Council of the European Union

Brussels, 13 February 2024
(OR. en)

6527/24

TELECOM 58
AUDIO 19
EDUC 43
COMPET 160
RECH 64
IND 74
MI 161
ESPACE 14
CYBER 40
JAI 252
DATAPROTECT 81
FREMP 72
RELEX 187
CADREFIN 34

COVER NOTE

From:	Secretary-General of the European Commission, signed by Ms Martine DEPREZ, Director
date of receipt:	9 February 2024
To:	Ms Thérèse BLANCHET, Secretary-General of the Council of the European Union
No. Cion doc.:	SWD(2024) 37 final
Subject:	COMMISSION STAFF WORKING DOCUMENT Monitoring and Evaluation Framework for the Digital Europe Programme

Delegations will find attached document SWD(2024) 37 final.

Encl.: SWD(2024) 37 final

EUROPEAN
COMMISSION

Brussels, 9.2.2024
SWD(2024) 37 final

COMMISSION STAFF WORKING DOCUMENT

Monitoring and Evaluation Framework for the Digital Europe Programme

Monitoring and Evaluation Framework for the Digital Europe Programme

Staff Working Document

CONTENTS

1. INTRODUCTION

This Monitoring and Evaluation Framework sets out the monitoring and evaluation strategy for the 2021-2027 Digital Europe Programme. It is mainly based on core performance indicators listed in the Digital Europe Programme Regulation (EU) 2021/694 ([1]). Additionally, supporting, contextual ([2]) and topic-level indicators are also used when gathering data for the interim and final evaluations, as they provide information on the wider policy landscape in which actions carried out under the Digital Europe Programme take place or to help measure progress made on specific actions.

This framework, which sets out in detail the monitoring and evaluation strategy for the Digital Europe Programme, is intended to be used as a tool to better account for the programme's spending, as requested by the European Court of Auditors and the European Parliament, provide evidence for the evaluation of the programme, inform policymaking and facilitate communication on the programme's achievements.

The data collected will ensure that progress towards the objectives outlined in the Digital Europe Programme Regulation is continuously monitored. It will also enable regular assessment as to whether the programme is on track to deliver its expected results.

The Monitoring and Evaluation Framework provides indicators to monitor the inputs, outputs, results and impact of the Digital Europe Programme:

- The **core performance indicators** set out in the Regulation aim at providing information on progress towards the Digital Europe Programme objectives. Such information is to be included in obligatory reporting activities, such as the Programme Performance Statement annexed to the draft annual budget.

- **Additional supporting indicators** are designed to collect additional data for the midterm and final evaluations. They provide data to measure the effectiveness of specific work strands of the programme.

- Other indicators: **Contextual indicators** set out by the Digital Decade Policy programme in January 2023 ([3]) are aimed at providing information on progress towards wider policy objectives, in particular the Digital Decade targets (e.g., the number of ICT specialists in the EU). **Topic-level indicators** provide detailed insight into progress made on a specific topic.

All indicators described above will inform the **interim and final evaluations** of the Digital Europe Programme, based on the evaluation criteria **effectiveness, efficiency, relevance, coherence** and **EU added value.** These evaluation criteria and the general

([1]) Regulation (EU) 2021/694 of the European Parliament and of the Council of 29 April 2021 establishing the Digital Europe Programme and repealing Decision (EU) 2015/2240 (Text with EEA relevance): Publications Office (europa.eu)

([2]) See Better Regulation Toolbox, EUR-Lex - 52021DC0219 - EN - EUR-Lex (europa.eu), which states that 'contextual information should also be collected. Contextual information refers to developments that are not intentionally related to the individual initiative, although they may influence it or be influenced by it, such as the economic growth, break-through (emerging) technologies, new behavioural patterns etc.' (p. 361).

([3]) Decision (EU) 2022/2481 of the European Parliament and of the Council of 14 December 2022 establishing the Digital Decade Policy Programme 2030: EUR-Lex - 32022D2481 - EN - EUR-Lex (europa.eu).

principles for monitoring and evaluation are described in the Commission's Better Regulation guidelines, which inform this document. The data gathered on these five evaluation criteria will help analyse whether EU funds are efficiently managed, whether the Digital Europe Programme is coherent with other EU funding programmes, and whether it is still relevant in this time of rapid technological change. This insight will inform the design of future work programmes and the adjustment of funding priorities, if necessary, to maximise the impact of EU investment.

This document also introduces a mechanism to consistently provide data on progress towards Digital Europe Programme's objectives, which will highlight any potential bottlenecks or challenges to its implementation. In doing so, it functions as an early warning system signalling any deviations from the objectives and ensuring that mitigating measures can be taken on time.

The gathered data will contribute to identifying the concrete benefits of this EU initiative for individuals, companies and society at large and will inform communication on the success of the programme.

The framework significantly contributes to EU digital policy as it helps to: (i) deliver on reporting requirements; (ii) provide evidence in support of policy decisions; and (iii) ensure visibility of the role EU investments play in meeting EU digital policy goals and providing concrete benefits to people across the EU. The gathered data will guide policymaking and help ensure that investment under the Digital Europe Programme remains effective, efficient, relevant, coherent and adds EU value.

The Digital Europe Programme should remain flexible and respond to technological, societal, or economic developments and address pressing challenges. Milestones and targets of indicators need to reflect these changes in priorities. The Digital Europe Programme has already demonstrated its flexibility responding to several urgencies, for instance, by reacting swiftly to the major supply shortage of semiconductors exacerbated by the COVID 19 pandemic by introducing a new specific objective to promote leadership in semiconductor technologies. In addition, Russia's war of aggression against Ukraine and the ensuing heightened risk of large-scale cybersecurity threats led to the support for the EU Cyber Solidarity Act, which introduced the Cyber Emergency Mechanism into the Digital Europe Programme to increase preparedness and response to large-scale cybersecurity incidents. This framework reflects changes in priorities of budget spending due to immediate urgencies or recent developments.

2. LEGAL PROVISIONS

The provisions for monitoring, reporting, and evaluation of the Digital Europe Programme are set out in Articles 25 and 26 of **Regulation (EU) 2021/694** of the European Parliament and of the Council of 29 April 2021 establishing the Digital Europe Programme:

- Article 25 requires the monitoring and reporting of the programme based on measurable indicators, a methodology to assess progress towards the achievements of the objectives and a reporting system to ensure that data are collected 'efficiently, effectively and in a timely manner'.

- Article 26 requires an interim evaluation 'no later than four years after the start of the implementation of the Programme' and a final evaluation of the programme by the end of 2031 as well as an efficient and effective evaluation reporting system.

- Annex II lists the 14 key performance indicators to monitor the implementation and to report on the progress of the programme towards the achievement of its specific objectives.

3. INTERVENTION LOGIC OF THE DIGITAL EUROPE PROGRAMME

The Digital Europe Programme shapes the digital transformation of Europe. It is based on the Regulation (EU) 2021/694 of the European Parliament and of the Council of 29 April 2021 establishing the Digital Europe programme and repealing Decision (EU) 2015/2240. The programme's objective is to support the digital transformation of industry and public administration to enhance the EU's open strategic autonomy and competitiveness and to reinforce EU critical digital capacities. It focuses on the key areas of (i) high performance computing, (ii) cloud-to-edge infrastructure, (iii) data spaces and artificial intelligence, (iv) cybersecurity, (v) the necessary upskilling to provide a workforce for these advanced technologies; (vi) the deployment of these technologies and their best use for critical sectors like energy or climate; (vii) and support to industry, small and medium-sized enterprises and public administrations in their digital transformation.

The programme is complemented by an array of regulatory measures aimed at eliminating barriers to digital innovation in several critical areas. These measures aim, for example, at incentivising business-to-business and business-to-government (B2B and B2G) data sharing across the EU (Data Governance Act ([4]), Data Act ([5])), creating a safer and fairer online environment for users and businesses (Digital Services Act ([6]), Digital Markets Act ([7])) and increasing the level of security of network and information systems across the EU (NIS2 Directive ([8])).

([4]) Regulation (EU) 2022/868 of the European Parliament and of the Council of 30 May 2022 on European data governance and amending Regulation (EU) 2018/1724 (Data Governance Act): EUR-Lex - 32022R0868 - EN - EUR-Lex (europa.eu)

([5]) Proposal for a Regulation of the European Parliament and of the Council on harmonised rules on fair access to and use of data (Data Act): EUR-Lex - 52022PC0068 - EN - EUR-Lex (europa.eu)

([6]) Regulation (EU) 2022/2065 of the European Parliament and of the Council of 19 October 2022 on a Single Market For Digital Services and amending Directive 2000/31/EC (Digital Services Act): EUR-Lex - 32022R2065 - EN - EUR-Lex (europa.eu)

([7]) Regulation (EU) 2022/1925 of the European Parliament and of the Council of 14 September 2022 on contestable and fair markets in the digital sector and amending Directives (EU) 2019/1937 and (EU) 2020/1828 (Digital Markets Act): EUR-Lex - 32022R1925 - EN - EUR-Lex (europa.eu)

([8]) Directive (EU) 2022/2555 of the European Parliament and of the Council of 14 December 2022 on measures for a high common level of cybersecurity across the Union, amending Regulation (EU) No 910/2014 and Directive (EU) 2018/1972, and repealing Directive (EU) 2016/1148 (NIS 2 Directive): EUR-Lex - 32022L2555 - EN - EUR-Lex (europa.eu)

Main challenges and needs

The EU has been facing harsh global competition and needs to continue to act to invest in digital technologies and ensure Europe's strategic autonomy and competitiveness. The impact assessment of the Digital Europe Programme ([9]) published in June 2018, identified, in particular, the following challenges:

The investment gap of the EU in digital by comparison to the US and China hampered deployment of digital capacities and uptake of advanced digital technologies. In 2016, Europe invested 3 to 4 billion USD into Artificial Intelligence while Asia invested 8 to 12 billion USD and North America 15 to 23 billion USD ([10]). Investments in HPC in the EU represented 60% of US investment ([11]). The same lack of investment has been identified in the area of cybersecurity, with a study for the Dutch government estimating that the US invested 10 times as much as the EU in cybersecurity ([12]).

This investment gap was linked to inadequate capacities in key technological areas. High Performance Computing (HPC) capacity, for instance, was described as 'fragmented and underdeveloped' ([13]), not meeting the high demand for these advanced computing systems. This lack has impeded EU's success in the data economy. Similarly, the lack of high-quality data, limited AI competences, and absence of AI competence centres hampered the development of Artificial Intelligence (AI) 'ecosystems' bringing together AI developers, users and financers.

The impact statement further highlights the EU's unpreparedness to tackle cybersecurity attacks on its critical infrastructure. In 2017 the ITU Global Cybersecurity Index ([14]) revealed that only 2 EU member states, Estonia and France, were among the top 10 countries with regard to their cybersecurity commitment. In particular, main weaknesses existed with regard to cybersecurity in the areas of HPC and quantum technologies.

Another important challenge identified before the implementation of the Digital Europe Programme, was the slow and uneven uptake of digital solutions in the public sector by member states. A factor impacting the slow uptake was the lack of interoperability. In the field of judiciary, for instance, the absence of electronic communication between courts and legal authorities hampered law enforcement across EU.

Equally, the uneven and inadequate digitalisation of businesses represented a main challenge, with SMEs lagging behind large enterprises and significant divergence among member states.

Furthermore, in stakeholder consultations conducted prior to the implementation of Digital Europe, the most cited obstacle for lack of investment in digital was the lack of

([9]) Commission Staff Working Document Impact Assessment, Accompanying the document Proposal for a Regulation of the European Parliament and of the Council establishing the Digital Europe programme for the period 2021-2027: EUR-Lex - 52018SC0305 - EN - EUR-Lex (europa.eu)

([10]) Artificial intelligence the next digital frontier?, McKinsey Global Institute, 2017

([11]) IDC study: HPC in the EU, SMART 2014/0021

([12]) Dutch investments in ICT and cybersecurity: putting it in perspective, *The Hague* Centre for Strategic Studies, Dec 2016

([13]) Commission Staff Working Document Impact Assessment, Accompanying the document Proposal for a Regulation of the European Parliament and of the Council establishing the Digital Europe programme for the period 2021-2027: EUR-Lex - 52018SC0305 - EN - EUR-Lex (europa.eu)

([14]) Global Cybersecurity Index 2017: https://www.itu.int/dms_pub/itu-d/opb/str/D-STR-GCI.01-2017-PDF-E.pdf

staff with the needed skills ([15]). In 2017, 47.5 % of companies stated that they found it hard to recruit ICT specialists ([16]).

Challenges

- Meet growing demand for access to world-class digital infrastructures - European businesses, public sector and researchers are forced to access and process the computing, data, or AI resources outside the EU.
- Overcome legal and technical barriers to data sharing by establishing secure, accessible, interoperable and privacy-preserving data spaces in key sectors/areas respecting EU rules and values.
- Enhance cybersecurity in view of frequent and complex cyberattacks on critical infrastructures.
- Narrow the digital skills gap, especially in the area of advanced digital skills through training and reskilling and upskilling of the workforce.
- Tackle the inadequate uptake of digital solutions in areas of public interest, uneven adoption of digital solutions among Member States and lack of their interoperability.
- Ensure the digital transformation leaves no one behind; foster the take-up of digital skills and digital solutions by businesses (in particular SMEs).

In recent years several achievements in the areas mentioned above have been made. The EuroHPC pre-exascale supercomputer LUMI, for instance, has been ranked in first place as the fastest supercomputer in Europe for the third time in a row and has been ranked third fastest in the world. The pre-exascale supercomputer Leonardo, another EuroHPC system, also made the list of world's most powerful supercomputers.

Recent development, however, have further stressed the importance of accelerating the digital transformation. The COVID-19 pandemic, for instance, has highlighted the critical role of data, digital technologies and infrastructures and has demonstrated how our societies and economies can further benefit from digital solutions. Data has an ever-growing impact on how we produce, consume and how we live our lives. To speed up the development of the European economy and to harness the value of data for the benefit of European society, common European data spaces in strategic economic sectors and domains of public interest are necessary. Indeed, data and its socio-economic potential play an essential role both in Europe's digital transformation and in economic recovery plans. EU-wide common, interoperable data spaces in strategic sectors will contribute to overcoming legal and technical barriers to data sharing by combining the necessary tools and infrastructures and addressing issues of trust by way of common rules ([17]).

Russia's war of aggression against Ukraine has further highlighted the importance of being able to protect the EU's critical infrastructures and the public services that depend on them. Malicious cyber activities threaten our economies, our way of life, and our freedoms and values, and can even potentially undermine the cohesion and functioning of our democracy.

([15]) Commission Staff Working Document Impact Assessment, Accompanying the document Proposal for a Regulation of the European Parliament and of the Council establishing the Digital Europe programme for the period 2021-2027: EUR-Lex - 52018SC0305 - EN - EUR-Lex (europa.eu)

([16]) Eurostat 2017 survey on ICT usage and e-commerce in enterprises

([17]) See Staff working document on data spaces | Shaping Europe's digital future (europa.eu)

The rapid acceleration of digitalisation has exacerbated the systemic gap between market needs and available skills on the use of advanced digital technologies in the workplace. Currently, the EU faces a shortage of digital experts who can develop cutting-edge technologies. In 2022, 62,8% of enterprises that recruited or tried to recruit ICT specialists reported difficulties in filling vacancies ([18]). In key areas, such as cybersecurity and data analysis, there are constantly hundreds of thousands of vacancies. A strong digital economy powered by workers with digital skills is vital for innovation, growth, jobs, and competitiveness in the EU, in particular, in the context of the twin green and digital transitions.

Over the past ten years, online public services have become more and more frequent, a trend which has been accelerated by the COVID-19 pandemic. The Digital Decade's target is for public services to provide all key services for businesses and individuals online by 2030. A few Member States, such as Estonia, Finland and Malta, are already on a good track to achieving this target. However, several other Member States, such as Romania, Greece, Bulgaria and Slovakia are still lagging behind. While Member States are steadily increasing their offer of basic digital service, further investment is needed in areas of advanced public services using AI, robotics and big data [(19)]. Furthermore, a satisfactory level of interoperability has not yet been achieved, which impedes the potential for wider adoption.

In the private sector, the uptake of digital solutions by businesses remains uneven among Member States, sectors (particularly between high tech and traditional areas), and between large companies and SMEs. The 'Digitalisation in Europe 2022-2023' report by the European Investment Bank shows that the digitalisation gap between the US and Europe has been decreasing in the past four years. Investment in digital as a response to the Covid 19 pandemic has been higher in the US, however, mainly due to the low investment in digital of EU micro and small enterprises [(20)].

Eurostat data confirm that 29.7% of the EU's large enterprises [(21)] had a very high Digital Intensity Index (DII) and 54% a high level, while only 10.2% of medium-sized companies [(22)] registered a very high-intensity level and 46% a high DII. Only 2.3% of small enterprises (23) reached a very high digital intensity, with only 24,1% scoring a high DII [(24)].

In addition, European Union is engaged on its path towards climate-neutrality by 2050, and the digital transition plays an important role in achieving this objective. For instance,

---

([18]) Analyse one indicator and compare countries — Digital Scoreboard - Data & Indicators (digital-agenda-data.eu)

([19]) Digital Economy and Society Index (DESI) 2022, Thematic Chapters: The Digital Economy and Society Index (DESI)

([20]) Digitalisation in Europe 2022-2023: Evidence from the EIB Investment Survey

([21]) Large enterprises = 250 and more employees and self-employed persons

([16]) Medium-sized enterprises = 50-249 employees and self-employed persons

([23]) Small enterprises = 10-49 employees and self-employed persons

([24]) Statistics | Eurostat (europa.eu)

digital technologies allow for higher efficiency and productivity across industries, including within the area of green technologies, with positive effects on growth and competitiveness. They also help change the energy and environmental stance, by reducing dependence on foreign fossil fuels and supporting the deployment of renewable energies. Digital technologies further open new opportunities for social progress and economic development in the context of the twin green and digital transitions.

Objectives

To address the above-mentioned challenges in a systematic way, the Digital Europe Programme is designed to boost the digital transformation of the economy and society bringing much needed benefits to individuals and businesses. The programme focuses on:

- building essential capacities and advanced skills in key digital technology areas, contributing to Europe's technological sovereignty;
- accelerating their deployment and best use in areas of public interest and the private sector.

To pursue these goals, the Digital Europe Programme comprises five specific objectives. An additional specific objective to boost Europe's competitiveness and resilience in semiconductor technologies and applications was proposed in February 2022 ([25]). The European Chips Act that complements the Digital Europe Programme with this new specific objective on semiconductors, entered into force on 21 September 2023 ([26]).

Specific Objective 1- High Performance Computing (HPC)

This specific objective will pursue the following operational objectives:

- deploy, coordinate at EU level and operate an integrated demand-oriented and application-driven world-class exascale supercomputing and data infrastructure that shall be easily accessible to public and private users, in particular SMEs, irrespective of the Member State in which they are located, and easily accessible for research purposes, in accordance with Regulation (EU) 2018/1488 ([27]);
- deploy ready to use operational technology resulting from research and innovation in order to build an integrated EU HPC ecosystem, covering various aspects in the scientific and industrial value chain segments, including hardware, software, applications, services, interconnections and digital skills, with a high level of security and data protection;
- deploy and operate post-exascale infrastructure, including integration with quantum computing technologies and research infrastructures for computing science and

([25]) Proposal for a COUNCIL REGULATION amending Regulation (EU) 2021/2085 establishing the Joint Undertakings under Horizon Europe, as regards the Chips Joint Undertaking.

([26]) Regulation (EU) 2023/1781 of the European Parliament and of the Council of 13 September 2023 establishing a framework of measures for strengthening Europe's semiconductor ecosystem and amending Regulation (EU) 2021/694 (Chips Act): EUR-Lex - 32023R1781 - EN - EUR-Lex (europa.eu).

([27]) Council Regulation (EU) 2018/1488 of 28 September 2018 establishing the European High Performance Computing Joint Undertaking: EUR-Lex - 32018R1488 - EN - EUR-Lex (europa.eu).

encourage the development within the EU of the hardware and software necessary for such deployment.

Specific Objective 2 - Artificial Intelligence

The EU's financial contribution under this specific objective shall pursue the following operational objectives:

- build up and strengthen core AI capacities and knowledge in the EU, including building up and strengthening quality data resources and corresponding exchange mechanisms, and libraries of algorithms, while guaranteeing a human-centric and inclusive approach that respects EU values.
- make the capacities referred to in point above accessible to businesses, especially SMEs and start-ups, as well as civil society, not-for-profit organisations, research institutions, universities and public administrations, in order to maximise their benefit to the European society and economy;
- reinforce and network AI testing and experimentation facilities in Member States; develop and reinforce commercial application and production systems in order to facilitate the integration of technologies in value chains and the development of innovative business models and to shorten the time required to pass from innovation to industrial production and foster the uptake of AI-based solutions in areas of public interest and in society.
- AI-based solutions and data made available shall respect the principle of privacy and security by design and shall fully comply with data protection legislation.

Specific Objective 3 - Cybersecurity and Trust

The financial contribution from the EU under this specific objective shall pursue the following operational objectives:

- support the building-up and procurement of advanced cybersecurity equipment, tools and data infrastructures, together with Member States, in order to achieve a high common level of cybersecurity at European level, in full compliance with data protection legislation and fundamental rights, while ensuring the strategic autonomy of the EU;
- support the building-up and best use of European knowledge, capacity and skills related to cybersecurity and the sharing and mainstreaming of best practices;
- ensure a wide deployment of effective state-of-the-art cybersecurity solutions across the European economy, paying special attention to public authorities and SMEs;
- reinforce capabilities within Member States and private sector to help them comply with Directive (EU) 2016/1148 of the European Parliament and of the Council ([28]) including through measures supporting the uptake of cybersecurity best practices;
- improve resilience against cyberattacks, contribute towards increasing risk-awareness and knowledge of cybersecurity processes, support public and private organisations

(28) Directive (EU) 2016/1148 of the European Parliament and of the Council of 6 July 2016 concerning measures for a high common level of security of network and information systems across the Union (OJ L 194, 19.7.2016, p. 1).

in achieving basics levels of cyber security, for example by deploying end-to-end encryption of data and software updates;

- enhance cooperation between the civil and defence spheres with regard to dual-use projects, services, competences and applications in cybersecurity, in accordance with a Regulation establishing the European Cybersecurity Industrial, Technology and Research Competence Centre and the Network of National Coordination Centres (the 'Cybersecurity Competence Centre Regulation').
- increase the preparedness (ex-ante) and response (ex-post) to large-scale cybersecurity incidents through the testing of essential entities and the gradual set-up of an EU-level cyber reserve with services from trusted private providers that would be ready to intervene at Member States' request in cases of significant cross-border incidents. These activities will support the EU Cyber Solidarity initiative proposed in April 2023.

Specific Objective 4 - Advanced Digital Skills

The financial contribution from the EU under this specific objective shall support the development of advanced digital skills in areas covered by the programme in order to contribute to increasing Europe's talent pool, bridge the digital divide and foster greater professionalism, especially with regard to high performance and cloud computing, big data analytics, cybersecurity, distributed ledger technologies (e.g. blockchain), quantum technologies, robotics, AI, while taking gender balance into account. In order to tackle skills mismatches and to encourage specialisation in digital technologies and applications, the financial contribution shall pursue the following operational objectives:

- support the design and delivery of high-quality, long-term training and courses, including blended learning, for students and for the workforce;
- support the design and delivery of high-quality, short-term training and courses for the workforce, in particular in SMEs and in the public sector;
- support high-quality on-the-job training and work placements for students, including traineeships, and the workforce, in particular, in SMEs and in the public sector.

Specific Objective 5 - Deployment and Best Use of Digital Capacities and Interoperability

The financial contribution from the EU under this specific objective shall pursue the following operational objectives:

- support the public sector and areas of public interest, such as health and care, education, judiciary, law enforcement, consumer protection, single market, customs, transport, mobility, energy, environment, cultural and creative sectors, including relevant businesses established within the EU, to effectively deploy and access state-of-the-art digital technologies, such as HPC, AI and cybersecurity;
- deploy, operate and maintain trans-European interoperable state-of-the-art digital service infrastructures across the EU, including related services, in complementarity with national and regional actions;
- support the integration and use of trans-European digital service infrastructures and of agreed European digital standards in the public sector and in areas of public interest to facilitate cost-efficient implementation and interoperability;

- facilitate the development, update and use of solutions and frameworks by citizens, public administrations and businesses, including of open-source solutions and the re-use of interoperability solutions and frameworks;
- offer the public sector and the industry, in particular SMEs, easy access to testing and piloting of digital technologies and increase the use thereof, including in particular their cross-border use;
- support the uptake by the public sector and the EU industry, in particular SMEs and start-ups, of advanced digital and related technologies, including in particular HPC, AI, cybersecurity, other leading edge and future technologies, such as distributed ledger technologies (e.g., blockchain);
- support the design, testing, implementation, and deployment and maintenance of interoperable digital solutions, including digital government solutions, for public services at EU level which are delivered through an open data-driven reusable solutions platform aiming to foster innovation and establish common frameworks in order to unleash the full potential of the public administrations' services for citizens and businesses;
- ensure the continuous capacity at EU level to lead digital development, in addition to observing, analysing and adapting to fast-evolving digital trends, and share and mainstream best practices;
- support cooperation towards achieving a European ecosystem for trusted data sharing and digital infrastructures using, inter alia, distributed ledger services and applications, including support for interoperability and standardisation and by fostering the deployment of cross-border applications based on security and data protection and privacy by design, and by default complying with consumer and data protection legislation;
- build up and strengthen the European Digital Innovation Hubs and their network.

Specific Objective 6: Semiconductors

This new specific objective was integrated into the Digital Europe Programme with the adoption of the Chips Act Regulation ([29]) and will promote Europe's leadership in semiconductor technologies and applications.

Input

Financial Resources

The proposed financial allocation for the Digital Europe Programme stands at EUR 8 638 million. This amount covers all specific objectives, including a new specific objective to promote EU leadership in semiconductor technologies and applications. The budget is implemented in multiannual work programmes. The Digital Europe funds are allocated in

([29]) Regulation (EU) 2023/1781 of the European Parliament and of the Council of 13 September 2023 establishing a framework of measures for strengthening Europe's semiconductor ecosystem and amending Regulation (EU) 2021/694 (Chips Act): EUR-Lex - 32023R1781 - EN - EUR-Lex (europa.eu).

the form of grants or procurements and through Contribution Agreements as well as financial support through equity and quasi-equity by combining funding with the InvestEU guarantee, such as the Investment Platform for Strategic Digital Technologies or the Chips Fund.

The Commission directly manages the activities related to specific objectives on artificial intelligence, advanced digital skills and widening the best use of digital technologies. The European Health and Digital Executive Agency (HaDEA) has been entrusted with implementing part of the Digital Europe Programme's budget. The activities related to specific objective on HPC are mainly implemented through the EuroHPC Joint Undertaking and the specific objective on cybersecurity will be mainly implemented through the European Cybersecurity Industrial, Technology and Research Competence Centre and the Cybersecurity Competence Network. The new SO6 – semiconductor technologies and applications – will be implemented by the Chips Joint Undertaking. Actions related to 'Destination Earth' (a flagship initiative in SO1 with the aim to develop a digital twin of the earth), are implemented through contribution agreements by the European Space Agency, the European Centre for Medium-Range Weather Forecasts and the European Operational Satellite Agency for Monitoring Weather, Climate and the Environment from Space. The Investment Platform for Strategic Digital Technologies is implemented through indirect management with the European Investment Fund under InvestEU.

The Digital Europe Programme complements several other funding programmes, in particular Horizon Europe. While Digital Europe Programme focuses on large-scale digital capacity and infrastructure building to support the uptake and deployment of critical existing or tested innovative digital solutions across the EU, Horizon Europe supports research, technological development, demonstration, piloting, proof-of-concept, testing and innovation - including pre-commercial deployment - for innovative digital technologies. The Connecting Europe Facility (CEF2) also complements the Digital Europe Programme as it supports the high capacity broadband and 5G corridors necessary to deploy digital services and technologies across the EU.

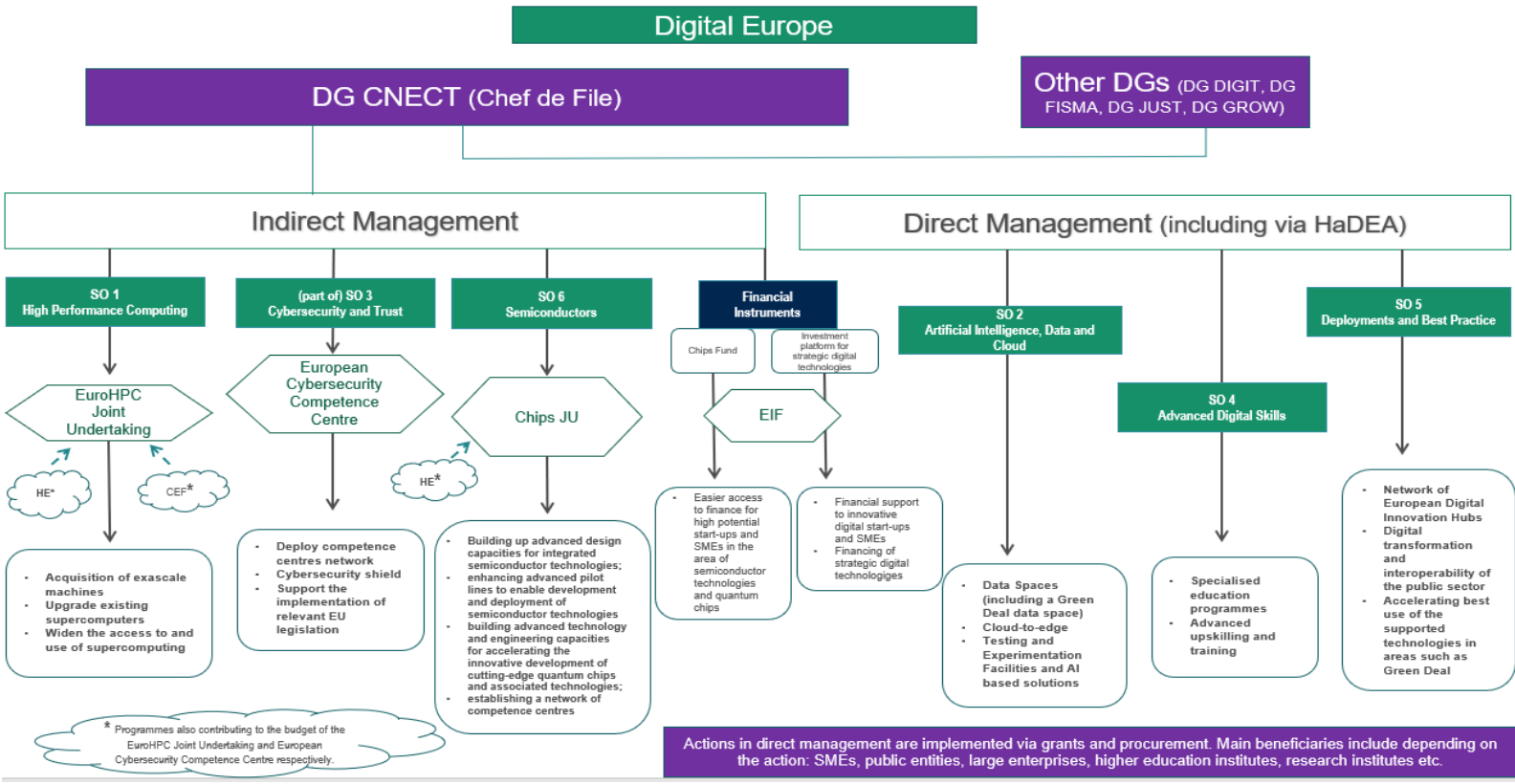
The activities under indirect management by the EuroHPC Joint Undertaking and the European Cybersecurity Competence Centre will also reinforce the innovation actions supported by Horizon Europe and the Connecting Europe Facility. The EuroHPC Joint Undertaking will also implement Horizon Europe and CEF2 supported activities in high performance computing. Horizon Europe will provide support for research and innovation underpinned by cybersecurity infrastructures and facilities, including testing, experimentation and demonstration across all sectors and disciplines impacted by cybersecurity. In addition, Horizon Europe will support research and innovation on cyber-secure components and software relevant for areas such as protecting infrastructure or privacy and data protection.

There are numerous other synergies and complementarities with EU funding programmes. For instance, **Erasmus+**, supports excellence in education and training and contributes to the digital transformation of education and training systems, and thus has concrete synergies with specific objective 4 of the Digital Europe Programme (Advanced Digital Skills). **Creative Europe** promotes the digital transition of the cultural and creative sectors and aims to promote skills for audiovisual professionals in support of the digital transition. **EU4Health** supports the deployment of health dataspaces and digital tools and services to accelerate the digital transition in health care. Furthermore, the **Single Market** programme fosters the digitalisation of SMEs and industry, the **Justice**

programme funds e-Justice projects, which aim to improve the effectiveness of the justice system. The **European Regional Development Fund** promotes innovative and smart economic transformation and regional ICT connectivity. The **European Social Fund+** aims to mainstream and upscale innovative technologies and solutions in the areas of employment, social security coordination, social inclusion and supports education and training for digital skills. In the context of the **Recovery and Resilience Facility** each Member State must dedicate at least 20% of its recovery and resilience plan to the digital transition. **InvestEU** promotes investments in numerous digital areas, such as AI, quantum technology, IoT, blockchain. Another example are the **Fiscalis and Customs** programmes, which support IT capacity building and innovation with regard to the European Electronic Systems for customs and taxation.

Most actions planned under the programme require co-investments by the public and private sectors. The forms of these co-investments are described in the relevant parts of the various Digital Europe work programmes. For co-investment from other EU funding programmes, in particular the cohesion policy funds, the Commission published a notice on the synergies between Horizon Europe and the European Regional Development Fund (ERDF). This notice also provides a practical example of cumulative funding between ERDF and the Digital Europe Programme. ([30]) The European Digital Innovation Hubs (EDIH) are financed by the Digital Europe Programme with a maximum of 50% of eligible costs, the other part may be financed by the ERDF (or can come from other public or private funding).

The graph below shows the current programme structure of the Digital Europe Programme:



([30]) Commission Notice, Synergies between Horizon Europe and ERDF programmes (2022): Publications Office (europa.eu)

Main Activities

The programme includes activities in the following main areas:

- High Performance Computing (HPC): Deployment of world-class exascale, post-exascale supercomputing and quantum computing capacities to ensure the widest access to and use of these capacities;
- Artificial Intelligence (AI): Deployment of EU-wide common data spaces based on a cloud-to-edge federated infrastructure and promote testing and adoption of Artificial Intelligence-based solutions;
- Cybersecurity: Building up of advanced cybersecurity capabilities (including a quantum secure communication infrastructure for Europe); promote the sharing of best practices and ensure wide deployment of the state-of-the-art cybersecurity solutions across the European economy;
- Advanced digital skills: Boosting of academic excellence, by increasing the education offer and training in key digital technologies, such as HPC, cybersecurity, robotics, data, extended reality, cloud computing and AI; in various economic sectors and conversion programmes for non-ICT workers.
- Adoption and best use of key digital technologies: Reinforcing the European blockchain capacities and the digital transformation of public administrations and services through interoperability solutions, deploying a network of European Digital Innovation Hubs supporting the digital transformation of European public and private organisations ([31]);addressing key societal challenges (e.g. environment and climate change) via high impact deployments; and promoting an inclusive and trustworthy digital space.

Expected outputs, results and impact

The graph below lists the outputs, results and impact of the Digital Europe Programme.

The output section shows the main short-term outputs of Digital Europe projects for each Specific Objective. Key outputs include an integrated network of world-class HPC including exascale and post-exascale, EU wide open and interoperable common data spaces in key areas (e.g. Skills, Health, Finance, Agriculture, Mobility, Tourism, Culture and Green Deal data spaces) based on cloud-to-edge federated infrastructure, advanced cybersecurity tools, infrastructures and know-how across the EU economy, specialised education programmes, a network of European Digital Innovation Hubs and interoperable state-of-the-art digital service infrastructures across the EU and related public sector services and services of public interest.

([31]) JRC (2023). Characteristics and regional coverage of the European Digital Innovation Hubs network. JRC Technical Reports, JRC134620.

The main expected results show the mid-term effects of Digital Europe projects, directly linked to the activities in each specific objective. These include significantly increased processing capacities excellence in HPC applications, the availability and exchange of data across the EU in a trustworthy and secure manner to foster the development of new data driven products and services, EU wide deployment of the state-of-the art cybersecurity solutions, access to advanced digital skills and the digital transformation of European private organisations and the public sector.

The expected impact shows the long-term effects on businesses, public organisations and society. In particular, Digital Europe actions are expected to ensure the EU's digital strategic autonomy through the reinforcement of its digital capabilities in HPC, AI, cybersecurity and advanced digital skills and their wide use across the economy and society.

Digital Europe Programme

Needs

- Meet growing demand for access to world-class digital infrastructures - European businesses, public sector and researchers are forced to access and process the computing, data, or AI resources outside the EU.
- Overcome legal and technical barriers to data sharing by establishing secure, accessible, interoperable and privacy-preserving data spaces in key sectors/areas respecting European rules and values.
- Enhance cybersecurity in view of frequent and complex cyberattacks on critical infrastructures.
- Narrow the digital skills gap, especially in the area of advanced digital skills.
- Tackle the inadequate uptake of digital solutions in areas of public interest; uneven adoption of digital solutions among Member States and lack of their interoperability.
- Ensure digital transformation leaves no one behind; foster the take-up of digital skills and digital solutions by businesses (in particular SMEs).

General Objectives

Europe as a driver of digital transformation for the economy and society bringing benefits to citizens and businesses. The main objectives are:

- building essential capacities and advanced skills in key digital technology areas, ccontributing to Europe's technological sovereignty;
- accelerating their deployment and best use in areas of public interest and the private sector.

Activities are implemented within Specific Objectives (SO):

SO 1: High Performance Computing
SO 2: Artificial Intelligence, Data and Cloud
SO 3: Cybersecurity and Trust
SO 4: Advanced Digital Skills
SO 5: Adoption and best use of key digital technologies
SO 6: Semiconductors (WP to be drafted)

Inputs

The financial envelope for the implementation of the Digital Europe Programme is **8 638 million** to be implemented through multiannual Work Programmes.

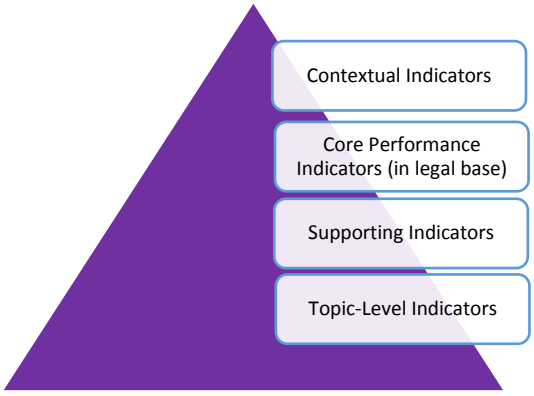
The Programme is carried out in direct management via grants and procurements and in indirect management by the European Cybersecurity Competence Centre, EuroHPC Joint Undertaking, the Chips JU, as well as via Contribution Agreements by the European Space Agency, the European Centre for Medium Range Weather Forecasts and the European Operational Satellite Agency for Monitoring Weather, Climate and the Environment from Space. The Investment Platform for Strategic Digital Technologies is also implemented in indirect management with the European Investment Fund under InvestEU.

Main Outputs	An integrated network of world-class HPC, including exascale supercomputing and data infrastructure A post-exascale supercomputing infrastructure, including the integration with quantum computing technologies Networking of Member State HPC and data capacities HPC Competence Centers, providing HPC services to industry (in particular SMEs), academia and public administrations Deployment of ready to use/operational technology: supercomputing as a service resulting from R&I to build an integrated European HPC ecosystem.	EU wide open and interoperable common Data spaces in key sectors (e.g. Skills, Health, Finance, Agriculture, Tourism, Culture and Green Deal data spaces) based on cloud-to-edge federated infrastructure. Common European libraries of algorithms accessible to all World-class testing and Experimentation Facilities for Artificial Intelligence-based solutions in real setting, in essential sectors open to all actors across Europe and connected to the network of the European Digital Innovation Hubs.	Advanced cybersecurity tools, infrastructures and know-how across European economy Scaling up and networking of existing technological capacities in the competence centres in Member States Support to the implementation of relevant EU legislation.	Specialised education programmes Advanced upskilling and short-term professional training in key digital technologies, such as HPC, cybersecurity, and AI On-the job training in competence centres and companies deploying advanced technologies.	Accelerating wide adoption and best use of the supported technologies in areas such as Green Deal, Destination Earth and other Digital Twins European ecosystem for trusted infrastructures using Distributed Ledgers (e.g. Blockchain) services and applications Interoperable state-of-the-art digital service infrastructures across the Union and related services in the public sector and in areas of public interest. Deployment of and access to advanced digital solutions for public sector and industry Network of European Digital Innovation Hubs.
Main Results	Significantly increased processing capacities Excellence in HPC applications Public and private organisations including research institutes, have access to and widely use world-class EU's high performance computing to process their data A full EU ecosystem that provides the necessary HPC and data capabilities for Europe.	Public and private organisations across Europe have access to information in common European Data Spaces, access to common libraries of algorithms where they are able to identify and acquire whichever solution works best for their needs and to experiment and test AI in real settings. The data spaces ensure the availability and exchange of data from across the EU in a trustworthy and secure manner to foster the development of new data driven products and services. Organisations integrate tested AI based solutions.	Reinforced network of cybersecurity competence centres EU wide deployment of the state-of-the art cybersecurity solutions, including quantum facilities and data resources for cybersecurity Public and private bodies have increased capabilities to protect EU citizens and businesses from cyber threats .	EU citizens have the opportunity to acquire advanced digital skills and businesses have better access to ICT specialists.	Increased capacity to address major societal challenges, for instance use of a highly accurate digital model of the Earth (Destination Earth) to better respond to major natural disasters and adapt to climate change. Digital transformation of European private organisations, in particular SMEs. Digital transformation and interoperability of areas of public interest (e.g. Public administration, health, judiciary, smart cities, energy and environment).
Expected Impact	HPC, quantum computing and data capabilities for Europe to compete globally.	Strengthened core Artificial Intelligence capacities in Europe Better decision making based on combined data sources and patterns.	Increased capability of EU to prevent cyber-attacks and protect critical infrastructures.	Skilled people to develop, roll-out and use new technologies Narrowing advanced digital skills gap.	Decrease in digital divide and fragmentation in Europe, EU-wide digital transformation in areas of public interest and industry Increased readiness to tackle key societal challenges (e.g. Destination Earth to tackle climate change, etc.)

Europe's digital strategic autonomy through reinforced digital capacities in HPC, AI, Cybersecurity, advanced digital skills and wide use of digital technologies across the economy and society.

4. TYPES OF INDICATORS

This framework focuses on the core performance indicators listed in the Regulation. It also presents supporting indicators that will close monitoring gaps that became visible after the first year of implementation. Two other types of indicators - contextual and topic-level indicators - will in some areas complement these performance indicators in order to collect contextual information and obtain detailed data on progress in specific actions.



Contextual indicators provide information on Europe's digital performance and progress towards the higher-level digital policy goals. They have a much wider scope than the other indicators and there is no direct causality between programme-specific actions and the measured changes. While Digital Europe actions and the contextual data are not intentionally linked, Digital Europe actions may have an influence on these data or be influenced by them.

Core performance indicators are indicators listed in the Digital Europe Programme Regulation. They are representative of the programme in that they measure progress towards the objectives of the main work strands across the multiannual financial framework and inform annual reporting on EU spending.

Supporting indicators are designed to ensure that essential information on the progress of specific work strands is collected for the interim and final programme evaluation.

Topic-level indicators have been developed in some specific areas. Data on the progress of specific actions within a specific timeframe is particularly useful in areas where the higher-level performance indicators measure the impact of several work strands in one single indicator. These indicators will provide detailed performance information available in the first years of programme implementation.

5. LIST OF INDICATORS

This chapter provides details on the data and indicators outlined in the previous chapter, supporting evidence for monitoring the implementation of the Digital Europe Programme and progress in achieving its objectives, in accordance with the Commission Communication on Better Regulation.

5.1. Core performance indicators

Annex II of the Digital Europe Programme Regulation lists the 14 core performance indicators that measure progress in achieving the specific objectives of the Digital Europe Programme. This progress is reported annually in the context of the Programme Performance Statement annexed to the Annual Management and Performance Report for the EU budget (AMPR). In the interim and final evaluations, which will cover the effectiveness, efficiency, coherence, relevance and EU added value of the Digital Europe Programme, these indicators will be mainly used to report on the effectiveness of the programme. Some of these indicators (1.2, 2.2, 2.3, and 4.3) in addition will indicate how relevant the actions are to the main stakeholder groups. The targets of these indicators have been estimated in the context of a DG CNECT corporate decision-making process based on committed budget, targets defined in the impact assessment, an extrapolation of requirements in the first work programmes or call texts. Targets depend on financial allocation and funding priorities in the Work Programmes, and for this reason may require revision.

1.1. The number of jointly procured HPC infrastructures (SO1)	
Indicator Type	Output
Definition	Number of mid-range (pre-exascale), exascale and post-exascale computers, as well as quantum computers procured with Digital Europe funding under joint procurement
Unit of Measurement	Absolute Number
Data Source	EuroHPC Joint Undertaking
Data provider and responsible for data collection	EuroHPC Joint Undertaking, data computed by DG CNECT.C2
Frequency of Data Collection	Annual
Baseline	7 Supercomputers (2 precursors to exascale and 5 petascale supercomputers have been acquired during the 2014-2020 MFF)
Target	21 (2026)
Underlying definitions and concepts	Exascale computing refers to computing systems capable of at least one exaFLOP, or a billion billion (i.e., a quintillion) calculations per second. Pre-exascale systems have close to exascale performance. Post-exascale have performance superior to exascale computers.

1.2 The usage of the exascale and post-exascale computers in total and by various stakeholder groups (universities, SMEs etc.) (SO1)	
Indicator Type	Result
Definition	The indicator measures the share of totally available computing time in %
Unit of Measurement	% of totally available computing time in minutes (expressed as fraction)
Data Source	EuroHPC Joint Undertaking
Data provider and responsible for data collection	Euro HPC Joint Undertaking, data computed by CNECT.C2
Frequency of Data Collection	Annual
Baseline	0. The indicator is strictly linked to the implementation of Digital Europe
Target	10% by 2025
Underlying definitions and concepts	Totally available time is the time for which the infrastructures could theoretically be used. SMEs are enterprises with fewer than 250 employees. Large enterprises have 250 employees or more. Industry corresponds to the NACE sectors.

2.1. Total amount co-invested in testing and experimentation facilities (SO2)	
Indicator Type	Input
Definition.	The indicator measures the total spending on sites for experimentation and testing by Digital Europe and other funding providers, which include Member States, and the private sector.
Unit of Measurement	Euro
Data Source	Reporting of beneficiaries
Data provider and responsible for data collection	CNECT.A1
Frequency of Data Collection	Annual
Baseline	0. The indicator is strictly linked to the implementation of Digital Europe;
Target	EUR 180 000 000 by 2027
Underlying definitions and concepts	A Reference Testing and Experimentation Facility is a technology infrastructure that has specific expertise and experience in testing mature technology in a given sector, under real or close- to-real conditions.

2.2. The usage of common European libraries or interfaces to libraries of algorithms, usage of common European data spaces and usage of testing and experimentation facilities related to actions under this Regulation (SO2)	
Indicator Type	Result
Definition	Comprises four indicators for the three AI high impact deployments: Usage of the Cloud-to-edge marketplace (2.1.3); Usage of the European AI platform (2.2.1); Usage of European Data Spaces (2.2.2); and Usage of Testing and experimentation facilities (2.2.3).

	2.1.3 Usage of Cloud-to-Edge marketplace: number of user organisations on the ecosystem. 2.2.1. Usage of the European AI on demand platform: Usage of the platform resources (e.g., number of resources put on the platform, downloads of software, linking of end-users and solutions providers). 2.2.2. Usage of European Data Spaces: Number of organisations involved as data providers and data users. 2.2.3. Usage of Testing and experimentation facilities: Number of entities having used the testing and experimentation facilities' services.
Unit of Measurement	Absolute number
Data Source	Reporting of beneficiaries
Data provider and responsible for data collection	CNECT.G1 (data spaces), CNECT.A1 (AI on demand, TEF), CNECT.E2 (marketplace)
Frequency of Data Collection	Annual
Baseline	0. The indicator is strictly linked to the implementation of Digital Europe
Target	1600 users by 2030
Underlying definitions and concepts	The cloud-to-edge marketplace will be an online platform providing businesses (notably SMEs) and national public authorities with the means to access trusted data processing services, notably cloud and edge services. The European AI on demand platform is a single access point to high quality tested AI resources (e.g. safe, robust and transparent AI algorithms; new generation hardware computing; smart robots) Data spaces organise access to and use of data including IT systems, governance frameworks, standards and cloud-based services. A Reference Testing and Experimentation Facility is a technology infrastructure that has specific expertise and experience in testing mature technology in a given sector, under real or close-to-real conditions.

2.3. The number of cases for which organisations decide to integrate AI into their products, processes or services, as a result of the programme (SO2)	
Indicator Type	Result
Definition	Number of new customers acquiring solutions offered by the technology providers having used the Testing and Experimentation Facilities, or the resources from the AI on demand platform.
Unit of Measurement	Absolute number
Data Source	Monitoring by the European Commission (e.g., survey sent to users of the services offered by the programme and the EDIHs)
Data provider and responsible for data collection	CNECT.A1
Frequency of Data Collection	Annually during project implementation and at least once after its completion but could be repeated 3 years later.
Baseline	0. The indicator is strictly linked to the implementation of Digital Europe

Target	100 by 2030
Underlying definitions and concepts	A Reference Testing and Experimentation Facility is a technology infrastructure that has specific expertise and experience of testing mature technology in a given sector, under real or close to real conditions.

3.1.a The number of cybersecurity infrastructure, or tools, or both jointly procured (SO3)	
Indicator Type	Output
Definition	This indicator measures the number of different categories of cybersecurity infrastructure, and tools (e.g., data resources for cybersecurity; situational awareness tools) jointly procured at EU level with Digital Europe funding.
Unit of Measurement	Number of infrastructures and tools
Data Source	Monitoring by European Commission
Data provider and responsible for data collection	CNECT.H1
Frequency of Data Collection	Annually
Baseline	0. The indicator is strictly linked to the implementation of Digital Europe.
Target	15 by 2027
Underlying definitions and concepts	This indicator measures the number of different categories of cybersecurity infrastructure, and tools (e.g., data resources for cybersecurity; situational awareness tools) jointly procured at the EU level with Digital Europe funding.

The above indicator measures the cybersecurity infrastructures and tools **jointly procured**. As the majority of Cybersecurity actions will be implemented via other implementation modes than joint procurement, the complementary indicator 3.1.b has been created to demonstrate the full extent of infrastructures and tools deployed under SO 3 (via joint procurement and other implementation modes).

Indicator 3.1b ([32]) (): Cybersecurity infrastructure and/or tools deployed (SO3)	
Indicator Type	Output
Definition	This indicator measures the number of different categories of cybersecurity infrastructure, and/or tools (e.g., data resources for cybersecurity; situational awareness tools) deployed at EU level with Digital Europe funding.
Unit of Measurement	Number of Infrastructures, and tools
Data Source	Reporting of Beneficiaries
Data provider and responsible for data collection	CNECT.H1

([32]) This indicator is not in the Digital Europe Regulation but will be reported on in the context of the Programme Performance Statement. As the majority of Cybersecurity actions will be implemented via other implementation modes than joint procurement measured by indicator 3.1a, the complementary indicator 3.1.b has been created to demonstrate the full extent of infrastructures and tools deployed under SO 3.

Frequency of Data Collection	Annually
Baseline	0. The indicator is strictly linked to the implementation of Digital Europe
Target	165 by 2027
Underlying definitions and concepts	An 'Infrastructure' is a research or experimentation infrastructure such as a testbed, cyber range or computing/communication facility. This could be either data and/or software only or involve physical facilities. A 'Tool' is a physical device and/or software/algorithm used to increase the security of ICT systems. Examples would be intrusion detection software or data resources allowing situational awareness of critical infrastructures.

3.2. The number of users and user communities getting access to EU cybersecurity facilities (SO3)	
Indicator Type	Result
Definition	The indicator measures the number of unique companies/organisations/entities using cybersecurity facilities (cybersecurity infrastructure, services and/or tools as in indicator 3.1b) notably to meet requirements under relevant EU legislation (NIS Directive or other) or to contribute to the European Commission's cyber policy goals.
Unit of Measurement	Unique companies/organisations/entities
Data Source	Reporting of beneficiaries
Data provider and responsible for data collection	CNECT.H1
Frequency of Data Collection	Annually
Baseline	0. The indicator is strictly linked to the implementation of Digital Europe
Target	400 by 2028
Underlying definitions and concepts	An 'Infrastructure' is a research or experimentation infrastructure such as a testbed, cyber range or computing/communication facility. This could be either data and/or software only, or involve physical facilities. A 'Tool' is a physical device and/or software/algorithm used to increase the security of ICT systems. Examples include intrusion detection software or data resources allowing situational awareness of critical infrastructures. A 'service' is the provision of expertise to help organisations deploy, manage and optimise or access cybersecurity solutions. This indicator is based on an estimate of the number of cybersecurity infrastructures in the pure sense (e.g. cyber ranges or new security operation centres), and also on an estimate of tools that strengthen existing infrastructures, such as electricity networks, communication networks, transport infrastructures, etc.

4.1. The number of persons who have received training to acquire advanced digital skills supported by the programme (SO4)	
Indicator Type	Output
Definition	Number of individuals taking part in training activities supported by the Digital Europe programme
Unit of Measurement	Absolute number
Data Source	Reporting of beneficiaries
Data provider and responsible for data collection	CNECT.G2
Frequency of Data Collection	Annually or biannually (depending on the type of courses).
Baseline	0. The indicator is strictly linked to the implementation of Digital Europe
Target	65 000 by 2027
Underlying definitions and concepts	The indicator measures the number of individuals enrolled in training activities supported by the Digital Europe, at the start of the training activities under consideration and as reported by the grant beneficiaries.

4.2. The number of enterprises, in particular SMEs, having difficulty in recruiting ICT specialists (SO4)	
Indicator Type	Impact
Definition	Enterprises reporting hard-to-fill vacancies for jobs requiring ICT specialist skills, as percentage of enterprises that recruited/tried to recruit personnel for jobs requiring ICT specialist skills
Unit of Measurement	Percentage
Data Source	EU survey on ICT usage and e-commerce in enterprises
Data provider and responsible for data collection	DG CNECT.B2 from Eurostat (unit G4)
Frequency of Data Collection	Biannually
Baseline	55,43% (2020)
Target	No target, estimate is 68,4% in 2029 based on the current skills gaps and without taking into account EU action ([33]).
Underlying definitions and concepts	The indicator is related to hard-to-fill vacancies reported by enterprises during the previous calendar year. Hard-to-fill vacancies refer to a range of situations in which enterprises find it difficult to find individuals with specific skills (hard-to-fill vacancies due to skills shortage).
Risks and Limitations	The indicator is only indirectly linked to the implementation of Digital Europe. It can be assumed that Digital Europe will contribute to improving the trend observed, but the extent of this contribution cannot be estimated. In addition, and importantly, external factors (including business digitalisation,

([33]) As this is a contextual indicator, its scope is much wider than solely measuring the impact of Digital Europe. There is therefore no defined target. This indicator serves as a compass for monitoring progress towards the digital policy goals.

	labour market and demographic dynamics) will affect the current trend and could result in deviations from the milestones and targets presented above.

4.3. The number of people reporting an improved employment situation after the end of the training supported by the programme (SO3)	
Indicator Type	Result
Definition	Number of participants enrolled in training activities that found employment or report an improved employment situation 6 months after completion of those activities.
Unit of Measurement	Absolute number
Data Source	Reporting of Beneficiaries
Data provider and responsible for data collection	Survey sent to participants in training courses, final figure computed by CNECT.G2
Frequency of Data Collection	Biannually
Baseline	0. The indicator is strictly linked to the implementation of Digital Europe
Target	26 200 by 2027
Underlying definitions and concepts	The definition of the indicator depends on the employment status of the participants at the time of enrolment to the training activities supported by Digital Europe. Therefore, two cases can be distinguished: 1. Participants unemployed, inactive or in education at the beginning of the training: improved employment situation means that the participants find employment, including self-employment, 6 months after completing the training. 2. Participants employed at the beginning of the training: improved employment situation means that the participants transited from precarious to stable employment, and/or from underemployment to full employment, and/or have moved to a job requiring higher competences/skills/qualifications, entailing more responsibilities, and/or received a promotion 6 months after completing the training.

5.1. The take-up of digital public services (SO5)	
Indicator Type	Result
Definition	This is a composite indicator measuring progress towards the uptake targets for selected digital public services supported by the programme used as proxies. For each solution used as a proxy, sub-indicators will measure its uptake. These sub-indicators use different metrics. One of the sub-indicators, for instance, measures the number of projects reusing eDelivery. Another sub-indicator related to digital services in the area of justice and consumer protection, on the other hand, measures the percentage of the work completed (100% (1) means full completion of work). To compute the average progress on this composite indicator, all sub-indicators are measured in terms of

	percentage of completed work (for sub indicators using absolute numbers, progress is measure as follows: milestone/target*100). To calculate the overall progress, each sub-indicator is taken into consideration to the same degree. This indicator is composed of the following sub-indicators: • **Common services platform** measuring the number of projects reusing eTranslation, • Number of projects reusing eDelivery, • Number of projects reusing the Interoperability testbed • **Once-only principle** (OOP) implementation measuring the Schedule Performance Index and Cost Performance Index (If score is>1, the performance is on track) • Number of Member States connected by the end of the action to OOP • Support to an **EU electronic identity system** measuring the number of countries enabled by the funded activities to exchange the new digital identity credentials • **Digital services in the area of justice and consumer protection** measuring the achievement of key milestones for three actions (i.e., Maintenance and development of the core EU justice and consumers systems, e-CODEX and EU eLab). Target evaluated against the successful completion of the planned work under each component. A value of 1 = 100% of the objectives were met. Each area of focus has a 25% weight to compute the overall score.
Unit of Measurement	Normalised 0-1 progress scale
Data Source	Monitoring by the European Commission
Data provider and responsible for data collection	Common Service Platform (CNECT.G3/H4, DIGIT.B2 and DG DGT for eTranslation) OOP and Digital Wallet (CNECT.H4) Justice and Consumer Protection (JUST.H4)
Frequency of Data Collection	Annually
Baseline	0. The indicator is strictly linked to the implementation of Digital Europe
Target	1 (full implementation of all work strands) by 2026
Underlying definitions and concepts	For this indicator, digital public services are activities, infrastructures and tools supporting the provision of electronic public services to individuals or businesses, typically over the internet. A public service is an activity of general interest defined, created and monitored by the public authorities (e.g., health and care, justice, etc.). Take-up can refer to several elements, such as the deployment, sectoral coverage and use of services.

5.2. Enterprises with high digital intensity score (SO5)	
Indicator Type	Impact
Definition	Percentage of enterprises ([34]) in the EU with a digital intensity score of 'high' or 'very high', as measured by the digital intensity index. 'High' means that the company reports to be using at least 7 out of 12 pre-defined digital technologies.
Unit of Measurement	% of EU enterprises (expressed as a fraction)
Data Source	EU survey on ICT usage and e-commerce in enterprises
Data provider and responsible for data collection	CNECT. B2 from Eurostat (unit G4)
Frequency of Data Collection	Annually
Baseline	155% (2020)
Target	No target, estimate is 21% by 2029 ([35])
Underlying definitions and concepts	The Digital Intensity Index (DII) measures the availability at firm level of 12 different digital technologies. The value of the index ranges from 0 to 12. An index of 7 to 9 is considered high, and of 10 to 12 very high. The list of technologies partially changes every year since 2015.
Risks and Limitations	This indicator is based on a representative sample of all EU enterprises with 10 or more employees and self-employed person in NACE Rev. 2 ([36]) sections C to J, L to N and group 95.1 and thus has a much larger scope than the beneficiaries of the programme. The contribution of the programme is therefore difficult to isolate. Multiple external factors lead to changes in the Index (including the economic context, and other policies). The list of technologies has been adjusted every year since 2015 to reflect technological developments and policy priorities. This reduces comparability between years, with expected fluctuations across years, making projections on future trends very challenging.

5.3. The extent of the alignment of the National Interoperability Framework with the European Interoperability Framework (SO5)	
Indicator Type	Result
Definition	Average level of implementation of the European Interoperability Framework (EIF) at EU level.
Unit of Measurement	1-4 continuous scale
Data Source	The indicator is calculated from the current EIF monitoring mechanism, showing the mean value of EU level implementation. The data are collected consistently and exhaustively through a detailed survey covering the 27 Member States, combined with measurements from the Commission's secondary data

([34]) See definition of 'enterprise': Glossary: Enterprise - Statistics Explained (europa.eu)

([35]) As this is a contextual indicator, its scope is much wider than solely measuring the impact of Digital Europe. There is therefore no defined target. This indicator serves as a compass for monitoring progress towards the digital policy goals.

([36]) https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex%3A32006R1893

	sources such as open data portal indicators.
Data provider and responsible for data collection	DIGIT.B.2
Frequency of Data Collection	Annually
Baseline	3.750 (2020)
Target	3.775 (2025)
Underlying definitions and concepts	The EIF supports European public administrations in their effort to design and deliver seamless European public services to businesses and individuals, which are digital-by-default, cross border-by-default and open-by-default. It is key to establishing the Digital Single Market in that it supports cross-border and cross-sectoral interoperability for the delivery of digital public services in the EU. The methodology is based on the EIF Monitoring Mechanism and consists of a set of meaningful and measurable KPIs to assess the level of implementation of the 47 EIF recommendations. These 47 recommendations are organised under the EIF's three pillars, and 25 thematic areas, each of which is related to at least one EIF recommendation. The results of the 25 thematic areas are then aggregated into the three pillars, which are then aggregated into a single average score per Member State giving an overall indication of the level of implementation of the EIF in that particular country. The mean value of the single score of the individual Member State is the single indicator that will be used.

5.4. Number of businesses and public sector entities that have used the services of European Digital Innovation Hubs (SO5)	
Indicator Type	Result
Definition	Cumulative number of users of the European Digital Innovation Hubs (EDIH), by user category (businesses of different sizes, public sector entities, etc.), sector, and location and by technology involved. This indicator refers to all types of services offered by the EDIHs: test before invest, funding support, skills and training and ecosystem and networking services.
Unit of Measurement	Absolute number (unique entities)
Data Source	Digital Transformation Accelerator
Data provider and responsible for data collection	CNECT.A4
Frequency of Data Collection	Annually
Baseline	0. The indicator is strictly linked to the implementation of Digital Europe
Target	191 400 by 2027
Underlying definitions and concepts	EDIH provide technological expertise and experimentation facilities to enable the digital transformation of the industry and the public sector.

Progress on these indicators is reported in the annual Programme Performance Statement published on Digital Europe programme - Performance (europa.eu).

SO 6

Indicators related to the new SO6 on semiconductors, were introduced by the Chips Act Regulation ([37]). Annex II of the Regulation lists the indicators below. These will be defined in more detail once the related work programmes will be available.

1. The number of legal entities involved (subdivided by size, type and country of establishment) in the actions supported by the Initiative. In relation to the Initiative's operational objective 1:

2. The number of design tools developed or integrated under the Initiative. In relation to the Initiative's operational objective 2:

3. The total amount co-invested by the private sector in design capacities and pilot lines under the Initiative. In relation to the Initiative's operational objective 3:

4. The number of users of semiconductors or user communities seeking, and the number of users of semiconductors or user communities obtaining, access to design capacities and pilot lines under the Initiative. In relation to the Initiative's operational objective 4:

5. The number of businesses, which have used the services of national competence centres supported by the Initiative.

6. The number of persons who have successfully concluded training programmes supported by the Initiative to acquire advanced skills and training on semiconductor technologies and quantum technologies.

7. The number of active competence centres in the Union in the context of the Initiative. In relation to the Initiative's operational objective 5:

8. The number of start-ups, scale-ups and SMEs that have received venture capital from the Chips Fund activities and the total amount of capital investments made.

9. The amount of investment by companies operating in the Union, including by segment of the value chain in which they operate.

5.2. Additional Supporting Indicators

After the first year of implementation of the Digital Europe Programme, an assessment of the monitoring strategy concluded that additional indicators are necessary to ensure a 'deeper analysis of performance in the interim and ex post evaluations of the programme', as requested in the Communication on the Monitoring Framework for the EU budget under the 2021-2027 MFF[38]. A mapping of the indicators from the legal basis onto the Digital Europe actions, revealed certain monitoring gaps and led to 10 additional performance indicators being developed. The 10 additional indicators, outlined below, will provide valuable input for the programme's mid-term and ex post evaluations.

([37]) Regulation (EU) 2023/1781 of the European Parliament and of the Council of 13 September 2023 establishing a framework of measures for strengthening Europe's semiconductor ecosystem and amending Regulation (EU) 2021/694 (Chips Act): EUR-Lex - 32023R1781 - EN - EUR-Lex (europa.eu).

([38]) Communication on the performance framework for the EU budget under the 2021-2027 MFF

1. Number of EU computer systems in world top 10 ([39]) (SO1)	
Indicator Type	Result
Definition	Number of supercomputers featured in the TOP500 list installed in the EU amongst the top 10 systems in terms of computing power.
Unit of Measurement	Absolute number (computer systems)
Data Source	www.top500.org
Data provider and responsible for data collection	Top500.org Figure computed by CNECT.C2
Frequency of Data Collection	Biannually (June and November)
Baseline	0. The indicator is strictly linked to the implementation of DEP
Target	Two EU computer systems in world top 10 by 2026
Underlying definitions and concepts	The Top500 list uses as a yardstick of performance the `best' performance as measured by the LINPACK benchmark. LINPACK was chosen because it is widely used and performance numbers are available for almost all relevant systems. More information available at: https://www.top500.org/project/linpack/
Other methodological comments (if relevant)	The ranking methodology is based on a benchmark that does not measure the overall performance but rather the performance for a specific type of operation.

2. HPC: Percentage of computing power of top 500 systems installed in the EU ([40]) (SO1)	
Indicator Type	Result
Definition	Share of the total computing power of top 500 systems corresponding to systems installed in the EU.
Unit of Measurement	Percentage of total computing power (expressed as a fraction)
Data Source	www.top500.org
Data provider and responsible for data collection	CNECT.C2
Frequency of Data Collection	Biannually (June and November)
Baseline	0. The indicator is strictly linked to the implementation of Digital Europe
Target	10% by 2026 (for supercomputers funded by Digital Europe) Estimation is based on the fact that EuroHPC supercomputers made 10.77% of the total TOP500 list (Rmax performance) in

([39]) funded by Digital Europe credits.

([40]) funded by Digital Europe credits.

	November 2022.
Underlying definitions and concepts	The Top500 list uses as a yardstick of performance the `best' performance as measured by the LINPACK Benchmark. LINPACK was chosen because it is widely used and performance numbers are available for almost all relevant systems. More information on: https://www.top500.org/project/linpack/

3. Number of operated services available on the Destination Earth (DestinE) Core Service Platform (SO1)	
Indicator Type	Output
Definition	DestinE Core Service Platform services are ready-to-use functions and applications with reliable performance levels (formal service-level agreement), available for users. Examples include modelling, visualisation and collaboration services.
Unit of Measurement	Absolute Number (services)
Data Source	The data are collected and reported from the DestinE Core Service Platform Registry
Data provider and responsible for data collection	European Space Agency (ESA)
Frequency of Data Collection	Annually
Baseline	0. The indicator is strictly linked to the implementation of Digital Europe.
Target	15 at the end of Phase 1 ([41]) (June 2024).
Underlying definitions and concepts	The indicator is used to measure the coverage of DestinE services, their attractiveness and adoption by users.
Other methodological comments	The number of services includes those operated on the DestinE Core Service Platform and those funded by third-parties or other EU programmes.

4. Number of different data types available from the DestinE Core Service Platform (measures data providers) (SO1)	
Indicator Type	Output
Definition	Number of distinct categories or thematic areas from which data are made available to the

([41]) Destination Earth is to be implemented in 3 phases.

	DestinE user community. This refers to the number of data types belonging to different categories / domains / fields. The indicator is used to demonstrate the diversity of data resources available for end users.
Unit of Measurement	Absolute Number (data types)
Data Source	DestinE Data Lake Data Portfolio and DestinE Core Service Platform Service Portfolio
Data provider and responsible for data collection	European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT)
Frequency of Data Collection	Annually
Baseline	0. The indicator is strictly linked to the implementation of Digital Europe
Target	15 at the end of Phase 1
Underlying definitions and concepts	The indicator is used to measure the level of diversity of the categories of data available to end users. The objective is to measure the variety of data resources to be used, and the list will grow as DestinE moves to new areas and fields. The value expressed in this indicator refers to and includes multiple categories or thematic areas.

5. Number of agreed Destination Earth partnership project plans and use cases (SO1)	
Indicator Type	Output
Definition	A partnership project plan is a document describing the planned work of the third party (partner) and the contributions of the European Centre for Medium-Range Weather Forecasts (ECMWF), the European Space Agency (ESA) and/or the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT). It is agreed via the process described in the Joint Partnership Plan. A use case is outsourced work on a specific application contracted by one of the three implementing entities under DestinE. This can be a specific contract or a work package under a larger contract. The indicator measures the progress of user uptake at different levels and in various formations and setups.
Unit of Measurement	Absolute Number (project plans and use cases)

Data Source	DestinE Partnership Plan (updated annually) Reports by ECMWF and ESA and EUMETSAT on partnership activities.
Data provider and responsible for data collection	ECMWF, ESA, EUMETSAT
Frequency of Data Collection	Annually
Baseline	0. The indicator is strictly linked to the implementation of Digital Europe
Target	20 at the end of Phase 1, including partnerships or use cases with institutions at national, EU, and possibly local levels.. Partnerships and use cases should demonstrate the added value of DestinE and cover a variety of high impact sectors, e.g. energy, water and public health management, and corresponding stakeholders and workflows. Estimates are based on Phase 1 planning and interest received in user engagement activities. Phase 2 estimates are contingent on budget availability for Phases 2 and 3.
Underlying definitions and concepts	DestinE User Partnerships are structured work relations with policy institutions from EU services, EU Member State services (national, regional, local levels) and, possibly, global institutions. They aim to help design and implement sustainable services throughout the lifetime of DestinE in a way that corresponds to the specific needs of the users. Use Cases are an effective way of involving stakeholders in the development and initial operations of DestinE. They serve to: a. demonstrate key features of DestinE capabilities, b. address a key challenge affecting a user of DestinE with a view to improving the situation substantially. c. involve active domain users in exploring and contributing to advanced features of DestinE. Such use cases may concern a variety sectors, including forestry, water management, air quality management, urban development, maritime or air transport, biodiversity and disaster risk mitigation.

6. Number of entities supported in strengthening preparedness for and response to major cybersecurity incidents (SO3)	
Indicator Type	Result
Definition	The indicator measures the number of penetration tests, incident response support actions and mutual assistance support actions provided.
Unit of Measurement	Absolute number (of entities participating in preparedness actions, and entities supported in the context of incident response and mutual assistance actions)
Data Source	ECCC
Data provider and responsible for data collection	ECCC and CNECT.H1 will collect this data when conducting preparedness actions and responding to requests for mutual assistance and incident response.
Frequency of Data Collection	Annually
Baseline	0. The indicator is strictly linked to the implementation of Digital Europe
Milestones and Target	300 (2025)
Underlying definitions and concepts	'Preparedness actions' are collective and individual actions to prepare for and tackle cyberattacks or security breaches. Such actions include coordinated collective testing, penetration tests, individual exercises, risk monitoring and training. 'Incident response' is an organised approach to addressing and managing the aftermath of a security breach or cyberattack. 'Mutual assistance' means addressing and managing the aftermath of a security breach or cyberattack with the help of the authorities of another country.

7. Number of cities and communities developing smart digital solutions as a result of Digital Europe funding (SO2)	
Indicator Type	Result
Definition	Number of cities, towns, villages, and communities that have developed a digital strategy or have developed smart digital solutions like local digital platforms or local digital twins as a result of DEP funding.

Unit of Measurement	Absolute number (cities and communities)
Data Source	Reporting by beneficiaries
Data provider and responsible for data collection	Reporting by beneficiaries, figure computed by unit CNECT.C3
Frequency of Data Collection	Biannually (June and November)
Baseline	0. The indicator is strictly linked to the implementation of Digital Europe
Target	20 by 2027
Underlying definitions and concepts	This indicator covers cities, towns, villages and communities that (i) have a strategy in place to develop a local digital platform, (ii) have developed a platform, and (iii) use a Local digital Twin with associated visualisation, modelling and prediction capabilities.
Other methodological comments (if relevant)	Numbers arrived at using this methodology will exclude those projects involving cities developing data and modelling solutions unless they associate these solutions to EU algorithmic registers and EU data spaces. The number arrived at may not reflect all contributing projects as some will be difficult to track.

8. Usage of the European Blockchain Service Infrastructure and of the European Blockchain sandbox (SO5)	
Indicator Type	Result
Definition	Number of users (including public and private organisations and members of the public) participating in the EBSI ecosystem and accessing and using services provided through the European blockchain service infrastructure (EBSI). The indicator will further include the number of sectors/areas covered and of countries using the EBSI. Finally, it will include the number of users (including start-ups and other projects) accessing and engaging with the European blockchain sandbox.
Unit of Measurement	Absolute number (estimated organisations and individuals) Further breakdown: Type of beneficiary (member of public, enterprise, SME, public administrations), sector or areas, location.
Data Source	European Blockchain Partnership monitoring combined with external input
Data provider and responsible for data collection	European Blockchain Partnership, facilitator of the European Blockchain sandbox, data computed by CNECT. F4
Frequency of Data Collection	Every 2 years (2023, 2025, 2027)
Baseline	0. The indicator is strictly linked to the implementation of Digital Europe.
Target	EBSI: Number of countries hosting an EBSI node (25 by 2027)

	Number of sectors/areas covered: 15 (2027) Estimated number of organisations benefiting from EBSI services: 500 (2027) Number of individuals benefiting from EBSI services: 200 000 (by 2025) Number of projects involved in the regulatory sandbox: 60 (by 2025).
Underlying definitions and concepts	Digital Europe actions will support the further development and deployment of the infrastructure and of use cases or applications to be implemented as part of EBSI. This will include services used by individuals, businesses and public administrations. Special attention will be paid to cross-border applications supported by Digital Europe, but local applications will also be supported where appropriate (as EBSI can contribute to them). For instance, sharing validated diplomas on EBSI can involve individuals, enterprises and universities, and can be cross-border for mobility purposes but also local in individual Member States. EBSI should help track the number of transactions for reporting purposes. For the European blockchain sandbox, the number of start-ups or projects participating in its activities will be monitored. (The sandbox activities will be organised in cohorts with a specific number of participants). Other aspects, e.g., the participation of regulators from a given number of countries, number of guidelines developed, etc., can be easily monitored.
Other methodological comments (if relevant)	There may be difficulties in obtaining relevant data as well as discrepancies in data collection in various Member States when EBSI is used for local services.

9. Number of European Digital Innovation Hubs, their geographical distribution and their specialisations (SO5)	
Indicator Type	Output
Definition	Number of EDIHs that have received a Digital Europe grant and an overview of their specialisation and geographical distribution (according to the NUTS 2 classification).
Unit of Measurement	Absolute number, with associated features, made visible through an interactive map (catalogue).
Data Source	https://www.edihnetwork.eu - EDIH catalogue
Data provider and responsible for data collection	EDIH, Responsibilities for data collection: Digital Transformation Accelerator (procurement contract), figure computed by DG CNECT.A4
Frequency of Data Collection	At time of contracting
Baseline	0. The indicator is strictly linked to the

	implementation of Digital Europe
Target and how the target was estimated	151 EDIHs (1st Call - 136 and 2nd Call -15), all EEA countries covered by at least one EDIH
Underlying definitions and concepts	EDIHs provide technological expertise and experimentation facilities to enable the digital transformation of the industry and the public sector

10. Entities that have been supported by the European Digital Innovation Hubs showing a significant increase in their digital maturity (SO5)	
Indicator Type	Result
Definition	Cumulative number of entities having benefited from EDIH services that have increased their digital maturity score by at least x points in the Digital Maturity Assessment (DMA) tool representing significant progress. The threshold for significant progress will be determined at a later stage.
Unit of Measurement	Absolute number (unique entities)
Data Source	https://www.edihnetwork.eu - DMA questionnaire
Data provider and responsible for data collection	EDIH, Unit A4/ Digital Transformation Accelerator (procurement contract)
Frequency of Data Collection	Annually
Baseline	0. The indicator is strictly linked to the implementation of Digital Europe
Target and how the target was estimated	19.140 – cumulative number of entities in 2027 that have used EDIH' services and have increased their digital maturity score
Underlying definitions and concepts	Digital maturity will be determined through the DMA questionnaire, which assesses digital business strategy; digital readiness; human-centric digitalisation; data management; automation & intelligence; and green digitalisation ([42]).

5.3. Contextual Indicators

Contextual indicators will provide relevant insight into Europe's digital performance and progress towards the high-level digital policy goals. The contextual information should provide insight into 'developments that are not intentionally related to the individual initiative, although they may influence it or be influenced by it' ([43]). The contextual information relevant for the Digital Europe Programme will be gathered through a few Key Performance Indicators (KPIs) from the Digital Decade Policy programme (DDPP) ([44]), which entered into force on 8 January 2023. This programme sets objectives and targets for 2030 for the EU in four key areas ('Digital Compass'): digital

([42]) JRC (2023). Digital Maturity Assessment (DMA) Framework & Questionnaires for SMEs/PSOs. A guidance document for EDIHs. JRC133234.

([43]) Better Regulation Toolbox. 2021: p.361: br_toolbox-nov_2021_en.pdf (europa.eu).

([44]) Decision (EU) 2022/2481 of the European Parliament and of the Council of 14 December 2022 establishing the Digital Decade Policy Programme 2030: EUR-Lex - 32022D2481 - EN - EUR-Lex (europa.eu).

skills, digital infrastructures, digitalisation of businesses and digitalisation of the public sector to boost the EU's digital transformation.

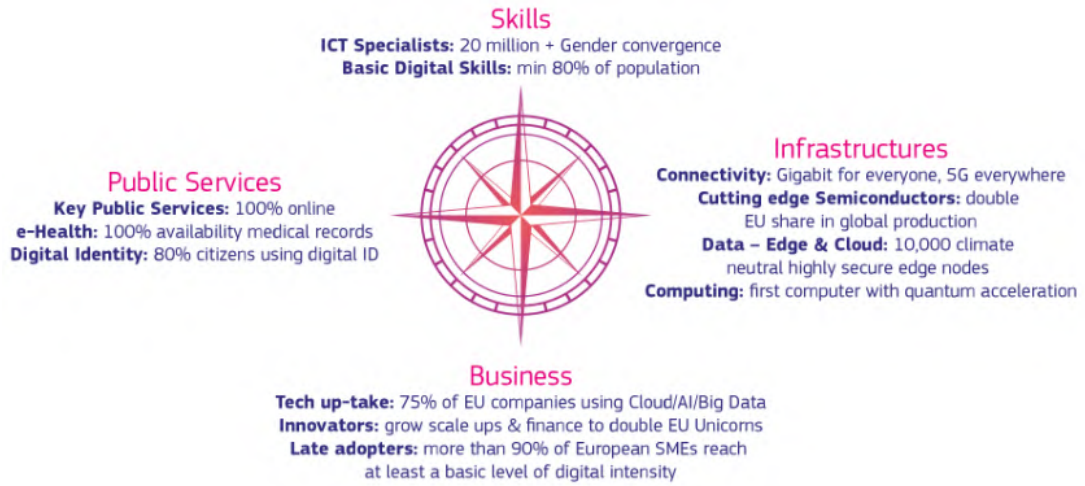


Figure 1: The Digital Decade Compass

The observed trends will help to evaluate the relevance of the programme in terms of progress achieved towards the digital transformation, and to identify potential gaps or needs, which could influence future work programmes. Among the DDPP's KPIs, the following are considered to be particularly relevant contextual indicators for the Digital Europe Programme and will be closely monitored:

(1) **Percentage of ICT specialists in total employment:** ICT specialists, measured as the number of individuals aged 15-74 who are employed as ICT specialists; and gender convergence, measured as the percentage of women and men among those individuals employed as ICT specialists. In accordance with the ISCO-08 code classification. ICT specialists are workers who have the ability to develop, operate and maintain ICT systems, and for whom ICT constitutes the main part of their job, including but not limited to ICT service managers, ICT professionals, ICT technicians, ICT installers and servicers.

(2) **Semiconductors,** measured as value generated, in the form of revenues, by semiconductor activities in the EU, in all stages of the value chain, with respect to the global market value. For the first year, reporting will be done on the basis of those activities in the EU.

(3) **Percentage of European Enterprises adopting Artificial intelligence technologies:** Artificial intelligence, measured as the percentage of enterprises using at least one artificial intelligence technology.

(4) **SMEs with at least a basic level of digital intensity**, measured as the percentage of SMEs using at least 4 of 12 selected digital technologies.

(5) **Online provision of key public services for citizens**, measured as the share of administrative steps that can be done fully online for major life events. The following life events are considered: moving; transport; starting a small claims procedure; family; career; studying; health.

(6) **Access to eID** measured as the number of Member States that have issued a wallet in accordance with the Proposal for a Regulation of the European Parliament and of the Council amending Regulation (EU) No 910/2014 as regards establishing a framework for a European Digital Identity ([45]), once a regulation based on the proposal is adopted and enters into force. In the first 2 years, it will also be monitored based on the number of Member States that have notified at least one national eID scheme in accordance with Regulation (EU) No 910/2014.

5.4. Topic-level indicators

For 27 topics in the first work programme (2021-2022) ([46]) and 18 topics planned in 2023 in the 2023-2024 Work Programme ([47]), the Commission defined data that will be gathered to comprehensively monitor the performance of specific topics, in particular where the performance indicators cover several work strands and are too wide in scope to capture technical details, or where individual topics are not directly covered by higher level indicators. These indicators provide detailed information for the analysis of the evaluation criterium effectiveness (of the interim evaluation). They may also play a role in this context when the analysis focuses on concrete examples where data gathered through these indictors could point to specific challenges, achievements, or best practice. The full list of topic-level indicators can be found in **Annex A**.

The full design of these indicators (definition, unit of measurement, data source, frequency of data collection, baseline and target and any other relevant information to facilitate data sharing, use and reuse, and aggregation) and their monitoring will be managed by the Commission's operational units in charge. The list will be continuously updated as new topics are being implemented following the adoption of Work Programmes.

5.5. Additional benchmarks, indicators and data collection tools for the evaluation

As detailed in Tool #47 of the Better Regulation Toolbox[48], the interim and final evaluations cover five main evaluation criteria: effectiveness, efficiency, coherence, relevance and EU added value. The indicators in section 5 mainly provide data to assess the evaluation criterium effectiveness and to some degree the criterium relevance. An evaluation matrix, with evaluation questions and all relevant indicators including additional indicators or benchmarks covering the other evaluation criteria (EU added

([45]) COM/2021/281 final.

([46]) The DIGITAL Europe Programme – Work Programmes | Shaping Europe's digital future (europa.eu)

([47]) The DIGITAL Europe Programme – Work Programmes | Shaping Europe's digital future (europa.eu)

([48]) Better Regulation Toolbox, Tool #47, Evaluation Criteria and Questions, br_toolbox-nov_2021_en_0.pdf (europa.eu), p. 402-413.

value, coherence, and efficiency) will be developed during the evaluation period and published in the interim evaluation report.

Part of the data on the programme activities implemented through grants will be collected by the Commission through tools in the *eGrants* IT system that supports the project's entire lifecycle (see section 6.2 for details). Evidence will also be collected through public and targeted stakeholder consultations, from beneficiaries' reports feedback-to-policy reports, project portfolio analyses and other sources to be identified during the preparation of the interim evaluation.

For the part of the programme activities implemented through procurements, the Commission will gather the data from the contractors. In the case of Destination Earth, the data will be collected from the implementing entities, as specified in the Contribution Agreements. Other significant data sources will include a study and surveys obtained from third parties (see Chapter 6. data management for details).

6. DATA MANAGEMENT

This chapter provides an overview of the main actors in the data collection process, their responsibilities and how data are collected in the online tool eGrants. It also details the responsibilities of the operational units in DG CNECT and topic owners in other DGs in collecting and monitoring data for the performance indicators.

6.1. Main actors

As the lead DG for the Digital Europe Programme, DG CNECT is the main actor involved in data collection. Other DGs are also involved as topic owners of specific work strands. Furthermore, the implementing bodies (HaDEA, the High-Performance Computing Joint Undertaking, the European Cybersecurity Competence Centre and the three entities implementing Destination Earth) play a crucial role in the collection, aggregation and monitoring of performance information.

Operational units in DG CNECT are tasked with carrying out sanity checks on all the performance information obtained from implementing bodies, and with providing the data in aggregated form along with a narrative outlining the progress achieved. DG CNECT will provide clear justifications for delays and are responsible for putting in place appropriate mitigating measures in case of bottlenecks or delays.

6.1.1. Directorate Generals

As the lead DG, **DG CNECT** coordinates the strategic planning, delegation and implementation of the programme's budget. Several other DGs are involved in the implementation of specific work strands:

DG DIGIT is a key partner for actions related to interoperability. DIGIT.B2 contributes to the performance reporting within the annual budget cycle and is in charge of

monitoring progress on the Digital Europe Programme Regulation indicator that measures the alignment of the National Interoperability Framework with the European Interoperability Framework. The unit also provides input to the Programme Performance Statement and participates in the budget hearing for the interoperability budget line.

DG JUST (A1) coordinates the actions related to digitalisation of justice and consumer protection. The unit provides data for the composite indicator in the Regulation on the update of digital public services and regular updates on the performance of this work strand.

DG HOME ([49]), **DG FISMA** (unit C1, financial data space) and **DG GROW** (unit G4, public procurement data infrastructure) are involved in the implementation and monitoring of the programme as topic owners. These units are in charge of developing the monitoring framework at topic level and for monitoring the topics under their responsibility. They will provide aggregated data on progress on their work strands upon request.

DGs associated to specific topics, e.g., to sectoral data spaces, will be consulted on topic-specific indicators.

DG ENV (unit 01), for instance, is coordinating the definition of use-cases regarding the Green Deal Data Space in cooperation with DG ENV policy departments as well as other concerned DGs. DG MOVE contributes to the mobility data space and DG DGT is responsible for providing services and resources for the Language Data Space.

6.1.2. Executive Agency (direct management)

HaDEA is entrusted with implementing part of the Digital Europe Programme's budget. In particular, it implements selected topics under Specific Objective 2 (artificial intelligence), Specific Objective 4 (advanced digital skills) and Specific Objective 5 (deployment, best use of digital capacities and interoperability). HaDEA is responsible for monitoring and reporting on projects falling under its responsibility. It will provide contributions to the programme's midterm and *ex post* evaluations upon request.

6.1.3. Other implementing bodies (indirect management)

The High-Performance Computing Joint Undertaking (EuroHPC-JU) is responsible for implementing a set of tasks in the areas of HPC and quantum computing under specific objective 1. The JU monitors actions for topics under its responsibility. It reports performance information on the progress of these actions (legal, additional and topic-level indicators) to CNECT.C2 for annual reports as well as the midterm and *ex post* evaluations. CNECT.C2 is the main interface with the JU and closely follows its work.

The European Cybersecurity Competence Centre (ECCC) will be the single implementation body for selected work strands under the Digital Europe Programme's specific objective 3 on cybersecurity. This EU body will become autonomous in 2024. The ECCC will be responsible for collecting information and monitoring progress on the Digital Europe Programme's performance indicators, and for providing input to its

([49]) currently no Digital Europe actions are being implemented by DG HOME

midterm and final evaluations. Unit CNECT.H1 will be the main interface with the ECCC for the programme and will ensure that they apply appropriate monitoring activities.

The European Space Agency (ESA), the European Centre for Medium-Range Weather Forecasts (ECMWF) and the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) are independent entities entrusted with implementing the topics underpinning the Destination Earth initiative through the signature of Contribution Agreements. CNECT.C1 is the topic owner, and in this capacity, it liaises with the relevant stakeholders and implementing bodies. These entities are in charge of monitoring progress on Destination Earth based on a range of technical KPIs detailed in the Contribution Agreements. CNECT.C1 is responsible for providing aggregated data for the evaluation of the programme.

6.1.4. The Investment Platform for Strategic Digital Technologies (indirect management)

The Investment Platform for Strategic Digital Technologies (IP-SDT) is a financial instrument intended to provide financial support to eligible projects through equity and quasi-equity by combining funding from the Digital Europe Programme with the InvestEU guarantee. The IP-SDT is implemented in indirect management under the InvestEU programme, more specifically, by the European Investment Fund (EIF). The DG responsible for setting up a monitoring strategy for the platform is DG ECFIN, who is in charge of financial and organisational matters, as well as monitoring and reporting tasks, including financial reporting.

Overview of main actors and flow of performance information

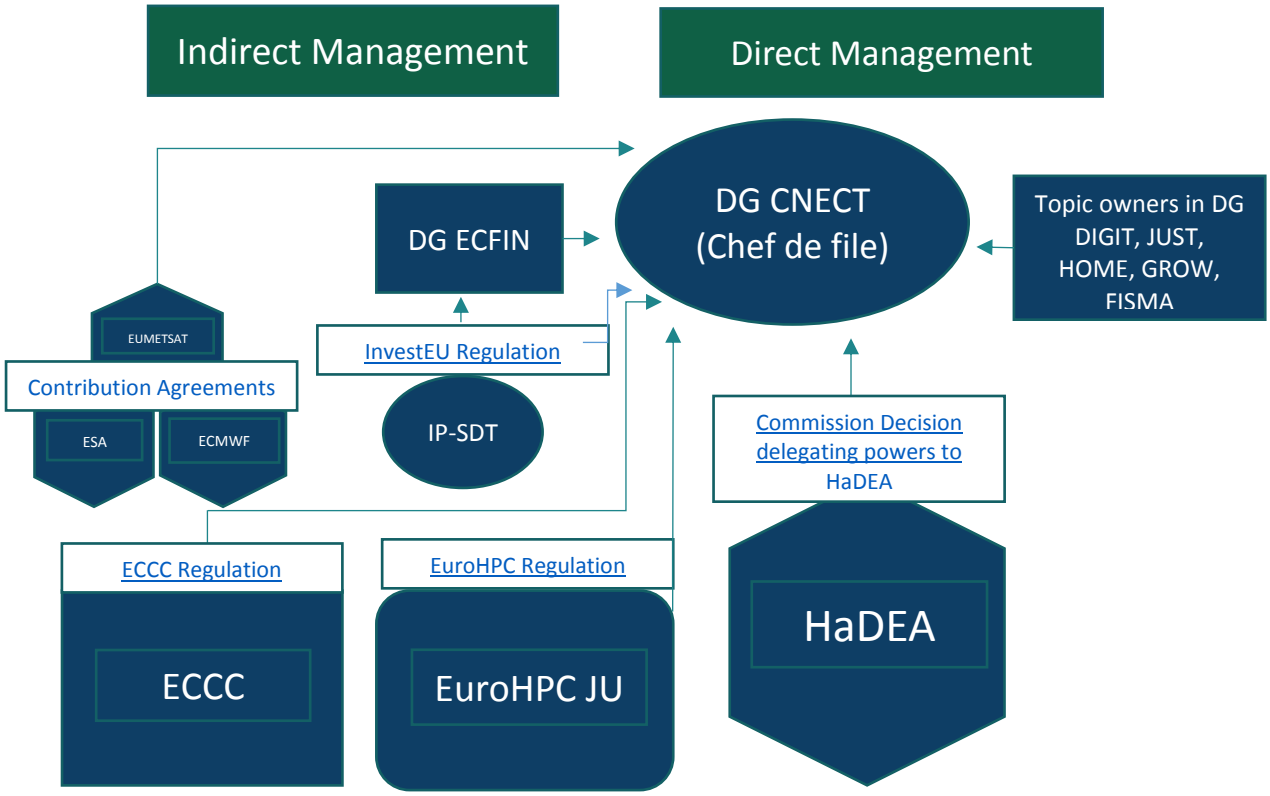


Figure 1: Actors responsible for data collection, legal basis and flow of information

6.2. Data Collection

Data linked to the performance indicators set out in this Monitoring and Evaluation Framework are in principle collected from beneficiaries or from contractors. In addition, some of the data for the mid-term and ex-post evaluations will be collected through surveys or acquired from third parties.

For procurements, the monitoring and reporting requirements and responsibilities are specified in the contracts signed by the winning tender. For procurements not managed by DG CNECT, the topic owners in other DGs and the implementing bodies are responsible for gathering the data from the contractors, aggregating them and reporting on them to DG CNECT. For procurements managed by DG CNECT, the operational units in charge will provide the data to CNECT.D.1.

For grants, beneficiaries are the main source of data. They provide data for the core performance indicators and additional indicators as part of their mandatory reporting obligations. These include regular technical, progress and/or interim as well as final reports. Their reporting obligations are detailed in Article 21 of the grant agreements. These include the continuous reporting on the progress of an action and the related deliverables. In addition, prefinancing reports (if prefinancing payments are requested) and periodic reports (to request interim and final payments) must be provided. These reports contain a technical and financial part. The technical part provides an overview of

the implementation of an action. The financial part includes a financial statement, explanation on the use of resources and certificates on the financial statements.

The data are collected through submission forms and reports are gathered in the corporate 'eGrants' IT system, which is a single gateway for all exchanges with the beneficiaries throughout the project lifecycle. The project officers/call coordinators in the involved DGs and the implementing agency will check the reliability of data and verify that the information provided by the beneficiaries is coherent across all submission forms and corresponds to the produced deliverables.

To collect information related to some of the core performance indicators, a specific submission form (form C) has been designed and is available to beneficiaries in eGrants. Beneficiaries are obliged to complete form C when submitting reports, as specified in their grant agreements. This form will gather data for the following indicators in the Digital Europe Programme Regulation:

- 2.2. The usage of common European libraries or interfaces to libraries of algorithms, usage of common European data spaces and usage of testing and experimentation facilities related to actions under this Regulation
- 3.1. The number of cybersecurity infrastructure, or tools, or both jointly procured.
- 3.2. The number of users and user communities getting access to European cybersecurity facilities
- 4.1. The number of persons who have received training to acquire advanced digital skills supported by the programme.
- 4.3. The number of people reporting an improved employment situation after the end of the training supported by the programme.

The submission form C will also collect data for the following additional indicator:

- 9. EBSI: Usage of the European Blockchain Service Infrastructure and of the European Blockchain sandbox

The submission form C will take the gender dimension into account with regard to Specific Objective 4 and will collect, where possible, sex aggregated data on participants of the training courses funded by the Digital Europe Programme and the completion rate.

In addition to data for core performance indicators, relevant management data and statistics will be collected through eGrants as well. Several interlinked IT tools have been integrated into the eGrants portal, each coming into play at a different stage of the project lifecycle. For example: SEP for experts to evaluate and rank project proposals; REDRESS to manage complaints on the evaluation procedure; SYGMA to manage grants and monitor funded projects during their entire life cycle, including capturing information and data on the dissemination and use of their results; and COMPASS to manage grants, experts and audit management. Some of this data will be visible on the **Digital Europe Dashboard**, which allows users to explore and visualise data to prepare statistics on funding implementation and outcomes, for reporting, analysis, monitoring or decision-making purposes. The Digital Europe Dashboard has been made available to members of the Digital Europe Programme Committee, gathering representatives of all member states and associated countries.

Responsibilities in DG CNECT

The data on the core performance indicators is needed for the annual reporting (Programme Performance Statement to be attached to the annual draft budget). Data on all indicators as well as management data, will feed into the Digital Europe Programme's midterm and final evaluations. For all indicators, the responsibility for the timely collection, aggregation and quality checks lies with the operational units in charge. An overview of the responsibilities for monitoring the different types of indicators in DG CNECT is provided below.

Level	Purpose	Scope	Lead	Tasks
Contextual Indicators	Provide detailed information on the wider context and trends related to the higher-level digital policy goals	6 contextual indicators relevant for the specific objectives of Digital Europe	B2	B2: monitoring of and reporting on contextual indicators
Core performance Indicators	Measure whether Digital Europe is delivering the expected results, remains relevant and meets the objectives outlined in the Regulation.	14 KPIs in the legal base	D1 and operational units	D1: coordination Operational units: Continuous monitoring of and reporting on KPIs in legal base
Additional indicators	Supplement the core performance indicators and provide important data on the progress of the programme for the interim and final evaluations	10 additional indicators	D1 and operational units	D1: coordination Operational units: Continuous monitoring of and reporting on additional indicators R5 and R3: Provision of statistical data on the implementation of projects and other relevant data retrieved mainly from eGrants to gather input to respond to the evaluation criteria, in particular, efficiency and relevance.
Topic-Level indicators	Measure detailed progress towards Digital Europe objectives at topic-level	27 topics for the first work programmes	Operational units	Operational units: design and monitoring of indicators

Annex A Topic Level indicators

SO1

Topic	Indicator (title)	Unit
National Competence Centres for High Performance Computing	Number of SMEs that have been supported by EuroHPC CCs Number of companies (not SMEs) that have been supported by EuroHPC CCs Number of academic and public research institutions that have been supported by EuroHPC CCs Number of projects involving at least 2 EuroHPC CCs Number of training projects involving collaboration among NCCs, Centres of Excellence and/or between the NCC and CoE networks Number of exploitation and dissemination projects involving collaboration among NCCs, Centres of Excellence and/or between the NCC and CoE networks Number of HPC application projects involving collaboration among NCCs, Centres of Excellence and/or between the NCC and CoE networks	C2
Topics related to quantum computing	Several KPIs were published to monitor and evaluate the progress of quantum technologies in Europe for the following technological pillars: Ecosystem, Quantum Communication, Quantum Computing, Quantum Simulation, Quantum Sensing and Metrology, and Education. The KPIs measure impact of Digital Europe funding but also other funding programmes, most notably, Horizon Europe: https://qt.eu/about-quantum-flagship/newsroom/key-performance-indicators-2030/	C2
Destination Earth- Core Service Platform and Data Lake	Indicators defined in the Contribution Agreements and provided by the three implementing bodies: • Number of operated services available on the DestinE Core Service Platform •Number of data types available for retrieval from the DestinE Core Service Platform • Number of participants in the DestinE open reviews • Number of agreed partnership project plans involving	C1

	ESA • Number of active users in the last 3 months (active is defined as 'having established a connection to the DestinE Core Service Platform') •Number of users having retrieved Digital Twin generated data •Overall user satisfaction •Number of applications in the DESP marketplace making use of Al Technology •DestinE Core Service Platform data retrieval API availability •DestinE Core Service Platform data volume retrieved at the user side •DestinE Core Service Platform Services Performance (Average percentage of time of the DESP services within the maximum performance range interval) •First-call resolution rate •Incident response time •SLA compliance rate •Overall user satisfaction from help desk and support activities •Number of operated data retrieval APIs towards external data sources •Volume of data retrieved from external sources •Overall availability of Data Lake infrastructure •Overall availability of Data Lake access services •Data set timeliness •Amount of data sets available in Data Lake •Number and volume of datasets ingested •Volume of data circulated within the DestinE Data Lake infrastructure •Ingestion, data access & retrieval information on Data Lake •Ingestion performance of data sets stored in the Data Lake •end-to-end data availability in Data Lake (amount, content, completeness)	

Destination Earth - Digital Twins	**Number of:** • Hydrology applications •Energy applications •Food applications •Health applications •Trans-continuum **km/area:** •Spatial resolution/coverage of monitoring and prediction DT Extremes datasets •Spatial resolution/coverage of monitoring and DT improvement over prediction DT Climate datasets **hours:** •Temporal availability/timeliness of DT output for continuous production mode •Temporal availability/timeliness of DT output for on-demand production mode **per cent:** •Availability of decision- ready information derived from DT output Number or CPU hours •Number of (service level) applications using DT-Extremes output •Number of (service level) applications using DT-Climate output •Number of (service level) applications using full-resolution, high frequency output •Number of (service level) applications using critical-path output •Number of applications producing candidate models to be added to DT Engine •Number of new datasets created from DT output **Number:** •Amount of data sets pushed into the Data Lake(s) •Ingestion, access & usage of Earth observation data **Node-hours/day:**	C1

	•Actual HPC node allocation for continuous production mode •Actual HPC mode allocation for on-demand product mode **Per cent:** •Sustained vs peak performance **Number:** •Extreme-scale software component uptake •machine learning software component uptake **Per cent:** •HPC efficiency gains in DT production •Data exploitation gains in DT production and use in application	

S02

Topic	**Indicator (title)**	**Unit**
Marketplace for federated cloud-to-edge based services	•Design and offer an EU marketplace for federated cloud-to-edge based services: •Number of European cloud-to-edge based services offered on the marketplace. •Number of functionalities offered by the marketplaces: (a) catalogue, (b) brokerage, (c) transaction and (d) delivery of federated cloud-to-edge based services). •Number of unique user organisations on the marketplace. •Average frequency of use of the marketplace by client organisations. •Diversity of stakeholders involved: (i) public entities, (ii) companies, (iii) SMEs and (iv) actors of Common Data Spaces. •User satisfaction	E2
Secretariat for the Alliance on Processors and Semiconductor technologies	•Number of Alliance members engaged and active in the network and contributing to the thematic working groups as well as attending the General Assembly, and their satisfaction level as measured by survey; •Number of Member States covered by the Alliance; •Number of alliance members engaging in strategic activities in relation to the objectives of the Alliance	A3

Preparatory actions for the Green Deal data space	•Number of data spaces/ecosystems/communities contributing to the roadmap for the future EU Green Deal data space	G1
Preparatory actions for the data space for smart communities	•Number of cities or communities (geographical coverage) involved/supporting the established governance scheme •Number of priority data sets agreed as part of the data space •Number of validation workshops including a wide range of EU and Member States organisations representing smart cities and communities, EU standardisation bodies as well as public and private data owners at local level	C3
Data space for smart communities (deployment)	•Number of cities or communities (geographical coverage) involved in the pilots •Number of priority data sets validated as part of the cross-sectoral pilots •Number of reusable services made available to wide range of cities and communities in the EU	C3
Preparatory actions for data spaces for manufacturing	•Number of relevant stakeholders involved/supporting the governance scheme set up by the CSA •Number of validation workshops with industry decision makers •Number of technology and data space service providers offering middleware based on the solutions identified by the network/supporting the blueprint. •Number of data providers offering data sets based on the standards and conditions identified by the network.	A4
Data spaces for manufacturing (deployment)	•Percentage increase in number of organisations participating in the Data Space based on shared governance since project start •Number, and geographic distribution, of connected data providers offering data sets based on the standards and conditions identified by the network. •Data volume shared in the network, volume of data effectively used multiple times •Number of data generating assets effectively connected to data spaces •Number of data space service providers offering analytics based on the solutions identified by the network. •Share of SMEs among data providers and data users	A4
Preparatory actions for the data space for agriculture	•Effectiveness of the participatory approach in terms of appropriate representativeness of associations of farmers and other private sector actors, advisers, potential 'third parties' ([50])public administration and/or governmental bodies •Quality and credibility of the proposed design approaches for the data space (as confirmed by stakeholders and external experts) •Soundness of the multi-stakeholder governance scheme (as confirmed by stakeholders and external experts)	E4

([50]) 'third parties' in the context of the Common European Data Spaces

Data space for media (deployment)	• Number of relevant media stakeholders, including SMEs, coming from different EU and associated countries participating in the media data space initiative • Number of media sub-sectors represented by stakeholders (target should be at least 2) • Number of datasets (content, data and metadata) available to produce new products and formats, in different EU languages and EU markets	G2
Preparatory actions for the financial data space	The proposal sets out a number of measures (still under negotiation but not expected to change significantly) to monitor the implementation of ESAP: Article 12 Monitoring the implementation and functioning of ESAP: 1. ESMA, in close cooperation with the EBA and EIOPA, shall monitor the functioning of ESAP based on at least the qualitative and quantitative indicators laid down in paragraph 2, and shall publish an annual report about the functioning of ESAP. 2. The qualitative and quantitative indicators referred to in paragraph 1 are the following: (a) the number of visitors and searches; (b) the percentage of searches that lead to a view or a download; (c) the number and percentage of machine-readable information accessible on ESAP and the number and percentage of machine-readable views and downloads; (d) the proportion of notifications pursuant to the automated validations referred to in Article 10; (e) any significant malfunction or incident; (f) an assessment of the accessibility, quality, usability and timeliness of the information in ESAP; (g) an assessment of whether ESAP meets its objectives, taking into account the evolution of its use and the information flows within the EU; (h) an assessment of end-user satisfaction; (i) a comparison with similar systems in third countries.	FISMA
Data Spaces Support Centre	(a)Number of stakeholders engaged in the network. (b): Number of identified standards. (c): Number of identified technical specifications. (d): Number of identified building blocks. (e): Number of technology providers offering new middleware based on the solutions identified. (f) Satisfaction of preparatory actions for sectoral data spaces with the coordinating role of the DSSC	G1

SO 4

Topic	Indicator title	Unit
Promoting European innovation in education	• Effectiveness of the pan-European network to: • maximise the number of EdTech stakeholders coming from at least 14 Member States actively involved in the pan-European network connected with all relevant actors and linked with other existing pan-European networks,	G2

	initiatives and programmes; • exchange good practices, market trends and insights of the EU EdTech start-up/SME landscape identified in each Member State; • set up relevant network activities to increase the opportunities of the EdTech companies on the European and global EdTech market in the long run; •promote European excellence in educational innovation. •Quality and relevance of the support provided to EdTech companies by offering them relevant business and educational mentoring and training services. •Quality and robustness of the developed guidelines, roadmap and skills toolkit.	

SO 5

Topic	Indicator (Title)	Unit
Governance of the Living-in.eu community	•Number of signatory cities and communities that sign the Join Boost Sustain Declaration (using the EU Survey tool); •Number of new supporters joining the movement; •Number of specifications and assets further developed or created and their reuse by cities and communities; • Number of plenary meetings with signatories and with supporters per year; and of meetings of all sub-groups; •Number of commitments in the 'Join Boost Sustain' Declaration implemented; •Number of events organised by Living-in.eu movement; •Number of living-in.eu web site visits •Number of events relating to smart and sustainable cities and communities to which living-in.eu contributed.	C3
Digital solutions in support of the New European Bauhaus initiative	•Number of stakeholders involved in the network; •Number of best practices/ use cases/ digital tools/lessons learnt/, presented for reuse and upscaling though the means identified in the 'scope' section; •Number of meetings, workshops and conferences organised by the Network per year; •Number of events relating to smart and sustainable cities and communities to which the Network on digital solutions for the New European Bauhaus has contributed •Number and nature of gaps and challenges identified.	C3
Core EU Justice and Consumers IT Systems	•Number of simple searches in BRIS through the European Access Point search engine on the e-Justice Portal •Number of deployments of the eEvidence Digital Exchange system (eEDES) •Number of visitors to the ODR platform/consumer redress web space	DG JUST
Digitalisation of justice	•Number of requests/cases handled via the decentralised IT system in the context of the Regulations on Service of Documents and Taking of Evidence (recast) (as of the date of entry into force)	DG JUST

	•Number of requests submitted through the decentralised IT system, in accordance with Article 3(1) of the Regulation on digitalisation of judicial cooperation (as of the date of entry into force) •The number of submissions made through the European electronic access point hosted by e-Justice Portal in accordance with Article 4(1) of the Regulation on digitalisation of judicial cooperation	
Common platform for online investigations and law enforcement (EU eLab)	•Number of onboarded public authorities for the purposes of consumer protection cooperation or market surveillance •Number of individual users •Number of authorities and businesses reached through the supporting activities	DG JUST
Security (law enforcement): AI-based pilots	•Number of tools made available to Member State law enforcement agencies through Europol repository for tools or through EACTDA repository for tools	DG HOME
Better Internet for Kids (BIK) platform - EU coordination	Number of EU and EEA countries associated with the programme participating in each Safer Internet Day (SID) Number of people reached through events and training activities: Capacity building: • number of trainings organised for the network; • number of MOOCs organised and number of participants. Youth participation: • number of children involved divided by age group and gender; • number of events with youth participation; • number of awareness-raising activities targeting children in vulnerable situations. Cooperation with international partners: • number of non-EU countries and international organisation participating in the Safer Internet Forum (SIF); number of countries involved in exchanges and mentoring.	G3
Safer Internet Centres (SICs)	•Number of new or updated online resources made available by the Safer Internet Centres (e.g., training courses, videos, online events, online tools and apps). The minimum target is 1,100 resources uploaded combined by all EU co-funded Safer Internet Centres per year. •Number of requests handled by the co-funded helpline services. The minimum target is 63,000 requests every	G3

	year combined by all EU co-funded helplines. •Number of reports received by the co-funded hotlines. The minimum target is 200,000 reports every year combined by all EU co-funded hotlines.	
IT system supporting the removal of online child sexual abuse material (CSAM)	•Average number of days per year to take down illegal content (e.g., child sexual abuse material) by Internet service providers and Law Enforcement Agencies upon reporting from hotlines.	G3
Initial Network of European Digital Innovation Hubs	•Number of businesses and public sector entities that have used the European Digital Innovation Hubs' services, by user category (businesses of different sizes, public sector entities, etc.), sector, location and type of support received. Where relevant, this will include a description of which Digital Europe programme capacities have been used. •For access to finance: amount of additional investments successfully triggered (e.g. through venture capital, bank loan, etc.) •Number of collaborations planned with other EDIHs and stakeholders outside the region at EU level, and description of jointly shared infrastructures / joint investments with other EDIH. A set of additional impact indicators will be collected and analysed with the support of the Digital Transformation Accelerator: •Increase in digital maturity of organisations that have used the services of the EDIH network. Digital maturity will be defined on the basis of a questionnaire assessing the categories digital strategy and readiness, intelligence and automation, data and connectedness, green and human-centric digitalisation. The green digitalisation category will focus on the use of digital technologies to improve environmental sustainability and the inclusion of circularity in value chains. •Market maturity ([51]) and market creation potential of innovations ([52]), as defined in the JRC's Innovation Radar methodology: https://joint-research-centre.ec.europa.eu/innovation-eu-funded-research-innovation-projects-innovation-radar_en	A4

2023 topic level indicators

([51]) JRC (2018). Innovation Radar: Identifying the maturity of innovations in EU-funded research and innovation projects. JRC111160.

([52]) JRC (2020). Market Creating Innovations in the EU Framework Programme. Methodology behind the Innovation Radar's Market Creation Potential Indicator. JRC Technical Reports, JRC121066.

SO1

Topic	Indicator (title)	Unit
Destination Earth	•Number of agreed partnership project plans and use cases. •Number of operated services available on the DestinE Core Service Platform. •Number of different data types available from the DestinE Core Service Platform.	C1

SO2

Topic	Indicator (title)	Unit
Cloud IPCEI Exploitation Office	•Yearly number of IPCEI cloud-to-edge results exploited. •Number of yearly IPCEI Exploitation Office's social media campaigns and content produced. •Number of total participants in events, activities organised by the IPCEI Exploitation Office per: (a) IPCEI participants and (b) non IPCEI-participants. •Yearly environmental impact of the IPCEI-CIS at aggregated level.	E2
Highly Secure Collaborative Platform for Aeronautics and Security Industry	•Successful management of Restricted EU information •Number of proof-of-concept / use-cases	E2
Data space for Skills	•number of participants of the data space •amount of data available via the data space •number of data sharing transactions	G2
Data Space for Tourism	•Maturity, reliability and security of the technical infrastructure deployed. •Number of relevant stakeholders including SMEs participating actively in the data space. •Amount and variety of data types accessible through the data space. •Geographical coverage of the available data sets. •Number of pilots successfully launched and accomplished.	G2
Federated European Infrastructure for Intensive	•number of different ICU databases connected to the European ICU data infrastructure – at least 15 from at least 10 different eligible countries by the	H3

Care Units' (ICU) data	end of the project; •number of registered users (including for example researchers, healthcare professionals, clinicians, innovators) actively accessing the European ICU data infrastructure in operation and utilising its resources – at least 100 by the end of the project; •volume and number of data points, as well as types of ICU datasets and corresponding patient information accessible through the European ICU infrastructure by the end of the project; •demonstration of ICU datasets integration and use with "virtual human twin" multi-scale, multi-disciplinary computational models in at least 4 (four) different clinical domains, including for example infectious diseases, cancer, cardiovascular disease, brain disorders, with clear evidence of enabling computational model-based tool development and validation in these domains by the end of the project.	
Genome of Europe	•number of different national reference genome databases connected – at least 10 from at least 10 different eligible countries; •number of whole genome sequences with the corresponding phenotypic information included in the European reference genome – for at least 100.000 citizens; •European reference genome established and supported by appropriate software – in at least two different use cases.	H3
The European Single Access Point (ESAP) for EU capital markets ([53])	•the number of visitors and searches; •the percentage of searches that lead to a view or a download; •the number and percentage of machine-readable information accessible on ESAP and the number and percentage of machine-readable views and downloads; •the proportion of notifications pursuant to the automated validations referred to in Article 10; •any significant malfunction or incident; •an assessment of the accessibility, quality, usability and timeliness of the information in ESAP; •an assessment of whether ESAP meets its objectives, taking into account the evolution of its use and the information flows within the EU; •an assessment of end-user satisfaction; •a comparison with similar systems in third	FISMA.C1

([53]) Based on Proposal for Regulation to establish a European single access point, ESMA, in close cooperation with the EBA and EIOPA, shall monitor the functioning of ESAP based on at least the qualitative and quantitative indicators laid down in paragraph 2, and shall publish an annual report about the functioning of ESAP.

	countries.	
Digital Product Passport	•Identifications of further needs for standardisation and specifications to ensure interoperability, security, and acceptance by all the stakeholders •Concrete and experienced benefits and challenges in using DPP for each of the stakeholders •Number of value chain actors including the number of actors including consumers. •Number of interactions, speed and usability of the system, in particular for SMEs, interoperability performance and cyber security tests; There will be a survey to measure consumer satisfaction.	Ilias Iakovidis
Coordination of AI sectorial Testing and Experimentation Facilities	<u>To be confirmed by consortium</u> •Impact of common communication campaigns across all relevant sectors. •Number/size of the mentoring/twinning programs for innovators •Number of common resources and services across the TEFs, and impact on the overall TEFs' offer. •Efficiency gain (qualitative or quantitative) in TEFs in offering centralised support for common activities. • Number of exchanges with other relevant initiatives (e.g.: EDIHs, national competence centres). • Number of regulatory sandboxes set up by sectorial TEFs that received support by the CSA. • Number of total assets enabled in the AI-on-demand platform.	A1
Developing CitiVerse	•Number and identification of CitiVerse solutions using MIMs Plus-compatible solutions. •Number and identification of the different use cases addressed. •Number and identification of the different Local Digital Twins expanded. •Number and identification of recommendations for an interoperable and open CitiVerse platform. •Number and identification of cities/regions/communities involved in the use cases. •Number of citizens potentially involved in each use case and in total.	C3

SO 4

Topic	Indicator (title)	Unit
Advanced digital skills analysis	•Number of analyses, surveys conducted; •Number of collaboration and support activities for DIGITAL-SO4 actions conducted; •Number of recommendations provided on how to best support education and training opportunities in the area of advanced digital skills (related to specific technologies and specific sectors); •Number of communication and dissemination activities carried out.	G2
Reinforcing Skills in Semiconductors	•Number of communication initiatives delivered toward the public. •Number of persons attending physical events and number of visitors or dimension of the audience for online events. •Number of events targeting secondary schools' students, including for example a summer/winter schools, introductory seminars, on-the-job experiences, and visits to business facilities and number of involved students. •Number of training events for secondary school teachers. •Number of partners from countries where semiconductors skills levels are low, according to the Digital Economy and Society Index.	G2
Cybersecurity Skills Academy	•Number of relevant players cooperating in support of the Cybersecurity Skills Academy and contributing to its goals; •Relevant initiatives to promote cyber skills identified; •Number of promotion activities for relevant cyber skills initiatives; •Degree of reach out of awareness campaigns conducted; •Number of respondents (target audience) reached through the communication performed; •Degree of support to strategies on cybersecurity skills from public and private players and contribution to alignment of these strategies achieved by the cooperation network.	G2

Boosting digital skills of young people, in particular girls	Indicators for scaling up EU Code Week: •Number of activities registered on the EU Code Week website (minimum target in year 1: 70 000, minimum target in year 2: 100 000); •Number of participants (minimum target in year 1: 2.5 million, minimum target in year 2: 3 million), share of female participants, and age of participants reported on the EU Code Week website; •Number of teachers and school leaders successfully completing a Code Week training (minimum target per year: 2 000); •Number of teachers in the EU Code Week Facebook group for teachers (minimum target: 35 000); •Number of EU Code Week ambassadors (minimum 1 in each EU Member State) and active leading teachers (minimum 500); •Number of community events at EU level, including number of participants (minimum 1 in-person meeting per year taking place in Brussels and at least 1 in-person meeting per year taking place in another EU Member State, as well as a minimum of 2 online events per year); •Number of events at national level, including number of participants, strengthening the national collaboration between ambassadors, leading teachers and correspondents in Ministries of Education or other educational authorities and organisations. Indicators for increasing the pool of young people, particularly girls, who would be interested in studying STEM and ICT and/or embarking on a digital career: •Number of Member States reached with the different activities, ensuring inclusivity by putting the focus on those Member States that lag behind regarding the number of women in ICT and percentage of female ICT students; •Number of courses or camps delivered during holidays, evenings or weekends; •Number of extracurricular activities organised; •Number of career days organised; •Number of study guidance/information events organised; •Number of pupils visiting higher education institutions, e.g., state-of-the-art laboratories, experiencing campus facilities and/or following seminars; •Number of awareness raising campaigns conducted	G2
Network of Safer Internet Centres (SICs)	•Number of new or updated online resources made available by the Safer Internet Centres (e.g. online trainings, videos, online tools, apps, etc.). The minimum target is 1,100 resources uploaded	G3

	combined by all EU co-funded Safer Internet Centres per year. •Number of people reached through events and training activities. The minimum target is 500,000 people reached through events and trainings per year combined by all EU co-funded Safer Internet Centres. •Number of awareness-raising activities targeting children in vulnerable situations. The minimum target is 20% of the total awareness raising activities organised every year combined by all EU co-funded Safer internet Centres to target children in vulnerable situations. •Number of active youth participants. The minimum target is 1,250 youth participants per year combined from all EU co-funded Safer Internet Centres. The turnover rate of youth participants is at least 30% per year, compared to the previous year. •Number of requests handle by the co-funded helpline services. The minimum target is 63,000 requests every year combined by all EU co-funded helplines. •Number of reports received by the co-funded hotlines. The minimum target is 200,000 reports every year combined by all EU co-funded hotlines.	
IT system supporting the removal of online child sexual abuse material (CSAM)	•number of reports inserted: •number of classified files per year.	G3
Support to Dissemination and Exploitation (D&E)	• Clarity of the conceptual and operational framework for D&E. • Feasibility for the EC to put the conceptual and operational framework for D&E into practice. • Feasibility for stakeholders to buy into the framework and actions proposed. • The degree to which the diversity of the programme has been considered (Programme specific objectives, implementing bodies, implementing instruments, technologies and stakeholders) • Number of actors actively involved in the delivery of the framework • Number of activities from the framework delivered within the lifetime of the project.	R5
Supporting the Network of National Contact Points (NCPs)	• Number of NCPs support services provided to stakeholders in each participating country and specific objective; • Variation in total number of applicants in proposals broken down per countries and specific objective respect to work programme 2021/22 calls for proposals; • The number of dedicated promotion events	R5

	overall and the distribution for each participating country. • The participation in dedicated promotion events overall and for each participating country.	