DS4Skills
Data Space for Skills

D1.2. Key results to inform the DIGITAL work programme 2023-2024 and sustainability

Final version

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About DS4Skills

The Data Space for Skills (DS4Skills) is a 13-month project aiming to prepare the ground for developing an open and trusted European Data Space for Skills that supports sharing and accessing skills data and engaging with the broad community of skills stakeholders.

DS4Skills aims to identify relevant data sources for the skills data space based on stakeholders' needs and propose conceptual approaches for the future deployment of the European Data Space for Skills.

Project consortium

The DS4Skills consortium brings together 10 full partners and 4 associated partners with solid experience in data ecosystem and community building, a wide network of stakeholders from diverse backgrounds, including researchers, training providers, companies, and associations representing industry and data ecosystems.

Partners
DIGITALEUROPE | TNO | Mydata Global |Chamber of Commerce and Industry of Slovenia – CCIS | Adecco Formazione | Headai | Universitaet Koblenz-Landau | Vastuu Group | Visions | BDVA | European EdTech Alliance | Prometheus-X | Fraunhofer ISST | Swedish Jobtech

Advisory Board
ANewGovernance | Crue Universidades Españolas | CSC - IT Center for Science | European AI Forum | European Commission – DG JRC – Directorate Innovation and Growth | European University Association | Gaia-X | Gaia-X Hub Germany | Gaia-X & French Ministry of Education | Jozef Stefan Institute - Slovenia/UNESCO | Nokia | NTT Data | OECD | Tampere University, Finland | VMWARE | VTT & BDVA | Grande École du Numérique | ICoBC & LinkedIn | Ministry of Education, Science and Sports of Slovenia | Promanad | TNO

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D1.2 Key results to inform the DIGITAL work programme 2023-2024 and sustainability, 2023, Final version.

Deliverable D.1.2: "Key results to inform the DIGITAL work programme 2023-2024 and sustainability"

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List of acronyms and abbreviations

This table provides a list of acronyms and abbreviations that are used in this document. It is not meant to provide an exhaustive list of all the terms related to the subject of this report.

Term	Definition
ADE	Adecco
API	Application Programming Interface
CCIS	Chamber of Commerce and Industry of Slovenia
CoP	DSSC Community of Practice
CSA	Coordination and support action
BB	Building Block
DE	DIGITALEUROPE
DEP	Digital Europe Programme
DGA	Data Governance Act
DS	Data Space
DSA	Digital Services Act
DSSC	Data Spaces Support Centre
DS4Skills	Data Space for Skills project
EBDVF	European Big Data Value Forum
EC	European Commission
ESCO	European Skills, Competences, Qualifications and Occupations
EU	European Union
GDPR	General Data Protection Regulation
HAI	HeadAI
IDSA	The International Data Spaces Association
MDG	MyData Global
PDIs	Personal Data Intermediaries
UoK	University of Koblenz
VIS	Visions
WP	Work Package

1 Executive Summary

1.1 Introduction

This report provides a summary of the results of the DS4Skills project for 13 months of research, covering the period from October 2022 to October 2023. This deliverable highlights the key results of the project that can be useful to inform the DIGITAL work programme 2023-2024 and to provide useful information to various related EC projects and European Commission policy officers interested in the field of data spaces. Each of these results is discussed in detail, with a focus on the implications for the development and implementation of a European Data Space for Skills. This this report also introduces some sustainability measures considered during the lifetime of the project.

1.2 Objectives

The main objectives of this report are:

- To provide a summary of the key results of the DS4Skills project identified over the 13 months of the project (October 2022-October 2023).
- To provide a stand-alone document with specific recommendations for the Digital Europe Programme (DEP) call on the implementation of the European Data Space for Skills (Annex 1).
- To introduce relevant sustainability measures considered for the key outputs of the DS4Skills project.

1.3 Methodological approach

The methodological approach consists of a combination of desk research and stakeholder engagement activities.

- Desk research involved the review of the deliverables produced during the whole duration of the project, as well as relevant literature and documentation related to the project, combining processes of analysis and synthesis of information.
- Stakeholder engagement involved interactions with the Data Space Support Centre (DSSC), the conclusions of DS4Skills Advisory Board online meeting held on the 31st of March 2023 and the presential meeting held on the 14th of June 2023 in Brussels, the 3 online workshops organised to gather relevant feedback on the DS4Skills Blueprint, and from the final workshop and meeting held in Valencia on the 25th and 26th of October 2023.
- Elicitation of a set of agreed recommendations among all DS4Skills partners regarding the last version of the DEP call for the European Data Space for Skills implementation.

1.4 Results

The key results obtained in the context of the DS4Skills project that are considered relevant to inform the DIGITAL work programme, and the sustainability measures in place during the lifetime of the project can be summarised in the following aspects:

Results to inform the DIGITAL Programme 2023-2024:

- **Human-centric approach**. The human-centred approach in data spaces prioritises the needs and interests of individuals and society, fostering trust, ensuring interoperability, and providing effective governance.
- **Personal Data Intermediaries (PDIs)**. PDIs play a crucial role in enabling the sharing of personal data in a secure and controlled manner while prioritising the protection of individual rights and privacy. PDIs enable compliance with the Data Governance Act and help ensure that the European Data Space for Skills can operate in a way that aligns with European values and promotes trust and transparency in data sharing.
- **Overall interoperability aspects**. Interoperability is essential in the development of data spaces, enabling different systems and platforms to communicate with each other and exchange data seamlessly. In the context of the Data Space for Skills, this will ensure that data is freely available for analysis and use, allows for the mapping, matching, and forecasting of skills, enhance the quality and reliability of data, and facilitate the development of new services and applications.
- **An interactive Blueprint for the European Data Space for Skills**. A well-structured blueprint provides a roadmap for achieving the goals and objectives of the European Data Space for Skills initiative, aligns the efforts of different stakeholders, provides a framework for measuring progress and assessing the effectiveness of interventions, builds trust and confidence among stakeholders, and drives innovation and collaboration. It is available in a web interactive platform (reachable at: Development of the blueprint for the skills data space - DS4Skills) and in a wiki tool (reachable at: DS4Skills Blueprint -skillsdataspace-blueprint.eu) that ensure a higher user experience and an easier way to consult the contents.
- **Report on key input provided to the work of the Data Spaces Support Centre (DSSC).** This document aims to provide a comprehensive overview of the collaborative activities between the DSSC and DS4Skills, the analysis of key DSSC documents, and the examination of skills data space initiatives. All aimed at reinforcing and integrating generic data space design approaches into the development of a blueprint for the European Data Space for Skills.
- **Consensus on the DS4Skills Blueprint with wide community of stakeholders.** DS4Skills workshops gathered various stakeholders from numerous countries across Europe and allowed them to share their views and feedback. The results helped to forge a consensus around the operational blueprint and specific use cases which guide the DS4Skills's efforts to provide conceptual approaches for the future deployment of the DS4Skills Blueprint and the future European Data Space for Skills.
- **DIGITALEUROPE's policy paper on the European Data Space for Skills.** The activities carried out in DS4Skills brought to the draft of a report encapsulating key recommendations derived from the project experience, supplemented by insights gathered during different stakeholders and advisory board meetings. The paper will provide a roadmap to chart the future of digital skills and their transformative impact on European education and competitiveness.
- **Final recommendations for the DEP call on the implementation of the European Data Space for Skills**. The European Commission is on track with major investments to deploy and implement its data strategy through data spaces. One of these data spaces is the Skills & Education Data Space, with major societal and business implications. To be effective, The Education &

Skills Data Space implementation needs to work in collaboration with other complementary projects and this document proposes an approach for this complementarity to design a fit-for-purpose Skills & Education Data Space implementation project as part of the common European data spaces.

Sustainability measures in place during the lifetime of the project:

- **Sustainable key outputs**. DS4Skills project consortium has worked on establishing a sustainable business model for the key outputs for the project: the online Inventory tool, the online web interactive DS4Skills Blueprint, and the wiki version of the DS4Skills Blueprint.
- **Collaborative partnerships and new related projects**. DS4Skills project has established partnerships with various stakeholders such as different units at the European Commission, national governments, universities, research organizations, SMEs, and other stakeholders active on European-funded projects which could potentially embrace the approach promoted by DS4Skills and implement the Blueprint in a later stage.
- **Communication, dissemination, and stakeholders' engagement activities.** The project's partners have conducted various and high-impact dissemination activities throughout the duration of the project, including participation in conferences, webinars, and workshops with participant from the ecosystem, to raise awareness of the project and promote the outputs among relevant stakeholders.
- **Elaboration of project proposals to ensure project sustainability**. Some DS4Skills consortium members have already submitted project proposals under the Digital Europe Programme and the Erasmus+ Programme to ensure the sustainability of the main project results and their continuous impact. The success rate of the submitted proposal has been 100%. At the finalisation of the project, DIGITALEUROPE and key partners such as (Visions, Prometheus-X, HeadAI and others) have already ensured their participation in future related projects, such as EDGE-Skills and SIMPL.

1.5 Conclusions

After the research conducted in the project, the main conclusions regarding the **key results** that can be relevant to inform the DIGITAL work programme are:

- The **human centric approach in data spaces is important** because it enables the development of skills data spaces that can deliver value in the field of education and labour domains. By prioritising the needs and interests of individuals and society, skills data spaces can foster trust and provide effective governance, which can create value for both organizations and individuals.

- **The use of PDIs is essential** for the European Data Space for Skills to operate effectively and securely while prioritizing the protection of individual rights and privacy. By enabling secure and controlled personal data sharing, PDIs can facilitate more personalised and effective services for individuals while enhancing trust and transparency in data sharing.

- **Interoperability is a key enabler of the Data Space for Skills** as it enables the seamless exchange and analysis of data across different systems and

platforms. By ensuring that data is freely available, aligned with skills needs, and of high quality, interoperability can facilitate better decision-making, policy development, and resource allocation, which can lead to more effective and efficient education and training systems, a more skilled workforce, and increase competitiveness.

- The **Blueprint for the European Data Space for Skills** is key to unfold a visionary roadmap for the future European Data Space for Skills, propelling it into the forefront of digital innovation. Rooted in collaboration, trust, and open data exchange, the blueprint for the European Data Space for Skills elucidates a comprehensive framework that addresses important aspects ranging from business models and governance to technical architecture, user experience, as well as growth and roll-out strategy.

- The DS4Skills consortium's experience with the Data Space Support Centre (DSSC) has led to several **key recommendations aimed at optimizing the effectiveness and efficiency of future data space deployment projects**. These include community building through platforms like the DSSC Community of Practice (CoP) and thematic groups, the effectiveness of appointing relationship managers for seamless cooperation, and the need for careful planning of project timelines. The consortium also highlighted the necessity for maintaining working versions of DSSC documents online, with clear disclaimers and change logs, to ensure transparency and consistency. This collaboration work should continue beyond the conclusion of DS4Skills, as both blueprints are dynamic, evolving documents that will continue to develop and adapt over time.

- **Building consensus on the DS4Skills Blueprint** with a wide community of stakeholders is essential to solidify an agreement around key issues and actionable takeaways that can shape the future of skills data spaces. The important outcomes included repositioning human centricity in the Blueprint, distinguishing individual and organizational end-users, refining Personal Data Intermediaries (PDIs), incorporating references to the AI Act, enhancing data flow representation, and emphasizing ease of use and interoperability.

- **DIGITALEUROPE policy paper on the European Data Space for Skills** outlines a roadmap defining general strategy, approach, challenges and key performance indicators necessary to shape the future of skills data spaces in Europe. The paper highlights the key aspects on which to focus to guide Europe towards a unified vision of a data space for skills to empower individuals, foster innovation, and position Europe as a global leader in the digital era.

- To be effective, European Data Space for Skills implementation needs to work in collaboration with other complementary projects. The final recommendations for the DEP call on the implementation of the European Data Space for Skills highlight the necessity to build on the work done and initiated in previous projects and capitalize on the maturity of the knowledge produced through DS4Skills and other initiatives. It is recommended to focus on two main work strands. The first work strand is the work towards the data space for skills considering the input provided by the Data Spaces Support Centre (DSSC) and, as possible, the smart cloud-to-edge middleware platform Simpl. The second work strand consists of grants supporting skills-

related institutions in making use of technologies and linking up to the data space, through the project EDGE-SKILLS. It focuses on seizing the opportunities of advanced technologies for increasing the quality, sustainability, use and reuse of the data, as well as building digital capacity in the skills sector by collaborating with existing and relevant European, national and regional initiatives and platforms.

The key conclusions regarding the **sustainability measures** put in place during the 13 months of the project are:

- The DS4Skills project has established a range of partnerships with stakeholders, including national governments, universities, research organizations, and SMEs, that can help sustain the impact of the project beyond the EU funding period.

- The DS4Skills consortium worked to establish a sustainable business model for the Online Inventory tool, which is a key output of the project, and will ensure its maintenance for two years after the end of the project.

- The project consortium conducted various dissemination activities, such as conferences and workshops, to promote the Blueprint approach and to raise awareness of the project and its outputs among relevant stakeholders, which could help sustain the impact of the project beyond the EU funding period (read more in the Communication report under 5.3).

- The consortium has identified various measures and financial resources that will be necessary to ensure the sustainability and long-term impact of the project, such as leveraging available EU and national funding programs, establishing partnerships and collaborations, and seeking financial support from private sources.

2 Methodological approach

The methodological approach consists of a combination of desk research and stakeholder engagement activities.

The **desk research** component of the methodological approach involved a review of documentation, project deliverables produced during the 13 months of the project, and some relevant literature. This desk research aimed to provide a comprehensive overview of the project's objectives, activities, and expected outcomes. Specifically, the desk research focused on:

- **Reviewing project deliverables**. The desk research involved a detailed review of the deliverables produced during the 13 months of the project, including the amended project proposal, interim report, recommendations coming from the Interim Review meeting and stakeholder engagement activities.
- **Reviewing relevant literature**. The desk research also included a reduced review of relevant literature on data sharing, human-centred approach, personal data intermediaries (PDIs), interoperability, digital skills, and related topics.

The **stakeholder engagement** component of the methodological approach involved engaging with key stakeholders involved in the project, including the Data Space Support Centre (DSSC) and the Advisory Board. This stakeholder engagement aimed to provide valuable insights and perspectives from stakeholders involved in the project, helping to validate and refine the findings and conclusions presented in this deliverable. Specifically, the stakeholder engagement activities included:

- **Interactions with the Data Space Support Centre (DSSC)**. The project consortium engaged with the DSSC to discuss the project's objectives, activities, and expected outcomes. These interactions helped to validate the project's approach and provided valuable insights and perspectives on the project's potential impact.
- **Advisory Board meeting**. The meeting held on March 31st, 2023, provided an opportunity to engage with a diverse group of stakeholders, including experts from academia, industry, and government. The meeting provided valuable feedback on the project's progress and helped to validate the findings and conclusions presented in this deliverable.

The **DS4Skills recommendations** component of the methodological approach involved engaging with all DS4Skills partners to collect agreements and insights aimed at contributing to the upcoming Digital Europe Programme call on the implementation of the European Data Space for Skills. The recommendations aimed to provide concrete propositions for the implementation call to achieve effective results and build on the progress made by DS4Skills and complementary projects. Specifically, the formulation of the Recommendation included:

- **Analysing existing projects**. The analysis focused on data spaces' projects and initiatives operating in the skills and education sector. The project team engaged in knowledge sharing and discussion regarding the projects more in line with the approach of DS4Skills and its results. These interactions helped to identify practical sustainability measures for DS4Skills and emphasize the project's potential impact.
- **Interactions with relevant stakeholder**. The meeting held in Valencia on the 25th and 26th of October 2023 provided a unique opportunity to exchange views and discuss with a wide variety of stakeholders. The meeting provided insightful inputs to finalise the recommendation presented as Annex to this document.

3 Key results

During its lifetime, the DS4Skills project has yielded several key final results, including the importance of a human-centric approach to data spaces, the use of personal data intermediaries (PDIs) for secure and controlled personal data sharing, overall interoperability aspects, precise blueprint to roll out the Data Space for Skills covering all topics and clear use cases propositions, a Report on Input provided to the work of the Data Spaces Support Centre (DSSC), and a shared consensus on the blueprint with wide community of stakeholders.

3.1 Human centricity approach

The human-centred approach in data spaces is based on the principle that data should serve people and society, rather than the other way around. This means that

data spaces should be designed with a focus on meeting the needs and interests of individuals and society. In the context of the DS4Skills project, this approach is particularly relevant for skills data spaces, which aim to enable lifelong learning and support the development of human capital in Europe.

There are several reasons why the human centric approach is important.

- Firstly, it fosters trust between different actors in the data space, such as employers, education and training providers, and learners. By placing the needs and interests of individuals and society at the forefront, data spaces can build trust and confidence among these actors, which is essential for effective collaboration and cooperation.

- Secondly, the human centric approach ensures interoperability at various levels, including semantic, technical, legal, and operational levels. Interoperability means that different systems and platforms can communicate with each other and exchange data seamlessly. This is important for skills data spaces because it enables the mapping, matching, and forecasting of skills, which can help learners to identify relevant education and training opportunities, and employers to find the skilled workers they need.

- Thirdly, the human centric approach provides effective governance through agreements on leadership, compliance, and contracts. Governance is essential for data spaces because it establishes the rules and procedures for data sharing and use. By prioritizing human centricity in governance, data spaces can ensure that data is used in a responsible and ethical way, and that the interests of individuals and society are protected.

3.2 Personal Data Intermediaries (PDIs)

Personal data intermediaries (PDIs) play a crucial role in the European Data Space for Skills by enabling the sharing of personal data in a secure and controlled manner while prioritizing the protection of individual rights and privacy. In the skills data space, personal data are scatered across multiple organisations that are often siloed, making it challenging to access and share personal data to provide more personalized and secured services.

- PDIs act as trusted third-party entities that manage personal data on behalf of individuals and facilitate its sharing with other parties in a secure and controlled manner. By doing so, PDIs help individuals retain control over their personal data while still enjoying the benefits of sharing it with others. They also provide transparency and accountability in the data sharing process, enabling individuals to understand how their personal data is being used and by whom.

- The use of PDIs is essential to address the privacy risks associated with personal data sharing, which can lead to the exploitation of personal information by unscrupulous entities. With PDIs, individuals can have greater control over their personal data and can trust that their data is being used in a way that prioritizes their rights and privacy.

- Furthermore, the use of PDIs enables compliance with the Data Governance Act, which sets out the legal framework for data sharing within the European Union. The Act aims to enhance trust in data sharing and promote the development of data spaces while ensuring that individual rights are protected. By enabling the implementation of personal data spaces in compliance with the Data Governance Act, PDIs help to ensure that the European Data Space for Skills operates in a way that aligns with European values and promotes trust and transparency in data sharing.

3.3 Overall interoperability aspects

Interoperability is a key concept in the development of data spaces because it enables different systems and platforms to communicate with each other and exchange data seamlessly. This is essential for several reasons:

- Firstly, interoperability ensures that data are not locked in silos or proprietary systems but is freely available for analysis and use across the entire Data Space for Skills. This enables better decision-making by employers, learners, and education and training providers, who can access a wider range of data to make informed decisions.

- Secondly, interoperability allows for the mapping, matching, and forecasting of skills across different domains and systems. For example, it enables education and training providers to align their programs with the needs of employers and helps learners to identify relevant training opportunities that match their skills and interests. It also enables the forecasting of future skills needs, which can inform policy development and resource allocation.

- Thirdly, interoperability enhances the quality and reliability of data by enabling data to be validated and cross-checked against other sources. This is important for skills data spaces because it ensures that the data used to inform decision-making are accurate and up to date.

- Finally, interoperability can facilitate the development of new services and applications that can add value to the Data Space for Skills. For example, it can enable the development of new tools and platforms that provide personalised learning and training recommendations to learners, or that enable employers to identify potential candidates for vacant job vacancies.

3.4 An interactive Blueprint for the European Data Space for Skills

A well-structured blueprint is critical for the development of the European Data Space for Skills because it provides a roadmap for achieving the goals and objectives of the initiative. The blueprint outlines the strategic priorities and key actions that need to be taken in order to develop a fully functioning skills data space that can deliver value to stakeholders across the education, training, and employment sectors.

- One of the key benefits of a well-structured blueprint is that it provides a clear and unified vision for the skills data space, which can help to align the efforts of different stakeholders and ensure that everyone is working towards a common goal. This is particularly important in a complex and rapidly evolving field like skills data, where there are many different actors and systems involved.

- Another benefit of a well-structured blueprint is that it provides a framework for measuring progress and assessing the effectiveness of different interventions. By setting clear targets and milestones, the blueprint enables stakeholders to monitor progress and identify areas where further action may be needed. This can help to ensure that resources are used effectively and efficiently, and that the skills data space is delivering value to stakeholders.

- A well-structured blueprint can also help to build trust and confidence among stakeholders by providing a clear and transparent framework for data sharing and governance. This is particularly important in an area like skills data, where there may be concerns around data privacy and security. The blueprint can help to address these concerns by setting out clear rules and procedures for data sharing, and by providing assurances around data security and privacy.

- On top of that, a well-structured blueprint can help to drive innovation and collaboration by providing a framework for experimentation and co-creation. By setting out clear priorities and objectives, the blueprint can encourage stakeholders to develop new ideas and approaches that can contribute to the overall success of the skills data space. This can help to drive innovation and foster collaboration among different actors and systems, which can lead to new insights and approaches that can benefit the wider education, training, and employment sectors.

- To ensure an interactive and easy to consult Blueprint, it has been made available in a web interactive platform (reachable at: Development of the blueprint for the skills data space - DS4Skills) and in a Wiki tool (reachable at: DS4Skills Blueprint -skillsdataspace-blueprint.eu).

3.5 Key input provided to the work of the Data Spaces Support Centre

A Systematic analysis and the creation of a reference architecture based on proposed design approaches and common data space building blocks defined in DSSC blueprints (e.g. identification & authentication, access rights management, access control, consent recording mechanisms and data analytics technologies) and customisation to sector-specific requirements, led to a report including inputs and approaches provided to the Data Spaces Support Centre.

The result of this activity is the creation of a collaboration that can facilitate the alignment of standards with the DSSC. This can facilitate data sharing and enable data exchange mechanisms across future sectorial data spaces, as well as across existing skills platforms. Furthermore, in inputs can result in contribution to DSSC

guidelines and good practises for standards, technical tools such as APIs and identification of potential for synergies between data spaces.

This process can help optimization of resources, continuous knowledge transfer with mutual benefit and collaboration aimed at successful implementation of data spaces in the skills sector.

3.6 Consensus on the DS4Skills Blueprint with wide community of stakeholders

Throughout the project lifetime, a series of dedicated activities such as workshops were conducted to facilitate the dialogue on the future of the Data Space for Skills. In particular, DS4Skills organised three online two-hour workshops between May 2023 and September 2023. The first workshop featured participants from various sectors, including research, infrastructure services, education, public authorities, employment services, and end-user services. The second workshop invited members of the Data Spaces Support Centre (DSSC), whose recommendations and standards provide the basic components of the DS4Skills Blueprint for the Data Space for Skills. Like the first workshop, the third one expanded the scope of invitees and included representatives from different sectors.

This dialogue was conducted with the use of different contrasted methodologies for validation with stakeholders (e.g., Timeout methodology by Finnish Innovation Fund SITRA which proved to be an effective tool to facilitate the discussion between people from different sectors, backgrounds, and fields).

These workshops aimed to forge consensus around the operational blueprint and specific use cases, which guide the DS4Skills's efforts to provide conceptual approaches for the future deployment of the DS4Skills Blueprint and the future European Data Space for Skills.

This activity can support a wide adoption from the ecosystem active in the data space for skills environment of the approaches promoted by DS4S and also shared with the EU Commission and the Data Space Support Centre. This can foster a common approach across the relevant stakeholders and help to drive innovation and foster collaboration among different actors and systems.

During these activities, the participants validated and expressed consensus on many important aspects already identified and highlighted in the Blueprint and the user cases. Some of these points were: the importance of governments' provision of initial financial support; and a guarantee of the neutral stance by the actors responsible for the governance of data spaces.

In addition to validating and achieving consensus on the areas already pinpointed and proposed by the DS4Skills consortium, the workshops played a pivotal role in identifying and establishing agreement on additional issues, such as:

- Stressing the relevance of the human centricity at the beginning of the Blueprint.
- Clearly distinguishing between individual and organisational end-users.
- Focusing on use cases that emphasise business value and benefits for each role.

- Refining the scope and functionality of Personal Data Intermediaries (PDIs).
- Improving the representations of data flow and building block interactions.
- Enhancing the reliance on the technical building blocks of DSSC.
- Introduce ease of use and seamless interoperability concepts into the Blueprint and make them integral.

3.7 DIGITALEUROPE policy paper on the European Data Space for Skills

DIGITALEUROPE policy paper on the European Data Space for Skills is the result of the activities of knowledge exchange, analysis and research carried out in DS4S. The paper promoted a united approach to the European Data Space for Skills aimed at fostering competitiveness and innovation in Europe.

The document highlights the necessity of ambitious KPIs that reflect the commitment to measuring the profound impact of data-driven insights on education outcomes, employment rates and economic growth. It focuses on addressing challenges and risks (such as interoperability, data sharing and trust) as an essential measure to recognise the significance of standardised data formats, robust data sharing frameworks and the imperatives of data security, privacy and ethical data use. It recalls the importance of a customer-centric approach to guide the development of tailored solutions and foster user adoption. Furthermore, it insists on the need of cultivating early adopters, as achieving critical mass necessitates the engagement of early adopters who recognise the added value of digital skills. In this sense, it is essential to actively cultivate partnerships, alliances and collaborations to ensure broad participation and widespread impact.

3.8 Final recommendations for the DEP call on the implementation of the European Data Space for Skills

The DS4Skills consortium produced in the form of Recommendation their collective agreements and insights aimed at contributing to the upcoming Digital Europe Programme (DEP) call oriented to the implementation of the European Data Space for Skills.

As part of the DS4Skills project, the consortium has been collecting the stakeholders' needs and proposes practical approaches, such as the DS4Skills Blueprint. Leveraging the cumulative experience of the DS4Skills consortium and the active engagement of experts in various Data Spaces Coordination and Support Actions (CSAs) and DEP initiatives, the consortium formulated well-structured and practical recommendation for successfully implementing the European Data Space for Skills.

This document share the valuable lessons learned from the DS4Skills preparatory action and provide recommendations that will ensure that the DEP call is fully coordinated with the results of DS4Skills projects, and with a number of parallel initiatives, such as the Data Space Support Centre (DSSC) and the EDGE-skills

project, ensuring that efforts will not be duplicated, but all projects will complement each other harmoniously.

The document is structured thematically, presenting specific recommendations in each area of focus, including how to align with the DS4Skills Blueprint, DSSC, and EDGE-Skills initiatives. Additionally, it is addressed how to structure coordination activities, which are the funding options for the implementation approach, and offer illustrative examples of how the Objectives, Impact, and Tasks can be formulated in the future proposal.

By offering targeted recommendations, the DS4Skills consortium can enhance the effectiveness and successful outcomes of the future DEP call, paving the way for the implementation of a trusted and open European Data Space for Skills.

4 Sustainability measures in place

This section highlights the strategies implemented by the DS4Skills project consortium to ensure the continuity and impact of the project beyond the funding period, including the establishment of partnerships, dissemination activities, and a sustainable business model for key project outputs. Additionally, the section discusses the financial resources and measures necessary to ensure the project's long-term impact, including leveraging available EU and national funding programs and private sources, as well as utilizing the relationships and networks built during the project to develop joint initiatives and engage with relevant stakeholders.

4.1 Continuation and sustainability of the project

The DS4Skills project has several strategies in place to ensure the sustainability and impact of its outputs beyond the end of the EU funding in October 2023.

The project established a sustainable business model for an **Online Inventory tool**, which is one of the key outputs of the project. The DS4Skills coordinator DIGITALEUROPE and partner Visions will ensure the maintenance of the online inventory for two years after the end of the project. During this time, they will continue to update and develop the inventory to ensure it remains as up-to-date and accurate as possible.

The project has established **partnerships with various stakeholders** such as, different units at the European Commission (e.g., DG Employment and Unit H1 on Cybersecurity), several national governments (such as the Employment area of the Swedish Government), and also universities, research organizations, and SMEs, which could potentially help sustain the impact of the project by developing joint use cases that can be used to shape up the Blueprint for the project and to be further implemented in a later stage. These partnerships could lead to ongoing collaborations, knowledge sharing, and the adoption of project outputs in different sectors.

The project team has conducted various high impact **dissemination activities** during the lifetime of the project, including participation in conferences, webinars, and workshops. These activities aim to raise awareness of the project and its outputs among relevant stakeholders, which could help sustain the impact of the project beyond the EU funding period.

In addition, the project coordinator, DIGITALEUROPE, and other partners have already developed **project proposals** under the Digital Europe Programme and Erasmus+ Programme to ensure the sustainability of the main project results and their impact. This proactive approach to seeking additional funding demonstrates their commitment to the long-term success of the project.

The proposals designed during the lifetime of the project are:

Title	**European Dataspace for Growth and Education – Skill (EDGE-Skills)**
Coordinator	Prometheus-X
Programme	Digital Europe Programme
Date of submission	25 January 2023
Budget	19M€
Partners	43 partners
Countries	9 countries
Description	EDGE-Skills will launch numerous education & skills data ecosystems across the continent thanks to the development and deployment of innovative and indispensable building blocks. EDGE-Skills will deploy an innovative marketplace allowing any organisation to easily build data ecosystems to fit their needs and ensure a lasting business and governance model of this marketplace.

Table 1: EDGE-Skills project overview

Title	**European Network of Cybersecurity Skills Hubs (CyberHubs)**
Coordinator	DIGITALEUROPE
Programme	Erasmus+
Date of submission	03 May 2023
Budget	1.5M€
Partners	21 partners
Countries	11 countries
Description	The CyberHubs project aims to enhance the cybersecurity skills ecosystem in Europe by establishing a network of 7 Cybersecurity Skills Hubs in Belgium, Estonia, Greece, Hungary, Lithuania, Slovenia, and Spain, which will promote the development of digital skills in cybersecurity and support the development of a skilled cybersecurity workforce. The project's objectives include conducting comprehensive cybersecurity skills mismatches analysis including mapping existing cybersecurity education and training offers across EU Member States, developing a national cybersecurity skills strategy in each partner country, organising a European Cybersecurity Hackathon to foster innovation, establishing twinnings between

	Cybersecurity Skills Hubs, and promoting collaboration between education and industry sectors.

Table 2: CyberHubs project overview

4.2 Measures and financial resources oriented to sustainability and long-term impact

To ensure the sustainability and long-term impact of the DS4Skills project beyond the EU funding period, the project team has identified various measures and financial resources that will be necessary.

Sustainable key outputs. DS4Skills project consortium has worked on establishing a sustainable business model for the key outputs for the project: the online Inventory tool, the project website and related social networks, the online web interactive DS4Skils Blueprint and the wiki version of the DS4Skills Blueprint are all assets of the project aimed at generating a concrete impact on the future of development of data spaces in the education and skills sector. These outputs can help all data spaces stakeholders across Europe and beyond to understand how to adopt a holistic approach, encompassing business models, governance, technical architecture, user experience, and more, to ensure a comprehensive and resilient ecosystem.

Collaboration partnerships and new related projects. A key component of sustainability is to ensure that the valuable results and knowledge achieved through the DS4Skills preparatory action will be leveraged to pave the way for the implementation of a trusted and open European Data Space for Skills. DIGITALEUROPE and other key partners of DS4Skills (such as Visions, Head-AI and others) have already ensured their participation in future related projects, such as EDGE-Skills and Simpl. This commitment is aimed at ensuring that efforts will not be duplicated, but shared knowledge from previous projects and initiatives will converge towards a harmonized approach to data spaces. Furthermore, DS4Skills project has established partnerships with various stakeholders such as different units at the European Commission, national governments, universities, research organizations, SMEs, and other stakeholders active on European funded projects which could potentially embrace the approach promoted by DS4Skills and implement the Blueprint in a later stage.

Communication, dissemination, and stakeholders' engagement activities. DS4Skills partners engaged with relevant stakeholders and decision-makers throughout the project to promote the project's outcomes, advocate for its goals, and generate interest and support for the Blueprint. Continued support from industry players, learning providers, public organizations, and policymakers will be promoted to maintain and build upon the partnerships and collaborations established through the project. This can be achieved through the sustainable outputs produced by the project, such as the online Inventory tool, the project website and related social networks, the online web interactive DS4Skils Blueprint and the wiki version of the DS4Skills Blueprint that will support the dissemination and promotion of the project and its approaches.

Elaboration of project proposals to ensure project sustainability. Some DS4Skills consortium members have already launched project proposals to other Digital

Europe Programme and Erasmus+ Programme to ensure the sustainability of the main project results and their impact. The success rate of the submitted proposal has been 100%. In the consortium view, one crucial element is leveraging available EU funding programs that align with the project's objectives. The Digital Europe Programme (DEP) is an important EU funding instrument that supports the digital transformation of Europe's society and economy. DEP has relevant calls for proposals that could support the continuation of the DS4Skills project, such as the implementation call for the European Data Space for Skills, the call for proposal on "Digital Skills for the Workforce" or the call for proposals on "Common European Data Spaces". The Erasmus+ program also provides opportunities for education and training projects related to digital skills and could be a potential funding scheme to sustain the project's outcomes.

In addition to EU funding, there are also **national funding programmes** that can be used to sustain the project's outcomes, particularly in EU Member States with national funding programmes to support the development of digital skills and the digital transformation of businesses. They can collaborate on future projects or initiatives that align with the goals and objectives of the DS4Skills project and secure funding from other sources such as private sources like corporate sponsors, investors, or philanthropic organizations.

Private sources such as corporate sponsors, investors, or philanthropic organizations that share the project's vision can also be explored for financial support. Partners can leverage the relationships and networks built during the project to further develop joint initiatives, exchange good practices and resources, and explore new avenues for cooperation.

Moreover, the project team has established **partnerships and collaborations** that can be leveraged to secure additional funding opportunities beyond EU funding. These partnerships can be utilized to develop joint initiatives, exchange good practices and resources, and explore new avenues for cooperation.

5 Conclusions

The main conclusions regarding the **Key results** that can be relevant to inform the DIGITAL work programme are:

- The **human centric approach in data spaces is important** because it enables the development of skills data spaces that can deliver value in the field of education and labour domains. By prioritizing the needs and interests of individuals and society, skills data spaces can foster trust, ensure interoperability, and provide effective governance, which can lead to success for both organizations and individuals.

- The **use of PDIs is essential** for the European Data Space for Skills to operate effectively and securely while prioritizing the protection of individual rights and privacy. By enabling secure and controlled personal data sharing, PDIs can facilitate more personalized and effective services for individuals while enhancing trust and transparency in data sharing.

- **Interoperability is a key enabler of the skills data space**, as it enables the seamless exchange and analysis of data across different systems and platforms. By ensuring that data is freely available, aligned with skills needs, and of high quality, interoperability can facilitate better decision-making, policy development, and resource allocation.

  The **Blueprint for the European Data Space for Skills** is key to unfold a visionary roadmap for the future European Data Space for Skills, propelling it into the forefront of digital innovation. Rooted in collaboration, trust, and open data exchange, the blueprint for the European Data Space for Skills elucidates a comprehensive framework that addresses important aspects ranging from business models and governance to technical architecture, user experience, as well as growth and roll-out strategy.

  A well-structured, easy to consult and interactive blueprint is critical for a harmonized and shared approached in support of the development of the European Data Space for Skills. The blueprint identifies the crucial elements to consider and the actions to take to develop a fully functioning data space for skills. The Blueprint promotes an ethical, human cantered and fair approach to data spaces. A vision that can unite key actors active in different sectors and relevant stakeholders. The importance of a unified and clear strategy for the implementation of a data space for skills at European level is undeniable and the DS4S Blueprint represents a reference point in a complex and rapidly evolving field like skills data, where there are many different actors and systems involved.

- The DS4Skills consortium's experience with the Data Space Support Centre (DSSC) has led to several **key recommendations aimed at optimizing the effectiveness and efficiency of future data space deployment projects**. These include community building through platforms like the DSSC Community of Practice (CoP) and thematic groups, the effectiveness of appointing relationship managers for seamless cooperation, and the need for careful planning of project timelines, and the alignment on several key aspects of blueprint development, encompassing the design process, building blocks, toolboxes, standards, interoperability, and protocols.

  The collaborative efforts and alignment yielded numerous mutually beneficial contributions between the two projects, providing valuable insights that helped shape the direction of both projects.

  It is important to emphasise that this alignment work should continue beyond the conclusion of DS4Skills. Both blueprints are dynamic, evolving documents that will continue to develop and adapt over time. The DS4Skills blueprint will continue to evolve during the DS4Skills deployment stage, while the DSSC blueprint will evolve throughout the lifespan of the DSSC project by incorporating insights from other sectorial dataspaces and by evolving generic guidance and reference implementations.

- **Building consensus on the DS4Skills Blueprint** with wide community of stakeholders is necessary to ensure a wide adoption from the ecosystem active in the data space for skills environment of the approaches promoted by DS4Skills and also shared with the EU Commission and the Data Space Support Centre. Throughout the project, a shared agreement was built around

important outcomes, including repositioning human centricity in the Blueprint, distinguishing individual and organizational end-users, refining Personal Data Intermediaries (PDIs), incorporating references to the AI Act, enhancing data flow representation, and emphasizing ease of use and interoperability.
A wide consensus on the DS4Skills Blueprint can foster a common approach across the relevant stakeholders and it can help to drive innovation and foster collaboration among different actors and systems. This will ensure the effectiveness of the future data spaces initiatives and it will support faster progress in the sector.

- **The DIGITALEUROPE policy paper on the European Data Space for Skills** is relevant as it will delve deep into pivotal aspects for the implementation of the Data Space, offering a roadmap to chart the future of digital skills and their transformative impact on European education and competitiveness. The essential elements addressed in the paper such as the need for ambitious KPIs for a transformed future; the importance of addressing challenges and risks; the need for a customer-centric approach; and eventually the strain to cultivating early adopters lay the basis for an inclusive, ethical and innovative transition to the digital era.

- The **final recommendations for the DEP call** on the implementation of the European Data Space for Skills is crucial because it shares the valuable lessons learned from the DS4Skills preparatory action and provide recommendations that will ensure that the DEP call is fully coordinated with the results of DS4Skills projects, and with a number of parallel initiatives, such as the Data Space Support Centre (DSSC) and the other relevant projects (such as EDGE-skills, Simpl) ensuring that efforts will not be duplicated, but all projects will complement each other, paving the way for the implementation of a trusted and open European Data Space for Skills

The key conclusions regarding the **sustainability measures** put in place during the project lifetime by the DS4Skills consortium are:

- The DS4Skills project has established a range of partnerships with stakeholders, including national governments, universities, research organizations, and SMEs, that can help sustain the impact of the project beyond the EU funding period.

- TNO and DIGIis working to establish a sustainable business model for the Online Inventory tool, which is a key output of the project, and will ensure its maintenance for two years after the end of the project.

- The project consortium has conducted various dissemination activities, such as conferences and workshops, to raise awareness of the project and its outputs among relevant stakeholders, which could help sustain the impact of the project beyond the EU funding period.

- The consortium has identified various measures and financial resources that will be necessary to ensure the sustainability and long-term impact of the project, such as leveraging available EU and national funding programs, establishing partnerships and collaborations, and seeking financial support from private sources.

6 ANNEX I

DS4Skills further recommendations for the DEP call on the implementation of the European Skills & Education Data Space

1 Context and background

The European Commission is on track with major investments to deploy and implement its data strategy through data spaces.
One of these data spaces is the Skills & Education Data Space; with major societal and business implications.
The Education & Skills Data Space implementation, to be effective, needs to work in collaboration with other complementary projects, notably:

- **Data Spaces Support Centre (DSSC)**: considering the DSSC blueprint and other guidelines.
- **Data Space for Skills (DS4Skills)**: considering the DS4Skills blueprint.
- **European Dataspace for Growth and Education - Skills (EDGE-Skills)**: using the skills-specific building blocks and infrastructure developed.
- **Simpl**: using the generic building blocks and infrastructure developed.

This document proposes an approach for this complementarity to design a fit-for-purpose Skills & Education Data Space implementation project as part of the common European data spaces.

2 Complementarity among projects

- **The DSSC Blueprint** brings a conceptual model of data spaces, the roles they require, their interoperability, and provides conceptual descriptions of the building blocks needed across all data spaces. In particular:
  - It serves as the legitimate body to ensure alignment and interoperability across all data spaces.
  - It does not provide any software components but will recommend some building blocks (coming from other organisations).

- **The DS4Skills Blueprint** brings a conceptual model for the Skills & Education data space:
  - Descriptions of main usage scenarios.
  - Descriptions of business models.
  - Descriptions of governance model.
  - Descriptions of specific building blocks for the skills & education data space.
  - Strategies for ensuring human centricity.

- **The EDGE-Skills Large Scale pilot** brings an operational and tested skills data space infrastructure:
  - It develops, tests and operates all the building blocks recommended by DS4Skills through several pilots.
  - It supports and launches a Data Space Governance Authority (Prometheus-X) to govern the data space infrastructure and certify trusted data intermediaries, as described by the DSSC and DS4Skills Blueprints.

- It tests governance and business models for different skills data space use cases.
- It onboards 100 organisations on the skills data space infrastructure using a pilot testing approach.
- It launches trusted infrastructure providers (data intermediaries) that operate the infrastructure for all participants in a decentralised way, as described in the DSSC and DS4Skills Blueprints.

- **Simpl** brings an operational and tested generic data space infrastructure:
  - Simpl will develop generic open-source building blocks for data spaces.
  - EDGE-Skills will work with Simpl to ensure its building blocks are well integrated into the Simpl building blocks and that the Simpl building blocks are well integrated into the skills data space infrastructure.

3 Objectives & Scope

3.1 Objectives

The objective is to develop and deploy a secure and trusted data space for skills. Data is at the core of skills and education, offering enormous potential for innovative applications. Databases of job offers, lists of curricula and certifications, inventory of topics studied at all levels of education and training, as well as skills taxonomies, can help better define human resources, training, business, and educational policy strategies.

The data space for skills is a European Common Data Space for sharing and accessing skills data for various purposes, from analytical and statistical purposes to policy development or re-use in innovative applications in line with European values, with a particular emphasis on ethics, diversity and privacy.

This action will thus continue the development and start the deployment of an operational data space for skills. The objective is to make high-quality content available, foster reuse of digitised resources and provide more opportunities for the community to offer enriched services, thanks to the use of advanced technologies.

It will build on the work launched in previous projects, which consists of two work strands. The first work strand is the work towards the data space for skills within the relevant CSAs (Coordination and support action), considering the input provided by the Data Spaces Support Centre (DSSC) and, as possible, the smart cloud-to-edge middleware platform Simpl. The second work strand consists of grants supporting skills related institutions in making use of technologies and linking up to the data space, through the project EDGE-SKILLS. It focuses on seizing the opportunities of advanced technologies for increasing the quality, sustainability, use and reuse of the data, as well as building digital capacity in the skills sector by collaborating with existing and relevant European, national and regional initiatives and platforms.

3.2 Scope

The awarded proposal will integrate, test and deploy the data space for skills, based on existing technical building blocks and on the concept and design elaborated in the framework of the preparatory action on data space for skills. It will also provide continuous maintenance operations of the data space, monitor the usage of the data space and offer a helpdesk.

The awarded proposal will use, in so far as possible and when available, the smart cloud-to-edge middleware platform Simpl[1]. It will also work in close partnership with the Data Spaces Support Centre[2] to ensure alignment with the rest of the ecosystem of data spaces implemented with the support of Digital Europe Programme, in particular in view of a data spaces reference architecture; common building blocks, toolboxes and standards; and data governance models. Right from the outset, the awarded proposal is expected to work towards achieving financial sustainability by the conclusion of the awarded proposal and consider relevant actions in this respect. It will also make use of technologies and linking up to the data space, through the project EDGE-SKILLS. Complementarity will be sought with other existing tools such as Europass, ESCO, European Learning Model, EURES or Skills-OVATE, by establishing links to actions of these initiatives as appropriate.

The awarded proposal will closely collaborate with and integrate the work from a project funded in the call DIGITAL-2022-CLOUD-AI-03 which aims at delivering open building blocks for a data space supporting growth and education and take into consideration the work and recommendations of the preparatory action for the data space for skills launched under Digital Europe WP 2021-2022 (DIGITAL-2021-PREPACTS-DS-01-SKILLS)[3].

The active participation of data providers and users from the project's inception is highly recommended since it will ensure that the data space is designed and structured to meet their needs, making the data space more relevant and leading to increased adoption rates and a stronger sense of ownership of data providers and users by the end of the project's runtime.

Through cascading funding, the following is included in the scope of this action:

- coordination activities
- technical integration
- use cases deployment

The action includes a running phase which pursues the following goals:

- It will focus on a few identified domains to reduce complexity and to ensure mutualisation at EU level and create a set of next generation skills and education products that are largely deployed across the EU.
- This will create the sufficient network effect and critical mass adoption to then have a sustainable data space and mitigate the risk of not having enough datasets or services connected or too scattered projects.
- This will ensure that all relevant stakeholders, data and service providers are onboarded onto the same infrastructure, such that their data sets and services can then be reused by any use case.
- Focusing on first targeted and co-funded use cases will allow a strong marketing and political push to adopt the infrastructure by major stakeholder and these integrations can then be used to support further use cases.

- Thus, the running phase ensures that major stakeholders adopt the data space, and its value is showcased at a large EU wide level.

More concretely, the running phase includes the following tasks:

- The running operations of the DSGA / Support and Coordination, this entails:
  - Ensuring the project management over the duration of the project.
  - Ensuring the day- to- day business and governance activities of the DSGA (running committees, organising audits and certifications, publishing building blocks and technical recommendations.
  - Supporting the selected use cases in using the governance, business and technical models developed.
  - Managing and implementing the selection process.
  - Communication & dissemination activities.

- The integration of large and medium data and service providers to the data space infrastructure:
  - This entails funding for these providers to cover the technical and operational costs of integrating the data space connectors.
  - This ensures all relevant data and services providers are connected to the data space and the relevant use cases can thus be implemented.

- Three large skills data space use cases in specific digital skills domains, entailing:
  - The operational and business tasks of the participants to design and deploy the use cases across their organisations.
  - The integration of the data and service providers needed for the implementation of the use cases.
  - The integration of the technical building blocks and data intermediary services to interconnect the data and service providers during the implementation of the use cases.

Proposed method for this action:

- DSGA / Coordination open calls for large use cases in three domains that are EU-wide, include big public and private organisations, and address three main Skills usage scenarios identified by the CSA on each topic.

- DSGA / Coordination open calls for data and service providers to be integrated and used. The use case winners select and pay service, data and data intermediary providers to put into place the use case.

- DSGA / Coordination supports, facilitates, and adapts building blocks when needed.

4 Deliverables

Coordination and support activities

- Setup of the Data Space Governance Authority, including the code of conduct and contract template.
- Update of the Blueprint inherited from the preparatory action DS4Skills to keep it aligned with the most recent version released by the DSSC and considering the lessons learned by the EDGE-Skills pilot projects.
- Adapt the technical infrastructure for the deployment of the data space for skills, based on the building blocks developed and tested by the EDGE-Skills pilot projects.
- Development of the data governance framework, which comprises a set of rules of legislative, administrative and contractual nature covering. This framework should cover access rights, processing, using and sharing data in a trustworthy and transparent way.
- Create a refined long-term economic sustainability business plan for the skills data space. This plan should be based on the EDGE-Skills pilot experience and consider scaling with cross-sectoral operation in mind.
- Guidance support and training documentation to reduce the entry barrier for stakeholders wishing to participate in the data space. This should also include guidance support and materials on how to adopt a human-centric approach to skills data spaces. Moreover, it should align with all relevant EU guidelines and legislation, such as the DA, DGA, the Digital Rights and Principles declaration or the AI ethical guidelines.
- Once the data space is deployed, reports should be generated and, on an *ad-hoc* basis covering usage, detected problems, and the solutions provided
- Produce a report about the connection of the data space with other relevant local, national and European initiatives on skills and qualifications data, such as for example the Alliances for Sectoral Cooperation on Skills.

Large scale skills data spaces

- Facilitate access to a vast volume of accurate and reliable data in machine readable format and ensure there is a strategy and adequate means to update data throughout its life cycle after the project concludes.
- Development of a European ecosystem of data providers and user through the implementation of three operational ecosystems. These spaces should have long-term sustainability prospects and encompass all the European Union regions.

5 Key Performance Indicators (KPIs)

5.1 Key KPIs for scaling DS4Skills in real world applications

5.1.1 Operational efficiency KPIs:

- Measuring time and cost efficiency in deploying the common European operative model and infrastructure. This KPI assesses the efficiency in setting up the infrastructure and services for skills data management, certification, and employment guidance.
- Number of datasets from existing EC sources (Europass, ESCO, European Learning Model, EURES or Skills-OVATE) used during the project to develop solutions.
- Number of job profiles or ESCO occupations refined (in close collaboration with ESCO)
- Number of training offers shaped up in agreement with organisations participating in existing Blueprint Sector Skills Alliances.
- Number of new services (as origin of new business models) created during the project by SMEs.

5.1.2 Interorganizational synergies KPIs:

- Total number of private and public organisations collaborating to boost the European labour market. This measurement tracks the extent to which private and public organisations work together, reflecting the level of collaboration and synergy achieved.
- Number of organisations representing data providers or final users involved in the project
- Number of potential contributions to educational policy strategies (for example in collaboration with the Cybersecurity Skills Academy and other relevant initiatives at national and regional levels.)

5.1.3 Citizen Engagement KPIs:

- Total number of final users participating in the services (e.g., students, workers, citizens). This KPI gauges the level of citizen engagement with the infrastructure and services, reflecting its effectiveness in serving the target audience.
- Number of final users impacted by the developments produced within the project.

5.1.4 Innovation uptake KPIs:

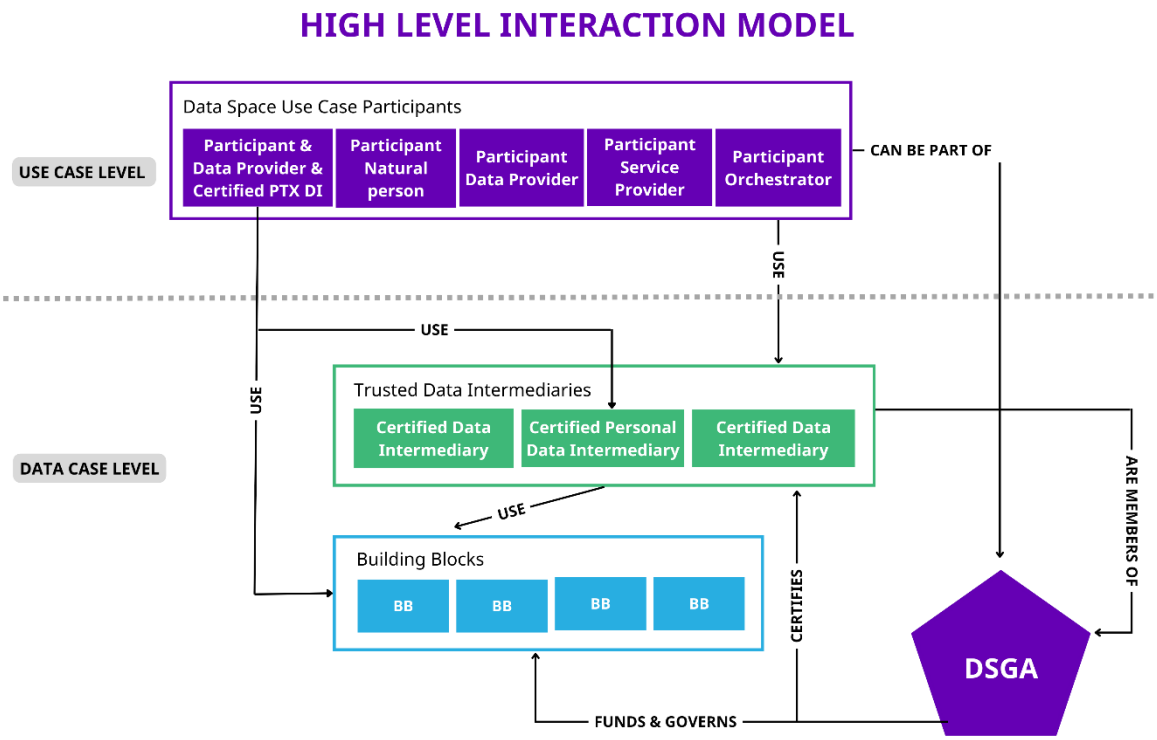
- Innovative uses of skills-related data spaces beyond the common model. This KPI assesses the degree to which private initiatives incorporate and innovate

with skills-related data spaces, showcasing the platform's adaptability and potential for various innovative applications.

- Number of solutions and final workforce impacted by the project in the 3 ICT areas with more skills gap in Europe: Artificial Intelligence, Cybersecurity, and Cloud Computing and DevOps.

6 Proposed approach

The DS4Skills blueprint presents such a high-level model for the skills data space:



To make this operational, two different phases are needed:

- **Building phase**: set up the structures, define business and governance models, and develop and test building blocks.
- **Running phase**: create traction and network effect on the data space, integrate large relevant data and service providers, and use the system at scale.

The EDGE-Skills project and the Skills data space deployment project should complement each other to effectively implement these phases.

6.1 EDGE-Skills funds: BUILDING PHASE

- Support and set up of the Data Space Governance Authority (DSGA).
- Development of needed building blocks.
- Integration of building blocks into data intermediary cloud services.

- Setup of the governance and business models of building blocks and data intermediaries.
- Integration of first data and service providers with the data space.
- Testing of the data space through pilots and proof of concept data space use cases.

6.2 Implementation Skills funds: RUNNING PHASE

DS4Skills proposes a cascading funding of 10m€ with:

- 100% funding for coordination activities
- 50% funding of technical integration costs
- 50% funding of use cases deployment

The costs could be broken down as follows:

- 2m€ (100% funding) for the running operations of the DSGA / Coordination and Support actions, this entails:
    - Ensuring the project management over the duration of the project.
    - Ensuring the day-to-day business and governance activities of the DSGA (running committees, organising audits and certifications, publishing building blocks and technical recommendations)
    - Supporting the selected use cases in using the governance, business and technical models developed.
    - Managing and implementing the selection process.
    - Communication & dissemination activities
    - Sustainability activities

- 1m€ (50% funding) to integrate large and medium data and service providers to the data space infrastructure:
    - This entails funding for these providers to cover the technical and operational costs of integrating the data space connectors.
    - This ensures all relevant data and services providers are connected to the data space and the relevant use cases can thus be implemented.

- 7m€ (50% funding) for 3 large skills data space use cases in specific digital skills domains, this would entail:
    - The operational and business costs of the participants to design and deploy the use cases across their organisations.
    - The integration of the data and service providers needed for the implementation of the use cases.
    - The integration of the technical building blocks and data intermediary services to interconnect the data and service providers during the implementation of the use cases.

6.2.1 Method for the running phase

- DSGA / Coordination open calls for large use cases in three domains that: are EU-wide, include big public and private orgs, and address three main Skills usage scenarios identified by the CSA on each topic.

- DSGA / Coordination open calls for data and service providers to be integrated and used (preferably after consulting with the use cases call winners)
- The use case winners select and pay service, data and data intermediary providers to put into place the use case (they get funding for the techn and op costs)
- DSGA / Coordination supports, facilitates, and adapts building blocks when needed.

6.2.2 Why to fund the running phase

- Focusing first on a few identified domains reduces the complexity in the message and guarantees high demand. Moreover, this ensure mutualisation at EU level and creates a set of next generation skills and education products that are largely deployed across the continent, to create true EU digital champions.
- This will allow to create the sufficient network effect and critical mass adoption to then have a sustainable data space and mitigate the risk of not having enough datasets or services connected or too scattered projects.
- Lastly, this will ensure that all relevant stakeholders, data and service providers are onboarded onto the same infrastructure. Their data sets and services could then be reused by any use case.
- In a nutshell, focusing on first targeted and co-funded use cases will allow a strong marketing and political push to adopt the infrastructure by major stakeholder and these integrations can then be used to power all sorts of use cases.
- Without this co-funding of the RUNING phase, the risk is that major stakeholders do not adopt the data space and its value is not showcased at a large EU wide level.

Type of action	Grants for Financial Support
Indicative budget	EUR 10 million
Indicative call planning	Third set of calls
Indicative duration of the action	36 months
Implementation	Executive Agency HaDEA
Type of beneficiaries	Schools, universities, vocational education and training institutions, learning organisations, businesses, students, Human Resources (HR) organisations and employment agencies, IT developers, other private and public actors (particularly in job search and recruitment services as well as data sharing), trade and industry associations and alliances

Table 3: Grants for financial support

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Funded by
the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Commission. Neither the European Union nor the granting authority can be held responsible for them.