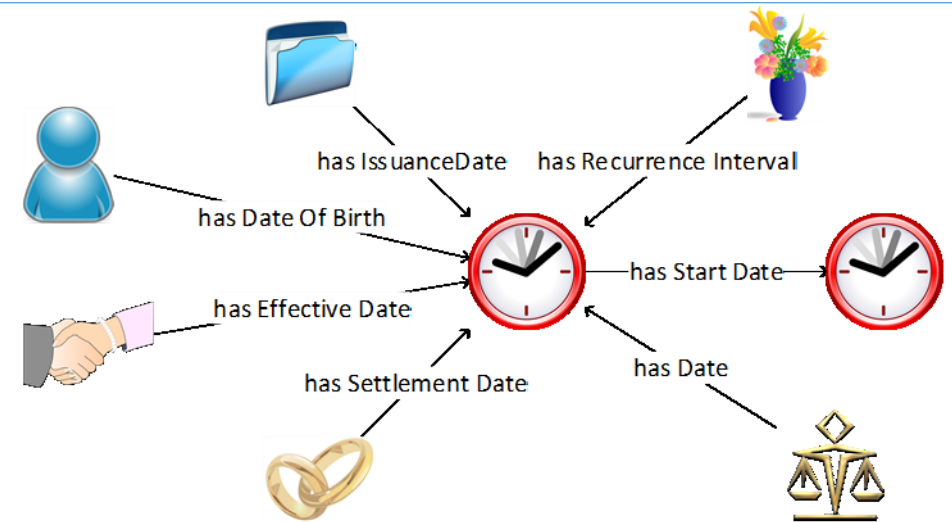
Time Instant: A temporal entity that is a member of a time scale, with no extent or duration

Time Interval: a segment of the time axis, a location in time, with an extent or duration

- Time Instant subtypes reflect precision, Date, datetime, and timestamp.
- The Time Interval can be a Duration (e.g., 10-year) or the period between two dates.



- Every concept has time Instants or Intervals.
- A Person, AA has a date of birth.
- Documents have issuance dates.
- Commitment have settlement dates.
- Arrangements may specify recurrence and other intervals.
- Time Intervals have Start and End Dates.



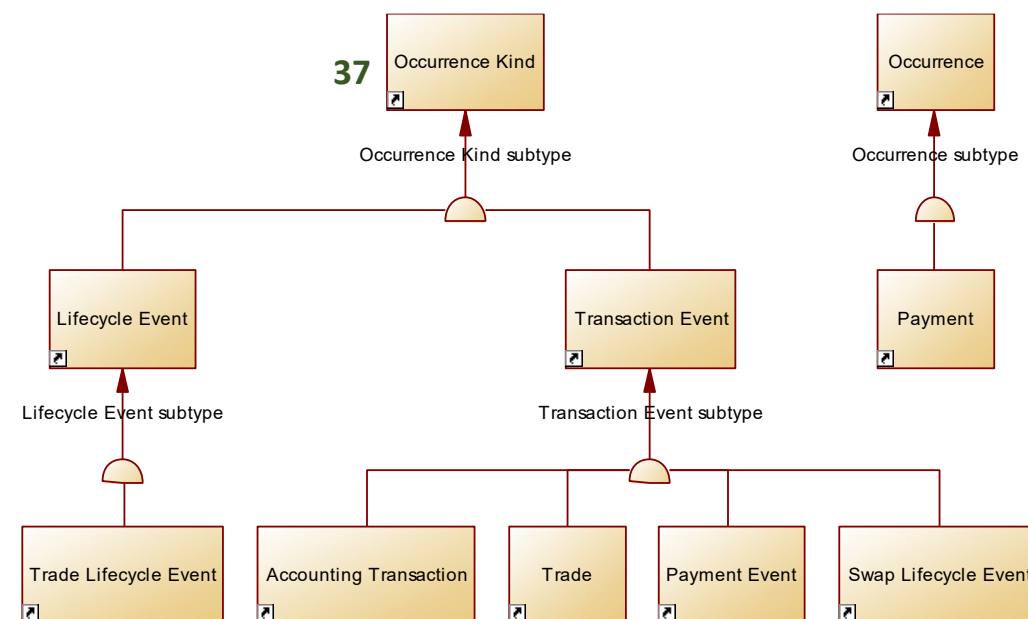


Occurrence (OCC)

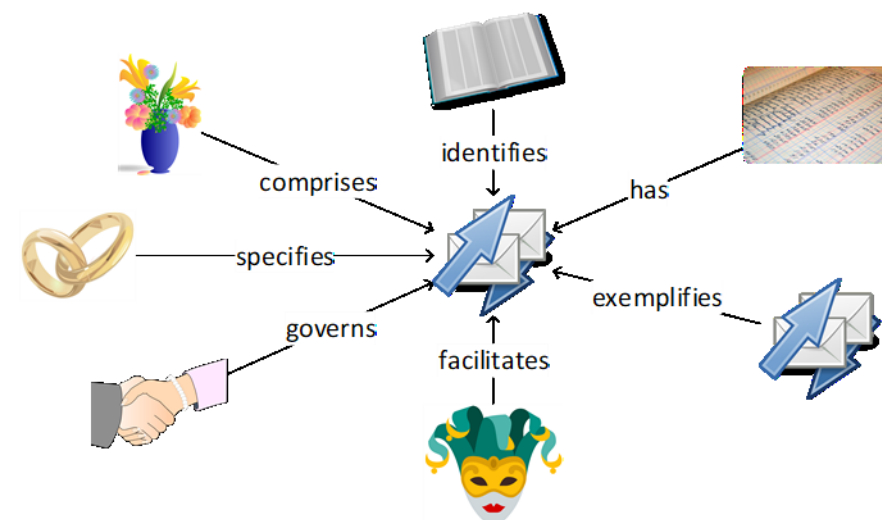
An Occurrence is a happening of an Occurrence Kind.

Instances of Occurrence Kind are types of events, each having a description.

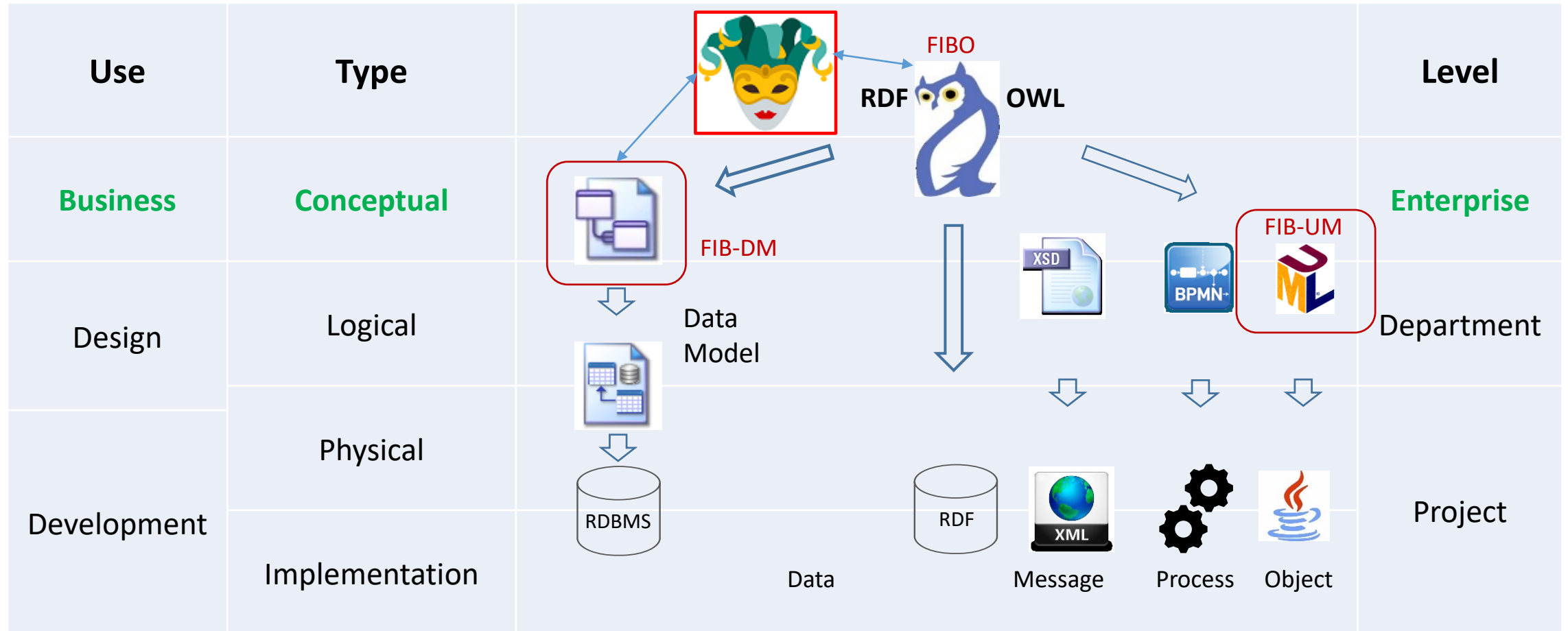
- Transaction Events are the most important Occurrence Kinds.
- We find Trade, Payment, Swap and Accounting Transactions.
- Lifecycle Events occur during the stages of a Lifecycle.
- The Occurrence, the actual instance of an event follows the Occurrence Kind Structure. For example, a Payment is an instance of the Payment Event.



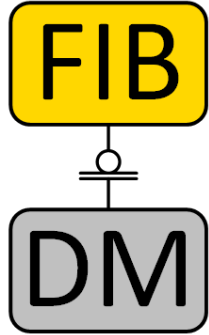
- Commitments and Agreements may specify for certain Occurrence Kinds to happen.
- Arrangement can comprise of Occurrence Kinds.
- A Reference identifies the Occurrence, for example a transaction or trade ID.
- The Occurrence exemplifies the Occurrence Kind.
- Accounts have transactions
- Things in Role may facilitate Occurrences.



Semantic Enterprise Information Architecture



References and further reading



The FIB-DM website

- scalable SVG diagrams of the complete subtype hierarchies
<https://fib-dm.com/financial-industry-business-concept-diagrams/>
- Diagrams of the Concept Maps
<https://fib-dm.com/financial-industry-business-concept-relationships/>



Follow the FIB-DM LinkedIn page for news, updates, and to read and share comments.

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



Watch FIB-DM Education videos on YouTube.

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



FIBO references on the Enterprise Data Management Council website

<https://spec.edmcouncil.org/fibo/>





(and other data modeling tools)

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