

Common Domain Model (CDM™)
CDM Collateral Working Group
29th October 2024



- 1. Summary of CDM collateral start up guide workshop 23/24 September**
- 2. Transforming Legacy CSAs into CDM with AI**
- 3. Explore AND/OR Eligibility rules in the CDM**
- 4. CDM Asset refactoring – potential impact to Eligible Collateral Criteria Asset identity**

- **CDM Collateral Workshop**
- Representatives from Blackrock, Bloomberg, BNP Paribas, BNYMellon, Citi, D2LT, DRS, Equilend, Euroclear, FIS, JPMorgan, OSTTRA, Pirum, ZKB
- Covered 6 Modules over 2 days
 - First day introduced the CDM, its architecture, modelling language, interfaces and background
 - Second day focused on Collateral Use cases
 - Very hands on workshop with people actually doing some modelling and using the tools available e.g. Rosetta, Object Builder
 - Great interaction between attendees
- Feedback very positive with great ideas for follow ups

“Very interesting and well-pitched”

“I think this course is great and shows great potential, it really brought the model to life for me”

“[more] Visuals on basics, e.g. where CDM sits between the participants”

“[more] Design principles, applications and sample use cases”

DAY ONE - CDM Collateral Start-up Guide Workshop – Monday, September 23, 2024

8:30 AM	Registration and Continental Breakfast
9:00 AM	Introduction and Welcoming Remarks Chris Rayner, Senior Associate- Market Infrastructure & Technology ISLA Vernon Alden-Smith, Director Collateral Initiatives ISDA
9:15 AM	Introduction to the CDM Module A will introduce you to some of the key concepts and explain how the CDM solves real world problems in financial markets. You will be guided through the first module following on your own devices with opportunities to ask questions.
9:45 AM	How the CDM Works The second module B in the series explains how you can access the CDM and introduces the main tools. There will be interactive opportunities to become familiar with creating your own workspaces and navigating around the CDM model guided by the tutors.
10:45 AM	Morning Break
11:15 AM	Accessing the CDM The third module C in the series introduces you to some of the key concepts and models in the CDM; you will have an opportunity to gain some hands-on experience writing basic code and understanding the various namespaces in the CDM including collateral documents and eligibility terms.
1:00 PM	Lunch
2:00 PM	How the CDM is Used The fourth module D in the series explains how the CDM is used within financial services to deliver key initiatives. You will understand how the CDM is translatable in various formats, how user interfaces can help you build CDM code for eligible collateral including hands on demos. This section also covers how CDM can be used to run operational functions using standard code.
3:45 PM	Afternoon break
4:15 PM	Recap and End of Day One Discussion The last session of the day will be an opportunity to recap what you have learned, ask questions and have a general roundup of the day's activity.
4:45 PM	Day One Concludes

DAY TWO - CDM Collateral Start-up Guide Workshop – Tuesday, September 24, 2024

8:30 AM	Registration and Continental Breakfast
9:00 AM	CDM Collateral Use Cases – Part One Day 2 will cover Module E and the collateral use cases in more detail, you will drill-down on some specifics to demonstrate how the CDM can be used to improve business operations within collateral. Part One will focus on the Collateral documentation use cases with opportunities to explore clauses in documents and translate test data into CDM.
10:30 AM	Morning Break
11:00 AM	CDM Collateral Use Cases – Part Two Part two of Module E will focus on the eligible collateral use cases, you will learn how to build an eligible collateral schedule as CDM, use functions to combine data and run eligibility checks. Other collateral use cases such as cash interest calculation and the margin call process will also be covered.
1:00 PM	Lunch
2:00 PM	Summary and Recap on CDM Collateral Use Cases This session will be an opportunity to recap on what you have learned about collateral use cases in Module E, ask questions and have a general roundup of the mornings activity.
2:30 PM	Advanced Features Parts of the final module F will be covered, introducing you to some of the more advanced concepts in the CDM that enable the model to be adopted to transform the processing of financial data. Including how to become involved, join the various working groups and current roadmap.
3:00 PM	Recap and End of Day Two Discussion The last session of the day will be an opportunity to recap what you have learned in day two, ask questions and have a general roundup of the whole event including how to provide feedback.
3:30 PM	Day Two Concludes

Credit Support Annexes (CSAs)

- Governs collateral arrangements in OTC derivatives, mitigating counterparty risk
- Sets the rules for exchanging collateral between parties

Common Domain Model (CDM)

- Industry-standard model for standardizing derivatives data
- Digitizing CSAs into CDM JSON format enhances efficiency and data consistency

Challenges with Legacy CSAs

- Unstructured, diverse legal documents
- Variations in legal terms, formats, customizations, and jurisdictions create inconsistencies
- Multiple versions (English Law, NY Law, VM CSA..)

Generative AI Solution

- Extracts key terms from various CSA versions
- Converts unstructured documents into standardized CDM format
- Facilitates automation, digitization, and standardization in collateral management

Objectives

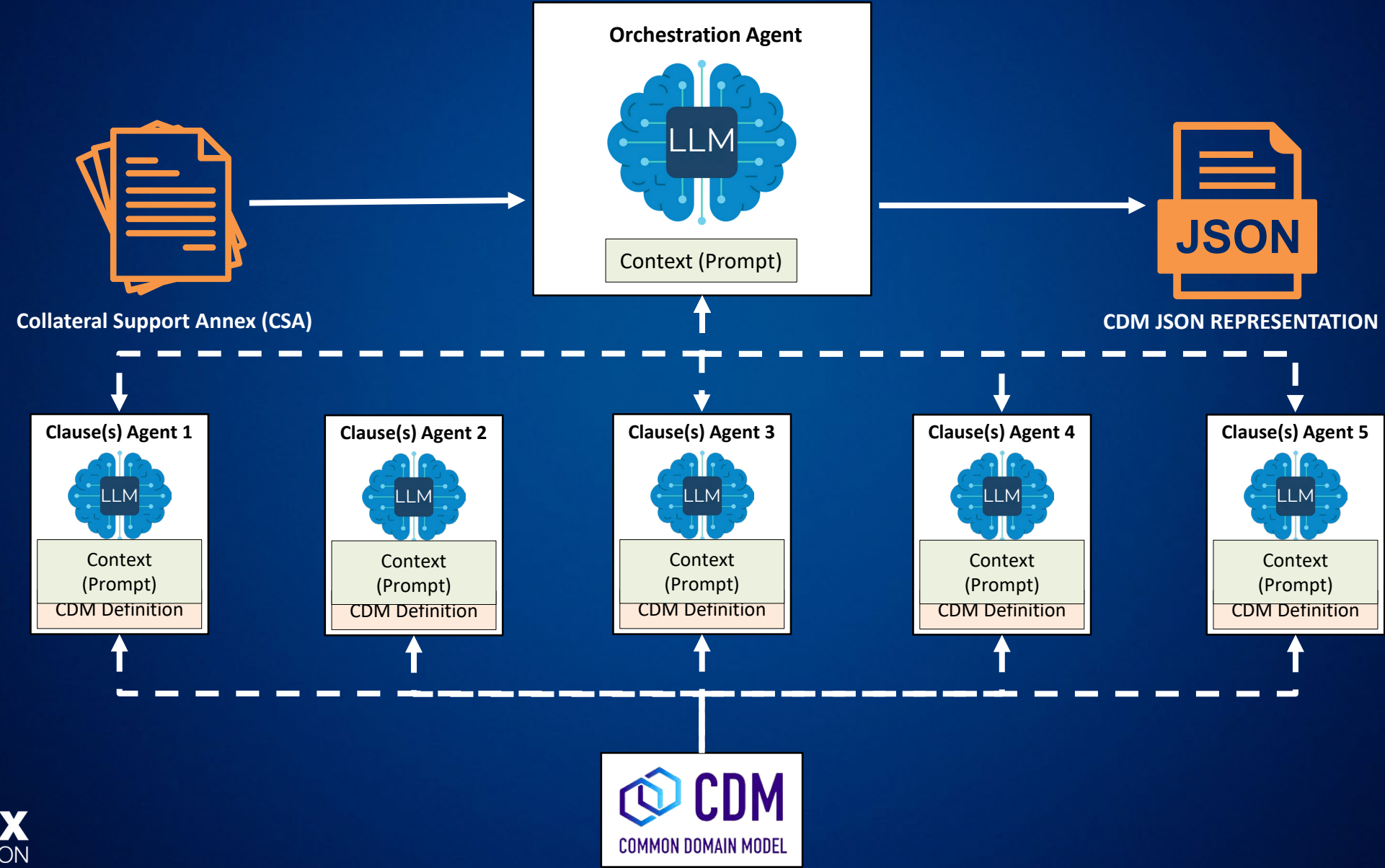
- Develop a scalable framework for extracting and standardizing CSA terms into CDM

ISDA & AWS Collaboration

- ISDA partnered with AWS AI Cloud Innovation Center (AI CIC) to research and develop a cutting-edge AI framework for CSA standardization

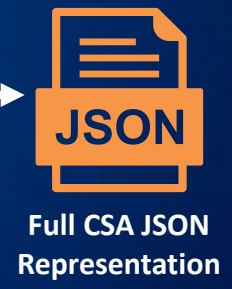
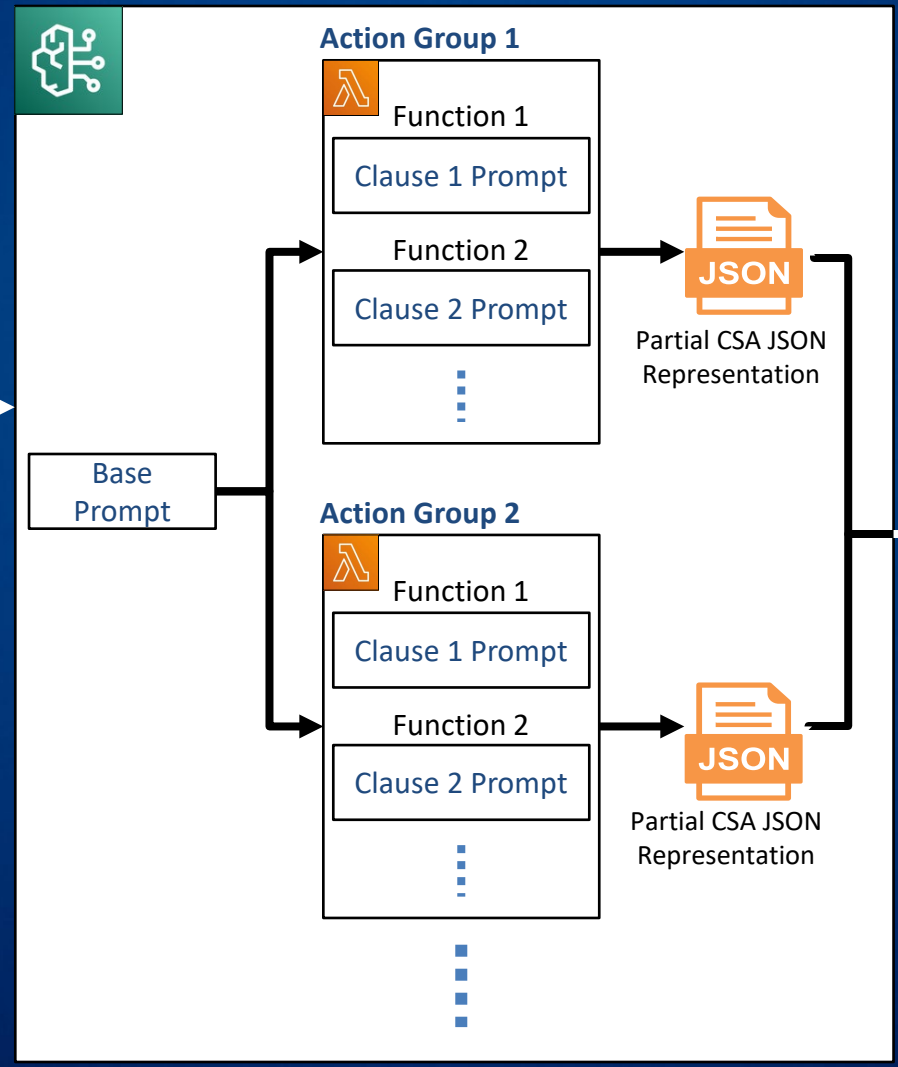
Key Goals

- Harness Generative AI in handling complex legal documents
- Improve accuracy in processing various CSA versions
- Enhance operational efficiency and standardization in collateral management
- Develop a scalable solution that can adapt to future industry needs



CDM Multi-Agent Architecture AWS Bedrock

Bedrock Agent



AI in Action: CSA to CDM Conversion Demo

Next Steps

- Benchmark LLMs for extraction of CSA terms into CDM format
 - Explore fine-tuning foundational LLMs

Background

- Eligible Collateral is modelled using the data type **EligibleCollateralSpecification** which can contain many **EligibleCollateralCriteria**, which are themselves constructed from **CollateralTreatment**, **IssuerCriteria** and **AssetCriteria**.
- The attributes **isIncluded** (true/false) and **qualifier** (all/any) can be used to model some simple cases of and / or logic in the construction of certain parts of the criteria (eg **AgencyRatingCriteria**).
- WG members have requested that the functionality is extended to enable more complex combinations of AND and OR logic across multiple terms, as seen in this example screenshot.
- This can be thought of as an algebraic logic problem where more permutations are permitted, such as:

a OR b

a OR (b AND c)

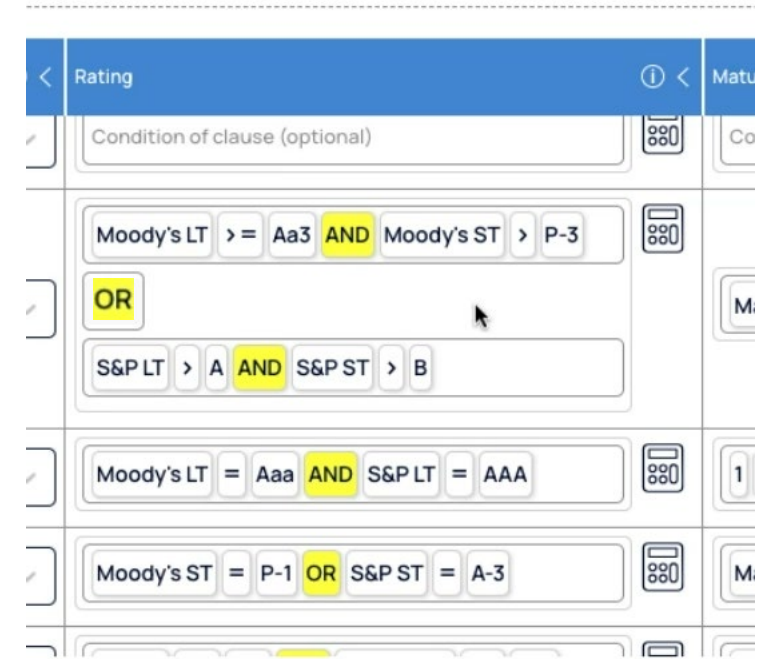
(a OR b) AND (c or d)

(a AND NOT b) or c

etc

a AND b

(a OR b) AND c



Design

- This can be thought of as an algebraic logic problem where more permutations are permitted, such as:

a OR b

a OR (b AND c)

(a OR b) AND (c or d)

a AND b

(a OR b) AND c

(a AND NOT b) or c

etc

Implications

- We believe it is possible to enhance the model to support more complex logic.
- However, the implication may be more complex modelling of both the data types and attributes within Eligible Criteria and of the model when projected, e.g. into JSON.
- In mitigation, it would be expected that most end-users will be interacting with vendor or member-owned UIs, not the actual model or raw data.

Working Group Decision

- Is this enhanced functionality necessary?
- Are the trade-offs appropriate?

Background

- The CDM consists of a number of core components, including the Product, Event and Process Models, and the Legal Agreements structure.
- The Product Model defines the construction of a **ContractualProduct** using **EconomicTerms** and has its heritage in the OTC derivatives market and FpML.
- As the CDM becomes more widely adopted and expands to cover all financial markets and products, we wish to close some of the modelling gaps and address some model issues so that it can be adopted more widely.

Concept of Asset

- We have introduced the concept of **Asset** which is defined as “something that can be held by one party and is transferable from one party to another” and has the following sub-types:
 - **Cash**
 - **Commodity**
 - **DigitalAsset**
 - **Instrument** – which is one of
 - **ListedDerivative**
 - **Loan**
 - **Security.**

Trades

- OTC trades are negotiated between two parties and in the CDM the result is represented by a **NonTransferableProduct**.
- We are introducing the concept of a **TransferableProduct** – ie the ability to trade one of the asset types without a bilateral contract. This will enable better modelling of cash FX, listed securities, exchange traded products, etc.

Collateral

- We intend to align the **AssetCriteria** definitions to the new Asset model, including:
 - Ability to define Assets which are eligible in an **AssetCriteria**, rather than “Products”.
- Also potential to align Enums used in Product Qualification with those used in Eligibility.

Implementation

- The introduction of **Asset** and **TransferableProduct** (and many additional related changes) is now available in CDM 6.0-dev and ISDA Foundations 3.0-dev. Also, see the documentation at <https://cdm.finos.org/docs/next/product-model>
- The production release of CDM 6.0 will be delivered by the end of this year.
- This can include enhancements to the Collateral model.

Asset Eligibility for Collateral

type EligibleCollateralSpecification:

identifier Identifier (0..*)
party Party (0..2)
counterparty Counterparty (0..2)
criteria EligibleCollateralCriteria (1..*)
partyRole PartyRole (0..*)

type EligibleCollateralCriteria **extends**

CollateralCriteriaBase:
treatment CollateralTreatment (1..1)

type CollateralCriteriaBase:

issuer IssuerCriteria (0..*)
asset AssetCriteria (0..*)
appliesTo CounterpartyRoleEnum (0..2)

type AssetCriteria:

collateralAssetType AssetType (0..*)
assetCountryOfOrigin ISOCountryCodeEnum (0..*)
denominatedCurrency CurrencyCodeEnum (0..*)
agencyRating AgencyRatingCriteria (0..*)
maturityType MaturityTypeEnum (0..1)
maturityRange PeriodRange (0..1)
assetIdentifier AssetIdentifier (0..*)
collateralTaxonomy CollateralTaxonomy (0..*)
domesticCurrencyIssued boolean (0..1)
listing ListingType (0..1)

was previously:

productIdentifier ProductIdentifier (0..*)

type AssetIdentifier:

identifier string (1..1)
 [metadata scheme]
identifierType AssetIdTypeEnum (1..1)

ultimately uses:

enum ProductIdTypeEnum:
 BBGID
 CUSIP
 ISIN
 Name
 RIC
 SEDOL
 <"etc...">

condition AssetCriteriaChoice:

optional choice collateralAssetType,
 collateralTaxonomy, assetIdentifier

Leverage the new “Asset” for Eligibility for Collateral

Change to use **Asset** would provide richer mechanisms to describe the assets that are eligible while still retaining the use of specification by an **identifier**:

type AssetCriteria:

collateralAssetType AssetType (0..*)
assetCountryOfOrigin ISOCountryCodeEnum (0..*)
denominatedCurrency CurrencyCodeEnum (0..*)
agencyRating AgencyRatingCriteria (0..*)
 maturityType MaturityTypeEnum (0..1)
 maturityRange PeriodRange (0..1)
asset Asset (0..*)
collateralTaxonomy collateralTaxonomy (0..*)
 domesticCurrencyIssued boolean (0..1)
 listing ListingType (0..1)

condition AssetCriteriaChoice:

optional choice collateralAssetType,
 collateralTaxonomy, asset

choice Asset:

Cash
 Commodity
 DigitalAsset
 Instrument

choice Instrument:

ListedDerivative
 Loan
 Security

type Security **extends** InstrumentBase:

securityType SecurityTypeEnum (1..1)
 debtType DebtType (0..1)
 equityType EquityTypeEnum (0..1)
 fundType FundProductTypeEnum (0..1)

type AssetBase:

identifier AssetIdentifier (1..*)
taxonomy Taxonomy (0..*)
 isExchangeListed boolean (0..1)
 exchange LegalEntity (0..1)
relatedExchange LegalEntity (0..*)



“Listing” already exists to support indices for Eligibility for Collateral

type AssetCriteria:

collateralAssetType AssetType (0..*)
assetCountryOfOrigin ISOCountryCodeEnum (0..*)
denominatedCurrency CurrencyCodeEnum (0..*)
agencyRating AgencyRatingCriteria (0..*)
 maturityType MaturityTypeEnum (0..1)
 maturityRange PeriodRange (0..1)
asset Asset (0..*)
collateralTaxonomy collateralTaxonomy (0..*)
 domesticCurrencyIssued boolean (0..1)
listing ListingType (0..1)

condition AssetCriteriaChoice:

optional choice collateralAssetType,
 collateralTaxonomy, asset

type ListingType:

exchange string (0..*)
 [metadata scheme]
 sector string (0..*)
 [metadata scheme]
index Index (0..*)

choice Index:

CreditIndex
 EquityIndex
 InterestRateIndex
 ForeignExchangeIndex
 OtherIndex

Defect to be fixed:
 These three attributes
 currently have (0..1)
 cardinality

type EquityIndex extends IndexBase:

type IndexBase extends AssetBase
name string (0..1)
 [metadata scheme]
 provider LegalEntity (0..1)
 assetClass AssetClassEnum (0..1)

type AssetBase:

identifier AssetIdentifier (1..*)
taxonomy Taxonomy (0..*)
 isExchangeListed boolean (0..1)
 exchange LegalEntity (0..1)
relatedExchange LegalEntity (0..*)

Allows reference to an
 externally-maintained
 static data or **reference**
data source