EUROPEAN
COMMISSION

Brussels, 24.1.2024
SWD(2024) 21 final

COMMISSION STAFF WORKING DOCUMENT

on Common European Data Spaces

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1 Introduction

Data is reshaping the way we produce, consume and live. It is the basis for creating many innovative products and services, driving productivity and resource efficiency gains across all sectors of the economy. Above all, data is the fuel for training and improving artificial intelligence (AI) algorithms and it is an essential driver for innovation in AI. The benefits of data touch upon every aspect of our lives, ranging from more sustainable energy production and use to healthier lives and better healthcare.

With a view to creating a solid data-driven economy, the European strategy for data (2020)[1] sets out the path to the creation of a genuine single market for data in which both personal and non-personal data, including sensitive business data, will be able to flow seamlessly across borders and sectors in a safe and secure manner, in line with EU rules and values, for the benefit of European businesses – notably AI innovators – and citizens. This will enable the EU to become a leading role model for a society empowered by data to make better decisions – in business and the public sector.

To realise this vision, common European data spaces are being established to facilitate trusted and secure data pooling and sharing in strategic economic sectors and domains of public interest. The sectoral and domain-specific common European data spaces will gradually be interconnected to form a pillar of the single market for data. This will allow for the development of more data-driven, evidence-based policies across the EU.

Specifically in the rapidly evolving field of generative AI, the availability of high-quality data is paramount for fostering innovation and ensuring Europe's competitiveness in the world. Foundation models, which are at the fundament of general purpose AI (capable of performing a wide array of tasks), including generative AI, depend on a vast amount of data to train themselves, enabling generative AI systems to handle new and diverse situations. In this light, common European data spaces play a critical role in providing a steady supply of data, including language data, to economic actors, thereby creating a fundament for AI innovation in Europe. As such, the Commission is reinforcing the Union's commitment to technological excellence and digital sovereignty, while ensuring adherence to European values such as privacy, security, and ethical data usage. Data, combined with computing power, algorithms and talent, will be among the key drivers of European leadership in trustworthy AI.[2] AI start-ups and SMEs will also be key participants in common European data spaces benefitting from a diverse ecosystem in which they can share and obtain data.

In the data strategy, the Commission announced common European data spaces in a number of sectors and domains of public interest, while specifying that others could be added at a later stage. In the past years, additional sectoral/ domain-specific common European data spaces have indeed been announced, bringing the current number to a total of 14.

There is no one-size-fits-all structure for common European data spaces; each space is organised by participants taking into account the unique characteristics of the specific sector/

[1] COM(2020) 66 final
[2] COM(2024) 28 final

domain. However, there are two key elements that are shared by all: a common European data space brings together relevant *data infrastructures* and *governance frameworks* in order to facilitate data pooling, access and sharing. Building on this, the first Staff Working Document (SWD) on data spaces, published on 23 February 2022[3] further to a request from the European Council, outlined the following general key features:

Key features of a common European data space

- A secure and privacy-preserving infrastructure to pool, access, share, process and use data.
- A clear and practical structure for access to and use of data in a fair, transparent, proportionate and/non-discriminatory manner and clear and trustworthy data governance mechanisms.
- European rules and values, in particular personal data protection, consumer protection legislation and competition law, are fully respected.
- Data holders will have the possibility, in the data space, to grant access to or to share certain personal or non-personal data under their control.
- Data that is made available can be reused against compensation, including remuneration, or for free.
- Participation of an open number of organisations/ individuals.

This second SWD provides an overview of the current status of the common European data spaces. First, it gives an update on the enabling EU legislative framework for data spaces. Since the publication of the first SWD, there have been some significant milestones – notably the entry into application of the Data Governance Act, adoption of the Data Act and adoption of the implementing act on high-value datasets. Second, it presents the state of play of data-space related EU support actions, including sector- and domain-specific initiatives, the Data Spaces Support Centre (DSSC) and smart open-source middleware (Simpl), as well as relevant European Digital Infrastructure Consortia (EDICs) and ongoing work on standards and interoperability. Finally, for each sector- or domain-specific common European data space, this second SWD presents progress over the past two years as well as the upcoming key milestones.

Significant advancements have been achieved in the development of sector- and domain-specific data spaces. Nonetheless, the pace of progress varies, contingent upon the preparedness of each specific sector. Some data spaces are still in the preparatory stages, while others are already in the deployment phase. Hence, it is crucial to ensure strong commitment from all stakeholders involved, in particular SMEs in view of their crucial role in the data economy, if we are to realise our vision of establishing a genuine single market for data.

[3] SWD(2022) 45 final

2 Update on legislation

Considerable progress was made in 2022-23 on Europe's strategy for the digital age[4], a key policy priority identified by the current Commission (2019-24), as well as on its supporting legislation. At the same time, the European Union focused on policies supporting Europe's technological sovereignty in key enabling technologies and infrastructures for the data economy[5] in the context of an uncertain geopolitical environment. These new policies are reshaping the digital regulatory landscape, thereby creating a modern environment which includes the necessary safeguards to incentivise digital investments from market players.

The regulatory framework for the digital economy strongly builds on the data strategy, in particular the Data Governance Act, the Data Act and the implementing act on high-value datasets. As regards personal data, this enabling legislation for the development of common European data spaces builds on a solid and trusted legislative framework, notably the GDPR[6] and the ePrivacy Directive[7].

Another important recent development related to data includes the entry into force of two new markets regulations, namely the Digital Markets Act and the Digital Services Act. The Commission's proposal on the Artificial Intelligence Act (AI Act) is yet another milestone toward completing the EU-level regulatory toolbox. In December 2023[8], political agreement on the AI Act between the European Parliament and the Council was reached.

National actors will play a key role in making this EU-level regulatory toolbox work on the ground in order to benefit the largest possible range and number of beneficiaries in the Member States. They will also be instrumental in making the common European data spaces work in each Member State and with the involvement of all key players so that the European single market for data as envisaged in the data strategy becomes a reality in the medium term.

*As a key component of the **common European green deal data space**, Destination Earth is developing a highly accurate digital model of the Earth. It will enable projections on urban flooding and heat exposure, for example, which will allow downstream applications to calculate related safety and health risks in cities and allow for timely policy measures to be taken.*

[4] https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age_en
[5] COM(2020) 66 final
[6] Regulation (EU) 2016/679
[7] Directive 2002/58/EC
[8] https://digital-strategy.ec.europa.eu/en/news/commission-welcomes-political-agreement-artificial-intelligence-act

2.1 European strategy for data

The European strategy for data[9] is one of the cornerstones of the EU's digital strategy. It articulates the ambition for Europe to become a leading data economy through the creation of a European single market for data together with the enabling legislative framework for the governance of common European data spaces.

The data strategy envisions strong synergies between the data legislation and the respective deployment actions to mutually reinforce each other. In this spirit, it announced proposals for two new legislative instruments – the Data Governance Act and the Data Act – as well as the adoption of an implementing act on high-value datasets under the Open Data Directive.

2.1.1 Data Governance Act

The first instrument announced in the data strategy, the Data Governance Act (DGA)[10], entered into force on 23 June 2022 and is applicable since 24 September 2023. The DGA strengthens trust in data sharing by regulating organisations that bring the demand and supply sides of the data market together. The Regulation is a key building block for the common European data spaces.

The DGA facilitates the development of common European data spaces through several mechanisms:

- Recognised data altruism organisations support the emergence of sufficiently-sized data pools made available on the basis of data altruism in order to enable data analytics and machine learning, including across the Union.
- Data intermediation services support the bilateral or multilateral sharing of data or the creation of platforms or databases enabling the sharing or joint use of data, as well as the establishment of specific infrastructure to connect data subjects and data holders with data users. As orchestrators of data-sharing ecosystems, data intermediaries open the market in the context of common European data spaces[11].
- To help potential re-users find relevant information on what data is held by which public authorities, Member States are required to make a safe reuse of specific categories of public sector data possible. This is facilitated through the European register for protected data held by the public sector, available at data.europa.eu – the official portal for European data[12]. This complements the 2019 Open Data Directive, which does not cover the types of public sector data addressed by the DGA.

The European Data Innovation Board (EDIB)[13], also established under the DGA, acts as an advisory body to the Commission for all matters related to the implementation of the DGA and for horizontal issues pertaining to the common European data spaces. It consists of Member State representatives from the competent authorities for data intermediation services and for the registration of data altruism organisations, the European Data Protection Board (EDPB[14]), the

[9] COM(2020) 66 final
[10] Regulation (EU) 2022/868
[11] https://op.europa.eu/en/publication-detail/-/publication/379cf850-4553-11ee-9854-01aa75ed71a1/language-en
[12] https://data.europa.eu/data/datasets?superCatalogue=erpd&locale=en
[13] https://ec.europa.eu/transparency/expert-groups-register/screen/expert-groups/consult?lang=en&groupID=3903
[14] https://edpb.europa.eu/edpb_en

European Data Protection Supervisor (EDPS[15]), the EU Agency for Network and Information Security (ENISA[16]), the SME envoys network[17], and other representatives of relevant bodies in specific sectors as well as bodies with specific expertise.

The first meeting of the EDIB took place on 13 December 2023.

2.1.2 Data Act

The Data Act was proposed in February 2022[18] and entered into force on 11 January 2024[19]. It shall apply from 12 September 2025. As the second key legislative initiative announced in the European data strategy, the Data Act complements the Data Governance Act by clarifying access and use rights on data with the objective of ensuring fairness in the data economy.

The main aim of the Data Act is to remove barriers to the access to high-quality data, particularly in the industrial context (currently 80% of this data is not used). It facilitates data sharing both in business-to-business (B2B) and business-to-consumer (B2C) situations while ensuring that data protection rules are respected when personal data is shared. The Data Act is an ambitious measure aiming to facilitate the development of new products and services leveraging on Europe's wealth of data. It does so by clarifying the rights and obligations of the different parties involved in the use of data from connected products, notably clarifying that lawful users of such products have full access and usage rights, as well as rights to control use by others.

Furthermore, it establishes a mechanism by which public sector bodies can request data from a business where there is an exceptional need and provides clear rules on how such requests should be made. An exceptional need can be, but is not limited to, a public emergency such as a pandemic or earthquake. It also includes measures to protect SMEs from unfair contractual terms imposed by stronger players and to increase the competitiveness of the European cloud market by removing legal, technical and financial obstacles to effective switching between cloud service providers.

To assist parties in drafting and negotiating contracts, the Data Act provides that the Commission shall develop and recommend non-binding model contractual terms for B2B data sharing and standard contractual clauses for cloud contracts.

In addition, the Data Act introduces safeguards on transferring non-personal data beyond the EU borders at the request of a third country government where that would create a conflict with Union law or the national law of the relevant Member State, or in exceptional cases where a data holder is highly likely to suffer serious economic damage from the disclosure of trade secrets.

Finally, it defines essential requirements regarding the interoperability of data spaces and sets out interoperability provisions for providers of data processing services.

[15] https://edps.europa.eu/_en
[16] https://www.enisa.europa.eu/
[17] https://single-market-economy.ec.europa.eu/smes/sme-strategy/sme-envoys-network_en
[18] COM(2022) 68 final
[19] Regulation (EU) 2023/2854

2.1.3 Implementing act on high-value datasets

The Open Data Directive[20] lays down the legal framework for the reuse of public-sector information, including publicly funded research data. It also introduces the concept of high-value datasets. These are defined as documents, the reuse of which is associated with important benefits for society and the economy. They are therefore subject to a separate set of rules ensuring their availability free of charge, in machine-readable formats. Member States shall make them available via Application Programming Interfaces (APIs) and, where relevant, as a bulk download.

In December 2022, the Commission adopted an Implementing Regulation[21] that, based on the initial six categories defined in the Open Data Directive (Geospatial, Earth observation and environment, Meteorological, Statistics, Companies and Company ownership, and Mobility), lays down a list of concrete high-value datasets and the arrangements for their publication by the Member States. The Implementing Regulation will enter into application on 9 June 2024.

The open data generated or held by government entities plays a pivotal role in enriching data availability within common European data spaces. It enhances data quality and interoperability and facilitates the reuse of data across borders. Availability of this diverse data also allows for cross-domain insights and the ability to address complex, interconnected challenges more effectively.

2.2 Digital Markets Act and Digital Services Act

The Digital Markets Act (DMA) entered into force on 1 November 2022 and its implementing regulation was adopted on 14 April 2023[22], in view of the applicability of the DMA from 2 May 2023. The DMA applies to large digital platforms acting as important gateways for business users to reach consumers. The objective of this legislation is to ensure contestable and fair markets in the digital sector and to enable other companies to access these markets and compete on a balanced, even field.

There is a strong focus on data access and use in the DMA. For example, it introduces an obligation for gatekeepers not to use data they collected from the business users of their platforms to compete with those business users as well as an obligation not to combine personal data of consumers from two or more of their core platform services without consent in accordance with the GDPR.

The Digital Services Act (DSA)[23] was presented as a complementary measure to the DMA, covering online content moderation, clarifying responsibilities and obligations of online intermediary services, hosting services and large online platforms. The DSA aims to increase democratic control and transparency of online content, in particular harmful content. More specifically, the DSA introduces a new transparency regime which will ensure access, under

[20] Directive (EU) 2019/1024
[21] Commission Implementing Regulation (EU) 2023/138
[22] Regulation (EU) 2022/1925
[23] Regulation (EU) 2022/2065

specific conditions, to data collected by very large online platforms with tens of millions of users in the European Union.

The DSA came into force in November 2022 after a long negotiation and intense discussion with industry representatives and civil society associations. It is applicable since July 2023 for very large platforms and from January 2024 for all other actors. An essential aspect of compliance is the establishment of a risk management system to identify and mitigate potential risks for society, like harmful content. In February 2024, EU Member States will have to appoint Digital Services Coordinators who will oversee compliance.

2.3 Sectoral and domain-specific legislation

In addition to the cross-sectoral legislative framework described in the previous sections, sectoral data-sharing legislation can be an important enabler for the development of common European data spaces.

There are three types of sector/ domain-specific legislation:

- sector-specific legislation and policies that include data sharing as a key enabler;
- legislation to help ensure availability and interoperability of private sector data;
- legislation to help ensure availability and interoperability of public sector data[24].

The status updates of the common European data spaces in section 6 include detailed information on these sectoral initiatives.

[24] The Interoperable Europe Act proposal will further strengthen cross-border interoperability and cooperation in the public sector across the EU.

3 EU-funded initiatives

The EU is funding several initiatives related to common European data spaces. Coordination and support actions and deployment actions are mostly funded under the Digital Europe programme. Innovation and research initiatives are funded under Horizon Europe.

The funded data space initiatives fall into three main groups: (1) sector- and domain-specific initiatives, (2) the Data Spaces Support Centre, and (3) Simpl: smart open-source middleware.

The common European health data space facilitates access to electronic health data, such as cancer images data and related patient data, and provides a trusted framework for researchers, innovators and clinicians to leverage data, for instance to develop and benchmark trustworthy AI tools based on imaging data.

3.1 Sectoral and domain-specific data spaces

Through the Horizon Europe and Digital Europe programmes, the Commission supports several sectoral and domain-specific common European data space initiatives.

Under Digital Europe (DIGITAL), coordination and support actions (CSAs) started in late 2022 to lay the basis for the development of eight data spaces (agriculture, financial, Green Deal, manufacturing, mobility, smart communities, skills and tourism). The activities concerned community-building and preparatory work – in collaboration with the Data Spaces Support Centre (DSSC, see 3.2) – on a blueprint and governance architecture, a roadmap and the identification of priority datasets.

Also under DIGITAL, grants and procurements supported the start of the gradual deployment of eight data spaces (cultural heritage, health (genome, cancer images), language, manufacturing, media, mobility, public administrations (public procurement) and smart communities). For the cultural heritage, manufacturing and media data spaces, this also includes specific grants to support activities of SMEs in these sectors (see Annex I for further details).

Furthermore, the Commission supported the creation of an energy and a research and innovation (EOSC) data space through the Horizon Europe programme, with dedicated CSAs and research and innovation actions (RIAs, IAs).

The sectoral and domain-specific data space projects work in close partnership with the DSSC to ensure alignment with the rest of the data spaces' ecosystem implemented with EU support. The joint work targets the definition of: (1) the data space reference architecture, building blocks and common toolboxes; (2) common standards, including semantic standards and interoperability protocols, both domain-specific and cross-cutting; and (3) data governance models, business models and strategies for running data spaces. It is expected that, in the future, most of the data spaces receiving funding under DIGITAL will include end-users, in particular SMEs given their role as key actors in the data economy.

In 2022-23, DIGITAL, Horizon Europe and the Connecting Europe Facility (CEF) also provided an important range of support actions on topics that are closely related to the development of the common European data spaces, such as smart open-source middleware (see

3.3 on Simpl), open data, destination Earth (DestinE), digital infrastructures and technologies for data management, including compliance, privacy preservation, green and responsible data operations[25].

EU-funding and support, both for specific sectoral data spaces as well for important related digital and data topics, will continue through the upcoming 2024 calls under the DIGITAL, Horizon Europe and CEF work programmes[26].

Moreover, in the context of the EU's Recovery and Resilience Facility (RRF), the recovery and resilience plans of several Member States also support actions related to common European data spaces[27].

3.2 Data Spaces Support Centre

As put forward in the first DIGITAL work programme 2021-22[28], a CSA started in October 2022 to set up and operate a Data Spaces Support Centre (DSSC)[29]. Running until the end of March 2026, the DSSC coordinates all relevant actions on the sectoral data spaces to ensure that they develop in a coherent way, are interoperable and benefit from economies of scale through the use of common practices, components (referred to as 'building blocks') and tools (e.g. software implementations or services implementing the abovementioned building blocks that are considered fit for purpose).

As an initial priority, the DSSC has formed a diverse stakeholder network encompassing all organisations and initiatives relevant to the development of data spaces, comprising three subsets: (1) the Community of Practice, (2) the Strategic Stakeholder Forum, and (3) Liaisons and Collaborations.

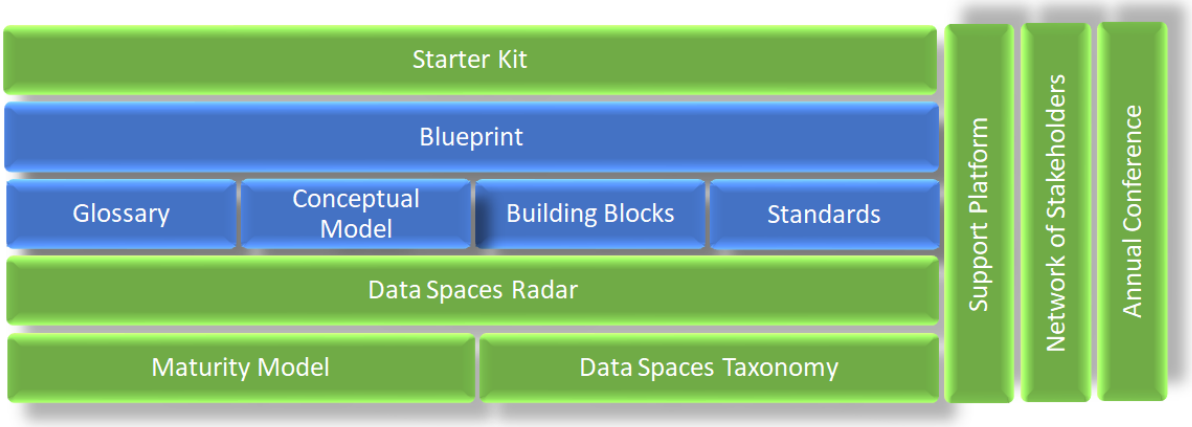
The Community of Practice (CoP) currently consists of the EU-funded common European data space initiatives (see 3.1). They are the primary focus group for the DSSC and are crucial for co-creating DSSC assets[30]. The Strategic Stakeholder Forum (SSF) is a think-and-do-tank that supports the DSSC objectives and offers recommendations on governance and sustainability[31]. Lastly, under Liaisons and Collaboration, the DSSC collaborates with other relevant initiatives and stakeholders for the development of data spaces[32].

To support the deployment of data spaces, the DSSC collaborates with stakeholders to create and share assets covering different aspects related to data spaces. These assets are freely accessible to all common European data space initiatives[33] as well as the public at large. Currently, these include a starter kit and a blueprint. The blueprint contains a glossary, a data space conceptual model and building blocks, as well as a collection of standards and

[25] See DIGITAL and Horizon Europe work programmes 2021-22.
[26] See DIGITAL and Horizon Europe work programmes 2023-24.
[27] https://commission.europa.eu/business-economy-euro/economic-recovery/recovery-and-resilience-facility_en#map
[28] https://digital-strategy.ec.europa.eu/en/activities/work-programmes-digital
[29] https://dssc.eu/
[30] https://dssc.eu/space/DC/27983886/Community+of+Practice
[31] https://dssc.eu/space/DC/28049509/Strategic+Stakeholder+Forum
[32] https://dssc.eu/space/DC/28770341/Liaisons+and+Collaborations
[33] https://dssc.eu/space/DDP/117211137/DSSC+Delivery+Plan+-+Summary+of+assets+publication

specifications from the data space technology landscape. The assets will be updated and expanded at specific points in time for the entire duration of the project.

Overview of DSSC assets, created in cooperation with the network of stakeholders (source: dssc.eu)



Lastly, the DSSC supports the work of the recently created European Data Innovation Board (EDIB, see 2.1.1), in view of its task to propose guidelines for common European data spaces and to enhance the interoperability of data as well as data-sharing services between different sectors and domains, in compliance with existing EU legislation on data protection.

3.3 Simpl: Smart Open-Source Middleware

In order to ensure that the data spaces will be deployed based on a common technical infrastructure, the Commission is procuring the development of the open-source smart cloud-to-edge middleware platform Simpl[34]. The contractual and development phase started in January 2024. Over time, the following products should be developed and are expected to be used by all data spaces funded under DIGITAL:

- Simpl-Open: this will be the open-source software stack itself. It will power data spaces and other cloud-to-edge federations initiatives. The outcome of the work will be released progressively as the project is open source. This should lead, indicatively, to a proof of concept available by summer 2024 and a minimum viable platform by the end of 2024.
- Simpl-Labs: a pre-installed demonstration/ playground environment where third parties can do two things: first, sectoral data spaces in their early stages of inception will be able to experiment with the deployment, maintenance and support of the open-source software stack before deploying it for their own needs. Second, more mature data spaces will be able to use Simpl-Labs to assess their level of interoperability with Simpl-Open.

[34] https://digital-strategy.ec.europa.eu/en/news/simpl-cloud-edge-federations-and-data-spaces-made-simple-updated-august-2023

- Simpl-Live: these are distinct instances of the Simpl-Open software stack in the form of customised production environments for sectoral data spaces where the Commission itself plays an active role in their management. In 2024, technical studies preliminary to the effective use of Simpl-Open will be conducted for the following data spaces: language, public administrations (public procurement), Green Deal (smart communities and Destination Earth), health (secondary eHealth), research and innovation – EOSC.

4 European Digital Infrastructure Consortia

4.1 A new instrument for multi-country projects

As part of the policy programme 'Path to the Digital Decade', the Commission has put forward a framework to develop and implement multi-country projects (MCPs). MCPs are large-scale projects that allow for Member States' intervention in strategic areas to contribute to the digital transformation of the EU.

MCPs will pool EU, national and private resources and bring together Member States to achieve progress that no Member State could otherwise achieve on its own, without prejudice to applicable State aid rules. For example, they could support the EU-wide deployment of a European Blockchain Service Infrastructure or of a common European data space.

To swiftly establish and operate MCPs, the Commission has created a new type of legal entity: a European Digital Infrastructure Consortium (EDIC). An EDIC will be able to apply for funding from the centrally managed EU programmes, including the DIGITAL Europe programme, Horizon Europe, the Connecting Europe Facility for Digital and the Recovery and Resilience Facility, as well as funds under shared management.

4.2 EDICs related to common European data spaces

In the context of the sectoral common European data spaces, two formal applications to create EDICs that are relevant for the language and the smart communities data spaces, were submitted to the Commission at the end of 2023. After adoption of a Commission Implementing Decision, they are expected to start their work in the course of 2024.

Member States' submissions of formal applications on EDICs related to common European data spaces

EDIC name	EDIC description	Member States
Alliance for Language Technologies (ALT EDIC)	Objectives and main features: Development, deployment and promotion of AI-based Large Language and Foundation models. Contribution to building a common European language data space. Main infrastructure: Practical implementation of Language Technologies	Host: FR. Formal application submitted by: FR, BG, HR, IE, IT, LT, LV, NL, PL, SI.
Networked Local Digital Twins towards the CitiVERSE	Objectives and main features: The EDIC will implement an open digital infrastructure enabled by interoperability and mutual agreements to avoid further fragmentation of the European digital urban platforms ecosystems. Contribution to building a common European smart communities data space. Main infrastructure: EU Local Digital Twin toolbox.	Host: ES Formal application submitted by: CZ, HR, EE, FR, LV, PT, SI, ES.

5 Standards and interoperability

Common European data spaces will have a transformative effect on all sectors of the EU economy and they will play an important role in the green and digital transition of multiple ecosystems. In addition to sector-specific data, industry - including SMEs - will need access to data from other relevant sectors and horizontal domains (e.g. green deal, legal, skills, research and innovation). Ensuring cross-sectoral data interoperability and the gradual creation of a true single market for data is therefore essential.

Now that the key legislative instruments have been approved and are coming into effect, the focus has shifted to implementation. In this phase, standards will be a key enabler for interoperability and to fully leverage the potential of data sharing.

In the Annual Union Workplan for Standardisation 2024[35] and the Rolling Plan for ICT Standardisation 2024 [36], the following four processes are considered as the key focus areas for standardisation initiatives:

The ambition is to define generic standards and best practices for each of these processes, applicable across all common European data spaces, enabling organisations to easily share and use data in a trusted, legally compliant way.

Domain-specific ontologies are an important element of common European data spaces, enabling the effective integration of data from different sources. The data usage standards will include generic mechanisms to manage and leverage such ontologies.

Many relevant data standards and specifications already exist, including specifications developed by, for example, data spaces consortia, the European Statistical System[37] and the European Commission[38]. The challenge will be to find the right mix and identify any gaps. This will require the joined expertise of the data spaces community and the data standards community. The Data Interoperability workstream (2023) of the High-Level Forum for Standardisation[39] involved experts from both communities.

[35] https://digital-strategy.ec.europa.eu/en/policies/rolling-plan-ict-standardisation
[36] https://digital-strategy.ec.europa.eu/en/policies/rolling-plan-ict-standardisation
[37] https://showvoc.op.europa.eu/#/datasets/ESTAT_Catalogue_of_ESS_Standards/data
[38] Data Spaces | Joinup (europa.eu)
[39] https://single-market-economy.ec.europa.eu/single-market/european-standards/standardisation-policy/high-level-forum-european-standardisation_en

The European Data Innovation Board will take their findings as a starting point and continue to promote such collaboration.

By facilitating the sharing of data collected via digital technologies on farms, such as through precision farming applications, the ***common European agriculture data space*** *will allow comparative analyses between farms in order to improve their sustainability and economic performance.*

6 Common European data spaces: state of play

This section presents an overview of the state of play of the common European data spaces announced in the European data strategy or later. It provides an update on funded initiatives, including important sectoral legislation, since the publication of the first Staff Working Document on common European data spaces (February 2022). The common European data spaces covered in this section have been established in strategic economic sectors and domains of public interest, where stakeholders have identified a need and a willingness to share data. This is an ongoing process, and common European data spaces in new sectors or domains have already been and may continue to be created.

For example, in the Transition pathway for construction[40], the Commission announced that it will assess various resources to finance the creation of a common European construction data space, including an analysis of its potential governance structure and its role in supporting interoperability, trust and data sharing. This analysis as well as proposals for future actions are part of a study on the digitalisation of the built environment, launched in January 2023.

Building on a reference architecture framework for digital platforms for construction[41], the study analyses existing initiatives in construction. It will propose development scenarios and analyse threats, opportunities, weaknesses and strengths in relation to the establishment of a data space. This will lead, by summer 2024, to recommendations for actions, cooperation mechanisms as well as effort- and resources-sharing to the Commission, Member States and industry in view of the development of a construction data space. Recent evolutions about building- and construction-related data, such as digital building logbooks and digitalisation of building permit processes, will be duly taken into account.

Furthermore, an important action relevant for data spaces will be the development of an EU Code of Conduct for data sharing in the social economy. Announced in the Action Plan for the Social Economy and the Transition Pathway for proximity and social economy[42], this will be developed in 2024 as a non-binding document, reflecting the specific values of social economy entities regarding their data-sharing activities in several contexts, for example in the development of digital commons[43] and data for good initiatives.

*By facilitating the discovery of, access to and sharing of data on infrastructure, capacity availability and real-time traffic from different transport modes, the **common European mobility data space** will contribute to more accurate estimated times of arrival and of interchange. This is an important resource for managing intermodal logistics in the freight sector as well as for personal mobility.*

[40] https://ec.europa.eu/docsroom/documents/53854 https://ec.europa.eu/docsroom/documents/53854
[41] https://www.digiplaceproject.eu/
[42] https://ec.europa.eu/social/main.jsp?catId=1537&langId=en
[43] 'Digital commons' refers to the collective creation and shared ownership of information and knowledge resources within a community.

6.1 Common European agriculture data space

The common European agriculture data space will contribute to realising the ambitions laid out in the Common Agricultural Policy (CAP) and the Farm-to-Fork-strategy[44]: it will enhance the sustainability and competitiveness of EU agriculture through the availability and sharing of production, land use, environmental and other data, allowing the precise and tailored application of production approaches at farm level and the monitoring of the performance of the sector and its policies. It also holds the potential to support the tracking of sustainability and labelling schemes, such as in the field of carbon farming or the marketing and sales of regional products. The data space will facilitate trustworthy pooling, sharing and use of agricultural data between farmers (who are the data owners according to the Code of Conduct on agricultural data sharing[45]), machinery companies, data service providers and public authorities. It will be accessible to all types of farmers and allow them to control whom data are shared with, in a transparent manner.

A coordination and support action (CSA) supported under DIGITAL (October 2022-Spring 2024) will help develop a governance and business model for the data space. It also takes stock of existing data-sharing initiatives on agriculture, identifies the needs of different stakeholders and assesses experiences with the Code of Conduct on agricultural data sharing. In 2023 and early 2024, it has further engaged stakeholders to reach agreement on key elements and to propose a roadmap for the data space.

The roadmap will guide the implementation of a data space blueprint funded under DIGITAL; the corresponding deployment action is expected to be launched at the end of 2024.

Interim results of the CSA already show the enabling effects of data spaces in the field of agriculture at regional and national levels. For instance, they enable the sharing of data collected via digital technologies on farms, such as through precision farming applications. This data can be used for comparative analyses between farms, for reducing administrative burden and to improve sustainability and economic performance. Data spaces also help in providing consumers with detailed information about product attributes, like origin and production methods.

From a policy perspective, several initiatives are ongoing to ensure the contribution of public data to this data space: (i) the development of a Spatial Agricultural Information System (SAIS) by 2026 that will ensure data from the Integrated Administration and Control System (IACS) can be integrated with other relevant datasets; (ii) the Farm Accountancy Data Network on the economic performance of farms is transitioning toward the Farm Sustainability Data Network (FSDN)[46] to widen the scope of data collection; data collection is expected from 2025 onwards; (iii) also from 2025 onwards, Member States will provide the Commission with data on CAP interventions and beneficiaries[47] which can be combined with other agricultural databases and geospatial data; and (iv) starting from 2024, farmers in the Member States will benefit from a

[44] https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en
[45] https://cema-agri.org/images/publications/brochures/EU_Code_of_conduct_on_agricultural_data_sharing_by_contractual_agreement_2020_ENGLISH.pdf
[46] COM(2022) 296
[47] Implementing Regulation (EU) 2022/1475

nutrient and fertilisation management system. Farmers could use the data space to share data generated by the platform.

The DIGITAL Work Programme 2023-24 supports a project on semantic interoperability to ensure seamless and automated data flows between the various agricultural data systems, in order to assess the impact of agriculture on different sustainability dimensions. The project will analyse a set of case studies from various domains (soil, water, biodiversity, ecosystems services, etc.).

New Horizon Europe R&I actions (notably DIVINE, ScaleAgData, CrackSense, AgriDataValue), and launched in February 2024, a Horizon Europe funded CSA on livestock tracking 'Dig4Live' and a R&I project on digital and data infrastructure '4Growth' will help develop the data space's business model.

The data space will also benefit from the Horizon Europe partnership 'Agriculture of Data'[48] (work programme 2023-24). A public consultation on the partnership's Strategic Research and Innovation Agenda (concluded in Q1 2023) confirmed complementarity with the data space.

In Q4 2022, a workshop with representatives of R&I initiatives in the field of agricultural data was organised by the Commission, providing further input to the data space. In Q4 2023, the Commission also organised a series of four webinars with Member States on agriculture data sharing to engage them in the CSA 'AgriDataSpace' and the development of the data space.

Milestones – future

- Prepare the ground for deploying the agriculture data space, e.g. stakeholders network, blueprint, governance model, priority data sets, roadmap (DIGITAL, 2022-24)
- Deployment of an operational agriculture data space (DIGITAL, 2024-27)

[48] https://research-and-innovation.ec.europa.eu/system/files/2022-04/ec_rtd_he-partnership-agriculture-data.pdf

6.2 Common European cultural heritage data space

The common European data space for cultural heritage is the flagship initiative of the Commission to accelerate digital transformation of Europe's cultural sector and foster the creation and reuse of digital cultural heritage content[49]. Its deployment is funded under the DIGITAL programme[50]. In November 2021, the Commission published the Recommendation on a common European data space for cultural heritage[51]. It encourages Member States to accelerate the digitisation of cultural heritage assets and provides guiding principles on data spaces for cultural heritage. The Commission Expert Group on the common European Data Space for Cultural Heritage (CEDCHE)[52] provides advice on the evolution of the data space and assists the Commission in monitoring development in the Member States. Its new subgroup on technical and legal aspects is examining specific areas including data and data governance, aggregation, 3D and XR, reuse and multilingualism.

Work on the deployment of the data space started in September 2022, building on the Europeana Digital Service Infrastructure. The initial 2-year period includes work in the following areas:

- Development and operation of the data space infrastructure. Collaboration with the Data Spaces Support Centre has been established.
- Data and data services: work towards a significant and sustained increase in high-quality, usable and accessible data. Using machine-learning and AI for enrichment to offer an improved user experience and new services.
- Data governance: support the sharing and facilitate the reuse of additional types of data, through new means and for new purposes.
- Strengthening the capacity and capabilities of professionals, supporting institutions in their digital transformation.
- Fostering connections with digital cultural heritage communities and with stakeholders in other sectors (cultural and creative sector, education, tourism, etc.) to create opportunities and incentives for use and reuse.
- Engaging diverse audiences by expanding pan-European themes and perspectives, inspiring use, reuse and participation.

Several supporting grants, funded under the DIGITAL programme, contribute to the deployment of the data space by delivering high-quality 3D data, by building the capacity of smaller cultural heritage institutions, by exploring the application of artificial intelligence technologies and by promoting a more inclusive and respectful approach to describing cultural heritage. The cultural heritage data space will preserve diverse assets through 3D digitisation, ensuring: (i) increased access and visibility, (ii) their availability for future generations and (iii) the ability for reuse in other projects, domains and sectors without physically harming them. Examples of the Twin it! Campaign include at-risk heritage like the Paphos Castle in Cyprus,

[49] https://pro.europeana.eu/page/common-european-data-space-for-cultural-heritage

[50] Complementary to the data space for cultural heritage, under Cluster 2 of Horizon Europe the setting up of a European Collaborative Cloud for Cultural Heritage (ECCCH) is about to be funded. The ECCCH aims to build a digital infrastructure that will facilitate the collaboration of cultural heritage institutions and professionals across the EU, by developing specific digital tools for the sector while removing barriers for smaller and remote institutions.

[51] C(2021) 7953

[52] C(2021) 4647

heavily visited sites like the Citadella of Gozo in Malta, and heritage with a low level of digitisation as the old church of Petäjävesi in Finland.

Milestone – achieved

✓ *Recommendation on a common European data space for cultural heritage (November 2021)*

Milestones – future

- Deployment of an operational cultural heritage data space, building on the Europeana Digital Service Infrastructure (DIGITAL, 2022-24)
- Twin it! 3D for Europe campaign, encouraging Member States to digitise their cultural heritage and increase the high-quality, usable and accessible 3D content in the data space (2023-24)
- Enrich and enhance the offer of 3D and extended reality (XR) content in the data space (DIGITAL, 2024-26)

6.3 Common European energy data space

Digitalisation of the energy system is a policy priority which underpins both the green and digital transitions. The EU Action Plan on digitalising the energy system[53], adopted in October 2022, lays down key actions to establish the common European energy data space and aims at consolidating a comprehensive and coherent EU framework for sharing data to support innovative energy services. This will help the EU reach its overall objectives in terms of energy security, sustainability and integration of energy markets, and it will pave the way towards lower consumer bills.

The availability of, access to and sharing of energy-related data based on seamless and secure data transfers among trusted parties is a key enabler for a digitalised energy system. As such, the energy data space will help the further integration of renewable energy sources, increase the energy system efficiency, and ensure a smooth and competitive transition towards the electrification of sectors such as heating and transport. This will be achieved by focusing on three main priorities designed to respond to the energy-related objectives of the European Green Deal and the Digital Decade: (i) flexibility services in energy systems; (ii) smart and bidirectional charging of electric vehicles; and (iii) data services to support building renovations that improve energy efficiency.

Six ongoing projects funded by Horizon Europe are preparing the ground for the deployment of the energy data space. Five of them develop detailed use cases, identify building blocks and define interoperability requirements. A coordination and support action will seek to establish an interoperability framework and an open, cross-domain community of stakeholders to work on developing, testing and deploying interoperable energy services.

An Implementing Act on interoperability requirements and procedures for access to electricity metering and consumption data was adopted in June 2023[54] to make data readily available to its rightful owners and other relevant actors, including for environmental and official statistics purposes, and to improve data interoperability. In addition, a public consultation[55] for a proposal for a Regulation on a network code on demand response closed recently. This aims to ensure that systems operators have access to energy resources from all electricity markets.

The Smart Energy Expert Group[56], which is currently being established, and its permanent 'Data for Energy' sub-group, will advise the Commission on the setting up of the energy data space.

The European Technology and Innovation Platform on Smart Networks for the Energy Transition (ETIP SNET[57]) and the Bridge initiative are providing studies, methodologies and tools.

The 2023-24 DIGITAL work programme will support an action for the deployment of the first operational version of the energy data space, starting in 2024.

[53] COM(2022) 552 final
[54] C(2023) 3477 final
[55] https://consultations.entsoe.eu/markets/public-consultation-networkcode-demand-response/
[56] C(2023) 6121 final
[57] https://smart-networks-energy-transition.ec.europa.eu/

Milestones – achieved

- ✓ *Adoption of the EU Action Plan on digitalising the energy system (October 2022)*
- ✓ *Adoption of implementing act for access to electricity metering and consumption data (June 2023)*

Milestones – future

- Establishment of the 'Smart Energy Expert Group' and a dedicated 'Data for Energy' working group (Q1 2024)
- Prepare the ground for deploying the energy data space (Horizon Europe, 2022-25)
- Deployment of a first operational version of the energy data space (DIGITAL, 2024-27)
- Regulation on a network code on demand response (2024-25)

6.4 Common European financial data space

In finance, data-driven services enable a shift from standardised products to personalised solutions to meet individual customer needs. Digital data allows for process automation enabling comparison services, facilitating smoother access to finance, and streamlining tasks like switching to new products and quicker customer onboarding with other financial service providers. This data space will contribute to the digital transformation of the EU financial sector to the benefit of customers. It will help boosting the digital finance sector in Europe and support Europe's economic recovery through investment. Embracing digital finance based on data will unleash innovation and create opportunities to develop better and more innovative financial products for consumers, including for people currently unable to access financial services.

The Digital finance strategy[58] announced the creation of a common European financial data space, which includes three main components.

The first relates to business-to-business and business-to-consumer data sharing in the EU financial sector (open finance). The proposed framework on Financial Data Access (FIDA)[59] (June 2023) across various types of financial services and products complements the Payment Services Directive (PSD2), applicable since 2018, which introduced similar data-sharing requirements with respect to payment accounts. PSD2 was reviewed[60] (June 2023) to improve its functioning. Under FIDA, both businesses and individual customers will retain full control over their data held by financial service providers whilst at the same time gaining access to innovative and more competitive services.

The second component is the establishment of the European Single Access Point (ESAP)[61], a technical infrastructure which will offer free and public access to information in the areas of financial services and capital markets. It will be fully operational by mid-2027 when its possible integration into other common European data spaces will be also examined. The ESAP will give companies more visibility towards both EU and international investors, opening up new funding sources. This is particularly important for small companies, including SMEs in small capital markets.

The third component, as announced in the Strategy on supervisory data in EU financial services[62], aims to put in place a system that delivers accurate, consistent and timely data to supervisory authorities at EU and national level, while minimising the aggregate reporting burden for all relevant parties. It is based on four building blocks: (1) consistent and standardised data, (2) data sharing and reuse, (3) improved and technology friendly design of reporting requirements, and (4) joint governance by relevant authorities. All of this will facilitate the use of modern technologies by reporting entities and supervisory authorities. In addition to past legislative changes in the financial sector to streamline reporting requirements and eliminate inconsistencies, the Commission has also made a proposal[63] on easier sharing of

[58] COM(2020) 591 final
[59] COM(2023) 360 final
[60] COM(2023) 365 final
[61] COM(2021) 723 final
[62] COM(2021) 798 final
[63] COM(2023) 593 final

data among authorities overseeing the EU financial system. A progress report on these measures will be published in 2024.

In addition, the Data Hub initiative, as part of the EU Digital Finance Platform, aims to facilitate the reuse of certain public sector data that cannot be made available as open data. The Data Hub will make available specific sets of synthetic supervisory data to participating firms for the purpose of testing new solutions and training artificial intelligence and machine-learning models. The Data Hub will thus make it easier to develop products that depend on data-intensive AI systems.

Milestones – achieved

- ✓ *Proposal to establish a European Single Access Point (ESAP) (November 2021)*
- ✓ *Proposal for a framework for financial data access (FIDA) (June 2023)*
- ✓ *Proposal regarding cross-cutting provisions to avoid duplicating certain reporting requirements in the fields of financial services and investment support (October 2023)*
- ✓ *Entry into force of the ESAP legislative package (January 2024)*

Milestones – future

- ESAP implementation (2024-27)

6.5 Common European green deal data space

The European Green Deal (EGD)[64] recognises data as an essential enabler of the changes needed for a just and green transition of the EU economy and society. The Green Deal data space will support the implementation of EGD policies with relevant data (e.g. on air, water, soil quality with regard to the zero-pollution strategy) and contribute to a higher level of environmental transparency. This will result in better decision-making by public authorities and more informed and empowered citizens about their environment.

'GreenData4All' is the core initiative for the creation of the Green Deal data space. In this context, the Commission is reviewing the existing EU rules on environmental geospatial data sharing, leveraging the opportunities emerging from the legislative instruments following the European strategy for data. The evaluation of the INSPIRE Directive was published in July 2022[65], and will be followed by an Impact Assessment under the GreenData4All initiative.

The Commission proposal for a Digital Product Passport (DPP) is currently under negotiation as part of the proposed Ecodesign for Sustainable Products Regulation[66]. CIRPASS (DIGITAL CSA, started in October 2022) is analysing many of the issues related to the DPP implementation in batteries, textiles and electronics value chains. A call for proposals has been published for full-scale DPP project support. It is expected that grant agreements for successful projects will be signed in Q1 2024. An evaluation for technical proposals to operate the DPP central registry has been concluded. Additionally, a draft standardisation request for IT standards and protocols for DPP operations is expected to be adopted by the Commission before the end of 2024.

In addition, the Commission has launched several actions to help define and deploy the data space. GREAT (DIGITAL CSA), initiated in September 2022, establishes data governance requirements, a technical architecture and priority datasets for the data space. It cooperates with four relevant Innovation Actions (Horizon)[67]. In parallel, Commission services are deliberating with internal and external stakeholders on potential use cases for a Green Deal data space, driven by sectoral regulatory proposals[68]. Building on the combined outcomes, the Commission will publish (Q1 2024) a follow-up call for proposals to deploy an operational data space.

As an enabler of the Green Deal data space, DS4SSCC (DIGITAL CSA, Oct 2022-Sep 2023) prepared a blueprint for the creation of a data space for smart communities. This has concretely helped cities to prepare their data strategy and industry to customise their data-based services. A deployment action, DS4SSCC-DEP (DIGITAL), started in October 2023 and will run until September 2026. Furthermore, a procurement agreement (signed in May 2023) will support the creation of an EU Local Digital Twin Toolbox to accelerate the rollout of Local Digital Twins integrated in the Living-in EU initiative[69].

[64] COM(2019) 640 final
[65] https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12427-Sharing-geospatial-data-on-the-environment-evaluation-INSPIRE-Directive- en
[66] COM(2022) 142 final
[67] See Annex I.
[68] For instance at the Green Data for All conference.
[69] https://living-in.eu/

Destination Earth (DestinE[70]), the flagship initiative that develops a highly accurate digital model of the Earth, will go live soon (July 2024). Contracts for the Core Platform and Data Lake, the first two Digital Twins, were awarded in 2022 and 2023. A preliminary review of use cases took place in 2022-23 to ensure seamless integration with DestinE. A cohesive governance structure was established early 2022 for Phase I, and preparations for Phase II (mid-June 2024) are underway. As a concrete example, DestinE will deliver projections on urban flooding and heat exposure, which will allow downstream applications to calculate related safety and health risks in cities and allow for timely policy measures to be taken.

Milestones – achieved

- ✓ *Proposal to create a Digital Product Passport (March 2022)*
- ✓ *Prepare the ground for deploying the smart communities data space (DIGITAL, 2022-23)*

Milestones – future

- Prepare the ground for deploying the Green Deal data space, e.g. stakeholders network, blueprint, governance model, priority data sets, roadmap (DIGITAL, 2022-24)
- Review of the existing EU rules on environmental geospatial data sharing (GreenData4all) (proposal in Q2 2025)
- Destination Earth (DestinE) goes live and is further developed (July 2024)
- Deployment of an operational smart communities data space (DIGITAL, 2023-26)
- Deployment of an operational Green Deal data space (DIGITAL, 2024-26)

[70] https://digital-strategy.ec.europa.eu/en/policies/destination-earth

6.6 Common European health data space

On 3 May 2022, the Commission adopted a proposal for a Regulation on the European Health Data Space (EHDS)[71], a key pillar for a strong European Health Union. Both co-legislators are aiming to reach an agreement in the current mandate of the European Parliament. The EHDS would enable natural persons to control their electronic health data while making it possible for researchers, innovators and policymakers to use such data in a trusted and secure way that preserves privacy. The EHDS would be a key building block of the European Health Union and would represent an integral pillar of the EU health policy.

The EU4Health Programme[72] is the main programme supporting the deployment and extension of cross-border infrastructures for the EHDS, covering both primary and secondary uses of health data, as well as preparatory and capacity-building actions for the implementation of the data space. Besides the EU4Health Programme, other programmes such as Digital Europe, Horizon Europe and the Recovery and Resilience Facility are also envisaged to support its implementation.

The flagship initiative for primary use of health data is MyHealth@EU[73], the cross-border infrastructure for the exchange of health data, which is already operational in 12 Member States, and the majority of Member States are working to join by 2025. The data domains covered, which currently enable the exchange of ePrescriptions, eDispensations and patient summaries, are being extended to allow the exchange of medical images, laboratory results and hospital discharge reports. In addition, the services are being extended to allow patients to access their own health data. A new joint action launched in 2023 builds on the work done by the eHealth Network to support the further development of MyHealth@EU and prepare the grounds for the European Electronic Health Records Exchange Format and EHDS implementing acts. Complementary actions will help increase semantic interoperability by promoting the use of common terminologies.

As regards the secondary use of health data, the Commission is financing (since October 2022) a pilot project to develop the HealthData@EU infrastructure and its potential use cases[74]. The Commission is also supporting the establishment of health data access bodies (HDABs) in each Member State. Building on the work of TEHDAS[75] (2021-23), which developed European principles for the secondary use of health data, a new joint action is planned from 2024 to 2026. A coordination and support action under Horizon Europe will start soon, aiming to develop the data quality and utility label planned in the EHDS. A capacity-building initiative for competent authorities on the secondary use of health data will start in 2024.

In addition to this work directly preparing the ground for the EHDS, there are other initiatives on improving data availability for research, innovation and healthcare. The European Federation for Cancer Images (EUCAIM) project is deploying a platform which will facilitate access to cancer images data and related patient data and provide a trusted framework for

[71] COM(2022) 197 final
[72] https://ec.europa.eu/health/funding/eu4health_en
[73] https://ec.europa.eu/health/ehealth/electronic_crossborder_healthservices_en
[74] https://ehds2pilot.eu/
[75] https://tehdas.eu/

researchers, innovators and clinicians to develop and benchmark trustworthy AI tools based on imaging data. The first version of the platform was delivered in September 2023, linking up 36 datasets of images on nine cancer types (breast, colon, lung, prostate, rectum, liver, glioma, neuroblastoma and glioblastoma), amounting to over 200 000 image series concerning around 20 000 individuals.

Finally, the European Genomic Data Infrastructure (GDI) project aims to enable secure cross-border access to genomic and related clinical data in at least 15 countries by the end of 2026. It will create unprecedented opportunities for personalised medicine. The GDI builds on the Beyond 1 Million Genomes project (Horizon 2020), which developed a framework for a federated interoperable network of genomic data.

A major project milestone has already been achieved through the delivery of a GDI Starter Kit in June 2023, which is a common set of software that can be tested on more than 2 500 synthetic genomics and phenotypic data (including cancer, rare diseases and population genomics) across borders.

Milestones – achieved

- ✓ *Proposal on the European Health Data Space (EHDS) (May 2022)*
- ✓ *Establishment of European principles for the secondary use of health data (TEHDAS) (July 2023)*

Milestones – future

- Pilot version of the EHDS infrastructure for secondary use of health data 'HealthData@EU' (EU4Health, 2022-24)
- Expansion of the geographical coverage of MyHealth@EU for primary use of health data (ongoing)
- Preparation of the establishment of Health Data Access Bodies in the Member States (EU4Health, 2024-27)
- Deployment of a European federation for cancer images (DIGITAL, 2023-26)
- Deployment of a European Genomic Data Infrastructure (DIGITAL, 2022-26)

6.7 Common European industrial (manufacturing) data space

The common European industrial (manufacturing) data space will help the European manufacturing industry, characterised by the complexity of its processes and value chains, to get more value out of industrial data, to create more flexible and more resilient supply chains and to further develop data-driven business models that take full advantage of advanced digital innovations.

The initiative will pave the way for secure, fair, sovereign, responsible and cost-effective data sharing in dynamic asset management, predictive maintenance and agile supply chain management in the European manufacturing sector and beyond. The data space will contribute to the achievement of the objectives of the New Industrial Strategy for Europe[76] by creating new business models, allowing the industry to be more productive, providing workers with new skills and supporting the decarbonisation of the EU economy at large.

In 2022, DIGITAL financed a coordination and support action (CSA), Data Space 4.0, to establish a cooperative multi-stakeholder data governance, an inventory of existing data platforms for manufacturing and a blueprint for manufacturing-specific building blocks for a relevant architecture. This will contribute to the long-term convergence of existing and new data-related initiatives in manufacturing. It will also advance and expand the dialogue among stakeholders by involving new participants and by proposing new data-driven business models and incentives schemes for data sharing.

Two proposals to develop data spaces for asset management in manufacturing were selected under DIGITAL in 2023. These data spaces will enable companies in different user roles to gain experience with sharing industrial data and showcase how trustworthy data brokers can operate and develop sustainable operating models. The medium-term goal is to establish a unified European manufacturing data space, with the long-term aim of integrating it with other data spaces supported by the Data Spaces Support Centre.

As the manufacturing sector is diverse and complex, the Commission may fund additional data space initiatives on supply chain management and complement and deepen use-case scenarios for manufacturing industries, by adding links to compliance with norms, including environmental requirements, product passports and tax regimes.

Cooperation with the European Digital Innovation Hubs is encouraged to support a broad uptake by industry, including SMEs. Working with the AI Testing and Experimentation Facility for Manufacturing will be stimulated to define European test and training datasets and to provide support for their establishment. Several Member States have already started initiatives to support the deployment of data spaces for manufacturing.

[76] COM(2020) 102 final

Milestones – achieved

- ✓ *Prepare the ground for deploying a manufacturing data space, e.g. stakeholders network, blueprint, governance model, priority data sets, roadmap (DIGITAL, 2022-23)*

Milestones – future

- Deployment of two operational manufacturing data spaces for asset management (DIGITAL, 2023-26)

6.8 Common European language data space

The implementation of the common European language data space started under the DIGITAL programme in January 2023. The primary objective is to deploy an ecosystem that enables the seamless collection, creation, sharing and re-use of multimodal language data and models across all sectors while navigating the complex terrain of legal regulations. This initiative will empower European industry and citizens with more accurate innovative AI-based language technologies, such as automatic translation, smart assistants or chatbots, by providing the necessary data. Aligned with the European strategy for data, it establishes an infrastructure and marketplace while implementing robust governance frameworks specifically tailored for language data, promoting cross-sector collaborations and enhancing Europe's data economy landscape.

The data space will be deployed in two work strands.

The first will establish an institutional Centre of Excellence for Language Technologies (CELT) to coordinate across Member States the creation and collection of multimodal language data and models. It will develop with the Member States a multi-stakeholder data and services governance scheme. The CELT will also elaborate a blueprint for the language data ecosystem and devise the best business models for all stakeholders. In addition, it will identify the large multimodal language models that Europe needs to develop and deploy, as well as the required datasets and data streams (e.g. public, private, citizen-collected).

The second strand focuses on deploying the infrastructure for multimodal language data and model collection, in cooperation with the planned Language European Digital Infrastructure Consortium (EDIC). Key actions include: (i) establishing robust systems for efficient collection and sharing of diverse language resources, ensuring availability for advanced language technology services; (ii) implementing CELT's framework for data governance, business models and strategies; (iii) promoting adoption of the language data space and its technology services across sectors, engaging with digital platforms and showcasing practical applications through pilot projects; and (iv) facilitating collaboration between Member States and industries to align language datasets and streams with new standards and principles through joint initiatives.

To further promote the ecosystem, the eLangTech services (which includes eTranslation and other language technology services) will support the collection of multilingual and multimodal language data and models, as well as provide access to the latest AI-based language services.

The successful deployment of the data space entails a meticulous integration process with ongoing work across all common European data spaces, including collaboration with the Data Spaces Support Centre, synchronisation with the AI on-demand platform and Testing and Experimentation Facilities, and cooperation with Digital Innovation Hubs fostering their active involvement in language technology advancements.

Milestones – achieved

✓ *Access to language services such as machine translation, automatic speech-to-text transcription and summarisation for European public administrations, SMEs, academia, NGOs (2023)*

Milestones – future

- Deployment of an operational language data space (DIGITAL, 2023-26)
- Make available additional language data and translation models (DIGITAL, Q1 2024)
- Launch of an Alliance for Language Technologies EDIC (ALT-EDIC) (Q1 2024)

6.9 Common European media data space

Grounded in the Media and Audiovisual Action Plan[77], the common European media data space aims to help media organisations thrive on data-driven collaboration and address the digital economy challenges of the digital economy, especially in relation to their competitiveness in a market dominated by online platforms.

The Commission is supporting the creation of this data space through DIGITAL: a 3-year deployment project named TEMS (Trusted European Media data Space) started in October 2023. This aims to create a resilient data-driven media ecosystem, while deploying large-scale cutting-edge services, infrastructures and platforms. It will also help media organisations of all sizes in fighting misinformation and provide better audience analysis. Moreover, the data space will improve data flows in production chains and support the adoption of AI and virtual reality technologies. The media subsectors represented in the project will be audiovisual (TV and films), archives, advertising, publishing, radio and journalism.

As digital transition becomes a sheer necessity for media outlets in Europe, the media data space offers them a much greater scope for growth through trusted data sharing and exchange. For example, independent news creators who do not have their own platforms will gain visibility and increase their business opportunities. For broadcasters producing in 3D environments, the interoperability services integrated in the data space will facilitate the exchange and repurposing of 3D assets or allow for remote joint production at lower costs. The TV channels will be able, for example, to present their production subtitled in multiple languages throughout the EU, as the data space will be equipped with efficient data-sharing protocols.

To complement the efforts related to the media data space, the Commission funded in 2022 and 2023 preparatory work[78] for the setting up of European media platforms. These platforms aim to enable publishers and broadcasters to pool together content and customer data to produce news content and factual programming in multiple languages with a view to increasing their reach and improving citizens' access to trusted information. In addition, under Horizon Europe 2021-22, the Commission financed projects supporting innovation in media, including eXtended Reality (XR) technologies through interdisciplinary cooperation, involving various professional groups[79].

[77] COM(2020) 784 final
[78] https://digital-strategy.ec.europa.eu/en/funding/european-media-platforms-2023
[79] There are four ongoing projects: TransMixR, MAX-R, XReco and EMIL.

Milestones – achieved

✓ *Two pilot projects on the creation of infrastructures for data- and information-sharing platforms for the media ecosystem (2021-22)*

Milestones – future

- Preparatory work to set up European media platforms to improve citizens' access to trusted information (2022-23)
- Explore innovative technologies for media, including extended reality (Horizon Europe, 2022-25)
- Deployment of an operational media data space (DIGITAL, 2023-26)

6.10 Common European mobility data space

The common European mobility data space (EMDS) supports the objectives of the Sustainable and Smart Mobility Strategy[80]. It will facilitate the access, pooling and sharing of data from existing and future transport and mobility data sources and help establish a truly efficient and interconnected multimodal transport system. This will contribute to the creation of a sustainable, smart and inclusive mobility and transport sector that is better adapted to the needs of its users.

The common European mobility data space builds upon and complements existing EU and national legislation and common building blocks related to transport data as well as data-sharing mechanisms proposed in existing passenger and freight transport-related ecosystems and legislation. A Commission Communication of 29 November 2023[81] announced the objectives, supporting measures, milestones and a proposed way forward, based on input from a Call for Evidence (Q4 2022)[82] and stakeholder workshops (Q4 2022 and 2023).

Examples of mobility and transport legislative initiatives that will contribute to the data space are:

- review of the regulatory framework for the European railway Vehicle Register[83] (Q2 2024); the recast of the regulatory framework for interoperable data sharing in rail transport (rail telematics applications)[84] (Q3 2024); and a new Commission Implementing Regulation under Directive (EU) 2016/797 to extend the ERA (EU Agency for Railways) ontology to the overall rail system (2025);
- revision of the ITS Directive, published on 30 November 2023[85];
- revision of the Delegated Regulation (EU) 2017/1926 on multimodal travel information services[86];
- revision of Directive 2005/44/EC on harmonised river information services (RIS)[87] (to be adopted in 2024/2025); and
- establishment of a multimodal transport common data set for regulatory freight transport information, as provided for in Regulation (EU) 2020/1056 on electronic freight transport information[88] (Commission Delegated Regulation to be adopted by Q2 2024).

The Commission supports the data space through various initiatives. A CSA under DIGITAL (PrepDSpace4Mobility, Oct 2022-Sep 2023) mapped mobility data domains and identified building blocks. A DIGITAL deployment action (deployEMDS), launched in November 2023, focuses on traffic and urban mobility data sharing use cases. A 1-year CEF study (kicked-off in January 2024) focuses on the EMDS governance and a layer that will interlink the various domains, followed by a deployment action (planned Q1 2025).

[80] COM(2020) 789 final
[81] COM(2023) 751 final
[82] https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13566-Transport-data-creating-a-common-European-mobility-data-space-communication-_en
[83] European register of rail vehicle (EVR) as referred to in Article 47 of Directive (EU) 2016/797
[84] Action 51 announced in COM(2020) 789 final
[85] Directive (EU) 2023/2661
[86] COM(2020) 789 final
[87] Directive 2005/44/EC
[88] Regulation (EU) 2020/1056

By facilitating the discovery of, access to and sharing of data on infrastructure, capacity availability and real-time traffic from different transport modes, the data space will contribute to more accurate estimated times of arrival and of interchange; this is an enhanced resource and asset management for logistics.

Milestone – achieved

- ✓ *Map existing mobility data ecosystems and provide first recommendations on building blocks for the data space (DIGITAL, 2022-23)*
- ✓ *Adoption of a Communication on the common European mobility data space (29 Nov 2023)*

Milestones – future

- Deployment of an operational mobility data space with focus on traffic and urban mobility data-sharing use cases of nine cities/regions (DIGITAL, 2023-26)
- Study on the data space governance and the interlinking of various domains (CEF, 2024)
- Deployment of the interlinking layer (CEF, planned 2025-28)

6.11 Common European public administrations data spaces

The European data strategy indicated the ambition of the European Commission to support the establishment of, *inter alia*, common European data spaces for public administration, to enable innovative 'gov tech', 'reg tech' and 'legal tech' applications supporting practitioners as well as other services of public interest.

Over the past 2 years, several initiatives have emerged that aim to support secure data sharing in support of European public administrations. These data spaces are different from other data spaces in the sense that they often stem from a public policy or EU legislation with the aim of creating public value for citizens and business. By implementing them from the start based on the principle of interoperability by design and on re-usable, data spaces-based interoperability solutions, interoperability will be enabled between these data spaces, allowing the direct use of datasets across the data spaces for cross-domain applications.

6.11.1 Public administrations: legal data space

The legal data space aims to ensure easily accessible, reusable and interoperable data on legislation and case-law produced by both the EU and its Member States.

The legal data space will support legal practitioners, public administrations and society in general as well as further uphold justice and the rule of law. Building a legal data space requires close cooperation among EU institutions and with Member States.

To make legal interdependencies between EU and national law explicit, the Publications Office contributes to developing interinstitutional standards and raises awareness of the benefits of common standards and interoperable frameworks[89]. Since March 2022, users can search for EU and national judicial decisions on EUR-Lex through a uniform identifier using the same recognisable format for all Member State and EU courts, namely the European case-law identifier (ECLI).

The Commission regularly includes implementation of ECLI among the priorities in subsequent e-Justice Programme calls for proposals. It also maintains the ECLI search engine on the e-Justice Portal. In parallel, work is ongoing on the implementation of a system to make legislation available online in a standardised format, namely the European Legislation Identifier (ELI).

Actions to increase legal data quality and develop the infrastructure and tools

- Extend the ELI standard to cover draft legislation and parliamentary activities (implemented in 2022 by the European Parliament, refinements are ongoing).
- Develop a standard protocol to harvest ELI data, allowing reuse and cross-border findability (completed end 2022).
- Provide data on the Official Journal of the EU in a more granular form, from a gazette-based publication to an act-based one (since October 2023).

[89] e.g. the European Legislation Identifier (ELI) and the European Case Law Identifier (ECLI). See also Council conclusions inviting the introduction of the ELI (2012/C 325/02) and Council conclusions inviting the introduction of the ECLI and a minimum set of uniform metadata for case law (2011/C 127/01).

- Make available as a legal data dump service a complete set of selected EU legal data for download (end 2024).
- Implement ELI identifiers on EUR-Lex for articles of EU legal acts for more precise linking.
- Pilot project to assess the feasibility of providing search of national legislation based on ELI metadata (DIGITAL, ongoing).
- Analyse the feasibility of automatized indexation of legal data via AI (based on SeTA@OP, a tool already implemented and used for non-legal data).
- Extend the coverage and quality of data concerning the EU legislative process, within the Joint Legislative Portal project (first version available in April 2024).

Actions to facilitate the understanding of EU and national law

- Visualisation of the timeline of legal acts (available since mid-2022).
- Roll-out of the 'EU Law in Force' website (July 2022)[90].
- Improved navigation in the summaries of EU Legislation (since 2023).

Milestones – achieved

✓ *Extension of the ELI standard to cover draft legislation and parliamentary activities (2022)*
✓ *More granular EU Official Journal data provision, from gazette-based to act-based publication (October 2023)*
✓ *More precise linking between EU law and national law (2023)*

Milestones – future

- Prototype of a Joint Legislative Portal (2024)
- Legal data dump service (2024)
- Implement ELI identifiers on EUR-Lex for articles of EU legal acts (2024)
- Pilot an ELI-based search engine for national legislation (DIGITAL, 2023-24)

[90] https://op.europa.eu/en/web/eu-law-in-force

6.11.2 Public administrations: public procurement data space

Public procurement data is essential to improve transparency and accountability of public spending, fighting corruption and improving spending quality.

In accordance with the March 2023 Communication[91], the Commission is establishing a public procurement data space (PPDS) covering EU and national datasets[92]. Since 2021, stakeholders[93] have expressed overwhelming support to this initiative.

Currently, data comes foremost from Tenders Electronic Daily (TED), the EU-wide portal for public procurement notices, managed by the EU Publications Office[94]. The PPDS will offer a comprehensive overview of procurement activities within the EU, from the lower-value procurements published only on national portals, to the higher-value ones published EU-wide on TED.

To understand the needs of various user groups (policymakers, public buyers, SMEs, NGOs), various co-creation workshops were organised in 2023.

The PPDS is based on a pilot project, which combines datasets from different Member States and data from TED. The eProcurement ontology forms the foundation for a common understanding of the concepts needed for the linking and reuse of different datasets within the PPDS. The ontology was funded through the ISA^2 programme. The current ontology, published in November 2023, covers the ePO Core, *eNotification, eOrdering, eCatalogue, eFulfilment and eContract* phases of the procurement life cycle. It is intended to cover all phases of procurement.

Through a procurement that started mid-2022, DIGITAL funds several PPDS activities, such as the IT infrastructure, an analytics toolset and the mapping of the EU notices to the eProcurement ontology[95]. The interoperability and interconnection of existing datasets is being increased, facilitating a more comprehensive overview of public procurement in the EU.

An initial version of the PPDS will be available in the first semester of 2024. From end 2023, interested Member States will be supported to connect their national portals to the PPDS. During 2024, the analytics toolset will be enhanced. As of 2025, it is planned to further extend the scope of the data available for analysis within the PPDS[96].

[91] Communication 2023/C 98 I/01
[92] Currently, TED covers procedures above EU procurement thresholds. Member States are investing in open data formats for below EU thresholds.
[93] https://single-market-economy.ec.europa.eu/single-market/public-procurement/digital-procurement/expert-groups_en
[94] https://ted.europa.eu/TED/main/HomePage.do
[95] https://joinup.ec.europa.eu/collection/eprocurement/solution/eprocurement-ontology/about
[96] https://single-market-economy.ec.europa.eu/single-market/public-procurement/digital-procurement/public-procurement-data-space-ppds_en

Milestone – achieved

- ✓ *Publication of eProcurement ontology v4.0.0 (November 2023)*
- ✓ *Connect national procurement portals to the public procurement data space (PPDS) (from end 2023)*

Milestones – future

- Initial version of the PPDS operational (2024)
- Enhance the analytics toolset (2024)
- Map data based on the EU eForms notices[97] to the eProcurement ontology (2023-25) and convert TED data into Linked Open Data (2022-25)
- Extend the scope of the data available for analysis within the PPDS (as of 2025)

[97] Implementing Regulation (EU) 2019/1780

6.11.3 Public administrations: Once Only Technical System (eGovernment)

The Once Only Technical System (OOTS) will enable eGovernment portals to automatically and securely gather evidence (in the form of documents or structured data) required in administrative procedures, directly from administrations in other Member States, upon the explicit request by citizens or businesses but without having to request this evidence from the applicant. The OOTS will form an EU-wide government-to-government data space, which will be seamlessly integrated into the common European data space for public administrations, and link public authorities that act as trusted authentic sources of information (base registries) [98].

The deployment of the OOTS is part of the Single Digital Gateway Regulation (SDG)[99], an ambitious EU eGovernment initiative to digitalise public administration, which is key to enhance the EU's competitiveness and achieve a level-playing field in the single market. Through the 'Your Europe' web portal[100], the SDG Regulation already provides citizens and companies that want to move or do business in another EU country a one-stop shop with:

- reliable and up-to-date information about rules and procedures in the Single Market, at all levels of government;
- direct, centralised and guided access to assistance and problem-solving services;
- feedback tools to report on the quality of services and single market obstacles.

The OOTS will make it much easier for competent authorities to access the authentic sources of all Member States.

Milestone – future

- Establishment of the Once Only Technical System (OOTS), in line with the operational and technical specifications set out in the OOTS Implementing Regulation[101] (2023-26)

[98] The OOTS uses highly reusable building blocks (e.g. eID, eDelivery, eSignature).
[99] Regulation (EU) 2018/1724
[100] https://europa.eu/youreurope/
[101] Implementing Regulation (EU) 2022/1463

6.11.4 Public administrations: security data space for innovation

In 2022-23, the Commission continued to explore the feasibility of creating a security data space for innovation. It aims to improve access by law enforcement authorities to relevant data, allowing them to test, train and validate algorithms with the objective to develop and use Artificial Intelligence (AI) in law enforcement and, in this way, increase the level of security in the EU, while ensuring full compliance with ethical, privacy and security rules on AI – in particular the forthcoming AI Act.

The Commission procured a study[102] which confirms that there is a clear need to facilitate data sharing across law enforcement authorities in Member States. However, it equally states that: (i) law enforcement is not a high priority in national AI strategies, (ii) the uptake of AI-based solutions and data spaces for law enforcement purposes is limited, and (iii) the use of data for innovation in law enforcement is relatively low.

In parallel, a dedicated DIGITAL deployment call for proposals was opened in 2022 to support the development of a security data space for innovation. This EUR 8 million grant with 50% EU funding did not trigger any proposals, even after being re-opened. Despite strong initial interest signaled by Member States for this call, they were, at the time, not in a position to guarantee sufficient engagement from the relevant national authorities and bring the necessary complementary funding.

On 23 March 2023, the Commission organised a workshop[103] where stakeholders agreed that a security data space for innovation is a condition *sine qua non* for seizing the opportunities of AI and improving access to relevant data. With security being a particular and sensitive area with specific constraints, a rulebook was considered necessary describing functional, technical and legal requirements for privacy-preserving and secure data sharing and use.

Following an Internal Security Fund call[104], the selected project *TESSERA: 'Towards data sets for the European Data Space for Innovation'* will initiate as from March 2024 the preparatory work on the creation of high-quality, large-scale and trusted datasets that are based on identified operational use cases. Particular attention will be given to the definition of requirements that allow for the interoperability of heterogeneous datasets, while ensuring privacy preservation and protection of fundamental human rights. The work is part of the ISF Thematic Facility that focuses on data standardisation and anonymisation as well as on the production of training datasets to test digital tools for law enforcement agencies at national level. This aligns with the policy objective to increase the use of Union security information exchange tools, systems and databases.

[102] Launched in January 2022 and finalised in June 2023. Final report to be published.
[103] https://home-affairs.ec.europa.eu/whats-new/events/ceris-workshop-artificial-intelligence-security-purposes-maximising-benefits-and-reducing-risks-2023-03-23_en
[104] ISF-2021-TF1-AG-DATA

On 16 May 2023, the Council's Standing Committee on Operational Cooperation on Internal Security (COSI) held a meeting which focused on the creation by Europol of a sandbox allowing Member States to develop, train and validate AI and machine-learning models. The Commission supports such a sandbox, provided it complies with existing EU law, including Union data protection law.

Milestone – achieved

✓ Study on data sharing across law enforcement authorities in Member States (June 2023)

Milestones – future

- Preparatory work to create high-quality, large-scale and trusted datasets, based on identified operational use-cases (ISF, 20243-26)
- Development of Europol's sandbox that will provide important insights for the future steps (planned 2024)

6.12 Common European research and innovation data space – EOSC

There has been a lot of progress on the Research and Innovation data space – EOSC (European Open Science Cloud[105]) since the publication of the first SWD. The EOSC is recognised by the Council of the European Union among the 20 actions of the policy agenda 2022-24 of the European Research Area (ERA) with the specific objective to deepen open science practices in Europe[106]. The Commission, Member States and the European research community have met regularly to steer its implementation along these main lines:

- Objective 1: Deploy the EOSC core services and expand the EOSC federation of existing research data infrastructures in Europe;
- Objective 2: Deploy Open Science policies and mainstream Open Science best practices across the European research community;
- Objective 3: Establish a monitoring mechanism to collect data and benchmark investments, policies, digital research outputs, open science skills and infrastructure capacities related to EOSC.

In pursuit of Objective 1, the EOSC federation's core components have been prototyped in an operational environment, alongside the EOSC Portal Catalogue and Marketplace services[107]. In 2022, the Commission initiated a public tender for procuring managed services of a fully operational EOSC infrastructure node, referred to as the EOSC EU Node. Additionally, EOSC thematic use cases have gained rapid adoption, including:

(1) The European COVID-19 Data Platform[108] facilitating data sharing and analysis to promote research on the virus. It has since 2020 been deployed as a successful EOSC use case. Its approach to open data and FAIR data management also contributes to the development of the health data space.

(2) The Blue Cloud Initiative[109] is developed as a FAIR ecosystem for marine research, benefitting from EOSC funding and policies, and using EOSC as a multiplier to reach secondary users. It directly supports the green deal data space and the Horizon Europe mission 'Restore our Oceans and Waters'.

Concerning Objective 2, many Member States have adopted strategies to promote open science and FAIR data practices, with action plans for national platforms and data services to link research infrastructures with EOSC. Multiple European and national EOSC Tripartite events have facilitated collaboration between the relevant parties to advance EOSC implementation.

For Objective 3, an EU-funded EOSC Observatory[110] and its dashboard, launched in November 2022, monitor Member States' EOSC readiness and contributions to the data space. This

105 A complete list of relevant documents on the European Open Science Cloud is available in the EOSC webpage.

106 https://commission.europa.eu/system/files/2021-11/ec_rtd_era-policy-agenda-2021.pdf

107 https://eosc-portal.eu

108 https://www.covid19dataportal.org/the-european-covid-19-data-platform

109 https://blue-cloud.org/blue-cloud-2026

110 https://eoscobservatory.eosc-portal.eu/home

common framework[111] tracks progress and impact and is jointly developed by the Commission and Member States[112].

EOSC operations will serve EU researchers by 2025. From 2024 to 2026, the EOSC federation will grow as a distributed 'system of systems', bridging multiple EU research infrastructures. The medium-term plan is to expand EOSC beyond research communities, connecting with the public and private sectors (as from 2024). Discussions on the post-2027 operation, governance, evolution and sustainability of the EOSC Federation have begun under EOSC tripartite governance.

Milestones – achieved

- ✓ *EOSC Core components; portal catalogue and marketplace prototyped in an operational environment (2022)*
- ✓ *Procurement for Managed Services for the EOSC Platform, i.e. EOSC EU Node (2023)*

Milestones – future

- Outreach of EOSC beyond the research communities (as from 2024)
- Creation and expansion of the EOSC Federation (Horizon Europe, 2024-26)
- Continued support from the Commission and members of the EOSC association to the implementation of the EOSC Strategic Research and Innovation Agenda (2021-27)

[111] https://doi.org/10.5281/zenodo.7410762
[112] https://doi.org/10.2777/382490

6.13 Common European skills data space

The common European skills data space will offer a secure, trusted and human-centric infrastructure for the sharing, access and reuse of skills and education data for various purposes, such as development of innovative applications and solutions, modernisation of the learning offer, research and analysis of labour market trends.

It will leverage on existing European, national and private solutions to match learners and jobseekers with suitable job and learning opportunities and tailor these services to the user needs. It will also offer an ecosystem for innovation and sharing of best practices, supporting the cooperation in the design and development of digital solutions by public employment services. It will counter the current fragmentation of skills and education data, bringing together initiatives that often operate in silos, thus avoiding duplication and allowing the scaling up of results.

Data from various sources will feed into the data space, promoting synergies and scalability of several Commission initiatives (such as reference frameworks for qualifications[113], digital skills and competence[114], the European skills classification (ESCO)[115], the European Learning Model, Europass[116,117], EURES[118]). These initiatives increase the transparency of information on people's skills and employers' needs, qualifications and learning opportunities, and they deliver on the 2020 European Skills Agenda[119].

Thanks to the European Digital Credentials for Learning[120] (EDC), individuals can easily share their learning achievements in a secure digital environment, when applying for a job or for further education and training. It also helps employers as well as education and training providers to quickly confirm if someone's digital certificates are genuine. Since its official launch, many Member States have already implemented the EDC in their digital ecosystem.

The EDC uses the European Learning Model[121] as data format. This data model aims to establish a single semantic vocabulary for learning in Europe. The data model is used at European level to exchange information on qualifications, learning opportunities and accreditation from national sources. The information can be displayed in Europass.

Other relevant initiatives include the Council Recommendations on individual learning accounts and on the European approach to micro-credentials[122], which will lead to more national data on learning being shared at European level, and the European Cybersecurity Skills Academy[123].

[113] Council Recommendation 2017/C 189/03
[114] https://publications.jrc.ec.europa.eu/repository/handle/JRC128415
[115] https://esco.ec.europa.eu/en
[116] https://europa.eu/europass/en
[117] Decision (EU) 2018/646
[118] COM(2020) 274 final
[119] https://ec.europa.eu/social/main.jsp?catId=1223&langId=en
[120] https://europa.eu/europass/en/europass-alati/european-digital-credentials
[121] https://europa.eu/europass/en/news/launch-european-learning-model
[122] Council Recommendation 2022/C 243/02
[123] COM(2023) 207

The DS4Skills DIGITAL CSA[124] (October 2022 - October 2023) prepared the development of an open and trusted common data space that supports sharing and accessing data on skills. The project has identified data sources through an online inventory. Existing initiatives in the inventory have been categorised and assessed; new projects are recruited and assessed constantly with an online submission form.

Under DIGITAL, a deployment action of the skills data space will start in January 2024 with the three following main objectives:

1. develop and deploy high-value education and skills data ecosystems;
2. develop and deploy innovative cloud to edge services for the data space;
3. make the data space accessible to all.

As a concrete example for the skills data space, interoperability with relevant European initiatives in the field of labour mobility such as EURES and EUROPASS will allow citizens to benefit from a wide range of tools providing matching and guidance services to improve employment prospects. Further linking with education and training opportunities and qualifications will help individuals identify relevant learning offers and could support policymakers and education and training providers in adapting the education and training offer to current labour market needs.

Milestone – achieved

✓ *Prepare the ground for deploying the skills data space (DIGITAL, 2022-23)*

Milestones – future

- Deployment of an operational skills data space (DIGITAL, 2024-26)

[124] https://www.skillsdataspace.eu/

6.14 Common European tourism data space

Tourism is an important part of the European economy. It employs or serves a significant proportion of the population. It is also directly and closely linked to many other sectors, such as mobility, culture, health, media and agriculture.

The common European tourism data space will serve the data needs of the public and private sector in a secure, transparent way. It will facilitate the sharing, processing and analysis of data within the sector. The data space will provide easy, cross-border access to key datasets, deploying trust mechanisms (security and privacy by design). The data space, connected to other sectoral data spaces (e.g. health, cultural heritage, media, mobility, smart communities), will provide access to varied and high-quality information to all relevant stakeholders across the EU. Enhanced data sharing within the data space will benefit a wide range of stakeholders. For consumers, this means a better offer to choose from and make more informed decisions. For decision makers, a means to predict tourist movements and adjust public services accordingly. For businesses, a possibility for better planning and better target their services. Data can help improve the impact of tourism on sustainability. For example, data on hotels' energy consumption, renewable energy certificates. Or, agro-food traceability tools can support local supply chains, thereby lowering the environmental impact of the restoration sector while supporting rural tourism.

The Transition pathway for tourism[125] points out that digitalisation and the increased scope for data generation, collection and services will provide opportunities for more sustainable and innovative services in the tourism ecosystem.

As a first step, an EU Code of Conduct for data sharing in tourism (February 2023)[126] is a non-binding document aimed at supporting trust between stakeholders – mostly SMEs – wishing to draw contractual agreements to share information. It also provides general guidance for stakeholders interested in sharing data.

Since November 2022, two CSAs have been funded by the Commission (DIGITAL) to prepare the deployment of the data space. These projects started to map the European tourism landscape to develop a sustainable tourism data space in a collaborative manner. In the month of October 2023, the two actions finalised the blueprint of the data space for deployment, which will serve as the basis for future policy and technical work.

A recent Communication[127] presents the key enablers of the data space and highlights that all requirements of the interested parties are considered and that the process is aligned with the creation of other sectoral data spaces, to ensure interoperability among sectoral data[128].

[125] https://op.europa.eu/en/publication-detail/-/publication/404a8144-8892-11ec-8c40-01aa75ed71a1
[126] https://etc-corporate.org/news/key-european-tourism-stakeholders-co-sign-a-code-of-conduct-on-data-sharing-in-tourism/
[127] Communication 2023/C 263/01
[128] Statistical bodies play a pivotal role as natural partners to data spaces, integrating data, supporting interoperability and enabling the reuse of existing data for enhancing and innovating official statistics.

Milestones – achieved

- ✓ *Communication 'Towards a Common European Tourism Data Space: boosting data sharing and innovation across the tourism ecosystem' (July 2023)*
- ✓ *Prepare the ground for deploying the tourism data space (DIGITAL, 2022-23)*

Milestones – future

- Set up a test action including public and private stakeholders on a voluntary basis to prepare the tourism data space (2024)
- Deployment of an operational tourism data space (DIGITAL, 2024-27)

7 Conclusions

Following the first SWD of February 2022[129], this second SWD provides an update on the common European data spaces that are being developed in various strategic sectors and domains of public interest in response to the European strategy for data. The current state of play of relevant horizontal aspects, such as horizontal legislative measures and concrete EU-funded actions that support the creation of the data spaces, are also presented.

Common European data spaces bring together relevant data infrastructures and governance frameworks to facilitate data pooling and sharing in specific sectors or domains. They will all be interlinked and will, in this way, gradually form a pillar of the single market for data that allows data from across the EU to be made available and shared in a trustworthy and secure manner. This will be a key driver of innovation, in particular in artificial intelligence.

Common European data spaces, through their governance models and deployment initiatives, will provide fair access to data for participants of all sizes. Special attention needs to be given to ensure accessibility by start-ups and SMEs that wish to share or use data. In line with the overall structure of the EU economy, SMEs represent a very high proportion of the overall data users' and data suppliers' population in the EU[130], so their active participation in this domain is of crucial importance to establish a genuine single market for data.

In 2024, the Commission will focus on implementing the enabling legislative instruments. Furthermore, the European Data Innovation Board (EDIB) that has been set up under the Data Governance Act will work on guidelines. In addition, the establishment of recognised data altruism organisations[131] and data intermediaries[132] as well as the European Register for Protected Data held by the Public Sector[133] will facilitate the safe and secure sharing of large volumes of data.

In 2024, stakeholders of the common European data spaces will continue to work towards implementing their key actions. The Data Spaces Support Centre will support the EDIB on its work and continue to deliver on important assets, in particular a new version of the blueprint every six months (V1.0 scheduled for March 2024), allowing to quickly respond to new developments.

Through its funding programmes, the Commission will continue in 2024-25 to support the development and roll-out of common European data spaces. In addition, it is expected that a proof of concept of the Simpl smart open-source middleware should become available in the course of 2024.

[129] SWD(2022) 45 final
[130] Some 98% of data supplier and data users companies in the EU are SMEs (European data market study).
[131] https://digital-strategy.ec.europa.eu/en/policies/data-altruism-organisations
[132] https://digital-strategy.ec.europa.eu/en/policies/data-intermediary-services
[133] https://data.europa.eu/data/datasets?superCatalogue=erpd&locale=en

In summary, substantial progress has been made since February 2022. However, it is evident that the pace of development varies significantly among data spaces, leaving a considerable amount of work yet to be completed. The primary challenges to transform the common European data spaces into tangible and valuable assets at this stage are to: (i) prioritise the deployment of and interconnection between data spaces, (ii) ensure the engagement of their participants, and (iii) promote the use of data spaces. Stakeholders, in particular SMEs as key actors in the data economy, are strongly encouraged to ensure their active involvement in this endeavour. This is pivotal for realising our vision of establishing a genuine single market for data.

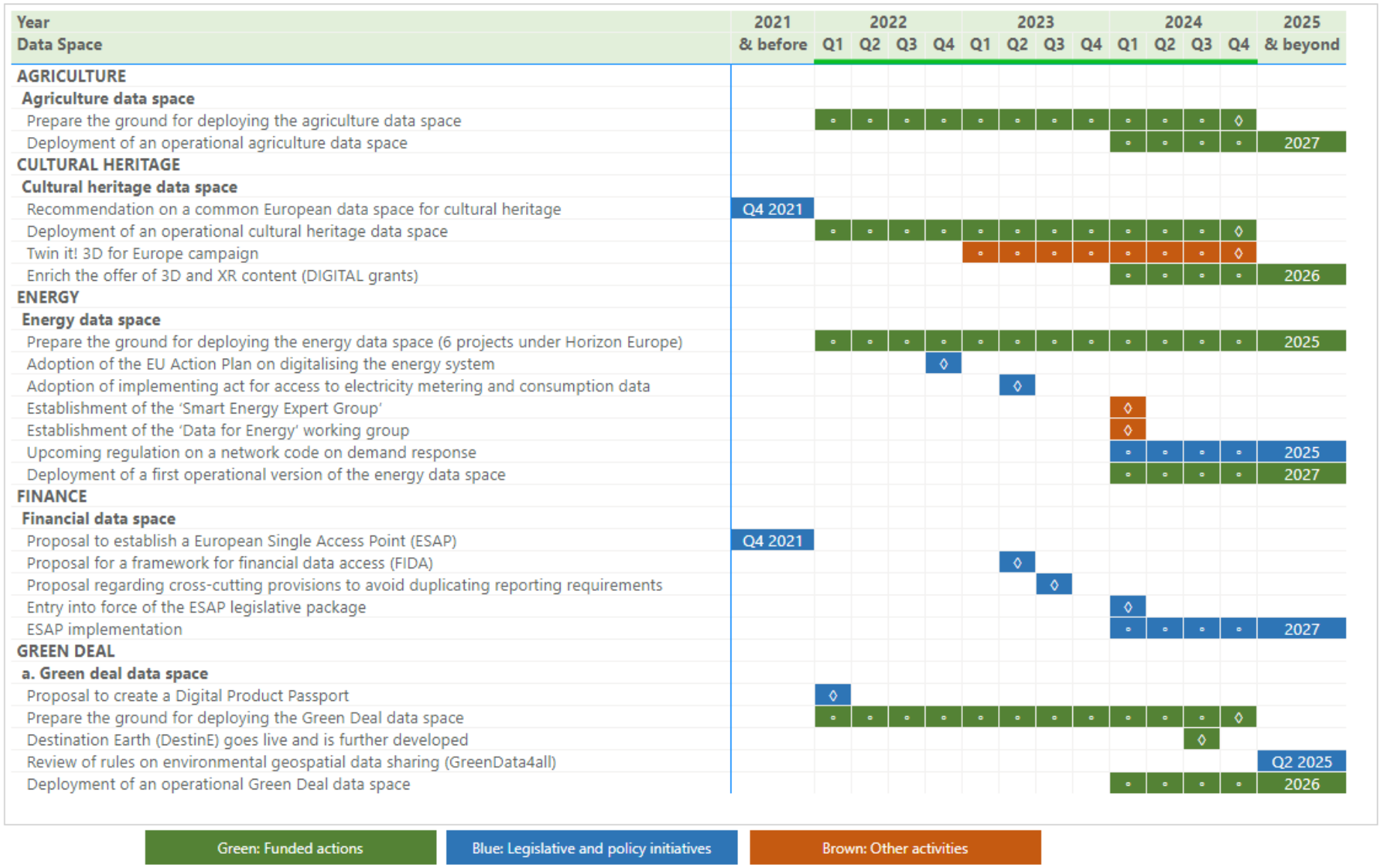
Annex I: List of EU-funded common European data space initiatives

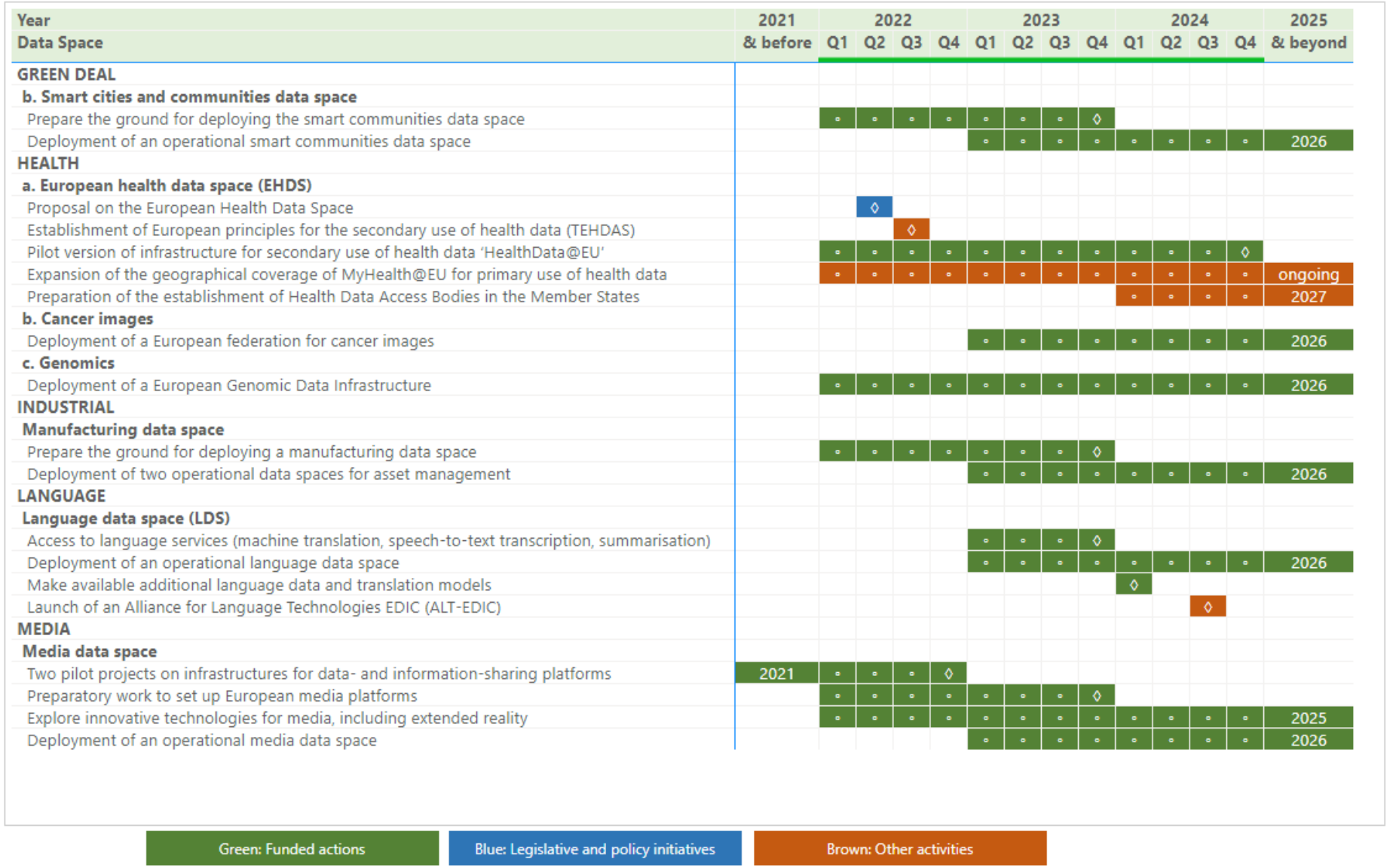
Common European Data Space	Related EU-funding 2022/2023
(1) Agriculture	AgriDataSpace (Digital Europe, Coordination and Support Action) Divine (Horizon Europe, Research and Innovation Action) CrackSense (Horizon Europe, Research and Innovation Action) ScaleAgData (Horizon Europe, Research and Innovation Action) AgDataValue (Horizon Europe, Research and Innovation Action) 4Growth* (Horizon Europe, Research and Innovation Action) Dig4Live* (Horizon Europe, Coordination and Support Action)
(2) Cultural heritage	Deployment of a common European data space for cultural heritage (Digital Europe, Procurement) Supporting projects : Eureka3D (Digital Europe, SME support grant) 5Dculture (Digital Europe, SME support grant) DE-BIAS (Digital Europe, SME support grant) AI4Europeana (Digital Europe, SME support grant)
(3) Energy	IntNET (Horizon Europe, Coordination and Support Action) Supporting projects: OMEGA-X (Horizon Europe, Innovation Action) EDDIE (Horizon Europe, Innovation Action) Enershare (Horizon Europe, Innovation Action) Synergies (Horizon Europe, Innovation Action) Data cellar (Horizon Europe, Innovation Action)
(4) Research and Innovation – EOSC	Skills4EOSC (Horizon Europe, Coordination and Support Action) EOSC Focus (Horizon Europe, Coordination and Support Action) FAIR-IMPACT (Horizon Europe, Coordination and Support Action) RDA TIGER (Horizon Europe, Coordination and Support Action) FAIRCORE4EOSC (Horizon Europe, Research and Innovation Action) AI4EOSC (Horizon Europe, Research and Innovation Action) EuroScienceGateway (Horizon Europe, Research and Innov. Action) FAIR-EASE (Horizon Europe, Research and Innovation Action) RAISE (Horizon Europe, Research and Innovation Action) SciLake (Horizon Europe, Research and Innovation Action) EOSC4Cancer (Horizon Europe, Research and Innovation Action) GraspOS (Horizon Europe, Research and Innovation Action) CRAFT-OA (Horizon Europe, Research and Innovation Action) AquaINFRA (Horizon Europe, Research and Innovation Action) Blue-Cloud 2026 (Horizon Europe, Research and Innovation Action) OSCARS (Horizon Europe, Research and Innovation Action) EVERSE (Horizon Europe, Research and Innovation Action) OSTrails* (Horizon Europe, Research and Innovation Action) EOSC Beyond (Horizon Europe, Research and Innovation Action)

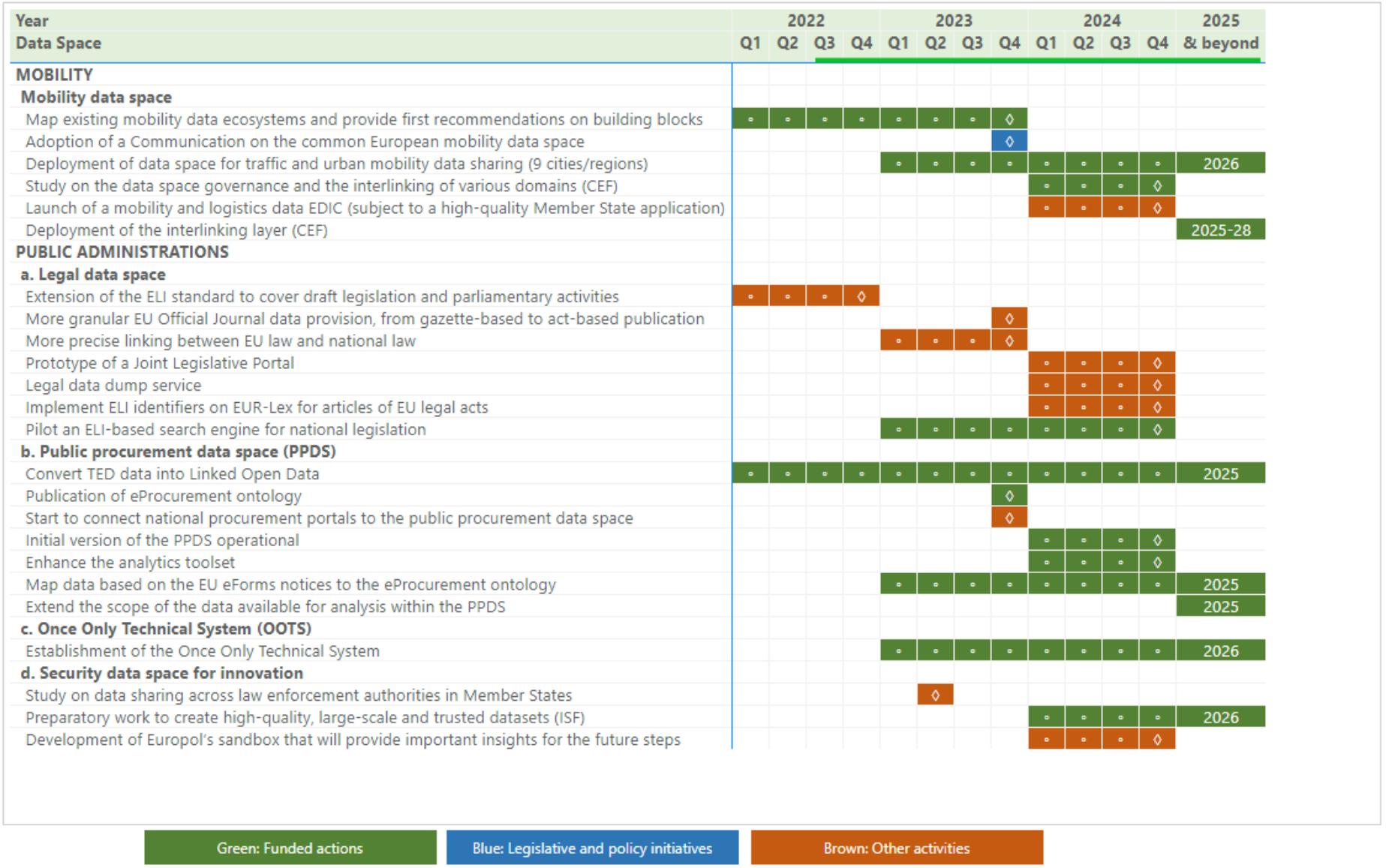
Common European Data Space	Related EU-funding 2022/2023
	EOSC-ENTRUST (Horizon Europe, Research and Innovation Action) SIESTA* (Horizon Europe, Research and Innovation Action) TITAN* (Horizon Europe, Research and Innovation Action)
(5) Finance	Digital Europe, procurement
(6) Green deal	GREAT (Digital Europe, Coordination and Support Action) AD4GD (Horizon Europe, Innovation Action) B-Cubed (Horizon Europe, Innovation Action) FAIRiCUBE (Horizon Europe, Innovation Action) USAGE (Horizon Europe, Innovation Action)
(a) Smart cities and communities	DS4SSCC (Digital Europe, Coordination and Support Action) DS4SSCC-DEP* (Digital Europe, deployment – Grant for Financial Support) Digital Europe, procurement
(7) Health	
(a) European Health Data Space	MyHealth@EU (EU4Health, direct grants to Member States and procurements) Support for health data access bodies (EU4Health, direct grants to Member States) Healthdata@EU pilot (EU4Health, action grant) Central services for HealthData@EU (EU4Health, procurements) Pilot project PaTHED on supporting patients' access to health data (EU4Health, direct grants to Member States) Support for SNOMED CT (EU4Health, direct grants to Member States) Capacity building for primary and secondary uses of health data (EU4Health, procurements) Joint action for primary uses of health data (EU4Health, direct grants to Member State authorities) Joint action for secondary uses of health data (EU4Health, direct grants to Member State authorities) Developing a Data Quality and Utility Label for the European Health Data Space (Horizon Europe, Coordination and Support Action)
(b) Cancer images	EUCAIM (Digital Europe, deployment)
(c) Genomics	GDI (Digital Europe, deployment)
(8) Language	Digital Europe, Procurement
(9) Manufacturing	Data Space 4.0 (Digital Europe, Coordination and Support Action) SM4RTENANCE (Digital Europe, deployment, SME Support Action) UNDERPIN* (Digital Europe, deployment – SME Support Action)
(10) Media	TEMS (Digital Europe, deployment - SME Support Action)
(11) Mobility	PrepDSpace4Mobility (Digital Europe, Coordination and Support Action) DeployEMDS* (Digital Europe, deployment - Simple Grant)
(12) Public Administrations	

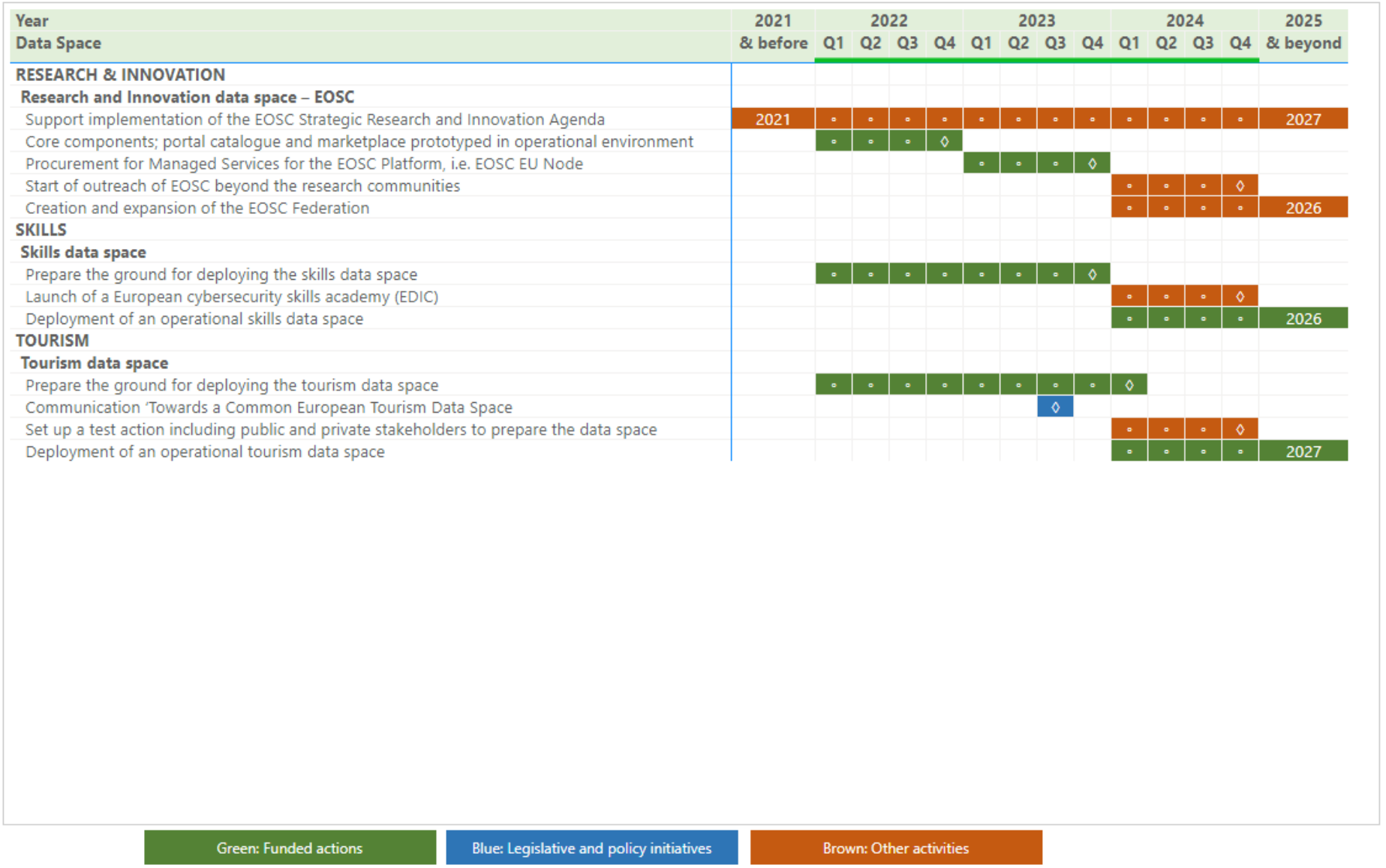
Common European Data Space	Related EU-funding 2022/2023
(a) Legal	Digital Europe, pilot
(b) Public procurement	Digital Europe, procurement
(c) OOTS	Digital Europe, procurement
(13) Skills	DS4Skills (Digital Europe, Coordination and Support Action) EDGE-Skills* (Digital Europe, Large-scale pilots for cloud-to-edge based service solutions, Simple Grant)
(14) Tourism	DATES (Digital Europe, Coordination and Support Action) DFST (Digital Europe, Coordination and Support Action)
* = *Projects recently started or to start shortly*	

Annex II: Timeline for common European data spaces (2022-24)




Year
Data Space
2021 & before
2022 Q1 Q2 Q3 Q4
2023 Q1 Q2 Q3 Q4
2024 Q1 Q2 Q3 Q4
2025 & beyond
GREEN DEAL
b. Smart cities and communities data space
Prepare the ground for deploying the smart communities data space
Deployment of an operational smart communities data space
2026
HEALTH
a. European health data space (EHDS)
Proposal on the European Health Data Space
Establishment of European principles for the secondary use of health data (TEHDAS)
Pilot version of infrastructure for secondary use of health data 'HealthData@EU'
Expansion of the geographical coverage of MyHealth@EU for primary use of health data
ongoing
Preparation of the establishment of Health Data Access Bodies in the Member States
2027
b. Cancer images
Deployment of a European federation for cancer images
2026
c. Genomics
Deployment of a European Genomic Data Infrastructure
2026
INDUSTRIAL
Manufacturing data space
Prepare the ground for deploying a manufacturing data space
Deployment of two operational data spaces for asset management
2026
LANGUAGE
Language data space (LDS)
Access to language services (machine translation, speech-to-text transcription, summarisation)
Deployment of an operational language data space
2026
Make available additional language data and translation models
Launch of an Alliance for Language Technologies EDIC (ALT-EDIC)
MEDIA
Media data space
Two pilot projects on infrastructures for data- and information-sharing platforms
2021
Preparatory work to set up European media platforms
Explore innovative technologies for media, including extended reality
2025
Deployment of an operational media data space
2026
Green: Funded actions
Blue: Legislative and policy initiatives
Brown: Other activities


Year
Data Space
2022
2023
2024
2025
Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 & beyond
MOBILITY
Mobility data space
Map existing mobility data ecosystems and provide first recommendations on building blocks
Adoption of a Communication on the common European mobility data space
Deployment of data space for traffic and urban mobility data sharing (9 cities/regions)
2026
Study on the data space governance and the interlinking of various domains (CEF)
Launch of a mobility and logistics data EDIC (subject to a high-quality Member State application)
Deployment of the interlinking layer (CEF)
2025-28
PUBLIC ADMINISTRATIONS
a. Legal data space
Extension of the ELI standard to cover draft legislation and parliamentary activities
More granular EU Official Journal data provision, from gazette-based to act-based publication
More precise linking between EU law and national law
Prototype of a Joint Legislative Portal
Legal data dump service
Implement ELI identifiers on EUR-Lex for articles of EU legal acts
Pilot an ELI-based search engine for national legislation
b. Public procurement data space (PPDS)
Convert TED data into Linked Open Data
2025
Publication of eProcurement ontology
Start to connect national procurement portals to the public procurement data space
Initial version of the PPDS operational
Enhance the analytics toolset
Map data based on the EU eForms notices to the eProcurement ontology
2025
Extend the scope of the data available for analysis within the PPDS
2025
c. Once Only Technical System (OOTS)
Establishment of the Once Only Technical System
2026
d. Security data space for innovation
Study on data sharing across law enforcement authorities in Member States
Preparatory work to create high-quality, large-scale and trusted datasets (ISF)
2026
Development of Europol's sandbox that will provide important insights for the future steps
Green: Funded actions
Blue: Legislative and policy initiatives
Brown: Other activities


Year
Data Space
2021 & before
2022 Q1 Q2 Q3 Q4
2023 Q1 Q2 Q3 Q4
2024 Q1 Q2 Q3 Q4
2025 & beyond
RESEARCH & INNOVATION
Research and Innovation data space – EOSC
Support implementation of the EOSC Strategic Research and Innovation Agenda
2021
2027
Core components; portal catalogue and marketplace prototyped in operational environment
Procurement for Managed Services for the EOSC Platform, i.e. EOSC EU Node
Start of outreach of EOSC beyond the research communities
Creation and expansion of the EOSC Federation
2026
SKILLS
Skills data space
Prepare the ground for deploying the skills data space
Launch of a European cybersecurity skills academy (EDIC)
Deployment of an operational skills data space
2026
TOURISM
Tourism data space
Prepare the ground for deploying the tourism data space
Communication 'Towards a Common European Tourism Data Space
Set up a test action including public and private stakeholders to prepare the data space
Deployment of an operational tourism data space
2027
Green: Funded actions
Blue: Legislative and policy initiatives
Brown: Other activities