



Market consultation

Collaboration Platform Asset Lifecycle Management

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N.V. Nederlandse Gasunie
Groningen, July, 2024

gasunie
crossing borders in energy

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1 GENERAL INFORMATION

1.1 Introduction

This document contains information regarding the market consultation for a collaboration platform for asset lifecycle management (hereafter: collaboration platform) for N.V. Nederlandse Gasunie (Gasunie).

Gasunie is preparing for a potential European tender regarding the purchase and implementation of a digital collaboration platform providing a “single point of access to asset data and asset related data, so that Gasunie and its partners share the same view on assets and communicate, exchange and manage the data during all phases of the asset lifecycle”.

As part of the preparation for a potential tender, Gasunie carries out this market consultation in order to understand which application(s) can fulfill the functions that Gasunie requires for a possible future collaboration platform. Your response will be used as input for a possible European public tender.

1.2 N.V. Nederlandse Gasunie

Gasunie manages and maintains the infrastructure for large-scale transport and storage of gas in the Netherlands and the northern part of Germany. Safety, reliability, sustainability and cost-effectiveness are central in everything we do. Our company was founded in 1963, four years after the discovery of natural gas in the northern Dutch province of Groningen. We are a public limited company under Dutch law and fully owned by the State of the Netherlands. Gasunie has two subsidiaries that manage the gas transport network: Gasunie Deutschland in Germany, and Gasunie Transport Services (GTS) in the Netherlands.

1.2.1 Our mission

Gasunie is a leading European energy infrastructure company whose core activities are gas transport and gas storage. We serve the public interest and facilitate the energy transition by providing integrated infrastructure services. We focus on value creation for our shareholder(s) and other stakeholders and apply the highest safety and business standards used in the sector.

1.2.2 Our vision

We believe in a sustainable future with a balanced energy mix and a lasting role for diversified gas. We believe that we serve our customers best with innovative gas and related infrastructure solutions.

Our three pillars:

- Ensuring a safe, reliable, affordable and sustainable gas infrastructure in our core area.
- Contributing to an efficient gas infrastructure and services for a properly functioning European natural gas and LNG market.
- Accelerating the transition to a carbon-neutral energy supply.

1.2.3 Code of conduct

Maintaining a good reputation is of great importance to Gasunie in achieving its strategic goals. Gasunie considers it its responsibility to ensure that its services are delivered within a value chain that complies with international standards. Therefore, Gasunie values professional and careful collaboration with suppliers and partners while maintaining high moral standards. The Code of Conduct applies to all Gasunie employees, including those working for companies within the Gasunie group and those who are seconded to or work on behalf of Gasunie. For suppliers, the Suppliers Code of Conduct is applicable. This document can be found on <https://www.gasunie.nl/en/suppliers>

2 INFORMATION ABOUT THE MARKET CONSULTATION

2.1 Goal of the market consultation

The goal of this market consultation is to obtain answers from the market so that a potential future tender can be directed to the market in the best possible way. In addition, Gasunie wants to encourage the market to participate and think along for possible solutions.

Gasunie will use the insights obtained from the market consultation (where relevant) in the preparation of the possible tender and the tender documents. In addition, Gasunie reserves the right not to use these insights or not to use them in full. Gasunie tries to work as transparently as possible by using the results of the market consultation to draw up the tender with the associated requirements. Gasunie expects to launch a tender in 2025.

2.2 Main question

The main question Gasunie wants to answer through this market consultation is:

“What application, or optimal combination of applications, can fulfill(s) the functions defined for the collaboration platform?”

In order to be able to answer this question, Gasunie asks market players to provide information about (one or more) applications that can execute all (or a subset) of the functions that, according to Gasunie, defines a collaboration platform.

In the following sections, more information is provided about asset data, context and background, applications currently used, the collaboration platform and its functions. The functions are described in detail in Appendix 5.

Market players are asked to answer multiple questions (in Appendix 1), so that Gasunie is able to answer the main question, as preparation for a potential tender.

2.3 Vision on managing asset data

As stated in section 1.2.2, Gasunie believes in a sustainable future with a balanced energy mix and a lasting role for diversified gas. For an organization that transforms into a infrastructure company that supports a balanced energy mix, accurate asset data and data exchange is crucial.

To facilitate the energy transition to full potential (e.g. supporting the many ongoing and future projects, efficient communication and data exchange with all the partners Gasunie collaborates with), the Managing Assets Digitally (MAD) program is initiated. MAD aims to the design of a more efficient and digital way of asset registration. MADs vision is to develop a digital environment in which Gasunie and its partners can collaborate and work together on parts of the Gasunie network, so that Gasunie can execute more energy transition related projects and activities in the years to come and creating easier access to data in the operate & maintain phase. MAD wants to obtain and/or optimize the following capabilities:

- Collaboration with partners;
- Registration of asset data;
- Data-driven asset lifecycle management;
- Data quality management for asset management.

In the modus operandi that MAD envisions, the asset lifecycle perspective is pursued. In order to manage asset data efficient and collaborate with partners, MAD defined the following statements (defined from the perspective of Gasunie):

#	Statement
1	Relevant asset data is always up-to-date and accessible, also for partners, unless...
2	We prefer structured data over documents.
3	Only if necessary, we generate documents out of data.
4	We can identify, track and trace an asset across the asset lifecycle.
5	We develop flexible ways of working for collaboration with partners.

6	We pay attention to, emphasize, and attach importance to chain responsibility and cross-functional collaboration in how we work.
7	We prefer relational, structural collaboration over transactional, ad-hoc collaborations.
8	We prefer the use of market standards (see Appendix 6) and norms over custom solutions for how we effectively collaborate on asset data with supply chain partners
9	We prioritize users' desires, work enjoyment, and convenience in everything we do.
10	We only automate if it leads to increased efficiency, reduced error-proneness, and/or greater job satisfaction

Table 1 – MAD statements

One of the main solutions for developing the capabilities described earlier, is a collaboration platform. Gasunie sees the collaboration platform as a "single point of access to asset data and asset related data, so that Gasunie and its partners share the same view on assets and communicate, exchange and manage the data during all phases of the asset lifecycle".

In section 2.5, the collaboration platform will be elaborated.

2.4 Current situation and background

For Gasunie, assets are the physical objects that make up the infrastructure enabling the transport and storage of gas (and liquids, in case of the Gasunie heat grid), e.g.: valves, pipes, compressors and pumps. The asset lifecycle is divided in several phases, see Table 2.

Asset lifecycle phase	Asset project phase	Description
Idea	Study/assessment	Assessing bottlenecks and opportunities to determine whether the execution of an asset project (i.e. a change of an existing asset or the development of a new asset) is necessary or desirable.
	Functional specification	Functional scope is determined; different alternatives are considered; preferred option is chosen. A project is defined.
Design	Project specification (incl. basic design)	The project approach is developed.
	Detail design	The preparatory activities are carried out to enable the realization of the project.
Supply chain	Contracting	Obtaining materials and labor/work
Realization	Realization	The construction work is carried out. In addition, activities are executed in order to record that the asset has been built in accordance with the design requirements (commissioning and post commissioning). Last, the activities to complete the project are carried out.
Operate & maintain		Commercial operation, maintaining and inspecting the assets.

Table 2 – Asset lifecycle phases

One of many complexities within Gasunie is the diversity of roles within the lifecycle: e.g. Asset Management, Operations, Safety, Health and Environment, IT and Audit, Risk management and Procurement. In addition, Gasunie collaborates with various (external) partners within these phases: e.g. engineering companies, contractors, governments, research agencies and other network operators.

Regarding asset management and the described phases, the following (engineering) disciplines are considered, amongst others:

1. Environment management (incl. stakeholder management and permit management);
2. Civil engineering;
3. Mechanical engineering (including process engineering);
4. Electrical engineering;
5. Instrumentation engineering;
6. Safety.

Often, data between Gasunie and its partners is shared using different media, the single source of truth is not clear every time. The shared data, both internal and external, is document-driven and -oriented. The documents are often derived from other source data (e.g. 2D pdf drawing are derived from a 3D model of a Gasunie plant, and shared). Because of this, potential relevant data is lost in the asset lifecycle management (ALM) processes, and different versions of the same data could be present in the organization.

Actually in Gasunie, asset data is primarily stored in four applications that together act as the asset registry (in Dutch: "bedrijfsmiddelenregister" - more information in Appendix 4):

- (1) an application for geographical information,
- (2) an application for the administrative information,
- (3) an application for drawings – saved and stored as 2D pdf documents, and
- (4) an application for document management.

Links between the four applications regarding an unique asset are available, but to a limited extent.

For example: using an identifier, it is possible to find information of a specific asset (e.g. valve) in the tool for geographical information and the tool for administrative information. But it's not possible to find the same asset in the drawing management application, because the stored drawings are not machine readable (pdf). Also, these drawings are derived from source data (e.g. 3D models and intelligent P&IDs), and this original source data is not machine readable, nor visualizable in the drawing tool.

Besides the above described applications: information is shared and exchanged by different media and applications (e.g. e-mail, SharePoint and by Gasunie developed fit-for-purpose tools). Projects makes use of an application for document storage, in which also asset data regarding the specific projects is stored.

Not working in the single source of truth, working with derived products instead of source data and using different ways to exchange data (in a decentralized way) lead to inefficiency in data exchange with longer lead times, not always having an up-to-date representation of the truth, and not optimized collaboration with partners.

MAD intends to address these issues by using a collaboration platform.

2.5 Collaboration platform for ALM

MAD sees the collaboration platform as an Asset Lifecycle Information Management (ALIM) solution that performs as a digital backbone for asset data during all phases of the asset lifecycle. The platform will be defined based on the following principles:

#	Collaboration platform principles
1	Data will be stored in systems that Gasunie controls (e.g. on-prem, cloud): no source data in systems of third parties during the operate and maintain phase of the asset lifecycle.
2	Within Gasunie, data is stored and kept in the designated source systems, and data is interlinked with other data.
3	Documents, 2D drawings and 3D models are stored in the collaboration platform.
4	As early as possible in the asset lifecycle, data will be transferred from collaboration platform and asset registry and vice versa, and data will be enriched over time.
5	More data, links/connections and details along the asset lifecycle.
6	Connections and exchange of data with operational systems (e.g. SCADA systems) is, for this consultation, out-of-scope.
7	Gasunie develops the template and platform in order to collaborate. The collaboration platform supports this template.
8	The collaboration platform supports the use of (inter)national and open standards and formats (see Appendix 6).
9	Requirements and as built specs must be remain available side by side, so that those can be (re)used for future decisions.
10	The collaboration platform is engineering/design tool independent
11	Hardware flexibility and independency (hardware agnostic).

Table 3 – Collaboration platform principles

MAD investigated the possibilities and the applications of a collaboration platform by means of a proof of concept (PoC). During the PoC, MAD implemented ten use cases (derived from all phases of the asset lifecycle) in an ALIM solution. Primary goal of the PoC was developing requirements and functions that define a collaboration platform for Gasunie. In addition, MAD gained experience with this type of solution.

The PoC resulted in the 23 functions stated below. MAD believes that these functions are required to satisfy the MAD statements and collaboration platform principles (i.e. Table 2 and Table 3). In Appendix 5, the exact description of each function can be found. (The index of the functions below does not represent priority).

1	Data management	9	3D visualization	17	Integration
2	Classification	10	Search	18	Report
3	Plant break down structure	11	Full-text search	19	Access control
4	Relations	12	Concurrent engineering	20	Audit trail
5	Import/export	13	Compare	21	Data retention
6	Data capture	14	Alert	22	Support
7	Validation	15	Workflow	23	Offline
8	Viewer	16	Review & markup		

Table 4 – Collaboration platform functions: the functions that, according to Gasunie, define a collaboration platform

During the PoC, MAD experienced that there is no “sheep with five legs” (i.e. Dutch saying, meaning, in this context, that there is not one application that can do everything, no “jack of all trades”).

As a consequence, Gasunie made the decision to conduct a market consultation in order to find an application, or an optimal combination of applications, that fulfill(s) the functions of a collaboration platform.

In the next chapter, the process regarding the market consultation will be discussed.

3 PROCEDURE

3.1 Client

The clients for this market consultation are department Asset Data Management (OOD) and department Technology (OT). Department OOD is responsible for the maintenance of the asset data in the asset registry. OT is the engineering department.

3.2 Process and structure

This market consultation will be published on TenderNed. The market consultation document (i.e. this document) is digitally available on TenderNed’s website. Based on this document, the market can form an understanding of the potential assignment. To gain insight into the market, Gasunie has formulated a set of questions included in Appendix 1. This annex also serves as the answer form for market players to respond to the questions.

3.2.1 Confidentiality and conditions

Gasunie treats all information sent by participating market parties confidentially if this is expressly stated and substantiated as to why it is confidential before information is shared. Confidential information is only shown to employees and advisors who are directly involved in market consultation. Gasunie is also entitled to use the information provided to draw up (any) tender documents and will not refer to participants in the market consultation or confidential information indicated in advance. Conditions:

- Communication will be conducted in English or Dutch
- All communication will exclusively take place with the contact persons mentioned in section 3.2.4.
- This market consultation is without obligation for all involved.
- If a tender results from this market consultation, participants in this market consultation will not be in an advantageous position compared to other participants or other providers in the possible tender.
- Market parties cannot derive any rights from the information provided during the market consultation.
- There are no costs associated with participating in the market consultation, but any costs you incur will also not be reimbursed.
- If necessary, Gasunie may contact market players to collect additional information.
- Acquisition as a result of this market consultation is not appreciated.

3.2.2 Uncertainties or questions about this market consultation

If there are any questions, the form in Appendix 2, i.e. “Model for asking questions” can be used. Please send the completed document by email to the contact persons mentioned below. The deadline for submitting questions is stated in section 3.3. The Notes of Information with the answers to the questions will be published on TenderNed on the specified date in section 3.3. The submitted questions will be anonymized by Gasunie.

3.2.3 Submitting responses to the market consultation

For answering the market consultation, please address the questions as outlined in Appendix 1. Gasunie kindly requests that answers are well-reasoned and explained. After completing the responses, the respondent can send the document via email to the contact persons mentioned below. Gasunie appreciates receiving the answers no later than the date and time specified in section 3.3.

3.2.4 Demonstrations

Gasunie would like to invite a maximum of five (5) participants that provide a compelling response for a demonstration. If the response is less than five or if too many parties respond, Gasunie will make a selection from the submissions. It is not a right to give a demonstration and participation in the demonstration is not mandatory. If the respondent is open to giving a demonstration, you can indicate your availability in Appendix 1 and submit it along with your answers to the contact persons. Demonstrations will take place onsite (Gasunie headquarters, Groningen, The Netherlands) and/or via Microsoft Teams (dependent on the preference of the respondent).

The primary goal of the demonstration is for us to get an understanding of the capabilities and suitability of the application(s). Therefore our preference is to have a live demo of the application(s). In addition we would like to ask questions about the presented application(s).

3.2.5 Contact persons

The first contact person for this market consultation is Arnoud Verver, senior purchaser IT, and is reachable via e-mail address a.a.h.verver@gasunie.nl. Please send your communication also to his backup Hidde Looper which can be reached at H.J.Looper@gasunie.nl.

3.2.6 Final report

The market consultation will conclude by sending an anonymized report to all participating parties. In addition, the report will be published as an attachment to a (potential) tender announcement. By participating in this market consultation, parties grant permission to use the provided information and/or data for this purpose, while adhering to the confidentiality provisions outlined in section 3.2.1. The content of the report will not be pre-coordinated in draft form with participating parties.

3.3 Planning

The schedule below (i.e. Table 5) does not confer any rights. The underlined dates are deadlines, unless Gasunie has communicated otherwise. Gasunie reserves the right to modify the schedule as needed.

In order to avoid the issue of respondents having to wait for a long time, Gasunie will publish answers to the questions (i.e. Notes of Information) multiple times.

Activity	Date/time (CET)
Publication on TenderNed	17 July, 2024
Deadline to submit questions – first round	7 august, 2024, 11:00
Publication first Note of Information	14 August, 2024
Deadline to submit questions – second round	10 September, 2024, 11:00
Publication second Note of Information	17 September, 2024
Deadline submitting written response market consultation	1 October, 2024, 11:00
Selection of respondents for demonstration	8 October, 2024
Demonstrations	21 - 25 October, 2024
Final report	1 November, 2024

Table 5 - Planning

APPENDICES

Appendix 1 – Model for submitting answers and availability

See excel

Appendix 2 – Model for asking questions

See excel

Appendix 3 – Glossary

#	Term	Meaning	Further information
1	ALIM	Asset Lifecycle Information Management	Used in the context of “ALIM solution”: a system in which asset lifecycle information can be managed.
2	ALM	Asset Lifecycle Management	
3	Asset	Item, thing or entity that has potential or actual value to an organization.	For Gasunie, the physical objects that make up the infrastructure that enables the transport and storage of gas, e.g.: valves, pipes and compressors.
4	Asset registry	Dutch: bedrijfsmiddelenregister (abbreviation: BMR)	In Gasunie, asset data is primarily stored in four applications that together act as the asset registry: (1) An application for geographical information, a Hexagon Intergraph G/Technology solution. (2) An application for the administrative information, i.e. SAP. (3) An application for drawings – saved and stored as 2D pdf documents, based on Meridian (by Accruent). (4) An application for document management, delivered by the Gasunie IT department.
5	Collaboration platform	Single point of access to asset data and asset related data, so that Gasunie and its partners share the same view on assets and communicate, exchange and manage the data during all phases of the asset lifecycle.	
6	Digital content	Digital files containing asset related information like documents, drawings, models etc.	
7	EIR	Exchange Information Request (Dutch: InformatieLeveringsSpecificatie, ILS)	An agreement between parties about which data and in what format data will be exchanged.
8	MAD	Managing Assets Digitally	Program that aims to the design of an efficient and digital way of asset registration
9	OTL	Object Type Library	A library with standardized object-types names (e.g. road, viaduct) and properties or specifications.
10	Partner	External party that collaborates with Gasunie in the design, realization and operation of assets (e.g. engineering companies, contractors).	

11	PoC	Proof of Concept	For Gasunie, a PoC is executed in a not-live system (i.e. not a production environment) with data that is not currently worked with (i.e. no production data). In contract, a pilot is executed with actual production data.
12	SSO	Single sign-on	
13	Structured data	Data that has a predefined format, so that it can be interpreted in an efficient way by both software and humans.	

Appendix 4 – Functions and function descriptions

ID	Function	Explanation
1	Data Management	Data Management is a vital system function that involves the comprehensive process of collecting, storing, organizing, and maintaining organizational data to ensure its accuracy, availability, and accessibility. It encompasses gathering data from various sources accurately and completely, safely storing data using object-oriented databases and structuring data for easy access and visibility. Allowing users to input metadata and validating the metadata against predefined standards. It associates metadata with the corresponding content (relations). Revision control tracks changes and manages different versions of data, ensuring consistency and traceability.
2	Classification	Classification is a system function designed to provide a systematic approach to organizing and categorizing digital files, objects, and (meta) data within the system. This function enhances management and utilization of digital content through the use of structured classification schemes. It involves defining categories, subcategories, and hierarchies based on predefined classification schemes, such as taxonomies, ontologies (e.g. OTL), or industry standards (like CFIHOS). Classification inheritance ensures that child objects inherit classification metadata from their parent objects within the hierarchy, maintaining consistency and structure.
3	Plant Breakdown Structure	Plant Breakdown Structure (PBS) is a system function that hierarchically organizes all components and systems within a plant. It starts by classifying plant components into a structured hierarchy based on predefined criteria and defining parent-child relationships to create a multi-level breakdown. This function attaches relevant metadata to each component, providing detailed descriptions and specifications. It also offers graphical visualizations of the PBS for easier understanding and navigation.
4	Relations	Relations Management is a system function designed to facilitate the creation, management, and utilization of relationships between digital files, objects, and data within the system. It involves creating relationships, defining how files and objects are related to each other, and associating metadata with these relationships to provide additional context and details. It allows for manual management, enabling users to create, update, and delete relationships. Hierarchical relationships, such as parent-child links, are managed to reflect structural and dependency connections.
5	Import/Export	Import/Export is a system function that manages the transfer of data and digital content into and out of the system. This function begins with parsing and interpreting import files, validating their data quality, and transforming the data into the system's internal format. It maps the data to existing structures and imports it into the system. For exports, it extracts the requested data, transforms it into the specified format, and delivers it to the designated destination. The function handles errors efficiently, logging all activities for monitoring and auditing purposes.

6	Data Capture	Data Capture is a system function designed to collect, validate, transform, and store data from diverse sources. This function begins with gathering data from various inputs such as files, databases, and includes manual data entry. It validates the data to ensure accuracy and completeness, transforms it into a standardized format, and associates relevant metadata for context. The captured data is then stored in designated repositories or databases available and visually displayed to end user
7	Validation	Data Validation is a system function designed to ensure the accuracy, integrity, and compliance of data stored within the system by systematically verifying its consistency, correctness, and adherence to predefined validation rules and criteria. The data validation process begins with the application of predefined validation rules to data entries, ensuring compliance with specified formats, ranges, and constraints. Data is compared against reference datasets or standards to identify discrepancies or inconsistencies, and errors are detected and flagged for resolution.
8	Viewer	Viewer system function enables users to efficiently access, display, and interact with various file types. It provides a user-friendly interface for navigating and opening files. The system supports multiple file formats, ensuring high-quality rendering and offering tools for zooming, panning, searching, and annotating content. (Remark: if a file contains objects that contain data, then the Viewer should also be able to show this object based data to the user. Example: intelligent P&IDs)
9	3D Visualization	3D Visualization is a system function designed to provide immersive and interactive visual representations of 3D data, enabling users to explore, analyze, and interpret spatial relationships, structures, and designs with enhanced depth and realism. Easily display and support a wide range of native 3D formats. 3D models and geospatial data are rendered to facilitate visual exploration. Scenes are composed by assembling multiple 3D objects, textures, and lighting effects to create realistic and engaging environments. Users can add annotations, labels, and markers to 3D models to highlight specific features or points of interest, enhancing understanding and communication. Simulation capabilities allow for the visualization of dynamic behaviors and interactions within the 3D environment, providing valuable insights for predictive analysis or training purposes.
10	Search	Search is a system function that enables users to efficiently locate latest data, documents, and other digital content within the system. The search results are ranked based on relevance, and additional filters can be applied to refine results. The results are presented in a user-friendly format, with options for advanced search techniques such as Boolean operators and wildcard searches.

11	Full-Text Search	Full Text Search is a system function designed to enable users to conduct comprehensive searches across all textual content stored within the system. This function plays a crucial role in facilitating efficient information retrieval and knowledge discovery by allowing users to find relevant documents, files, and records based on their textual contents. Search execution involves searching the index for documents and files containing the specified keywords and phrases, ranking results based on relevance. Search results are presented to users, with retrieved documents and files displayed along with highlighted text where search terms are found.
12	Concurrent Engineering	Concurrent Engineering is a system function designed to enable multiple users and external parties to collaboratively work on the same asset simultaneously and in different stages. This function allows for simultaneous access to project data, ensuring that changes made by one user are visible to others. It involves managing versions of project data to keep track of changes and ensure data integrity, and detecting and resolving conflicts when multiple users attempt to modify the same data.
13	Compare	Compare is a system function that allows users to compare different versions of a data object to identify changes, ensuring accurate version control and change tracking. The function begins with retrieving the relevant file versions from storage and analyzing their content to identify differences. It also compares metadata associated with each version to highlight changes in attributes. Differences are visually marked using indicators like color coding or annotations, and a side-by-side view of the file versions is provided for direct comparison.
14	Alert	Alert is a system function designed to enhance communication by delivering timely alerts, reminders, and updates to users based on specific events and user preferences. The function involves monitoring the system for predefined triggers, generating appropriate notification content, and scheduling delivery through various channels such as email, in-app messages, and push notifications. Users can customize their alert settings to control how and when they receive alerts. The Alert function tracks and logs all delivery activities to ensure accountability and allow for auditing.
15	Workflow	Workflow is a system function that orchestrates the flow of tasks, approvals, and document distribution within the system. This function involves designing and configuring workflows according to process requirements, automatically assigning tasks, routing documents for approval, and sending notifications to users. It tracks the status and progress of tasks in real-time, securely transmits documents to recipients, and records all actions for audit purposes.

16	Review & Markup	Review & Markup function is designed to facilitate the evaluation and feedback process for digital content such as documents, drawings, and models. This function provides a comprehensive set of tools for users to add annotations, markups, and comments directly onto the content, enhancing communication and collaboration among stakeholders. Users have access to a variety of markup tools, allowing them to add text comments, highlights, shapes, arrows, and freehand drawings. Markup tools enable users to visually emphasize or correct parts of the content using underlines, strikethroughs, and other graphical elements.
17	Integration	Integration is a system function that enables seamless connectivity and data exchange between the system and external applications, databases, and services. This function begins with analyzing integration requirements and compatibility, followed by managing APIs that facilitate communication. It involves mapping and transforming data to ensure compatibility, establishing secure connections using appropriate protocols, and ensuring real-time or scheduled data synchronization. The Integration function handles errors and logs activities for troubleshooting and auditing purposes. It also implements security measures to protect data during the integration process.
18	Reports	Reports is a system function designed to provide the capability to generate comprehensive reports and insights based on the analysis of data stored within the system. It involves collecting data from various sources within the system, processing and preparing this data for analysis, and executing predefined or custom analysis algorithms. The function creates detailed reports based on the results of the analysis, including graphical representations such as charts and graphs to enhance understanding and insights. Users can customize reports by selecting specific parameters, filters, and formats, allowing for tailored analysis to meet specific needs. Automated reporting capabilities enable the scheduling and generation of reports at regular intervals or based on specific triggers, ensuring timely availability of critical information.
19	Access Control	Access Control is a system function that secures the platform by regulating who can access specific data. It begins with authenticating users through their credentials (local or SSO) and then authorizes access based on predefined access policies and roles. This function ensures that only authorized users can access sensitive (meta) data and files. Access decisions are logged for monitoring and auditing purposes, providing a record of all access attempts and actions. Policy management allows administrators to create/modify access rules and create/modify roles and members.

20	Audit Trail	Audit Trail is a system function designed to track and record all user activities and system changes, ensuring accountability and supporting security and compliance efforts. This function involves capturing detailed logs of user actions, such as logins and metadata modifications, as well as changes to files. Access to audit trail is available to authorized personnel, and timestamps are applied to each logged action and event for chronological tracking.
21	Data Retention	Data Retention is a system function that governs the storage, archiving, and disposal of data in compliance with regulatory, legal, and organizational policies. This function involves defining retention policies, classifying data, and automatically archiving it after a specified period. It ensures the secure storage of archived data, allows authorized users to retrieve data when necessary, and securely deletes data that has reached the end of its retention period. All actions related to data retention are logged for audit and compliance purposes.
22	Support	Support function in a software application provides users with assistance and resources to resolve issues, understand features, and maximize the utility of the application. It includes several key components designed to offer comprehensive help and guidance, ensuring users can effectively use the software and troubleshoot problems. The support is also multilingual.
23	Offline	Offline functionality is a system function designed to enable users to access, create, edit, and manage digital files and data without requiring a constant internet connection. This function allows users to download or cache files and data for offline access, ensuring continuity of work and productivity even when offline. It enables local editing, allowing users to create, edit, and manage files and data on their local device. When an internet connection is re-established, data synchronization processes automatically.

Appendix 5 – Norms and standards

The most important norms and standards for a collaboration platform are (in random order):

#	Standard	Official name
1	ISO 55000	Asset management
2	ISO/IEC 27001	Information security, cybersecurity and privacy protection
3	ISO 19650	Building Information Modelling (BIM)
4	ISO 16739	Industry Foundation Classes (IFC)
5	ISO 23387	Building information modelling (BIM)
6	CFIHOS (JIP36)	Capital Facilities Information HandOver Specification