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AI Professional Services:

- Data
- AI

Transforming Operations and Creating Customer Value

Feb 2025

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Simplifying CDM Implementation

CDM Trained CoPilot
Retrieval-Augmented Generation System

Feb 2025

Why?

Detailed And Comprehensive Model

Several Different Sources Of Data: Documentation And Code

Solution:

CDM AI Enabled Tutor:

- Teaches Concepts
- Provides Examples
- Provides References To Documentations and Source Code

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Optimizing Retrieval-Augmented Generation for CDM

Applying Large Language Models (LLMs) to financial pre-competitive use cases presents unique challenges, particularly in RAG on CDM documentation. Effective fine-tuning, integration of expert feedback, and synthetic trade data generation are critical hurdles in leveraging AI for standardizing derivative contracts. How can we optimize these processes to enhance accuracy, reliability, and adoption?

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Large Language Models (LLMs): Transforming Information Consumption and Generation

Large Language Models (LLMs) are fundamentally disrupting how we work, consume, and generate information. By leveraging vast amounts of data, LLMs provide new ways to interact with and understand content, making them indispensable tools for modern enterprises.

Their distinct features include:

- "Picture" of the World and “logical” decision-making;
- Focus on main elements in the provided information and ability to generalize;
- Ability to follow Instructions and generate controlled output;
- Awareness of Structured Query Language (SQL) syntax and dialects along with other programming languages.

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Limitations of LLMs in Corporate Environments

Limitations of Foundation Models and LLMs lie primarily in their UNAWARENESS of the Corporate Information Landscape:

1. **What** Corporate Information Exists?
2. **Where** Is Corporate Information Stored?
3. **How to Retrieve** Corporate Information?
4. **Who Can Access** What Information?
5. What Are the **Quality Metrics**?
6. Who **Owns** the Data and How Is It **Processed**?
7. What is the **Cost** of Data?

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Augmenting LLM’s Generative Capabilities with Corporate Information

What is Retrieval-Augmented Generation?

Retrieval-Augmented Generation (RAG) is the process of optimizing the output of a large language model, so it references an authoritative knowledge base outside of its training data sources before generating a response.

RAG extends the already powerful capabilities of LLMs to specific domains or an organization's internal knowledge base, all without the need to retrain the model.

Source: https://aws.amazon.com/what-is/retrieval-augmented-generation/

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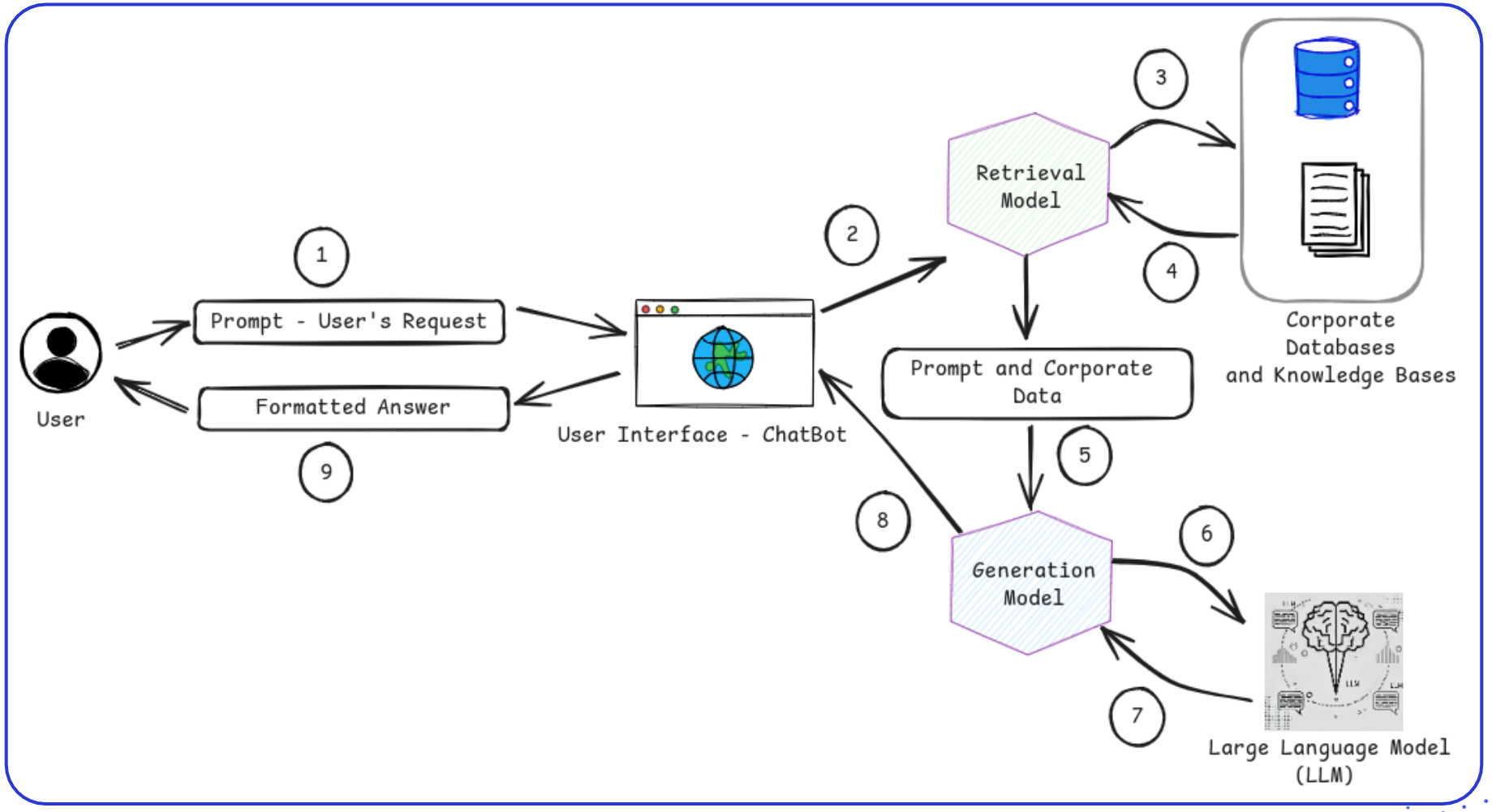
Retrieval-Augmented Generation (RAG) Concept



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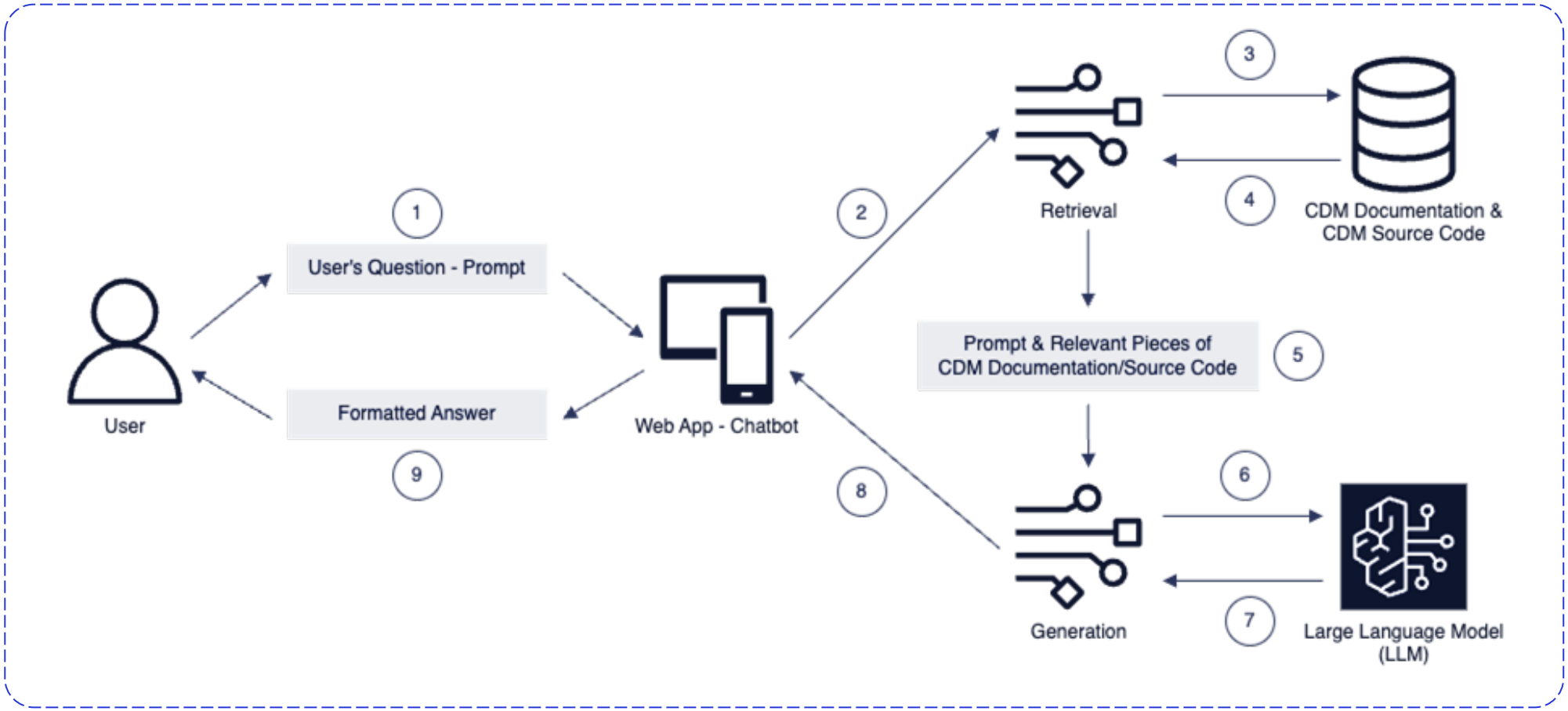
Flow Diagram



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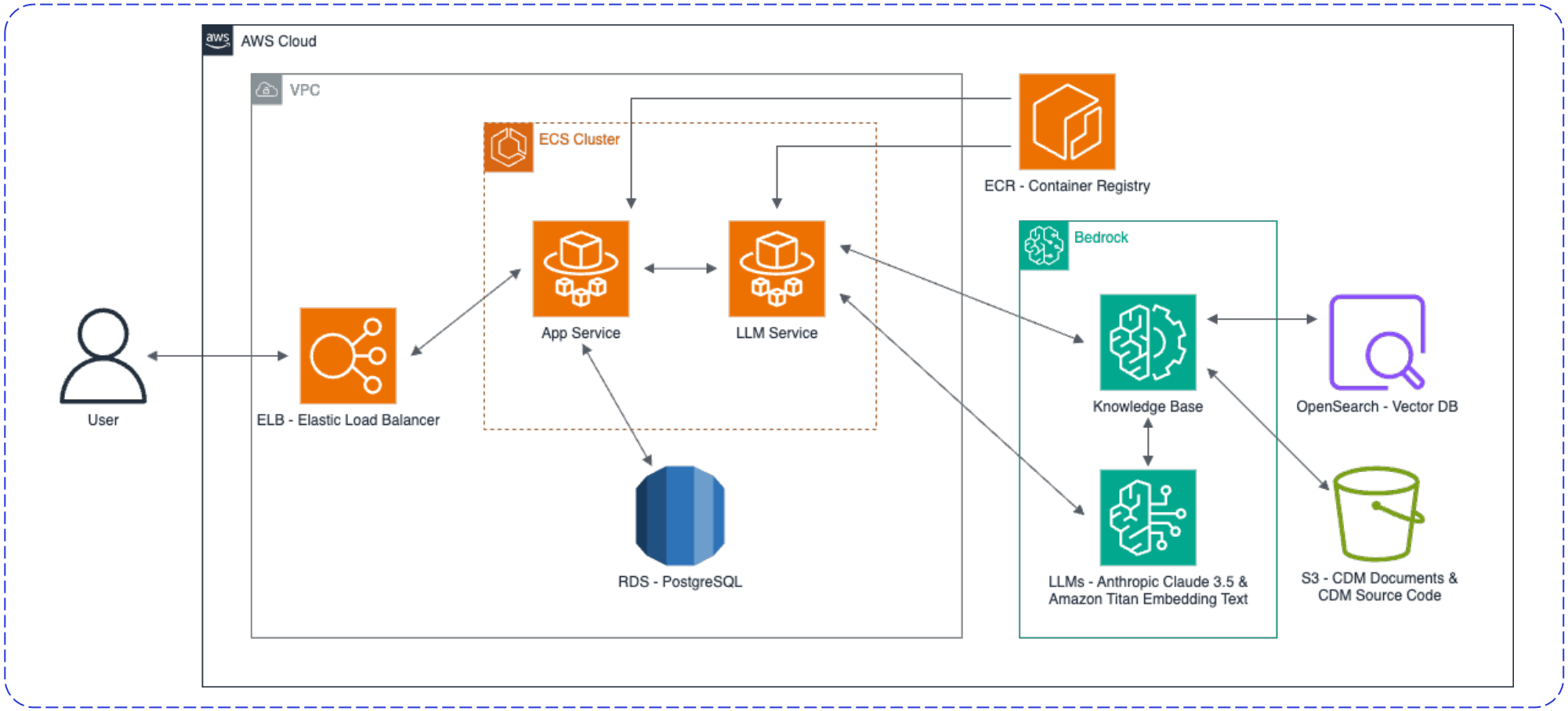
Architecture Diagram



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I What coverage does the CDM have of different publications of the ISDA CSA

Based on the information provided, the CDM covers several publications of the ISDA Credit Support Annex (CSA) and related agreements. Specifically, the CDM supports the following:

Initial Margin Agreements:

- ISDA 2016 Phase One Credit Support Annex (CSA) (Security Interest -- New York Law)
- ISDA 2016 Phase One Credit Support Deed (CSD) (Security Interest -- English Law)
- ISDA 2016 Phase One CSA (Loan -- Japanese Law)
- ISDA 2018 CSA (Security Interest -- New York Law)
- ISDA 2018 CSD (Security Interest -- English Law)

Variation Margin Agreements:

- ISDA 2016 CSA for Variation Margin (VM) (Security Interest - New York Law)
- ISDA 2016 CSA for VM (Title Transfer -- English Law)
- ISDA 2016 CSA for VM (Loan -- Japanese Law)
- ISDA 2016 CSA for VM (Title Transfer -- Irish Law)
- ISDA 2016 CSA for VM (Title Transfer -- French Law)

The CDM also supports various Collateral Transfer Agreements (CTAs) and Security Agreements related to these CSAs, as well as some aspects of the ISDA Master Agreement Schedule.

This coverage allows for a comprehensive digital representation of these legal agreements within the CDM framework, supporting standardization and automation of processes related to these agreements.

Sources

Common Domain Model (CDM) documentation

1. https://cdm.finos.org/docs/cdm-materials/
2. https://cdm.finos.org/docs/cdm-overview/
3. https://cdm.finos.org/docs/legal-agreements/
4. https://cdm.finos.org/docs/CDM-Collateral-WG/
5. https://cdm.finos.org/docs/home/

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I Can the CDM present the data required for a margin call message

Yes, the CDM can represent the data required for a margin call message. Based on the information provided, the CDM includes several types and attributes specifically designed for margin call messaging. Here are some key components:

1. MarginCallBase: This is a base type that represents common attributes required for both Issuance and Response to a Margin Call action.
2. MarginCallIssuance: This type extends MarginCallBase and represents attributes required for a Margin Call Issuance under a legal agreement.
3. MarginCallResponse: This type also extends MarginCallBase and represents attributes required for a Margin Call Response.
4. MarginCallInstructionType: This type represents enumeration values to specify the call notification type, direction, and specific action type.
5. CollateralPortfolio: This type represents common attributes to define the details of collateral assets, to be used in margin call messaging and contribute to collateral balances.

These types include various attributes that capture essential information for margin call messages, such as:

- Parties involved
- Call identifiers
- Agreement types
- Exposure amounts
- Collateral positions and balances
- Call amounts
- Response actions

The CDM's structure allows for detailed and standardized representation of margin call data, supporting both the issuance and response aspects of the margin call process.

Sources

Common Domain Model (CDM) documentation

1. https://cdm.finos.org/docs/use-cases/

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Common Domain Model (CDM) source (

Provectus CDM COMMON DOMAIN MODEL

I How can the CDM handle bespoke language outside of normal terms fond in collateral agreements

The CDM provides a way to handle bespoke language or additional terms in collateral agreements that fall outside of standard terms. This is done through the use of the `Clause` type.

According to the provided information, the `Clause` type is defined as:

```
type Clause:
    identifier string (0..1)
    terms string (0..1)
    subcomponents Clause (0..*)
```

This type allows for:

1. An optional identifier for the clause
2. The content of the bespoke clause as a string
3. Additional hierarchical components of the clause if relevant

The `Clause` type can be used in various parts of the CDM model where additional, non-standard terms might be needed. For example, in the `AdditionalDisruptionEvents` type, there's an attribute:

```
additionalBespokeTerms Clause (0..*)
```

This allows for the inclusion of any extra bespoke agreements related to extraordinary events that aren't covered by the standardized terms.

By using the `Clause` type, the CDM provides flexibility to capture and represent bespoke language or additional terms that may not fit into the predefined structure of the model, ensuring that all aspects of a collateral agreement can be represented digitally.

Sources

Common Domain Model (CDM) documentation

1. https://cdm.finos.org/docs/eligible-collateral-representation/
2. https://cdm.finos.org/docs/CDM-Collateral-WG/
3. https://cdm.finos.org/docs/legal-agreements/

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source/src/main/rosetta/legaldocumentation-master-type.rosetta

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Provectus CDM COMMON DOMAIN MODEL

I Can the CDM represent Eligible Collateral terms

Yes, the CDM can represent Eligible Collateral terms. The CDM provides a standard digital representation for collateral eligibility data, which is crucial for various purposes including representation in legal agreements governing transactions and workflows.

Key aspects of the CDM's Eligible Collateral representation include:

1. A comprehensive digital representation to support data requirements for universally identifying collateral types.
2. The ability to identify attributes of collateral that contribute to risk, such as asset type, interest structures, economics, and unique characteristics.
3. Use of data standards to specify eligibility-related information like haircuts, credit ratings, and asset maturity terms.
4. Functions to apply treatment rules to predefined collateral criteria, including include/exclude logic.
5. Application of treatment rules for concentration limits caps by percentage or value.
6. Attributes to identify regulatory rules by defined eligibility identification categories.
7. Means of identifying schedules and constructing reusable collateral profiles.

The CDM uses the `EligibleCollateralSpecification` data type as a root type to represent eligible collateral. This includes components such as:

- Collateral Issuer Criteria
- Collateral Product Criteria
- Collateral Treatment

These components allow for detailed specification of eligible collateral, including issuer and asset characteristics, as well as treatment rules like haircuts and concentration limits.

This standardized representation in the CDM aims to facilitate digital negotiation, straight-through processing, and digitization of collateral management, allowing institutions to exchange eligible collateral information accurately and efficiently in digital form.

Sources

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2. https://cdm.finos.org/docs/legal-agreements/

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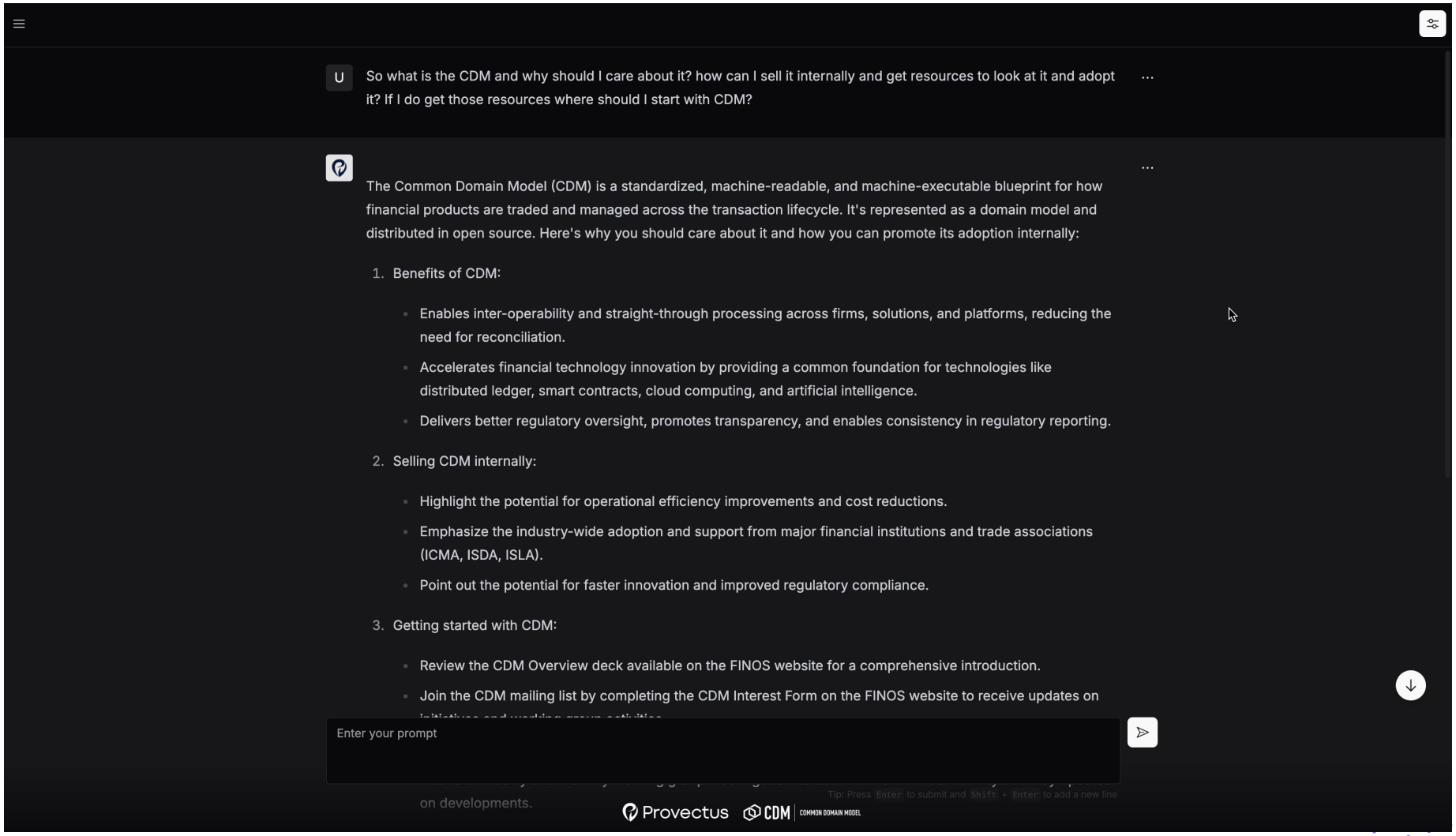
Demo



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