Chem-X Consortium

The Business Identity Guideline for the Chemical Industry

Version 1.0 – January 2026

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Project Coordinator	Dr Andreas Wollny
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Related Task(s)	Results and review of the existing BPDM system of Catena-X, Cofinity-X [1]and Manufacturing-X with regard to extensibility to interoperable business identifiers and data models beyond the Automotive industry.
Lead Organization	Cofinity-X
Contributing Partner(s)	BASF,Cofinity-X,Covestro,Henkel,Merck,SAP, Wacker, Spherity.
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History

Date	Version	Submitted by	Reviewed by	Comments
16.01.2025	1.0	Vikas Mishrikoti	The guideline was reviewed by the Chem-X TP2 team members.	
10.11.2025	0.9	Vikas Mishrikoti	The guideline was reviewed by the Chem-X TP2 team members and underwent an external consultation process from November 11 to November 30, 2025.	All comments and proposed changes received during the consultation period are documented and addressed separately.

Confinity-X is currently the operating company within Chem-X. In the future, these services may be provided by a different operating company.

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1. Summary

This document provides a comprehensive analysis and framework for extending Business Partner Data Management (BPDM) concepts from the automotive domain (as implemented in Catena-X, Cofinity-X, and Manufacturing-X) to the chemical industry under the Chem-X initiative.

It outlines:

- Foundational principles,
- Governance structures,
- Data models, and
- Interoperability standards

This is necessary to achieve secure, scalable, and cross-industry data exchange for business partner information.

The study emphasizes the role of the Business Partner Number (BPN) as a globally unique, ISO/IEC 6523-compliant identifier that ensures traceability, trust, and data quality across data spaces.

Chem-X builds upon a proven identity and trust architecture, harmonizing with European and international frameworks such as CEN/CLC/JTC 24 and the EU Digital Product Passport (DPP) initiative by leveraging Catena-X standards—including CX-0010 (BPN), CX-0012 (Data Pool API), CX-0074 (Gate API), CX-0018 (Dataspace Connectivity), and CX- 0149 (Verified Company Identity). —This document also details BPDM's reference architecture, data exchange governance, and the "Golden Record" concept to ensure data integrity.

It evaluates the onboarding process, identifier types, and lifecycle management of business partners, providing clear technical and governance guidance.

Strategically, the Chem-X approach accelerates adoption by leveraging established Catena-X standards, reduces integration costs, and ensures compliance with EU and ISO norms.

Additionally, it establishes a unified, interoperable foundation for trusted data exchange across industries—enhancing transparency, compliance, and sustainability throughout global supply chains.

2. Keywords

2.1. Data Management and Governance

- Business Partner Data Management (BPDM)
- Business Partner Number (BPN)
- Golden Record
- Data quality
- Data governance
- Identifier standards
- Address identifier
- Site representation

2.2. Standards and Frameworks

- Chem-X
- Catena-X
- Cofinity-X
- Manufacturing-X
- Gaia-X
- ISO/IEC 6523
- DIN EN 18219
- EU standardization
- CEN/CLC/JTC 24

2.3. Digital Infrastructure and Identity

- Digital Product Passport (DPP)
- Verifiable Credential (VC)
- Identity and trust framework
- Data sovereignty
- Data space
- Legal entity
- Onboarding process
- Interoperability

3. Abbreviation and Acronyms

Table 1: Abbreviation/Acronyms and Full Form / Meaning

Abbreviation/Acronyms	Full Form / Meaning
AG	Aktiengesellschaft (German for Public Limited Company)
API	Application Programming Interface
BPN	Business Partner Number
BPNL	Business Partner Number – Legal Entity
BPNA	Business Partner Number – Address
BPNS	Business Partner Number – Site
BPDM	Business Partner Data Management
BMWK	Bundesministerium für Wirtschaft und Klimaschutz (Federal Ministry for Economic Affairs and Climate Action)
Catena-X	Catena-X Automotive Network
CEN/CLC/JTC 24	European Standard Technical Committee – Joint Technical Committee 24
Chem-X	Chemical Industry Extension of Catena-X
CX	Catena-X Standard Identifier Prefix
DIN EN	Deutsches Institut für Normung – European Norm
DPP	Digital Product Passport
DUNS	Data Universal Numbering System
GLN	Global Location Number
HRB	Handelsregisternummer (German Commercial Register Number)
IBR	International Business Registration
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
JTC	Joint Technical Committee
LEI	Legal Entity Identifier
NIF	Número de Identificación Fiscal (Tax Identification Number, Spain)
NPM	Non-Production Material
PI	Program Increment
TIN	Taxpayer Identification Number
Tfs	Together for Sustainability
UID	Unique Identifier
VAT	Value-Added Tax
VC	Verifiable Credential
W3C	World Wide Web Consortium

4. Introduction

The accurate and standardized exchange of business partner data is fundamental to achieving seamless collaboration, traceability, and compliance across supply chains. The automotive sector has been at the forefront of addressing this challenge through large-scale digital initiatives such as Catena-X, Cofinity-X, and Manufacturing-X, which aim to build secure, sovereign, and interoperable data spaces for industrial ecosystems.

The foundation of these initiatives is Business Partner Data Management (BPDM)—a distributed service-based system for managing legal entities, sites, addresses, and identifiers in a verifiable and consistent manner. BPDM systems rely heavily on identifiers like the Business Partner Number (BPN) to ensure traceability and trust across organizational boundaries. While initially tailored to meet the complex requirements of the automotive industry, the growing demand for cross-industry data interoperability raises a critical question: Can these BPDM systems be effectively extended and adapted to other sectors such as Chemical Industries.

This documentation presents a results-based review and critical assessment of the BPDM implementation in Catena-X, Cofinity-X, and Manufacturing-X. It examines how these systems manage identity and data modeling, evaluates their compliance with open standards (e.g., W3C, ISO, Gaia-X), and explores their potential for extendibility beyond the automotive domain. Special attention is given to interoperability challenges, governance models, and data sovereignty concerns that impact multi-sector adoption.

5. Objectives

To inform both technical and strategic stakeholders within the chemical industry about the viability, limitations, and required enhancements for adapting automotive-centric BPDM systems into cross-industry solutions. These adaptations aim to support scalable, trusted, and sovereign business partner data management. While the focus is on chemical sector applicability, Catena-X frameworks are explicitly referenced throughout the document, as they provide a foundational structure for interoperability and trust that can be extended beyond automotive use cases.

The main emphasis of this guideline is on Business Identity (the company's digital identity), While BPDM is available as an optional service for companies that wish to leverage Its additional benefits.

6. Business Partner Data Management (BPDM)

The Business Partner Data Management (BPDM) is a distributed service-based system, composed of a set of dedicated services, that simultaneously serve multiple stakeholders and use cases. It is based on a central data pool of business partners, which operates under data space governance and underlies interoperability through standardization.

The main target is to create business partner data records (such as customer/supplier) with a high quality and currentness, to provide other processes with these data. This results in less rework and adjustment due to better master data quality, which ultimately leads to an overall cost reduction for participating companies.

Additionally, Value Added Services should be offered to enrich those business partner data sets even further and give additional information or warnings about the business partners. Getting a 360° view on your business partners also helps with reducing costs and achieving process excellence because better decisions can be made.

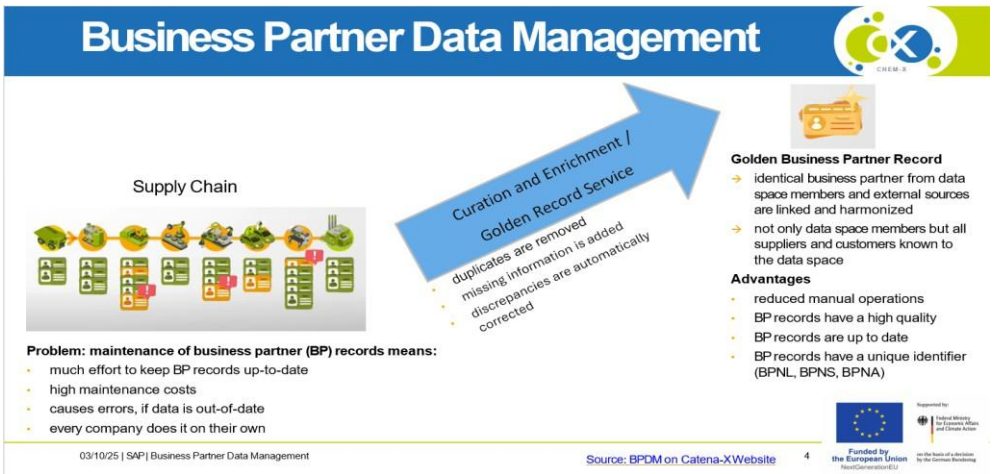

Figure 1: Business Partner Data Management System

Figure 1 Demonstrates how Business Partner Data Management is improved through the Golden Record Service within the Catena-X ecosystem.

It begins by identifying a common issue: maintaining business partner (BP) data across the supply chain is challenging, costly, and error prone. Each company typically manages its BP data separately, which leads to inconsistencies, outdated information, and duplication.

The Golden Record Service—highlighted as "Curation and Enrichment"—addresses these issues by automatically cleaning and harmonizing BP data. It removes duplicates, fills in missing information, and corrects discrepancies by aggregating data from multiple participants and trusted external sources.

The result is the Golden Business Partner Record, a unified and accurate representation of each business partner. These records are shared across the Catena-X data space and include a unique identifier (BPNL, BPNS, BPNA), ensuring consistent identification of partners.

Key advantages of this process are:

- Reduced manual effort in maintaining data
- Higher data quality
- Continuously updated and synchronized records
- Consistent partner identification across the network

Note: Mandatory Information (Minimum Required Dataset for smes)
Legal Entity Information
Main Organization Address
Identifiers (Commercial Register Number, VAT ID, LEI, EORI Number)

6.1 BPDM Standards Integration into IMDS

BPDM Standards can be integrated into established automotive material data ecosystems by serving as a common business partner with master data layer across systems with different functional scopes. IMDS focuses on finished parts and in-vehicle material declarations, while Chem-X manages state-as-delivered chemical product data supplied to OEM. By referencing BPDM Golden Business Partner Records within both IMDS and Chem-X, consistent partner identification and interoperability can be achieved without changing their existing material or chemical data models.

7. Business Partner Data Management (BPDM) Standard reference

BPDM within Catena-X is supported by three key standards that enable consistent and interoperable data exchange across organizations. These include:

- CX-0010 Business Partner Number v2.1.0 | Catena-X – Library, which defines a standardized identifier for business partners;
- CX-0012 Business Partner Data Pool API v4.1.0 | Catena-X – Library, which facilitates access to and synchronization of business partner data through a centralized pool; and
- CX-0074 Business Partner Gate API v3.1.0 | Catena-X – Library, which governs controlled data sharing and validation processes.

These BPDM standards are currently being discussed and further developed within the Catena-X BPDM Expert Group, ensuring they remain aligned with evolving industry needs and technical requirements. The CX-0018 Dataspace Connectivity v3.2.0 standard defines the mechanisms for secure and interoperable data exchange across decentralized data spaces.

Together, these standards form the foundation for robust and scalable business partner data management across industries.

These standards are not only automotive-specific and are also designed to be applicable across various industries. Their industry-agnostic architecture allows organizations to adapt and extend them with additional requirements, provided the core data models and implementation principles remain unchanged. This flexibility ensures broad usability while maintaining interoperability across sectors.

Note: in addition to industrial entities, public research institutions, universities, and scientific departments are also regarded as a business partner.

8. Golden Record

A key outcome of implementing these standards is the creation of Golden Records—harmonized, high-quality master data entries for each business partner. These records ensure consistency and reliability across systems and organizations, enabling trusted data exchange and supporting downstream use cases such as compliance, traceability, and supplier collaboration.

A Golden Record is a business partner for data entry that has successfully passed a predefined set of quality rules. These rules validate and transform the data into a harmonized, standardized, and semantically unified structure, as defined by the BPDM standards. Achieving Golden Record status is a prerequisite for a business partner with data entry to be assigned as a valid Business Partner Number, ensuring it meets the integrity and interoperability requirements of the Catena-X ecosystem.

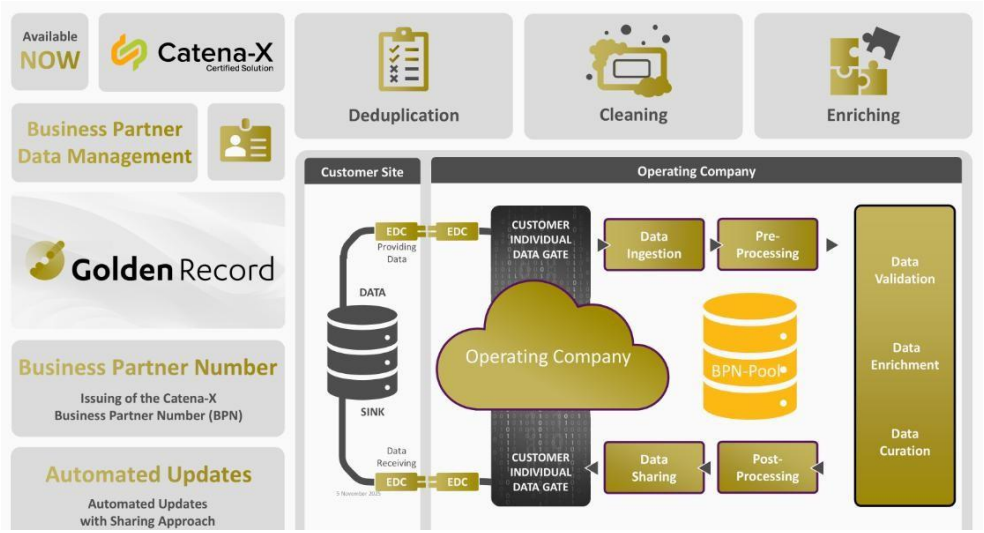

Figure 2: Golden Record process in Catena-X

The process collects business partner data from multiple participants, cleans and validates it, removes duplicates, enriches and harmonizes the entries according to Catena-X quality standards, and generates a single, trusted master version known as the Golden Record. Each record is linked to a unique Business Partner Number (BPN) and assigned to a confidence level based on data quality and provenance. Participants can access, update, and receive notifications about changes through Catena-X apis, ensuring that the ecosystem always operates on accurate, consistent, and up-to-date partner data.

Note: Golden Record creation—covering matching, deduplication, and data quality checks—is fully handled by the BPDM provider.
Companies only submit basic business partner data, while an automated pre-validation tool is currently under discussion and Envisaged for future implementation.
SME's can upload data via CSV, flat-file, or simplified REST, with the system automatically returning the enriched Golden Record, all handled
In accordance with Catena-X governance principles, and can optionally act as App Providers, offering applications that use governed business partners
Data while adhering to security and data exchange standards.
Note: Automatic pre validation tool is under development.

9. BPDM Reference Architecture

The BPDM reference architecture defines the modular components, interfaces, and responsibilities that underpin how partner data is exchanged, curated, and consumed across the Catena-X ecosystem ensuring data sovereignty, trust, and consistency across multiple organizations.

As seen in Figure 3, the Data Sharing Area represents the environment of a sharing member, which is a company participating in the Catena-X ecosystem. Within this space, the company utilizes the Business Partner Data Manager (BPDM) to handle its internal Master Data Management (MDM) processes for business partners. Through the Dataspace Connectivity component (CX-0018), the company can securely and consistently exchange data with Catena-X, following standardized protocols. This process involves managing and maintaining business partner information locally, uploading and downloading data via the data connector, monitoring the progress and status of Golden Record creation, and engaging with other participants in the data space to ensure transparent and efficient collaboration.

The Tenant Separation area, illustrated in the middle section of the architecture, ensures that all shared data passes through securely isolated environments. This separation is crucial to prevent anti-trust conflicts and protect competitive information between customers and suppliers. Within this framework, all business partner data is anonymized and made accessible only through governed agreements and contractual controls, ensuring full compliance with data sovereignty and privacy regulations. The BPDM Gate (CX-0074) serves as the secure entry point to the Catena-X network, managing and validating all data transactions. Meanwhile, the BPDM Orchestrator oversees and coordinates data flow, task execution, and synchronization across systems. The Golden Record Dashboard provides information on curated Business partner records, and the Partner Network UI provides access for the partners to the BPDM pool.

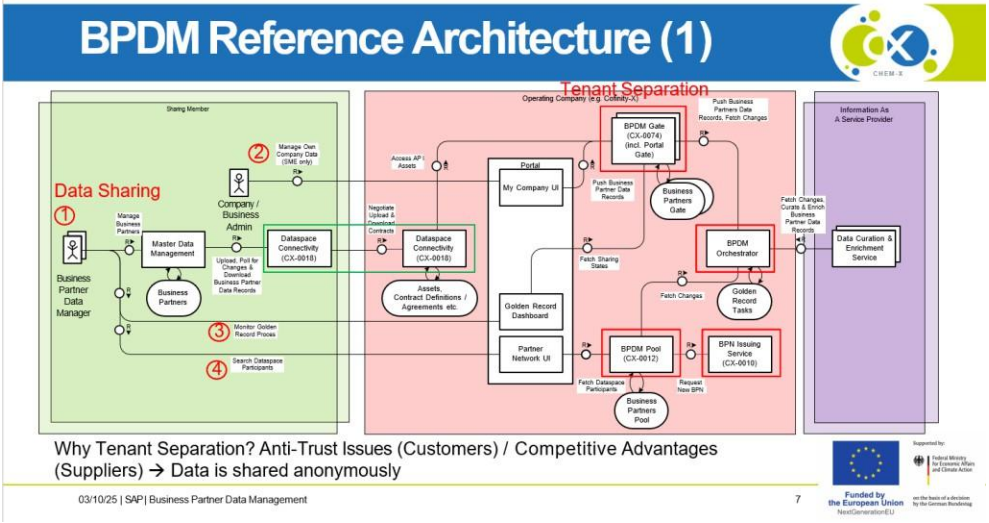

Figure 3: Business Partner Data Management reference architecture diagram

Figure 4 illustrates the data flow within the Business Partner Data Sharing use case based on the BPDM reference architecture. The process begins with the Business Partner Data Manager at the company level, where master data is managed and uploaded to the Dataspace Connectivity service (CX-0018). This enables secure exchange of business partner information across the dataspace. The operating company (e.g., Cofinity-X) then facilitates controlled access and negotiation of data sharing agreements through portals and apis, including the BPDM Gate API (CX-0074) and BPDM Pool API (CX-0012). These components ensure that business partner records are pushed, fetched, and synchronized with the Golden Record Dashboard, maintaining data consistency and quality. Finally, the BPDM Issuing Service (CX-0010) and Data Curation C Enrichment Service validate and enrich the shared data, completing the cycle of trusted, interoperable business partner information exchange across participants.

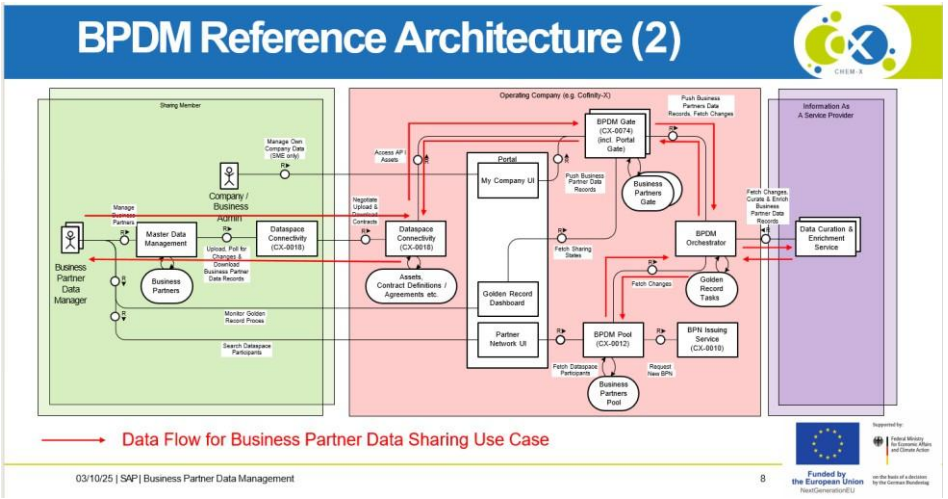

Figure 4: Data flow for Business Partner Data Sharing use case

Note: To minimize effort for SME's, participants are only required to enter the mandatory information requested by the BPDM provider, While all other processes in the architecture diagram are executed automatically. Tenant separation is achieved through platform-level Logical isolation using identity and access management, secure apis, and governed data access controls, all handled automatically by The BPDM provider without any technical effort required from participants.

10. BPDM Data Exchange Governance

10.1 GENERAL PRINCIPLES

This Data Exchange Governance defines the key principles that apply to each Participant when exchanging data within the Catena-X Data Space for one or more purposes predefined by the Catena-X Association (“Predefined Purpose(s)”).

Each Participant must accept this Data Exchange Governance to enable data exchanges through a Registered Connector. The process of agreeing to this Data Exchange Governance, as well as the conclusion of legally binding data exchange contracts, lies outside the scope of this document. This Governance does not determine or restrict how Participants make their contractual declarations legally binding.

This Governance provides standardized technical parameters to facilitate data Exchanges (“Technical Data Exchange Elements”), together with mandatory Requirements and optional default settings that correspond to the Predefined Purposes. These are further specified in the Catena-X Repository, which is maintained by the Association. The Association may, as part of the standardization process, add, modify, replace, or remove Technical Data Exchange Elements, other mandatory requirements, optional default settings, and Predefined Purposes within the Repository.

Participants are free to select the relevant Predefined Purposes for their data exchange contracts. Any modifications to the Repository only take effect for subsequent data exchange contracts; existing or ongoing data exchanges remain unaffected.

A Business Application Provider (“App Provider”) is a Participant that:
Facilitates data exchange contracts,
Develops and provides data-related services, and/or
Contributes to the development of the Repository and the Catena-X Data Space by proposing additional Predefined Purposes related to specific applications.

An App Provider may process data only for:
The Predefined Purposes and any Individual Purposes determined by the Data Provider and/or Data Consumer, as applicable (including any required data storage) to facilitate the relevant data exchange; and/or
Developing and providing data-related services within the Catena-X Data Space, in compliance with the overall Governance Framework.

Participants are generally free to agree on the geographical locations from which the Data Provider provides, and the Data Consumer processes data, provided that they comply with the geographical restrictions set out in the Country Clearance List.

Country Clearance List

The Country Clearance List defines the jurisdictions that are approved by the Catena-X Association for data processing and exchange. It reflects compliance with applicable data protection, security, and regulatory standards. Participants must ensure that all data exchanges occur only between entities located in countries included in the current Country Clearance List.

Note: The Country Clearance List is maintained and periodically updated by the Association. The version in effect at the time of contract execution is binding.

Note: All data ingestion, processing, and exchange are governed in accordance with Catena-X Data Exchange Governance principles, Ensuring secure, complaint, and standardized management, validation, and sharing of business partner information across the platform.

10 Golden Rules of Catena-X

Unless otherwise stated, the defined terms and guiding principles under the Catena-X Governance Framework, particularly the 10 Golden Rules, apply to this Data Exchange Governance. These rules establish the foundation for trustworthy, secure, and sovereign data collaboration across the Catena-X ecosystem:

1. Data Sovereignty – Data owners retain full control over their data and its permitted uses.
2. Voluntariness – Participation in Catena-X and any data exchange is based on voluntary consent.
3. Interoperability – Systems and connectors must support standardized and interoperable data exchange.
4. Decentralization – No central data storage; data remains within the participants' Own IT environments.
5. Data Security – All exchanges must ensure confidentiality, integrity, and availability of data.
6. Trustworthiness – Participants act transparently, reliably, and in compliance with agreed governance standards.
7. Fairness and Non-Discrimination – Equal participation rights for all members, with transparent governance processes.
8. Sustainability and Compliance – Data exchange supports environmentally and socially responsible business practices.
9. Innovation Enablement – Open, standardized frameworks encourage innovation and value creation.
10. Transparency and Traceability – Data origins, exchanges, and purposes must be traceable and auditable.

Note: SME's can upload data via CSV, flat-file, or simplified REST, with the system automatically returning the enriched Golden Record, All managed according to Catena-X governance principles. For instance, Data Sovereignty ensures a single-site SME's data remains Within its jurisdiction, Tenant Separation isolates their data from others, and Access Governance restricts usage to authorized partners

11. Business Partner

In general, a business partner is any entity (such as a customer, supplier, employee, or service provider) that does business with another entity.

In data spaces, a business partner is an organization (figure 5) (such as an enterprise or company, university, association, etc., and not a natural person) or one of its organization parts that acts as unique partner within the supply chain - either in the role of a direct participant, or a consultant, or a non-production-material (NPM) supplier.

Figure 5 shows the high-level structure of a Business Partner entity in the BPDM model. At its core is the business partner aggregate, which connects to three essential elements: legal entity, Site, and Address. This structure ensures that each business partner can be represented not only as a legal entity but also by its operational sites and associated addresses, providing a comprehensive view of organizational identity and location.

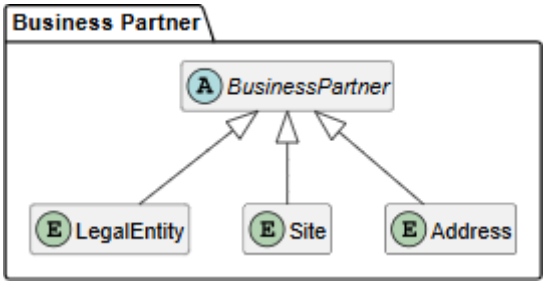

Figure 5: Business Partner

Figure 6: Generic Business Partner:

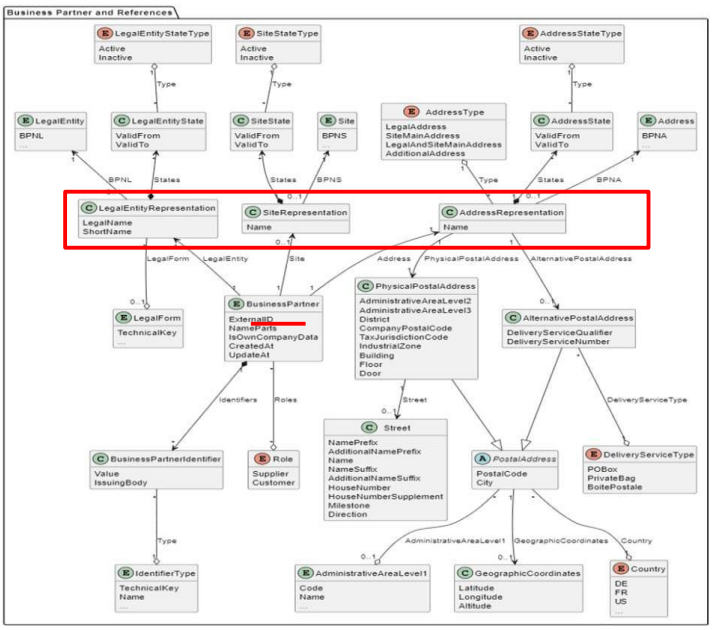

Figure 6 expands this concept into a detailed reference model, illustrating the relationships and attributes that define a business partner in data spaces. It includes representations for Legal Entity, Site, and Address, each with specific attributes such as legal name, short name, and physical address details. The diagram also shows connections to identifiers, roles (e.g., supplier, customer), and geographic information, enabling precise and interoperable data exchange. This granular model supports the creation of a Golden Record, ensuring consistency and accuracy across multiple systems and participants.

LEGAL ENTITY:

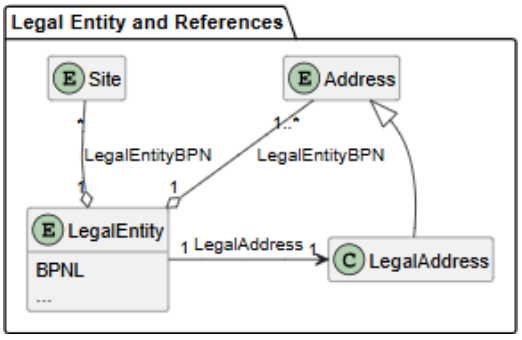

Figure 7: Example of Legal Entity

In general, a legal entity is a juridical person that has legal rights and duties related to contracts, agreements, and obligations. The term especially applies to any kind of organization established under the law applicable to a country.

In data spaces, a legal entity is a type of business partner representing a legally registered organization with its official registration information, such as legal name (including legal form, if registered), legal address and a legally secure external identifier (e.g. VAT ID, TIN, HRB number, LEI).

A legal entity has exactly one legal address, but it is possible to specify additional addresses that a legal entity owns. Thus, at least one address is assigned to a legal entity. A legal entity can own sites. Thus, many or no sites are assigned to a legal entity. A legal entity is uniquely identified by the BPNL.

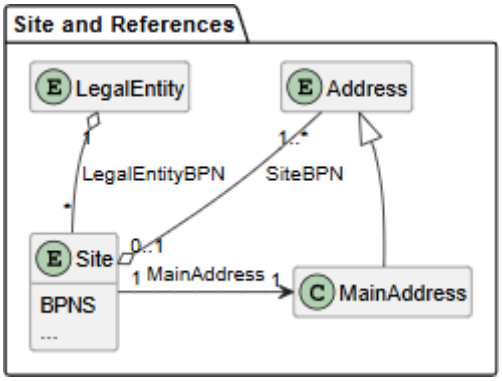

Figure 8: Example of Site

In general, a site is a delimited geographical area in which an organization conducts business. In data spaces, a site is a type of business partner representing a physical location or area owned by a legal entity, where a production plant, a warehouse, or an office building is located.

Each site is associated with one legal entity as its owner. A site may have multiple addresses, but one is designated as the main address, but it is possible to specify additional addresses (such as different gates), that belong to a site. Thus, at least one address is assigned to a site. A site can only be uploaded and modified by the owner (the legal entity), because only the owner knows which addresses belong to which site. A site is uniquely identified by the BPNS.
Figure 8: Example of Site

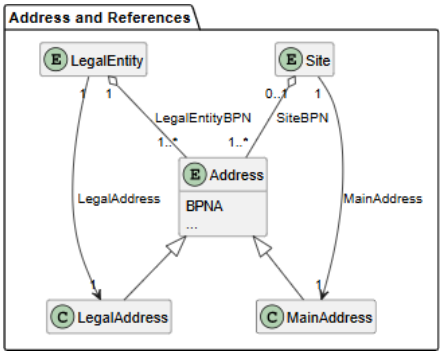

Figure 9: Example of Address

In general, an address is a collection of information to describe a physical location, using a street name with a house number and/or a post office box as reference. In addition, an address consists of several postal attributes, such as country, region (state), county, township, city, district, or postal code, which help deliver mail.

In data spaces, an address is a type of business partner representing the legal address of a legal entity, and/or the main address6 of a site, or any additional address of a legal entity or site (such as different gates).

An address is owned by a legal entity. Thus, exactly one legal entity is assigned to an address. An address can belong to a site. Thus, no one or site is assigned to an address. An address is uniquely identified by the BPNA.

12. Examples of Business Partner in relation with Legal Entity, Site and Address:

12.1 Example 1 of legal entity and its Legal address

A business partner has assigned a legal entity and its legal address.
Dr. Ing. H.c. F. Porsche Aktiengesellschaft, Porscheplatz 1, 70435 Stuttgart, Deutschland

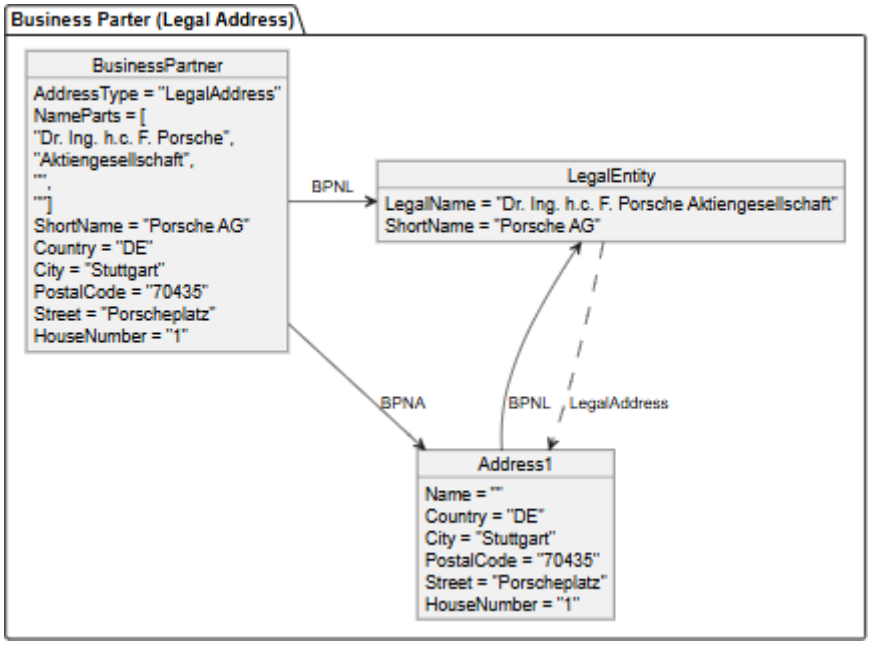

Figure 10: Example of Legal entity and its Legal address

12.2 Example of legal entity and one of its additional addresses

A business partner has assigned a legal entity and one of its additional addresses. Dr. Ing. H.c. F. Porsche Aktiengesellschaft, Schwieberdinger Str. 130, 70435 Stuttgart, Deutschland

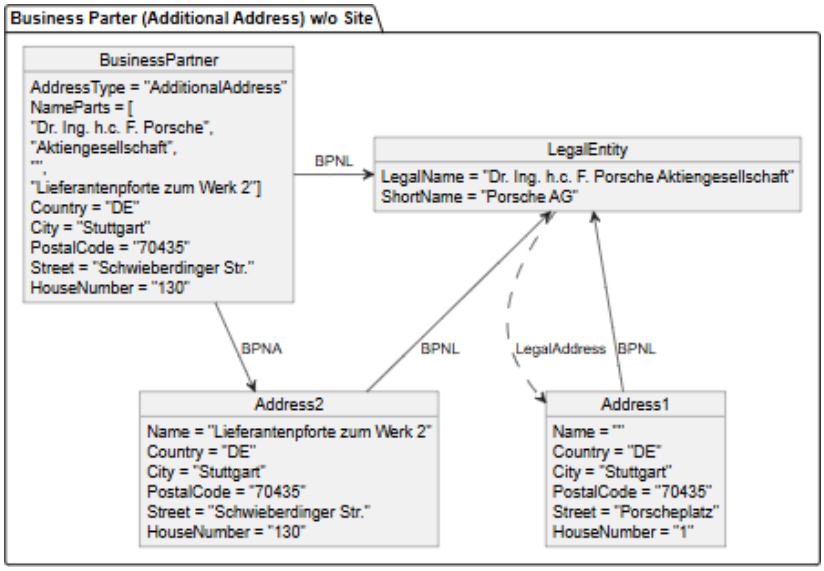

Figure 11: Example of Legal entity and one of its additional addresses

12.3 Example of legal entity, a site and its main address1

A business partner having assigned a legal entity, a site and its main address1, which is not the legal address.
Dr. Ing. H.c. F. Porsche Aktiengesellschaft, Porsche Zuffenhausen, Werk 2, Hauptpforte, Porschestraße 42, 70435 Stuttgart, Deutschland

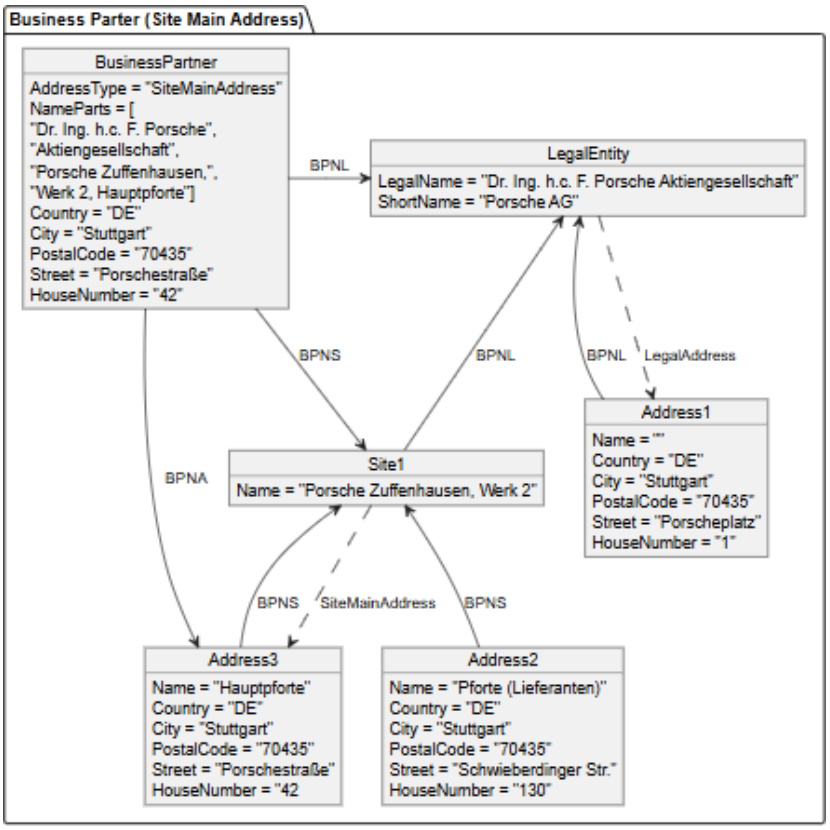

Figure 12: Example of Legal entity, a site and its main address1

12.4 Example of legal entity, a site and its main address1 which is also a legal address:

A business partner having assigned a legal entity, a site and its main address1, which is also the legal address.
Schaeffler Group USA Inc. Fort Mill 1, 308 Springhill Farm Rd, Fort Mill, SC 29715, USA

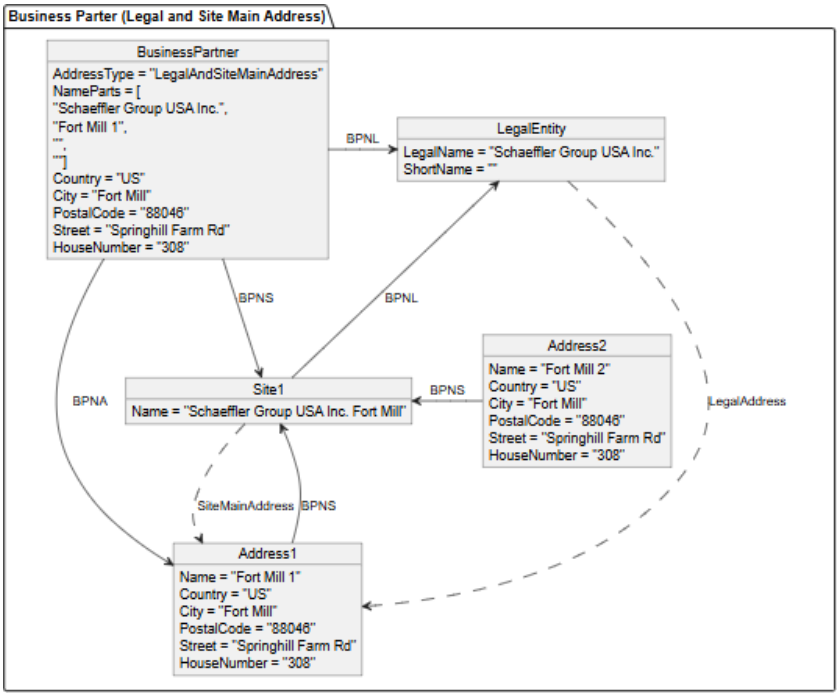

Figure 13: Example of legal entity, a site and its main address1 which is also a legal address

12.5 Example of legal entity, a site and one of its addresses, which is neither the legal address nor the main address1 of that site.

A business partner having assigned a legal entity, a site and one of its addresses, which is neither the legal address nor the main address1 of that site.
Dr. Ing. H.c. F. Porsche Aktiengesellschaft, Porsche Zuffenhausen, Werk 2, Pforte (Lieferanten), Schwieberdinger Str. 130, 70435 Stuttgart, Deutschland

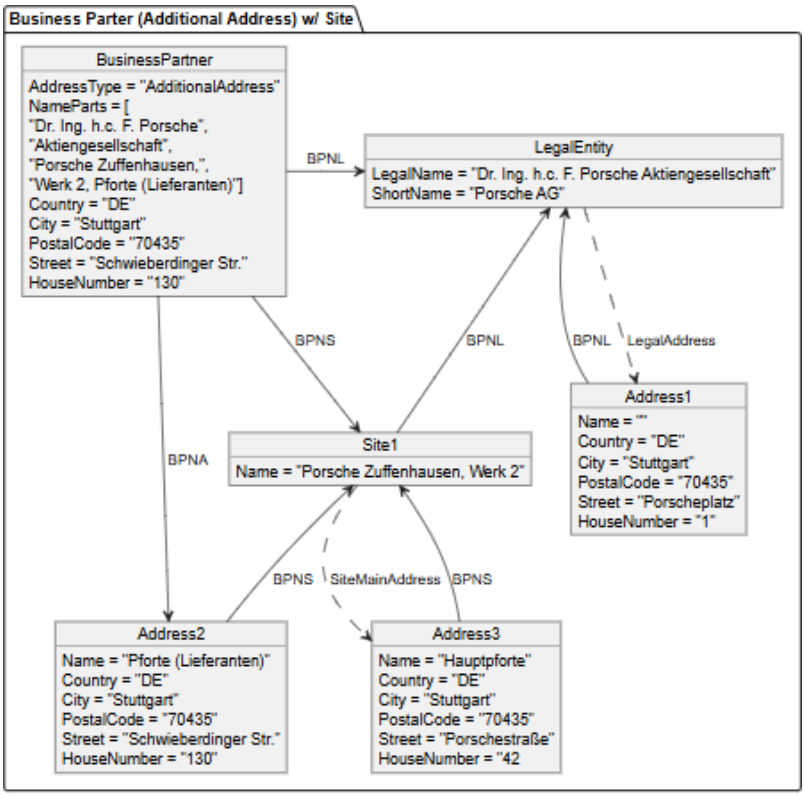

Figure 14: Example of legal entity, a site and one of its addresses, which is neither the legal address nor the main address1 of that site.

13. Adress Identifier

An address identifier (uniquely) identifies the address, such as the Global Location Number (GLN).

An identifier type defines the name or category of an identifier, such as the German Handelsregisternummer, a VAT registration / taxpayer identification number, etc. The identifier type is valid for a business partner type and used in a specific country.

Table 2: Address Identifier Table

Attribute	Description	(Data) Type / Code List / Enumeration
Value	The value of the identifier like "0847976000005"	String
Type	The type of the identifier.	Identifier Type

An identifier type can be classified into one or more of the following identifier type categories:

1. VAT: value-added tax registration (so-called value-added tax identification numbers (VAT ids or vatins), e.g. EU VAT ID, UID MWST/TVA/IPA)
2. TIN: taxpayer identification (so-called taxpayer identification numbers (tins), e.g. SIREN, NIF)
3. NBR: national business registration (e.g. HRB-Nummer, Firmenbuchnummer) for different purposes (e.g. Commercial register, trade register), which are not related to tax
4. IBR: international business registration (e.g. LEI, EORI) for different purposes (e.g. Regulatory reporting, risk management at financial regulatory bodies)
5. OTH: other identifier types (e.g. DCB D-U-N-S, GS1 GLN), which are not legally secure

IDENTIFIER TYPE DETAILS:

The identifier type details describe which countries an identifier is valid and mandatory Table 3:

Identifier Type Details

Attribute	Description	(Data) Type / Code List / Enumeration
Country	The two-letter country code according to ISO 3166-1:2020 of the country in which the identifier type is valid. Can be empty if identifier type is valid in all countries.	String

Mandatory Indicates whether the identifier type is mandatory in Boolean country.

14. Identifier Type

An identifier type defines the name or category of an identifier, such as the German Handelsregisternummer, VAT number, Global Location Number (GLN), etc. The identifier type is valid for a business partner type and used in a specific country.

Figure 15: Example of Identifier Type

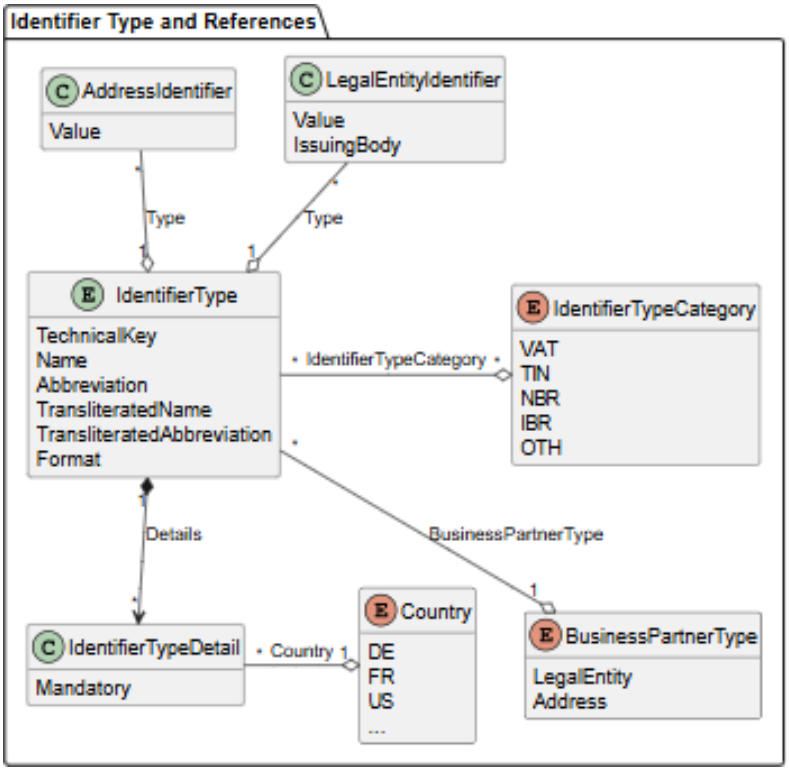

Figure 15: Example of Identifier Type

15. Legal Entity Representation

A legal entity representation adds context information to the legal entity, on which the business partner provides a view. Additionally, it contains some of the information from the assigned legal entity.

Table 4: Legal Entity Representation

Attribute	Description	(Data) Type / Code List / Enumeration
Legal Entity BPN	The BPNL of the legal entity, on which the business partner provides a view.	String
Legal Name	The name of the legal entity, on which the business partner provides a view, according to official registers.	String
Short Name	The abbreviated name of the legal entity, on which the business partner provides a view.	String

States	The list of (temporary) states of the legal entity.	List of Legal Entity State
Legal Form	The legal form of the legal entity, on which the business partner provides a view.	Legal Form

LEGAL ENTITY STATE:

A legal entity state indicates if the legal entity is active or inactive[5]. This does not describe the relation between a data space participant and a business partner and whether they have active business, but it describes whether the legal entity is still operating.

Table 4: Legal Entity State

Attribute	Description	(Data)Type/ codelist/Enume Ration
Valid From	The date and time from which the state is valid.	Date/Time
Valid To	The date and time until the state is valid.	Date/Time
Type	One of the state types: active, inactive.	Enum

SITE REPRESENTATION:

A legal entity representation adds context information to the site, on which the business partner provides a view. Additionally, it contains some of the information from the assigned site.
Table 5:

Attribute	Description	(Data) Type/Code List / Enumeration
Site BPN	The BPNS of the site, on which the business partner provides a view.	String
Name	The name of the site, on which the business partner provides a view. This is not according to official registers, but according to the name the owner chooses.	String
States	The list of the (temporary) states of the site.	List of Site State

SITE STATE:

A site state indicates if the site is active or inactive[5].This does not describe the relation between a data space participant and a business partner and whether they have active business, but it describes whether the site is still operating.

Table 6: Site state

Attribute	Description	(Data) Type / Code List / Enumeration
Valid From	The date from which the state is valid.	String
Valid To	The date until the state is valid.	String
Type	One of the state types: active and inactive.	Enum

ADDRESS REPRESENTATION:

An address representation adds context information to the address, on which the business partner provides a view. Additionally, it contains most of the information from the assigned address.

Table 7: Address representation

Attribute	Description	(Data) Type / Code List / Enumeration
Address BPN	The BPNA of the address, on which the business partner provides a view.	String
Name	The name of the address, on which the business partner provides a view. This is not according to official registers but according to the name the sharing members agree on, such as the name of a gate or any other additional names that designate the address in common parlance.	String
States	The list of (temporary) states of the address.	List of Address State
Type	One of the address types: Legal Address, Site Main Address1, Legal and Site Main Address1, Additional Address.	Enum
Physical Postal Address	The physical postal address of the address, on which the business partner provides a view, such as an office, warehouse, gate, etc.	Physical Postal Address

Alternative Postal Address	The alternative postal address of the address, on which the business partner Provides a view, for example if the goods are to be picked up somewhere else.	Alternative Postal Address

ADDRESS STATE:

An address state indicates if the address is active or inactive. This does not describe the relation between a data space participant and a business partner and whether they have active business, but it describes whether the business partner is still operating at that address.

Table 8: Address state

Attribute	Description	(Data) Type / Code List / Enumeration
Valid From	The date from which the state is valid.	String
Valid To	The date until the state is valid.	String
Type	One of the state types: active and inactive.	Enum

16. Legal Form

A legal form is a mandatory corporate legal framework by which companies can conduct business, charitable or other permissible activities.

Table 9: Legal form

Attribute	Description	(Data) Type / Code List / Enumeration
Technical Key	The technical identifier of the legal form according to ISO 20275:2017.	String
Name	The name of legal form according to ISO 20275:2017.	String
Abbreviations	A list of abbreviated names for the legal form according to ISO 20275:2017, such as AG for German Aktiengesellschaft.	String
Transliterated Name	The transliterated name of legal form according to ISO 20275:2017.	String
Transliterated Abbreviations	A list of transliterated abbreviated names for the legal form according to ISO 20275:2017, such as AG for German Aktiengesellschaft.	String

Language	The two-letter language code according to ISO 639:2023 of the language, for that the name of the legal form has been given.	String
Country	The two-letter country code according to ISO 3166-1:2020 of the country in which the legal form is valid.	String
Administrative Area Level 1	The administrative area in which the legal form is valid, such as a region within a country.	Administrative Area (Level 1)
Is Active	Indicates whether the legal form is actively used or is inactive and should not be used to register new organizations.	Boolean

17. Physical Postal Address:

A physical postal address describes the physical location of an office, warehouse, gate, etc.

Table 10: Describes Physical Postal Address

Attribute	Description	(Data) Type / Code List / Enumeration
Geographic Coordinates	The exact location of the physical postal Address in latitude, longitude, and altitude.	Geographic Coordinates
Country	The two-letter country code of the physical Postal address according to ISO 3166-1:2020.	String
Administrative Area Level 1	The administrative area of the physical postal address, such as a region within a Country.	Administrative Area (Level 1)
Administrative Area Level 2	The name of the locally regulated secondary country subdivision of the physical postal address, such as county Within a country.	String
Administrative Area Level 3	The name of the locally regulated tertiary country subdivision of the physical address, such as townships within a country.	String
Postal Code	The alphanumeric identifier (sometimes including spaces or punctuation) of the physical postal address for the purpose of sorting mail, synonyms: Postcode, post code, PIN or ZIP code.	String
City	The name of the city of the physical postal address, synonyms: town, village, Municipality.	String

Attribute	Description	(Data) Type / Code List / Enumeration
Geographic Coordinates	The exact location of the physical postal address in latitude, longitude, and Altitude.	Geographic Coordinates
District	The name of the district of the physical postal address which divides the city into Several smaller areas.	String
Street	The street of the physical postal address, synonyms: road, avenue, lane, boulevard, highway	Street
Company Postal Code	The company postal code of the physical postal address, which is sometimes required for large companies.	String
Tax Jurisdiction Code	The identifier of the particular geographic or governmental area to which the physical mailing address belongs, and which is responsible for administering tax laws and collecting taxes from individuals and businesses.	String
Industrial Zone	The industrial zone of the physical postal address, designating an area for industrial development, synonym: industrial area.	String
Building	The alphanumeric identifier of the building addressed by the physical postal address.	String
Floor	The number of a floor in the building addressed by the physical postal address, synonym: level.	String
Door	The number of a door in the building on the respective floor addressed by the physical postal address, synonyms: room, suite.	String

STREET:

A street is a public road in a city, town, or village, typically with houses and buildings on one or both sides, synonyms: road, avenue, lane, boulevard, highway.

Table 11: Describe attributes related to street

Attribute	Description	(Data) Type / Code List / Enumeration
Name Prefix	The street related information, which is usually Printed before the official street name on an address label.	String
Additional Name Prefix	The additional street related information, which is usually printed before the official street name on An address label.	String

Name	The name of the street.	String
Name Suffix	The street related information, which is usually printed after the official street name on an Address label.	String
Additional Name Suffix	The additional street related information, which is usually printed after the official street name on An address label.	String
House Number	The alphanumeric identifier represents the exact Location of a building within the street.	String
House Number Supplement	The alphanumeric identifier represents the exact location of a business partner in a building. Note this information might be further detailed semantically in the building, floor, and door attributes. However, this attribute is the only Relevant for addressing the business partner.	String
Milestone	The alphanumeric identifier representing the exact location of an addressed object within a street without house numbers, such as within Long roads.	String
Direction	The cardinal direction describing where the exit to the location of the addressed object on large highways / motorways is located, such as Highway 101 South.	String

ALTERNATIVE POSTAL ADDRESS:

Physical Postal Address

An alternative postal address describes an alternative way of delivery, for example if the goods are to be picked up somewhere else.

Table 12: Describes Alternative Postal Address

Attribute	Description	(Data) Type / Code List / Enumeration
Geographic Coordinates	The exact location of the alternative postal Address in latitude, longitude, and altitude.	Geographic Coordinates
Country	The two-letter country code of the postal Address according to ISO 3166-1:2020.	String
Administrative Area Level 1	The administrative area of the alternative Postal address, such as a region within a country.	Administrative Area (Level 1)
Postal Code	The alphanumeric identifier (sometimes including spaces or punctuation) of the alternative postal address for the purpose of sorting mail, synonyms: postcode, post Code, PIN or ZIP code.	String
City	The name of the city of the alternative postal address, synonyms: town, village, Municipality.	String
Delivery Service Type	One of the alternative postal address types: P.O. box, private bag, boite postale.	Enum
Delivery Service Qualifier	The qualifier uniquely identifying the delivery service endpoint of the alternative postal address in conjunction with the delivery service number. In some countries for example, entering a P.O. box number, postal code and city is not sufficient to uniquely identify a P.O. box, because the same P.O. box number is assigned multiple times in Some cities.	String
Delivery Service Number	The number indicating the delivery service endpoint of the alternative postal address to which the delivery is to be delivered, such as A P.O. box number or a private bag number.	String

ADMINISTRATIVE AREA (LEVEL 1):

An administrative area (level 1) is the country subdivision according to ISO 3166-2:2020, such as regions within a country.

Table 13: Describes Administrative area

Attribute	Description	(Data) Type / Code List / Enumeration
Name	The name of the country subdivision According to ISO 3166-2:2020.	String
Code	The six-character alphanumeric code according to ISO 3166-2:2020, consisting of the two-letter ISO 3166-1:2020 country code and a three-character alphanumeric code for the subdivision in that country, separated by a Hyphen.	String

GEOGRAPHIC COORDINATES:

Geographic coordinates describe an exact location in latitude, longitude, and altitude, according to ISO 6709:2022 with WGS 84 (NGA STND 0036 1.0.0) as the currently only supported coordinate reference system.

Table 14: Describes Geographic Coordinates

Attribute	Description	(Data) Type / Code List / Enumeration
Longitude	The geographic coordinate of a place indicating the distance to the west or east of the line passing through Greenwich, in Decimal degrees (DD).	Float
Latitude	The geographic coordinate of a place indicating its distance to the north or south Of the equator, in decimal degrees (DD).	Float
Altitude	The geographic coordinate of a place Indicating its height above mean sea level, in meters.	Float

18. Business Partner Number (BPN)

The Business Partner Number (BPN) is a globally unique, world-wide scalable, semantically enriched, interoperable, time-dependent, stable, human-readable identifier for business partners known in the data space that represent an organization or one of its organization parts from foundation to closure.

Additionally, the BPNL (BPN for legal entities) is legally secure. Consequently, it is also the unique identifier for the data space participants. The Catena-X Business Partner.

Number serves as a blueprint for similar data spaces that follow the Catena-X concepts, which promotes interoperability between these data spaces.

EXAMPLES: BPN: BPNL1234567890ZZ
BPN: is used here as a placeholder for the issuing agency according to IDO/IEC 15459.
L : identifies the legal entity of the business partner
ZZ : is the individual check digit, which is formed according to ISO 7064.

Figure 15: Example of BPNL and its relations to BPNA and BPNS which are depicted in the following example:

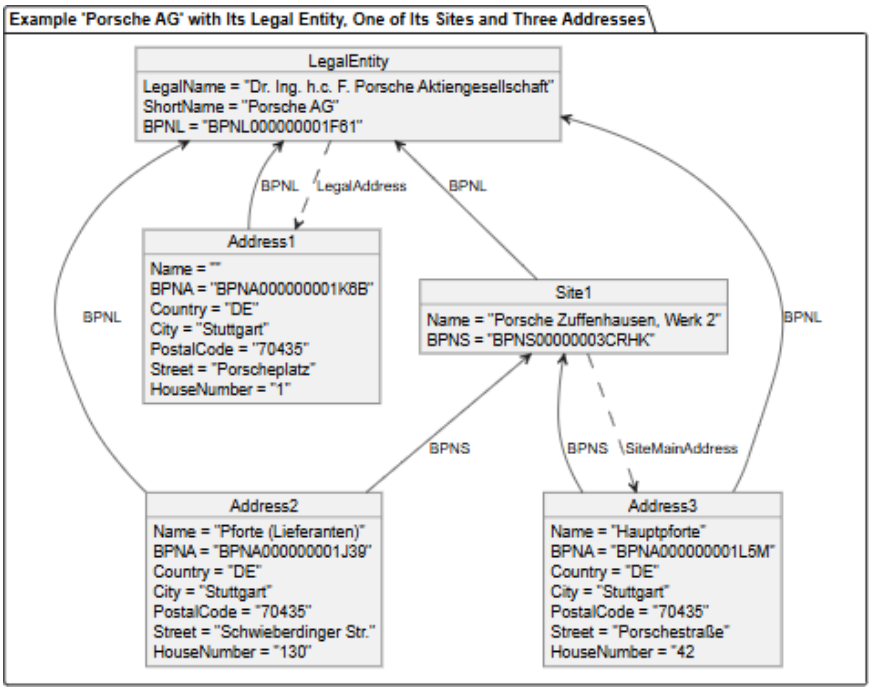

Figure 15: Example of BPNL and its relations to BPNA and BPNS which are depicted in the following example:

19. BPN Qualities

- The BPN is a globally unique identifier, with which an organization or one of its organization parts have exactly one identifier world-wide, so that no two organizations or organization parts have the same identifier and no two identifiers stand for the same organization or organization part
- The BPN is a world-wide scalable identifier, that can identify all organizations and their organization parts on a global scale
- The BPN is a semantically enriched identifier, that includes the type of business partner it identifies

- The BPN is an interoperable identifier, which is used cross-application and cross-organization in all conceivable business contexts
- The BPN is a time-dependent identifier, that has a validity for which it identifies an organization or one of its organization parts in the (legally) defined limits of their existence
- The BPN is a stable identifier, which never changes structurally, never ceases to exist and never is reassigned, even if the organization or one of its organization parts ceases to exist
- The BPN is a human-readable identifier, that is comparable to a telephone number or a postal code
- The BPN is an identifier, which inherently supports error detection
- The BPNL is a legally secure[1] identifier, that enables the unambiguous identification of contracting parties, ensuring a reliable foundation for legally binding data exchange contracts

20. Structure of BPN:

The structure of a BPN MUST be registered as an organization identification scheme according to ISO/IEC 6523-1:2023 and ISO/IEC 6523-2:1998 with the Registration Authority under an International Code Designator (ICD), so that only the issuing organization can issue organization identifiers or organization part identifiers for this scheme.
The BPN MUST have the following structure (table 16), being a 16-character identifier. Table 16:

BPN Structure

Prefix	Type Character	Entity Characters	Check Characters
BPN	1 character	10 characters	2 characters

A well-defined and standardized structure, which relies on existing standards as well as on common practice, guarantees acceptance:

- The prefix is always "BPN" in upper case, which marks the identifier as a Business Partner Number
- The type character semantically enriches the BPN, so that the type of the business partner can be directly determined. It is one of the uppercase letters 'L', 'S', or 'A':
  - L stands for legal entity
  - S stands for site
  - A stands for address
- The entity characters are alphanumerical uppercase characters that ensure that the BPN is world-wide scalable, being capable of identifying 36^10 ~ 3.6 quadrillion different business partners per type
- The check characters are alphanumerical uppercase characters that implement the error detection using a verification algorithm according to ISO/IEC 7064:2003 MOD 1271-36

- The regular expression for the BPN is: BPN[LSA][A-Z0-G]{10}[A-Z0-G]{2}

21. Business Partner Number Life Cycle:

The BPN of a business partner has an own lifecycle, depending on the corresponding state of the business partner in the real world.
Therefore, each business partner in BPDM MUST have a state with the following state definitions:

- Active
- Inactive

As the BPN is time-dependent, the state MUST have a start and an end date, which defines the validity of the business partner (state) and thus the validity of the BPN.
Even if a business partner becomes inactive, the business partner and its BPN MUST be further accessible. The BPN MUST NOT change structurally over its lifetime. Both requirements are crucial for the BPN to be considered as stable.

Figure 16: Example of ISO/IEC6523

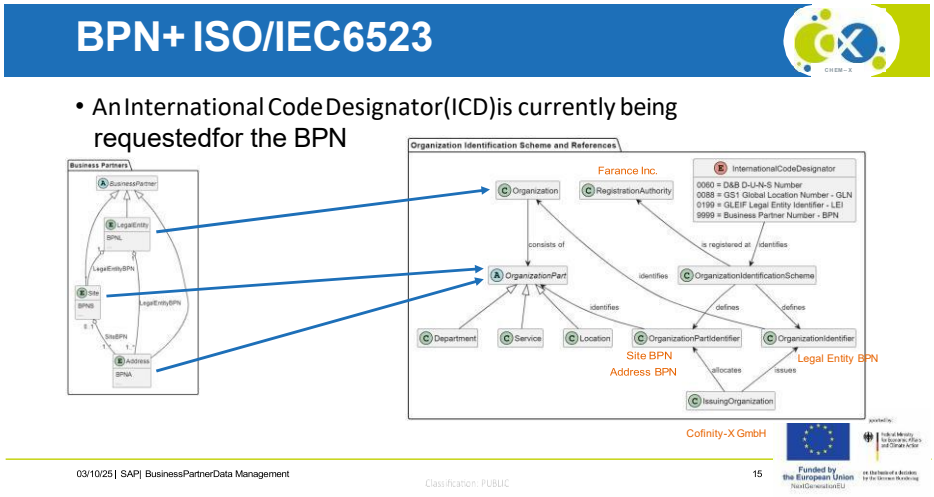

Figure 17: Example of ISO/IEC6523

22. Onboarding Process (Company Registration)

Description: The onboarding process consists of the
(i) Registration process
(ii) Registration Approval Process
(iii) Technical Integration Process
In accordance with the CX-0006 standard (see Figure Onboarding Process). To join the data space, all participants must complete the registration process. To exchange data

Participants must also complete the technical integration process and sign up for the General Data Exchange Framework.

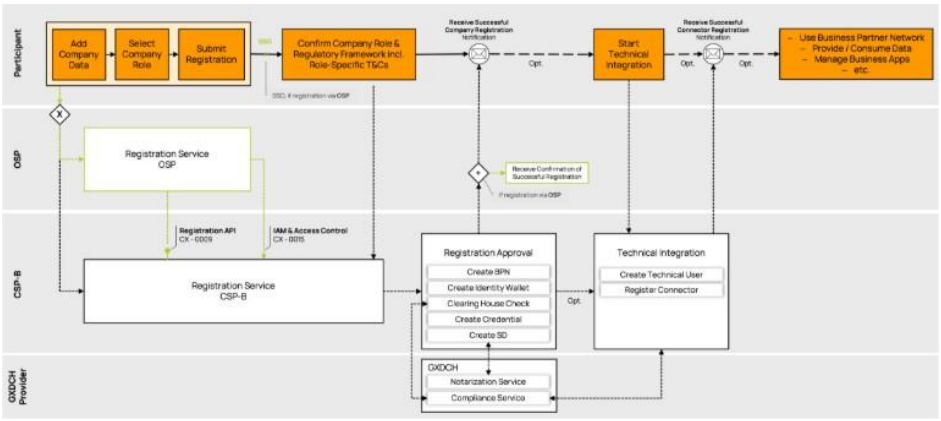

Figure 18: Onboarding Process

22.1 Registration:

"As part of the registration process, all participants are required to provide their company details, select the appropriate company role(s), and submit their registration through the Onboarding Service Provider's registration service.".

Step 1: "CX-Admin from Confinity-X invites Chem-X companies to onboard to the portal using the details provided"

Company Name:
Email:
First Name:
Last Name:

Step 2: Invite appears in the email as mentioned below:

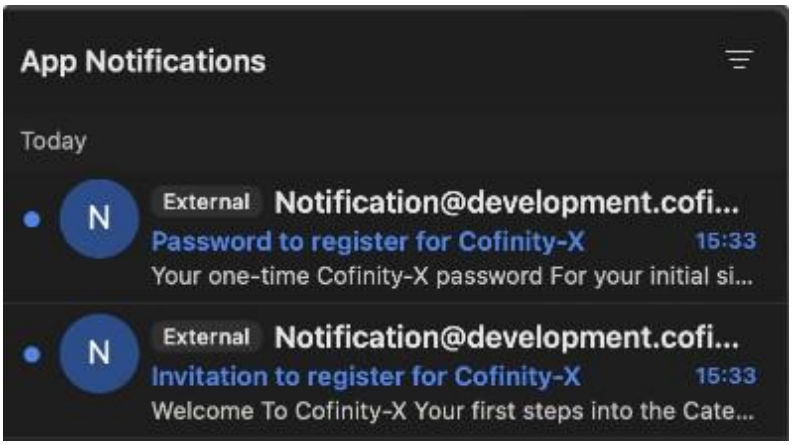

Figure 19: Example of email notification

Step 3: Click on the Start Registration

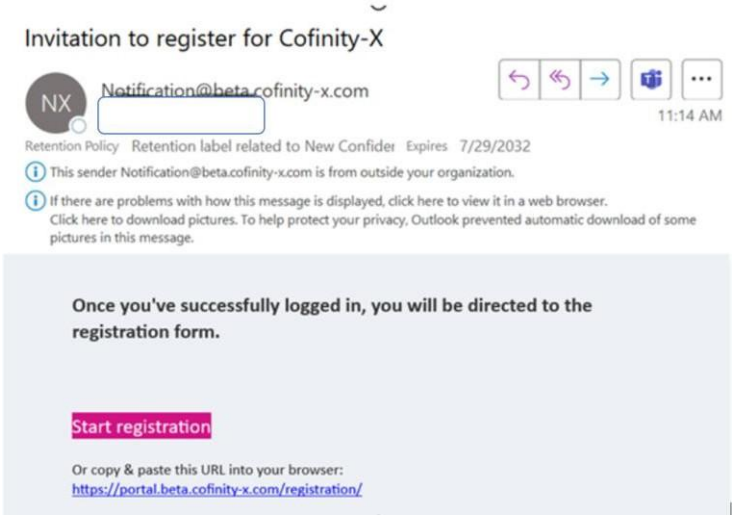

Figure 20: Example of registration link in email notification

Step 4: Locate the company name within the email as shown in the example below

Figure 21: Example of registration process received by email

Step 5: Enter the registered company name in the search field. From the displayed results, select the corresponding company.

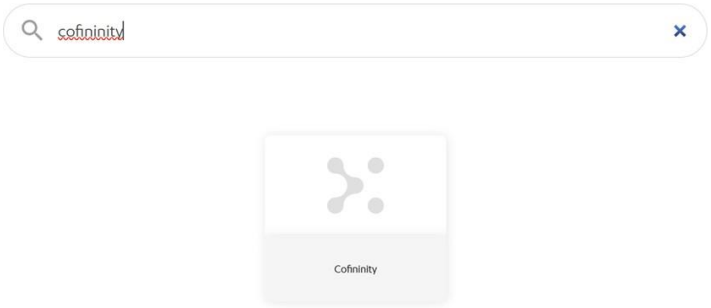

Figure 22: Example of search view

Step 6: Input the email address associated with the invitation, and enter the password included in that email.

Select Login to proceed to the user account.

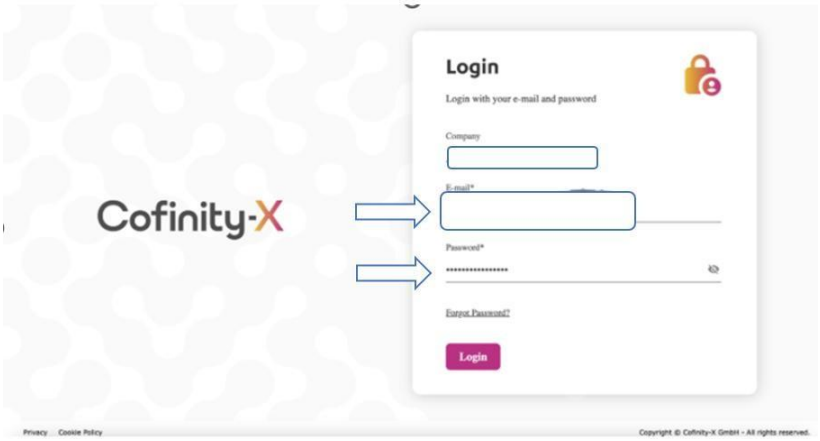

Figure 23: Example of login page

Step 7: After clicking Login, you will be directed to the password reset page. Follow the prompts to reset your password and create a new one.

Step 8: Once password is successfully reset, user will be directed to the homepage of Confinity-X portal – Click on Start registration

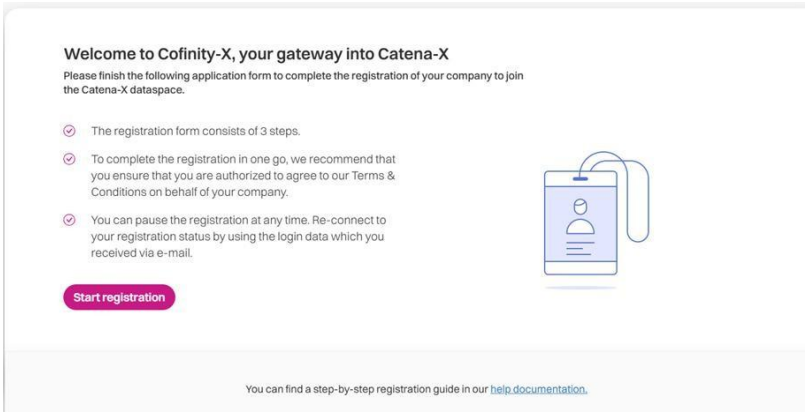

Figure 24: Example of registration start page

Step 9: Skip this section.

Note: Search for your company's data using the BPN to autofill the relevant fields, then continue by scrolling to the next section.

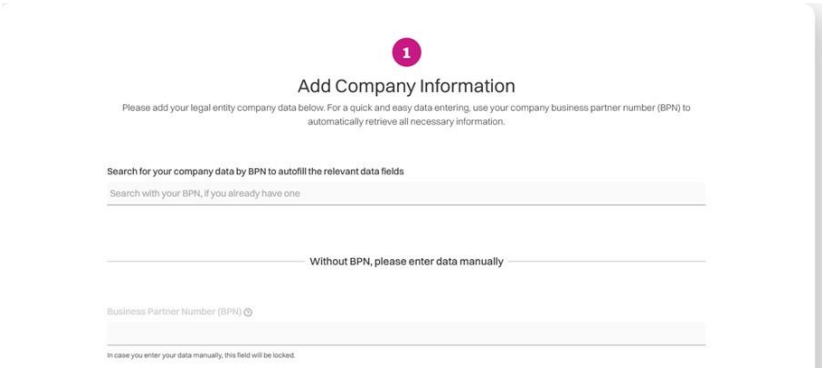

Figure 25: Example of search page

Step 10: Provide your company details

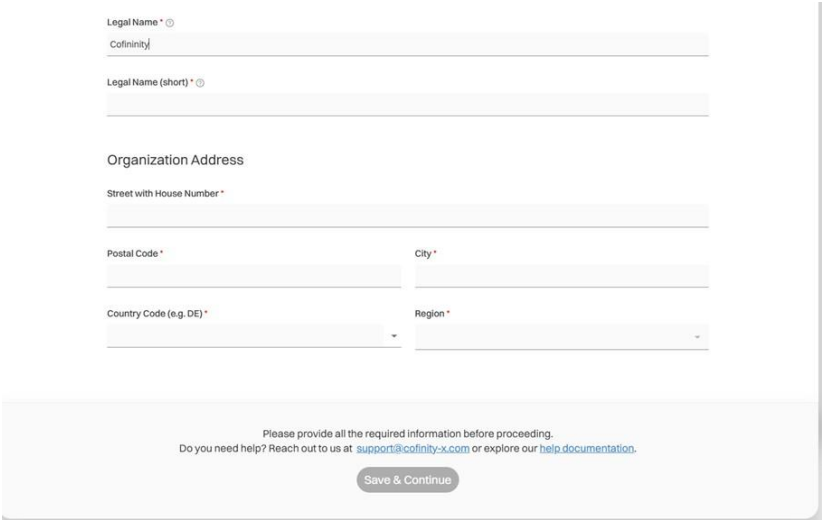

Figure 26: Example of company detail entry page

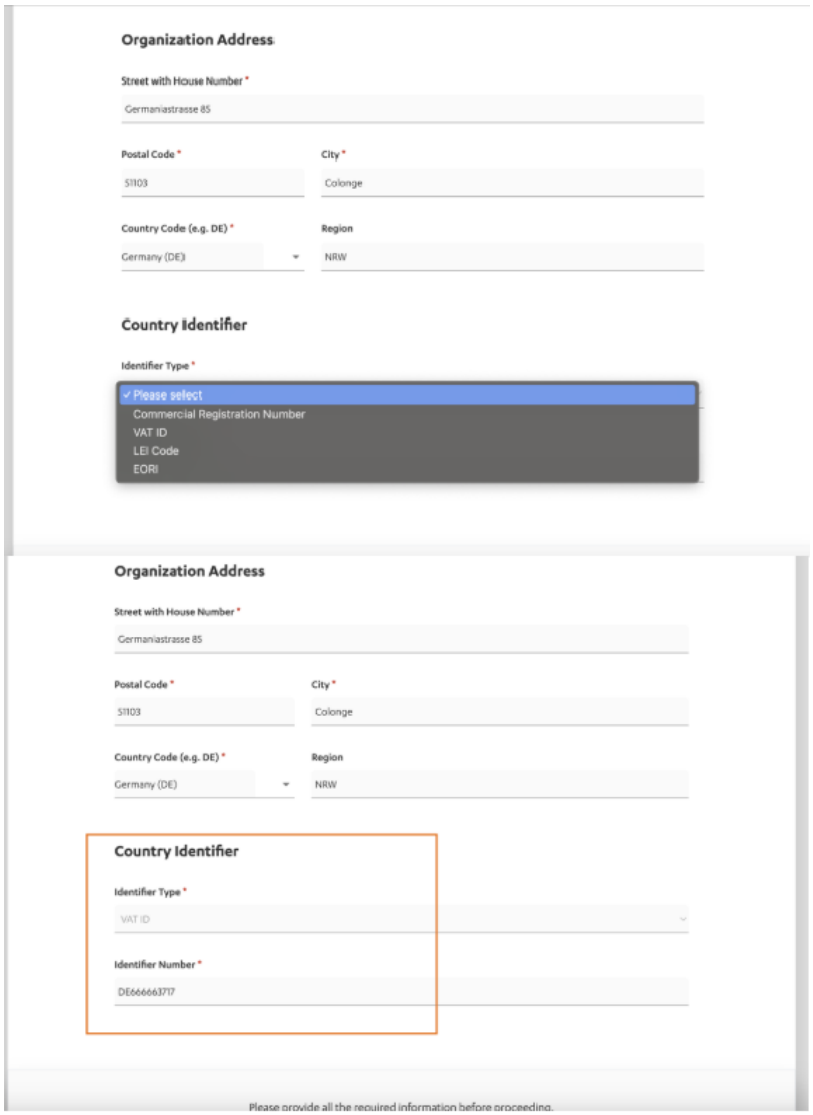

Figure 27: Example of company detail entry page

Step 11: Click on the Save s Continue
Step 12: Check the desired company roles and then click ‘Save s Continue’

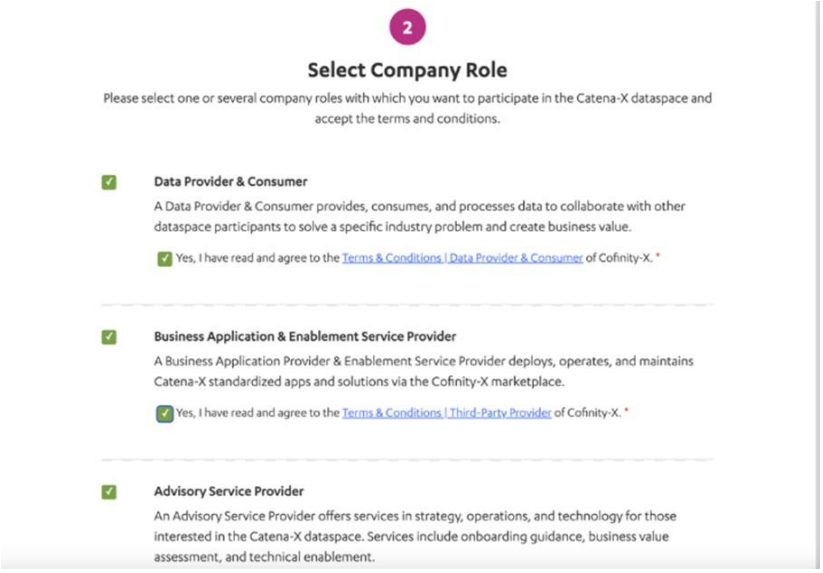

Figure 28: Example of company roles selection page

Step 13: On Upload Documents page, simply move forward by clicking ‘Save s Continue’

Step 14: Verify the entered information for your company on the 'Verify s Submit' page and click on the 'Submit' button

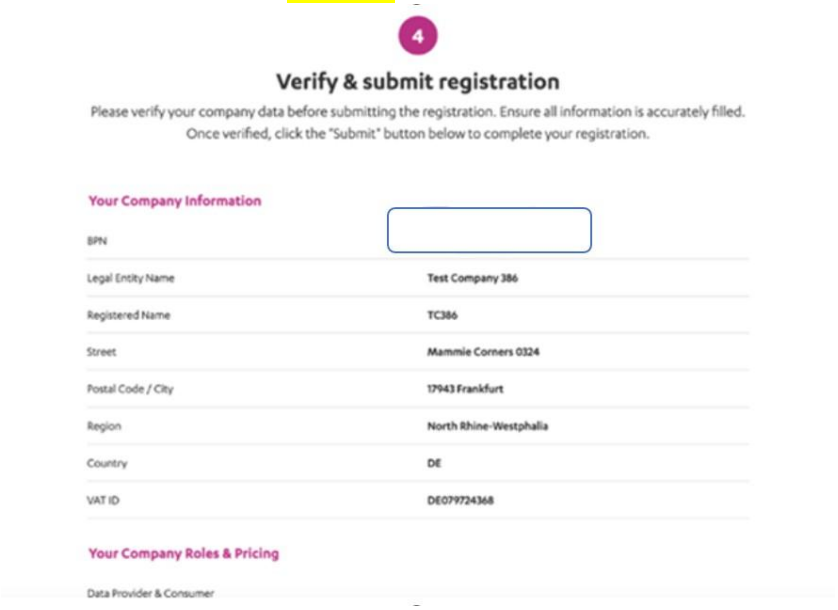

Figure 29: Example of verification and submission page

Step 15: After successfully completing the registration, the following details will be displayed on the screen.

Review the information, then click Go to Portal to proceed.

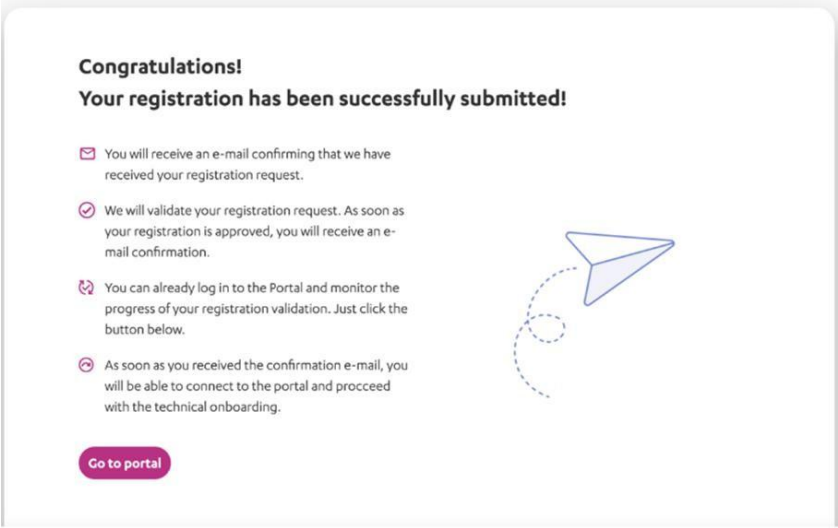

Figure 30: Example of final registration acceptance page

Step 16: On the portal, users can view the onboarding status of their registered company

Note: "This process typically takes around 48 hours."

23. Examples of BPDM for Chemical Industry

Task 1: Review how legal entity data is defined, stored, and used in Chemical industries.

Task 2: Analyze how address types are validated and liked to business entities in Chemical industry and list out any additional address types which are related to Chemical Industry

Task 3: "Are further legal identifier types to be supported in Chem-X in addition to the ones supported in Catena-X?"

Task 4: legal name and legal form in Chemical Industry

Task 5: Company physical Address Parameters to identity the company location like legal entity, Site or Address

23.1 Abstract Summary of BPDM Template:

This document is a structured template for Business Partner Data Management (BPDM), capturing comprehensive details about business partners, their legal entities, roles, and associated sites and addresses. The primary sheet records unique identifiers, name components, and classifications such as roles (e.g., customer or supplier). It also includes hierarchical data linking business partners to legal entities and physical or alternative addresses, supporting multi-level representation of organizations and their

Locations. The template ensures standardized data for effective master data governance, compliance, and interoperability across systems.

BPDM_Template.xlsx

23.2 Task Results

- Chem-X TP2 AP1 Task 2.xlsx

As an example, to test the framework Henkel entered parts of their business structure into the BPDM template to show validity and completeness of the approach.

bpnl	legalName	legalShortName	legalForm	isParticipantData	createdAt	updatedAt	legalAddress
TEMP_BPNL1	Henkel AG & Co. KGaA		T0YJ		2025-06-01	2025-06-01	BPNA00000001K6B
TEMP_BPNL2	Henkel Holding GmbH & Co. KG		T0YJ		2025-06-01	2025-06-01	
TEMP_BPNL3	Leo Erste Investment GmbH		3W7E		2025-06-01	2025-06-01	
TEMP_BPNL4	Leo Erste Investment GmbH		3W7E		2025-06-01	2025-06-01	
	Leo Zweite Investment GmbH		3W7E		2025-06-01	2025-06-01	
	Schwarzkopf & Henkel GmbH		3W7E		2025-06-01	2025-06-01	
	Henkel Fragrance Center GmbH		3W7E		2025-06-01	2025-06-01	
	Henkel Fragrance Center GmbH		3W7E		2025-06-01	2025-06-01	
	Henkel Bautechnik GmbH		3W7E		2025-06-01	2025-06-01	
	CHEMOFAST Anchoring GmbH		3W7E		2025-06-01	2025-06-01	
	CHEMPHAR Handels- und Exportgesellschaft mbH				2025-06-01	2025-06-01	
	youtiful GmbH		3W7E		2025-06-01	2025-06-01	
	Clynol GmbH		3W7E		2025-06-01	2025-06-01	
	Columbia Cosmetics GmbH		3W7E		2025-06-01	2025-06-01	
	Columbia Cosmetics GmbH		3W7E		2025-06-01	2025-06-01	
	Hans Schwarzkopf & Henkel GmbH & Co. KG (old)				2025-06-01	2025-06-01	
	Czewo Full Filling Service GmbH		3W7E		2025-06-01	2025-06-01	

Figure 31: Legal entities

bpna	name	adressType	isParticipantData	createdAt	updatedAt	siteBpn	legalEntityBpn	physicalPostalAddress
BPNA00000001K6B	Hauptsitz	LegalAddress	FALSE	2024-12-01	2025-01-01	BPNSXXXXX	BPNL000000001F61	DZ, 43200, BP No 66, Zone Industrielle, 36.166667,6.166667
BPNA00000001J39	Pforte (Lieferanten)	AdditionalAddress	FALSE	2024-12-01	2025-01-01	BPNS00000003CRHK	BPNL000000001F61	DZ, 16112, BP No 1, Zone Industrielle de Reghaia, Route Nationale 5, 36.74,3.34
BPNA00000000IL5M	Hauptpforte	SiteMainAddress	FALSE	2024-12-01	2025-01-01	BPNS00000003CRHK	BPNL000000001F61	EG, 11835, Buildings S2A & S2B, Katameya Downtown, 5th Floor, 90 Road, 5th Settlement, 30.095472,31.238679
BPNA0000000RPOT9	Fort Mill 1	LegalAndSiteMainAddress	TRUE	2024-12-01	2025-01-01	BPNL000000000JS9	BPNL000000000SM0	KE, 00100, Outer Ring Road, Ruaraka, -1.247172,36.872868
BPNA0000000V5L2X	Fort Mill 2	AdditionalAddress	TRUE	2024-12-01	2025-01-01	BPNL000000000JS9	BPNL000000000SM0	ZA, 1451, 55 Potgieter Street, -26.321043,28.136272

Figure 32: Addresses

bpns	name	isParticipantData	createdAt	updatedAt	legalEntityBpn	mainAddress
BPNSXXXXX	Chelghoum Laid, Zone Ind. (Production)		2025-06-01	2025-06-02	BPNL000000001F61	BPNA00000000IL5M
BPNSXXXXX	Algiers, Reghaia (Production)		2025-06-01	2025-06-02	BPNL000000000SM(	BPNA0000000RPOT9
BPNSXXXXX	New Cairo City, Downtown Katameya (Office)		2025-06-01	2025-06-02		
BPNSXXXXX	Nairobi, Ruaraka (Production)		2025-06-01	2025-06-02		
BPNSXXXXX	Johannesburg, Alrode (Production)		2025-06-01	2025-06-02		

Figure 33: Sites

Conclusion:

The proposed structure with Legal entities, Sites C Addresses, fits also for the participating chemical companies. For Chemparks with different Legal entities, different BPNA ids can be set up. Also, the organization of different sites in one legal address can be realized within this concept as the BPDM content on site level is under responsibility of the company itself.

- How Address Types Are Validated and Linked to Business Entities.docx

Category	Chemical Industry	Automotive Industry
Key Identifiers Used	DUNS, VAT, REACH ID, GLN, BPNL (Catena-X), LEI	DUNS, VAT, GLN, BPNL (Catena-X), LEI
Storage Systems	ERP (e.g., SAP), Regulatory Systems (REACH-IT), SDS Authoring Tools, BPDM, LIMS	ERP, Supplier Portals, Catena-X BPDM
Role in Data Exchange	Central in sharing SDS, ESG data, Digital Product Passport (DPP)	Central in traceability, quality, and production data exchange
Integration with Catena-X/BPDM	Yes – for identity validation, regulatory data sharing, product passport linkage	Yes – for supplier master data, part traceability, process chain transparency

Figure: 35 Comparison of Data Management Practices Between the Chemical and Automotive Industries

Task Result Summary:

This document presents a detailed comparative assessment of Business Partner Data Management (BPDM) implementation between the Automotive Industry and the Chemical Industry, with a specific focus on evaluating the adaptability of Catena-X standards to the Chem-X ecosystem. The study analyzes template data from key chemical industry participants, including BASF, Henkel, and other consortium partners, to assess alignment with the Catena-X Business Partner Number (BPN) model and related governance frameworks.

Through structured evaluation of entity relationships—covering Legal Entity, Site, and Address representations—the project examined identifier integrity, data exchange mechanisms, and master data governance models. The analysis identified that while both industries share a fundamental need for standardized, interoperable, and high- quality business partner data, the automotive sector has already operationalized these requirements through the Catena-X framework, underpinned by ISO/IEC-compliant standards such as CX-0010 (Business Partner Number), CX-0012 (BPDM Data Pool API), and CX-0149 (Verified Company Identity).

The comparison revealed that the Chem-X data model could fully adopt the Catena-X BPDM principles with minimal modification, ensuring consistency, scalability, and regulatory compliance. By leveraging the existing Catena-X ecosystem, Chem-X can accelerate the establishment of a trusted, interoperable data space for chemical suppliers, manufacturers, and partners, avoiding redundant framework development.

Conclusion: The study concludes that the Catena-X standards for Business Identity, notably the Business Partner Number (BPN) and its associated verification mechanisms, should be adopted as the foundation for Chem-X BPDM. This approach ensures seamless cross-industry interoperability, strengthens data quality and governance, and supports the broader goal of creating a unified, sovereign, and transparent industrial data ecosystem.

24. Identifiers analyses - European Standard Technical Committee CEN/CLC/JTC 24

This analysis is based on draft pren 18219:2025 – Digital product passport - Unique identifiers
Source: https://app.nbn.be/data/r/platform/public-portal/home?P_lang=en

24.1. Summary of the identifier solution proposed by JTC24

This draft European Standard by the Technical Committee CEN/CLC/JTC 24 aims to support the implementation of Digital Product Passport (DPP), It establishes a framework for the creation and management of unique identifiers.

These identifiers connect products, economic operators, and facilities to their digital counterparts and are designed to be distinct, reliable, and universally recognizable. To ensure interoperability and reduce implementation costs, these identifiers are designed to integrate with existing International Standards.

24.2. Key concepts, data structures, and identifier types of Chem- X and JTC24

Table 17: Comparison between Chem-X and JTC24

	CHEM-X	CEN/CLC/JTC 24
Data Structures	Dedicated information models for economic operators aka business partners and materials (Business Partner, Sites and Address)	Abstract, semantic model definition (needs sync with Chem-X information model
Identifier Types	Material ID (Product Identifier: Item, model, batch) Business Identity (BPNL, BPNS, BPNA)	Product Identifier (item, model, batch) Economic Operator and Facility Identifier
Identity C Trust Framework	Business Partner Data Management (BPDM), Identity Wallet, Verifiable Credential (BPNL, Membership)	N/a
Guiding principles for identifiers	Based on CX-0010, CX-0149 in accordance to CEN/CLC/JTC 24	Global uniqueness Persistence Syntax Semantics Interoperability Openness

24.3. Similarities and Differences

Table 18: Comparison between Chem-X and JTC24

	CHEM-X	CEN/CLC/JTC 24
Legal Entities, Organizations	Business Partner Number Legal (BPNL)	ISO/IEC 6523-compliant identifiers e.g. Legal Entity Identifier (LEI) Digital Object Identifier (DOI)
Facilities and Sites	Business Partner Number Site (BPNS) Business Partner Number Address (BPNA)	ISO/IEC 6523-compliant identifiers e.g. Structured path identification Digital Object Identifier (DOI)

24.4. Integration and Alignment Points

Potential alignment with Catena-X is needed as this project precedes CEN/CLC/JTC 24 availability. Chem-X may be aligned with JTC24 as it is considered during design phase.

24.5. Technical and Governance Implications

Based on the given CEN/CLC/JTC 24 draft document pren 18219:2025, the current Chem-X approach is compatible with DIN EN 18219 for the EU Digital Product Passport (DPP), including ISO/IEC 6523-compliant identifiers and W3C vcs for secure, decentralized identity verification.

As the CEN/CLC/JTC 24 draft documents don't describe specific architectural requirements beyond identifier features there have been no road blockers identified in context of the Chem-X architecture specification efforts.

24.6. Summary of challenges, risks, and necessary conditions for integration or coexistence

As stated in 20.1.4 Chem-X identifier schemas are well aligned with CEN/CLC/JTC 24.

25. Conclusion

Adopting the Catena-X Identity and Trust Framework for Chem-X.

Chem-X adopts the Business Partner Number (BPN) verifiable credential (VC), and the Membership verifiable credential as defined in Catena-X standard CX-0149. This leverages a proven, secure, and interoperable identity and trust framework, accelerating development and enhancing the Chem-X value proposition by avoiding the need to build foundational infrastructure from scratch.

The Catena-X identity C trust framework addresses the core challenge of decentralized data spaces: reliably identifying data space participants.

It is based on the following Catena-X standards:

- CX-0010 – Business Partner Number: A unique, ISO/IEC 6523-registered identifier issued by a trusted issuer.
- CX-0012 – BPDM Data Pool API C CX-0074 – BPDM Gate API: Define the authoritative "Golden Record" data model for data space participants and business partners and provide API access for consistent data exchange.
- CX-0149 – Verified Company Identity: Encapsulate the BPN and verified membership into W3C-compliant, cryptographically signed vcs, which are issued by a trusted issuer and presented / verified by the data space participants during data exchange.

This architecture is based on a pragmatic fusion of a central trusted issuer and decentralized presentation and verification during data exchange — a design that ensures trust, scalability, and interoperability.

The central trusted issuer for bpns and Verifiable Credentials:

Guarantee's uniqueness ensures that each legal entity has exactly one validated BPN, avoiding ambiguity and conflicts across the data space(s).

Provides high-quality master data: curates standardized, verified records — critical for automation and reliable partner interactions.

Serves as a trust anchor: a centralized validation process leverages the knowledge of the data space participants as well as external sources to ensure the authenticity of bpns and vcs issued under CX-0010 and CX-0149.

Enable efficient onboarding: companies get their BPN and vcs once and can interact with all other trusted participants, significantly reducing integration overhead.

This central trusted issuer underpins a fully decentralized, peer-to-peer data exchange model based on CX-0018, supporting sovereignty and resilience while maintaining a common foundation of trust.

Strategic Benefits for Chem-X:

- Speed and efficiency reuses mature standards and open-source / reference implementation-based services, avoiding redundant development.
- Cross-sector interoperability: bpns and vcs are valid across data spaces (e.g., Chem-X and Catena-X), enabling integrated value chains across industries.
- Regulatory alignment: meets the requirements of DIN EN 18219 for the EU Digital Product Passport (DPP), including ISO/IEC 6523-compliant identifiers and W3C vcs for secure, decentralized identity verification.

Adopting the Catena-X identity and trust framework for future-proofs Chem-X, reduces project risk, and provides an industrially validated foundation for secure, scalable, and interoperable data exchange.

26. Open topics under ongoing discussion

26.1 Handling of Inactive Companies

26.1.1 Current Status

The data model contains valid fields; however, the product is not actively triggered due to a lack of defined processes.

Future work could focus on automating the handling and management of inactive companies, which are currently managed on-demand through manual procedures and Chem-X will collaborate with Catena-X from Data exchange community.

26.1.2 Planned Improvements

Based on the Data Sharing Group's expressed interest, the feature has been earmarked for future development and is expected to be included in an upcoming Program Increment.

26.1.3 Future Scope

Future implementation will involve automating the management of inactive companies across both product and process dimensions by leveraging the datahub and other services.

26.2 Company Bankruptcy

As part of future improvements, mechanisms can be introduced to ensure that when Credit Bureau agencies identify inactive companies, the system is promptly informed either through direct notifications or change requests for field mapping.

26.2.1 Process Activation Plan

As part of future improvements, the datahub process will be activated with scheduled semi-annual triggers to facilitate automated checking and updating the shared data pool.

26.2.1 Monitoring Manual Checks

Datahub is designed to automatically initiate updates for inactive companies. Credit Bureau agencies will maintain their role in continuously scanning for such entities. For manually curated records, curators must verify inactive company information to ensure reliability.In future iterations, this verification process will be targeted for increased automation.

26.3 Company mergers, split offs, renaming

As of now, the handling of company lifecycle events such as mergers, renaming, and splitoffs within BPDM is not fully defined as a completed, normative feature of the Catena-x standards, but is still under discussion and development within the BPDM context. The existing standards focus on core master data (Business Partner Numbers, Golden Records, apis) and foundational behaviors, with some lifecycle aspects like soft delete being mentioned but not yet formalized as a business state.

In other words, while Catena-X BPDM standards support structured business partner identification and record management today, the explicit lifecycle rules for organizational change events are part of ongoing evolution and may be introduced in future releases of the standards and reference implementations.

27. References

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5. Catena-X Standards – CX-0018 – Dataspace Connectivity v3.2.0
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10. ISO 6709:2022 – Geographic Point Location
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12. ISO 639:2023 – Language Codes
13. Gaia-X Trust Framework
14. Catena-X Data Exchange Governance Framework
15. Cofinity-X Business Partner Data Sharing Community
16. Https://catenax-ev.github.io/docs/Jupiter/operating-model/what-service-map#core-services

28. Glossary

All definitions used in this deliverable are aligned with the terminology provided in the https://projektchemx.sharepoint.com/sites/ksgmbhprojektmanagement2/TPX/Glossa ry.aspx