



Finland's National Roadmap

EU Digital Decade Policy Programme 2030



Publications of the Finnish Government 2024:7

Finland's National Roadmap

EU Digital Decade Policy Programme 2030

Finnish Government Helsinki 2024

Publication distribution

**Institutional Repository
for the Government
of Finland Valto**

julkaisut.valtioneuvosto.fi

Finnish Government

Ministry of Transport and Communications

This publication is copyrighted. You may download, display and print it for Your own personal use.

Commercial use is prohibited.

ISBN pdf: 978-952-383-743-0

ISSN pdf: 2490-0966

Layout: Government Administration Department, Publications

Helsinki Finland 2024

Finland's National Roadmap EU Digital Decade Policy Programme 2030

Publications of the Finnish Government 2024:7

Publisher Finnish Government

Group author Coordination group for digitalisation (Digital Office)
Language Finnish **Pages** 67

Abstract

The EU's Digital Decade programme sets common targets for Europe's digitalisation until 2030. The programme obliges Member States to prepare their own national road maps for realising these targets.

Finland's road map is based on the [Government Report](#) on digital compass (VNS 10/2022 vp), implementation plan preparations and the Government Programme of Prime Minister Orpo's Government and budget decisions. The road map was drafted under the guidance of the ministerial working group on social transformation at the Coordination Group Digital Office where all of the ministries are represented.

The key targets include competence, digital infrastructure, businesses and public services. The plan describes the current state and targets of Finland's digitalisation and the measures to support the EU's common targets in digitalisation.

The road map takes into account the first European Commission report on the state of the Digital Decade and the recommendations for necessary development measures. The European Commission will publish a report annually. The road map would be updated for the first time in 2024, and every two years after that.

In addition, there is a broader implementation plan for the national digital compass that will guide the development of digitalisation. This is scheduled to be completed by the end of 2023.

Keywords digitalisation, European Union, management, information society

ISBN PDF 978-952-383-743-0 **ISSN PDF** 2490-0966

URN address <https://urn.fi/URN:ISBN:978-952-383-743-0>

Suomen etenemissuunnitelma EU:n Digitaalinen vuosikymmen 2030 -politiikkaohjelma

Valtioneuvoston julkaisu 2024:7

Julkaisija Valtioneuvosto

Yhteisötekijä Digitalisaation ja datatalouden vastuualueen yhteistyöryhmä (Digitoimisto)
Kieli suomi Sivumäärä 67

Tiivistelmä

EU:n digitaalinen vuosikymmen -politiikkaohjelmassa asetetaan EU:n yhteiset tavoitteet digitalisaatiolle vuoteen 2030. Ohjelma velvoittaa jäsenvaltioita laatimaan kansalliset etenemissuunnitelmat tavoitteiden saavuttamiseksi.

Suomen etenemissuunnitelma perustuu valtioneuvoston selontekoon digitaalisesta kompassista (VNS 10/2022 vp) ja sen toimeenpanosuunnitelman valmistelutyöhön sekä pääministeri Orpon hallitusohjelmaan ja budjettipäätöksiin. Se on laadittu yhteiskunnan uudistamisen ministerityöryhmän ohjauksessa digitoimistossa, jossa kaikki ministeriöt ovat edustettuina.

Osa-alueita ovat osaaminen, digitaalinen infrastruktuuri, yritykset ja julkiset palvelut. Suunnitelmassa kuvataan Suomen digitalisaation nykytila ja tavoitteet sekä toimenpiteet, joilla tuetaan EU:n yhteisiä digitavoitteita.

Etenemissuunnitelmassa on huomioitu myös Euroopan komission ensimmäinen EU:n digitalisaation tilaa kuvaava raportti ja suositukset tarvittavista kehittämistoimista. Komission raportti tullaan julkaisemaan vuosittain. Etenemissuunnitelma päivitetäisiin ensimmäisen kerran vuonna 2024 ja jatkossa joka toinen vuosi.

Etenemissuunnitelman lisäksi digitalisaatiokehitystä ohjataan Suomen kansallisen digikompassin laajemmalla toimeenpanosuunnitelmalla, jonka on tarkoitus valmistua vuoden 2023 lopussa.

Asiasanat digitalisaatio, Euroopan unioni, johtaminen, tietoyhteiskunta

ISBN PDF 978-952-383-743-0 ISSN PDF 2490-0966

Julkaisun osoite <https://urn.fi/URN:ISBN:978-952-383-743-0>

Finland's färdplan EU policyprogrammet för det digitala decenniet 2030

Statsrådets publikationer 2024:7

Utgivare Statsrådet

Utarbetad av Samarbetsgrupp för ansvarsområdet för digitalisering och dataekonomi (Digitaliseringsbyrån)
Språk finska **Sidantal** 67

Referat

I politikprogrammet EU:s digitala decennium fastställs EU:s gemensamma mål för digitaliseringen fram till 2030. Programmet förpliktar medlemsstaterna att utarbeta nationella färdplaner för att uppnå målen.

Finlands färdplan baseras på [statsrådets redogörelse](#) om den digitala kompassen (SRR 10/2022 rd) och beredningen av genomförandeplanen för den digitala kompassen samt på innehållet i statsminister Petteri Orpos regeringsprogram och budgetbeslut. Färdplanen utarbetades vid digitaliseringsbyrån, där alla ministerier är representerade, under ledning av ministerarbetsgruppen för samhällsförnyelse.

Delområdena är kompetens, digital infrastruktur, företag och offentliga tjänster. Planen innehåller en beskrivning av digitaliseringens tillstånd i Finland och de mål och åtgärder som stöder EU:s gemensamma digitaliseringsmål.

I färdplanen beaktas även Europeiska kommissionens första rapport om digitaliseringens tillstånd i EU och rekommendationerna om vilka utvecklingsåtgärder som behöver vidtas. Kommissionens rapport kommer att publiceras årligen. Färdplanen ska uppdateras första gången 2024 och i fortsättningen vartannat år.

Utöver färdplanen styrs digitaliseringsutvecklingen i Finland även av den bredare genomförandeplanen i Finlands nationella digitala kompass. Genomförandeplanen avses vara färdigställd i slutet av 2023.

Nyckelord digitalisering, Europeiska unionen, ledarskap, informationssamhälle

ISBN PDF 978-952-383-743-0

ISSN PDF 2490-0966

URN-adress <https://urn.fi/URN:ISBN:978-952-383-743-0>

Contents

1	State of play of digital transformation	7
1.1	State of play in Finland	7
1.2	Challenges.....	11
1.3	Strengths and assets	16
2	National trajectories and target values to contribute to achieving EU’s digital targets	22
3	Measures to achieve EU’s digital targets	24
3.1	Overview of measures	24
3.1.1	Competence.....	24
3.1.2	Infrastructure.....	27
3.1.3	Business digitalization	32
3.1.4	Public services.....	36
3.2	Description of measures.....	39
4	Main measures contributing to the general objectives	51
5	EU-level cooperation	52
5.1	Multi-Country Projects	52
5.2	Factors promoting digitalisation at the Union level.....	59
6	Stakeholder feedback	61
7	Overall impact and conclusion	65

1 State of play of digital transformation

1.1 State of play in Finland

Finland punches above its weight in the European Union with regard to issues related to digitalisation and the data economy. Finland ranks first of 27 EU Member States in the 2022 edition of the [Digital Economy and Society Index \(DESI\)](#). Compared to the EU average, Finland continues to lead on most DESI indicators and keeps improving its excellent scores at a yearly growth rate above the average of countries with a similar score.

In the sectors where Finland fares best, its performance may be considered so good that there is little realistic hope of any significant score improvement, going forward.¹ On the other hand, Finland also faces considerable challenges related to the development of digitalisation and leveraging the potential of digitalisation. These involve, for example, developments in the productivity of labour, skills shortages, and the ability of SMEs to make use of the opportunities afforded by digitalisation in their operations and to grow their business.

Competence: current state

In the 2022 and 2023 DESI editions, Finland ranks first out of the 27 EU Member States in human capital. Its digital skills level is well above the EU average in all the three indicators concerning digital skills. The EU [Digital Decade 2030 policy programme](#) sets the target of no less than 80% of the EU population having basic digital skills. Finland has all but reached this target already, as 79% of the country's population have at least basic digital skills (EU average 54%).²

Nearly half of Finland's population (48%) have above basic digital skills. The proportion of the workforce employed as ICT specialists is at 7.6% and ICT graduates in Finland account for 7.6% of all the graduates, close to twice the EU average of 4.2%.³ The percentage of people working in ICT as well as of ICT graduates among all graduates has been on the rise

1 [DESI 2022, Finland](#)

2 [Report on the state of the Digital Decade, 2023](#)

3 [Eurostat](#)

in recent years. The ICT sector accounts for 12% of new students at universities of applied sciences and 10% of all degree students at universities. The proportion of female ICT specialists has also increased from 21% to 24% between 2019 and 2022.⁴

The digital skills of the population need to be ensured, as functioning in society is to an increasing extent taking place by means of digital tools. Adequate digital skills are a precondition not only for finding employment but also for participation and inclusion in society. Skills and competencies are also necessary to prepare for hybrid and cyber security threats as well as influence through information. Digital skills are built by strengthening competence, increasing equality in education, and supporting continuous learning. Investment should be made in increasing the number of ICT experts. The attractiveness of the sector also to women and international professionals should be ensured.

Infrastructure: current state

While Finland is a leader in 5G commercial services provision, DESI indicates it lags behind EU targets in the provision of very high capacity network (VHCN) coverage in rural areas. In Finland, the main principle in the development of telecommunications networks is technological neutrality. Among other things, this involves promoting both fixed networks and wireless broadband networks in parallel. Owing to geographical factors, the broadband offering in Finland largely relies on wireless connections.

The broadband aid scheme tied to the Recovery and Resilience Facility (RRF) has allowed public funding to be directed to sparsely populated areas where broadband will not be made available on a commercial basis. As laid out in the Government programme, the Ministry of Transport and Communications is preparing a study on the need to continue the broadband aid scheme. The study is to be completed in early 2024. Finland's ability to reach the [EU 2025 connectivity objectives](#) and the Digital Decade targets for 2030 depends on measures to promote wireless broadband and very-high speed fixed connections. For the most part, broadband connections in Finland have developed on a market basis and in a technology-neutral manner. Public aid has been allocated only to areas lacking in commercial offering. Finland is a frontrunner in 5G deployment and intends to strongly promote the availability of mobile broadband also going forward.

Digital infrastructure comprises not only connectivity but also computing capacity and data economy structures, among other things. Finns and Europeans have access to the third most powerful supercomputer in the world, LUMI, which in turn is linked with the

4 [DESI 2022, Finland](#)

quantum computer Helmi of VTT, among others. Besides for scientific research, LUMI resources are also available to enterprises. The EuroHPC joint undertaking will launch a call in 2024 on hosting new top-level EuroHPC supercomputers.

Finland's digital compass⁵ is broader in scope than the EU digital compass and includes objectives involving development of data economy and the cyber security of infrastructure. Critical infrastructure with strong cyber resilience, including not only direct ICT infrastructure but also the ICT-dependent energy, transport and water resources management networks, is one of the pillars of the operating capacity of society. The ability to develop and protect critical infrastructure plays a key role in the digital transformation.

Business digitalization: current status

Finland is performing strongly on many of the digitalisation targets under the Digital Decade programme that concern enterprises. In SME digital intensity, Finland has already reached the EU target of 90% and is vastly above the EU average of 55%.

According to [Statistics Finland](#), 81% of enterprises used chargeable cloud services in spring 2022. The share of enterprises that use cloud services has grown by 30 percentage points in eight years. Of large enterprises, as many as 97% use cloud services. Cloud services are most commonly used for email, office software and file storing. Artificial intelligence-based solutions were used by 16% of Finnish enterprises in 2021. New figures on this topic will be released in November 2023. With regard to use of cloud services, Finnish enterprises already exceed the EU Digital Decade 2030 target.

Finland's advantages in tapping the business opportunities of the data economy are its excellent digitalisation rate and digital capacities as well as high-calibre digital entrepreneurship conditions along with top-notch competence in the sector. However, these strengths are yet to be realised in higher business value. Finland should indeed invest in developing data economy competence and creating new data-based business in SMEs in particular. Finland needs investment in enterprise growth and upscaling. For Europe's digital high-growth companies, the EU's well-functioning digital single market is an important reference region for scaling up operations. A great deal of positive development has been seen in recent years.

5 [Government report: Finland's Digital Compass, 2022](#)

There is a significant number of technology enterprises operating in Finland that are the world's leading players in their respective market segments. These create growth for the smaller enterprises included in their value chains. SMEs need to be more extensively involved in taking advantage of digitalisation and data economy services and in the role of producers in innovation and business ecosystems.

Public services: current state

The foundation of Finnish society is competent public administration. Finland's public administration and digital public services have ranked high in numerous international comparisons including the EU-wide DESI as well as the eGovernment Benchmark. According to the findings of the latter, Finland for all intents and purposes has already reached the Digital Decade 2030 target of 100% online availability of key public services.

As required by the EU target for 2030, 100% of Finnish citizens have access to their electronic health records online via the service MyKanta. The service enables the centralised archiving of electronic health records and the long-term storage of this data. Citizens may use the MyKanta service to browse their personal medical records and results of laboratory tests.

With regard to electronic identification, Finland ranks high in the eGovernment comparison with a figure of 92%. However, Finland still has a ways to go to implement international electronic identification, as for the time being it lacks means of identification to enable cross-border eID. All in all, the development of digital public services in Finland is active and on an upward trajectory.

Finland has long been successful in developing digital solutions for public administration. Even though the key public services are already available in digital format from the perspective of user experience, services have been scattered to different locations and systems. The focus in digitalisation development is on streamlining e-services. In the interests of easier e-service use by people and enterprises, digital services will be compiled into service packages. Finland will carry out projects to digitalise public and private services relating to life events and business transactions so that these services operate seamlessly together. As an example, the ease of managing the affairs of a deceased relative will be ensured.

Digital rights and principles

The EU [declaration](#) on European digital rights and principles promotes a digital transition shaped by European values. Finland's digital compass is based on European values and the European digital rights and principles have been taken into account in setting Finland's targets.

In Finland, digital inclusion in society is supported by factors including the strong digital skills of the population and the high degree of digitalisation in public services. Public services are to be further developed by bundling public services on different platforms into service packages and ensuring the smooth portability of data between the various services. This would improve the development of services particularly for the least advantaged groups in society and support service accessibility. At the same time, increasing attention must be paid to enhancing the digital skills of these groups of people.

As society becomes increasingly digital, it is vital to ensure that everyone has the opportunity to participate in society and its activities. Even though the digital skills of Finland's population are the highest in the EU, there are groups of users here, too, who still need support in this area. Going forward, it remains important to ensure the accessibility of both public and market-driven digital services. Media literacy and the ability to tackle influence through information are, for their part, preconditions for a trust-based, open and democratic society.

Digitalisation, new technologies and the use of data provide opportunities for moving towards a climate-neutral, resource-saving, green and resilient circular economy. At the same time, digitalisation and the data economy also consume energy and resources to an increasing extent. Adopting digital technologies that promote and enhance the green transition requires competence, research and solutions. Allocating RDI investment and training professionals are but two aspects in which Finland takes this twin transition into account.

1.2 Challenges

The global phenomena of digitalisation and the data economy are becoming increasingly complex and applying to a growing number of sectors and industries. The accelerating climate crisis, an ageing and geographically concentrated population, the transformation of work resulting from digitalisation and new kinds of security threats in the digital environment are challenging governance structures and operating methods created over the last century. We also have the sustainability gap in public finances to solve as the ageing of the population increases the number of senior citizens and creates pressure on health, care and pension expenditure and the decrease in the working-age population impairs economic growth opportunities.

Finland needs additional investment to realise the benefits of the digital transition and the data economy. Finland is falling behind in the global growth of the data economy and enterprise growth is challenged by the shortage of professionals especially in high-productivity sectors, the ICT sectors included. Enterprises, the SME sector in particular,

should grow their digital competence and invest in developing the data intensity of business and services as well as in new digital technologies. Public-sector productivity also threatens to stall without investment in digital technologies and related new operating models. With regard to the regulation of data protection, it will be ensured that the regulation allows, for example, the development of services based on the smooth portability and sharing of data.

Table 1. Finland's weaknesses and threats

Weaknesses	Threats
Finland is starting to lag behind the global growth of the data economy	Failing to invest in digitalisation at the central government level and provide digital investment incentives to businesses would erode Finland's competitiveness
Lack of financing and management models that enable cooperation across the boundaries between sectors and industries.	Finland fails to latch onto the global growth of the data economy.
Investments in the growth of the digital economy and data economy are at a lower level than those of Finland's peers	Growth is slowed down by the shortage of skilled professionals.
The relatively low amount of ICT investment slows down the growth of productivity	Intensifying global competition for skilled professionals
Lack of practical solutions for the flow of data	Businesses fail to employ the international skilled professionals who are in Finland
Services based on the sharing of data between various parties have not been created to a significant extent	Growing digital marginalisation, leading to exclusion in society
–	Weakening security in digital environments, which hampers the functioning of society and erodes trust in the public authorities
–	Regulations affecting the operating environment for businesses is implemented in a form that is too detailed and restrictive (EU level and national level) or failing in the consistent implementation of regulations

Competence: challenges

Although the Finnish population is digitally skilled in the European comparison, these skills must be systematically developed throughout the educational system. Attention should be paid to digital skills among all age groups, including the adult population and older people whose educational path may not have equipped them with the requisite basic digital skills. Lack of digital skills may lead to digital marginalisation, dropping out of education, a disadvantaged position on the labour market and health problems. The definition, fundamental nature and indicator setting of digital skills must be reviewed from the perspective of current and future needs. We must move from basic technical skills towards a more versatile and deeper understanding of digital skills in the digital era.

From the perspective of Finland's competitiveness and economic growth, significant challenges relating to competence include skills shortages and the labour productivity trend that has remained stagnant since 2008. Productivity development is influenced by factors including the increased number of workers in sectors that generate less value added. Skills shortages are seen in many higher-productivity sectors, ICT included.

Global competition for digital talent has grown fiercer and may be expected to further intensify in the years to come. This will become apparent in Finland, too. Even though the basic digital skills of the Finnish population rank high in international benchmarking studies and Finland educates a considerably higher number of ICT professionals than is the EU average, the availability of ICT professionals threatens to become a bottleneck in the development of business and public services. In 2021, 59% of enterprises which recruit ICT professionals reported difficulties in filling vacancies. There is a need for not only ICT competence but also competence in various fields where digital capabilities support professional development and the application of skills.

Attracting digital professionals with a university degree or a university of applied sciences degree, researchers and specialised experts is an acute challenge for Finland. It is important that ICT education and training is widely available and that it attracts new students, including women and international students. The proportion of international students among the graduates of Finnish universities is the highest in the ICT industry in relative terms, but only some of them end up working in Finland. While efforts have been made to develop services aimed at international professionals, there is still room for improvement in this respect. Working life must also be made more diverse. Going forward, an increasing number of the international digital professionals graduating in Finland should also find employment here.

The low share of tertiary-degree graduates among people aged 25–34 in Finland when compared to most OECD countries and other Nordic countries has long been an issue in Finland. Student intake to higher education institutions in Finland is limited and the

number of student places has been slow to increase. Even though ICT graduates account for a fair share of all graduates in Finland, the overall number of graduates must be increased.⁶

Attention must moreover be paid to the digital competence required in other sectors. Technological developments will increase the relevance of this aspect. The pace of technological change and its scope in the various sectors call for investment in research and doctoral education as well as flexible opportunities for skills development and continuous learning at various career stages, for example through the establishment of microcredentials. Skills development models to meet the needs of SMEs in particular are needed in order to tap the potential of digitalisation and the data economy.

Increased R&D funding also strengthens the link between research and education. While significant investments in RDI activities will also support ICT skills development, boosting the volume of competence is also essential to advancing RDI activities.

Infrastructure: challenges

Finland is a sparsely populated country, which impacts on the way fixed network connections are established. Network construction is primarily market-driven. The connectivity indicators for Finland are largely in line with EU averages. However, Finland is below EU average in terms of the coverage of Very High Capacity Networks (VHCN) and Fibre To The Premises (FTTP) subscriptions.⁷

At the moment, the fastest and most reliably operating fixed connections are achieved with optical fibre. Very-high speed connections are needed particularly for services that require high, predictable connection speeds, in addition to which optical fibre connections serve as the basis for ultra-high speed wireless connections. Due to their different characteristics, fixed and wireless connections are not mutually replaceable; instead, both are needed, and the amount of capacity required will continue to grow in the years to come.

To maintain its position among the leaders of technological and digital service development, Finland must carry out active and advanced development of communication connections and networks and participate in the drafting and decision-making related to regulation and standardisation.

6 [DESI 2022, Finland](#)

7 [DESI 2022, Finland; Report on the state of the Digital Decade, 2023](#)

Business digitalization: challenges

The sustainable development of Finland's economy depends to a significant degree on how SMEs can grow, boost their productivity, improve their competitiveness and reduce their environmental footprint with the help of new technologies, among other things. The key is to understand the opportunities presented by digitalisation to accelerate business. Seizing these opportunities requires action by both the public sector and the business sector.

The SME sector is still in the early stages of tapping into the benefits of the data economy. The competence gap presents a major obstacle to new, data-based value creation by SMEs. SMEs' capabilities and understanding of the potential of data must be strengthened and more attention must be paid to digital competence and the recruitment of international talent. In addition to education and training leading to degrees and qualifications, working life-driven continuous learning solutions must be developed. Examples of these are bespoke training programmes and small competence modules. The challenges of the data economy, as SMEs see them, culminate not only in competence but also in structural issues; free data portability and accessibility; the non-interoperability of systems and data stores across organisational and national boundaries is also a challenge. This often prevents data-based co-creation and the harnessing of data reserves.

The start-up ecosystem has developed significantly over the past decade-plus. When compared to its peers, Finland generates fewer start-ups that can be scaled globally, however. Finland's strong ICT and technology expertise is not generating high-growth start-up enterprises to the expected extent. Accelerating the growth of start-ups and boosting their internationalisation capabilities should be given more attention.

At the EU level, harmonisation has been – or is being – carried out in regulation concerning areas such as data protection, the responsibility of platforms, the application of AI and competition in the digital market. The risk is that EU-level regulation will be implemented as excessively restrictive and detailed. In the worst case, this would increase the administrative burden, create legal uncertainty for investments and reduce businesses' innovation and business opportunities. The competitiveness of enterprises requires a proportionate legislative framework, which enables new innovations and the emergence of new digital business regardless of sector.

Public services: challenges

Although Finland is a forerunner in digital public services, the user experience may seem fragmentary because the services are decentralised across numerous platforms. In order to make services smoother, services should be developed based on life events and business events. A current challenge consists of the smooth sharing of data and the security of data sharing from the users' perspective. As yet, consumers cannot easily and securely share their data across multiple public services, which limits the effectiveness and human-centricity of digital services.

The smooth functioning of digital society services and activities requires a well-functioning soft digital infrastructure both nationally and internationally. Finland needs to step up its investments in soft digital infrastructure to make digital infrastructure widely available to different sectors and applications. This will also support the implementation of the Digital Single market, which the EU is aiming for. This requires investments in the development of soft infrastructure and operating methods.

1.3 Strengths and assets

Finland is in a good position to benefit from digitalisation and solve the challenges digitalisation brings. However, strengths do not automatically turn into successes. Among its strengths, Finland counts its strong digitalisation expertise and education, the good digital skills of the population and enterprises, and the generally favourable attitude of society towards technology. Finland is a trust-based society. Enterprises, authorities and the third sector engage in effective dialogue and collaboration, which provides an excellent foundation for the agile execution of data economy experiments, for example. Finland has a high digitalisation rate and reliable networks, and its public digital services function well.

Table 2. Finland's strengths and opportunities

Strengths	Opportunities
Strong digitalisation competence and education, digital skills	The data economy creates new digital services and business
Favourable attitude towards technology	Digital green transition solutions generate exports
Trust-based society	Finland is profiling itself as an expert in cyber security, which creates export opportunities
The agility needed for experimentation in cooperation between the public authorities, businesses and the third sector	Increase the number of IT professionals through training and education as well as by attracting skilled professionals
Trendsetter in the My Data approach	Ensure an adequate level of matching funds for EU funding to drive growth and take advantage of European expertise
The rate of digitalisation of public services and digital public services	Create practical solutions for sharing and managing data
Well-functioning networks	Digital public services for individuals and businesses enhance daily life and increase productivity

Commitment to the long-term management of digitalisation development

The benefits of digitalisation are not achieved merely by adopting new technological solutions. The renewal of society requires networked and cross-sectoral management and operating models concerning digitalisation. Cooperation between the different administrative branches, sectors and actors in society and establishing a shared understanding of the preconditions to development are crucial to directing digitalisation development. These strengthen Finland's capacity to remain among the leaders in digitalisation also in the future. Close cooperation between the public and private sectors provides an excellent foundation for the development of digitalisation and for data economy experiments.

Finland is committed to a long-term view of digitalisation management. Finland has created a permanent structure to direct and cross-sectorally manage national digitalisation development and to establish a national overall picture. The structure includes a ministerial working group responsible for digitalisation and data economy promotion and public administration development. The working group is supported by an inter-ministerial coordination group, the Digital Office, for digitalisation which strengthens cooperation, coordination and information flows between the ministries.

[Finland's Digital Compass](#) was prepared under the guidance of the ministerial working group and the leadership of the coordination group for digitalisation in cooperation with stakeholders. The digital compass is based on European values and the Digital Decade 2030 programme. The government report on Finland's digital compass was issued in October 2022 and adopted in Parliament in February 2023.

Finland's digital compass has a broader scope than the EU digital compass. Finland wishes to be a trendsetter in areas including the data economy and the creation of the requisite structures and operating models. A key issue for Finland is how to realise the potential of digitalisation and the data economy in the form of practical solutions in areas such as business, public sector productivity and service enhancement, or creation of the practical structures of the data economy. The development and steering of digitalisation requires action not only from the central government but also from the municipal sector, businesses, universities, research institutions, the third sector and civil society. With this in mind, the digital compass is created and updated in close cooperation with stakeholders. The digital compass action plan is currently under preparation.

In addition to the digital compass, national digitalisation development is to be steered and implemented with the help of the digital portfolio. Currently under development, the digital portfolio is a monitoring tool that covers the most significant digitalisation projects

of central government. With the aid of the digital compass and the digital portfolio, an overall picture can be formed of national objectives and ongoing development projects and investments can be allocated and timed more effectively.

The following are the preconditions for success in Finland's digitalisation development:

- Joint governance framework between different sectors, overall picture and prioritisation between sectors. Development of indicator setting and impact assessment.
- Models for cross-sectoral project management; models for management of phenomenon packages and service packages; assessing investment productivity and ensuring interoperability.
- Sufficient investment and new investment models, including data resource quality maintenance, interfaces, information security and data protection that necessitate also working through the maintenance backlog that has already emerged. Developing investment models to support solutions and operating models that span across the boundaries between sectors and taking the full life-cycle of projects into consideration.
- Developing the competences of the public authorities in a rapidly changing operating environment, for example technology, regulatory and sustainability competencies and knowledge management.
- User-drivenness and leveraging agile methods, open-minded use of new technologies and operating methods.
- Enabling legislation and proactive, long-term and technology-neutral development of the regulatory framework both at the industry-specific level and in an industry-independent context.
- Cooperation. Broad cooperation between the public, private and third sectors and higher education institutions and research institutions, and establishing a common language and understanding around digitalisation and the data economy.

Competence: strengths

Finland stands among world leaders in digital competence based on most indicators: basic digital skills, number of ICT experts, and share of ICT experts who are women. Considerably more ICT professionals are educated and graduate in Finland than is the EU average. The number of graduates with an ICT degree is on the rise. Good digital skills are the foundation – and also a precondition – for equal inclusion in our increasingly digital society. Broadly, it is a question of possibilities and capabilities to play an active and innovative role and apply new technologies in digital environments.

Finland has solid technological competences and a strong educational system. New ICT students account for 12% of all students starting university of applied sciences and for 10% of students starting university. National statistics indicate that at present, 8% of university of applied sciences graduates and 9% of those earning a master's degree or doctorate at university graduate in the ICT sector. While student intake was broadened earlier, this is yet to be reflected in full in the number of graduates.

The aim is to respond to ICT competence needs through education and training leading to degrees and qualifications and by improving completion rates and employment. Efforts will also be made to increase the number of international students in Finland and their employment here.

The programme to develop digital Bildung and basic digital skills responds to the need for further enhancement of the level of basic digital skills of the population. Means to accomplish this include strengthening the media literacy and digital competences of staff who work with young people and strengthening awareness of digital Bildung.

Infrastructure: strengths

Fast, high-quality and reliably operating communication networks and the digital data that flows seamlessly through them lay the foundation for the services and innovations of the current technological transformation.

The total coverage of the 5G network in Finland (95%), for example, is clearly above the EU average of 81%. Finland's 5G coverage in the high-quality 3.4-3.8 GHz band that is essential to using sophisticated applications that require high bandwidth is also much higher than the EU average of 41%.⁸

Finland is a pioneering country in mobile networks and aims to be a leading player as the developer and user of next-generation mobile networks in the future. New spectrum bands for wireless broadband have been introduced in Finland faster than in other EU Member States.

World-class research is being conducted in 6G network technologies and other key technologies, such as quantum computing and microelectronics. Microelectronics and quantum technology are two sectors where Finland has particular competence as well as competitive advantage. The market for both of these is growing at a substantial rate. Quantum computing holds vast potential for greater efficiency in high-performance

8 [DESI 2022, Finland; Report on the state of the Digital Decade, 2023](#)

computing, scientific modelling and RDI activities. International research cooperation is central to the development of quantum computers. Its technology competences allow Finland to build the infrastructures of the future on which digitalisation and data economy solutions are based. Finland also has the competence to build transparent AI solutions.

Finland is a significant hub of global, inter-continental connections. Finland is involved in promoting a submarine cable system that connects three continents and passes through the Arctic region, the first of its kind.

Business digitalization: strengths

Finland's advantages in tapping the business opportunities of the data economy are its excellent digitalisation rate and digital capacities as well as digital entrepreneurship conditions of high standard along with top-notch competence in the sector. In international comparisons, Finland is ranked among advanced AI countries and considered one of Europe's AI leaders among digitally advanced countries.

Finland is seeking growth in data-intensive business and in data-based value creation in enterprises. Around 93% of enterprises in Finland have fewer than 10 employees. Consequently, it is important for Finland that also SMEs invest in AI and big data, for example. There is a significant number of technology enterprises operating in Finland that are the world's leading players in their respective market segments. These enterprises create growth for the smaller enterprises included in their value chains and boost the numbers of internationally competitive enterprises.

In particular, Finland's strengths include high-level technological research and joint development efforts, in which public investment and pro-digitalisation innovation policy are key enabling factors. One of Finland's strengths is that a significant proportion of publicly tendered R&D funding targeted at businesses is related to digital solutions.

Business Finland, for example, has been the instrument to provide funding for measures that promote future connectivity, the data economy and the green transition and also support growth and internationalisation as well as RDI infrastructure that promotes digitalisation. The [Act on Research and Development Funding](#) entered into force at the beginning of 2023 and its implementation will considerably increase central government funding for RDI activities in 2024–2030. RDI expenditure will be increased to 4% of GDP by 2030 and the ambition level of RDI measures will be raised in selected key technologies as outlined in the Roadmap for Research, Development and Innovation adopted in spring 2020.

According to the [most recent EIB country overview](#), 52% of enterprises in Finland can be classified as active innovators. In addition, technological innovation measured by number of patent applications took an upward turn in 2020 after two decades of trending down.

Public services: strengths

Finland has achieved the objective of providing key public services online. The aim is to continue the development so that in the future, a large part of public services will be digital and automated whenever appropriate. By utilising digitalisation, the development of public services aims to significantly reduce the need for services for businesses and citizens, or even eliminate the need for services. In the future, the digitalisation of service packages related to life events and business events will be at the core of the development of public services. Finland has solid experience in the digitalisation of public services, which gives a good basis for moving to the next stage of development.

Going forward, communications from and with public authorities will primarily take place through digital channels. A gradual transition to the primacy of digital services when dealing with the authorities is also envisioned. Finland strives to enable the use of AI in the automation of certain decisions issued by the authorities. This can only be accomplished once legislation has been reviewed and amended. Finland is implementing a comprehensive reform of data protection legislation to enable the use of new technologies, for example cloud services, and the easier portability of data between different information systems.

If digitalisation is to reduce the need of people and enterprises to use public services and services are to be easy to use also internationally, soft infrastructure to enable this objective must be developed. One important component is the further development of the digital identity, which would advance the digitalisation of society with the help of soft digital infrastructure. As concerns national legislative drafting, it is moreover important to note that national preparations for the eIDAS Regulation regarding legislation and functional solutions must be initiated in Finland.

The transition towards a real-time economy will be supported by promoting, for example, possibilities for business documentation, such as e-invoices and electronic receipts, to be securely transferred between parties digitally in real time.

2 National trajectories and target values to contribute to achieving EU's digital targets

The trajectories of Finland's National Roadmap⁹ have been projected on the basis of the key performance indicators, definitions and data sources adopted by means of the implementing act. At this point, Finland will not set milestones for all of the digital targets.

With regard to the milestones determined, the modelling methodology is based on the methodology used by the Commission concerning the common targets of the EU. [The report provided by the Commission](#)¹⁰ shows that the phenomena relating to digitalisation and the indicators reflecting them take differing trajectories. The increased prevalence of certain phenomena is expected to be following a linear growth path, with the percentage increase being constant, that is, the annual trajectory of the phenomenon displaying a steady progressive path. Indicators on targets including those relating to competence – percentage of population with at least basic digital skills and number of ICT specialists – are expected to show a linear behaviour. For these, Finland's milestones have been determined on the basis of the trajectory to date and of the target so that the target is reached in a linear manner.

Other phenomena follow an S-curve pattern where the initial stage of growth is exponential but the growth flattens out over time. Digitalisation-related trajectories expected to behave like this include gigabit coverage, 5G coverage and take-up of cloud computing services, big data and AI. With regard to 5G coverage, Finland's milestones have been determined so based on the trajectory following the S-curve pattern.

9 Where necessary, the paths for the trajectories will be supplemented at a later date.

10 European Commission (2023) JRC Technical Report: Methodology to project Digital Decade trajectories towards 2030.

Table 3. Baseline, estimated annual milestones and target for 2030. Finland will not set milestones for all of the targets. It is not justified to set national targets for all of the EU targets.

Digital Decade target	Baseline 2023, Finland (DESI 2023 or most recent)	2024	2025	2026	2027	2028	2029	Target 2030, Finland
1a Basic digital skills, % of 16 to 74-year-olds	79	81.8	82.7	83.5	84.4	85.3	86.1	87
1b ICT experts, % of population	7.6	8.2	8.5	8.8	9.1	9.4	9.7	10
2a Gigabit, % ¹¹	71	–	–	–	–	–	–	100
2a 5G, %	95	97	98	99	99.2	99.5	99.9	100
2c Edge nodes	–	–	–	–	–	–	–	–
2d Quantum computer	0/1	–	1	1	1	1	1	1
3ai Cloud computing services, % of enterprises	66 (DESI) 81 (Statistics Finland)	–	–	–	–	–	–	75
3aii Big data, % of enterprises	22	–	–	–	–	–	–	75
3aiii Artificial intelligence (AI), % of enterprises	16	–	–	–	–	–	–	75
3b Digital intensity among SMEs, %	90	–	–	–	–	–	–	90
3c Unicorns	–	–	–	–	–	–	–	–
4a Digital public services %, citizens	92 (DESI), 100% (eGov)	–	–	–	–	–	–	100
4a Digital public services %, enterprises	100	–	–	–	–	–	–	100
4b Access to electronic health record, %	89 (DESI), 100 (eGov)	–	–	–	–	–	–	100
4c Electronic identification, %	92 (eGov)	–	–	–	–	–	–	100

11 The need to continue the broadband aid scheme will be explored. Annual milestones can be evaluated when the report is completed in 2024.

3 Measures to achieve EU's digital targets

3.1 Overview of measures

This chapter first describes the measures, which are presented in accordance with the EU digital targets. A more detailed description of the measures is provided below.

3.1.1 Competence

EU target:

1) A digitally skilled population and highly skilled digital professionals, with the aim of reaching gender balance

a) At least 80% of 16 to 74-year-olds have basic digital skills

Finland's target (expressed in the Government report on Finland's digital compass): Finland ranks first on basic digital skills in the European DESI index. National target: 87% of 16 to 74-year-olds.

National baseline (DESI 2023): 79%

Union baseline (DESI 2023): 54%

The means to reach the target is the development programme for digital Bildung and basic digital skills.

The timetable for implementing the measure is presented in the tables with the symbol ×.

Measures contributing to the target	2023	2024	2025	2026	2027	2028	2029	2030
1.1. Promote digital skills, media literacy and digital service use and participation skills (incl. critical literacy)	×	×	×	×				
1.2 Launch societal discussion on digital Bildung and inclusion in an increasingly digital society	×	×						
1.3 Develop a set of indicators for media literacy.		×						

Contribution of measures to addressing challenges:

- Basic digital skills must be extended to an even broader group with the aim of ranking first among EU Member States.
- While Finland's current situation ranks well in the EU comparison, an increasing share of the population are in need of basic digital skills. Basic digital skills are often a fundamental condition for acquiring other competences, managing everyday life and using services.
- The measures will strengthen digital Bildung, skills and capabilities, media literacy included, in education and training as well as in other contexts. The digital competence of employees in the education and culture sector and their ability to pass on digital skills and competence will be strengthened. Awareness of the importance of digital Bildung will be communicated. Public libraries also play an important role in promoting digital education in all population groups.

Estimated investment gap and possible actions to reach national target values:

Finland performs well on this target in the European comparison. Nonetheless, if 100% digital public services are the objective, adequate public basic skills must be held by everyone. Investment is widely needed in administration in the education and culture sector in order to define, set indicators for and monitor the digital skills of the future as well as to develop these both as part of the educational system and also subsequently, whether in training or in self-driven skills enhancement. To an increasing extent, it is about the basic skills. At the same time, the ageing population of Finland necessitates a greater focus on teaching and maintaining digital skills among the older population. New mechanisms for maintaining and enhancing skills must be developed.

EU target:

b) at least 20 million ICT specialists are employed within the Union, while promoting the access of women to this field and increasing the number of ICT graduates

Finland's target in the report (updated): Shoot for a level of 10% in the number of ICT experts.

Finland's target in the government report: The share of women among ICT professionals has increased.

National baseline (DESI 2023) 7.6%

Union baseline (DESI 2023): 4.6%

The target is pursued by means of the digital competence development programme and the digital professionals action plan.

Measures contributing to the target

	2023	2024	2025	2026	2027	2028	2029	2030
1.4 Meet competence needs in the ICT sector through education and training leading to degrees and qualifications and by developing educational pathways for ICT experts and professionals.	x	x	x	x	x	x		
1.5 Introduce additional incentives for international students to remain in Finland to work after graduation	x	x	x					
1.6 STEM work	x	x	x	x	x	x	x	x

Budget allocated to measures by target:

Public investment, already allocated:

- higher student intake, government budget session 2023: an additional appropriation of EUR 41.3 million for increasing the number of student places will be allocated to universities and universities of applied sciences during 2024-2027. The appropriation for 2024 will be EUR 11.7 million. The new

student places will be allocated in particular to sectors with labour shortages, such as early childhood education and care and health and social services. The figures represent the entirety of education-level raising, in which ICT is only one element. While the full appropriation has been outlined in the budget, the annual progress and breakdown among sectors will be decided at a later date.

Contribution of measures to addressing challenges: There is a general shortage of university and university of applied sciences educated ICT professionals and Finland is no exception. Gender equality in the sector has been poorly achieved. The measures will deliver more ICT graduates into the labour market to alleviate the shortage of professionals. Student intake in the sector can be increased, provided more funding is made available. The STEM measures serve to bolster the sector's attractiveness among under-represented groups. Additional incentives for international students will increase the number of professionals who find employment in the Finnish job market.

Estimated investment gap and possible actions to reach national target values: In 2020–2022, a significant number (>2,200) separately funded additional student places were allocated to the ICT sector at universities of applied sciences and universities. Keeping up an equivalent boost in intake would require considerable additional funding.

3.1.2 Infrastructure

EU target:

2) secure, resilient, performant and sustainable digital infrastructures:

a) all end users at a fixed location are covered by a gigabit network up to the network termination point, and all populated areas are covered by next-generation wireless high-speed networks with performance at least equivalent to that of 5G, in accordance with the principle of technological neutrality

Finland's target in the government report: All Finnish households and businesses have the opportunity to use a 1-gigabit telecommunications connection and the 5G network covers the entire population in 2030.

Gigabit:

- National baseline (DESI 2023): 71%
- Union baseline (DESI 2023): 73%

5G:

- National baseline (DESI 2023): 95%
- Union baseline (DESI 2023): 81%

Measures contributing to the target

	2023	2024	2025	2026	2027	2028	2029	2030
2.1 Promoting the availability and quality of communications connections	x	x	x	x	x	x	x	x
• Frequencies	x	x	x	x	x	x	x	x
• Promoting broadband investments	x	x	x					

Budget allocated to measures by target: see chapter 3.2.

Contribution of measures to addressing challenges:

- **Frequencies:** The efficient use of frequencies is vital to the development of digitalisation. Finland has already made available the frequency bands for 5G. In the WRC, Finland is advocating for additional 5G frequencies. However, the EU is not in favour of using TV frequencies for mobile solutions, for example.
- **Broadband coverage:** Finland is a sparsely populated country and it is expensive to build fixed broadband in sparsely populated areas. Connections here were rapidly constructed on a commercial basis and in a technology neutral manner in areas where there is demand. Public funds have been used to support the construction of fixed high-speed connections in sparsely populated areas. There is limited potential for financial aid, however.

EU target:

b) the production, in accordance with Union law on environmental sustainability, of cutting-edge semiconductors in the Union is at least 20% of world production in value

Finland's target in the government report: Finland has a pilot production line for manufacturing semiconductor components or an industrial scale semiconductor component production plant that is connected with European and global semiconductor research.

National baseline: –

Union baseline: approximately 10% of global production value

Measures contributing to the target	2023	2024	2025	2026	2027	2028	2029	2030
2.2 Additional appropriations to acquire and deploy shared equipment for the Kvanttinova pilot environment for microelectronics and quantum technology.	x	x	x	x	x			

Budget allocated to measures by target see chapter 3.2.

The development of the piloting environments will also comprise additional measures, for example the 1–3 centres of excellence for semiconductors in accordance with the European Chips Act that will be set up at a later date.

Contribution of measures to addressing challenges: Microelectronics and quantum technology are two sectors where Finland has particular competence as well as competitive advantage. Finland will be made home to an RDI environment and business hub for specialised microelectronics and quantum technology that counts among the largest and most important in all of Europe. This will enable new products and services to be scaled up to an industrial scale. National funding will make it possible to apply for funding under the European Chips Act as well.

EU target:

c) at least 10,000 climate-neutral highly secure edge nodes are deployed in the Union, distributed in a way that guarantees access to data services with low latency (i.e. a few milliseconds) wherever businesses are located

Finland will not set a national target for the number of climate-neutral highly secure edge nodes. As described in the broader national digital compass of Finland, Finland supports the Union-level target in particular through measures relating to data portability-promoting infrastructure, the creation of environments and ecosystems for high-performance computing and handling protected data, development of AI capabilities, and accomplishing the business conditions and investments required to link these. In addition, the measure calls for action at the EU level to increase data interoperability and to create and standardise up-scaling markets for cloud computing services.

National baseline: –

Union baseline: unknown

Contribution of measures to edge node target:

	2023	2024	2025	2026	2027	2028	2029	2030
2.3 Influence the EU programme for the upcoming period regarding the up-scaling of cloud computing services in the single market, in particular through the harmonisation of conformity specifications for data infrastructure and information security.	×	×						
2.4 The national legislative amendments necessary to the development of data spaces will be implemented:	×	×	×	×				
- Mobility Data Space 2023–2025								
- Health Data Space 2024–2026								
- Public services 2024–2026								

EU target:

d) the Union has, by 2025, its first computer with quantum acceleration, paving the way for the Union to be at the cutting edge of quantum capabilities by 2030

Finland’s target in the government report: A quantum computer with a minimum of 50 qubits is in use in Finland by 2025.

National baseline: A 5q computer is already in use and a 20q computer will become available in 2023.

Union baseline: 0

Measures contributing to the target	2023	2024	2025	2026	2027	2028	2029	2030
2.5 50q quantum computer for VTT			×					

Budget allocated to measures by target: see chapter 3.2.

Contribution of measures to addressing challenges: The measure will ensure that the necessary conditions are in place for developing and using quantum computing extensively.

3.1.3 Business digitalization

EU target:

a) at least 75% of Union enterprises have taken up one or more of the following, in line with their business operations: | (i) | cloud computing services; (iii) artificial intelligence; (iii) big data;

Finland's target in the government report: A minimum of 90% of SMEs reach at least a basic level of digital intensity and at least 75% of SMEs use cloud services, big data and AI.

Cloud computing services

- National baseline (DESI 2023): 66% of enterprises (Statistics Finland 2022¹²: 81% of enterprises use cloud services)
- Union baseline (DESI 2023): 34%

Artificial intelligence

- National baseline (DESI 2023): 16% (Statistics Finland; figure will next be released in late 2023: 16% of enterprises use artificial intelligence)
- Union baseline (DESI 2023): 8%

Big data

- National baseline (DESI 2023): 22%
- Union baseline (DESI 2023): 14%

12 Statistics Finland, [Use of information technology in enterprises 2022](#)

Measures contributing to the target	2023	2024	2025	2026	2027	2028	2029	2030
3.1 EDIH 13	x	x	x	x	x	x	x	
3.2 Business Finland's mission Digital Native Finland	x	x	x	x	x			

Budget allocated to measures by target see chapter 3.2.

Contribution of measures to addressing challenges:

- Digital capabilities and digital entrepreneurship conditions of high standard are yet to be realised as higher value of business.
- SMEs need to be more extensively involved in taking advantage of digitalisation and data economy services and in the role of producers in innovation and business ecosystems. The hubs function as service points that boost digital investment and, in particular, the digitalisation of SMEs.
- Through the Digital Native Finland mission, investing in the connectivity and data economy of the future together with the development of software expertise will provide export companies with a competitive advantage and attract foreign investments.

13 EDIH funding until 2025.

EU target:***b) more than 90% of Union SMEs reach at least a basic level of digital intensity***

Finland's target in the government report: A minimum of 90% of SMEs reach at least a basic level of digital intensity and at least 75% of SMEs use cloud services, big data and AI.

National baseline (DESI 2023): 90%

Union baseline (DESI 2023): 69%

Measures contributing to the target	2023	2024	2025	2026	2027	2028	2029	2030
3.1 EDIH14	x	x	x	x	x	x		

Budget allocated to measures by target: see chapter 3.2.

Contribution of measures to addressing challenges: The digital capabilities of enterprises, in particular of the SMEs that trail behind leading enterprises, will develop and the enterprises will be able to develop and regenerate their business.

Estimated investment gap and possible actions to reach national target values: The information will be supplemented at a later date.

14 EDIH funding until 2025.

EU target:

c) the Union facilitates the growth of its innovative scale-ups and improves their access to finance, leading to at least doubling the number of unicorns

Finland's target in the government report: The number of start-ups increases and, by 2030, more and more start-ups are growing and entering international markets.

National baseline: -

Union baseline (2022): 249 unicorns in the EU

The model for monitoring Finland's target requires further development. The number of unicorns is not a justified indicator for a country of Finland's size.

Measures contributing to the target	2023	2024	2025	2026	2027	2028	2029	2030
3.2 Business Finland Mission: Digital native Finland	x	x	x	x	x			
3.1 EDIH	x	x	x	x	x	x	x	

The Government Programme moreover commits to promoting a set of themes on the data economy. The set of themes will be established at a later date.

Contribution of measures to addressing challenges:

- Low digital technology adoption rate in SMEs
- When compared to its peers, Finland generates fewer start-ups that can be scaled globally.
- SMEs need to be more extensively involved in taking advantage of digitalisation and data economy services and in the role of producers in innovation and business ecosystems.

3.1.4 Public services

EU target:

a) there is 100% online accessible provision of key public services and, where relevant, it is possible for citizens and businesses in the Union to interact online with public administrations¹⁵

Finland's target in the government report: Approximately 40 of the most significant life event service packages have been digitalised or automated. Human-centric digital services constitute a proactive, human-centric and efficient set of services.

Services to the citizens:

National baseline: DESI 2022: 90%; eGovernment Benchmark 2021–2022: 98.7%.

Union baseline: DESI 2022: 75%

General timetable: Finland has reached the set target but continues the development of digital public services towards a higher degree of human-centricity and ease of use in order to grow the utilisation rate.

Services for business:

National baseline: DESI 2022: 93%; eGovernment Benchmark 2021–2022: 100%

Union baseline: DESI 2022: 82%

¹⁵ Averages calculated on the basis of online availability data in the eGovernment Benchmark: Family 100% (2022), career 100 % (2022), studying 100 % (2022), transport 96% (2021), justice 100 % (2021), Moving 92 % (2021), Health 100 % (2021).

Finland has reached the set target and is not implementing any further reportable measures in this respect. Finland continues to develop the public services geared to enterprises so as to make these even easier to use, more interoperable and internationally more accessible.

General timetable: Finland has reached the set target and is not implementing any further reportable measures in this respect. Finland continues to develop the public services geared to enterprises so as to make these even easier to use, more interoperable and internationally more accessible.

EU target:

b) 100% of Union citizens have access to their electronic health records

Finland's target in the government report: 100% of Finns have access to their digital health and social services records. Digital health services and data are used in everyday life.

National baseline: eGovernment Benchmark 2021-2022: 100%; State of the Digital Decade report: 90%

Union baseline: State of the Digital Decade report: 72%

General timetable: Finland has reached the set target.

EU target:

c) 100% of Union citizens have access to secure electronic identification (eID) means that are recognised throughout the Union, enabling them to have full control over identity transactions and shared personal data.

Finland's target in the government report: Finland has soft infrastructure that enables digital services. A general, joint, secure and open-to-everyone trust infrastructure of verified data has been created for using e-services and exchanging data.

National baseline: (eGovernment Benchmark 2021–2022): 92%

Measures contributing to the target

	2023	2024	2025	2026	2027	2028	2029	2030
National preparations for the eIDAS Regulation	×	×						

Budget allocated to measures by target:–

Contribution of measures to addressing challenges: The eIDAS Regulation seeks to enhance trust in electronic transactions and electronic business in the single market.

3.2 Description of measures

Competence

Promote digital skills, media literacy and digital service use and participation skills (incl. critical literacy).

New measure	× yes – no
Short description of the measure	<p>Promote digital skills, media literacy and digital service use and participation skills (incl. critical literacy)</p> <p>Content of the measure: Promote the digital skills and critical media literacy of students as well as the digital service use and participation skills (incl. critical literacy) of people of working age, older people and special groups.</p> <p>Strengthen the media literacy, ICT competences and programming skills of educational staff as well as workers in the fields of youth work, culture and sports and exercise.</p> <p>Also ensure that information about study opportunities can easily be located by the target groups.</p> <p>Link with target: 1 a) At least 80% of 16 to 74-year-olds have basic digital skills.</p> <p>Tentative timeline: education and training offering 2023–2025, in other respects 2023–2026</p>
Budget allocated or planned, other resources	<p>National funding (implemented to the extent permitted by the spending limits), RRF funding in part (making the education and training offering easy to locate).</p>
Expected impact and timing	<ul style="list-style-type: none"> • Reducing digital inequality, development of equal digital skills and critical literacy skills, stronger national resilience. • More people attend training in basic digital skills, particularly people from groups that currently have the poorest basic digital skills, such as older people.

1.2 Societal discussion on digital Bildung and inclusion in an increasingly digital society is launched.

New measure	× yes – no
Short description of the measure	<p>Launch societal discussion on digital Bildung and inclusion in an increasingly digital society</p> <p>Content of the measure: Plan, launch and implement a series of discussions on digital Bildung. The Ministry of Education and Culture will be responsible for the opening and closing sessions, while events organised by other parties involved in digitalisation, for example from the private sector and education and culture sector, will be implemented under the umbrella theme.</p> <p>Link with target: 1 a) At least 80% of 16 to 74-year-olds have basic digital skills.</p> <p>Tentative timeline: 2023–2024.</p>
Budget allocated or planned, other resources	National funding: Envisioned funding EUR 0.03 million, implementation on the part of the ministry to take place as part of official duties.
Expected impact and related timing	A component in communicating digitality and particularly digital measures on competence and Bildung to the wider public.

1.3 Develop a set of indicators for media literacy.

New measure	× yes – no
Short description of the measure	<p>Develop a set of indicators for media literacy.</p> <p>Content of the measure: The National Audiovisual Institute KAVI is taking part in a pan-Nordic project to develop a set of indicators for measuring certain aspects of media literacy (Nordic MIL Index).</p> <p>Link with target: 1 a) At least 80% of 16 to 74-year-olds have basic digital skills.</p> <p>Tentative timeline: The Nordic project is ongoing and initial results will be forthcoming in spring 2024. No resources are available as yet for post-pilot efforts.</p>
Budget allocated or planned, other resources	KAVI is working on the project as part of its official duties. Project coordinator Sweden has been granted Nordic funding for the pilot project.
Expected impact and related timing	Stronger overall picture and knowledge base regarding media literacy

1.4 Meet competence needs in the ICT sector through education and training leading to degrees and qualifications and by developing educational pathways for ICT experts and professionals.

New measure	× yes – no
Short description of the measure	<p>Meet competence needs in the ICT sector through education and training leading to degrees and qualifications and by developing educational pathways for ICT experts and professionals.</p> <p>Content of the measure: Assess and develop educational pathways and the contents of ICT education, incl. microcredentials, with the aim of boosting completion rates and employment and raising the educational level.</p> <p>Increase provision of education and training in the ICT sector and the number of ICT graduates. Any additional funding made available will be allocated to increasing student intake. The aim is to strengthen education thus to increase the number of ICT graduates without additional funding and as part of official duties in the preparation and steering by information of the agreement period of higher education institutions.</p> <p>Degree and qualification targets for the 2025–2028 agreement period will be agreed with the higher education institutions. In setting the targets, provision of education and training for the ICT field is also taken into account.</p> <p>Link with target: 1 b) at least 20 million ICT specialists are employed within the Union, while promoting the access of women to this field and increasing the number of ICT graduates.</p> <p>Tentative timeline: 2023–2027.</p>
Budget allocated or planned, other resources	<p>Core funding; degree and qualification targets for the agreement period 2025–2028 will be agreed with the higher education institutions in 2025. Higher student intake, government budget session 2023: an additional appropriation of EUR 41.3 million for increasing the number of student places will be allocated to universities and universities of applied sciences during 2024–2027. The appropriation for 2024 will be EUR 11.7 million. The new student places will be allocated in particular to sectors with labour shortages, such as early childhood education and care and health and social services.</p>
Expected impact and related timing	<p>Higher number of new students in the sector, higher completion rate, higher number of graduates, better match with labour market needs, improvement in skills shortage, and higher educational level.</p>

1.5 Incentives for international students to remain in Finland to work after graduation are introduced.

New measure	× yes – no
Short description of the measure	<p>1.5 Introduce additional incentives for international students to remain in Finland to work after graduation, which boosts the availability of skilled professionals in the field.</p> <p>Content of the measure: The ways in which to introduce additional incentives to remain in Finland to work after graduation will be assessed as part of the implementation of the Government programme. In respect of the sector of the Ministry of Education and Culture, the work will take place within the remit of a working group tasked, as laid out in the Government programme, to review steps towards the full costing of tuition fees for students liable to pay tuition fees.</p> <p>Link with target: 1 b) at least 20 million ICT specialists are employed within the Union, while promoting the access of women to this field and increasing the number of ICT graduates</p> <p>Tentative timeline: 2023 – 2025.</p>
Budget allocated or planned, other resources	–
Expected impact and related timing	Higher number of new students in the sector, higher completion rate, higher number of graduates, better match with labour market needs, improvement in shortage of skilled professionals, and higher educational level.

1.6 STEM work

New measure	× yes – no
Short description of the measure	<p>The STEM strategy and STEM work will continue.</p> <p>Content of the measure: STEM work seeks to ensure an adequate level of competence in society to support sustainable growth. Measures are divided into three categories: 1) Measures for developing teaching and education, 2) measures for monitoring, reporting and general development, and 3) measures for promoting communications and interest. The work is carried out in close cooperation with stakeholders. Overall, the measures support greater equal opportunities and stronger participation in education and training in the sector among all genders.</p> <p>Link with target: 1 b) at least 20 million ICT specialists are employed within the Union, while promoting the access of women to this field and increasing the number of ICT graduates.</p> <p>Tentative timeline: 2023–2030.</p>
Budget allocated or planned, other resources	<p>–</p>
Expected impact and related timing	<p>Increased attractiveness of the STEM sectors, the ICT sector included, and improved equality in terms of e.g. gender among those seeking education in the sectors.</p>

Infrastructure

2.1 Promoting the availability and quality of communications connections

New measure	× yes – no
Short description of the measure	<ul style="list-style-type: none"> • Effective use of frequencies through active frequency policy and international advocacy. • Possible new broadband aid scheme. <p>Content of the measure:</p> <p><i>Frequencies:</i> Ensure the effective use of frequencies through active frequency policy and international advocacy. Includes, among other things, 2G licence review and advocacy in the EU frequency policy. Finland has already deployed the frequency bands for 5G and was one of the first countries in Europe to grant 5G licenses. Going forward, the necessity of a licence condition that ties to 2G technology in certain frequency bands will be reviewed, taking into account the public interest objectives as well as the relevance of the frequencies freed from the 2G network to the development of wireless broadband.</p> <p><i>Broadband:</i> Promote broadband investment in areas where advanced/high-speed connections will not become available on a commercial basis. In areas with competition and demand, broadband will be made available on market terms. The continuation of the broadband aid scheme implemented in sparsely populated areas will be assessed in autumn 2023. The assessment will also cover the required funding. The goal of the broadband aid scheme is to establish fibre availability for 6,400 households by Q2/2024 and for 16,000 households by Q2/2026 in areas where these connections would not be constructed on a market basis.</p> <p>Tentative timeline: Frequencies: ongoing implementation, ITU advocacy at WRC23, 20 November – 15 December 2023.</p> <p>Continuation of the broadband aid scheme will be assessed in autumn 2023. Current scheme: launched on 3 February 2023 – ongoing. Applications for broadband aid may be submitted in 2022–2023 and the projects for which aid has been granted should be completed no later than by the end of 2025.</p>
Budget allocated or planned, other resources	<p>National funding, EU funding: The current broadband aid scheme is tied to the EU Recovery and Resilience Facility. The scheme will make RRF funding in the amount of EUR 32 million available.</p>
Expected impact and related timing	<ul style="list-style-type: none"> • Maximally efficient use of frequencies within the confines of the existing frequency bands. • Improved broadband availability in areas where connections will not be constructed on a market basis.

2.2 Semiconductors and quantum technology

New measure	× yes – no
Short description of the measure	<ul style="list-style-type: none"> • The Government will make sure that the necessary conditions are in place for developing and using quantum computing extensively. • Acquisition and deployment of shared equipment for the Kvanttinova pilot environment for microelectronics and quantum technology. <p>Content of the measure: Finland will be made home to an RDI environment and business hub for specialised microelectronics and quantum technology that counts among the largest and most important in all of Europe. This will enable new products and services to be scaled up to an industrial scale.</p> <p>The development of the piloting environments will also comprise additional measures, for example the 1–3 centres of excellence for semiconductors in accordance with the European Chips Act that will be set up at a later date.</p> <p>Link with target: The Union will have its first computer with quantum acceleration by 2025, paving the way for the Union to be at the cutting edge of quantum capabilities by 2030.</p> <p>Tentative timeline: 2024–2027.</p>
Budget allocated or planned, other resources	<ul style="list-style-type: none"> • National funding EUR 79 million • EU funding: National funding will make it possible to apply for funding under the European Chips Act.
Expected impact and related timing	<p>Microelectronics and quantum technology are two sectors where Finland has particular competence as well as competitive advantage and the market for which is growing at a substantial rate; Finland remains an internationally attractive RDI partner and target for investments and professionals in the fields of microelectronics and quantum technology.</p>

2.3 50 qubit quantum computer

New measure	× yes – no (includes both existing and new)
<p>Short description of the measure</p>	<p>The Government will make sure that the necessary conditions are in place for developing and using quantum computing extensively.</p> <p>Content of the measure: VTT will continue the development of a quantum computer with a minimum of 50 qubits for use in Finland by 2025. In its 2023 budget session, the Government of Finland allocated EUR 70 million to VTT for upscaling the quantum computer to 300 qubit by 2027.</p> <p>High-performance computing will be leveraged in the development of a national quantum computing environment by linking the quantum computer with the LUMI supercomputer.</p> <ul style="list-style-type: none"> • Finland is a participant in the LUMI-Q project of the EuroHPC joint undertaking to obtain a quantum computer that is to be placed in the Czech Republic. The LUMI-Q quantum computer will be linked with the LUMI supercomputer. <p>Link with target: 2d) The Union will have, by 2025, its first computer with quantum acceleration, paving the way for the Union to be at the cutting edge of quantum capabilities by 2030.</p> <p>Tentative timeline: 2025.</p>
<p>Budget allocated or planned, other resources</p>	<p>National funding: an additional EUR 70 million in total to upscale the quantum computer towards 300 qubit.</p>
<p>Expected impact and related timing</p>	<p>Finland remains an internationally attractive RDI partner and target for investments and professionals in the fields of microelectronics and quantum technology. Finland's quantum computing infrastructure and the ecosystem emerging around it (high performance computing included) will grow and retain its standing as pioneer. This will provide a foundation for stronger scientific research, the growth of new, perhaps radical enterprises and technology sectors and stronger national competitiveness. RDI in quantum technology supports sustainable economic growth and wellbeing.</p>

Enterprises

3.1 European Digital Innovation Hubs (EDIH)

New measure	× yes – no
Short description of the measure	<p>EDIH; the four Finnish hubs in the network of European Digital Innovation Hubs:</p> <ul style="list-style-type: none"> • Robocoast • HealthHub Finland • Finnish AI Region (FAIR) • Location Innovation Hub. <p>Content of the measure: The EDIH are non-profit consortia which provide services to support the digital transformation of SMEs in particular. They function as service points that boost digital investment and, in particular, the digitalisation of SMEs.</p> <p>Link with target: At least 75% of Union enterprises have taken up one or more of the following, in line with their business operations: cloud computing services, artificial intelligence, big data; also linked to the target: The number of start-ups increases and, by 2030, more and more start-ups are growing and entering international markets.</p> <p>Tentative timeline 2023–2029.</p>
Budget allocated or planned, other resources	<ul style="list-style-type: none"> • EU (Digital Europe programme) 50%. • National funding 30% up to EUR 3.7 million in the first three years, no decision as yet beyond then. • Other funding 20%.
Expected impact and related timing	<p>The aim is that the digital capabilities of enterprises, in particular of the SMEs that trail behind leading enterprises, will develop and that the enterprises will be able to develop and regenerate their business.</p>

3.2 Business Finland – Digital Native Finland mission:

New measure	× yes – no
Short description of the measure	<p>The missions of Business Finland accelerate systemic change and help solve major global challenges. They aim to create value for society on a broad scale and identify significant future market opportunities for Finnish companies. In practice, missions combine long-term strategic forecasting with assisting companies here and now.</p> <p>Content of the measure: The goal of the Digital Native Finland mission is to accelerate digital transformation. By increasing digital capabilities, sustainable customer value can be increased and the productivity of companies raised to the next level. Investing in the connectivity and data economy of the future together with the development of software expertise provides export companies with a competitive advantage.</p> <ul style="list-style-type: none"> • 6G Bridge programme (2022–2026). • Data Economy programme (2023–2027). <p>Link with target:</p> <p>The number of start-ups increases and, by 2030, more and more start-ups are growing and entering international markets.</p> <p>At least 75% of Union enterprises have taken up one or more of the following, in line with their business operations: cloud computing services, artificial intelligence, big data.</p> <p>Tentative timeline 2022–2027.</p>
Budget allocated or planned, other resources	<p>National funding: Funding targets for Data Economy programme and 6G Bridge, EUR 135 million and EUR 130 million, respectively.</p>
Expected impact and related timing	<p>Investing in the connectivity and data economy of the future together with the development of software expertise will provide export companies with a competitive advantage, attract foreign investments and foster the further development of an effective digital society.</p>

3.3 Set of themes on the data economy

New measure	× yes – no
Short description of the measure	<p data-bbox="592 510 1262 611">Future measure, preparations now being started under the theme of “Growth from the data economy and digitalisation” in the Government programme:</p> <ul data-bbox="592 633 1262 920" style="list-style-type: none"> <li data-bbox="592 633 1262 801">• A broad-based set of strategic themes on the data economy will be established with the aim of accelerating the use of technologies that generate value added for data (quantum computing, fast wireless networks, cyber security and artificial intelligence. Health data is also specifically mentioned. <li data-bbox="592 824 1262 920">• A data economy growth programme will be launched to improve the capacity of businesses to harness data to develop their products and services. <p data-bbox="592 943 890 969">Content of the measure: TBD</p> <p data-bbox="592 992 1054 1021">Tentative timeline: Estimated start 2024–2025</p>
Budget allocated or planned, other resources	–
Expected impact and related timing	–

Public services

4.1 National preparations for the eIDAS Regulation

New measure	× yes – no
Short description of the measure	<p>Preparatory measure; the eIDAS Regulation seeks to enhance trust in electronic transactions and electronic business in the single market.</p> <p>Content of the measure: Prepare and reconcile national views and opinions on the contents of the legislative proposal as a whole, including the technical requirements of the wallet application.</p> <p>The eIDAS Regulation establishes a framework to ensure that people and businesses can use their own national electronic identification schemes (eIDs) to access public services available online in other EU countries.</p> <p>The Regulation helps create a European single market for trust services by ensuring that they will work across borders and have the same legal status as their traditional paper based equivalents.</p> <p>Tentative timeline: 2023–2024.</p>
Budget allocated or planned, other resources	The budget and the necessary resources will be specified as preparations proceed
Expected impact and related timing	Finland's views is taken into account in the preparation of the European digital identity and the outcome of the negotiations aligns with Finland's objectives.

4 Main measures contributing to the general objectives

Finland's digital compass is a national strategic roadmap extending to 2030 that provides an overview of Finland's digital transformation and provides the direction for national development work. It is based on the EU's Digital Compass and the [EU Digital Decade Policy Programme 2030](#), but it also includes national objectives and themes that are complementary to the EU's Digital Compass. Consequently, Finland's national digital compass, and the action plan being prepared, contribute towards not only the EU's common Digital Decade targets but also towards the general objectives of the Policy Programme and [the European Declaration on Digital Rights and Principles](#).

Table 4. Examples of measures contributing to general objectives.

Theme	General objectives	Examples of measures
Digital citizenship	Reference to objectives specified in Article 3(1)a, b and g	Developing accessibility (Ministry of Finance, Ministry of Social Affairs and Health, Ministry of Education and Culture) https://okm.fi/korkeakoulutuksen-saavutettavuussuunnitelma (in Finnish) Digital divide, learning (Ministry of Finance and Ministry of Education and Culture) https://digivisio2030.fi/en/basic-information-on-the-digivisio-2030-programme/
Fostering leadership and sovereignty	Reference to objectives specified in Article 3(1)c, d, e, f, i and k	Measures of Finland's national digital compass, with measures concerning data infrastructure and data economy among those being prepared, Ministry of Transport and Communications, Ministry of Economic Affairs and Employment Measures of Finland's national digital compass: information security and cyber security, Ministry of Transport and Communications High-performance, edge, cloud and quantum computing, Ministry of Transport and Communications, Ministry of Education and Culture, Ministry of Employment and the Economy https://www.csc.fi/lumi
Contributing to the green transition	Reference to objectives specified in Article 3(1)h and j:	Climate and Environmental Strategy for the ICT Sector 2021, Ministry of Transport and Communications National Climate and Energy Strategy, Ministry of Economic Affairs and Employment

5 EU-level cooperation

5.1 Multi-Country Projects

The implementation of the EU's Digital Decade Policy Programme 2030 includes Multi-Country Projects (MCP) as well as European Digital Infrastructure Consortia (EDICs) that are set up to implement the MCPs. Finland is currently a founding member of two EDIC projects (Copyright Infrastructure and Mobility and Logistics Data). Finland has expressed its tentative interest in participating in five EDIC development projects and, in addition to these, has taken part in the early-stage preparation of four development projects.

Multi-Country Projects (MCPs) in discussions on which Finland has participated.

1+Million Genomes, Ministry of Social Affairs and Health

MCP in brief: –

How participation in this MCP will contribute to the Member State

achieving the general objectives and the digital targets: The 1+MG initiative aims to enable secure access to genomics and the corresponding clinical data across Europe for better research, personalised healthcare and health policy making.

Finland is one of the 27 countries that have signed the 1+MG declaration. Work relating to the declaration has been carried out in Finland since 2018, and the National Mirror Group operating under the Ministry of Social Affairs and Health is responsible for the national coordination. The implementation of the 1+MG declaration is promoted by the European Genomic Data Infrastructure (GDI) project (launched in 2022) and the Genome of Europe project (due for launch in 2024).

Budget allocated or planned, other resources: Both projects require an annual total of 50% of self-funding from Finland (EUR 1–2 million per project) in 2022–2027(8). The EU's total commitment to 1+MG implementation as part of the European Health Data Space currently amounts to EUR 40 million.

Expected impact: –

Other Member States or other entities participating: Finland plays a leading role alongside Sweden in the 1+MG project and has supported the setting up of an EDIC on Genomics.

Language Data Space, Ministry of Finance

The development of AI through multi-country cooperation can create more diversified language-independent functionality for AI. Similar progress can also be made in many other fields where citizens interact with the authorities. It should, however, be ensured that a question submitted in a certain language will not automatically mean a solution based on the service provision or practices of a particular country.

How participation in this MCP will contribute to the Member State achieving the general objectives and the digital targets: The development of AI through multi-country cooperation can create more diversified language-independent functionality for AI. Both a joint effort to gain a sufficient data mass and investment in taking account of the national language environment and operating culture will be required. In Finland, advice must be provided on the practices of the Finnish system even when a question is submitted in a language other than Finnish. Correspondingly, while abroad, Finnish-speakers should receive advice on the practices of the relevant country's systems even when submitting a question in Finnish.

Budget allocated or planned, other resources: There is no allocated budget. Other resources comprise various national projects that can be regarded as contributing towards this. In addition, there is a national computing quota in the LUMI supercomputer of CSC that might be able to provide a quota for this project.

MCP implementation mechanism: –

Expected impact: Datasets, software and services will be offered through a common mechanism so that enterprises will be able to develop and tailor national and international solutions.

Mobility and Logistics Data, Ministry of Transport and Communications (Finland involved in setting up)

The Netherlands, Germany and Finland submitted a pre-notification to set up a Mobility and Logistics Data EDIC to the Commission in June 2023. In August 2023, Spain also became a founding Member State. The preparation of the formal application has commenced.

The EDIC is thematically consistent with the Commission communication and regulatory measures concerning a European Mobility Data Space due for publication in October 2023. The EDIC is hoped to create a practical-level platform to support their implementation. Finland, as part of the EDIC's activities, has signed up for inclusion projects relating to the theme and linked to EU-level cooperation. Among others, the Government Resolution on the Logistics Digitalisation Strategy includes measures for cross-border cooperation to organise exchange of data.

The aim is to accelerate the development of the European digital environment and data space relating to transport, mobility and logistics. A key aim for this activity is to promote the EU-wide uptake of common, interoperable and scalable solutions. The objectives of the EDIC can be summarised as follows:

- stepping up and coordinating cooperation between EDIC members with a view to national and EU-level measures and investments targeted at the digitalisation of mobility and logistics maximising the generation of added value and speeding up the digital transformation and the achievement of the EU's digital targets;
- bridging the gap between project-based experimentation and development and longer-term availability and sustainability of a common data infrastructure, including aspects relating to the exchange and use of data;
- making collective use in the cooperation of the competence, knowledge, experiences, best practices, financial resources, activity, channels of influence and project work of all EDIC members as efficiently and effectively as possible to produce common, interoperable, scalable solutions for the digital environment (identifying and making efficient use of synergies);
- where necessary, linking international organisations and third countries with projects;

- providing solutions for the EU-wide market and strengthening competitiveness, and
- making diverse use of EU financial instruments.

Budget allocated or planned, other resources: Finland has provisionally indicated that it will provide an in-kind contribution towards EDIC membership.

MCP implementation mechanism: National coordination and operational activities are to be implemented with support from Fintraffic and the administrative branch of the Ministry of Transport and Communications. Related discussions have already commenced.

Expected impact: In 2022, Fintraffic launched preparatory work aiming to promote the development of the Finnish traffic data ecosystem. This ecosystem work is open to all and can be regarded as being the first, comprehensive joint effort of the transport and traffic sector where the various actors get together to discuss, plan and implement measures to develop a common and fair operating environment. At best, this trajectory may generate significant benefits for Finnish traffic users and actors as well as added value of broader societal significance. The aim is for the nationally launched work to be integrated with the work carried out within the EDIC so that Finland will be able to make use of its competence, experiences – and possibly also the solutions created – at the EU level, and will therefore be able to have a positive impact on the development of the European transport, traffic, mobility and logistics sector. At the same time, Finland will gain the opportunity to make use of the competence, experience, knowledge and best practices of other EDIC countries with a leading role in traffic automation and digitalisation. This will enable Finland to produce even better solutions to support new digital services and innovations so that the targets set for transport, traffic, sustainable development and digital transformation will be achieved in the best possible way.

Other Member States or other entities participating: Current founding members: NL, DE, ES and FI.

Copyright Infrastructure Digital European Infrastructure Consortium (CI EDIC) (Finland a founding member)

The CI EDIC will be tasked with implementing an open rights data framework (ORDF) to facilitate the speedy, simple and precise management, licensing and enforcement of copyrights and related rights. The consortium will cooperate closely with the creative industries sectors and provide open access to its outputs. The CI EDIC is an EU-level project where the various creative industries define shared practices, try out open standards, and recommend technologies and practices for the sharing and exchange of trustworthy copyright information.

The pre-notification was submitted in May 2023. The preparation of the participation application is well underway and progressing in all four applicant Member States in cooperation with the European Commission. Finland is proposed as the Member State where the EDIC has its statutory seat. To be presented to the minister very shortly. The decision to set up the CI EDIC is expected in late 2023.

How participation in this MCP will contribute to the Member State achieving the general objectives and the digital targets: The CI EDIC will directly support the growth and resilience of the creative industries and cultural sectors. It will directly promote the EU's Digital Decade Policy Programme targets and the objectives of participating Member States in promoting digitalisation.

Budget allocated or planned, other resources: A small budget has been granted for EDIC setting-up costs. An annual budget of EUR 200,000 is planned to consist of funds reallocated from other purposes. The activities of the EDIC will be funded from EU programmes and private sources. Members will participate in the activities primarily by providing an in-kind contribution, that is, human resources for the EDIC.

MCP implementation mechanism: The CI EDIC will be a not-for-profit organisation acting as a convener and facilitator in the development of common practices for the creative industries. The work of the CI EDIC will be guided by the urgency of cases of use and the potential impacts of standards and digitalisation on practices. The CI EDIC will support the coordination of national projects and cooperate with other initiatives of the Digital Decade Policy Programme.

Expected impact: The CI EDIC will support the implementation of the harmonised legislation of the EU (13 directives and 2 regulations) concerning copyright and related rights. Efficient cooperation will make the potential realisation of the digital single market more tangible and therefore more desirable. It will facilitate access to data on rights and make eID a requirement for the authentication of users and rightsholders and, consequently, will allow them to manage their own data.

Other Member States or other entities participating: Four Member States will apply for CI EDIC membership in 2023: Finland, Estonia, Latvia and Lithuania.

Blockchain Ministry of Finance (Finland not participating in setting-up notification, will follow the project)

The EBSIC EDIC is a project introducing the European Blockchain Services Infrastructure (EBSI) created by the European Blockchain Partnership for smoother cross-border public services and exchange of data in the public sector. The current key objectives of the project include enabling the transmission of verified proofs into a digital wallet held by a person.

How participation in this MCP will contribute to the Member State achieving the general objectives and the digital targets: The Finnish Government [submitted an Europe communication to the Parliament of Finland on European blockchain cooperation in December 2022](#). In early 2023, Finland expressed its interest in participating in the EBSIC EDIC in the future. During spring 2023, Finland followed but did not participate actively in the preparatory work for the EBSIC EDIC. In June, a group of Member States submitted the formal application for the setting-up of the EDIC to the Commission. **Finland did not join in the setting-up phase.**

Budget allocated or planned, other resources: –

MCP implementation mechanism: To be registered in Belgium, the EDIC organisation will be provided with the resources and assigned with all the tasks relating the EBSI development and administration. Member States joining the EDIC would pay an annual membership contribution to the EDIC.

Expected impact: A key problem for Finland together with the other Nordic countries has been to understand what added value could be generated by a distributed trust infrastructure in an operating environment of centralised registers. While nationally, the added value is not obvious, benefits from making use of the EBSI can be seen in cross-border exchange of data where some parties do not have access to centralised registers.

Other Member States or other entities participating: The application for the setting-up of the EBSIC EDIC was submitted to the Commission by Belgium, Italy, Croatia and Portugal. In Finland, the closest and potential interface with the EBSI has been the transmission of degree and qualification certificates into the digital wallet in the education sector. The Ministry of Education and Culture/Finnish National Agency for Education is involved in the Multi-Country Digital Credential for Europe (DC4EU) project piloting the use of the eIDAS European Digital Identity (EUDI) Wallet where the potential use of the EBSI has been discussed.

AgriFood, Ministry of Agriculture and Forestry (situation open)

It is expected that the project/EDIC cooperation will foster capacities for the digitalisation of Finnish agriculture and enable the participation of Finnish organisations (Finnish Food Authority, Natural Resources Institute Finland, enterprises, etc.) in EU cooperation.

Budget allocated or planned, other resources (if relevant): –

MCP implementation mechanism: –

Expected impact: –

Connected Government, Ministry of Finance

How participation in this MCP will contribute to the Member State achieving the general objectives and the digital targets: Finland has been following the project mainly through the Tax Administration's Real Time Economy (RTE) project and the advantages of potential EDIC participation are mainly seen as a channel of influence concerning EU-level development of interoperability and recognition of its importance.

Budget allocated or planned, other resources: No current resources. Any contribution to the project would be in kind.

MCP implementation mechanism: –

Expected impact: May promote the development of European interoperability.

In addition, Finland cooperates actively at the project level with Nordic countries and Baltic States in fields including the following:

- digitalisation of transport and logistics,
- real time economy,
- digital wallet pilots,
- 5G, 6G, quantum technology, other future technologies.

Where necessary, Finland will supplement the list of Multi-Country Projects or joint commitments at a later date.

5.2 Factors promoting digitalisation at the Union level

Finland has participated actively in the work to develop the soft infrastructure required for EU regulation, harmonisation of data management and data spaces, that is, interoperability of data. Interoperability and scaling capacity are a fundamental condition for the growth of the EU's digitally enabled market and enterprises as well as for realising the efficiency gains of digitalisation. A cross-border operating environment of enterprises and public services calls for successful increases in the cross-border interoperability of

the high-security solutions required by personal data and sensitive data, too. It is only by means of the EU-wide free flow of data, including across state borders, that a scalable market for digital services and solutions for service providers can be enabled.

This is why the EU's Digital Decade targets should also include more broadly targets to accelerate the interoperability and development of the data economy to guide EU funding, legislative review, coordination and standardisation of soft infrastructure and data space development as well as high-security solutions and environments for protected data. Finland's national digital compass provides examples of key results this set of topics could comprise.

6 Stakeholder feedback

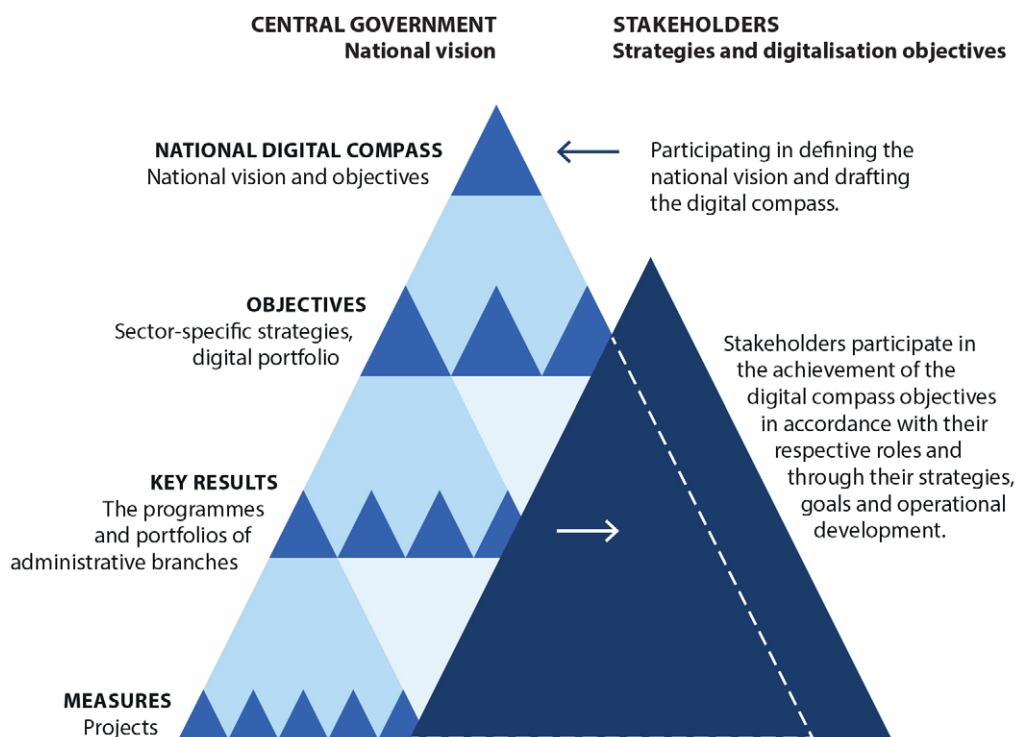
The contents of Finland's National Roadmap were created in close cooperation with stakeholders starting from late 2021¹⁶. The National Roadmap is based on the Government Report on [Finland's Digital Compass](#) and the preparation of its action plan.

In line with the Government Report, Finland's digital future will be created together and through purposeful action. The impact of the digital compass relies on strong and close cooperation between the public administration and stakeholders, including the business sector. Cooperation built around the digital compass creates the opportunity to engage in dialogue on national needs, priorities and actions to promote digitalisation and the data economy with businesses, the municipal sector, the third sector, as well as universities and research institutions. The digital compass actions particularly involve the central government, but the goal is to engage stakeholders in promoting the national objectives and inspire stakeholders to take the national objectives into account in their strategies and the development of their operations.

Cooperation means maintaining shared situational awareness, sharpening the objectives based on that situational awareness, the allocation of public investment, and the planning and implementation of the necessary measures. The actions can be implemented together by the public and private sectors, initiated by businesses or be driven by the public administration. Private sector commitment to, and investments in, digitalisation and the data economy are important for Finland's achievement of the digital compass objectives. The business sector, the third sector, research institutions and universities must be kept involved in all stages of the digital compass effort, as is the case with public sector stakeholders.

16 Further information: <https://valtioneuvosto.fi/hanke?tunnus=LVM066:00/2021>

Figure 1. The digital compass will be implemented through cooperation.



The preparation of Finland's digital compass with stakeholders:

- Digital compass for Finland, kick-off event on 26 November 2021
- Participatory workshops themed on the compass cardinal points for stakeholders in January–February 2022. A total of several hundred participants.
- First round for written comments in spring 2022¹⁷. The total number of submissions was 145.
- Second round for written comments in autumn 2022¹⁸. The total number of submissions was 90.
- In addition, regular briefings were held online for stakeholders.

17 Lausuntopalvelu online service for comments, first draft: [Comments - Lausuntopalvelu service](#)

18 Lausuntopalvelu online service for comments, second draft: [Comments - Lausuntopalvelu service](#)

The action plan of Finland's Digital Compass implementing the Government Report and the roadmap to be submitted to the Commission are currently being finalised. Close cooperation with stakeholders has continued:

- A series of workshops in January–March 2023. In addition to preparation of administration, workshops were organised for stakeholders for each compass cardinal point theme, with open online events also held.
- Stakeholders were also consulted in a seminar on 14 March 2023.
- The preparation has involved the continued organisation of regular briefings and the roadmap has been discussed in these.
- The plan is to organise an open online event on the digital compass action plan in October 2023.

Summary of stakeholder feedback received during the preparation of Finland's Digital Compass

Stakeholders have regarded the creation of the digital compass and the national roadmap as important. Feedback has underlined the significance of digitalisation and data economy for the structures, functioning and development of society and the economy. The creation, including the method employed, of the digital compass has been regarded as good, and the same applies to the related closer inter-administrative cooperation and stronger leadership with regard to digitalisation themes by means of the ministerial working group on digitalisation and data economy and the inter-ministerial coordination group supporting its work. The significance of a comprehensive shift in the way of thinking and doing things was highlighted in feedback received. The shift in the way of thinking required by digitalisation must be mainstreamed comprehensively throughout society. For Finland to latch on to the growth of the data economy, deeper cooperation between actors is needed in making use of digitalisation.

During the preparation of the digital compass report and action plan, stakeholders provided numerous suggestions for measures that were taken into account in the preparation. There was an emphasis on collecting ideas from stakeholders in the initial stages of the preparation of the report as well as the action plan. Stakeholders were broadly represented and actively took part in the preparation.

Plenty of feedback and suggestions for further preparation were received during the two extensive rounds for written comments on the report. Stakeholders commenting on the first draft regarded the compass objectives and their coverage as good on the whole. Numerous implementation-related suggestions were received in the second round for comments in particular. Both rounds for comments provided numerous suggestions for improvements to the structuring and themes, key results and indicators of the compass.

Feedback providers hoped to see attention paid in further preparation to issues including the number and tangible nature of key results and measures as well as monitoring and impact assessment. A great deal of attention was paid in the comments to the data economy, data quality and interoperability. Cyber security and comprehensive digital security were seen as highly relevant themes. Promoting the digital green transition, increasing the carbon handprint and identifying the role of enterprises as a key driver in the digital green transition were regarded as good themes for the digital compass.

The broad-based approach cutting across the boundaries between sectors poses a challenge to the management of digitalisation, with feedback received identifying inter-administrative and cross-sectoral cooperation as a condition for digitalisation development that should be reflected more strongly in the digital compass, too. The need for digital and data policy structures and management was also highlighted in comments. The feedback received resulted in the digital compass report being supplemented with regard to the cross-sectoral management of digitalisation.

7 Overall impact and conclusion

To achieve the ambitious targets, investments need to be reviewed and resources need to be appropriately allocated to digitalisation and the creation of the preconditions for the data economy. The ministerial working group in charge of steering digitalisation together with the coordination group for digitalisation constitute a management model that makes it possible to direct the development of digitalisation and manage it effectively so that bottlenecks can be avoided and synergies generated between the various development measures. The coordination group for digitalisation also coordinates Finland's participation in the Digital Decade 2030 efforts at the EU level: the work of the Digital Decade Board and Digital Decade Committee as well as preparation of the EDICs, among others. The coordination group and its networks moreover engage in broad cooperation to influence the EU regulatory framework and its implementation as well as the preparation of the digitalisation policy measures of the next Commission.

Finland has already reached or is close to reaching many of the Digital Decade targets, even before 2030. In cooperation with stakeholders, Finland has prepared a national digital compass that sets broader and more ambitious targets than its EU equivalent for the development of digitalisation, the data economy, public services and cyber security.

The Finnish population's good basic digital skills and positive attitude to technology provide an excellent foundation for the further development of digital skills and for raising the digital intensity of SMEs. Even though strong basic skills provide a good foundation for reaching the Digital Decade 2030 targets, the shortage of skilled workers and ICT professionals in particular constitutes a major risk to the development of digital solutions for enterprises and public services. SMEs in particular require also solutions for skills enhancement that allow the efficient development of digital skills as part of their day-to-day business. Finland's investment in ICT competence and the development of continuous learning solutions as well as measures to increase the number of higher education graduates promote the realisation of the digital targets of enterprises and public administration. Digital skills among all population groups and age groups are important to participation and inclusion in society as well as the realisation of digital rights.

Finland seeks to act as a trailblazer in digitalisation and development of the data economy. The significance of the data economy to national economies will increase considerably by 2030. [According to the EU's data market study](#), the growth of the market is faster than

in other sectors. In order to develop a digital infrastructure, data economy structures and approaches must be established in the single market. This 'soft infrastructure' of the data economy plays a key role in determining the EU profile as creator of cross-border solutions of the future both in the single market and also more widely. In the development of connectivity with regard to the availability of fast broadband, Finland aims for technologically neutral solutions in such a way that ultra high-speed wireless connections and fixed broadband complement each other.

Digitally capable Member States that rely on cross-border development and exports to generate growth are vital to the accomplishment of the Digital Decade targets. Such Member States can act as trendsetters through regional hubs of excellence shared by multiple countries to build and pilot European solutions, thus setting the pace for the development of the entire EU towards the 2030 targets. This also means that old structures and approaches must be abandoned, especially in administration and the organisation of services. Simplification and mutual recognition of demonstration of conformity relating to digital solutions, interoperability and cyber security are also required.

The development of digitalisation calls for cooperation between enterprises and the public sector as well as systemic approaches and new kinds of management models throughout society. In addition, both the public and private sectors should invest in digitalisation and make use of multiple sources of funding. Finland's target is to increase research and development expenditure to 4% of GDP by 2030. Achieving this target would also have a significant impact on the development of technologies that promote digitalisation and the implementation of the digital compass, provided that RDI investments are allocated to projects that promote digitalisation. Several measures related to pursuing the digital compass targets are already under way, or funding has been allocated to them in recent decisions. Decisions on the use or commitment of government appropriations will be made in the budget procedure.

Determined progress is being made on the long-time EU goal of a digital single market. At the EU level, harmonisation has been – or is being – carried out in regulation concerning areas such as data protection, the responsibility of platforms, the application of AI and competition in the digital market. The risk is that EU-level regulation will be implemented as excessively restrictive and detailed. In the worst case, this would increase the administrative burden, create legal uncertainty for investments and reduce businesses' innovation and business opportunities. The competitiveness of enterprises requires a proportionate legislative framework, which enables new innovations and the emergence of new digital business regardless of sector.

The single-market policy of the EU is becoming more closely linked with its foreign policy decisions. From the viewpoint of SMEs in particular, developing cloud computing services and cross-border integrated service solutions is often a precondition for upscaling. In order to make cross-border digital public services and data spaces work for the benefit of European users, foreign policy decisions should not be made separate from the development of the single market and instead, the choices made in both foreign and internal policy should constitute a cohesive and coherent whole in terms of leveraging the potential of digitalisation. This is particularly relevant to Member States which have small national markets but also have digital capabilities, the upscaling of whose enterprises is based on internationalisation and which can act as drivers of digitalisation in the EU.



FINNISH
GOVERNMENT

SNELLMANINKATU 1, HELSINKI
PO BOX 23, 00023 GOVERNMENT, FINLAND
valtioneuvosto.fi/en/
julkaisut.valtioneuvosto.fi

ISBN pdf: 978-952-383-743-0

ISSN pdf: 2490-0966