

DATA SPACE 4.0

**A European Common Digital Manufacturing Infrastructure and Data Space
Pathway for Connected Factories 4.0 Data Value Chain Governance**

Digital Europe EU Grant Agreement: 101083939

Title	D6.1 - DSSC cooperation activities report
Document Owners	IDSA
Contributors	ALL
Dissemination	PU - Public
Date	14/10/2024
Version	1.0



Document History

01/07/2023	Structure of the deliverable and third risk collection based on FMEA methodology
03/07/2023	Initial definition of ToC and identification of responsibilities.
11/07/2023	Agreement on the ToC and responsibilities during the GA in Brussels
24/10/2023	Documents sharing and request for contributions
26/10/2023	First draft of the document for internal review
11/04/2024	Contributions to the second version of the document
23/05/2024	Second version of the document review and edition
15/10/20124	Final version for submission

Document Fiche

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Workpackage	WP6
Task	T6.1
Nature	Report
Dissemination	PU- Public



Project Partners

Participant organisation name	Acronym
ASOCIACIÓN DE EMPRESAS TECNOLÓGICAS INNOVALIA	INNO
FONDAZIONE POLITECNICO DI MILANO	FPM
COMMISSARIAT A L ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES	CEA
VDI TECHNOLOGIEZENTRUM GMBH	VDI TZI
BRAINPORT INDUSTRIES COOPERATIE UA	BPI
INDUSTRIE 4.0 OSTERREICH – DIE PLATTFORM FUR INTELLIGENTE PRODUKTION	PIA
CHALMERS TEKNISKA HOGSKOLA AB	CHALMERS
INTERNATIONAL DATA SPACES EV	IDSA
ENGINEERING - INGEGNERIA INFORMATICA SPA	ENG
UNPARALLEL INNOVATION LDA	UNPARALLEL
SOFTWARE QUALITY SYSTEMS SA	SQS
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Executive Summary

This document provides a comprehensive overview of the collaboration between DATA SPACES 4.0 EU and the Data Space Support Centre (DSSC) during their co-creation processes. The collaboration began with the establishment of co-creation channels and integration into existing DSSC communities, fostering liaisons with other projects within the Community of Practices (CoP).

DATA SPACES 4.0 EU actively engaged with the DSSC through various mechanisms, contributing valuable insights through surveys and participation in meetings and events. A significant area of collaboration centered on adopting Building Blocks and Blueprint, resulting in the development of key deliverables. DATA SPACES 4.0 EU also actively participated in defining data governance models for the manufacturing sector.

The project's dedication to communication, dissemination efforts, and active involvement in events further solidified the partnership. Overall, the collaboration demonstrated a strong emphasis on knowledge sharing, asset development, and advancement of data spaces, contributing to a thriving data space community.

Keywords: Blueprint, Building blocks, co-creation process, Community of Practices (CoP).

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Acknowledgement

This document is a deliverable of DATA SPACES 4.0 EU project. This project has received funding from the European Union's Digital Europe program under grant agreement N° 101083939.



Table of Contents

- Executive Summary..... 4
- Table of Contents 6
- Abbreviations and Acronyms..... 8
- List of Figures..... 9
- List of Tables..... 9
- 1 Introduction..... 10
 - 1.1 Purpose and scope 10
- 2 About DSSC..... 12
- 3 How we collaborated with the DSSC processes? 14
 - 3.1 Establishment of co-creation channels with DSSC..... 14
 - 3.1.1 Existing communities 14
 - 3.1.2 Co-creation channels 15
 - 3.2 DSSC relationship management activities..... 19
 - 3.3 Key areas of collaboration: 19
 - 3.3.1 The DSSC and the building blocks (T6.1)..... 21
 - 3.3.2 DSSC and the blueprint (T6.1)..... 22
 - 3.3.2.1 Blueprint co-creation process with the DSSC: 24
 - 3.3.3 DSSC standardization activities (T6.2) 25
 - 3.3.4 DSSC data governance models in Manufacturing (T3.1, T6.3 and T6.4) 26
 - 3.3.5 Communication and dissemination activities (WP7)..... 27
 - The communication activities 27
- 4 Main activities and co-creation process with DSSC 30
 - 4.1 Reporting, interviews and questioners. 30
 - 4.2 Building blocks contributions..... 31
 - 4.3 Blueprint for manufacturing status..... 33



4.4	Data Spaces Symposiums.....	36
4.5	Events, meetings, CoP follow up.	41
4.5.1	COP Meetings more in detail.....	42
5	Conclusions	44
	Annex I. Liaisons	46
	Annex II. Experts Groups	47



Abbreviations and Acronyms

Acronym	Meaning
CA	Consortium Agreement
CPPS	Cyber-Physical Production System
DoA	Description of Action
EC	European Commission
GA	General Assembly
IPR	Intellectual Property Regulations
KPI	Key Performance Indicator
OSS	Open-Source Software
REI	Responsible Exploitation & Innovation Board
RRI	Responsible Research & Innovation
TCC	Technical Coordination Committee
WP	Work Package



List of Figures

Figure 1. DSSC Delivery Plan – Summary of Assets Publication..... 12

Figure 2. DATA SPACE 4.0 collaboration with DSSC – co-creation channels. 17

Figure 3. DATA SPACE 4.0 deliverable contributing to DSSC..... 20

Figure 4. DSSC Building Blocks 22

Figure 5. DSSC Conceptual Model of Data Space Blueprint 23

Figure 6. DSSC conceptual model 2.0..... 26

Figure 7. DSSC information gathering and collecting feedback 31

Figure 8. DSSC Main Reference Documents publicly available 32

Figure 9. Data Space 4.0 Process to Manufacturing Data Space Blueprints 34

Figure 10. Data Spaces blueprint Structure. 35

Figure 11. The Hague Data Spaces Symposium | Agenda 36

Figure 12. Darmstadt Data Spaces Symposium | Marketing..... 38

Figure 13. Darmstadt Data Spaces Symposium | The European Manufacturing Data Space . 40

Figure 14. Data Spaces 4.0 EU contribution to DSSC 45

List of Tables

Table 1. Manufacturing lounge session by DATA SPACES 4.0 EU 37



1 Introduction

DATA SPACES 4.0 EU project has aligned with the Data Spaces Support Centre (DSSC) to ensure harmonization with the European Data Spaces Technical Framework and the wider data spaces ecosystem. In chapter 3.1, the establishment of this strategic relationship is thoroughly explained. A dedicated Work Package 6 (WP6) has been implemented within the DATA SPACES 4.0 EU project, comprising a comprehensive range of activities aimed at fostering close collaboration with DSSC at all levels. The partnership between key DATA SPACES 4.0 EU partners, namely IDSA and FF, with the DSSC initiative has played a crucial role in achieving successful alignment between both Coordination and Support Actions (CSAs).

DATA SPACES 4.0 EU has actively participated in DSSC stakeholder group activities, contributing to shaping a common data space for the mutual benefit of data space 4.0 assets. This concerted effort ensures that both projects work in synergy, maximizing the impact and efficacy of their endeavors.

1.1 Purpose and scope

The purpose of this activity was to facilitate DATA SPACES 4.0 EU community participation in DSSC activities, meetings and relevant Working and stakeholder groups. Ensure that DSSC gains visibility on the need for deployment of manufacturing data spaces. Adopt DSSC recommendations as part of the project assets. Ensure correct alignment of blueprint and data models with the DSSC recommendations.

The primary objective of WP6 Data Space Support Centre Coordination was to ensure seamless alignment between manufacturing data spaces and DSSC support services, fostering economies of scale and facilitating the global deployment and operation of data spaces 4.0. This document serves as a comprehensive guideline for future data space deployments, outlining how to effectively collaborate with the DSSC. It identifies key areas of collaboration between the DATA SPACES 4.0 EU project and the DSSC, and reports on the co-creation process and main activities developed in partnership with the DSSC.

DATA SPACES 4.0 EU plans were to co-design technical infrastructure blueprints for multilateral data space 4.0 deployment rooted in Industry 4.0 foundations. Consultation,



awareness, and adoption workshops have been held, gathering advanced building blocks to facilitate data space instantiation and sector-specific development. The initiative aimed to unite existing national, regional, and local data ecosystems and stakeholders to establish common principles for industrial data sharing and re-use at the EU level, impacting 98% of European Industry 4.0 activities.



2 About DSSC.

The Data Spaces Support Center (DSSC) is a virtual organisation and EU-funded project which supports the deployment of common European data spaces and promotes the reuse of data across sectors. It is a partnership of 12 prime partners and 16 associated partners all of them well-recognized entities in the data spaces domain. The project started at the same time than DATA SPACES 4.0 EU preparatory action and will last 42 months, covering so the deployment projects as well.

The main mission of the DSSC is to enable data spaces to reach a higher flight level faster, supporting them in having a quick start and an accelerated scale-up. Another important mission is to coordinate the action across all the data spaces, facilitating their cross-fertilization and interoperability, by providing common grounds for all of them. Thus, the data spaces may focus on their domain-specific business challenges and in providing value for their participants, leveraging on the DSSC for basic common building blocks.

DSSC provides a set of guidelines and tools to address all the aspects in a data space, from technical matters to organizational and business ones. This includes a diversity of “assets” in continuous evolution, which initial list is below.

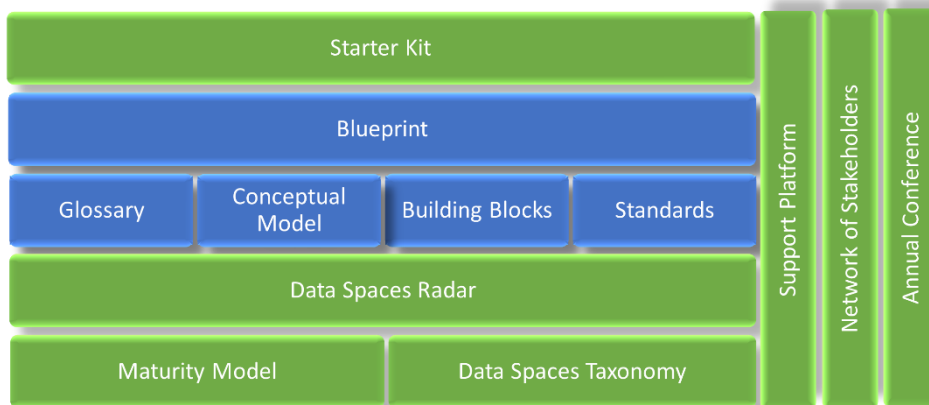


Figure 1. DSSC Delivery Plan – Summary of Assets Publication.



All these assets were built in a co-creation process with all the data spaces and relevant stakeholders, following the commitment of the DSSC with openness and transparency. Diverse instruments have been put in place to carry out this co-creation process and fostering the participation of the data spaces: Community of Practice, Expert Groups, Thematic Groups and Strategic Stakeholders Forum.

DSSC is sharing all the information with the community through a collaborative Support Platform and with the general public in the web site www.dssc.eu.

The [DSSC Delivery Plan and Summary of assets publication](#) is available on the DSS website.



3 How we collaborated with the DSSC processes?

3.1 Establishment of co-creation channels with DSSC

One of the key objectives of the Data Space Support Centre (DSSC) is to get inputs and feedback from relevant organizations and initiatives involved in developing data spaces to establish a co-creation process for the DSSC assets.

3.1.1 Existing communities

This **Network of Stakeholders** is made up of a diverse range of groups and individuals. The DSSC has defined three levels of network of stakeholders corresponding to initiatives and bodies of data spaces need to collaborate with for alignment and/or holistic picture:

1. Liaisons and collaboration. The DSSC liaises and collaborates with relevant initiatives and stakeholders to gather requirements, share knowledge, and align goals. Initially, the focus is on European initiatives, research projects, and skills programs, and later expands to include international initiatives, standardization bodies, policymakers, and national projects.
2. Community of Practices (CoP). The Community of Practices (CoP) is a mechanism from the DSSC that fosters collaboration among people and organizations working on data space initiatives in various sectors. It enables learning, alignment, and contribution to common developments. Initially prioritizing EU-funded projects, the CoP aims to expand its scope to include other initiatives. Being part of the CoP offers benefits such as staying informed on EU data space developments, harmoniously co-creating data spaces across sectors, and receiving support services from DSSC.
3. The Strategic Stakeholders Forum (SSF) consists of organizations with expertise in Data Spaces. It serves as a think-and-do-tank, supporting the DSSC in achieving policy



objectives. Alongside the DSSC consortium partners, the SSF provides recommendations on governance, evolution, and sustainability of the Support Centre. These stakeholders act as enablers, influencers, and users of Data Spaces, offering expertise in design and implementation. They contribute to shaping the Support Centre, share knowledge, promote it as ambassadors, aid in asset development and sustainability, and engage with other initiatives and stakeholders. INNOVALIA is one of the founding members of the SSF.

DATA SPACES 4.0 EU is part of the Community of Practices and has collaborated with other CSA that are part of these community such as DS4Skills, GREAT and PrepDSpaces4Mobility, SM4RTENANCE, UNDERPIN and CIRPASS project.

3.1.2 Co-creation channels

DATA SPACES 4.0 EU supported and collaborated with the DSSC on the creation of assets as part of the Community of Practices. The project has established communication and collaboration channels with the based on the different mechanisms established by the DSSC. The picture below describes the co-creation channels of DATA SPACES 4.0 EU project to collaborate with DSSC.

1. Relationship manager is a designated role within the Data Spaces Support Centre, responsible for serving as the primary point of contact for DATA SPACES 4.0, Clara Pezuela, FIWARE, has this role as member of the DSSC. Detailed accounts of the activities developed with the relationship manager can be found in chapter 3.2 DSSC relationship management activities.
2. Thematic Groups of Data Spaces are collaborative platforms that bring together experts and stakeholders to explore and co-create knowledge in specific aspects of data spaces. Covering technology, governance, and business perspectives, the groups advance the understanding and implementation of data spaces, fostering innovation and value creation across various sectors.

Technology thematic group of Data Spaces: This TG aims at sharing and co-creating knowledge about technological aspects of a data space, including topics like blueprint, building blocks, standards, inventories. Focuses on sharing and co-creating



knowledge related to technological aspects of data spaces, covering topics such as blueprints, building blocks, standards, and inventories.

Thematic group of governance of Data Spaces aims to share and co-create knowledge concerning the governance aspects of data spaces. Thematic group of business of Data Spaces: Dedicated to sharing and co-creating knowledge about the business aspects of data spaces. INNOVALIA, IDSA, FIWARE has participated in the different Thematic groups contributing with requirements, and experience from manufacturing domain taking in consideration the output from:

- D2.2 “Predictive Maintenance and agile value network data governance guidelines” (Feb. 2023).
 - D2.3 “Manufacturing Data Space Alliance and Data Space Design, Deployment and Operation Methodology”. •
 - D3.2 “Business Model navigator and Data Space 4.0 maturity assessment model”. (Feb. 2024) •
3. Experts groups: is a committee of internal and external experts responsible of the definition of building blocks and blueprint. ENGINEERING, FIWARE and IDSA have participated in the different experts groups to participate and contribute
 4. Support Platform, is accessible through the dssc.eu and it is a single point of truth about data spaces which opens and activates a place to host, grow and curate discussions related to data spaces for all the actors of the data economy and where they can access a knowledge base including the DSSC assets.

The DATA SPACES4.0 EU consortium- members have registered onto the DSSC knowledge platform to have access to the assets to review it and provide feedback and to participate to the different working groups.



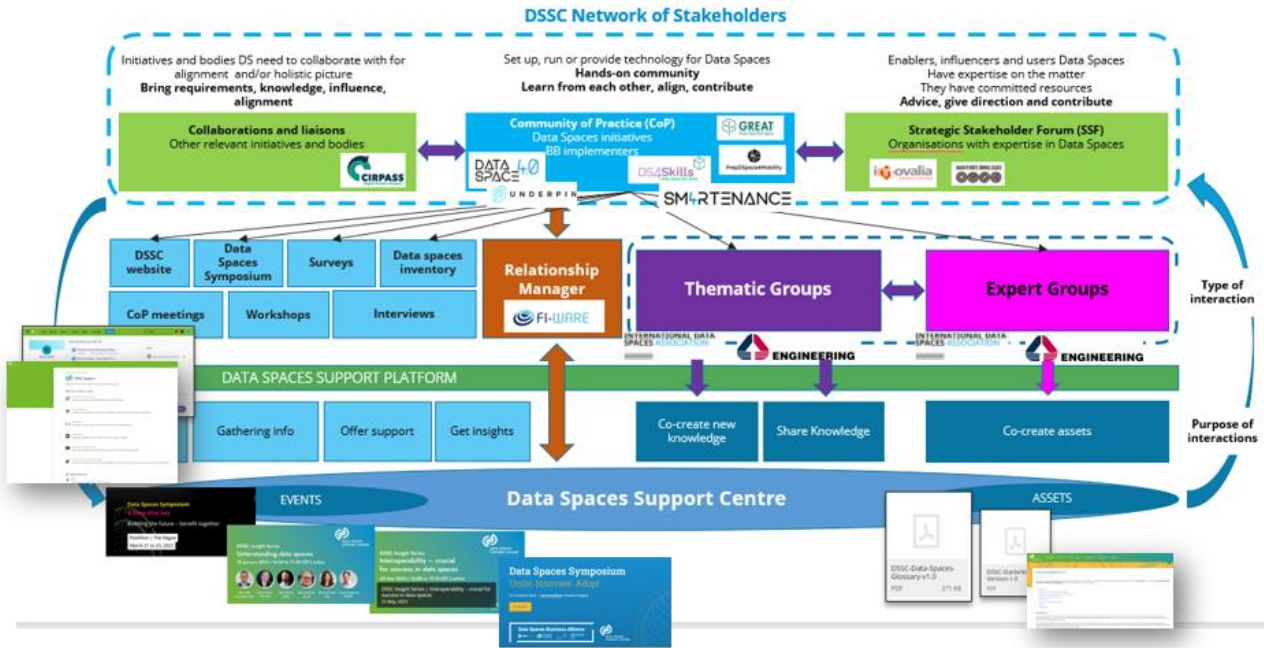


Figure 2. DATA SPACE 4.0 collaboration with DSSC – co-creation channels.

Through these channels, we actively collaborated with the DSSC by providing valuable inputs for knowledge capture through surveys and interviews. Additionally, we actively participated in CoP meetings and contributed to events organized by the DSSC such as Data Spaces Symposiums. The DATA SPACES 4.0 EU project collaborated with the Data Spaces Support Centre (DSSC) through four surveys and activities. The first, the Data Spaces Survey, led by MyData, collected initial information by March 3, 2023. The second, the Impact Survey, led by Capgemini, built on the data from the first survey and contributed to the impact analysis, in March 22, 2023. The third, the Standards Survey, led by FIWARE, was completed by April 30, 2023, and focused on aligning standards, although it was linked to the first survey and may have been missed by some. The fourth, Requirements & Building Blocks, led by Gaia-X, intended to further contribute to the impact analysis. All of these surveys aim to gather and structure critical information for DSSC's development work on data spaces.

The deliverable D4.2, *Blueprints for Data Spaces 4.0 (Dec. 2023)*, is a key output of the DATA SPACES 4.0 EU project, contributing by providing essential elements like the blueprint for Data Space 4.0, certification models, and open-source building blocks. While this deliverable is crucial, it requires integration with other deliverables for a more comprehensive framework. The DSSC will be engaged to validate the outcomes and offer feedback, particularly focusing on manufacturing domain needs, fostering collaboration and further improvement of the Data Space 4.0 blueprint.



Key Contributions of D4.2 to the DSSC:

- Provides a Data Space 4.0 blueprint, certification models, and open-source building blocks.
- Requires integration with other deliverables (D2.2, D2.3, D3.2, and D5.2) for a complete framework.
- Will be validated during the Data Space 4.0 Week, with engagement from the DATA SPACES 4.0 EU community.
- Engages the DSSC to validate and provide inputs for Blueprint validation.
- A one-to-one validation exercise with the DSSC focuses on the manufacturing domain, analyzing the DSSC Blueprint for potential enhancements.
- A cross-fertilization mechanism with new Data Space for Manufacturing Deployment projects is planned to ensure two-way communication and adaptability.

In collaboration with IDSA, ENG monitored DSSC Blueprint' design phase, by participating and contributing to the DSSC Technology Thematic Group's outcomes, mainly the DSSC Blueprint, with specific contributions to the Data Space Conceptual Model, the DSSC Standards and technologies landscape, the Glossary and the Building Blocks Taxonomy. The collaboration has been further ensured via the nomination of a Relationship Manager among the two initiatives, and enhanced via the participation to several events as the DSSC Insight series, the Data Space Symposium and DSSC Workshop in collaboration with JRC. The DATA SPACES 4.0 EU Blueprint has been presented during the DSSC Technology Thematic Group meeting held in March 2024.



3.2 DSSC relationship management activities

According to the DSSC Glossary, a Relationship Manager (RM), Clara Pezuela is the person from the Data Spaces Support Centre that serves as the dedicated DSSC contact point for a data space initiative or another member of the community of practice. The RM are the bridges between the DSSC and the Community of Practice, where all data space initiatives are engaged. Thus, DATA SPACES 4.0 EU project has Clara as the DSSC's RM since the project start.

During the project, Clara Pezuela, as RMs had the following responsibilities:

- Single point of contact for the DATA SPACES 4.0 EU project in relation to the DSSC
- Acquire relevant information for the DSSC and present the DSSC assets to the DATA SPACES 4.0 EU project in collaboration with IDSA, FIWARE and INNOVALIA as part of the WP6 activities
- Report to the consortium the main highlights from DSSC meetings, events and actions
- In collaboration with INNOVALIA (Coordinator) and IDSA (T6.1 leader) identification of the needs and expectations of the project respect to DSSC.
- Establishing a good understanding of the DATA SPACES 4.0 EU project setting (Deliverables and Outcomes)

FIWARE as RM of DATA SPACES 4.0 EU project, has organized follow up meetings on bi-weekly basis (on Fridays at 8:30 CET) with the coordination team. FIWARE has informed during these meetings about the latest news and progress of the DSSC and resolving questions from the project. She also provided recommendations on how to approach DSSC assets and capturing all the requests, feedback and issues of the project for the DSSC. She also facilitated the engagement of the data space in the Data Spaces Symposium, the presentation of the data space in one of the editions of the Insight Series and dissemination of the news about the DATA SPACES 4.0 EU project.

3.3 Key areas of collaboration:

During the project, DATA SPACES 4.0 EU has delivered valuable assets as part of the project activities, in WP2 T2.4 & T2.5 Data Governance models set the mission and requirements for data governance and interoperability of future data spaces 4.0. compiled in D2.1



Manufacturing DS governance Interoperability and data federation requirement. The D2.2 “Predictive Maintenance and agile value network data governance guidelines” (Feb. 2023) provides requirements on predictive maintenance and agile value network data spaces through a series of surveys and workshops.

On the other hand, WP3 – T3.1 Business ecosystems and Industrial Agreement provides state of play and future recommendations for the creation and governance of Data-driven industrial value chains detailed in the D3.1 Data space 4.0 industrial agreements Catalogue, the deliverable was delivered in February 2023 and updated with a pragmatic industrial data agreements for data spaces “cookbook” collected in a new chapter 6.

The WP4 worked on requirements for blueprints and certification strategy also on analyzing the data platforms to identify the instrumental to instantiate the common data space building blocks and the specific manufacturing enablers to leverage not only industrial cloud/edge continuity but also data space 4.0 continuity for enhanced implementation of maintenance and supply chains data value chains. The deliverables D4.2 was submitted on Nove. 2023 and updated in June 2024 to reflect the latest changes in DSSC Blueprint 1.0, in September 2024 D4.2 release the cookbook version.

WP5 facilitates to the manufacturing community a solid SWOT analysis for data space 4.0 deployment that along with existing blueprints will determine the necessary roadmap for data space deployment and digital platform enhancement (D5.1).

These tasks have contributed to the cross-fertilization among DATA SPACES 4.0 EU and DSSC.

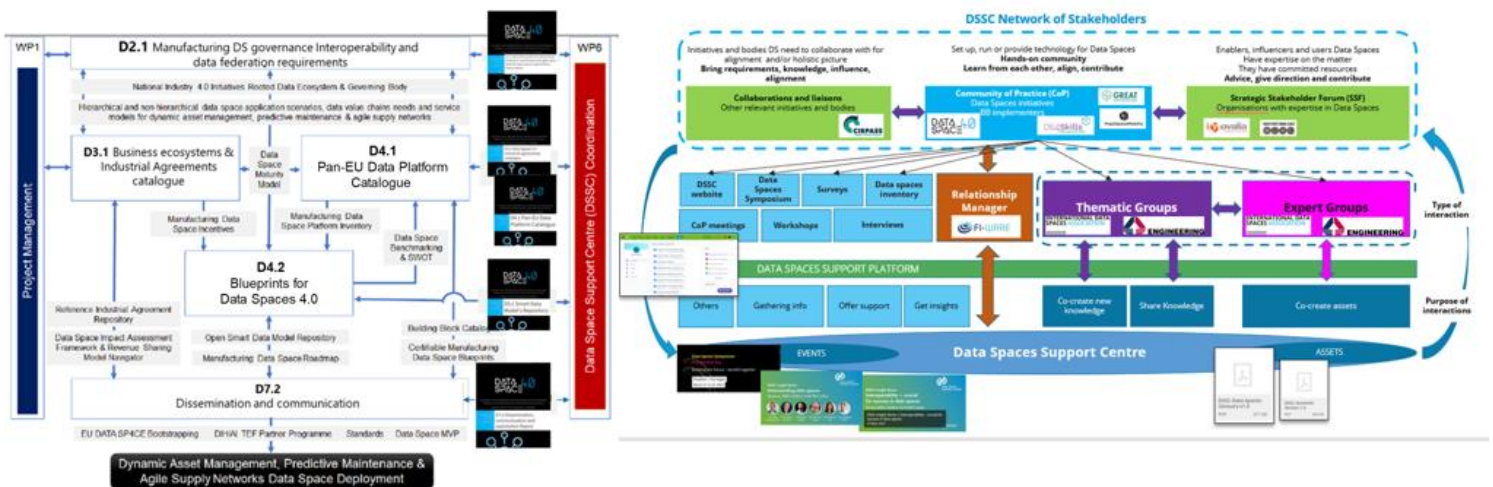


Figure 3. DATA SPACE 4.0 deliverable contributing to DSSC



Below we explain in more details how activities from WP6 has coordinated with DSSC on the areas of building blocks and blueprints (T6.1), standardization activities (T6.2), data spaces governance models (T6.3, T6.4) and communication and dissemination activities (WP7).

3.3.1 The DSSC and the building blocks (T6.1)

A key area of collaboration among DATA SPACES 4.0 EU and the Data Space Support Centre is represented by the adoption by DATA SPACES 4.0 EU - as main reference and benchmark - of the Building Blocks taxonomy defined by the DSSC.

Following this definition, a Building Block is “*a basic unit or component that can be implemented and combined with other building blocks to achieve the functionality of a data space*” (DSSC Glossary, Version 1.0, March 2023, Data Space Support Centre website (<https://dssc.eu/>)).

The Design Principles for Data Spaces Position Paper (Nagel L., 2021) has been adopted by the Data Space Support Centre as well, who performed a continuous improvement on the basis of the latest discussions and insights on data spaces at international level.

A further elaboration on the *business, governance, and legal* building blocks has been proposed in an updated Building Block Taxonomy, summarized in [Error! No se encuentra el origen de la referencia.](#), which has been adopted by DATA SPACES 4.0 EU after its first publication held in September 2023.

Therefore, the Building Blocks’ definition, their impact and the integration of the key elements relevant for the manufacturing domain play a key role in collaboration of the two initiatives, deeply described in 4.2 Building blocks contributions .

The DATA SPACES 4.0 EU project has developed a comprehensive mapping between Data Space Building Blocks and the RAMI 4.0 (Reference Architectural Model for Industry 4.0). This mapping is designed to facilitate a

better understanding of Data Spaces by aligning the Building Blocks with RAMI 4.0. It aims to simplify the analysis for system architects who are already experienced in designing and implementing manufacturing platforms based on the RAMI 4.0 framework.



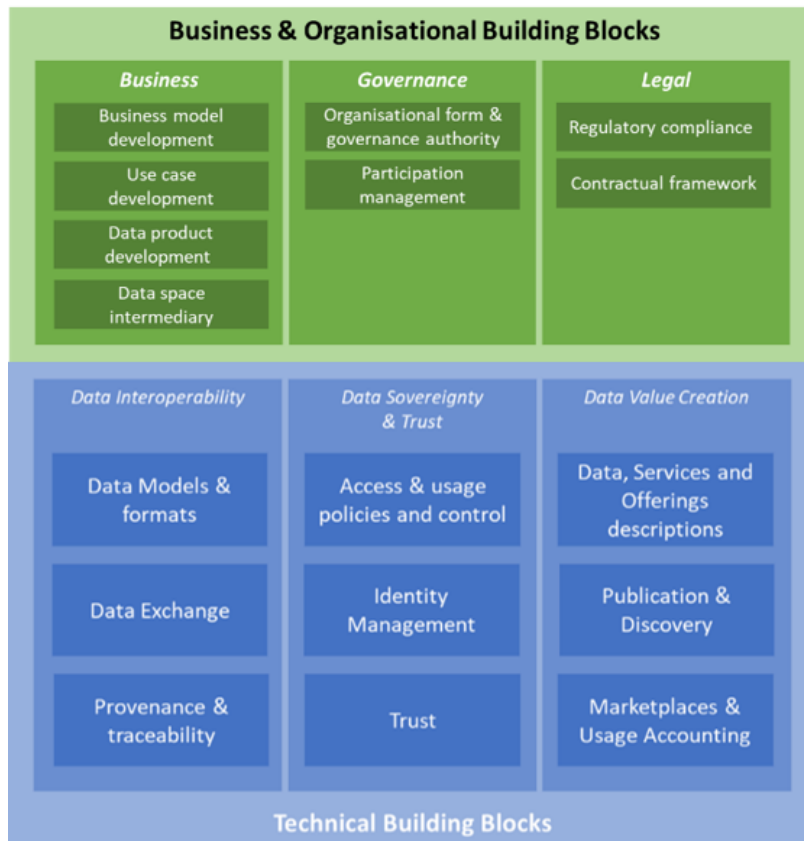


Figure 4. DSSC Building Blocks

3.3.2 DSSC and the blueprint (T6.1)

The Blueprint represents one of the major outcomes of both the initiatives DATA SPACES 4.0 EU and Data Space Support Centre. In the Data Space Glossary (DSSC Glossary, Version 1.0, March 2023, Data Space Support Centre website (<https://dssc.eu/>)), the latter defined the Blueprint as “a consistent and comprehensive set of guidelines to support the implementation, deployment and maintenance of data spaces. In the blueprint, you can find the conceptual model of data space, data space building blocks, and recommended selection of standards, specifications and reference implementations identified in the data spaces standards and technologies landscape”.



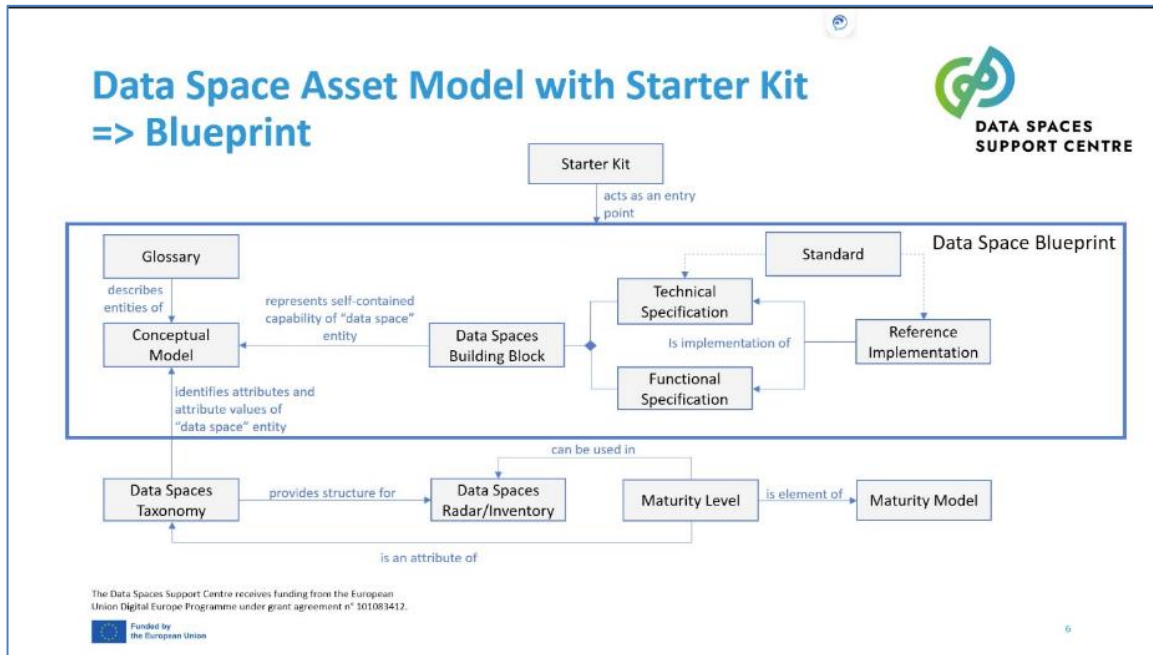


Figure 5. DSSC Conceptual Model of Data Space Blueprint

Among its objectives, DATA SPACES 4.0 EU aims at delivering harmonised modular certifiable future-proof and secure data spaces 4.0 Blueprints. The deliverable D4.2 Blueprints for Data Spaces 4.0 is a crucial component of the DATA SPACES 4.0 EU project, focused on the development of the Data Space 4.0 blueprint. This includes key elements like certification models and building blocks for manufacturing data spaces. The activities developed around this deliverable can be explained as follows:

1. Co-design Phase for Manufacturing Data Spaces Building Blocks:

In Task 4.2 (T4.2), a methodology was created to identify specific building blocks for the manufacturing domain. This phase focused on understanding the unique requirements and features needed for Manufacturing Data Spaces, ensuring their alignment with Industry 4.0 principles.

2. Analysis of Industry 4.0 vs. DSSC Building Blocks:

The Data Spaces for Manufacturing Blueprints section provides an in-depth comparison between the core principles of Industry 4.0 and the twelve building blocks established by the Data Spaces Support Centre (DSSC). This analysis is key to ensuring that the Data Spaces align with existing Industry 4.0 frameworks, facilitating their adoption.



3. Blueprint Adoption for Manufacturing Data Spaces:

A checklist was developed under the "Manufacturing Data Space Blueprint Adoption" phase. This checklist contains essential questions that help ensure the accurate definition of the value proposition and the proper setup of Manufacturing Data Spaces. It serves as a tool for decision-makers to evaluate the readiness and potential benefits of adopting the blueprint.

4. Certification Programs and Code of Conducts:

Task 4.4 (T4.4) involved an analysis of existing certification programs and codes of conduct related to data management. This includes comparing frameworks such as the IDSA Certification Program, the GAIA X Labelling Program, and the Data 4.0 lifecycle management Code of Conducts. The results from this comparison help guide the development of certification models for Manufacturing Data Spaces.

5. Blueprint Certification Strategy:

A certification strategy for the Data Space 4.0 blueprint was developed, offering a strategic approach to how this blueprint can be applied to real-world Manufacturing Data Value Chains. This strategy outlines the steps necessary for organizations to achieve certification and comply with data governance standards within the manufacturing sector.

3.3.2.1 Blueprint co-creation process with the DSSC:

The process of creating the DSSC Blueprint (0.5, 1.0, 1.5) was a co-creation process. We had a bilateral collaboration with the DSSC. Specifically on the blueprint versions 0.5 and 1.0 that were developed in parallel with the DATA SPACES 4.0 Blueprint as part of the D4.2 Blueprints for Data Spaces 4.0. Below we identify the chronological main activities developed:

- Sept. 2023 - DSSC released Blueprint v0.5 where DATA SPACES 4.0 EU project contributed with the ongoing results of D4.2 Blueprints for Data Spaces 4.0. Key contributions were the description of data spaces 4.0, the certification models, the building blocks catalogue for manufacturing data spaces and Open source building blocks for manufacturing.
- Nov. 2023 DATA SPACES 4.0 EU project released the first version of D4.2 to formalise the Blueprints for Data Spaces 4.0



- March 2024 DSSC released Blueprint v0.5 considering new inputs from DATA SPACES 4.0 EU project, as an example inputs from D3.2 Business Model navigator and Data Space 4.0 maturity assessment model.
- June 2024 DATA SPACES 4.0 EU project updated D4.2 Blueprints for Data Spaces 4.0 to reflect the latest changes in DSSC- Blueprint v1.0
- Sept. 2024 DATA SPACES 4.0 EU project release the cookbook version of D4.2 Blueprints for Data Spaces 4.0

3.3.3 DSSC standardization activities (T6.2)

The DSSC provides an asset called “Data Spaces Standards and Technologies landscape” which includes the collection of candidate standards and reference implementations for developing the technical Building Blocks, which are the basic components to form a data space infrastructure.

The initial collection was circulated for all data spaces and most of them provided their inputs and comments. The DATA SPACES 4.0 EU project analysed the list to comment and endorse those that are relevant for the domain. The DSSC collection of standards addresses the cross-domain standards, since the domain-specific ones must be considered by each sectorial data space.

Around 130 standards for all the technical BBs have been identified so far. They are under the analysis of the DSSC Expert Groups to produce the Technical Specifications of the BBs. On top of that, the Manufacturing data space may propose their own specific proposals for the implementers in the domain.

Additionally, to this activity, the DSSC is also working on a standardization plan to align the ongoing standardization activities around data spaces and identifying potential standardization request to cover the gaps. This work will be aligned with the High Level Forum for standardization.

EU DATA SPACES 4.0 has contributed to the analysis of standards for mapping purpose. Furthermore, the project has contributed to the DSSC standardization reporting, support on the organization of the interoperability workshop during data spaces symposium and the alignment with DSSC T4.3 Common standards and open source technologies for data spaces.



3.3.4 DSSC data governance models in Manufacturing (T3.1, T6.3 and T6.4)

Governance in a Data Space involves creating and maintaining a framework to coordinate actions among different organizations involved in the Data Space to achieve their goals and progress through different stages. The DSSC focuses on expanding the understanding of governance in Data Spaces since it has been underexplored in previous literature. As part of the taxonomy of building blocks, the DSSC has defined the organisational and Business building blocks where three Governance building blocks has been defined: (1) Data governance framework, (2) Roles and responsibilities and (3) Decision-making rules and policies.

A trustworthy governance framework is crucial for Data Spaces, and the Data Space Governance Body is responsible for establishing it. This framework includes principles, standards, policies, and practices that define how the Data Space is managed and how decisions are made. Data governance is an integral part of Data Space governance, determining who can take actions with respect to data and managing these rights and responsibilities. Governance in Data Spaces is key and the DSSC has been considered in the new conceptual model (level 1) where we see the importance of defining governance frameworks for data spaces.

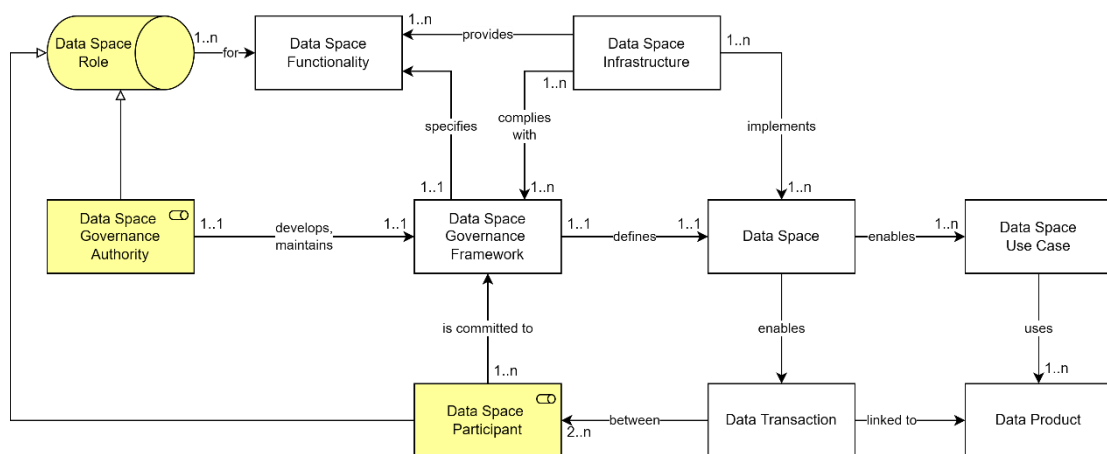


Figure 6. DSSC conceptual model 2.0



The graphic above depicts the conceptual model of a data space. A data space is governed by a framework that sets the rules and requirements for its organizational, procedural, and technical components. These components, such as connectors and identity services, come together to form the data space infrastructure. This infrastructure allows participants to offer data products, which can be discovered and accessed by other participants based on specified terms and conditions.

Data space participants can engage in data transactions, where one or more parties agree on data usage and the rights attached to that data. These transactions are tied to specific data products, enabling the data provider to maintain control over their data. The governance framework ensures compliance and facilitates smooth operations across the data space, supporting various use cases and transactions.

EU DATA SPACES 4.0 has contributed on D3.1 Data Space 4.0 Industrial Agreements Catalogue with some valuable references such as the Digital Value Chain EC Study, which provided valuable insights and recommendations for creating and governing data-driven industrial value chains. Another important contributions is an open EU repository for Industry Agreements documentation and templates that has been created by EU DATA SPACES 4.0 experts and will be continuously updated by our EU, national, regional and associational stakeholders, in order to provide “DS for Manufacturing deployment” applicants with a “one stop shop” for Industry Agreements.

3.3.5 Communication and dissemination activities (WP7)

Since the beginning of the CSA, various communication and dissemination efforts have been put in place to raise awareness and engage with target audiences. Partners and initiatives actively coordinated events, workshops, webinars, and more to promote the activities within the DATA SPACES 4.0 EU framework and its future outlook.

The communication activities

Digital Factory Alliance Website: The website serves as a hub for events, news, webinars, and a newsletter to engage with target communities and increase interest and engagement.



DATA SPACES 4.0 EU Website: This website provides an overview of the project's objectives and outcomes, aiming to engage visitors and encourage their participation in initiatives and programs.

Social Media: The project team actively uses LinkedIn and Twitter to connect with professionals, share updates, and promote events and surveys.

Events: The project team participated in various conferences, workshops, and meetings to collaborate with experts, industry, and stakeholders in the digital and manufacturing domain.

Innovation Committee Kick-off: An innovation committee was established to foster collaboration among data space initiatives and develop a framework for multilateral cooperation.

International Stakeholders' Meeting: The project team planned a meeting to initiate an international dialogue and co-design a framework for global collaboration.

Co-creation Workshop: A workshop was organized to engage stakeholders in co-creating the catalog of data platforms and data marketplaces.

The project team has defined several key performance indicators (KPIs) to measure the effectiveness of their communication efforts. These include website visits, Twitter followers, engagement rates, published media, newsletter subscribers, and more. So far, the project team has achieved significant progress in most of these KPIs.

Looking ahead, the project team plans to continue with their current successful strategies while also investing in new initiatives like creating videos, fact sheets, posters, and infographics. They also intend to participate in more events and workshops to further engage with the target audience and build a strong community around data spaces 4.0.

The communication and dissemination efforts made during the project have contributed to creating awareness and engagement around DATA SPACES 4.0 EU as shown in the KPI achievement on D7.3. Data Space 4.0 community sustainability plan & deployment bootstrapping. Through the utilization of various communication channels such as websites, social media, events, and workshops, the project team has successfully reached a global audience and fostered collaboration with experts, industry partners, and policymakers. The



project team aims to maintain this momentum and continue expanding their reach and impact in the future.



4 Main activities and co-creation process with DSSC

4.1 Reporting, interviews and questioners.

DSSC has defined a data gathering that update on the heartbeat, the goal is that the CoP members know what the DSSC is going to request at what time! The DSSC has launched several activities for information gathering and collecting feedback of the main assets in the developing process. Below we identify the main activities that the DATA SPACES 4.0 EU. Project has collaborated with the DSSC:

1. Data spaces survey. The DSSC launched a survey to collect general information about data space initiatives. DATA SPACES 4.0 EU provided valuable information about the project, the information was collected on February and the format was with Excel files.
2. DSSC Collection of requirements & Building Blocks (survey and interview) was developed in June 2023 with the purpose of collection of standards and technologies as part of the survey and dedicated interviews to collect technical and non-technical requirements and building blocks.
3. DSSC 1st Survey to measure the impact of data space initiatives. DATA SPACES 4.0 EU provided an answer to the survey to measure the impact of data space initiatives, the survey we done during the first week of May. The document consisted on a questionnaire of 38 questions where the expertise from different partners form the project was required to be able to answer all the questions.
4. DSSC Interview on the impact of data spaces in manufacturing. DATA SPACES 4.0 EU participated on an interview to complement the survey to measure the impact of data space initiatives.



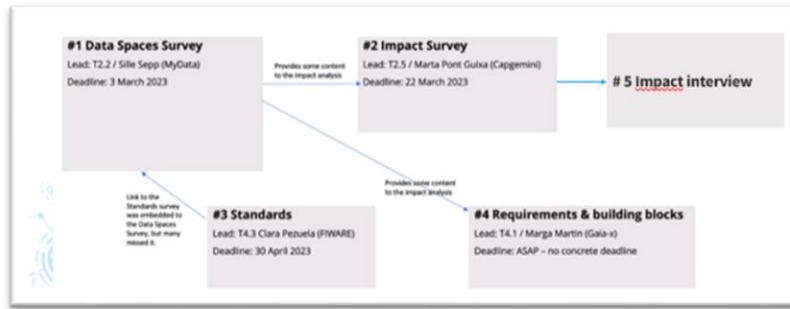


Figure 7. DSSC information gathering and collecting feedback

4.2 Building blocks contributions

As described in Section 3.3.1, the common ground on the concept of the Building Blocks mapping the building blocks with Industry 4.0 reference architecture. This is deeply represented by the following DATA SPACES 4.0 EU’s deliverables, where the contribution to the alignment of key elements representing the Building Blocks in the manufacturing context has been provided:

- *D3.1 - Data Space 4.0 industrial agreements catalogue*, where legal and organizational main elements have been investigated in the frame of the Data Spaces for the manufacturing domain.
- *D4.1 - Pan-EU Data Platform Catalogue*, in which the Technical Building Blocks represented the basis for the definition of key elements differentiating Data Platforms and Data Marketplaces in the DATA SPACES 4.0 EU’s Catalogue.
- *D5.1 - Smart Data Model's Repository*, where the Data Models and Formats have been analysed in the manufacturing context via the definition of technical specification, and supporting their correlation with governance, legal and business building blocks.

After the DSSC first publication of its results, a continuous analysis of the documentation available has been performed, including:

- the *Glossary* (DSSC Glossary, Version 1.0, March 2023, Data Space Support Centre website (<https://dssc.eu/>)), where the main concepts and roles in a Data Space have been described, to ensure transparency and establish a common vocabulary for DSSC communication with the different Preparatory Actions.



- the *Starter Kit* (Starter Kit for Data Space Designers, Version 1.0, March 2023, Data Space Support Centre website (<https://dssc.eu/>)), where the five dimensions of Business, Legal, Operational, Functional and Technical elements of a Data Space have been described to provide to a Data Space designer first insight on relevant aspects to be overlooked and analysed on the corresponding Data Space.



Figure 8. DSSC Main Reference Documents publicly available

- The two documents have been used to support DATA SPACES 4.0 EU’s activities, engaging with a multidisciplinary community of stakeholders, and getting aligned with the terminology and methodology identified in DSSC’s activities. This is represented for example in the activities performed within DATA SPACES 4.0 EU *Work Package 2 – Multi-stakeholder governance framework and Federated Data Ecosystems* on the requirements analysis, or in *Work Package 4 – Manufacturing Data Space Building Blocks and Blueprint Certification* activities dedicated to the Pan-EU Data Platform Catalogue.

Several other activities have been performed to support the collaboration among the two projects, it is remarkable the contribution to two Data Spaces Symposiums.:

- Participation to the *Data Space Symposium* (to be furtherly described in Section 4.4)
 - o *Mastering all technical data space challenges* (22/03/2023)
 - o *Domain lounge session | What data spaces in domains (could) look like* (22/03/2023)
 - o DATA SPACES 4.0 EU *Innovation Committee* (23/03/2023)



- Participation to different events of the *EU Data Space 4.0 Week* (held in 12-22/06/2023)
- Participation to *DSSC Insight series*

DATA SPACES 4.0 EU is represented by several consortium members in the main *Communities of Practice* and Thematic Groups established by DSSC, namely the *Governance Thematic Group*, the *Business Thematic Group* and the *Technology Thematic Group*, as deeply described in Section 4.5.

As members of the *DSSC Technology Thematic Group*, the participation to the corresponding meetings has been ensured, bringing to the contribution to the *Data Space Conceptual Model*, discussed in July 2023. A deeper analysis will be also performed concerning the *DSSC Standards and technologies landscape*, the *Glossary* and the *Building Blocks Taxonomy*, so to provide valuable results available in the DATA SPACES 4.0 EU deliverables, especially “*D4.2 - Blueprints for Data Spaces 4.0*”. Additionally, other contributions have been provided on Data Spaces requirements and aspects concerning data quality and FAIRness, as described in Section 3.3.4.

4.3 Blueprint for manufacturing status

According to 3.3.2 DSSC and the blueprint (T6.1), the Blueprint represents one of the major results of both DATA SPACES 4.0 EU and the Data Space Support Centre.

Following the DATA SPACES 4.0 EU implementation pathway, various activities were conducted to define the Blueprint for Manufacturing, contributing to the broader DSSC Blueprint.

A deeper analysis on the content provided by *DSSC Support Platform*¹ has been performed, to get aligned on terminology and methodology that would bring to the Data Space 4.0 Blueprint.

¹ The Support Platform is accessible through the DSSC website. It presents the DSSC's project timeline and its assets' release. The Support Platform represents a “Go-to-place” platform to get information and learn about data spaces, an access point to join the co-creation process of the data spaces blueprint and other assets supporting the realisation of data spaces and an entry point to organise the support by data spaces experts (in priority for data spaces funded under the Digital Europe Programme).



The participation *DSSC Blueprint Meeting*, held on 3rd May 2023, and to the *DSSC Blueprint Workshop*, held on 30th May 2023, has been also ensured, assuring a deeper knowledge on DSSC Reference Documentation, planned activities and expected contributions.

According to the two meetings dedicated to the DSSC Blueprints, DATA SPACES 4.0 EU provided its contribution to the *Blueprint status survey* in the DSSC’s consultation held on May 2023. Early blueprint material and the process to the definition of the Manufacturing Data Space Blueprints depicted in Figure 9 has been provided.

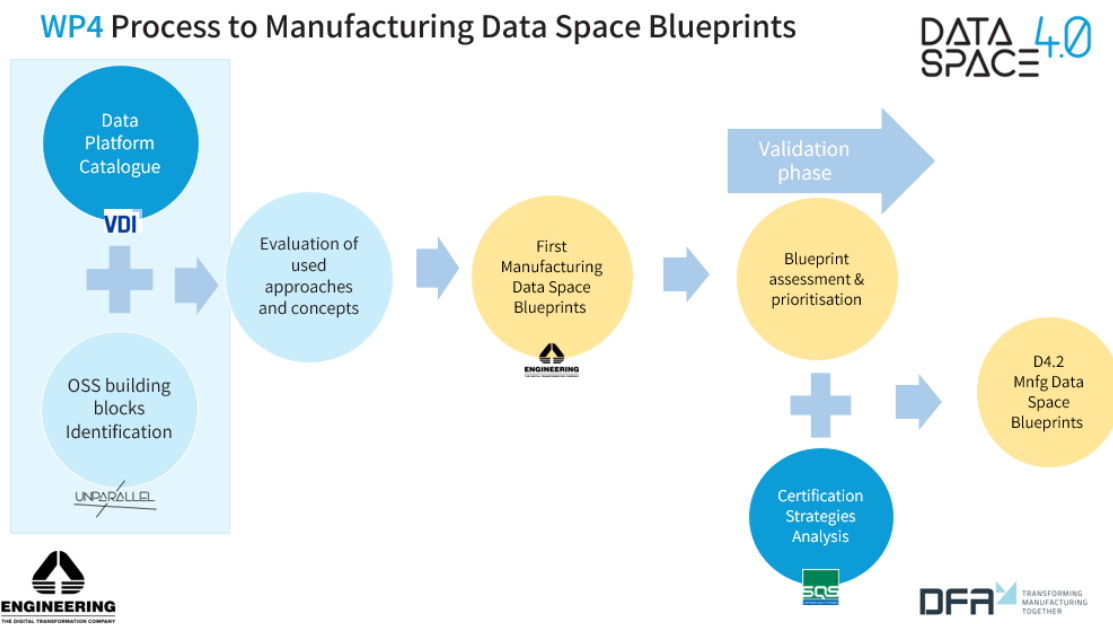


Figure 9. Data Space 4.0 Process to Manufacturing Data Space Blueprints

In line with DSSC main purpose on the constituency of a wider Data Spaces related community, a continuous analysis of the contributions received by the corresponding Data Spaces Preparatory Actions has been ensured. Few examples of the relationship and knowledge sharing among the initiatives are provided by the analysis of the *DS4SSCC – Data Space for Smart and Sustainable Cities and Communities*², *DS4SKILLS – Data Space for Skills*³, *GREAT – Green Deal Data Space*⁴, etc.

² DS4SSCC – Data Space for Smart and Sustainable Cities and Communities website is accessible at: <https://www.ds4sscc.eu/>

³ DS4SKILLS – Data Space for Skills website is accessible at: <https://www.skillsdataspace.eu/>

⁴ GREAT – Green Deal Data Space website is accessible at: <https://green-deal-dataspace.eu/>



Data Space Support Centre released its first version of the *Data Space Blueprint* in the last quarter of 2023, a consultation among the Data Space Preparatory Actions was opened in September 2023. Next, every 6 months a new version of the blueprint was released in so called heartbeats, with the last version of the Data Spaces Blueprint is expected in January 2026, far beyond Data Space 4.0’s finalization.

DATA SPACES 4.0 EU’s first draft of the blueprint was released in September 2023, allowing for feedback during the DSSC’s open consultation. A validation process for the outcomes was initiated during the last quarter of 2023, targeting the Innovation Committee, which was supported by the Digital Factory Alliance (DFA). Although DATA SPACES 4.0 EU was finalized by the end of 2023, the Innovation Committee continued contributing to the DSSC’s Blueprint development beyond the project’s completion

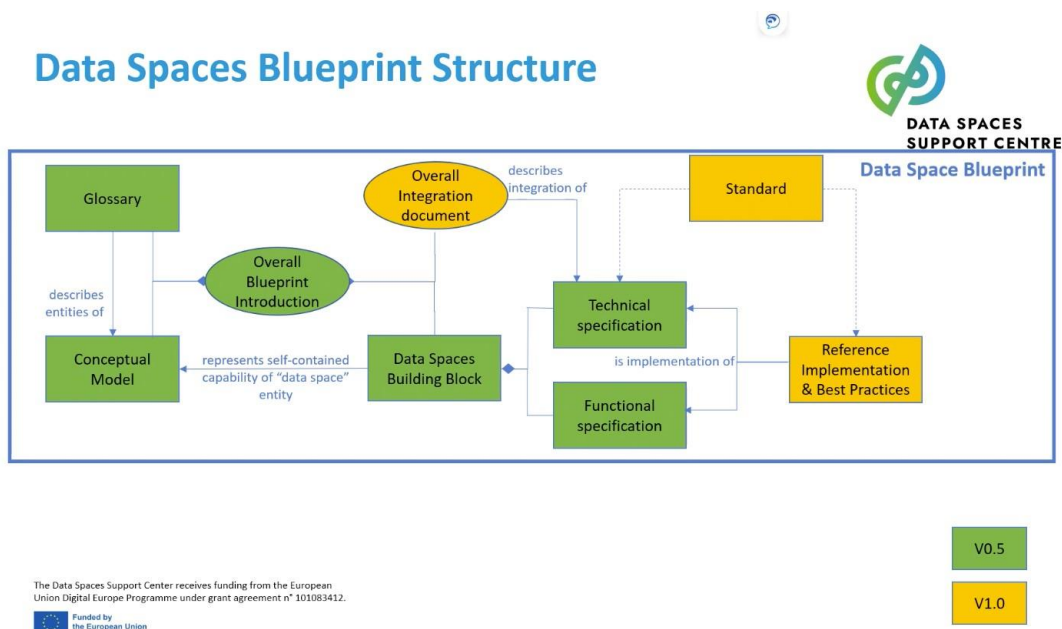


Figure 10. Data Spaces blueprint Structure.

Chapter 3.3.2. explained the co-creation process between DSSC and the DATA SPACES 4.0 EU project for the development of several versions of the DSSC Blueprint (v0.5, v1.0, v1.5), with key milestones as follows:

- September 2023: DSSC released Blueprint v0.5, with contributions from the DATA SPACES 4.0 EU project, including descriptions of Data Spaces 4.0, certification models, and manufacturing data spaces building blocks.



- November 2023: The DATA SPACES 4.0 EU project formalized its input by releasing *D4.2 - Blueprints for Data Spaces 4.0*, which served as the first official version of their blueprint.
- March 2024: DSSC launched Blueprint v1.0, integrating further contributions from the DATA SPACES 4.0 EU project, such as the Business Model Navigator and the Data Space 4.0 Maturity Assessment Model (from D3.2).
- June 2024: The DATA SPACES 4.0 EU project updated D4.2 to align with the latest inputs reflected in DSSC Blueprint v1.0.
- September 2024: DATA SPACES 4.0 EU released a cookbook version of *D4.2 Blueprints for Data Spaces 4.0*, which references Chapter 4.3 on manufacturing-specific blueprints, building on contributions detailed in Chapter 3.3.2.

4.4 Data Spaces Symposiums

The first Data Spaces Symposium took place in The Hague on 21-23 March 2023, organized the TNO, IDSA, BDI and the DSSC. It was attended by more than 700 participants and 150 speakers discussing data sharing and contributing to build the data spaces ecosystem.

On the 22nd March, the DSSC organized its Annual Conference, bringing together all the data spaces initiatives and relevant stakeholders with the purpose of raising awareness of the DSSC assets and to engage with the data space community. The program of the conference was as follows:



Figure 11. The Hague Data Spaces Symposium | Agenda



DATA SPACES 4.0 EU project was involved in the preparation domain lounge sessions in the morning and invited to join the Interactive four-perspective session in the afternoon. The data space was part of the Manufacturing & Energy parallel session, where Oscar Lázaro from Innovalia, as Project Coordinator was presenting the data space; and then several project in the scope of Manufacturing ecosystem were presented by Sergio Gusmeroli from Polimi. The full agenda can be seen below.

Timing	Topic	Presenter	On behalf of...
11:25-11:30	Welcome and agenda	Clara Pezuela (FIWARE) & Franziska Scherenberg (Fraunhofer)	DSSC
11:30-11:40	Manufacturing Data Space	Oscar Lázaro (Innovalia)	EU DATA SP4CE
11:40-11:50	Energy Data Space	Alberto Dognini (Fraunhofer)	INT:NET
11:50-12:00	Panel discussion	Oscar Lázaro & Alberto Dognini	Data Spaces
12:00-12:20	Pitches from DS projects	Manuel Pio Silva (EDP)	OMEGA-X (Energy)
		Michiel Stornebrink (TNO)	Enershare (Energy)
		Sergio Gusmeroli (POLIMI)	RE4DY (Manufacturing)
		Sergio Gusmeroli (POLIMI)	CircularTwAln (Manufacturing)
12:20-12:40	Open discussion with audience	All guided by moderators	
12:40-12:45	Wrap up and closing	Clara Pezuela (FIWARE) & Franziska Scherenberg (Fraunhofer)	DSSC

Table 1. Manufacturing lounge session by DATA SPACES 4.0 EU

During the panel discussion, the two data spaces which share some commonalities on motivation for data sharing, were discussing about which are the interoperability barriers between the two data spaces. They were trying to conclude with some possible use cases of data sharing across the two data spaces. They proposed some examples about the need to be more efficient in energy consumption in the supply chains or manufacturing of energy elements. The session was attended by around 100 people.

In the afternoon thematic sessions, the DATA SPACES 4.0 EU team that attended the event split across the sessions to cover all the sessions. The networking with other data spaces and with the DSSC was useful to find synergies and explore cross collaborations.

The second Data Spaces Symposium 2024, held in Darmstadt, organized the TNO, IDSA, BDI and the DSSC. There were more than 800 participants and 150 speakers to build the data spaces ecosystem



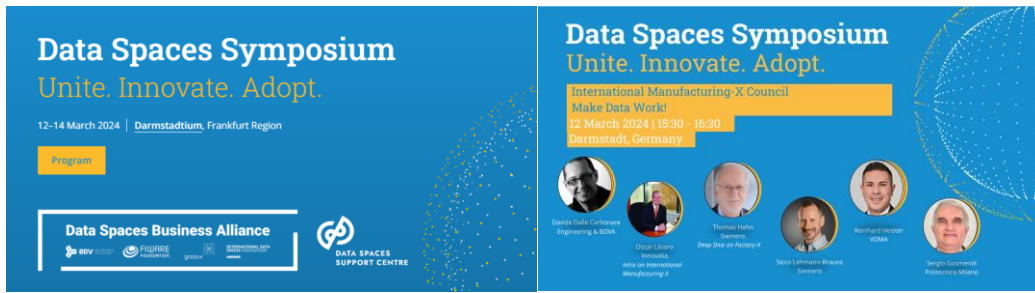


Figure 12. Darmstadt Data Spaces Symposium / Marketing

The Data Spaces Symposium 2024, from March 12-14, offered three days of sessions focusing on data spaces innovation and application. Highlights include IDSA Data Spaces Discovery Day, Gaia-X's Market-X Conference, BDVA Data Week, FIWARE Data Spaces Workshop workshops on digital twins, AI, and supply chains, and sessions about data space interoperability and certification. Industry leaders shared real-world use cases to promote sovereign data sharing and cross-sectoral collaboration. All the information about DSSC events at <https://www.data-spaces-symposium.eu/>

DATA SPACES 4.0 EU team contributed to organizing or participated on the following panel or sessions:

- International manufacturing-X Council (INNOVALIA): Focuses on leveraging data spaces in manufacturing industries.
- Vertical session 4: Data spaces for manufacturing (IDSA), supply chain and logistics organized by IDSA. Keynote: The European Manufacturing Data Space by Oscar Lazaro, INNOVALIA and Circular TwAIn presentation by Sergio Gusmeroli, POLITECNICO DI MILANO. During the Panel discussion: Data spaces and the Digital Product Passport - a perfect fit, Davide Dalle Carbonare, ENGINEERING, represented DATA SPACE 4.0. The slides are available on this [link](#).
- Smart Data Models & Exchange API in Data Spaces (FIWARE): Discusses technical frameworks for interoperable data exchange.
- Business applications of data for sustainability organized by BDVA FIWARE and INNOVALIA. INNOVALIA presented the Digital Twins & Automotive: Explores digital twins in the automotive sector.



- Panel on Data Spaces standardization – How to proceed? (IDSA): Tackles strategies for advancing standardization in data spaces.
- IDSA's Technical workshop on "Technical realization of data spaces" Let's tech talk about connectors: How new generation data space connectors drive interoperability (IDSA)



[All slides | Vertical session 4](#)

The European Manufacturing Data Space

  Oscar Lázaro
Innovatia

SM4RTENANCE: Trusted Data Sharing for Manufacturing Equipment Industry

  Oscar Lázaro
Innovatia

UNDERPIN: holistic asset management in critical manufacturing industry

  Panagiotis Georgiou
Motor Oil

Circular TwAI

  Sergio Gusmeroli
Politecnico Milano

TANGO: Digital technology for secure and trustworthy data flows

  Dries Verhees
Flanders Make

EuProGiant: Smart and sovereign data in manufacturing

  Gerald Ristow
Software AG

Panel discussion | Data spaces and the Digital Product Passport – a perfect fit?

  Davide dalle Carbonare
Engineering & Data Space 4.0

  Reinhard Heister
VDMA

  Sicco Lehmann-Brauns
Siemens

  Riccardo Giovannotti
GDSO

  Jon Kuiper
Ministerie van Infrastructuur en Waterstaat

  Ljiljana Stojanovic
Fraunhofer IOSB

Figure 13. Darmstadt Data Spaces Symposium | The European Manufacturing Data Space



4.5 Events, meetings, CoP follow up.

Events are important because they provide opportunities for members to network and learn/educate with all aspects related to technical, legal, usability, interoperability, etc. Events provide a platform for promoting the concept of data spaces, allowing associations to raise awareness and showcase the benefits of these innovative data management solutions. Also engaging with other initiatives, group of experts and connecting with industry and their realities and needs is possible.

The partners involved in DATA SPACES 4.0 EU have attended and participated in different events and meetings during the development of the project. In order to have a track of these events and plan the events of interest to come, the official DATA SPACES 4.0 EU Calendar has been released. The aim is to work collaboratively on nurturing this calendar which provides a general overview of the communication and dissemination actions.

There are different events where the DATA SPACES 4.0 EU project team has been participating on a regular manner:

1. Biweekly sessions with DSSC to get informed with updates and strategy, align DATA SPACES 4.0 EU ambition and objectives accordingly, and make contributions in workshops on DSSC legal framework, data governance, and business models.
2. Community of Practice conferences to update on DSSC offerings, communications, events, and opportunities, strengthen and line up collaborations across all initiatives and projects, and contribute to open floor discussions for emerging topics and ad hoc issues.
3. Insight series to understand top-down strategy and become aware of new topics of interest, define common requirements and establish best practices to accelerate the formation of data spaces.

In parallel, and as can be seen in the previous table, there are one-time conferences, workshops, trade fairs and assemblies where the project team has participated together with researchers, industry, expert groups, associations and policy makers. These events have



taken place in cities all around Europe but also sometimes remote. The objectives of these sessions include designing and co-creating surveys based on technical, legal, and business requirements; acquiring knowledge and expertise in various areas; participating in updates related to IDSA rulebook and new technologies; learning about best practices and bringing viewpoints to create a dialogue; taking part in discussions related to data modeling; attending events related to Gaia-X and other data spaces; introducing specific companies or projects to the community to create awareness for Gaia-X and related concepts; connecting policymakers and DIHs; and participating in panel discussions and the kickoff of the present project to discuss the role of data sharing...

For the months to come, there is plenty of activities planned. Not only the regular series will remain but also there are some one-time conferences and workshops where the project team is coming together with experts, industry and research with different targets such as:

- Coordinate, align, and trace work plan and strategy.
- Successfully running data spaces
- Enabling interoperability, fair principles, and ontologies among data spaces.
- Helping startups, SMEs, and big industries transform business models for the better using recognized Open Source technology.
- Engaging with all key players and community of data spaces.

4.5.1 COP Meetings more in detail

The COP meetings serve as a platform for collaboration, sharing knowledge, and addressing challenges related to data spaces, fostering a living community working towards advancing the field. Participants are encouraged to actively engage, share their feedback, and contribute to the success of data space initiatives. In the COP meetings, data spaces colleagues come together regularly to discuss and collaborate on various initiatives related to data spaces. The key points covered in the recent COP meetings have been:

Data Spaces Symposium: The COP members were encouraged to participate in the upcoming Data Spaces Symposium in The Hague, Netherlands. They were asked to register for the event and invite their colleagues and networks to make it a successful and impactful gathering.



Glossary Workshop: A workshop on the roles in data spaces was conducted, where participants discussed and deepened their understanding of the legal challenges related to data spaces, particularly focusing on key regulations such as the Data Governance Act (DGA), Data Act (DA), Digital Services Act (DSA), Digital Markets Act (DMA), and AI Act.

Data Spaces Survey: A data spaces survey was launched to characterize various data space initiatives. The participants were requested to fill in information for 2-3 initiatives from their sectors to contribute to the impact assessment of data spaces.

DSSC Website and Logos: The DSSC website was launched, and all COP members were requested to add their logos to the website to list all members of the Community of Practice.

Inventory of Data Space Initiatives: Various data space initiatives were presented, and the participants were encouraged to share their methodologies and resources in the Teams channel to facilitate learning and collaboration.

Thematic Groups: Thematic groups were established to focus on specific areas such as Technology of Data Spaces, Governance of Data Spaces, and Business of Data Spaces. Members were invited to register for the groups and participate in the upcoming kickoff meetings.

DSSC Blueprint Workshop: A workshop was organized to develop the joint data spaces blueprint, and the slides and recordings from the workshop were shared for feedback.



5 Conclusions

This document provides the summary of the collaboration between DATA SPACES 4.0 EU and the Data Space Support Centre (DSSC). Here are the key points:

1. **Co-Creation Channels:** The collaboration began with the establishment of co-creation channels, where DATA SPACES 4.0 EU integrated into existing DSSC communities. These channels included relationships with stakeholders, thematic groups, and expert groups, which were used to gather input, feedback, and knowledge through surveys, interviews, and active participation in events and meetings.
2. **Adoption of Building Blocks and Blueprint:** DATA SPACES 4.0 EU played a significant role in adopting and aligning the DSSC-defined building blocks for the manufacturing context. The project contributed to DSSC with key deliverables such as the Data Space 4.0 industrial agreements catalogue and the Pan-EU Data Platform catalogue, helping to define governance and interoperability standards in the manufacturing sector.
3. **Data governance models:** Collaboration extended to developing governance frameworks for manufacturing data spaces, contributing to governance building blocks that define roles, responsibilities, and decision-making policies within data spaces.
4. **Communication and dissemination efforts:** The project was proactive in communication and dissemination, leveraging various channels such as websites, social media, and events to raise awareness and engage with stakeholders. These efforts included participating in significant events like the Data Spaces Symposium, which brought together over 700 participants and contributed to discussions on data sharing and interoperability.
5. **Significant Contributions to DSSC:** DATA SPACES 4.0 EU contributed to shaping the DSSC Blueprint and aligning it with Industry 4.0 principles. The project helped define standards and provided feedback on DSSC assets, aiding in the continuous improvement of the DSSC's efforts to foster a European data space ecosystem.



The overall conclusion underscores the strong partnership between DATA SPACES 4.0 EU and DSSC, emphasizing the project's contributions to knowledge sharing, standardization, and fostering a vibrant data space community, especially in the manufacturing sector.

As part of the collaboration with DSSC, the *DATA SPACES 4.0 EU* project has actively participated in significant events and contributed to essential assets. The image below highlights the key collaboration in significant events and contributed to essential assets.

Notably, the project played a key role in the 1st Data Spaces Symposium in The Hague (March 2023), engaging in discussions on interoperability and governance in manufacturing and supply chains. In September 2023, the project released *D4.2 Blueprints for Data Spaces 4.0*, contributing critical building blocks for Manufacturing Data Spaces and aligning them with the RAMI 4.0 framework.

Looking forward, the project will continue its contributions during the 2nd Data Spaces Symposium in Darmstadt (March 2024), focusing on digital twins, supply chains, and standardization in data spaces. Furthermore, the project will play a pivotal role in the progressive release of the DSSC blueprints, with major milestones including Blueprint 0.5 (Sept. 2023), Blueprint 1.0 (March 2024), and Blueprint 1.5 (Sept. 2024). These blueprints will encompass certification models and the industrial agreements catalog, further solidifying the project's influence on the development of European manufacturing data spaces.

DATA SPACES 4.0 EU contribution to DSSC events and assets

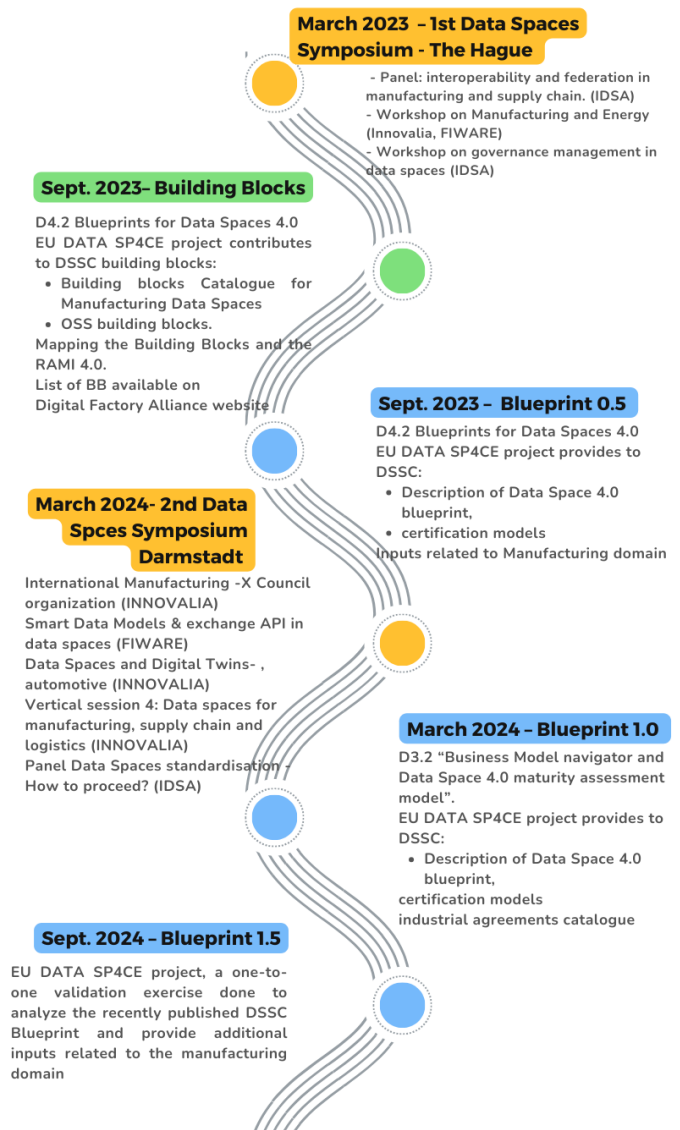


Figure 14. Data Spaces 4.0 EU contribution to DSSC



Annex I. Liaisons

Category	Specific initiatives									
European Data Initiatives	European Open Science Cloud (EOSC) Association, and some EOSC projects. <table border="1"> <tr> <td>In particular EOSC Future</td> <td>FAIR-Impact</td> <td>WorldFAIR</td> <td>FAIRCORE4EOSC</td> </tr> </table>	In particular EOSC Future	FAIR-Impact	WorldFAIR	FAIRCORE4EOSC					
	In particular EOSC Future	FAIR-Impact	WorldFAIR	FAIRCORE4EOSC						
	Open Data for AI projects part of Digital Europe Programmed: MAREGRAPH, RODEO, BeOpen, OME2									
	Destination Earth(DestinE) with engagement of ESA, EUMETSAT and ECMWF									
	JRC – Technical coordination of INSPIRE									
	Interoperable Europe (DG-DIGIT)									
	Copernicus and space programme									
Data.Europe.eu										
Research and Innovation projects contributing to Data Spaces	Data Platform Projects (funded under H2020 ICT13-a). <table border="1"> <tr> <td>DataPorts</td> <td>DataVaults</td> <td>FSM</td> <td>i3-Market</td> <td>Kraken</td> <td>OpertusMun-</td> <td>PimCity</td> <td>SmashHit</td> <td>Trusts</td> </tr> </table>	DataPorts	DataVaults	FSM	i3-Market	Kraken	OpertusMun-	PimCity	SmashHit	Trusts
	DataPorts	DataVaults	FSM	i3-Market	Kraken	OpertusMun-	PimCity	SmashHit	Trusts	
	Data-Driven Innovation Hubs Projects (funded under H2020 DT-ICT-05-2020) <table border="1"> <tr> <td>EUHubs4Data</td> <td>I4Trust</td> <td>REACH</td> <td>MediaFutures</td> </tr> </table>	EUHubs4Data	I4Trust	REACH	MediaFutures					
	EUHubs4Data	I4Trust	REACH	MediaFutures						
	Big Data technologies and Extreme scale analytics projects (funded under (H2020 ICT-51-2020) <table border="1"> <tr> <td>VesselAI</td> <td>Daphne</td> <td>More</td> <td>Marvel</td> <td>Everest</td> <td>Selma</td> </tr> </table>	VesselAI	Daphne	More	Marvel	Everest	Selma			
	VesselAI	Daphne	More	Marvel	Everest	Selma				
	Projects working in Data sharing in the common European data spaces and Strengthening Europe's data analytics capacity (funded under HE Cluster 4 – 2021/2022 – Data – 01) Technologies and solutions for compliance, privacy preservation, green and responsible data operations <table border="1"> <tr> <td>GLACIATION</td> <td>MobiSpaces</td> <td>TANGO</td> <td>TRUSTEE</td> <td>TEADAL</td> </tr> </table>	GLACIATION	MobiSpaces	TANGO	TRUSTEE	TEADAL				
	GLACIATION	MobiSpaces	TANGO	TRUSTEE	TEADAL					
	Technologies for Data Management <table border="1"> <tr> <td>Green.Dat.AI</td> <td>EnRichMyData</td> <td>SEDIMARK</td> <td>Watervese</td> <td>DataBri-X</td> <td>STELAR</td> <td>HPLT</td> </tr> </table>	Green.Dat.AI	EnRichMyData	SEDIMARK	Watervese	DataBri-X	STELAR	HPLT		
	Green.Dat.AI	EnRichMyData	SEDIMARK	Watervese	DataBri-X	STELAR	HPLT			
Technologies & solutions for data trading, monetizing, exchange and interoperability <table border="1"> <tr> <td>FAME</td> <td>DATAMITE</td> <td>PISTIS</td> <td>UPCAST</td> </tr> </table>	FAME	DATAMITE	PISTIS	UPCAST						
FAME	DATAMITE	PISTIS	UPCAST							
Methods for exploiting data and knowledge for extremely precise outcomes (analysis, prediction, decision support), reducing complexity and presenting insights in understandable way <table border="1"> <tr> <td>CREXDATA</td> <td>TEMA</td> <td>ExtremXP</td> </tr> </table>	CREXDATA	TEMA	ExtremXP							
CREXDATA	TEMA	ExtremXP								
Extreme data mining, aggregation and analytics technologies and solutions <table border="1"> <tr> <td>NEARDATA</td> <td>SYCLOPS</td> <td>EXA4MIND</td> <td>EFRA</td> <td>EMERALDS</td> <td>EXTRACT</td> <td>Graph-Massivizer</td> </tr> </table>	NEARDATA	SYCLOPS	EXA4MIND	EFRA	EMERALDS	EXTRACT	Graph-Massivizer			
NEARDATA	SYCLOPS	EXA4MIND	EFRA	EMERALDS	EXTRACT	Graph-Massivizer				
AI Initiatives	AI on Demand Platform (AIoDP) <table border="1"> <tr> <td>AI4Europe</td> <td>PrePAI</td> </tr> </table>	AI4Europe	PrePAI							
	AI4Europe	PrePAI								
	AI Testing and Experimentation Facilities (TEFs) <table border="1"> <tr> <td>CITCOM.AI</td> <td>agrifoodTEF</td> <td>TEF-Health</td> <td>AI-MATTERS</td> <td>PREVAIL</td> </tr> </table>	CITCOM.AI	agrifoodTEF	TEF-Health	AI-MATTERS	PREVAIL				
CITCOM.AI	agrifoodTEF	TEF-Health	AI-MATTERS	PREVAIL						
Adra-e (CSA for the AI, Data and Robotics partnership)										
EDIHs Hubs	Data Transformation Accelerator Network of EDIHS interested in Data and Data Spaces									
Cloud-to-Edge Initiatives	Cloud-to-Edge projects part of DEP in particular the Marketplace for federated cloud-to-edge based services <table border="1"> <tr> <td>Demo</td> </tr> </table>	Demo								
	Demo									
Alliance for industrial data, Edge and cloud										
EuroHPC JU	Joint Undertaking <table border="1"> <tr> <td>RIAG</td> <td>INFRAG</td> </tr> </table>	RIAG	INFRAG							
RIAG	INFRAG									
Skills	Advanced Digital Skills program of DEP: <table border="1"> <tr> <td>project (funded under DIGITAL-2021-SKILLS-01)</td> </tr> </table>	project (funded under DIGITAL-2021-SKILLS-01)								
project (funded under DIGITAL-2021-SKILLS-01)										
Other DEP Initiatives	Digital Product Passport (CIRPASS)									



Annex II. Experts Groups

