



Brussels, 23.2.2022
SWD(2022) 45 final

COMMISSION STAFF WORKING DOCUMENT

on Common European Data Spaces

1. Introduction¹

The European strategy for data of 19 February 2020² announced that in order to speed up the development of the European economy and to harness the value of data for the benefit of the European society the Commission will invest in common European data spaces in strategic economic sectors and domains of public interest. The strategy indicated that it would initially support ten data spaces, however, additional data spaces could follow in order to ultimately create a European data space – a genuine single market for data.

In its conclusions of 25 March 2021³, the European Council recognised *‘the need to accelerate the creation of common data spaces, including ensuring the access to and interoperability of data’*, and invited the Commission to *‘present the progress made and the remaining measures necessary to establish the sectoral data spaces announced in the European strategy for data of February 2020.’*

This document aims to provide an overview of the common European data spaces that are being developed in various sectors or domains in response to the European strategy for data. First, it presents relevant horizontal aspects, ranging from the concept of common European data spaces (Section 2), through data governance aspects and legislative measures (Section 3), to necessary data IT infrastructures, including EU support programmes for funding in this field (Section 4). Second, it describes the current state of play of the ten sectoral common European data spaces that were announced in the European strategy for data as well as of a common European data space in the media sector – announced in December 2020⁴, and for cultural heritage – announced in November 2021⁵ (Section 6), while recognising that in other sectors, such as tourism and construction, important work for the development of a common European data space is also ongoing (Section 5).

Data has an ever-growing impact on how we produce, consume and live our lives. The list of economic and social benefits of common European data spaces is long and ranges from more conscious energy consumption, to smart mobility, precision agriculture and better healthcare.

The COVID-19 pandemic has highlighted the critical role of data, digital technologies and infrastructures in our lives and demonstrated how our societies and economies can further benefit from digital solutions. In this particular context, a well-functioning common European data space for health, which has been marked as one of the priority initiatives by the European Council, will make a crucial difference in tackling potential health pandemics in the future.

On 9 March 2021, the Commission presented its vision with a set of measures leading to Europe’s digital transformation by 2030 in the Communication ‘2030 Digital compass: the European way for the digital decade’⁶. The development of common European data spaces in

¹ The views expressed in this Staff Working Document represent only those of Commission services, not of the European Commission.

² COM(2020) 66 final.

³ Statement of the Members of the European Council, 25 March 2021.

⁴ COM/2020/784 final.

⁵ C(2021) 7953 final.

⁶ COM(2021) 118 final.

strategic sectors and domains will constitute an important contribution to accelerating digital transformation in these fields and realising the digital decade objectives.

It is clear that data and its socio-economic potential enhanced by the creation of common European data spaces have an essential role to play both in Europe’s digital transformation and economic recovery plans. As envisioned in the European strategy for data, the different data spaces will be interconnected so that they progressively lead to a genuine European space in which data is broadly shared and used, while fully respecting the rights of individual persons and businesses over data. This will allow the full benefits of data to be reaped for the European economy, society and research.

2. Common European data spaces – concept

In the vision set out by the European strategy for data, the creation of EU-wide common, interoperable data spaces in strategic sectors aims at overcoming legal and technical barriers to data sharing by combining the necessary tools and infrastructures and addressing issues of trust by way of common rules⁷. A common European data space brings together relevant data infrastructures and governance frameworks in order to facilitate data pooling and sharing.

According to the European strategy for data, the data spaces will include:

- (i) the deployment of data sharing tools and services for the pooling, processing and sharing of data by an open number of organisations, as well as the federation of energy-efficient and trustworthy cloud capacities and related services;
- (ii) data governance structures, compatible with relevant EU legislation, which determine, in a transparent and fair way, the rights of access to and processing of the data;
- (iii) improving the availability, quality and interoperability of data – both in domain-specific settings and across sectors.

Apart from data sharing obligations set out in Union or Member States legislation, in the common European data spaces data will be made available on a voluntary basis and can be reused against compensation, including remuneration, or for free, depending on the data holder’s decision.

<p><i>Key features of a common European data space</i></p> <ul style="list-style-type: none">• <i>A secure and privacy-preserving infrastructure to pool, access, share, process and use data.</i>• <i>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.</i>• <i>European rules and values, in particular personal data protection, consumer protection legislation and competition law, are fully respected.</i>
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⁷ COM(2020) 66 final.

- *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*⁸.
- *Data that is made available can be reused against compensation, including remuneration, or for free.*
- *Participation of an open number of organisations/ individuals.*

There are different reasons why a data holder may want to share data⁹. Stakeholders indicate that data sharing helps to boost efficiency across supply chains and to support faster and more innovative product development¹⁰. Incentives for companies to share data include increased access to data of other contributors in exchange for giving access to the data they hold, analytical results derived from the shared data, the availability of services such as predictive maintenance services, and reduced time and costs of product marketing.

Common European data spaces should be guided by the following design principles:

- **Data control:** driven by sector-specific needs, common European data spaces could promote the development of tools to pool, access, use and share all types of data favouring the development of common open standards and findable, accessible, interoperable and reusable (FAIR) principles. In line with the applicable legislation, data holders could use these tools to ease the uploading of data into data spaces, to give or revoke their authorization to data and to change access rights and specify new conditions of how their data can be accessed and reused over time.
- **Governance:** put in place an appropriate governance structure to ensure fair, transparent, proportionate and non-discriminatory access to, sharing and use of data. That structure should comply with existing provisions of horizontal (e.g. General Data Protection Regulation, Free Flow of Non-Personal Data Regulation¹¹, ePrivacy Directive¹², Platform to Business Regulation¹³) and sectoral EU data-related legislation (e.g. type approval legislation¹⁴, Payment Services Directive 2¹⁵, Electricity Regulation¹⁶, Intelligent Transport Systems Directive (2010/40/EU)¹⁷).
- **Respect of EU rules and values:** data spaces will comply with the applicable EU legal frameworks on personal data protection¹⁸ and security, fundamental rights, environmental protection, competition law, and other rules relevant for the provision

⁸ In the proposal for a European Data Governance, a *data holder* is defined as “a legal person or data subject who, in accordance with applicable Union or national law, has the right to grant access to or to share certain personal or non-personal data under its control” (COM(2020) 767 final).

⁹ Micheli M., Ponti M., Craglia M. & Berti Suman A. (2020). Emerging models of data governance in the age of datafication. *Big Data & Society*, 7(2).

¹⁰ McCauley D. (2020). *The global AI agenda*, MIT Technology Review Insights.

¹¹ OJ L 303, 28.11.2018, p. 59–68.

¹² OJ L 201, 31.7.2002, p. 37–47.

¹³ PE/56/2019/REV/1.

¹⁴ OJ L 151, 14.6.2018, p. 1–218; OJ L 60, 2.3.2013, p. 1–51.

¹⁵ OJ L 337, 23.12.2015, p. 35–127.

¹⁶ OJ L 158, 14.6.2019, p. 54–124.

¹⁷ OJ L 207, 06.08.2010, p. 1-13.

¹⁸ OJ L 119, 4.5.2016, p. 1–88.

of data services in the EU, such as international trade commitments under the World Trade Organization's General Agreement on Trade in Services and other trade agreements. In addition, adequate technical, legal and organisational measures will be put in place to prevent unauthorised access to personal and non-personal data.

- **Technical data infrastructure:** participants in common European data spaces will be encouraged to use the common technical infrastructure and building blocks which will allow the data spaces to be built in an efficient and coordinated manner. The common technical infrastructure will have to take due account of the existing and emerging sectoral frameworks, and integrate the cybersecurity-by-design principle and respect the data protection by design and by default obligations enshrined in the General Data Protection Regulation (GDPR)¹⁹.
- **Interconnection and interoperability:** to avoid fragmentation, high integration costs and the creation of silos, the common European data spaces could develop on international standards, INSPIRE (for spatial data) and FAIR principles to favour interoperability, exploitation of data on EU computing infrastructures (e.g. cloud and HPC) and be interconnected and progressively made interoperable to lead to a genuine European data space, as envisioned in the European strategy for data.
- **Openness:** participation in common European data spaces is open to all actors (organisations/ individuals) that respect EU rules and values and comply with the rules defined in the scope of each EU data space. Openness would also serve to allow competition between different product and service providers requiring data sharing thereby avoiding any potential competition lock-in due to manufacturers' specific protocols.

Additionally, data collected in the various data spaces, when made available to the public, should be presented in accessible formats to persons with disabilities on equal basis with other citizens.

The above-mentioned features of the common European data spaces will allow data from across the EU - from the public sector, businesses and individuals as well as research institutions and other types of organisations (e.g. non-profit organisations) - to be made available and exchanged in a trustworthy and secure manner. Businesses and individuals in Europe will be in control of the data they generate²⁰ while knowing that they can trust the way in which it is used to boost innovation. This will enhance the development of new data-driven products and services in the EU and thereby create the core tissue of an interconnected and competitive European data economy.

The creation of common European data spaces is a pioneering venture. The multitude of sectors and domains involved, each of them with their own characteristics and specific data (e.g. personal health data, industrial manufacturing data) including appropriate reuse

¹⁹ OJ L 119, 4.5.2016, p. 1–88.

²⁰ As regards personal data, this relates to facilitating the exercise of rights of individuals over their personal data.

modalities for a range of different use cases, as well as the high number of interested stakeholders, make it a challenging endeavour. Furthermore, even within a specific sector, there is a complexity of diverse use cases, relevant actors with diverging interests in the data use and specific data needs that might be hard to reconcile. A *one-size fits all* approach, encompassing both the necessary technical data infrastructure and governance framework, has its limitations in terms of being able to meet the specific needs of each vertical sector or domain. It will, however, be key to identifying cross-sector commonalities and to developing, where possible, common concepts, models and building blocks that can be used in various sectors or domains, without compromising solutions already existing or emerging in the sector specific domains.

In this context, the European Data Innovation Board (EDIB), proposed by the Regulation on European data governance²¹ (the ‘Data Governance Act’), will play a fundamental role. It will support the Commission in issuing guidelines on how to facilitate the development of common European data spaces as well as identifying the relevant standards and interoperability requirements for cross-sector data sharing.

Stakeholders in need of accessing new sources of data have already been organising data spaces in different sectors. In strategic areas, such as those mentioned in the data strategy, the Commission will facilitate the development of EU-wide common data spaces, working in collaboration with relevant stakeholders, contributing to the definition of their objectives and promoting the use of EDIB guidelines. By recognising them as common European data spaces, the Commission will foster their deployment and adoption at EU level. In addition, through the Digital Europe programme (DIGITAL), the Commission will fund the creation of common European data spaces in specific sectors where the EU financial contribution will have an impact on their deployment as European digital infrastructures. These data spaces will be based on the common data infrastructure procured by the Commission in order to assure interoperability across sectors.

It should be noted that in order to be considered a common European data space, a data space does not necessarily need to receive EU funding or be officially recognised as such by the European Commission.

Finally, as also highlighted in the European data strategy, the common European data spaces will be potentially open to data and actors from across the world. International data flows are indispensable for trade as well as for regulatory cooperation, the competitiveness of European companies and to ensure the highest innovation levels. The EU welcomes companies, public organisations and individuals from around the world to use the common European data spaces, subject to compliance with applicable legislation and standards, including those developed in relation to data processing. With an open but assertive approach, the EU will ensure that companies and individuals can benefit from international data flows to the greatest extent possible, while at the same time guaranteeing full compliance with Union’s data protection and security rules. This also means ensuring a level playing field for all actors, including when data is used abroad.

²¹ COM(2020) 767 final.

3. Relevant cross-sectoral legislation and measures

With the GDPR²² and the ePrivacy Directive²³, the EU has put in place a solid and trusted legal framework for the protection of personal data which has become an example to follow for the various data protection regimes around the world. Consequently, the common European data spaces will fully comply and operate within the rules of the existing legislation on the protection of personal data.

The common European data spaces will also be in full compliance with existing competition law provisions. The Horizontal Block Exemption Regulations²⁴ and the Guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union (TFEU) on horizontal cooperation agreements provide rules for the sharing of know-how and information exchange between businesses to be in compliance with competition rules. These rules are currently being reviewed²⁵. Articles 101 and 102 TFEU prohibit anti-competitive agreements and the abuse of dominant market power, respectively. Additionally, the data spaces will fully comply with the international obligations of the European Union, notably the multilateral agreements in the World Trade Organisation and in its regional trade agreements.

In this legal context, the European strategy for data announced a package of legislative initiatives to create the necessary overarching governance framework for a data-agile economy, and to address common data sharing issues between different sectors and domains. Specifically, as part of this package, the horizontal measures proposed in the Data Governance Act, the planned measures in the Implementing Act on High-Value Datasets under the Open Data Directive and the Data Act proposal will create trust and fairness in relation to data access and reuse, thereby realising the full potential of data as an enabler of social and economic welfare in Europe.

Through the provisions of the Data Governance Act, data sharing in common European data spaces will be fostered by increasing trust in neutral data intermediaries that will help match data demand and supply in the data spaces, strengthening voluntary data sharing mechanisms across sectors and Member States and overcoming technical obstacles. The Data Governance Act provides for the establishment of a European Data Innovation Board (EDIB), which will assist the Commission in drawing up guidelines for common European data spaces, addressing, inter alia: (i) cross-sectoral standards to be used and developed for data use and cross-sector data sharing; (ii) requirements to counter barriers to market entry and to avoid lock-in effects, for the purpose of ensuring fair competition and interoperability; (iii) adequate protection for legal data transfers outside the Union; (iv) adequate and non-discriminatory representation of relevant stakeholders in the governance of a common European data space; (v) adherence to cybersecurity requirements in line with Union law.

Additionally, the Implementing Act on High-Value Datasets will make available more high-quality public sector data that are considered of high-value regarding their socioeconomic

²² OJ L 119, 4.5.2016, p. 1-88.

²³ OJ L 201, 31.7.2002, p. 37-47; New ePrivacy regulation is under negotiation, see European Council *Press Release* of February 2021 for updates.

²⁴ Notably OJ L 335, 18.12.2010, p. 36-42, and OJ L 335, 18.12.2010, p. 43-47.

²⁵ SWD (2021) 103 final, p. 75.

potential of reuse by all, including businesses (especially SMEs), free of charge and in a machine-readable format.

Furthermore, the Data Act proposal aims at enabling companies and consumers to have better control over data and to ensure a fair distribution of value generated by data along the data value chain. It lays down horizontal rules to boost data access and use within and across sectors, thus making a major contribution to the development of the common European data spaces at large.

In addition, in its May 2021 Communication "Updating the 2020 new industrial strategy: building a stronger single market for Europe's recovery"²⁶, the Commission announced the co-creation, with private and public stakeholders, of transition pathways across relevant industrial ecosystems. This joint effort of evidence-gathering aims to enrich the understanding of the current and future determinants of the performance of ecosystems, and of the policy levers which can affect it. A preliminary analysis conducted by the Commission to explore the relationship between sectorial data spaces and industrial ecosystems shows that the creation of common European data spaces will enable industrial ecosystems to tap into the full potential of data coming from multiple domains (Annex 2).

The above cross-sectoral legislative framework is complemented by a range of sector-specific legislation on data access adopted in some fields to address identified market failures, such as automotive²⁷, payment service providers²⁸, smart metering information²⁹, electricity network data³⁰, or intelligent transport systems³¹. The Digital Content Directive³² also contributes to empowering individuals by introducing contractual rights when digital services are supplied to consumers who provide access to their data.

4. EU funding programmes and other data infrastructure initiatives

Several EU horizontal programmes will support the development of common European data spaces through various funding actions, in particular with regard to building the necessary data infrastructure – notably, DIGITAL for digital deployment initiatives, the Horizon Europe programme for research and innovation and the Connecting Europe Facility for digital infrastructures. The recovery plans of several Member States also support actions on European data spaces. Furthermore, the Multi-Country Project in European Common Data Infrastructure and Services³³ will deliver a technical infrastructure for the deployment of data spaces. Finally, other data infrastructure initiatives, such as the European Alliance for Industrial Data, Edge and Cloud³⁴, industry driven GAIA-X or Digital Transport and Logistics Forum (DTLF), are relevant for the development of specific aspects of the common

²⁶ COM(2021) 350 final.

²⁷ OJ L 188, 18.7.2009, p. 1–13.

²⁸ OJ L 337, 23.12.2015, p. 35–127.

²⁹ OJ L 158, 14.6.2019, p. 125–199, OJ L 211, 14.8.2009, p. 94–136.

³⁰ OJ L 220, 25.8.2017, p. 1–120, OJ L 113, 1.5.2015, p. 13–26.

³¹ OJ L 207, 6.8.2010, p. 1–13.

³² OJ L 136, 22.5.2019, p. 1–27.

³³ SWD(2021) 247 final.

³⁴ European Commission, *Industrial alliances: Commissioner Breton chairs first meeting of European Alliance for Industrial Data, Edge and Cloud*, Press Release of 14 December 2021, see [here](#).

European data spaces. The European Regional Development Fund (ERDF) will also provide funding for data spaces and infrastructures, as well as related research and innovation activities, under certain conditions and circumstances.

4.1. Digital Europe Programme (DIGITAL)

DIGITAL (2021-2027) is the new EU funding programme for digital deployment and the first financial instrument that focuses on bringing digital technology to businesses and individuals. Under the programme, the Commission will provide strategic funding in five crucial areas: high performance computing, cloud, data and artificial intelligence, cybersecurity, advanced digital skills and accelerating best use of technologies across the economy and society, including through Digital Innovation Hubs³⁵.

In line with the objectives set in Regulation (EU) 2021/694 establishing DIGITAL³⁶ and in order to maximise the impact of the investments, the Commission will fund several of the data spaces announced in the data strategy (Green Deal, mobility, manufacturing, agriculture, finance, health and skills) as well as smart communities, language, cultural heritage, media and tourism.

As indicated in the DIGITAL Work Programme 2021-2022, common support actions will lay the basis for the development of each of the data spaces concerned through community building and preparatory work on interoperability and governance. For other data spaces (health, finance, media, public administrations, cultural heritage and language), DIGITAL grants and procurement will support their deployment.

Furthermore, the DIGITAL Work Programme foresees funding for the set up and operation of a Data Spaces Support Centre. A coordination and support action (CSA) funded under DIGITAL will coordinate all relevant actions on sectoral data spaces and make available (blueprint) architectures and data infrastructure requirements for the data spaces, including possible technologies, processes, standards and tools that will allow reuse of data across sectors by the public sector and European businesses³⁷. In addition, the Data Spaces Support Centre will have among its tasks that of supporting the work of the European Data Innovation Board (EDIB), set up by the Data Governance Act³⁸, in view of enhancing the interoperability of data as well as data sharing services between different sectors and domains³⁹, in compliance with existing EU legislation on data protection.

In parallel, the Commission is procuring an open source smart cloud-to-edge middleware platform that will address the needs of the different data spaces and enable the realisation of the European Cloud Federation⁴⁰. The platform will provide basic building blocks that serve as an enabling layer for the interconnection of the various data spaces, public authority cloud

³⁵ C(2021) 7914 final.

³⁶ OJ L 166, 11.5.2021, p. 1–34.

³⁷ C(2021) 7914 final.

³⁸ COM/2020/767 final.

³⁹ C(2021) 7914 final.

⁴⁰ COM/2020/66 final.

resources, Artificial Intelligence ecosystems etc., by providing the required interoperability mechanisms⁴¹.

For the first two years of implementation (DIGITAL work programme 2021-2022), the Commission has reserved an overall indicative budget of EUR 410 million to support the deployment of the common European data spaces, the Data Spaces Support Centre and open data related projects, as well as the underlying cloud-to-edge infrastructure and services.⁴²

4.2. Horizon Europe

From a research and innovation (R&I) perspective, the new EU programme Horizon Europe (2021-2027)⁴³ also contributes to the development of common European data spaces, among other things. In particular, Cluster 4 (Digital, Industry & Space) of the programme's Pillar II (Global Challenges & European Industrial Competitiveness) contains a specific section (so-called Destination) on world-leading data and computing technologies. Proposals for topics under this destination should set out a credible pathway to contributing to the following expected impact of Cluster 4 as set out in Horizon Europe Strategic Plan:

'Globally attractive, secure and dynamic data-agile economy, by developing and enabling the uptake of the next-generation computing and data technologies and infrastructures (including space infrastructure and data), enabling the European single market for data with the corresponding data spaces and a trustworthy artificial intelligence ecosystem.'

Horizon Europe (HE) destination *'World leading data and computing technologies'* is structured around three headings for funding actions: (1) Data sharing in the common European data spaces; (2) Strengthening Europe's data analytics capacity; and (3) From cloud to edge to Internet of Things (IoT) for European data.

The first heading focuses specifically on R&I actions to develop the tools to allow data sharing in common European data spaces. In line with the FAIR principles (Findable, Accessible, Interoperable and Reusable), the overall objective of the topics under this heading is to make Europe the most successful area in the world in terms of data sharing and data reuse, while respecting the legal framework related to security and privacy, fostering collaboration and building on existing initiatives.

The other two headings of this destination also address R&I issues that are key for thriving European data spaces, as is the overall objective of the topics in the second heading (Strengthening Europe's data analytics capacity) to make the EU fully autonomous in processing, combining, modelling and analysing large amounts of data for efficiently deciding on future courses of action with high accuracy and advanced decision-making strategies.

Furthermore, the third heading (From Cloud to Edge to IoT for European Data) aims to capitalise on the ongoing paradigm shift of data processing and analysis from the cloud (in data centres and centralised computing facilities) to the edge (in distributed, smart connected

⁴¹ C(2021) 7914 final.

⁴² C(2021) 7914 final. Additional activities in support of data spaces are included in other actions, e.g. EUR 155 million for actions supporting the Destination Earth initiative.

⁴³ See Horizon Europe *website*.

objects). The overall objective of the topics here is to establish the European supply and value chains in cloud-to-edge computing to Internet of Things (IoT) and tactile internet by integrating relevant elements of computing, connectivity, IoT, AI and cybersecurity.

For the first Horizon Europe work programme (2021-2022) the Commission has reserved an overall indicative budget of EUR 350 million to support the research and innovation actions described above.

4.3. The Recovery and Resilience Facility

The common European data spaces also have an important link to the EU's Recovery and Resilience Facility (RRF)⁴⁴. The RRF provides support to reforms and investments in Member States, and aims to financially support reforms and investments by Member States and aims to mitigate the economic and social impacts of the COVID-19 crisis, to make European economies more sustainable and resilient, and to support the green and digital transition. Several Member States include investments in data spaces in their national Recovery and Resilience Plans.

4.4. Multi-Country Project in European Common Data Infrastructure and Services

To better address gaps in the EU's critical capacities, the Commission will facilitate the rapid launch of multi-country projects, combining investments from the EU budget, Member States and industry, building on the RRF and other EU funding.

In this context, the *Multi-Country Project (MCP) in European Common Data Infrastructure and Services* is expected to support the creation of innovative data ecosystems as well as the necessary data processing infrastructure and services. The implementation of this MCP could be supported by two instruments: the ongoing Important Projects of Common European Interest (IPCEI) to implement Next-Generation Cloud Infrastructure and Services, and a European Digital Infrastructure Consortium (EDIC) to implement the common European data spaces⁴⁵.

The IPCEI would aim to deliver the next generation common federated⁴⁶ cloud-to-edge infrastructure and services and would include, among others, several relevant use cases⁴⁷. It would directly contribute to transforming/reforming the data processing sector by making it more diversified, low power, ultra-secure, interoperable and distributed to efficiently respond to the real time and data security needs of EU businesses, citizens and the public sector. The IPCEI would be designed and launched at the initiative of the Member States, subject to clearance by the Commission on compliance with State aid rules⁴⁸.

The EDIC could assure cooperation between the Commission, Member States and stakeholders maintaining at the same time a high degree of flexibility to facilitate the pooling

⁴⁴ See European Commission Recovery and Resilience *webpage*.

⁴⁵ SWD(2021) 247 final.

⁴⁶ "Federated" refers to a technical infrastructure connecting distributed data resources and services.

⁴⁷ See *IPCEI on Next Generation Cloud Infrastructure and Services (IPCEI-CIS) Working Paper - Value Chain Description*, (2021) *here*.

of EU and national funding, cross-border investments, and co-investment models with private stakeholders.

To guarantee an integrated approach between all objectives of the MCP, the Data Spaces Support Centre and the newly launched European Alliance for Industrial Data, Edge and Cloud⁴⁹ will help to ensure that EU funding in standard data-processing capacities matches the needs of common European data spaces.

4.5. Links with other data infrastructure initiatives

The common European data spaces have logical and coherent links with other regional, national and trans-national initiatives for data infrastructures, such as the private sector GAIA-X⁵⁰, the Data Spaces Business Alliance⁵¹, OPEN DEI⁵² and the Digital Transport and Logistics Forum⁵³ which aim to create a federated⁵⁴ data infrastructure based on European values regarding data and cloud sovereignty.

The Copernicus⁵⁵ component of the EU space programme will also contribute to the common European data spaces, providing a sustained source of space-based earth observation data. Benefiting from a free, full and open data policy, data spaces' users would access and directly exploit the Copernicus data and information, as well as the Galileo and EGNSS⁵⁶ open service in data-intensive platform infrastructures.

Coordination with other data infrastructure initiatives is essential to ensure interoperability and reasonable reuse of common reference models, processes and building blocks in order to, ultimately, achieve a pan-European data infrastructure and genuine single EU data market, as envisioned in the European strategy for data.

5. Ongoing initiatives to develop sectoral data spaces

There are some sectors in the EU, other than those already announced by the Commission in the European strategy for data, where work is also ongoing to harness the value of data and gradually develop common European data spaces. These include tourism and construction.

In the tourism sector, the need to work towards more data sharing has been highlighted by stakeholders as well as by the European Council⁵⁷. As a first step, an EU Code of Conduct for data sharing in tourism, led by industry and facilitated by the Commission, is planned to be adopted by summer 2022. A coordination and support action (CSA), funded by the Commission under DIGITAL, will enable the development of a multi-stakeholder data sharing governance scheme, bringing together local data ecosystem stakeholders. This will

⁴⁹ Launched on 19 July 2021, see European Commission European Alliance for Industrial Data, Edge and Cloud *webpage*.

⁵⁰ GAIA-X *website*.

⁵¹ See *BDVA, FIWARE, GAIA-X and IDSA launch an alliance to accelerate business transformation in the data economy*, (2021) *here*.

⁵² OPNDEI *website*.

⁵³ Digital Transport & Logistic Forum *website*.

⁵⁴ "Federated" refers to a technical infrastructure connecting distributed data resources and services.

⁵⁵ See Copernicus *webpage*.

⁵⁶ European Global Navigation Satellite System, *webpage*.

⁵⁷ European Council *Conclusions*, 27 May 2021.

allow them to jointly identify the data infrastructures needed to enable a data space for tourism at EU level.

Construction is mentioned in the Commission's update of the industrial strategy⁵⁸ as an ecosystem where the co-creation of transition pathways should be prioritised. Various initiatives developed by the Commission and the ecosystem's stakeholders to boost data use and sharing are expected to benefit from the digitalisation of construction processes and the creation of a level playing field, particularly for SMEs, and to allow better policymaking and user information for built assets, accelerating both the digital and the green transition.

6. State of play of the announced common European data spaces

This section presents an overview of the state of play of the common European data spaces listed in the European strategy for data as well as the planned data spaces for media (announced in December 2020) and for cultural heritage (presented in November 2021). Annex 1 provides a timeline (2021-2023) for all common European data spaces.

6.1. Common European industrial (manufacturing) data space

Data sharing in industry has the potential to power strong growth, help companies optimise existing processes and develop new products, and create new businesses.

Accordingly, the Update of the 2020 New Industrial Strategy explains that an industrial (manufacturing) data space will lead to more flexible and resilient supply chains⁵⁹.

Some local 'embryonic' data spaces have emerged in the manufacturing sector in the last few years. These have brought together companies holding and using data to agree on what data to share as well as the rules for managing and controlling data sharing, and to convince their industrial software providers to support the agreed data formats and semantics.

Several workshops with stakeholders in 2020 and 2021 have shown the need for speed and scale to attract end users beyond the local ecosystems of embryonic data spaces. The development of an industrial (manufacturing) data space requires a critical mass of manufacturing companies to start sharing data among themselves. It also needs critical mass to attract technology providers and get them to adapt their technology solutions to fulfil the requirements for data sharing.

The planned intervention in DIGITAL can meet these requirements by building on the embryonic data spaces and enlarging its uptake among end users and suppliers of solutions (e.g. enterprise resource planning vendors for supply chain management, but also industrial data platform providers). Several Member States have already started initiatives to support the deployment of data spaces for manufacturing.

In November 2021, the Commission published a call for proposals⁶⁰ within DIGITAL for a coordination and support action (CSA) to establish a cooperative multi-stakeholder data

⁵⁸ European Commission (2021). *Updating the 2020 Industrial Strategy: towards a stronger Single Market for Europe's recovery*, Press Release.

⁵⁹ COM(2021) 350 final.

⁶⁰ European Commission, *Preparatory actions for data spaces for manufacturing*, see [here](#).

governance, an inventory of commercially viable data platforms for manufacturing and a blueprint for manufacturing-specific building blocks. This should contribute to the long-term convergence of existing and new data-related initiatives in manufacturing by making use of a common data space's technical and soft infrastructure. The preparatory action will advance and expand the dialogue among stakeholders by involving new participants and proposing cooperative sustainable business models and incentive schemes to motivate participants to share data.

On the basis of this preparatory work, two data spaces for manufacturing will be called for deployment by relevant stakeholders⁶¹, in order to enable companies in different user roles (e.g. supplier, client, service provider) to interact with large amounts of industrial data across their organisational borders. Starting with two data spaces instead of an integrated one, each with a specific use-case, is a way to quickly reach a successful implementation and growth strategy. The medium-term objective is to create an integrated industrial data space. Finally, the long-term objective is to integrate this with other data spaces.

These data spaces will build on existing 'embryonic' data spaces with manufacturing companies, to further develop and encourage data sharing. This will showcase how trustworthy data brokers can operate and develop sustainable operating models, coordinated and financed by the participating companies.

The data spaces should preferably target data sharing for circularity in line with the Circular Economy Action Plan⁶², also involving organisations from the circular economy (e.g. reuse, repair, and remanufacturing, refurbishing or recycling companies to improve circularity).

Furthermore, cooperation with the European Digital Innovation Hubs for a broad uptake by industry as well as with the AI Testing and Experimentation Facility for Manufacturing to define European test and training datasets and to provide support for their establishment will be encouraged.

Key actions:

- Under the first call for proposals of DIGITAL (Q4 2021), the Commission has committed to fund a coordination and support action (CSA) to establish a multi-stakeholder data governance, an inventory of existing data platforms for manufacturing and a blueprint for manufacturing-specific building blocks. The CSA is expected to start in Q3 2022 and will last between 12 and 24 months⁶³.
- In addition, the Commission will launch a second call for proposals in Q3 2022, of a duration of 24 months, to support relevant stakeholders to deploy and scale-up two data spaces for manufacturing⁶⁴.

⁶¹ The preparatory action is expected to deliver interim results, which will help to inform and prepare consortia for the implementation action under the second call of the work program of DIGITAL.

⁶² COM(2020) 98 final.

⁶³ European Commission, *Preparatory actions for data spaces for manufacturing*, see *here*.

⁶⁴ Announced in C(2021) 7914 final.

6.2. Common European Green Deal data space

As announced in the Communication on the European Green Deal⁶⁵ ('EGD'), accessible and interoperable data, combined with digital infrastructure and artificial intelligence solutions, facilitate evidence-based decisions and expand the capacity to understand and tackle environmental challenges.

The European Green Deal data space will be developed in phases.

The first phase, under DIGITAL Work Programme 2021-2022⁶⁶, will prepare the ground and bring the relevant stakeholders together to develop a blueprint and a roadmap for the data governance and technical architecture of the European Green Deal data space.

As announced in the European strategy for data, the Commission will also assess, in the context of the 'GreenData4All' initiative⁶⁷, the interaction between the INSPIRE Directive⁶⁸ and the Directive on public access to environmental information⁶⁹. The aim is to modernise both Directives, following their evaluation in 2021⁷⁰, to align them with the current state of IT technology and to promote the active dissemination and sharing of public, privately held and citizen-generated data in support of the EGD objectives. This will contribute to the definition and operationalisation of legal, organisational and technical interoperable building blocks to share data in a machine-readable, agile and user-driven way, even beyond geospatial communities, at the point of use in the European Green Deal data space⁷¹. It will also support a phased and needs-driven roll-out of re-usable data services that are essential for monitoring and reaching environmental objectives set out in, for example, biodiversity, resilience to climate change, circular economy and zero pollution strategies.

Work on prioritising spatial data – also in alignment with other policies such as the Open Data Directive⁷² – has already started⁷³ and a steadily growing streamlined offering of environmental and geospatial reference data across Europe is becoming available⁷⁴ together with a robust and comprehensive validation framework to check their compliance and potential for interoperability⁷⁵. The outcome of this work will, together with other relevant horizontal legislation related to common data governance such as the Open Data Directive, the proposal for an Implementing Regulation on High-Value datasets, the proposal for a Data Governance Act and the proposal for a Data Act, provide the legal data governance foundations for the European Green Deal data space.

⁶⁵ COM/2019/640 final.

⁶⁶ European Commission, *Preparatory actions for the Green Deal data space*, see [here](#).

⁶⁷ COM/2020/66 final.

⁶⁸ OJ L 108, 25.4.2007, p. 1–14.

⁶⁹ OJ L 41, 14.2.2003, p. 26–32.

⁷⁰ European Commission, *Sharing geospatial data on the environment – evaluation (INSPIRE Directive)*, see [here](#).

⁷¹ Kotsev A., Minghini M., Cetl V., Penninga F., Robbrecht J. and Lutz M., *INSPIRE - A Public Sector Contribution to the European Green Deal Data Space*, EUR 30832 EN, Publications Office of the European Union, Luxembourg, 2021.

⁷² OJ L 172, 26.6.2019, p. 56–83.

⁷³ See the Repository for INSPIRE MIWP Action 2.1 'Need-driven data prioritisation' [here](#).

⁷⁴ See the INSPIRE Geoportals [website](#).

⁷⁵ See the INSPIRE Reference Validator [website](#).

The Commission's support for the creation of a Green Deal Data space will be driven by the data needs of the following EGD priority-related strategies and action plans:

- 2030 Biodiversity strategy and the proposal for the EU Forest Strategy post-2020⁷⁶
- Zero-pollution action plan⁷⁷
- Circular economy action plan (CEAP)⁷⁸
- Strategy on adaptation to climate change⁷⁹
- Farm to Fork strategy⁸⁰
- Bioeconomy strategy⁸¹

In addition, the Commission will, through the EuroGEO initiative⁸², strengthen the EU's role in building a Global Earth Observation System of Systems (GEOSS) and invest in the Destination Earth project. The aim of Destination Earth is to develop a high-precision digital model of the Earth to monitor and simulate natural and human activity. Destination Earth will contribute to the EGD and digital strategy by unlocking the potential of the digital modelling of Earth's physical resources and related phenomena, for example by modelling climate change, water and marine environments, polar areas and the cryosphere (parts of the Earth's surface where water is found in solid form). The models will be made on a global scale and will help speed up the green transition and predict major environmental degradation and disasters. By opening up access to public datasets across Europe and their reuse, Destination Earth represents a key component of the European Green Deal data space.

I - Destination Earth Data Themes (provided by European Commission, DG ENV)



⁷⁶ European Commission, *Biodiversity Strategy for 2030*, see here; COM/2021/572 final.

⁷⁷ COM/2021/400 final.

⁷⁸ COM/2020/98 final.

⁷⁹ European Commission (2021). *Building a climate-resilient future - A new EU strategy on adaptation to climate change*, see here.

⁸⁰ European Commission, *Farm to Fork Strategy*, see here.

⁸¹ European Commission (2018). *A sustainable bioeconomy for Europe*, Publications Office of the European Union.

⁸² European Commission, *About EuroGEO webpage*.

In the context of the EGD zero-pollution priority, the European Green Deal data space will provide re-usable data services on a large scale to assist in collecting, sharing, processing and analysing large volumes of data relevant for assuring compliance with environmental legislation and rules related to the priority actions set in the EGD.

Through a coordination and support action (CSA) under DIGITAL, the major stakeholders would define the technical data infrastructure and governance mechanisms for achieving the above-mentioned objectives. Horizon Europe actions will further deploy digital and data technologies as key enablers and strengthen EU and international science-policy interfaces as well as contribute to the Global Earth Observation System of Systems⁸³.

Funding provided under DIGITAL will also support the creation of a data space for smart communities, since cities and communities are an essential enabler of the EGD and sustainable development goals. The first call, launched in November 2021, will support the creation of its blueprint, while a second call in 2022 will fund its validation through pilot projects⁸⁴. This phase will be followed by the deployment of the data space and a network of Local Digital Twins (funding to support the creation of an EU Local Digital Twin Toolbox to accelerate the rollout of some 100 twins across the EU) integrated within the Living-in EU initiative (LiEU).

In the context of Horizon Europe's Pillar II (Global Challenges & European Industrial Competitiveness), under Destination 7, the Commission will support an innovative action (IA) on 'Common European Green Deal data space to provide more accessible and exploitable environmental observation data in support of the EGD priority actions' for a total indicative budget of EUR 10 million⁸⁵.

The European Strategy for data refers under the European Green Deal data space to an action for establishing a common European data space for smart circular applications to make available the most relevant data for enabling circular value creation along supply chains. Another key element of the European Green Deal data space is the collection and sharing of data on value chains and product information. As established in the new Circular Economy Action Plan⁸⁶, and in link with the upcoming Sustainable Products Initiative (Q1 2022)⁸⁷, this will be achieved through the deployment of a Digital Product Passport (DPP) that gathers such data to support sustainable production, enables the transition to the circular economy, provides new business opportunities to economic actors, supports consumers in making sustainable choices and allows authorities to verify compliance with legal obligations. This entails identifying the key DPP data as well as protocols for secure and tailored access to relevant stakeholders. The work will also contribute to the development of standardised and open digital solutions for identification, tracking, mapping, integrity-check and sharing of

⁸³ European Commission, *Common European Green Deal data space to provide more accessible and exploitable environmental observation data in support of the European Green Deal priority actions*, see [here](#).

⁸⁴ European Commission, *Preparatory actions for the data space for smart communities*, see [here](#).

⁸⁵ European Commission, *Common European Green Deal data space to provide more accessible and exploitable environmental observation data in support of the European Green Deal priority actions*, see [here](#).

⁸⁶ COM/2020/98 final.

⁸⁷ Announced in COM/2020/98 final, see also the European Commission 'Have your say' [webpage](#) about his initiative.

product information along its lifecycle ensuring interoperability across borders. The benefits of the first generation of the product passports for all involved stakeholders as well as for sustainability will be demonstrated at a later stage through actions in the common European industrial (manufacturing) data space.

Key actions:

- Within the ‘GreenData4all’ initiative, announced by the European strategy for data, the Commission will review (Q4 2022) the existing EU rules on environmental geospatial data and on public access to environmental information⁸⁸.
- Under the first call of DIGITAL (Q4 2021), the Commission has committed to fund a coordination and support action (CSA) to create a sustainable data governance scheme as well as a blueprint that connects existing national, regional and local data ecosystems and enables public and private stakeholders to access relevant data. The CSA is expected to start in Q3 2022 and will last between 12 and 18 months⁸⁹.
- Under the first call of DIGITAL (Q4 2021), the Commission has committed to fund a CSA to elaborate a blueprint for the creation of a data space for smart communities as an enabler of the Green Deal and Sustainable Development goals⁹⁰. It is expected to start in Q3 2022, and will last for 12 months. This will be followed in 2022 by a DIGITAL call⁹¹ for a grant supporting cross-sector data pilots to validate and refine the blueprint, and for a procurement to pave the way for the adoption of Local Digital Twins.
- ‘Destination Earth’⁹²: supported by the Commission through the DIGITAL Work Programme 2021-2022⁹³, this action will build an operational data ecosystem for the development and operations of ‘Digital Twins’ of the Earth (launched in Q4 2021, it has a duration of 24 months).
- ‘Digital Product Passport’: under DIGITAL⁹⁴, the Commission will provide funding to prepare the ground for a gradual deployment as of 2023 of digital product passports in the key value chains of electronics (consumer and/or industrial), batteries and at least another two of the priority products identified in the Circular Economy Action Plan⁹⁵ (the call was published in Q4 2021, with a view to starting the project in Q3 2022, it has a duration 24 months).

6.3. Common European mobility data space

The overall goal of the common European mobility data space is to accelerate the digital transformation of the European transport sector and to fully reap the benefits of data for the

⁸⁸ COM/2020/66 final.

⁸⁹ European Commission, *Preparatory actions for the Green Deal Data Space*, see here.

⁹⁰ European Commission, *Preparatory actions for the data space for smart communities*, see here.

⁹¹ Announced in C(2021) 7914 final.

⁹² COM(2020) 67 final.

⁹³ C(2021) 7914 final.

⁹⁴ C(2021) 7914 final.

⁹⁵ COM/2020/98 final.

sector and for society at large. As stated in the Smart and Sustainable Mobility Strategy⁹⁶, digitisation and enhanced use of data in all modes of transport (passenger and freight) are essential enablers for the transformation to safer, more efficient, accessible and sustainable mobility. The mobility data space will facilitate access, pooling and sharing of data from existing and future transport and mobility databases.

The mobility and transport sector has an important *acquis* of existing European frameworks (some of which are regulated) which organise data sharing for both passengers and freight in the domains of business-to-business (B2B), business-to-government (B2G), government-to-business (G2B) and government-to-government (G2G) data sharing. Most of these frameworks have their own governance, architecture, platforms, etc., and they already include some important achievements as regards the harmonisation of data-sharing conditions. This needs to be duly taken into account in the approach to the European mobility data space. Furthermore, various digital initiatives at European level, driven by Member States or by private actors, seek to provide the data governance, technical infrastructure and economic models to create a data economy in the mobility sector.

The common European mobility data space will build upon existing EU and Member States' legislation and infrastructures related to transport data. It should focus on promoting interoperability by contributing tools to support convergence on governance and infrastructure. Particular attention should be paid to enabling data sharing with linked sectors such as buildings, energy, environment or health, for example to fully leverage the benefits of e-mobility.

The legal framework of relevance for this data space is in constant evolution. The Sustainable and Smart Mobility Strategy⁹⁷ announced future legislative initiatives related to the sharing of mobility data as well as the adaptation of existing frameworks in the area of mobility. These legislative initiatives would also contribute to the development of the mobility data space.

In the automotive sector, type approval legislation provides for conditions of access of third-party service providers to repair and maintenance information. This legislation is currently under review.

In the air traffic sector, the Commission amended in 2020 the proposal for a Regulation on the Single European Sky⁹⁸ to include, among other things, new provisions on data availability and market access of data service providers in the field of air traffic management.

The Commission will support the deployment of the common European mobility data space by co-funding a number of projects under DIGITAL. The specific aim of those projects is to support the creation of technical infrastructures combined with governance mechanism to facilitate easy, cross-border access to key data resources, based on and in full alignment with existing and upcoming mobility and transport initiatives⁹⁹. In this context, the Commission will fund a first preparatory action to deliver a comprehensive mapping of the existing

⁹⁶ COM/2020/789 final.

⁹⁷ COM(2020) 789 final.

⁹⁸ COM/2020/579 final.

⁹⁹ Digital Europe Programme, Work Programme for 2021-2022, Annex, p47-49 Data space for mobility.

initiatives and their features and propose concrete actions to progressively harmonise them and ensure their interoperability, where appropriate¹⁰⁰. Also under DIGITAL, the Commission will fund one or several project(s) to make large amounts of accurate and reliable urban mobility data available and accessible in machine-readable format.

Additional financial support will come from the Connecting Europe Facility (CEF) funding instrument¹⁰¹. In the field of intelligent transport systems (ITS), the CEF Programme Support Action was launched in Q4 2021 to establish a stronger coordination mechanism to federate the National Access Points of the ITS Directive¹⁰². The CEF work programme 2021-2027¹⁰³ also allocated financial resources for technical support for the development of the mobility data space.

In addition to European initiatives, various data ecosystems, platforms and marketplaces, driven by Member States or private actors, seek to facilitate data sharing in the mobility sector¹⁰⁴. The common European mobility data space will benefit from these initiatives and focus on promoting the interoperability by recommending common building blocks.

In December 2021, the Commission adopted new transport proposals with the aim to modernise the EU's transport system and support the transition to cleaner, greener and smarter mobility¹⁰⁵. In this context, the Commission proposed to update the 2010 Intelligent Transport System Directive¹⁰⁶, which will stimulate the faster deployment of intelligent services, by proposing that certain crucial road, travel and traffic data, such as speed limits and traffic circulation plan, is made available in digital format. This would further contribute to data availability, reuse and interoperability.

Key actions:

- Under the first call of DIGITAL (Q4 2021)¹⁰⁷, the Commission will fund a coordination and support action (CSA) with the objective to make an inventory of existing mobility data initiatives, identifying gaps, overlaps and common building blocks that could contribute to the convergence of these initiatives and ways to integrate the mobility data space in the emerging European data and cloud services infrastructure. The CSA is expected to start in Q3 2022, and will last for 12 months.
- Under the third call of DIGITAL (Q3 2022), the Commission will support one or more projects to make a large amount of accurate and reliable mobility data available and

¹⁰⁰ European Commission, *Preparatory actions for the Data Space for mobility*, see *here*.

¹⁰¹ European Commission, *Connecting Europe Facility*, see *here*.

¹⁰² OJ L 348, 20.12.2013, p. 129–171 and Commission Implementing Decision C (2014) 1921, lastly amended by Commission Implementing Decision C (2020) 7434 of 4.11.2020.

¹⁰³ C(2021) 5763 final.

¹⁰⁴ The Mobility Data Space operated by DRM Datenraum Mobilität GmbH.

¹⁰⁵ European Commission (2021). *New transport proposals target greater efficiency and more sustainable travel*, News Article.

¹⁰⁶ COM(2021) 813 final.

¹⁰⁷ European Commission, *Data Space for Mobility, Funding & Tender Opportunities*, see *here*.

accessible in machine-readable format, to enable data analytics, artificial intelligence and cloud technologies¹⁰⁸.

- A revision of the Delegated Regulation (EU) 2017/1926 on multimodal travel information services to include mandatory accessibility of dynamic datasets, as well as an assessment of the need for regulatory action on rights and duties of multimodal digital service providers together with an initiative on ticketing, including rail ticketing, are planned for 2022¹⁰⁹.
- Revision of Directive 2005/44/EC on harmonised river information services (RIS)¹¹⁰ in Q4 2022. That revision will aim to better integrate inland waterway transport into multimodal logistics, increase inland waterway transport resilience and reduce negative externalities, contributing to the interoperability of information services and data sharing in inland waterway transport.
- Review the regulatory framework for interoperable data sharing in rail transport¹¹¹ through revisions of the technical specifications for interoperability for telematics applications for passengers (TAP TSI) and freight (TAF TSI) in 2022.
- Establish a common dataset for reporting formalities in EU ports as provided for in the European Maritime Single Window Environment Regulation (Q1 2022), and a multimodal transport common data set for regulatory freight transport information, as provided for in the electronic freight transport information (Q1 2023), facilitating digital exchange and data reuse between businesses and administrations¹¹².
- Propose rules on a trusted environment for the corridor data exchange framework to support collaborative logistics¹¹³, based on recommendations from the Digital Transport and Logistics Forum (DTLF). These rules will include the technical specifications for digital architecture, connection and registration issues, data semantics, common services and governance (2023).

6.4. Common European health data space

As announced in the 2021 Commission Work Programme¹¹⁴, the Commission is working on a legislative proposal for a European Health Data Space (EHDS) planned for adoption at the beginning of 2022. The EHDS is essential for advances in preventing, detecting and curing diseases from the perspective of patients as well as for informed, evidence-based decisions to improve the accessibility, effectiveness and sustainability of healthcare systems.

The legislative proposal will build upon and complement the horizontal frameworks announced in the Data Strategy, in particular the proposal for a Data Governance Act, with

¹⁰⁸ Announced in C(2021) 7914 final.

¹⁰⁹ Announced in COM/2020/789 final.

¹¹⁰ Announced in COM(2020) 66 final.

¹¹¹ Announced in COM(2020) 66 final.

¹¹² Announced in COM(2020) 66 final.

¹¹³ Action 54 of COM(2020) 789 final.

¹¹⁴ COM/2020/690 final.

more specific sectoral measures in the area of health. The proposal will pursue the following objectives:

- ensuring access, sharing and use of health data for healthcare delivery purposes (primary use of health data), as well as control by individuals over their health data;
- fostering a genuine single market for digital health services and products, including those based on AI;
- facilitating access to and reuse of health data for research, innovation, public health policy-making and regulatory activities, in a privacy-preserving, secure, timely, transparent and trustful way, with an appropriate institutional governance (secondary use of health data).

On 3 May 2021, the Commission launched a public consultation¹¹⁵ on the EHDS, which has fed into the preparation of the Impact Assessment to be adopted with the legislative proposal in 2022. A Joint Action by 25 European countries and co-ordinated by the Finnish Innovation Fund, Sitra, ‘Towards a European Health Data Space (TEHDaS)’ started in February 2021 with the aim to provide recommendations to the Commission by 2023 on several aspects, such as governance, interoperability, data quality, infrastructures and citizens’ empowerment.

As part of the Impact Assessment, the Commission is currently studying the infrastructure needs of the future of the EHDS, both in terms of supporting the use of health data for the provision of healthcare and supporting the further reuse of health data for research and innovation, policy-making and regulatory activities.

EU4Health¹¹⁶ will support the deployment and extension of the cross-border infrastructure for the EHDS, covering both primary and secondary uses of health data.

As far as the primary use of health data is concerned, the Commission continues to work with Member States to extend the geographical coverage of MyHealth@EU (eHealth Digital Service Infrastructure)¹¹⁷, the infrastructure that has been developed to ensure continuity of care for European citizens travelling abroad in the EU, to ensure that all Union citizens can benefit from its services. The system is operational in 7 Member States, and several more are expected to join in 2022. The Commission is also preparing for the expansion of data domains, which currently include ePrescription and Patient Summaries, to allow the exchange of images, laboratory results and discharge letters, and for the extension of the services to allow patients access to their own health data. The aim is to achieve full EU coverage by 2025¹¹⁸. A pilot project funded by EU4Health was launched in 2021 to test the access of patients to their own health data through MyHealth@EU.

¹¹⁵ See the European Commission ‘Have your Say’ *webpage*.

¹¹⁶ European Commission, *EU4Health 2021-2027 – a vision for a healthier European Union*, see *here*.

¹¹⁷ European Commission, *Electronic cross-border health services*, see *here*.

¹¹⁸ European Commission, *Electronic cross-border health services*, see *here*.

Alongside the planned legal proposal and under the EU4 Health Programme, the Commission launched a project grant call in October 2021¹¹⁹ for a pilot project for designing, developing, deploying and operating the infrastructure for the secondary use of health data that aims to connect national health data authorisation bodies, research infrastructures and public bodies, such as the EMA and the ECDC, across borders. The involvement of health researchers, public bodies and the regulatory community is key to ensuring that this infrastructure can in the future accelerate and make more effective research and policy outcomes in health, by shortening data access times and simplifying procedures for data reuse. The possible use-cases may include, for example, the analysis of the safety and efficacy of therapeutics. The aim of the pilot project is to demonstrate the feasibility of a small-scale cross-border infrastructure for reuse of health data while preserving the privacy and protection of personal data of individuals and to test the infrastructure and governance arrangements for a future large-scale deployment. The pilot project will reuse existing building blocks, e.g. the CEF building blocks. It is expected to be launched in early 2022.

Furthermore, the Commission is working on the secure, cross-border accessibility of genomic data with Member State signatories to the 1+ million Genomes Declaration, as part of a EHDS. Financial support for this project is planned during 2022 under DIGITAL for the deployment of an infrastructure that links national genomic datasets. Similarly, in 2022 the Commission will also support projects through DIGITAL to deploy a sustainable resource of anonymised cancer images that is accessible to researchers and innovators through the AI Testing and Experimentation Facilities.

Key actions:

- The Commission expects to adopt a legislative proposal on a governance framework establishing a European Health Data Space in 2022¹²⁰.
- The Commission will fund a pilot project for an EU infrastructure ecosystem for the secondary use of health data for research, policymaking and regulatory purposes¹²¹. The EU4Health call for proposal will close in Q1 2022.
- Under DIGITAL, the Commission will support the cross-border accessibility of genomic data with Member State signatories to the 1+ million Genomes Declaration (call 1, DIGITAL Q4 2021)¹²². This new phase of the project is expected to start in Q3 2022 and last between 36 and 48 months.
- Under DIGITAL, the Commission will support a project for deploying a sustainable resource of anonymised cancer images (call 2, DIGITAL Q2 2022).¹²³

¹¹⁹ European Commission, *Action grants for developing a pilot project for an EU infrastructure ecosystem for the secondary use of health data for research, policy-making and regulatory purposes*, see [here](#).

¹²⁰ COM/2020/690 final.

¹²¹ <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/eu4h-2021-pj-06>

¹²² <https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/digital-2021-cloud-ai-01-fei-ds-genomics>

¹²³ https://ec.europa.eu/newsroom/repository/document/2021-46/C_2021_7914_1_EN_annexe_acte_autonome_cp_part1_v3_x3qnsqH6g4B4JabSGBBy9UatCRc8_81099.pdf

- Under EU4Health¹²⁴, the Commission and the Member States will continue to fund in 2022 the expansion of the geographical coverage of MyHealth@EU¹²⁵, including the expansion of data domains to allow the exchange of images, laboratory results and discharge letters. Full EU coverage is to be achieved by 2025.

6.5. Common European financial data space

The Digital Finance Strategy¹²⁶ announced the creation of a European financial data space. Data has always been at the core of financial services and data-driven finance necessitates the use of varied datasets, such as publicly and privately held personal and non-personal data. Financial data includes publically disclosed company information and business registry data, as well as data reported by financial institutions to supervisory authorities. Financial data also relates to data about individual savings, mortgages, consumer credit, investments, pensions and insurance. Furthermore, innovation in finance also increasingly relies on non-financial data. Therefore, to ensure interoperability, the European financial data space needs to be developed in close connection with data spaces in other sectors.

The European financial data space includes three main components.

First, digital access to publicly disclosed financial and sustainability related information. As part of its Capital Markets Union Action Plan¹²⁷, the Commission proposed, in November 2021, a regulation to set up a European Single Access Point (ESAP)¹²⁸, which will be established by the European Securities and Markets Authority (ESMA). The ESAP will be a common source of free¹²⁹ public information about EU companies and investment products, regardless of where in the EU they are located or originated. It will interconnect various sources of publicly disclosed information. ESAP is expected to be operational from 2024 and will be gradually developed in a phased-in approach. In parallel with the ESAP regulation, the Commission has proposed¹³⁰ amendments to EU financial services legislation requiring public disclosures to be made systematically available on ESAP and in a data extractable or machine-readable formats. ESAP will in that way contribute to the creation of the European financial data space and facilitate data sharing among various stakeholders. It is expected that the availability of such high-value data will strengthen the use of technologies like artificial intelligence, machine-learning and natural-language processing in the near future. In addition, synergies with other initiatives are expected¹³¹. Starting from 2022, the set-up of the ESAP will also be supported under DIGITAL, as announced in the DIGITAL Work Programme 2021-2022.

¹²⁴ European Commission, *EU4Health 2021-2027 – a vision for a healthier European Union*, see [here](#). EU4Health is established by Regulation (EU) 2021/522 [OJ L 107, 26.3.2021, p. 1–29].

¹²⁵ European Commission, *Electronic cross-border health services*, see [here](#).

¹²⁶ COM/2020/591 final.

¹²⁷ COM/2020/590 final.

¹²⁸ COM/2021/723 final.

¹²⁹ Additional services may be offered by ESMA for a fee.

¹³⁰ The Regulation establishing the ESAP is accompanied by a Directive and a Regulation, which specify in the relevant EU legislation the information to be made accessible in the ESAP, as well as certain characteristics of that information in relation to formats.

¹³¹ E.g. such as the EU translation tool eTranslation, the Business Registers Interconnection System (BRIS) and Environmental, Social and Governance (ESG) data.

Second, easier reporting and sharing of supervisory data among EU and national supervisory authorities. The Commission has adopted a supervisory data strategy which aims to streamline EU-level supervisory reporting and facilitate data sharing between supervisory authorities at EU and national level, as well as making more information available to the industry¹³². The strategy envisages the development of a common data dictionary to ensure consistency and standardisation across the financial sector, making it easier to share and reuse data, and contributing to making reporting requirements machine-readable and executable. In addition, the Commission will continue the work in cooperation with the ESAP, in particular during the development of the technical standards for the ESAP. The supervisory data strategy will help enable the use of innovative technologies, including regulatory technology (RegTech) tools for supervisory reporting by regulated entities and supervisory technology (SupTech) tools for supervision by authorities. The strategy was adopted in November 2021¹³³.

The final component is business-to-business and business-to-consumer data sharing and reuse in the EU financial sector (open finance). The revised Payment Services Directive (PSD2)¹³⁴ led the way in opening up data sharing on payments accounts. Further steps towards enhanced data sharing and openness across and within the various types of financial services will enable the financial sector to fully embrace data-driven innovation, in full compliance with personal data protection and competition rules. The Commission intends to adopt a broad but gradual and cooperative approach to open finance. The Commission plans to adopt a legislative proposal for an open finance framework in 2022, building on and in full alignment with the broader data access legislative initiatives.

To ensure maximum coherence and synergies among these three elements of the European financial data space, the Commission will aim to use common governance structures to the extent possible. The objective is to help integrate European capital markets, channel investments into sustainable activities, support innovation and bring efficiencies for consumers, businesses and authorities alike.

Key actions:

- Under DIGITAL, the Commission will launch in 2022 a procurement to deliver a prototype of an ESAP-like architecture, as a first technical step in setting up the ESAP¹³⁵.
- The Commission plans to adopt a proposal for an EU open finance framework in 2022¹³⁶ to enhance access to and reuse of customer data across a wide range of financial services, building on and in full alignment with the broader data access legislative initiatives.

6.6. Common European energy data space

A common European energy data space will benefit the green and digital transitions that are currently underway in Europe. In particular, it will help to further integrate renewables as a

¹³² COM/2021/798 final.

¹³³ COM/2021/720 final.

¹³⁴ OJ L 337, 23.12.2015, p. 35–127.

¹³⁵ C(2021) 7914 final - Annex.

¹³⁶ COM/2020/591 final.

source of energy production in an efficient way, increase the energy system efficiency, and ensure a smooth and competitive transition towards the electrification of sectors such as heating and transport.

The first steps to creating a common European energy data space have already been put in place.

Firstly, energy-sector legislation (in particular the Clean Energy for all Europeans Package and the Fit-for-55 Package¹³⁷) and cross-sectoral data space building blocks, such as those provided by the Data Governance Act, define the main elements to enable future-proof data exchange across multiple parties in the energy sector (and beyond).

Secondly, various innovative national and EU-wide initiatives, including EU R&I projects such as the INTERCONNECT¹³⁸ large-scale pilot, explore the potential of data sharing among companies and develop new use-cases for the benefit of the energy transition¹³⁹. Many of these projects interact in order to define general design principles, in particular through the Bridge Initiative¹⁴⁰ and the Open DEI project¹⁴¹.

To strengthen the European market for energy, including innovative energy services based on data, these initiatives need to be connected so that they can be scaled up. Interoperability between different platforms and initiatives is also necessary to create a European energy data space in which (decentralised) renewable energy sources can be managed and CO₂ emissions from key sectors (e.g. transport, buildings) reduced. A data sharing infrastructure in the form of a set of agreements, protocols and a governance system that defines who shall or can share data, under what conditions and in what format, is therefore needed. Innovative applications and services call for common baseline requirements in compliance with the data protection by design and by default. These should provide consumers and citizens with the tools to effectively exercise their rights in a digital energy market and continuously drive the energy sector to maintain the highest cybersecurity standards.

In this context, the Commission is preparing a Communication “Action plan on the digitalisation of the energy sector” (expected in 2022)¹⁴² that will outline the concrete steps to support the creation of a European energy data space. In the Communication, the Commission will propose actions to create a cyber-secure data exchange infrastructure in the energy system, which can lead to innovative energy services for consumers and which promotes the

¹³⁷ European Commission (2021). *European Green Deal: Commission proposes transformation of EU economy and society to meet climate ambitions*, Press Release.

¹³⁸ The project develops and demonstrates advanced solutions for connecting and converging digital homes and buildings with the electricity sector. See *here*.

¹³⁹ For example, Horizon 2020 has supported smart grid and digitalisation projects for almost 1 billion Euros between 2014 and 2020 (COM(2020) 953 final).

¹⁴⁰ Bridge is a project that provides a framework and support for Horizon 2020 smart grid projects: see the *Bridge Data Management Working Group website*.

¹⁴¹ OPEN DEI is a project that provides a framework and support for Horizon 2020 data exchange projects across sectors to cooperate: see their policy paper *Design Principles for Data Spaces*.

¹⁴² Announced in COM(2020) 299 final, roadmap of the initiative available at the European Commission *Digitalising the energy sector – EU action plan*, Have your say *webpage*.

uptake of digital technologies in the energy sector while ensuring that the energy consumption of the IT sector is sustainable.

While work is ongoing to identify the actions, some concrete steps are already being prepared. On the one hand, detailed rules are being drafted¹⁴³ on data exchange and governance as well as on cyber-security, in line with the Electricity Directive¹⁴⁴ that was reviewed as part of the Clean Energy for all Europeans package. Also, as part of the renovation wave and the ongoing work on energy efficiency, the use and sharing of data for more efficient and smarter buildings is addressed in the Commission's proposal for a revised Energy Performance of Buildings Directive which was adopted on 15 December 2021¹⁴⁵.

On the other hand, Horizon Europe's 2021 work programme will fund an innovation action (call for proposals closed in October 2021) aimed at achieving a higher degree of interoperability between data platforms, making energy data available and re-usable, enabling new market roles, market participants and energy communities, and enabling new digital solutions and services supporting the energy transition¹⁴⁶.

Under DIGITAL, the envisaged open source cloud-to-edge middleware infrastructure¹⁴⁷ will accelerate the development of the data exchange infrastructure for the energy data space.

Key actions:

- The Commission will publish the Communication "Action Plan on the digitalisation of the energy sector" in Q2 2022¹⁴⁸.
- The Commission will propose an implementing act for metering and consumption data in 2022 and a network code on cyber-security by the end of 2022¹⁴⁹.
- Under the Horizon Europe work programme 2021-2022¹⁵⁰, the Commission will launch an Innovation Action supporting the energy data space, which will enable access to and use of energy data across Europe. The project is expected to start in Q3 2022.

6.7. Common European agriculture data space

In the European strategy for data, the Commission announced that it will work towards a common agricultural data space. This data space should facilitate trustworthy pooling and sharing of agricultural data between private stakeholders (e.g. farmers, machinery companies,

¹⁴³ Implementing Acts and a network code as foreseen by the Internal Electricity Market Directive, respectively.

¹⁴⁴ OJ L 158, 14.6.2019, p. 125–199.

¹⁴⁵ Revision of the Energy Performance of Buildings Directive, see *here*.

¹⁴⁶ European Commission, *Establish the grounds for a common European energy data space*, Funding & tender opportunities *webpage*.

¹⁴⁷ Developed and deployed under the first work programme of the Digital Europe Programme and the Connected Europe Facility 2 Digital.

¹⁴⁸ Announced in COM(2020) 299 final, roadmap of the initiative available at the European Commission *Digitalising the energy sector – EU action plan*, Have your say *webpage*.

¹⁴⁹ Announced in COM(2020) 66 final, roadmap of the initiative available at the European Commission *Access to electricity metering and consumption data – requirements*, Have your say *webpage*.

¹⁵⁰ European Commission, *Establish the grounds for a common European energy data space*, Funding & tender opportunities *webpage*.

data service providers), as well as with public authorities. Tailored use of data and data analytics in the field of agriculture contributes to increased competitiveness and the sustainability performance of the sector, e.g. through increasing the effectiveness of precision farming applications, and thus to the ambitions laid out in the Common Agricultural Policy and the Farm-to-Fork-Strategy. Several actions are already in place for improving discoverability of and accessibility to interoperable European agricultural data by re-using the European Spatial Data Infrastructure (INSPIRE Directive).

During a series of webinars held with different stakeholders and Member States in 2020, there were calls for more stock-taking of ongoing private and public initiatives in the field of agricultural data sharing and data interoperability, as well as to allow for more time for gaining experience with the implementation of the code of conduct on agricultural data sharing by contractual agreement, launched in 2018 by EU stakeholders¹⁵¹. Other questions were related to e.g., the design, input data, and infrastructure aspects, as well as to governance structures and business models. The Council Presidency, in cooperation with the Commission, also addressed the topic of the handling of agricultural data.¹⁵²

Against this background, the Commission announced at the Agriculture and Fisheries Council in December 2020 that the implementation of such a data space would be preceded by a preparatory coordination and support action (CSA)¹⁵³. This CSA, which aims at developing the approach for the data space with stakeholders and Member States, is planned in the first work programme of DIGITAL (Q4 2021). The CSA, expected to start in Q3 2022, will contribute to develop a governance and business model for the data space.

Certain actions under the first Work Programme of Horizon Europe Cluster 6 will boost the development of this data space.¹⁵⁴ In particular, two calls in 2021 are expected to generate additional knowledge, including on data economical aspects, the potential of big data in agriculture and on digital and data infrastructure, which should be especially beneficial for the development of a business model for the data space¹⁵⁵. The data space will also benefit from

¹⁵¹ European Commission, *Code of conduct developed by COPA-COGECA + CEMA, EIP-AGRI*, see *here*.

¹⁵² At the end of 2020, a conference was organised under the German Council presidency on digitalisation in agriculture, including a track on agricultural data and two Round Tables with Member States.

¹⁵³ See European Council, *Agriculture and Fisheries Council*, 15-16 December 2020.

¹⁵⁴ Cluster 6 of the Research and Innovation Framework Programme Horizon Europe will focus on Food, Bioeconomy, Natural Resources, Agriculture and Environment. The two calls are titled “Development of the markets and use of digital technologies and infrastructure in agriculture – state of play and foresight: digital and data technologies for the agricultural sector in a fast changing regulatory, trade and technical environment” and “Data economy in the field of agriculture – effects of data sharing and big data”.

¹⁵⁵ Concretely, the scope of these two calls under Horizon Europe are expected to cover - among others- the following activities, of direct relevance for the development of the data space: 1. Quantitative and qualitative analyses of the effects of various data sharing and marketing and use options for the actors along the agri-food supply chain and the development of scenarios for the data economy. 2. Assessing the implications of the ongoing policy-making process at EU level including the development of relevant legislation. 3. Assessing the effects of multi-level governance systems in the EU under consideration of the situation and conditions in various Member States as well as effects of international (trade) relations. 4. Reflecting on multiple data-sharing business and governance approaches and technical solution in data sharing in the agricultural sector. 5. Developing innovative approaches to forecast the markets and the uptake of digital technologies and digital infrastructure under consideration of fast-changing regulatory framing conditions in the fields of data, digital and machinery technologies and of agricultural policies.

the development of the Horizon Europe candidate partnership “Agriculture of Data”¹⁵⁶, planned for the work programme 2023/24, for which the preparatory work with Member States and stakeholders begun in spring 2021.

Horizon 2020 has funded a number of noteworthy projects in this domain. Some of these aim to tackle questions related to privately and publically held agricultural data and data interoperability, and other forthcoming large-scale projects aim to build digital platforms to support digital innovation in agriculture. For instance, the ATLAS project¹⁵⁷, with a budget of EUR 15 million, started in the end of 2019 and will conclude until early 2023. The project aims to deliver an interoperability framework among several heterogeneous data sharing systems.¹⁵⁸ Another project OpenDEI¹⁵⁹ has defined a set of general design principles for data spaces applicable across several sectors including agriculture. In the field of public data, there are national and European initiatives on sharing data from the Integrated Administration and Control System, of which some reuse the principles and technologies of INSPIRE.

Key actions:

- Under the first DIGITAL call for proposals (Q4 2021), the Commission will support a coordination and support action (CSA) aimed at developing a governance and business model for the data space with stakeholders and Member States¹⁶⁰. The CSA is expected to start in Q3 2022 and last for 18 months.

6.8. Common European data spaces for public administrations

6.8.1. Public administrations legal data space

In line with priorities highlighted by the European strategy for data for the common European data spaces for public administration, the legal data space aims at providing easily accessible, reusable, interoperable data in the area of legislation and case-law across the EU. These data can be then used in decision-making, research and the development of innovative legal tools. 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 closer cooperation among EU institutions and with Member States. The Publications Office of the European Union (OP) will consolidate a number of initiatives to lay the foundations of the legal data space. The OP works to promote interoperability, both at EU and national level, and to facilitate linking, access to and reuse of EU and national legal data.

¹⁵⁶ The principal objectives of the Horizon Europe candidate partnership Agriculture of Data are the exploitation of the potential of data technologies and earth observation offer to support sustainable agricultural production and policy monitoring and evaluation. Results of the activities carried out under this partnership can be expected to also provide indications how agricultural data can be capitalised through data technologies. For more information about the partnership, see European Commission, Agriculture of data *website*.

¹⁵⁷ ATLAS (2020). *Agricultural interoperability and analysis system*.

¹⁵⁸ An interoperability layer is being developed to allow secure interconnection of sensors with machines on a hardware level, as well as the connection of the field systems to data processing services. The data sharing system is demonstrated in several use cases.

¹⁵⁹ OPEN DEI is a project that provides a framework and support for Horizon 2020 data exchange projects across sectors to cooperate, see their policy paper *Design Principles for Data Spaces*.

¹⁶⁰ European Commission, *Preparatory actions for the data space for Agriculture*, see *here*.

Specifically, the OP contributes to the development of common standards to exchange legal information held at European and national level, by focusing on:

- the development of interinstitutional standards for the structuring of content and the secured and automated exchange of legal data within the Interinstitutional Metadata and Formats Committee (IMFC)¹⁶¹;
- providing EU related interoperability assets in the field of reference data (such as ontologies, core vocabularies, controlled vocabularies) contributing to better quality, discoverability and semantic interoperability of EU legal data;
- making these assets available for reuse to facilitate data exchange with and among Member States;
- raising awareness about the benefits of the common standards, core vocabularies and semantic interoperable models, and interoperable frameworks in the domain of legal information and documentary management (such as ELI and ECLI¹⁶²) within the EU institutions and with Member States.

To facilitate access to and linking and reuse of EU and national legal data, the OP has already put in place a common repository for automatic search and retrieval of legal data from the EUR-Lex website in open formats and is working on the development of infrastructure and tools such as:

- linking the ECLI-based search engine to EUR-Lex, allowing search for EU and national judicial decisions (to be operational in February 2022);
- offering a solution for a common search platform based on ELI metadata to offer an alternative search of EU and national legislation;
- implementing the extension of the ELI standard that covers draft legislation, thus allowing cross border findability of documents in the legislative process;
- making complete sets of files of chosen EU legal data available for download (legal data dump), to facilitate further reuse of this data in research, legal publishing and legal tech, among others;
- implementation on EUR-Lex of ELI identifiers for articles of EU legal acts for more precise linking, among others, between EU law and national law (to be available in 2022);
- a renovated digital repository infrastructure to underpin the hosting and dissemination of EU legal data, as well the modalities of operation of the repository for legislative and regulatory data coming from Member States.

Key actions:

¹⁶¹ See IMMC Core Metadata *website*.

¹⁶² Council conclusions inviting the introduction of the European Legislation Identifier (ELI) (2012/C 325/02) (OJ C 325, 26.10.2012, p. 3) and Council conclusions inviting the introduction of the European Case Law Identifier (ECLI) and a minimum set of uniform metadata for case law (2011/C 127/01) (OJ C 127, 29.4.2011, p. 1).

- Consolidation and streamlining of a number of initiatives by the OP to lay the foundations of the legal data space¹⁶³.

6.8.2. Public Procurement Data Space (PPDS)

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

In accordance with the European strategy for data, the Commission will elaborate a data space for public procurement data covering both the EU dimension, e.g. the Tenders Electronic Daily (TED)¹⁶⁴ - an online portal for public procurement notices from across the EU, managed by the Publications Office of the EU and the national dimension. The goal will be the setup of a Public Procurement Data Space (PPDS) at EU level in a federated manner¹⁶⁵. As a first step, under the Work Programme 2021-2022, DIGITAL will fund a procurement action¹⁶⁶ aimed at increasing the interoperability and interconnection of existing open data sets, to facilitate a more comprehensive overview of public procurement in the EU, including many key policy areas. The procurement action will be based on an existing pilot project, which combines data sets on Public Procurement from different Member States and data from TED. The mapping will be done using the ontology on eProcurement¹⁶⁷ funded under the previous Multiannual Financial Framework through the ISA² programme. The ontology will be the foundation for a common understanding of the concepts that will allow the linking and reuse of different datasets within the public procurement data space. The current release of the ontology covers the *eNotification* phase of the procurement life cycle and it is intended to cover all phases of the procurement life cycle.

An open-source pilot project integrating Member States open datasets with EU data from TED is currently ongoing and will be used to build the foundation of the PPDS. The drafting of the functional requirements of a new analytic IT tool for processing above thresholds data is ongoing.

The architecture of the PPDS was presented during a meeting with the Multi-Stakeholders Expert Group on eProcurement¹⁶⁸ at the end of April 2021. The participants expressed overwhelming support for the project.

The PPDS foresees a gradual implementation and will allow Member States to share their openly available public procurement data in a collaborative manner.

Key actions:

¹⁶³ COM(2020) 66 final.

¹⁶⁴ See the Tenders Electronic Daily *website*.

¹⁶⁵ A federated data infrastructure refers to a technical infrastructure connecting distributed data resources and services.

¹⁶⁶ C(2021) 7914 final.

¹⁶⁷ See About eProcurement Ontology *here*.

¹⁶⁸ See Multi-stakeholder Expert Group on eProcurement *webpage*.

- Procurement action under DIGITAL Work Programme 2021-2022 to map the data based on the EU *eForms* notices¹⁶⁹ and the eProcurement ontology¹⁷⁰. The duration of the action will be 24 months.

6.8.3. Public administrations security data space for innovation

In the AI expert group for home affairs, Member States pointed out on numerous occasions that a dedicated security data space would be a useful and necessary initiative to generate and share, in compliance with personal data protection rules, sufficient quantities of high quality data to facilitate and accelerate the development of AI technologies for law enforcement and security purposes. The scarcity of high quality and quantity of training and testing data constitutes a significant hurdle for security innovation by Member States authorities and EU Agencies.

The security data space for innovation was announced in the Commission's Communication on the EU Strategy to tackle Organised Crime 2021-2025¹⁷¹, published on 14 April 2021. This data space will lay the foundations of a federated data infrastructure¹⁷² at EU level specifically tailored to the needs of security and immigration stakeholders, including national authorities, EU agencies in charge of European security and justice representatives¹⁷³.

The Commission will support the creation of such data space. In the 2021-2022 Work Program of DIGITAL, there is an action to lay down the framework of a federated data architecture¹⁷⁴ at EU level for security innovation by funding the creation of the national components of a European security data space for innovation. This would allow innovation and development by setting up an EU-wide ecosystem for sharing, developing, testing, training and validating algorithms for AI tools for law enforcement and security purposes based on various different types of datasets, including pseudo operational and anonymized datasets, in line with the European strategy for data and in full compliance with applicable data protection rules. A call for proposal will be launched in Q1 2022, with the objective of having the selected projects starting in Q4 2022, for the participation of at least 6 law enforcement agencies and two businesses in the value of EUR 5-10 million in the form of a grant requiring 50 % co-financing.

The governance of the European security data space will follow a hybrid model, namely a federation of national and local data spaces with central services at European level. It will require an incremental development in the coming years, which necessarily must comply with the existing legal framework and be in line with the competences of all stakeholders as conferred by their respective legal instruments.

¹⁶⁹ eForms notices as defined in OJ L 272, 25.10.2019, p. 7–73.

¹⁷⁰ C(2021) 7914 final.

¹⁷¹ COM (2021) 170.

¹⁷² A federated data infrastructure refers to a technical infrastructure connecting distributed data resources and services.

¹⁷³ C(2021) 7914 final.

¹⁷⁴ A federated data architecture refers to a technical architecture connecting distributed data resources and services.

The establishment of the European security data space for innovation would entail the definition and development of common training data sets, data quality control, documentation, testing and validation procedures (based on the new requirements in the AI proposal and the future harmonised standards for their implementation), cloud-based storage and computing capabilities, etc.

The European security data space will be grounded on the existing legal instruments setting out competences and responsibilities for the Member States law enforcement authorities as well as the European Agencies responsible for justice and home affairs, in particular Europol and eu-LISA. These agencies shall play a key role in the governance of the security data space, considering its hybrid nature.

This data space will contribute to foster security research and development of AI technologies. It will strengthened technological sovereignty by creating high quality datasets that would enable national law enforcement authorities to develop and validate their own digital tools, which would 1) eliminate the threat of malicious interference of third countries/parties; 2) reduce the dependence on third-country vendors and allow for setting quality standards at EU level; and 3) increase the technological capabilities of national authorities.

Key actions:

- Under DIGITAL, the Commission will launch a call for proposals (Q1 2022) by simple grant (50% co-funding rates) to lay down the framework of a federated data architecture¹⁷⁵ at EU level for the security data space for innovation¹⁷⁶. Projects are expected to start in Q4 2022.

6.9. Common European skills data space

High-quality data on qualifications, learning opportunities, jobs and skills will feed the creation of this data space. Several Commission's initiatives, such as reference frameworks for qualifications¹⁷⁷ and for digital skills and competence¹⁷⁸, the European skills classification (ESCO)¹⁷⁹ and the Europass e-portfolio¹⁸⁰, increase transparency of information on people's skills, qualifications and learning opportunities and deliver on the European Skills Agenda¹⁸¹.

The European skills data space will aim at sharing and accessing skills data for various purposes, from analytical and statistical purposes to policy development or reuse in innovative

¹⁷⁵ A federated data infrastructure refers to a technical infrastructure connecting distributed data resources and services.

¹⁷⁶ C(2021) 7914 final.

¹⁷⁷ OJ C 189, 15.6.2017, p. 15–28.

¹⁷⁸ European Commission (2017). *DigComp 2.1: The Digital Competence Framework for Citizens with eight proficiency levels and examples of use*, JRC Publications Repository; European Commission, *European e-Competence Framework*, see [here](#).

¹⁷⁹ European Commission, Classification of European Skills, Competences, Qualifications and Occupations, see [here](#).

¹⁸⁰ OJ L 112, 2.5.2018, p. 42–50.

¹⁸¹ European Commission, *European Skills Agenda website*.

applications, as well as at providing easy, cross-border access to key datasets. The European skills data space will also aim to reduce the skills mismatches between education and training systems on the one hand and labour market needs on the other. Besides improving skills intelligence, this data space will deliver services to its users, with recommendations of learning opportunities to support their upskilling efforts, tailored to the information on their skills profiles.

On 25 October 2021, the Commission launched the European digital credentials for learning platform¹⁸², thus enlarging the pool of data on which the European skills data space will be built. Through this platform, individuals can easily share their learning achievements in a secure digital environment, when applying for a job or for further studies and training. It also helps employers, education and training providers to quickly confirm if someone's digital diplomas and certificates are genuine and accurate.

The skills data space will be created in collaboration with the several EU agencies such as the European Centre for Development and Vocational Training¹⁸³, the European Labour agency¹⁸⁴ and European Training Foundations¹⁸⁵. 18 Member States joined a pilot project in 2020 and some of them have already implemented the European digital credentials for learning in their digital ecosystem.

Reflections are currently on-going on the full scope of the skills data space, including relevant data available at national and European level. Relevant national level data could relate to national skills and occupations classifications, national platforms on learning and national qualification registers. Relevant European level data could cover the Skills Online Vacancy Tool¹⁸⁶ which presents information on the jobs and skills employers demand based on online job advertisements in 28 European countries and data from the European Skills classification (ESCO). Also future initiatives are relevant in this context such as forthcoming Commission proposals for individual learning accounts and on the European approach to micro-credentials could lead to more national data on learning being shared at the European level.

Under DIGITAL first Work Programme 2021-2022, a coordination and support action will call on the relevant stakeholders to explore possible options and conceptual approaches for the development and deployment of the skills data space.

Key actions:

- Under DIGITAL first Work Programme, the Commission launched a call for proposals (Q4 2021) for a coordination and support action (CSA) to engage all stakeholders and explore conceptual approaches for the future deployment of the skills data space¹⁸⁷. The CSA is expected to start in Q3 2022 and last for 12 months.

¹⁸² European Digital Credentials for Learning, see *here*.

¹⁸³ See European Centre for the Development of Vocational Training, see *here*.

¹⁸⁴ European Labour Authority, see *here*.

¹⁸⁵ European Training Foundation, see *here*.

¹⁸⁶ See webpage *here*.

¹⁸⁷ European Commission, *Preparatory actions for the data space for skills*, see *here*.

6.10. European Open Science Cloud

The European Open Science Cloud (EOSC)¹⁸⁸ brings together institutional, national and European stakeholders to develop an inclusive research data and services ecosystem in Europe. As requested by the Council¹⁸⁹, EOSC is being implemented since 2018 as a trusted open data environment to allow reliable reuse of research data to European researchers, innovators, companies and citizens.

There is an enormous innovation potential arising from combining research data with public and private data in all key sectors of the European data economy. The European strategy for data recognised EOSC as the basis for a science, research and innovation data space to be articulated with the new sectoral data spaces foreseen by the Strategy.

The long term objective of the EOSC is to enable a step change across scientific communities and research infrastructures in the EU towards seamless access, FAIR (Findability, Accessibility, Interoperability and Reusability) management and reliable reuse of research data and all other digital objects produced along the research life cycle (e.g. methods, software and publications). The EOSC ultimately aims to develop a 'Web of FAIR Data and services' for science in Europe upon which a wide range of value-added services can be built. These range from visualisation and analytics to long-term information preservation or the monitoring of the uptake of open science practices¹⁹⁰.

Following a preliminary phase of implementation (2018-2020) essentially based on EU grants (Horizon 2020 programme), EOSC has entered its second phase of implementation (2021-2030) as a new Co-programmed European Partnership in the Horizon Europe programme.

In July 2020, the EOSC Association, a legal entity, was established to govern the EOSC and provide a single voice to the broader EOSC stakeholder community. The membership of the association has been rapidly expanding to overtake 150 institutional members and 50 observers. A new EOSC European partnership was launched following the signing of the “Memorandum of Understanding for the Co-programmed European Partnership for the EOSC” by the European Union, represented by the Commission, and the EOSC Association on 31 July 2021¹⁹¹. The partnership will ensure, until the end of 2030, a coordinated approach from the Commission and the stakeholders to investments and initiatives in the EOSC ecosystem. An EU investment of almost EUR 500 million and an in-kind contribution of the partners of also EUR 500 million are foreseen in the period 2021-2027. The aim is to improve the storing, sharing and reusing of research data across borders and scientific disciplines¹⁹².

¹⁸⁸ A complete list of relevant documents on the European Open Science Cloud is available in the EOSC *webpage*.

¹⁸⁹ European Council conclusions on the European Open Science Cloud - (9291/18), Council conclusions on shaping Europe's digital future (8711/20).

¹⁹⁰ European Commission, European Open Science Cloud (EOSC), see *here*.

¹⁹¹ EOSC Association and the European Commission (2021). *Memorandum of Understanding for the European co-programmed partnership for the European Open Science Cloud (EOSC)*, see *here*.

¹⁹² European Commission (2021). *Launch ceremony of the EOSC European Partnership during the R&I Days 2021*, Press Release.

A new tripartite EOSC governance framework has been set up which was welcomed by the Council¹⁹³ in December 2020. The three parties include the EU, represented by the Commission, the European research community, represented by the EOSC Association, and EU Member States and countries associated with Horizon Europe, represented through a Steering Board set up in March 2021 as an expert group of the Commission.

In 2021, an EOSC Strategic Research and Innovation Agenda (SRIA)¹⁹⁴ was co-developed with the European research community and the EOSC governance framework. This Agenda sets the general, specific and operational objectives of the EOSC partnership until 2030, with key performance indicators and detailed priorities for 2021 and 2022. The implementation of the Agenda will follow a three-stage approach:

- Stage 1 (2021–2022): the core technical functions that enable the operations of the EOSC will be deployed (the so called EOSC core) to allow search and access functionalities and the federation of existing infrastructures with associated rules of engagement and governance.
- Stage 2 (2023–2024): expansion of the core data infrastructure with services that support the full cycle of workflows for scientific research in key thematic areas. Moreover, during this period it is expected that the kick off and development of pilot projects and demonstrators to link EOSC to the wider public sector and the private sector will begin.
- Stage 3 (2025–2027 and beyond): in addition to European infrastructures, the national research infrastructures delivered from the Member States and Associated Countries in particular will help to further expand the EOSC.

The EOSC overall infrastructure will be scalable, flexible and user-centric, constantly improved and upgraded following users' feedback and the state-of-the-art of the underlying core technologies.

Interoperability is a key factor to deepen the interconnections and composability of resources and services. The EOSC interoperability framework is inspired by the European Interoperability Framework (EIF) and the European Interoperability Reference Architecture (EIRA), providing a common understanding regarding the main technical elements and building blocks to be used. Through a bespoke EOSC Interoperability Framework, relevant infrastructure links and interfaces will be established to create synergies between the EOSC and the activities in the context of the common European data spaces and the European Alliance on Industrial Data and Cloud. Notably, the matured experience of FAIR data implementation to enhance discoverability, interoperability and reuse, will be shared and offered as best practice in the context of the common European data spaces support centre.

¹⁹³ Council conclusions on the New European Research Area (13567/20).

¹⁹⁴ EOSC Executive Board (2021). *Strategic Research and Innovation Agenda of the European Open Science Cloud*.

Key actions:

- The Commission, through the EOSC European Partnership, will support the deployment of EOSC core operations to serve EU researchers (2021-2025)¹⁹⁵ with dedicated funds under Horizon Europe Work Programme 2021-2022 for Research Infrastructures¹⁹⁶.
- The Commission, through the EOSC European Partnership, will support opening up, connecting and articulating EOSC beyond the research communities by engaging with industry and public sector at large from 2024 onwards¹⁹⁷.
- The Commission and the members of the EOSC association will support the implementation of the EOSC objectives with a cumulated investment of about EUR 1 billion until 2027¹⁹⁸.

6.11. Common European data space for media

The setting-up of a European data space for media was confirmed as part of the Media and Audiovisual Action Plan, adopted by the Commission on 3 December 2020, to support media companies in sharing data and developing innovative solutions. The creation of a media data space will also take into account the European Democracy Action Plan, adopted on 3 December 2020, in order to safeguard the freedom of expression as well as to help people assess the trustworthiness of content.

The media data space will integrate state of the art tools and services needed for the management and processing of data in full respect of the relevant EU and national legislation. It will take into account the inputs of the broad stakeholder community and will address European publishers, broadcasters, radios, advertising companies, media SMEs, technology providers, content and tech start-ups, content creators and producers. A media data space will:

- a) secure interoperability and an easy, cross-border access to key datasets,
- b) link to the creation of innovative solutions, tools and models for the production, curation, circulation and distribution of European media content across the Union,
- c) ultimately contribute to connect sub-dataspaces from various media sectors to a coherent data space, aligned with the European strategy for data.

Using these building blocks for the future media data space, EU media stakeholders will increase their capacity to understand and deal with data-driven business models and pool together increasing sets of content, data and metadata to produce new products and formats targeting expanded audiences in multiple languages. By providing access to larger datasets, the media ecosystem would be better equipped to scale up.

¹⁹⁵ COM(2020) 66 final.

¹⁹⁶ European Commission Decision C(2021)9128 of 15 December 2021, Horizon Europe Work Programme 2021-2022, see *here*.

¹⁹⁷ COM(2020) 66 final.

¹⁹⁸ EOSC Association and the European Commission (2021). *Memorandum of Understanding for the European co-programmed partnership for the European Open Science Cloud (EOSC)*, see *here*.

The creation of a media data space will consist of three layers of action, of which the development of the core infrastructure through funding from DIGITAL plays a fundamental role:

1. Infrastructure: including the deployment of enabling technologies, of the underlying structural components to design, implement and operate a data space as well as the required elements for data governance and setting of standards.
2. Applications: development of technical and innovative tools to operationalise content platforms, including, for example, modules on automatic translation, neutral search, editing tools, social media interaction, news aggregation and content-driven modules.
3. Content: support to curation, joint-production and circulation of news and media content and its adaptation to different audience targets and consumer preferences.

As the media sector comprises a number of heterogeneous fields, several sub spaces are likely to be used as initial building blocks for the European media data space, such as news media, audio-visual content sharing, augmented and virtual reality, film production and gaming. Consequently, the first emphasis will be on interoperability and creation of connections between these sub-spaces.

Key actions:

- Outreach actions and stakeholders consultations by the Commission, first conclusions expected Q1 2022¹⁹⁹.
- Two European Parliament Pilot Projects (2021-2022) setting out a feasibility study for the creation of infrastructures for data and information sharing platforms for the media ecosystem. First results are expected Q1 2022²⁰⁰.
- Through a call for proposals for a Preparatory Action (PA)²⁰¹, launched in Q3 2021, the Commission aims to set up media platforms enabling publishers and broadcasters to pool together content and customer data to produce news content and factual programming in multiple languages. The PA will build on the results of a content sharing action funded through the Multimedia Actions line. The projects are expected to start by 1 March 2022 and will have a duration of 12 to 15 months.
- Through Horizon Europe, publication of a first dedicated call for proposals in 2021 for prototyping advanced solutions for the creation, distribution and consumption of new

¹⁹⁹ Announced in COM(2020) 784 final.

²⁰⁰ European Commission, *SMART 2019/0094 Pilot Project — Digital European Platform of Quality Content Providers*, Call for tenders, see *here*.

²⁰¹ European Commission, *European media platforms*, call for proposals for a Preparatory Action, see *here*.

The call is part of the 2021 work programme regarding pilot projects and preparatory actions in the field of "Communications Networks, Content and Technology" requested by European Parliament, Commission Decision C/2021/3006 of 04 May 2021.

immersive and innovative products for media, which directly links to the media data space. Project(s) expected to start Q2-Q3 2022²⁰².

- Calling for initiatives under DIGITAL in 2022 to set up an infrastructure and develop tools for media data sharing, as well as tools for data analytics and services²⁰³.

6.12. Common European data space for cultural heritage

The Recommendation on a common European data space for cultural heritage, adopted on 10 November 2021²⁰⁴, paves the way for the creation of a cultural heritage data space. It aims at supporting and accelerating the digital transformation of Europe's cultural heritage sector by boosting the digitisation of cultural assets and the reuse of high-quality data in this sector and others, such as media and tourism. To this end, the Joint Research Centre of the Commission has developed the *Cultural gems*²⁰⁵, a map-based web platform aimed at creating a common repository for cultural and creative places²⁰⁶. City dwellers as well as organisations can contribute by adding less known places and stories hidden behind the physical places. This allows even smaller cities to engage with their residents and to promote local cultural and creative places on a Europe-wide map.

The Recommendation covers all types of assets with special attention to categories of cultural heritage, such as heritage at risk. It sets two targets for Member States on digitisation and online availability, to be achieved by 2030:

- digitise in 3D all monuments and sites at risk and 50% of the most physically visited cultural and heritage monuments, buildings and sites;
- contribute an additional 40 million, high quality, digitised and diversified types of cultural heritage assets for reuse to *Europeana*²⁰⁷.

By 2025, Member States should digitise 40% of the overall 2030 targets.

The data space for cultural heritage will build on the current *Europeana* platform, its robust data governance and model (such as the *Europeana Data Model* and the *Publishing Framework*²⁰⁸), and it will expand its functionalities, seizing new opportunities created by advanced technologies like 3D digitisation, cloud computing, crowd-sourcing, artificial intelligence and extended reality. During the recent COVID-19 pandemic, for example, *Europeana* and systems like *Cultural gems* and the Joint Research Centre's *Cultural and*

²⁰² European Commission Decision C (2021) 9128 of 15 December 2021, see Horizon Europe Work programme 2021-2022 [here](#).

²⁰³ C (2021) 7914 final.

²⁰⁴ C(2021) 7953 final.

²⁰⁵ See Cultural Gems [webpage](#).

²⁰⁶ Alberti, V., *et al.* (2021). *Cultural gems*, European Commission, Ispra, 2021, JRC126194.

²⁰⁷ See the Europeana Platform [webpage](#). Europeana currently gives access to 52 million cultural heritage assets, 45% of which can be reused in various sectors. Images and text make up 97.5% of the assets, with only 2.47% audiovisual content and 0.03% in 3D. Increased contributions of high quality digitised assets, such as in 3D, would enhance innovation and creation through the use and reuse of the digitised cultural heritage assets in various key domains, see C(2021) 7953 final.

²⁰⁸ See the Europeana.pro website [here](#) and [here](#).

*Creative Cities Monitor*²⁰⁹ have already shown their great potential for the safe resumption of activities in the cultural and creative sectors²¹⁰.

In order to facilitate a wide adoption of standards and reuse of data, the data space will be provided with trustworthy mechanisms, such as security by design technologies. It will also ensure data access and usage rights, including relevant EU copyright provisions²¹¹.

A Commission Expert Group has been set up²¹² to provide advice and expertise to the Commission on the creation of the data space for cultural heritage. Specifically, the group will contribute to the evolution of the data space for cultural heritage and sustainability of *Europeana* and support the Commission in defining the general objectives and priorities for actions for this data space under DIGITAL. It will also assist the Commission in monitoring developments regarding the way cultural digital resources can be reused in innovative ways to offer economic opportunities to cultural and creative industries.

The creation of the data space for cultural heritage aims to:

- strengthen infrastructures, with better services for data providers and aggregators;
- support the creation and integration of high-value datasets (HVDs) of digital cultural content of any kind, size and nature. These will boost research, reuse and the development of innovative applications in the cultural and creative sectors as well as in other areas such as tourism, or education;
- improve data (content and metadata) quality, access and reuse, enhance multilingualism and encourage the use of interoperable formats;
- build capacity and skills on digital transformation;
- further enlarge, coordinate and engage with the network of data partners (museums, galleries, libraries, archives, and other cultural institutions across Europe), accredited aggregators, and experts working in the field of digital cultural heritage;
- develop standards for the provision of datasets, including the *Europeana Data Model*.

Key actions:

- Under DIGITAL, the Commission will launch in Q1 2022 a procurement to extend *Europeana* to a data space for cultural heritage. The action will last 24 months and is expected to start in Q1 2023²¹³.
- Under DIGITAL, the Commission will launch in 2022 support grants to reach the objectives of the cultural heritage data space. It has a duration 24 months²¹⁴.

²⁰⁹ See Cultural and Creative Cities Monitor *webpage*.

²¹⁰ Commission coronavirus response, see *here*; and C/2021/4838.

²¹¹ OJ L 130, 17.5.2019, p. 92–125.

²¹² Creating decision: COMMISSION DECISION C(2021) 4647 of 29.6.2021 setting up the Commission Expert Group on the common European Data Space for Cultural Heritage and repealing Decision C(2017) 1444, see *here*.

²¹³ C (2021) 7914 final.

²¹⁴ C (2021) 7914 final.

7. Conclusion

This Staff Working Document provides an overview of the common European data spaces that are being developed in various strategic sectors or domains in response to the European strategy for data. Relevant horizontal aspects, such as governance and legislative measures and the EU programmes that support the creation of the data spaces, are also presented.

The data spaces will allow data from across the EU to be made available and shared in a trustworthy and secure manner. This will enhance the development of new data-driven products and services in the EU.

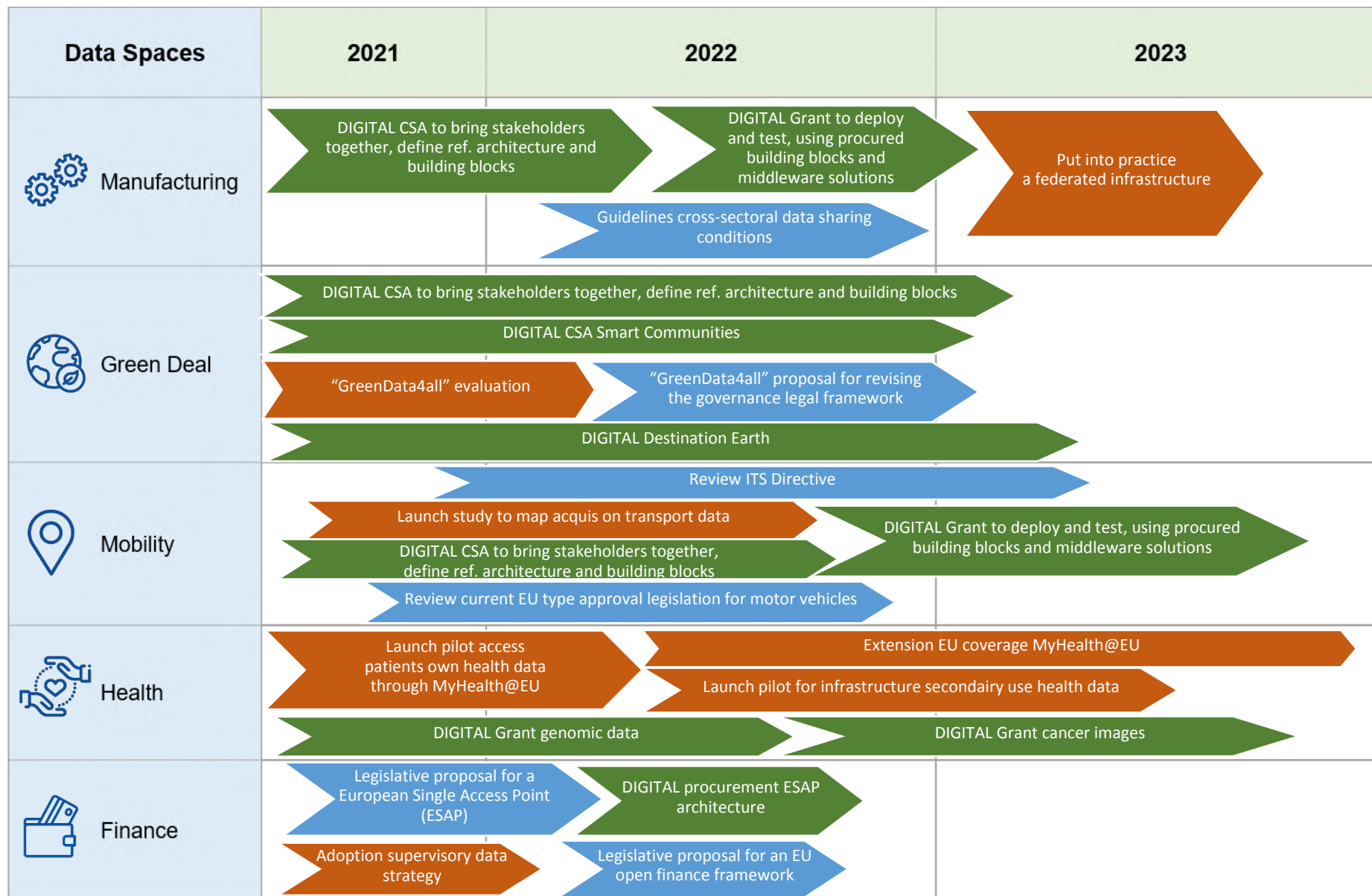
In February 2020, the European strategy for data presented the Commission's view for setting up initially 10 sectoral/domain-specific data spaces. Important steps have been achieved since then, both horizontally and per sector/domain, to allow more data sharing and providing the basis, in terms of both legislative and funding measures, for the data spaces. In November 2020, the Commission adopted the first horizontal legislative initiative in this direction, the Data Governance Act. Funding programs supporting the data spaces have been adopted and first calls launched in 2021. Progress has been achieved also in additional sectors, such as media, culture, tourism and construction, paving the way for increased data sharing.



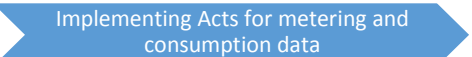



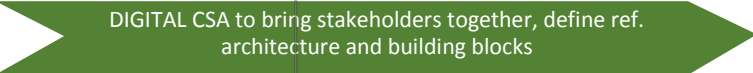


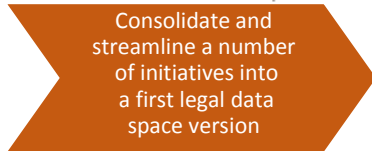
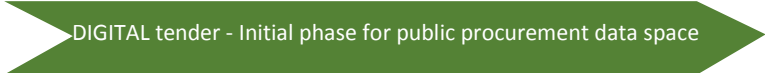
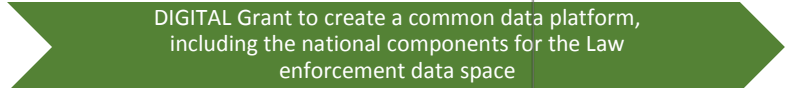


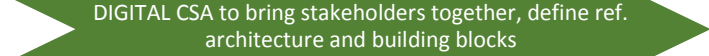



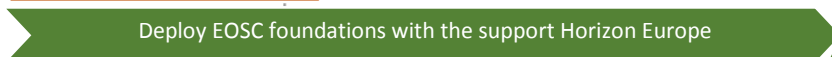

In 2022, the Commission will present the Data Act, which is the second major horizontal legislative initiative after the Data Governance Act. Additionally, a legislative proposal on a governance framework establishing the European Health Data Space will be proposed in the first half of the year. Other important milestones for 2022 include the adoption of a proposal for an EU open finance framework, a Digitalisation of Energy Action Plan, as well as the review of existing EU rules in the mobility sector and on environmental geospatial data and public access to environmental information. In parallel, work planned under the funding programs will continue for all data spaces concerned.

The Commission will further report on the development of common European data spaces in 2023.

Annex 1: Common European Data Spaces – Timeline

The blue **colour** represents legislative and political initiatives. The green **colour** represents funding initiatives of the Commission. The brown **colour** describes other actions.



Data Spaces	2021	2022	2023
 Energy	 Create a community of stakeholders	 Implementing Acts for metering and consumption data  Network code on cyber-security  Pilot projects Horizon Europe	
 Agriculture	 DIGITAL CSA to bring stakeholders together, define ref. architecture and building blocks  Agri data space projects Horizon Europe		
 Public Administration	 Consolidate and streamline a number of initiatives into a first legal data space version  DIGITAL tender - Initial phase for public procurement data space	 DIGITAL Grant to create a common data platform, including the national components for the Law enforcement data space	
 Skills	 Launch European Digital Credentials platform  DIGITAL CSA to bring stakeholders together, define ref. architecture and building blocks  Promotion, technical user support and technical improvement of ESCO, Europass, EDC and QDR		
 EOSC	 New EOSC European Partnership  Deploy EOSC foundations with the support Horizon Europe		 Deploy EOSC Value-added Services for scientists support Horizon Europe

Annex 2: Mapping between common European data spaces and industrial ecosystems

The European Commission conducted a preliminary analysis to explore the relationship between domain-specific/sectoral data spaces and industrial ecosystems. Each one of the industrial ecosystems²¹⁵ was mapped to the common European data spaces²¹⁶ based on the types of data it would need to have access to. The purpose of this pre-analysis was not to make an exhaustive list of the relevant mappings but to give an indication about the value of the common European data spaces for the green and digital transition of the industrial ecosystems.

Industrial ecosystems \ EU data spaces	Manufacturing	Green Deal	Mobility	Health	Financial	Energy	Agricultural	Legal	Procurement	Security	Skills	Open Science	Media	Cultural heritage	Tourism	Construction	Smart communities
Construction	✓	✓			✓	✓		✓	✓		✓	✓		✓		✓	✓
Tourism		✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓	✓		✓
Textile	✓	✓						✓	✓		✓	✓					
Proximity and social economy	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓	✓	✓	✓
Mobility-Transport-Automotive	✓	✓	✓			✓		✓			✓	✓					✓
Health	✓	✓		✓				✓			✓	✓					
Energy intensive industry	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓				✓	✓
Energy renewables	✓	✓	✓		✓	✓	✓	✓	✓		✓	✓				✓	✓
Retail	✓	✓	✓		✓		✓	✓			✓	✓			✓		
Electronics	✓	✓				✓		✓			✓	✓					
Digital industries	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓	✓
Cultural and creative industry	✓	✓						✓			✓	✓	✓	✓	✓	✓	
Agri-food	✓	✓		✓			✓	✓			✓	✓			✓		
Aerospace & Defence	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Mappings between industrial ecosystems and common European data spaces based on the types of data it would need to have access to

The results demonstrate that industrial ecosystems would need access to data coming beyond their domain and each data space is expected to contribute to the digital transition of multiple ecosystems. For example, the construction industrial ecosystem would need access to data shared not only by construction common data spaces but also by a wide range of other data spaces. Due to the horizontal nature of their data, it is anticipated that some common data spaces (manufacturing, green deal, legal, skills, open science) will have a transformative effect on all sectors of EU economy as they contain data needed for the vast majority of industrial ecosystems.

The identified mappings show the essential role of cross-sector data interoperability for the creation of a single EU data economy. Such interoperability can be achieved through the development at the European level of appropriate standards that will simplify and homogenise

²¹⁵Annual Single Market Report 2021.

²¹⁶ The list of common European data spaces included: the 10 sectoral common European data spaces that were announced in the European data strategy as well as a common European data space in the media sector – announced in December 2020, and for cultural heritage – announced in November 2021. The list also included the common data spaces on tourism, construction and smart communities for which important work for the development is ongoing

the interpretation of data and thus will tackle a major information exchange barrier. In this respect, the coordination and cooperation between stakeholders and the European Standardisation Organisations²¹⁷ will be key for developing the needed standards and increasing their visibility, within and across industrial ecosystems and European data spaces.

²¹⁷ European Commission, *Key players in European Standardisation*, see [here](#).