Vision Paper: European Federation of Data Innovation Spaces (i-Spaces)

Connecting Data and AI European policies with local impact / Federating European experimental resources and talent for success

BDV BIG DATA VALUE ASSOCIATION

EUHUB EUROPEAN FEDERATION OF DATA DRIVEN INNOVATION HUBS

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1. Executive Summary

We are in a complex environment around data where AI Innovators need data computing power at hand (now!); SMEs need support to become data-driven and join data ecosystems to strengthen their position in the digital value chains; Companies get more and more interest on data ethics, Data owners (really big data holders) need incentives to share; Fair data value chains still need to be invented; New AI and Data regulations bring challenges for innovators; Skills development, access to secure experimentation and open innovation seems to be more important than ever, …

In this context, a group of organizations which have developed strong business and human ecosystems around secure data-sharing experimentation facilities decided to join forces time back. They created a quality label for innovation data spaces (called i-Space label) as a way to benchmark, promote and evolve their ambitions and community. This is the i-Spaces community. They have federated themselves with the vision of being the reference for experimentation and innovation with industrial, public and personal Data and AI technologies following the European, national and regional values and principles. These organisations are at the core of HPC, AI TEFS, EDIHs, Data Spaces … and together create a super-core for Europe.

This super-core aggregates computing power, tools, ethics guidelines, business models, … in a global pan European federated catalogue that accelerates the evolution and adoption of Data driven innovation and AI Technologies and regulations in Europe by facilitating a safe, trustworthy and regulatory compliant environment for cross-border and cross-sector data-driven experimentation.

In this vision paper, the vision, mission and objectives of i-Spaces and the Federation of i-Spaces will be shown, jointly with the unique value proposition that these i-Spaces are providing for Europe. Central to the Federation are the pillars that uphold it. A guarantee of quality is ensured through the BDVA i-Space label. The federated catalogue serves as a testament to the commitment to collaboration. Special emphasis is given to SMEs and their integration into local ecosystems. Furthermore, a horizontal data-driven ethics framework encompasses all the operations.

The impact of the Federation is set to be widespread. With geographical coverage spanning numerous regions, the roadmap elucidates the strategies for a sustainable Federation. By emphasizing its vision, the Federation anticipate considerable expected impacts across various facets of the digital realm.

To close the document, a corollary of the importance of i-Spaces and the Federation for supporting the implementation of European Data Policies is generated.

2. Vision and Positioning

2.1. Vision and Mission Statement

In a world where data owners are empowered to protect their competitive, personal and sensitive data, and also promote innovation and collaboration in the digital space, safe and trustworthy environments for data experimentation and fast innovation without compromising the privacy and security are needed.

At the same time, new regulations are required to promote the responsible use of data and technology in Europe.

The i-Spaces Federation vision is to ***be the reference for experimentation and innovation with industrial, public and personal Data and AI technologies following the European, national and regional values and principles***, combining a qualified and coordinated network of Labs/testing facilities and the experience of **responsible practices of data management and AI *to support the European companies in their way into the data economy.***

EUHubs4Data enables the uptake of advanced data and AI technologies for business and society, promoting data interoperability, protection and innovation as the core principles of their operation, to consolidate the leadership of Europe in the ethical and human centric use of artificial intelligence, contributing to our international competitiveness.

The Federation's mission is to ***accelerate the evolution and adoption of Data driven innovation and AI Technologies and regulations in Europe*** by facilitating **a safe, trustworthy and regulatory compliant environment** for cross-border and cross-sector data-driven experimentation. The Federation links relevant European initiatives on Data and AI in a **single ecosystem** providing a ***sustainable high-quality and global European federated catalogue*** of ***data sources, data-driven services, courses and solutions deployed locally by the i-Spaces***.

The Federation, with its technological and geographical coverage offers a one-stop-shop ensuring that European companies at any level could easily access the economic opportunities presented by data-driven innovation, through a secure and decentralized platform where innovators can store, manage, process, and share their data in a safe and regulatory compliant environment.

i-Spaces will leverage advanced technologies such as artificial intelligence, big data infrastructures as well as value adding data innovation services. In addition, they act as a key consultant for European authorities, working closely with policymakers and regulators to improve existing regulations and develop new ones that support the responsible use of data and technology.

2.2. Strategic Objectives

Following the Mission and Vision, the main strategic objectives are the following:

- Compose an **integrated and orchestrated network** of i-Spaces working together to a global objective, developing and sharing knowledge and best practices.
- Facilitate the **experimentation and innovation** of the local ecosystem of SMEs and public administration through the local i-Spaces, and **accelerate the adoption of data and AI technologies**, promoting data interoperability, protection and innovation as the core principles of their operation.
- Understand the ***regional and national economy, society and regulations and combine them with the European ones to provide a personalised and quality service to the local ecosystem***.

- Create a **global and qualified catalogue** of data sources, data services and data courses, that brings together and federates the different individual catalogues.
- Facilitate the **access of local ecosystems to the main initiatives in Data and AI** in Europe.
- Contribute to the **assessment, definition and validation of current and future European regulations and standards** in data and AI that support the responsible use of data and technology.
- Consolidate the **leadership of Europe in the ethical and human centric use of data and artificial intelligence,** contributing to the international competitiveness.
- Establish **links with the main stakeholders around data spaces.**
- Be **sustainable in the future,** giving continuity to the results achieved in the project.

2.3. The European landscape of policies and initiatives

The EUHubs4Data project (and expected long-term or sustainable federation) has been devised as part of the activities of the Big Data Value PPP in alignment with the Strategic Research and Innovation Agenda (SRIA) and roadmap. The concept of i-Spaces (which are the basis of the EUHubs4Data Federation) was identified as one of the key instruments for the creation of value out of data in Europe.

The EUHubs4Data Federation project has kicked-started at the very end of the H2020 programme, in a period of transition between H2020 and Horizon Europe. Many other data initiatives and projects were also launched during 2020 and 2021, notably the data platforms projects under ICT-13 call, the Digital Transformation sister projects to EUHub4Data project under DT-ICT-05, the DT-ICT-11 (Energy Data Platforms) and the ICT-51 projects focused on big data technologies and extreme data analytics. These data projects and initiatives have been one of the focus areas for strategic engagement up to now. Many of these projects have finished at the end of 2022 (e.g the data platform projects).

In the meantime, new projects of relevance to the Federation and its objectives have started in 2022 as part of Horizon Europe (HE). In this context we need to highlight the projects funded under Horizon Europe, Cluster 4, Destination 3 result of the calls 2021-DATA-01-01 Compliance technology, 2021-DATA-01-03 Data management, 2022-DATA-01-04, Trading & exchange, 2022-DATA-01-01

Exploitation of data and knowledge, and 2022-DATA-01-05 on extreme data mining. The EUHubs4Data Federation will continue to bring together all those initiatives in collaboration with BDVA, and leverage some of their most relevant results by integrating them in the federated catalogue providing a unique European framework for data driven innovation.

In the context of the HE, partnerships launched in June 2021 are consolidating over time and are in the process of updating their Strategic Agendas. The AI, Data and Robotics Partnership (and its related CSA, the projects Adra-e that started in July 2022), the EOSC Partnership and the EuroHPC Joint Undertaking (that combines HE and DEP resources) are the most relevant partnerships for the EUHubs4Data Federation.

Relevant private data initiatives such as **GAIA-X** and public-private collaborations such as the **AI, Data and Robotics partnership** and the **European Alliance of Industrial data and Cloud** are getting a momentum and are likely to influence the way we shape the Federation.

Another major update in the ecosystem is the **implementation** of the **Digital Europe Programme**[1] (DEP) as many initiatives of great importance to the EUHubs4Data Federation, such as the **European DIHs (EDIH)**[2] and the **Digital Transformation Accelerator** (DTA) that will support them, the **European Data Spaces, the Testing and Experimentation Facilities (TEFs)**[3], the **AI on Demand platform**, and many **Digital Skills** projects selected in the first call for proposals. Special attention should be given to the **Data Spaces Support Centre (DSSC)** and the overall portfolio of preparatory actions for the domain specific Data Spaces as they all are key elements for the deployment of Data Spaces in Europe, sharing objectives with EUHubs4Data. Another important development in DEP is the announcement of **Simpl**[4], the smart middleware that will enable cloud-to-edge federations and support all major data initiatives funded by the European Commission, such as common European data spaces.

Linked to the Data Spaces, a relevant update in the ecosystem is the **Data Spaces Business Alliance (DSBA)**[5] that was launched on September 2021:

[1] European Commission, "The Digital Europe Programme" [Online]. Available: https://digital-strategy.ec.europa.eu/en/activities/digital-programme

[2] European Commission, "European Digital Innovation Hubs" [Online]. Available: https://digital-strategy.ec.europa.eu/en/activities/edihs

[3] European Commission, "Testing and Experimentation Facilities under the Digital Europe Programme" [Online]. Available: https://digital-strategy.ec.europa.eu/en/activities/testing-and-experimentation-facilities

[4] European Commission « Simpl: cloud-to-edge federations and data spaces made simple » [Online]. Availabe: https://digital-strategy.ec.europa.eu/en/news/simpl-cloud-edge-federations-and-data-spaces-made-simple

[5] More information about the DSBA can be found on the website: https://data-spaces-business-alliance.eu/

Gaia-X European Association for Data and Cloud AISBL, the Big Data Value Association (BDVA), FIWARE Foundation, and the International Data Spaces Association (IDSA) joined forces to drive the adoption of data spaces across Europe and beyond. The DSBA has developed multiple activities and produced outcomes of relevance for EUHubs4Data (and with the contribution of the project and the hubs). EUHubs4Data is fully engaged and has become part of the DSBA under the umbrella of BDVA. Another important alliance shaping the ecosystem is the **European Alliance of Industrial data, edge, and Cloud**[6] that has grown in members and activities.

EUHubs4Data is also increasingly connected to the MyData Global community, and especially the **ethics framework created by the project** creates a potential for synergies and collaboration.

Throughout the lifetime of the EUHubs4Data, the European data-sharing landscape has changed rapidly. From the **regulation perspective** several relevant legislative instruments have being proposed by the European Commission for the implementation of the European Data Strategy, in particular: 1) the **Data Governance Act** (DGA, Nov 2020, approved in June 2022) with a focus on ensuring trust in data transactions, 2) the **Digital Markets Act** (DMA, Dec 2020) regulating to data-based market power; 3) the **AI Act** (2021) with implications on AI data governance and data management; 4) the Implementing act on High-Value Datasets under the **Open Data Directive** to further unleash the socio-economic potential of data as a public good, and 5) the **Data Act** (DA, Feb 2022) targeting a wide spectrum of topics, including facilitating access to and use of data by businesses and consumers, and providing for the use by public sector bodies and institutions data held by enterprises in exceptional situations.

Additionally, the European Commission's policy proposal "**Path to the Digital Decade**" aiming to achieve a successful digital transformation of the Union by 2030 addressing the challenges and ambition described in the Commission's Communication "2030 Digital Compass"[7]. EUHubs4Data can make contributions to this policy programme accelerating and contributing to the Digital Transformation of Business and in particular the Big Data uptake (baseline uptake for Digital Compass 2020: 14% of EU companies; target for 2030: 75%) and by supporting the deployment of common European Data Spaces. This is considered a relevant focus area for the policy engagement of

[6] European Commission, "European Alliance for Industrial Data, Edge and Cloud" [Online]. Available https://digital-strategy.ec.europa.eu/en/policies/cloud-alliance

[7] 2030 Digital Compass: Your Digital Decade. European Commission. 2022. https://futurium.ec.europa.eu/en/digital-compass.

the project in the months to come. Connected to the Digital Decade policies, it is very important to monitor the different **national plans** linked to the implementation of the Next Generation EU[8] recovery fund as many of those are preparing large investments in the digital sector and an alignment with EU R&I strategy shall be expected.

Finally, the EC also published at the beginning of 2022 the communication "An EU Strategy on **Standardisation**: setting global standards in support of a resilient, green and digital EU single market" emphasising the dependences on the success of European actors in standardisation at international level and the Europe's competitiveness, technological sovereignty, and protection of EU values. One of the priority areas identified is "data standards enhancing data interoperability, data sharing and data re-use in support of the Common European Data Spaces". The role that the Federation can have to support Standardisation processes (such as the ones linked to the AI Act and shortly to the Data Act), is still under exploration.

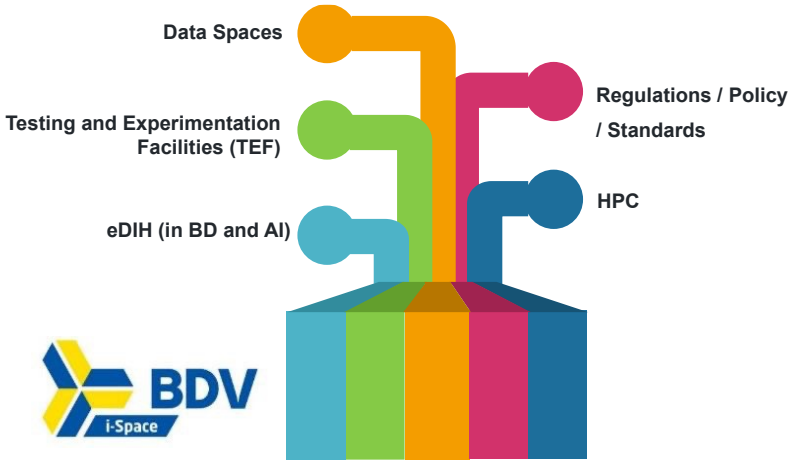
2.4. Unique value for Europe / Positioning

BDVA, the private side of the BDV PPP, modelled the concept of i-Spaces, defining a process and detailed criteria to "label" data experimentation infrastructures and incubators **as i-Spaces**. BDVA also implemented the operational and decision-making processes for this labelling, and has offered a secure, trusted, and open environment for knowledge sharing and ecosystem development.

BDVA i-spaces individually and EUHubs4Data as a whole, contribute to achieve the objectives of the Digital Decade and the adoption of new data and AI regulation and standards, but also i-spaces and EUHubs4Data contribute actively to the following strategies and initiatives:

- European Data Strategy and Data Spaces
- AI adoption, including AI TEFS, AI on demand and AI regulatory sandboxes
- Instruments for the digital transformation, including EDIHs, DTA and network of EDIHs
- HPC community and EuroHPC JU
- Regulations, policies, standards

[8] European Council, "A recovery plan for Europe". Available: https://www.consilium.europa.eu/en/policies/eu-recovery-plan/



2.4.1. European Data Strategy and Data Spaces

The European Commission published in February 2020 the "European Data Strategy", with the aim of positioning the European Union at the forefront of data-based economies, respecting and promoting the fundamental values of European societies (privacy, security, ethical standards, ...). This strategy includes very ambitious objectives in terms of the volume of data available (530% increase), the economic value of the data economy for Europe (829.000 million euros), the number of data professionals (10,9 million) and the percentage of citizens with digital skills (65%)

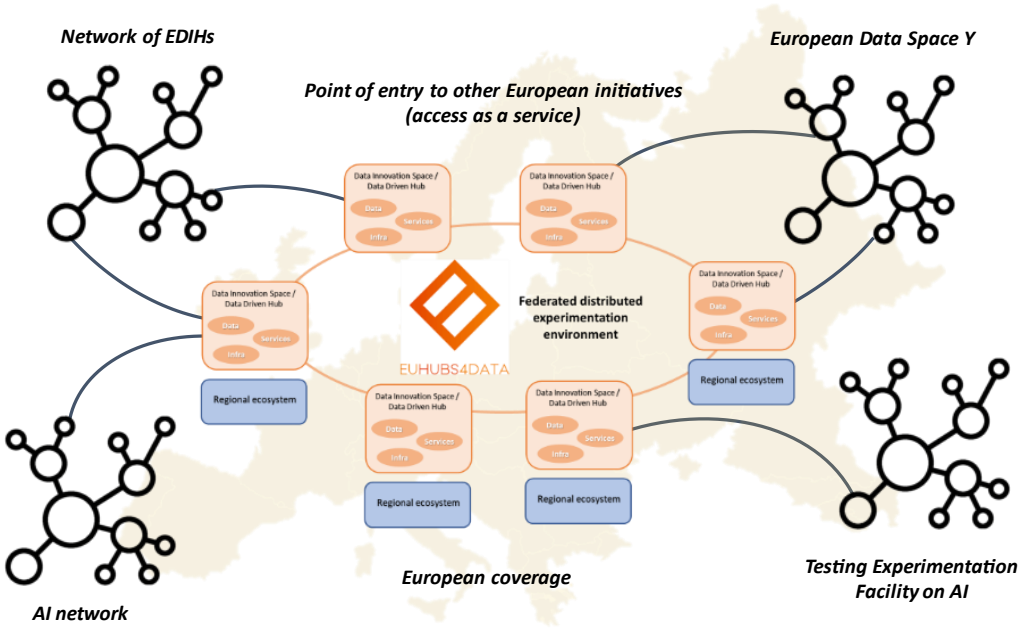
In this strategy, the importance of the availability and access to data is highlighted, and the way in which they are used, in order to face the challenges that arise, specially those related to people and companies' rights. For Europe, people are first when talking about technology development, and the European values and rights must be promoted in the digital world.

Europe recognizes that data is a special resource/asset for economic growth, competitiveness, innovation, employment, and social progress in general. A single data market will guarantee the competitiveness worldwide and the data sovereignty in Europe and in this environment, Common European Data Spaces are the main instrument to make the data strategy a reality.

Common European data spaces are unique environments with access to data and open to the entire world, in which both personal and non-personal data are shared securely, under the European laws, standards

and values. Data Spaces will guarantee that (i) data can flow efficiently between states and sectors, (ii) data protection, as well as consumer protection and fair competition, (iii) fair rules of access and use of the data.

EUHubs4Data was born in September 2020 to help in the implementation of the European Data Strategy, *providing a European network of enriched nodes able to boost the creation of Data Spaces and bring companies to them*, facilitating the creation of value chains generating, sharing, and exploiting quality data. EUHubs4Data members provide tools for data ingestion, data quality, data governance, data processing, data security and data sharing. Each of those nodes are a data space in themselves, because they allow the sovereign sharing of data among companies connected to that node. But they all are connected, forming a federation that enlarges the Data Space coverage and opens the door to a Universe of Data sources and services.



2.4.2. Contribution to the Digital Decade

The Digital Decade is an ambitious plan, the first ever digital strategy commonly agreed by the EU institutions, that sets targets for the 2021-2030 period. ***Those targets are: (i) Skills, (ii) Infrastructures, (iii) Business and (iv) Public Services. For each one of them, the local dimension should be considered as paramount for reaching a successful implementation of the policies and investment actions driving the Strategy.***

i-Spaces act as enablers of the digital transformation that operate at local level in different domains. Each hub offers different capabilities and areas of expertise and can be stronger on one or more of the 4 targets set by the Digital Strategy. However, what accomunates all the i-Spaces, is their knowledge of their local ecosystems, including the barriers that certain regions may have and that would hinder a smooth implementation of the actions related to the Digital Decade.

Looking at the governance model of the Digital Decade strategy, i-Spaces can play again an important role with their engagement of local communities. Thus, they can provide each EU Member State with the right knowledge of the local ecosystems and contribute to measure the progresses towards the targets. Those inputs will be significantly relevant for creating a solid overview of the MS provision of necessary statistics, data and facts gathering for the European Commission's yearly Annual Report on the state of play of EU's digital transformation. In other words, i-Spaces can be considered as information providers as well as local monitors of the KPIs the Digital Decade strategy.

Finally, i-Spaces can be a useful instrument to link communities across-borders of EU Member States. The Federation of i-Spaces, implemented through the EUHubs4Data project, is already a cross-border EU-wide network that operates to foster data-driven innovation. This characteristic can be very useful for the goal of the European Commission to invest in cross-border digital infrastructures (EDIC). The Federation of i-Spaces can be used as the basis for the investment, in the context of the new instrument of multi-country projects (MCP), in Digital Innovation Hubs

Different from the previous paragraphs, when looking at Multi-Country Projects as one of the implementation arms of the Digital Decade, the i-Spaces shall be considered as a network of data-driven innovation hubs and not as single entities. This network (i.e. i-Spaces Federation) will be an important stakeholder for the investment area of "data infrastructure and services" and "European Digital innovation Hubs"[9] and include several local communities which would automatically engage different Members States thus addressing the strategic needs for deploying Multi-Country Projects in the support of reaching the targets of the Digital Decade barriers at regional level (provided by i-Spaces)

[9] https://ec.europa.eu/newsroom/repository/document/2021-45/C_2021_7911_1_EN_annexe_acte_autonome_cp_part1_v2_d4ygL3fB7OJrEhLGIXBaC5w0X0_80907.pdf

2.4.3. AI adoption (AI TEFS, AI on demand, AI Regulatory sandboxes)

Large-scale reference testing and experimentation facilities (TEFs) are being developed to offer a combination of physical and virtual facilities, in which technology providers can get support to test AI-based software and hardware technologies. Four projects in high-impact sectors started in 2023 (agri-food, health, manufacturing and smart cities), and they will support regulatory sandboxes for supervised testing and experimentation.

The Federation of i-Spaces might serve as a catalogue of these and other TEFs, harmonizing their description, minimizing the effects of having divergent national sandboxing rules and lowering the access barriers for start-ups, small-scale providers and SMEs with simplified procedures.

Different sandbox frameworks and rules will most likely be implemented throughout the EU, either established by the different Member States or the European Data Protection Supervisor. Moreover, not only different rules will apply, but also their presentation will be different: the multilingual and multi-jurisdictional character of regulatory sandbox may erect barriers for SMEs who cannot afford a strong legal department. ***i-Spaces can act as AI Regulatory Sandboxes*** testing data reuse in the context of various regulatory frameworks and enabling SMEs environments for testing products and services in a regulation-complain way, free of legal risks and in direct touch with the regulators.

2.4.4. Digital Transformation: DIHs, EDIHs and DTA

Digital Innovation Hubs (DIHs) were launched in the European Union's policy framework as part of the Digitising European Industry initiative (DIE) in 2016, with the aim of promoting the adoption of advanced digital technologies by European industry. DIHs are defined as one-stop-shops that help companies become more competitive regarding their business/production processes, products or services using digital technologies, by providing access to technical expertise and experimentation. This allows companies to 'test before invest'.

DIHs also provide innovation services, such as financing advice, training and skills development that are needed for a successful digital transformation. DIHs act as a first regional point of contact, a doorway, and strengthen the innovation ecosystem.

In 2018, the European Commission introduced the concept of European DIHs (EDIHs) combining the benefits of a regional presence with the opportunities available to a pan-European network. The Digital Europe Programme allocated significant funding to support the establishment and operation of EDIHs across the European Union with the objective of increasing their capacities. The EDIHs network is supported by the Digital Transformation Accelerator (DTA), providing guides, training, connection to the main initiatives and impact assessment to all the EDIHs.

i-Spaces are following a very similar approach to Digital Innovation Hubs in Data, HPC and AI. In fact, ***most of the i-Spaces are coordinating or are a key player in the EDIHs already funded***, providing infrastructures, services and data for accelerating the penetration of the data economy in SMEs and public organizations, and ***also making the link between the EDIHs network and the data community & data spaces.*** *EUHubs4Data Federation* can lead the group of i-Spaces specialized in Data and AI, as an instrument for ***best practices and knowledge sharing***, a marketplace to enlarge the catalogue of services and opportunities for the local ecosystem.

2.4.5. EuroHPC JU: industrial users

One Objective of the EuroHPC initiative is broaden the use of HPC for a larger number of public and private users, wherever they are located in Europe. Dedicated Programs like FF4EuroHPC support SMEs in the development of innovative products and services on top HPC infrastructure. Those experiments are very similar in nature to the experiments conducted on i-Spaces in the EUHubs4Data project. While one side focusses on data and the other focusses on HPC, particularly the adoption of AI has generated a large overlap in existing efforts, with AI accelerating classical HPC domains such as simulation and AI needing ever larger infrastructure for learning deep models based on large data. With EuroCC a network of national HPC Competence exists to support efforts to bring industry on HPC infrastructure. With i-Spaces like CINECA, RISE and the Poznan Supercomputing and Networking Center are at the same time National HPC Competence Centers already sharing their services through both networks: this already shows a strong interlinkage. Efforts like Exellerat and Fortissimo that aim at providing pay-per-use HPC access and support, have shown both the potential but also the challenges and efforts needed for broad adoption on the market. i-Spaces as a one-stop-shop for SMEs could play a central role as a cross-sectorial gate way to HPC, as often the benefits of using specialized HPC infrastructure might not be

directly obvious to prospective users. From data economy HPC on the other hand can be a very important stepping stone towards digital sovereignty: Particularly modern HPC systems that feature GPU accelerators and large scale storage enable resource- and cost-efficient training of AI models such as language models as an alternative to hyper-scalers. The BDVA as private partner of the joint undertaking sees great potential in developing the federation of i-Spaces towards an interface between data spaces and HPC infrastructure, which would booster of investments in both areas. Particularly the combination of data access, service and infrastructure access combined with a local ecosystem is solid basis for such efforts.

2.4.6. Trust and ethics

The European single market is currently undergoing a profound digital transformation that brings about numerous opportunities for individuals, society, and the economy at large. Data-driven technologies hold the potential to enhance productivity, foster sustainability, and drive scientific advancements. However, it is crucial to recognize that this digital revolution also poses risks to fundamental rights and freedoms of individuals and within the European single market itself. As such, it is imperative to address the ethical and legal implications surrounding new data-driven technologies.

Two key issues demand attention within the European single market: determining the desired role of new technologies and shaping their design. To ensure that the digital transformation benefits society as a whole, it is essential for the ecosystem to engage in a thoughtful and inclusive dialogue for which a federation can build the basis. This discourse should center around the responsible use and development of data-based technologies, including artificial intelligence (AI), within the framework of the European data strategy. By actively participating in this discussion, the Federation of i-Spaces can leverage data-driven technologies in a manner that aligns with European values, safeguards fundamental rights, and promotes the common good.

2.4.7. Standards

The European Data Strategy is a visionary roadmap aiming to build a single European data space – a genuine single market for data. It envisages a space where personal as well as non-personal data, including sensitive business data, can be securely shared across businesses and borders. To materialize

this vision, a harmonized set of standards is crucial. Such standards would ensure data interoperability, guarantee consistent protection of data rights, and foster trust among stakeholders. They act as the pillars supporting the Strategy's aspirations, transforming the ambitious blueprint into a functional and streamlined data ecosystem.

i-Spaces are influential players in the European data landscape. Their inherent nature as collaborative and experimental hubs positions them as a player in standardization within the European Data Strategy. Within i-Spaces, diverse stakeholders converge to explore, test, and validate potential data practices and protocols. These spaces become crucibles where proposed standards undergo rigorous evaluation, ensuring they are not only technologically sound but also aligned with the broader socio-economic objectives of Europe. The multi-faceted representation within i-Spaces, including industry experts, academia, and policymakers, ensures a holistic and balanced approach to standard definition.

Beyond the definition phase, i-Spaces can also accelerate the adoption of these standards. By showcasing the practical benefits of standardized practices in real-world scenarios, they can encourage stakeholders to integrate these protocols into their operations. Additionally, i-Spaces function as centers of learning, disseminating knowledge and skills pertaining to the newly established standards. Through training sessions, workshops, and collaborative projects, they can nurture a proficient workforce that champions and embeds these standards across various sectors of the European data ecosystem.

2.4.8. *Regulations*

The evolution of the AI Act proposal highlights the importance of experimental and anticipatory regulation as innovation facilitators, especially directed towards the SMEs and start-ups. The huge response by the industry led to significant changes in articles 53 -54a of the AI Act proposal related to regulatory sandboxes as the most prominent form of the experimental and anticipatory regulation in a collaborative setting. In parallel, there are continuous efforts to improve the model of regulatory sandboxes and overcoming their general weaknesses such as lack of scale, need for better incentives for participation, transparency, democratic deficiency, infringement of legal certainty, unjustifiable costs, etc.

One way forward is the introduction of digital sandboxes into national and international context. The model of the digital sandbox could be regarded as a combination between a traditional regulatory sandbox and an innovation hub. It involves a digital testing environment with the participation of a regulator in a collaborative digital setting which allows the participation of additional stakeholders such as investors or future partners. It also could offer access to specific data necessary for the testing and development of the innovative products/services and shortening the time they need to be completed and brought to market. In addition, some digital sandboxes provide participants with synthetic data in order to satisfy specific data needs depending on the individual use cases which could be a huge incentive for innovators to participate in the sandbox even without relaxation of regulatory and legislative rules which is challenging in EU context and generally diminishes the added value of European sandboxes compared to other jurisdictions.

The i-Spaces and the Federation can be critical contributor to any national digital sandbox, but it has an even greater added values in a trans-national or Pan-European setting. While EU regulatory sandboxes show tendency of focusing on compliance the data as an incentive needs to be carefully designed and implemented in order to ensure EU's competitiveness in attracting innovation. This can be achieved in different ways one of them being through the framework of the DGA and the engagement of the Federation in the capacity of a data intermediary. Another possible solution could be the establishment of a digital sandbox-specific one-stop shop or data-as-a-service platform dedicated to catering the needs of Pan-European digital sandbox. Such approach combined with the characteristics and the scope of the i-Spaces and the Federation would greatly accelerate the development of the products/services in the sandbox and subsequently will attract more innovators, simultaneously enduring compliance of the products/services through the participation of the respective regulator(s).

The digital economy is regulated by a complex set of extant and upcoming legislation that governs the access, control, interoperability, and transactability of data, as well as the governance of online platforms. First of these is the incoming Data Act, whose provisions introduce B2G data sharing obligations alongside novel substantive data control rights, FRAND obligations for B2B data sharing, interoperability obligations in the context of data spaces, and legal requirements for the deployment of smart contracts. Further rules on interoperability are found in the Open Data Directive, which mandates

public authorities to share their data, particularly when it comes to high-value datasets, via standardized APIs in interoperable machine-readable formats. Data access and interoperability obligations for online intermediation services found in the Digital Markets Act are likewise pertinent. Where further industrial standardization is necessary to stimulate data sharing, both the Data Act and the Regulation on the free flow of non-personal data include provisions for the development of harmonized standards or self-regulatory codes of conduct in a variety of contexts. Where personal data processing is concerned, the GDPR's rules on data protection via lawful processing, purpose limitation, data minimisation, accuracy, storage limitation, and integrity, confidentiality, and accountability must be followed. Any operations that rely on AI systems will need to comply with the incoming AI Act. A wide variety of other regulations must also be considered by entities engaged in the digital economy depending on the context of their activities, including the Platform-to-Business Regulation and its rules on transparency and dispute settlement, the Digital Services Act's obligations for online platform content moderation, and the e-Commerce Directive's provisions regarding information society services. The one regulation that is most relevant to the Federating entity itself is the Data Governance Act, whose myriad obligations for data intermediation service providers carry significant implications for the Federation's governance regime. These implications are discussed in the subsequent section.

This rapidly growing corpus of data regulation, combined with the legal implications of other relevant fields for the activities overseen by the Federation (including contract, competition, and intellectual property law), showcase how important it is for the Federation and its partners to follow regulatory developments, comply with novel obligations, and exploit new legal avenues for increased data sharing and interoperability. However, the Federation should avoid being solely reactive when it comes to legal compliance. The new wave of European data regulation offers varying ways in which the Federation may participate in the drafting of industrial codes of conduct and harmonized standards, thereby shaping the future of its own regulatory landscape, particularly with regards to legal interoperability.

In view of the complexity of the digital economy's regulatory environment and the broad array of differing laws that may apply to an enterprise based on the specifics of its activities, the Federation will be ill-placed to offer legal support to individual experiments or federation members. As a matter of practical

necessity, federation members and participating experiments will need to ensure their own legal compliance.

Yet, as previously mentioned in this section, the Federation may instead ease the burden of legal compliance by fostering experimentation and sandboxing initiatives that bring together innovators and regulators into cooperative hubs in full respect of EU norms and values. Such an approach would complement the Federation's nature as a unifying entity and bring value to the individual entities, for whom the Federation could act as a gateway to a pan-European digital sandbox.

2.4.9. Data Intermediaries

As the Data Governance Act enters into force, its effort to foster trust in data sharing mechanisms and facilitate the emergence of neutral data intermediaries will invariably involve, challenge, and create novel opportunities for i-Spaces and the Federation.

Crucially, it is likely that the envisioned activities of i-Spaces and the Federation will qualify them as data intermediation service providers under the DGA. They will thus be obliged to adhere to strict requirements, including structural separation of intermediation services, limitations on data uses, limitations on contractual freedom regarding the provision of their service, obligations to ensure interoperability and implement technical, organisational, and legal safeguards, and even fulfil a fiduciary duty toward individuals that obliges intermediaries to act in data subjects' best interests.

From this, it follows that i-Spaces and the Federation will be neutral, trustworthy, and independent facilitators of data sharing, pioneering the emergence of new data-driven ecosystems. In terms of realising their economic potential and their role in the data market, I-Spaces and the Federation should explore possibilities to supplement their core data intermediation offering with permitted value-added tools and services that specifically facilitate data exchange, including but not limited to temporary storage, curation, conversion, anonymisation, and pseudonymisation.

From a legal perspective, the neutrality and fiduciary duty of data intermediaries under the DGA, coupled with their central position in the data sharing ecosystem, likely mean that I-Spaces and the Federation will play key roles in the exercise of data subject rights over personal data.

Furthermore, the DGA emphasises the role of data intermediaries in allowing non-discriminatory access to the data economy, particularly for SMEs and startup. The DGA also notes that public sector bodies should provide SMEs, startups, civil society, and educational establishments with preferential access to held data (e.g. via discounted or waived fees). It is relevant to explore to what extent, if at all, i-Spaces and the Federation, in relation to their work with SMEs and startups and by virtue of their neutrality, may negotiate preferential access to data held by public sector bodies. I-Spaces and the Federation have the potential to become key actors in furnishing SMEs with data by both private and public bodies.

Significantly, the DGA merely establishes a minimum standard for the regulation data intermediation services. Insofar as many legal and economic uncertainties around its provisions remain and additional regulation is necessary, the DGA provides for further national and Union-level legislation, as well as the creation of a European Data Innovation Board (EDIB). Participating in EDIB's subgroup for stakeholder involvement would allow i-Spaces and the Federation to take an active role in the development of appropriate purposes, sector-specific and cross-sectoral common standards, practices, and guidelines. In particular, unifying the input of individual data spaces via the Federation would allow for an active and impactful role in EDIB's work.

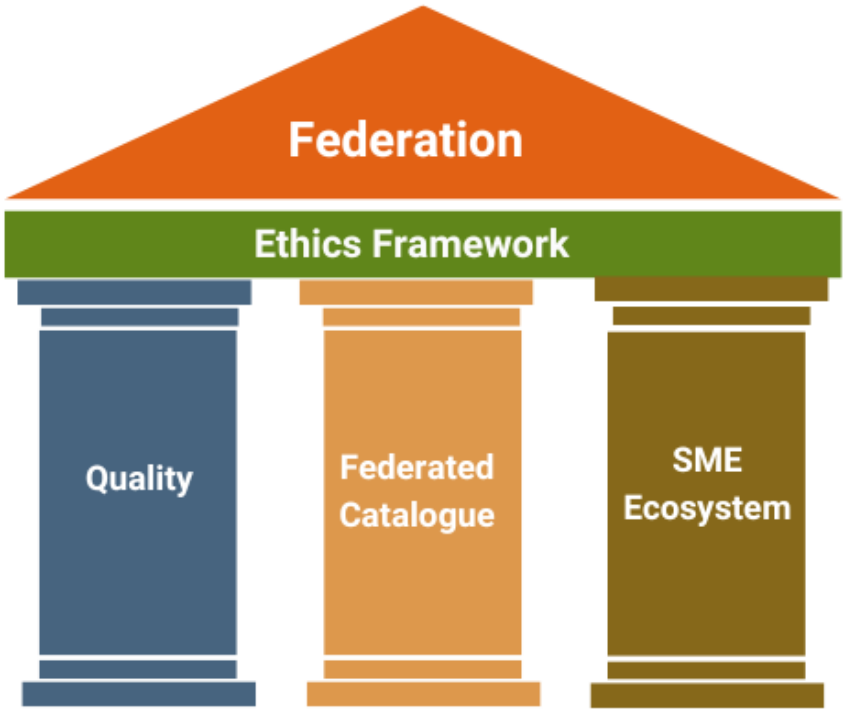
3. The pillars of the Federation

Based on the mission and vision statements (provided at the start of the document), the essential pillars of the Federation are:

- *Guarantee of quality*, to ensure trust among stakeholders.
- *Collaboration and a global European federated catalogue*
- *Access to SMEs and Local ecosystems*

But also, there is a horizontal one:

- *A data and AI driven ethics framework*, covering common ethics standards for i-Spaces, transparency, and fairness in the central catalogue, and fostering ethics awareness within SMEs. Through this pillar the Federation can facilitate safe and trustworthy cross-border and cross-sector experimentation.



3.1. Guarantee of quality: BDVA i-Space label

The Federation of i-Spaces is considered as a key instrument to foster data-driven innovation in Europe. Having state of the art resources and the highest expertise, they become central points for regional technology businesses to develop their products. The BDVA i-Space label also connects the hubs, enterprises and innovators to other European organizations for collaboration. Without these networks, a fluent European data economy could not happen.

The concept for the i-Space label was already outlined in the first version of the BDVA Strategic Research and Innovation Agenda in 2014 and the label was created in the following year. i-Spaces are cross-sectorial and cross-organisational innovation hubs that bring together data sources, AI technologies, competences and all the technical and non-technical aspects needed to allow SMEs and start-ups to get their data-driven and AI-related services, products and applications quickly tested, piloted, and exploited. The concept is nowadays more valid than ever, not only fully aligned with the European Data Strategy, but also key for instruments such as the TEFs, regulatory sandboxes and data spaces, among others.

i-Spaces aim at accelerating the take up of data-driven innovation in commercial sectors such as Manufacturing 4.0, Logistics, e Commerce, Media, Aerospace, Automobile, Energy, Agriculture and Agroindustry, Pharmacy; as

well as in non-profit sectors such as e-Government, Environment, Public Health, Smart Cities.

i-Spaces rely and build upon existing national and regional initiatives that play a central role in a European Data and AI ecosystem. They offer secure accelerator-style environments for running experiments in both private data and open data, bringing technology and application development together. I-Spaces act as incubators for new businesses in the development of skills, competences, and best practices. They also contribute to the building of a community, providing a catalyst for community engagement and acting as incubators and accelerators of data-driven innovation.

The European added value of i-Spaces is that they federate, complement and leverage activities of similar national incubators/environments, research and innovation projects and other national or European initiatives. I-Spaces are federating efforts and expanding through the EUHubs4Data project that aims to build a long term and sustainable Federation.
Another main strength of the Long-Term Federation is the high level of quality and efficiency of the services and assets provided to the European industry. This quality is mainly guaranteed by the labelling procedure that all i-Spaces members of the federation have to go through.

With this process, BDVA evaluates the excellence as a Data-driven Experimentation and Innovation Space (BDVA i-Space) in five basic domains:

infrastructure, services, projects and sectors, ecosystem/impact, and business/sustainability strategy; and in 2 additional domains: federation capabilities and ethics.

The evaluation criteria are organised in 8 different sections:

A. Identification and specific information
B. Infrastructures and technologies
C. Services
D. Projects and applications
E. Ecosystem and impact
F. Business strategy and sustainability
G. Federation (capabilities)
H. Ethics

BDVA has granted the label since 2016, and since the first open call, the group has grown steadily from 5 to 38 recognised i-Spaces, covering 21 European countries. In 2021, the call for labels that BDVA organizes annually to identify i-Spaces all around Europe was combined with the "call for DIHs" of the EUHubs4Data project, in a single open call that served not only to recognize BDVA i-Spaces in 2021, but also to select among those recognized i-Spaces the new members of the Federation.

All EUHubs4Data Hubs have been assessed by a common set of minimum criteria (i-Spaces label) such as infrastructure, access to data, knowledge, skills, level of experimentation, services provided anddata-sets available for experimentation.

The work in EUHubs4Data project has made the introduction of ethics and federation sections in the 2023 process.

3.2. The collaboration and the federated catalogue

Federations are currently receiving extra attention as mechanisms to increase service capacity and capabilities in a multi-supply environment to augment each individual federation member's ability to serve a wider user base.

Federated approaches must be structured around the objectives of their stakeholders, balancing community focused initiatives with pan- European solutions**. "Collaboration for common goals"** is an essential characteristic of federations. In the case of data driven innovation, the collaboration among European initiatives in a federated way is particularly relevant to mobilize data

by breaking data silos, fostering data sharing among different actors, enabling the re-use of data, and promoting cross-border collaboration. Those aspects have been highlighted by the European Commission in the European Data Strategy as key to establish European Common Data Spaces.

EUHubs4Data federation represents a step beyond with respect to the situation of existing data-driven hubs in Europe, in the sense that it considers a strong collaboration among involved hubs, supporting European business (mostly SMEs and start-ups) in their development and launching of data driven products and solutions to the market, and assisting them in their journey along the data value chain.

Leveraging the achievements of relevant European initiatives on Big Data, the federation will link all of them in a single ecosystem, composing a whole catalogue of data sources and datasets, services, and models, and providing a one-stop-shop that ensures that European companies at any level could easily access the economic opportunities offered by Big Data.

The federation will be composed in principle of Data Driven Innovation Hubs, which will contribute with their specific services to the global catalogue, and which will make this catalogue accessible at regional level.

As the main point of collaboration among all EUHubs4Data members **a federated catalogue** was created providing a unique European framework for data driven innovation, built from the individual assets of the Hubs members of the federation (such as datasets, data driven services and training courses). But also, this offer can be extended to any other type of asset (data platforms tools, access as a service, among others). Linked to the expansion of the EUHubs4Data hubs, the Federated catalogue has grown and mature and thanks to the 3 open calls for cross-border experiments, the catalogue has been tested and EUHubs4Data counts with success stories of new products and services incubated under the scope of the Federation.

In the case of EUHubs4Data Hubs, whose main goal is to bring innovation closer to (mostly) small actors of their respective regional ecosystem, to act in a federated way would enable them to improve their respective offers with additional assets coming from all over Europe, completing their catalogues with those services that could fill specific gaps. Besides, their services will be available not only to regional ecosystems, but to SMEs and start-ups in multiple European regions.

So far the catalogue is enriched by assets from the hubs, but (technically) it can be enriched with assets coming from other actors, always keeping in mind the quality needed to be offered by the services, that should be granted by the hubs. The federation will also collaborate with other initiatives on the offer side (not necessarily DIHs: data incubators, European projects, etc …), which will enrich the federated offer and provide access to additional assets (marketplaces, data sources, data platforms, etc…).

The federation will define the mechanisms needed for the members to contribute to the federated catalogue, and conditions for their assets to be included. The federation will also define criteria to include assets from external sources, as well as rules for members to combine services from others. Finally, the federation will also provide guidelines that regulate how the local offer is instantiated.

3.3. SMEs and local ecosystems

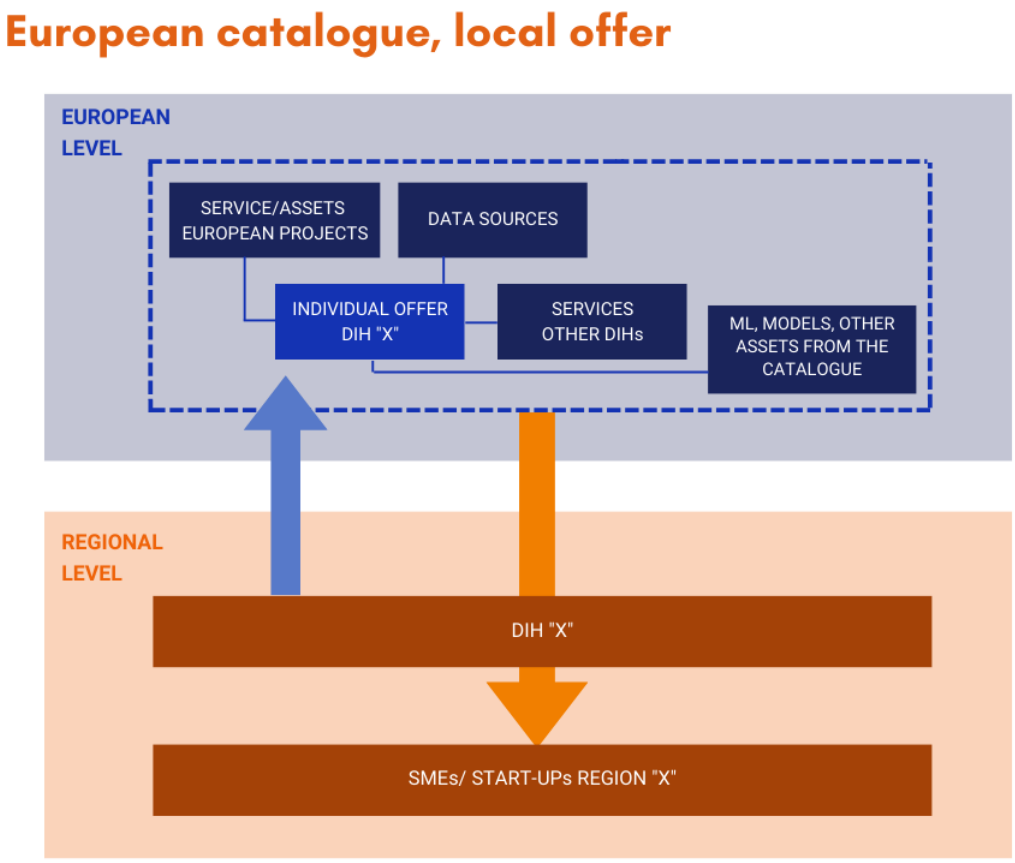
EUHubs4Data federation is an instrument to support experimentation, scaling, internationalization, and market uptake of data-driven solutions and services. The federation works closely to the demand side (SME representatives, industry advisors, etc.), these actors are strategic as they will provide knowledge, feedback about user experience and needs on the best way to reach end users and to drive the offer to meet the demand. At the end, this collaboration will be critical to orchestrate the service delivery.

EUHubs4Data has devoted a lot of efforts to create exposure of the SMEs to potential customers, at European and local level. The federation offers the opportunity to link the SMEs with other organisations and potential markets. These exposures have shown to be very useful not only in showing product values developed with the support of EUHubs4Data, but also to help SMEs understand what the actual customer need is. This knowledge can be harvested and improved in the future federation to encourage SMEs that need it. A network of i-Spaces covering most of the territory is a very valuable lever for the internationalization of SMEs.

The i-Spaces included in the federation are deeply rooted in their respective ecosystems and will grant access to EUHubs4Data federated catalogue of data sources, data-driven services, courses, and solutions to actors in their respective national or regional ecosystems, acting as an local access point, following the paradigm *"European catalogue, regional offer"*. In that sense, the i-Spaces of the federation will act as bridges to the global offer specifically adapted at local levels (filtered and adapted version of the global catalogue).

A central version of the catalogue with specific features will be available as an entry point to actors in geographical areas not covered by the federation.

In this way, the federation will foster community building and an interdisciplinary approach to solving entrepreneurs' and companies' needs. The federation will work as an ecosystem spanning from the local to the European level and will offer SMEs and start-ups the opportunity to have direct access to a global catalogue of services, datasets and training. This federated catalogue facilitates, mainly to the SMEs and start-ups, the access to cross border and cross sector data, as well as to big data services that support them in the development of new products and/or solutions, or in the improvement of existent ones. Finally, end users will benefit from access to the latest European innovation in different fields.



3.4. Horizontal: A data driven ethics framework

Trust has emerged as a critical issue within the data and AI ecosystem. The importance of trust cannot be understated, as it forms the foundation for fruitful collaborations and sustainable growth. However, differences in ethical standards across regions, particularly in Europe, have underscored the need for a concerted effort to establish common values. Recent developments

within the field have also demonstrated its dynamic nature, requiring continuous adaptation and evolution. In this vision paper, we present our approach to address the issue of trust in the data and AI ecosystem, focusing on three essential pillars: common ethics standards for i-Spaces, transparency and fairness in the central catalog, and fostering ethics awareness within SMEs.

Common Ethics Standards for i-Spaces:

To foster trust and ensure a consistent ethical framework, it is essential to establish common ethics standards for i-Spaces. These standards will serve as guiding principles for all participants in the ecosystem, providing a shared understanding of ethical considerations and responsibilities. By promoting transparency, accountability, and responsible data practices, we aim to build trust among stakeholders and facilitate meaningful collaborations.

Transparency and Fairness in the Central Catalog:

The central catalog plays a pivotal role in the data and AI ecosystem of the Federation, serving as a repository of diverse datasets and resources. To generate trust, it is imperative to implement ethics standards such as transparency and fairness within the catalog. This entails providing clear information about data collection methods, data provenance, and any biases present in the datasets. By ensuring fairness in data representation and usage, we empower SMEs to leverage the catalog confidently, thereby fostering trust and encouraging their active participation in the ecosystem.

Ethics Awareness within SMEs:

Recognizing that SMEs often face challenges in navigating the complexities of ethics in the data and AI landscape, we are committed to actively enabling them through ethics awareness initiatives. Trust is a two-way street, and it is crucial that i-Spaces trust SMEs while SMEs adopt risk-based thinking and ethical practices. By providing guidance, resources, and training programs, we aim to equip SMEs with the necessary knowledge and tools to incorporate ethics into their operations. This will not only enhance their competitiveness but also contribute to the overall trustworthiness of the ecosystem.

The Business Impact and Significance of Ethics:

Ethics is no longer a mere compliance requirement; it has become a business differentiator and unique selling proposition (USP). Embracing ethics in the data and AI ecosystem enables organizations, including SMEs, to build and

maintain trust with their stakeholders. It cultivates a positive reputation, enhances customer loyalty, attracts ethical investors, and fosters innovation by encouraging responsible and inclusive practices. By integrating ethics as a core element of their business strategy, SMEs can navigate the evolving regulatory landscape and seize opportunities while mitigating risks associated with data and AI.

4. A roadmap for impact

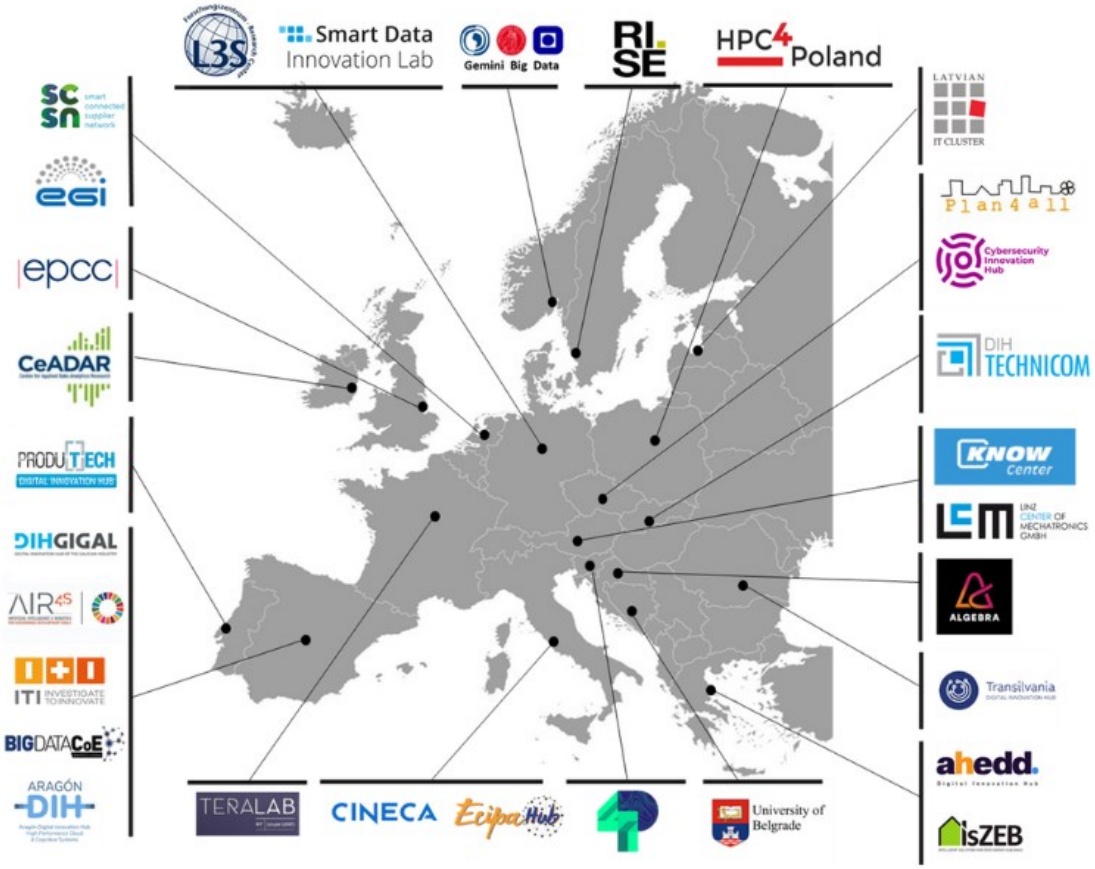
4.1. Geographical coverage

EUHubs4Data ***federation was initially composed of 12 i-Spaces working together*** to lower barriers to innovation for SMEs and start-ups, but it has been extended during the last two years through an open call for DIHs in order to ensure an orderly and fair selection process. The general criteria to select those new i-Spaces was two-fold:

- To expand the coverage of the regions and countries currently not covered by the Federation.
- To be recognized as BDVA i-Space, as a benchmark for the quality and relevance of the new DIHs and aligned with the status of current members of the Federation as BDVA i-Spaces.

To align both criteria, the EUHubs4Data open call for DIHs in 2021 was combined with the BDVA/DAIRO call for i-Spaces, allowing applicants to apply for both calls in one unified process. It was possible to apply for the i-Space label only; whereby the obtained label is mandatory for applicants applying to join the federation.

Then, during this process 18 new i-Spaces were selected ***increasing from 12 to 30 i-Spaces members of the Federation and covering in total 30 regions in 20 countries.*** This fact improved the federated Catalogue with new assets (services, datasets and trainings), but also the support to SMEs during the experiments. The federation currently has impact on:



BDV BIG DATA VALUE ASSOCIATION

EUH4D EUROPEAN FEDERATION OF DATA DRIVEN INNOVATION HUBS

The Federation long-term strategy aims to make sure that we attract new i-Spaces, successfully embed them within the Federation and consequently strengthen the EUHubs4Data offer and enabling the i-Spaces to offer their services/datasets/trainings Europe-wide and successfully participate within the Federation.

The successful implementation of the experiments, the ethical experience, the federated assets, network and the ecosystem created will offer benefits to attract further i-Spaces to the Federation.

All recognized i-Spaces (although some of them may not be members of EUHubs4Data) will be invited to join the Federation and several activities will be planned to create an active community beyond the 30 i-Spaces members.

4.2. Roadmap for a sustainable Federation

The sustainability of the Federation of i-Spaces is one of the main objectives of the project. EUHubs4Data has generated a coordinated group of 30 i-Spaces working together to create common results and also links with very important stakeholders. As a result of the project there is a set of more than 90 assets with different levels of maturity, which will serve as a base for the exploitation strategy of the federation.

The maintenance of this group working together and providing services, creating impact and visibility will generate some costs. The sustainability of the federation will be directly related to the value it is offering to its members, that can contribute with a fee, and to the consumers/users of the assets of the federation that can pay for the value received.

To establish a sustainability plan, the Federation will follow the next steps:

Identify the components of the federation: It is important to clearly define who is part of the federation, their rights and obligations and the way the federation is relating to the environment (stakeholders, customers, users, …). In a first approach, ***the members of the federation will only be labelled i-Spaces***. These i-Spaces provide the services and data to the federated catalogue which is the main asset managed by the federation.

In addition to the federated catalogue, EUHubs4Data has generated ***a pool of assets that can be exploited*** either individually by their owners or transferred to the Federation. The most relevant assets identified are the following:

Asset	Description
Community of i-Spaces	The group of i-Spaces working together in the EUHubs4Data project and in the creation of the federation
Stakeholders Group	Curated group of Strategic Stakeholders with direct connection to EUHubs4Data
SME Roadshow	Brand for a series of meetings, presentations, demonstrations to introduce and engage SMEs with the federation and the federation assets
Ethics toolkit	This asset encompasses: • EUH4D ethics handbook • Guidelines for ethics assessment • Methodology for ethics as a service • Ethics materials for webinars and related events (dedicated events, courses, webinars, etc … devoted to explain our findings, recommendations, etc …)
Big Data & AI Maturity Model and KPIs	List of questions and tool for assess Big Data and AI maturity of both an i-Space and an SME receiving services from an i-Space. These are used as part of the analysis of the local services offered in experiments.
EUH4D Federated Catalogue	The Federated catalogue is the catalogue of services, courses and data sources created in the project by the i-Spaces. Furthermore, the Federated Catalogue: • Provides a front-end that can be customized according to users' needs. • Allows i-Spaces to share services, datasets and training resources in a secure and trusted space.
DIH Security self-assessment	Self-assessment mapping of security practices per i-Space, inspired from ISO27001
Lessons learn from the experiments	Know how about managing SMEs in experiments
Branding of the project	Design and implementation of project branding and logo including promotional materials
Webpage	Design and update of the project website which acts as the entry point to the federation

Data Week and Data Forum	Events created and organized by the project on a yearly basis, aimed at policy makers, SMEs, data spaces
Social media account	Twitter and LinkedIn pages and audience (External) Mailing list of contact point (Internal)
Mobility Programme	Methodology for the design and development of training stays among the members of a federation.

Each asset has an exploitation plan and also a strategy to transfer the ownership of the asset to the Federation or the right to be exploited by the Federation.

***Define the Terms of Reference and Code of Conduct of the Federation*:** Once identified the members and the assets, a formal document is needed to establish the roles, responsibilities and decision making processes of the federation and also the resources and funding sources. Also the Collaboration principles need to be defined to be accepted by any of the members of the Federation.

Establish the exploitation strategy: From the individual assets exploitation plan and the transference model, a global exploitation strategy is defined for the Federation, including incomes like membership fees, but also grants for developing the activities, brokering fees and others. The assets exploited directly by the Federation will need to be governed (updates, maintenance, …) and this will generate also costs for the federation to take into account.

Define the legal form of the federation: Due to the regulatory constraints (Data Governance Act), not any legal form is feasible for the Federation because most probably it will be noticed as Data Intermediary and this requires an independent legal entity to share data.

There are different scenarios that fulfill the legal requirements of the Data Governance Act and that covers the objectives of the Federation and that will be described in the Federation Handbook.

4.3. Expected impact.

In the area of access to Data and Data sharing, an infrastructure has been stablished for sharing services and datasets across i-Spaces ***starting from zero shared datasets and services***, growing with 79 datasets integrated by the initial i-Spaces of the federation, and ***currently extended to 231 open data Sources and 247 services.***

The cross-border experiments supported by EUHubs4Data have created ***14 new public shared datasets*** as result of their experiments and additional 14 datasets declared internally in the experimenters' facilities but are not shared publicly for commercial or testing reasons.

In the area of ***promoting data driven innovation in Europe and engaging SMEs***, EUHubs4Data have engaged ***271 SMEs*** and ***directly involved 42 SMEs*** in the data driven innovation programme. Currently, 5 (out of 6) companies participating in open call 2 of EUHubs4Data have stated that the innovations made will improve their new products or services launched.

In the area of *visibility and positioning*, the events organised and co-organised by EUHubs4Data have a big impact on ***community building, visibility, and federation recognition***. The Data Forum particularly has been focused on the policy makers/institutions at the European and Local level. On the other hand, the Data Week has contributed to establishing the federation in the European research and innovation ecosystem and built credibility as a potential collaborator. The strong visibility to the large audience of the European Big Data Value Forum boosts the community building actions. As all these events have a strong presence of European and national policymakers, industry leaders and leading research organisations, the involvement in these events emphasized and consolidated the strategic importance of the EUHubs4Data in regards of the European level policy targets.

EUHubs4Data have organized the 3 editions of the Data Forum and co-organized 2 editions of the Data Week which had hundreds of attendees each and we can say we are actively engaging and enlarging the potential community. But also, EUHubs4Data has sponsored different events.

5. i-Spaces and the Federation supporting the Data Strategy in Europe

i-Spaces concept was defined a long time ago (2014), but it is totally alive and needed nowadays. i-Spaces are ecosystems with powerful infrastructures, knowledge, tools, data, … ready to provide services for the experimentation and innovation with Data and AI. They have a close contact and are well known and recognized in their local ecosystems and are also very well connected

globally, as stars of an impressive constellation around Data and AI, which is the Federation of i-Spaces.

Now, Digital Decade and the European Data Strategy came to bring Europe as a world leader in the secure, ethical and fair use and exploitation of Digital Technologies and specially, Data. European principles, people and companies' rights, are in the origin of these strategies, that have defined clear and ambitious adoption indicators. A combination of culture, technology, resources and regulations is needed to achieve the objectives.

In this context, i-Spaces and the Federation Unique Value Proposition is:

1. **A tool to achieve the targets of the European Digital Decade**: The European Digital Decade has defined concrete targets and objectives for 2030 and i-Spaces not only support achieving those targets related to the Digital transformation of businesses but they also build strong synergies with the European Data and AI Strategies. i-Spaces are a core part of the main instruments defined by the European Data and AI Strategies and are being deployed through Digital Europe Programme, Horizon Europe and National/regional programmes:
    - ***European Digital Innovation Hubs***: As practical execution grounds (95% of the i-Spaces are EDIHs or part of EDIHs ecosystems), i-Spaces elevate the function of EDIHs by acting as an intersection where technology, business, and innovation converge.
    - ***Testing and Experimentation Facilities (TEF)***: i-Spaces serve as optimal locales where TEFs can be implemented, providing a tangible ground for theoretical concepts to be translated into actionable solutions.
    - ***Data Spaces***: As neutral entities, i-Spaces facilitate the development and maturity of sectoral Data Spaces, ensuring equitable access and promoting data sharing and innovation across organizations.
    - ***AI Networks***: i-Spaces host AI networks, enabling practitioners to collaboratively develop, refine, and implement AI models, thereby driving advancements in AI technologies.
    - ***High-Performance Computing (HPC)***: By providing access to HPC facilities, i-Spaces support research and projects that require significant computational power, fostering developments in fields like simulations, complex data analyses, and more.
2. **A European data & AI sandbox:** Europe's data-driven ambitions need to be rooted in a culture that encourages experimentation. i-Spaces provide a safe but complete environment to help companies and research institutions to adopt a "fail fast, learn faster" approach, and refine models and strategies.
3. **Accelerators of data driven innovation**: i-Spaces speed-up the innovation cycle by providing access to technologies, data, infrastructure, and expertise that organisations might not possess in-house. They assure that all the investments in infrastructure and technologies are oriented to foster the culture of innovation and shorten the time to market.
4. **The access point for SMEs and start-ups to the data economy**: SMEs and start-ups need a coach to become data driven and exploit all the

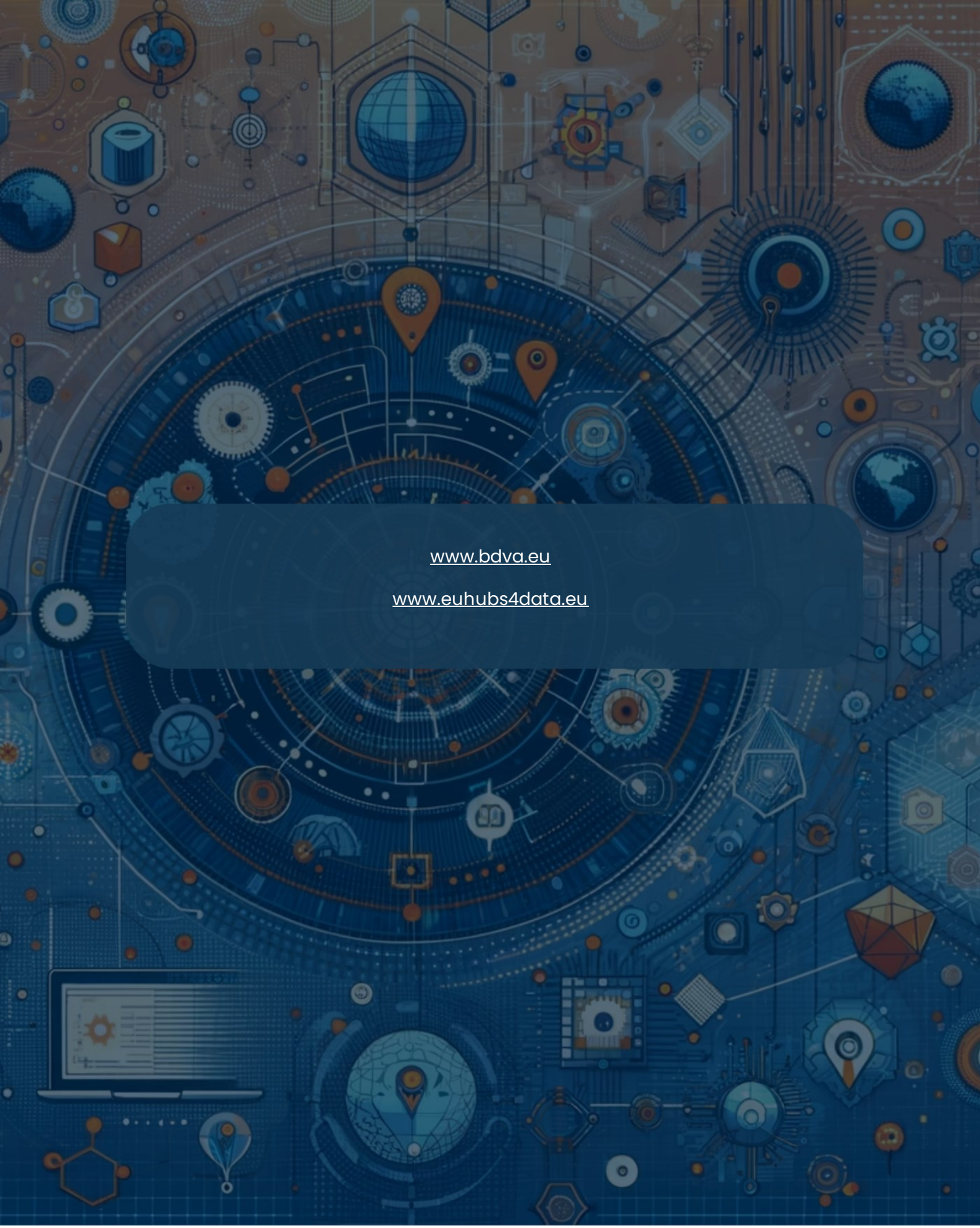
opportunities that the data economy brings. i-Spaces are close to those companies and provide them supportive infrastructure and resources and guiding them in their way to a universe of Data and AI. Start-ups and SMEs can leverage the infrastructural capabilities and knowledge repositories of i-Spaces to navigate through their initial phases without colossal investments and be connected cross-border.

5. **The forum for discussing about AI and data ethics**: AI and data ethics is becoming pivotal for companies. i-Spaces have developed an ethics toolkit specifically for overseeing Big Data and AI experiments. This ensures that innovation is prioritised in full alignment with European values and principles.
6. **An education and training hub for data and AI**: i-Spaces provide experimental Big Data and AI labs and very practical materials. These spaces become training grounds where professionals can hone their skills, learn about new technologies, and adapt to evolving industry needs.
7. **The European innovation network of regional collaboration hubs**: It is essential to promote the sharing of insights and findings from experimentation across EU member states. This not only accelerates innovation but fosters a unified European data strategy and contributes to retain the talent in Europe. i-Spaces foster collaborative environments where industries, academia, and governments can work synergistically on Big Data and AI challenges. They have federated themselves with the vision of being the reference for experimentation and innovation with industrial, public and personal Data and AI technologies following the European, national and regional values and principles.
8. **A connector between digital ecosystems**: with a common base and fundamentals, i-Spaces are diverse, and attending to their specialization, they are present in some of the main European initiatives around data computing and AI, like Competence Centres of HPC, AI TEFs, Data Spaces, Regulatory Sandboxes, … This diversity and positioning in different initiatives is brought to the community, connecting the digital ecosystems behind.
9. **A guide to navigate the regulatory and standards complex landscape**: Data Governance Act, Data Act, AI Act, GDPR, Digital Services Act, Digital Markets Act, Data Spaces Standards, … have been defined and will be defined in the following years and will change the way we work with data. The impact of new regulations is underestimated in

most of the cases. i-Spaces have the knowledge and the connections to intervene in the discussions when these regulations are being created and also have the guides to help companies and also public administration to adopt and follow them.

10. **A sustainable point of destination for many data innovation initiatives**: Most of the data innovation projects end with very interesting results but difficult to be exploited alone. i-Spaces Federation provides a global pan-European catalogue where these results can be included and reach the market.

The integral role of i-Spaces within Europe ensures that Big Data and AI technologies are not only advanced but also aligned with the socio-economic and ethical aspirations of the continent. By interlinking stakeholders and providing a robust infrastructure for experimentation, i-Spaces stand as catalysts that propel Europe's digital, data, and AI agenda forward.



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