



REPUBLIC OF SLOVENIA
GOVERNMENT OF THE
REPUBLIC OF SLOVENIA

DIGITAL SLOVENIA 2030



**An Overarching Strategy for
Slovenia's Digital Transformation
by 2030**

Information about the document

Document title:	DIGITAL SLOVENIA 2030 – An Overarching Strategy for Slovenia's Digital Transformation by 2030
Short title	DSI 2030
Place and date of the document	Ljubljana, March 2023

INDEX **[UPDATE AT END!]**

1. SUMMARY	1
2. INTRODUCTION	2
3. THE PURPOSE, VISION, GOALS, AND GOVERNANCE OF DIGITAL SLOVENIA 2030	7
4. HORIZONTAL PRINCIPLES OF ACTION	10
5. PRIORITY AREAS	15
6. GIGABIT INFRASTRUCTURE	15
7. DIGITAL COMPETENCES AND INCLUSION	18
8. THE DIGITAL TRANSFORMATION OF THE ECONOMY	28
9. THE ROAD TO SMART SOCIETY 5.0	33
A. 4.1 DATA FOR THE BENEFIT OF SOCIETY	35
B. 4.2 THE ECOSYSTEM OF ARTIFICIAL INTELLIGENCE AND NEW TECHNOLOGIES	37
C. 4.3 SMART CITIES AND COMMUNITIES.....	38
10. DIGITAL PUBLIC SERVICES.....	40
11. CYBERSECURITY.....	43
12. RELATED CONTENT	46
13. GREEN TRANSITION.....	46
14. A SUPPORTIVE ENVIRONMENT	47
15. NEXT STEPS	49
16. 10. ANNEXES	1
17. ANNEX 1: ANALYSIS OF STRENGTHS, WEAKNESSES, OPPORTUNITIES, AND THREATS (SWOT ANALYSIS).....	2
18. ANNEX 2: DIGITAL SLOVENIA 2020 – A BRIEF OVERVIEW OF IMPLEMENTATION	7
19. ANNEX 3: OVERVIEW OF OBJECTIVES AND INDICATORS	13
20. ANNEX 4: STRATEGIC POSITIONING	15

KEY ACRONYMS AND TERMS

CONCEPT/ACRONYM	EXPLANATION
CSIRT	Computer Security Incident Response Team
DESI	Digital Economy and Society Index This index summarises Europe's digital performance indicators and tracks the progress of EU Member States.
Digitalisation	Digitalisation covers many elements: it helps to transform the way businesses and other entities operate using digital technologies. It affects business models, communication flows inside and outside the organisation, and, in fact, the entire value chain.
Digital transformation	Digital transformation means transforming business and social activities into elements of the digital world.
Digital inclusion	Digital inclusion is the ability of individuals to access, use, trust, and participate competently, securely, and actively in the information society, using ICT infrastructure and digital technologies, solutions, and services.
Digital competence	Digital competence involves the confident, critical, and responsible use of digital technologies for learning, working, and participating in society. It is defined as a combination of knowledge, skills, and relations.
Digital divide	The digital divide (aka dividing line) defines the differences that arise in society as a result of a variety of factors related to access to and use of digital technologies. These factors include, for example, educational level, economic status, age, gender, etc.
Digitisation	Digitisation refers to the digital version of physical or analogue objects, mainly printed documents and photographs, as well as video and audio recordings.
Society 5.0	A society that can balance economic progress with tackling societal issues by providing goods and services that meet in detail a variety of hidden needs, regardless of location, age, gender, or language, through a high degree of integration of cyberspace and physical space.
EU	European Union
Gb/s	The number of gigabits per second.
Information literacy	Information literacy is the ability to locate, identify, retrieve, process, and use information optimally. It is the ability to access information and its sources effectively, to manage information, and to evaluate it critically and competently.

ICT	Information and Communication Technology This is a collective term for a wide range of computing, information, and communication devices (hardware), applications (software), networks (the Internet), and services.
Internet of Things	The Internet of Things is an extension of the Internet, connecting to and between devices. Using electronics, an Internet connection, sensors, and other hardware, these devices can communicate with each other and exchange data. These devices can also be remotely observed and controlled.
Lex specialis	A law governing a specific matter (<i>lex specialis</i>) takes precedence over a law governing general matters (<i>lex generalis</i>).
Local DESI	A Local DESI is a composite index of the digital economy and society at the municipal level, and is composed of various indicators that reflect the state of four elements based on data in each municipality: human capital, connectivity, the integration of digital technologies, and digital public services.
Mb/s	The number of megabits per second.
Metadata	Metadata is data that contains information about, but is not part of, a piece of data. An example of metadata are the dimensions of a photograph; this information is not part of the image.
SMEs	Small and Medium-Sized Enterprises
OECD	Organization for Economic Co-operation and Development
Open data	Open data is data that anyone can access, use, and share. It is subject to permission for any use, including reformatting, aggregation, and sharing with others, including for commercial purposes.
Open-source software	Open-source software is software for which the source code is released under a protective licence (e.g. public domain) that meets the criteria of the open-source definition. It authorises any use and modification of the software and its distribution in modified or unmodified form. It is often developed in public, with contributions from others. Such software is the most important example of open-source development and can be compared to user-made content.

Smart cities and communities	Smart cities and communities are living environments where citizens have chosen to use modern ICT to improve their quality of life. This will lead to better connectivity and optimal use of energy, materials, services, and financial resources.
ReSNV-2	Resolution on the National Security Strategy of the Republic of Slovenia
SI-CERT	The Slovenian national CSIRT
SIGOV-CERT	CSIRT of state administration bodies
Smart Data Models	Smart Data Models is a joint initiative of the FIWARE Foundation, TM Forum, IUDX, the non-profit international smart cities network Open & Agile Smart Cities, and many other people and organisations contributing to data models.
Broadband access	Broadband access is access to a high-speed public broadband network with a minimum speed of 30 Mbps.
Universal service	Universal service is the minimum set of electronic communications services of a specified quality available to all end users in the Republic of Slovenia at an affordable price, regardless of their geographical location.
URSIV	Information Security Office of the Government of the Republic of Slovenia
ZInfV	The Slovenian Information Security Act

SUMMARY

The Digital Slovenia 2030 strategy is the overarching strategy for the digital transformation of our country by 2030 and the response of the Government of the Republic of Slovenia to the development challenges of digitalisation. It is intended to provide strategic planning for promoting Slovenia's digital transformation in the development period by the year 2030. The strategy considers the ambitions and principles of the European Union (EU) and is the result of coordination between government representatives, institutions, academics, civil society, and the interested public. It addresses the key areas of Slovenia's digital transformation, building on European strategic documents and focusing on the main challenges of the digital transformation in Slovenia.

The Digital Slovenia 2030 strategy puts the individual and the environment in which he or she lives at the centre of the strategy, and highlights the principles of the European Declaration on Digital Rights and Principles (people at the centre, solidarity and inclusion, freedom of choice, cooperation, safety and security, sustainability) as the principles of the strategy, with a particular emphasis on the general awareness of the importance of digital transformation, the Internet as a strategic tool for digital transformation, the protection of a free and open Internet, the pursuit of cross-sectoral synergistic development effects, the use of the Slovenian language and the preservation of cultural identity, the promotion of research on and the development of digital technologies and their use, strategic autonomy and a single digital market, a democratic digital society, and the achievement of Slovenia's development goals through digital transformation.

The strategy anticipates orientations and targets with indicators to address the biggest development gaps to accelerate the development of digital transformation in all areas, from gigabit infrastructure to the digital transformation of the economy, digital public services, the road to Smart Society 5.0, cybersecurity, digital competences and inclusion, and related content such as enabling supportive environments and the green transition.

The Digital Slovenia 2030 strategy is a strategic document and contains specific measurable indicators in each of the thematic areas. The overarching objective of the strategy is to promote the digital transformation of Slovenia in all segments – society, government, local communities, and the economy. The ministry responsible for digital transformation will be responsible for managing the implementation of the strategy.

Given the horizontal nature of the field, the Digital Slovenia 2030 strategy stipulates that the Government of the Republic of Slovenia shall appoint a Strategic Council for Digital Transformation, which shall be a consultative body. The Strategy also stipulates that the ministry responsible for digital transformation shall appoint an inter-ministerial working group for digital transformation projects to effectively coordinate inter-ministerial projects of relevance in the field of digital transformation and to seek cross-sectoral development effects.

INTRODUCTION

During the COVID-19 pandemic, when social contacts were kept to a minimum, the importance of digitalisation was confirmed, but the developmental shortcomings of Slovenia's digitalisation were also clearly revealed.

In that crisis, the national digital communications infrastructure performed very well. Operators, users, the economy, and society made the best use of the benefits of years of major private and, to some extent, public investment in fibre-optic and mobile electronic communications infrastructure and in the development of Internet infrastructure. However, the quarantine further confirmed that some areas and households still lack access to the Internet via high-speed fixed networks, and that mobile coverage is also deficient in some places.

With the digital communications infrastructure working well in principle, during the COVID-19 pandemic users were confronted with a complex problem as regards electronic services, in terms of both availability and the skills needed to use such services, as well as the quality of the user experience.

These challenges were a bigger obstacle for average users in their efforts to work, learn, obtain information, deal with the government, and, last but not least, have fun in the online world than access to the Internet and personal computers or mobile devices themselves. On the one hand, the digitally skilled took advantage of the possibilities of the Internet and electronic services in the new and unusual context, while on the other hand, some people were, for the first time, seriously confronted with having to use online activities from home, as a result of the emergency situation.

The experience of the digital society during the COVID-19 pandemic provides valuable guidance for the strategic planning of the future promotion of digitalisation in Slovenia, which is needed to address the development gaps.

Digital Slovenia 2030 is the overarching strategic document of the Government of the Republic of Slovenia on digital transformation.

Digital Slovenia 2030 is the Government's response to the development challenges of digitalisation and is intended to provide strategic planning for promoting Slovenia's digital transformation in the development period by 2030.

In this context, it is essential to recognise that the needs of different segments of society or different target groups differ, that economic development, progress, and competitiveness must be ensured, and that public institutions, local communities, other key stakeholders, and individuals must be provided the necessary means and resources to enter together into a digitally advanced society and to take advantage of the benefits of digital technologies.

The predecessor of this strategy is Digital Slovenia 2020¹ (hereafter: DSI2020). This document was divided into five priority areas, which were defined by sectoral objectives and targets and had actions outlined to achieve them. Sixty actions were identified in total, of which 33, or 55%, were implemented by 2022 (see Annex 2 for more details).

¹ Digital Slovenia 2020. Available at: <https://www.gov.si/assets/ministrstva/MJU/DID/Strategija-razvoja-informacijske-druzbe-2020.pdf>.

Digital technologies, tools, and skills have become extremely important in recent years, and the European Commission has even identified the importance of digital transformation as a key to Europe's future prosperity and economic resilience.² This requires decision-makers to adapt and update their approach to a developmentally crucial area of modern society: digital transformation.

Digital Slovenia 2030 is an upgrade in line with new European and national strategic documents. To make it more effective, the following sections of the document discuss the priority areas for digital transformation, which are identified as key following the review of the implementation of the DSI2020 and follow the results of studies on a number of strategic documents on digital transformation. Given that digital transformation is a highly horizontal and interdisciplinary area, which by its nature, is embedded in all aspects of the daily lives of individuals, business, public administration, and society, the need for regular multi-stakeholder cooperation and coordination is highlighted.

The overview and summary of the **SWOT analysis** of the DSI2020 show that Slovenia has key strengths in the areas of its well-developed and capable electronic communications infrastructure, well-trained and agile economy, broad access to formal and non-formal education, high maturity in opening up public sector data and experience in developing e-services, and its systematic approach to cybersecurity by an established and competent national authority.

In reviewing the shortcomings, we highlight as key the high cost of building a powerful broadband infrastructure in white-spot areas, the lack of digital literacy of the population, the lack of adequate ICT professionals, the backlog of investment in ICT equipment, software, and databases, the siloed approach of ministries and bodies to digitalising content under their responsibility, and the significant staff and technology shortages in bodies and organisations in the field of cybersecurity.

Opportunities include adapting education to include digital competences in curricula, raising awareness among businesses of the importance of integrating advanced digital technologies, positioning Slovenia as an advanced reference environment for the deployment of new technologies (artificial intelligence, data curation), implementing the "digital by default" principle in public services, and seizing opportunities for better cooperation between all stakeholders in the area of cybersecurity.

The threats include the need to reduce the development gap in rural areas and to reduce the risk of the digital exclusion of the population, as well as the disintegration of ICT research and development capacities, the lack of stakeholder interest in implementing the necessary measures, the poor responsiveness of end users of public services, and the outflow of cybersecurity experts abroad (see Annex 1 for more details on the SWOT analysis).

² IPM Digital, Priporočila oblikovalcem javnih politik na področju digitalizacije in digitalne transformacije družbe (Recommendations for Public Policy Makers on the Digitalization and Digital Transformation of Society). Available at: <https://ipm-digital.si/wp-content/uploads/sites/4/2021/07/Priporoc%CC%8Cila-za-oblikovalce-politik.docx.pdf>.

We are increasingly recognising the **importance of putting the individual at the heart of the digital transformation.**³ The digital transformation must take into account user needs and consumer rights, and adequately protect human rights. At the same time, it is important to take special **care of the environment in which individuals live.**

We believe that digital transformation has many positive effects (also) on individuals, but we furthermore recognise that the introduction of digital technologies can also have a negative impact thereon. In the digital world, we must therefore also ensure adequate security and privacy, strict respect for human rights and ethical principles, and keep all Slovenian citizens regularly and adequately informed of all of this.

Digital Slovenia 2030 supports the European and national strategic orientations on climate change and commits to implementing the policies and measures already adopted to reduce greenhouse gas emissions, to building on these policies and measures, and to ending the implementation and adoption of policies and measures that are contrary to reducing greenhouse gas emissions.

It is crucial that both government representatives and wider stakeholders commit to regular communication and coordination, because only together, as a single community, can we be fast and competent enough to introduce new areas, technologies, models, etc., in a timely and meaningful way, as Europe is aware.

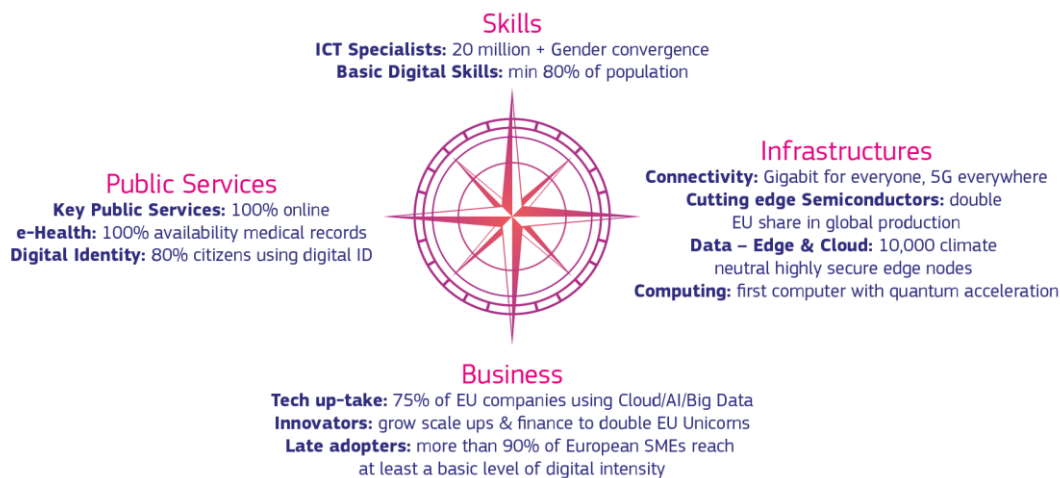
In March 2021, the European Commission set out its vision, goals, and options for the successful digital transformation of Europe by 2030 in the document **Europe's Digital Decade: Digital Targets for 2030**⁴, which proposes agreeing on a set of digital principles for the rapid deployment of major multi-country projects and preparing a legislative proposal setting out a robust governance framework to monitor progress – a **digital compass.**

It is based on four main points:

1. A digitally empowered population and highly skilled digital professionals: by 2030, at least 80% of adults should have basic digital skills, and 20 million ICT professionals should be employed in the EU, with an increasing share of women in such jobs.
2. Secure, efficient, and sustainable digital infrastructures: by 2030, all EU households should have gigabit connectivity, all populated areas should be covered by 5G technology, the production of high-end and sustainable semiconductors in Europe should be 20% of global production, 10,000 climate-neutral, highly secure edge nodes should be deployed in the EU, and Europe should have its first quantum computer.
3. The digital transformation of businesses: by 2030, three out of four businesses should be hiring cloud computing, Big Data, and artificial intelligence services, more than 90% of SMEs should reach at least a basic level of digital intensity, and the number of EU unicorns should double.
4. Digitalising public services: by 2030, all key public services should be available online, all citizens should have access to their e-health records, and 80% of them should use electronic identification.

³ Re-imagine Europe, A Human-Centered Digital Transformation. Available at: <https://reimagine-europa.eu/a-human-centered-digital-transformation>.

⁴ Europe's Digital Decade, Digital Targets for 2030. Available at: https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_sl.



Source: European Commission⁵

In September 2021, the European Commission published a Proposal for a **Decision of the European Parliament and the Council establishing a policy agenda for the "Road to the Digital Decade" by 2030**, aiming to achieve, accelerate, and shape the successful digital transformation of the EU economy and society. The proposal foresees that all Member States submit to the European Commission a strategic roadmap by 2030, proposing national pathways towards achieving the digital objectives at the EU level.

The European Commission will regularly monitor progress through the Digital Economy and Society Index⁶ and advise Member States, where necessary, on how to take action to make progress more visible. As part of the journey towards the Digital Decade, multi-country projects are also foreseen to accelerate the achievement of the digital goals. The European Commission will first launch calls for interested parties and then coordinate and promote the projects, possibly by setting up a European Digital Infrastructure Consortium based in an EU Member State.

While setting out concrete goals for the coming decade and how to work towards them, the European Parliament, the Council, and the Commission also adopted the **European Declaration on Digital Rights and Principles for the Digital Decade**⁷.

⁵ European Digital Compass Objectives. Available at: <https://twitter.com/EKvSloveniji/status/1369342924383780876/photo/1>.

⁶ More information on the Index: <https://digital-strategy.ec.europa.eu/en/policies/desi>.

⁷ European Declaration on Digital Rights and Principles for the Digital Decade. Available at: [https://eur-lex.europa.eu/legal-content/SL/TXT/PDF/?uri=CELEX:32023C0123\(01\)&from=EN](https://eur-lex.europa.eu/legal-content/SL/TXT/PDF/?uri=CELEX:32023C0123(01)&from=EN).



Source: European Regions Research and Innovation Network⁸.

⁸ Digital Principles for Europe's Digital Decade. Available at: <https://errin.eu/news/european-declaration-digital-rights-and-principles-proposal-unveiled>.

THE PURPOSE, VISION, GOALS, AND GOVERNANCE OF DIGITAL SLOVENIA 2030

Digital Slovenia 2030 considers the ambitions and principles of the EU and is the result of coordination between government representatives, institutions, business, academia, civil society, NGOs, and the interested public. We have addressed the key areas of Slovenia's digital transformation, drawing on European strategic documents and focusing on Slovenia's key challenges in the area of digital transformation. The individual themes are further defined in the sector strategies.

The aim of this strategy is to outline the development, strengthening, and promotion of digital transformation in Slovenian society, the state, local communities, and the economy by 2030.

Digital transformation has been a key driver of development in recent decades, and it requires adapting to new opportunities. The share of solutions, services, processes, products, and business models based on digital technologies is growing every day. At the same time, we must not forget the key challenges that these technologies bring, and we must understand that the individual and the vision of improving his or her life, including care for the environment, must be put at the centre, all through digital transformation.

The systemic approach to digital transformation needs to be strengthened, which requires the cooperation, guidance, and coordinated action of different stakeholders to help achieve the strategic objectives. The ability of society, the state, local communities, and the economy to respond to such challenges in a timely manner is key.

The vision of the Digital Slovenia 2030 strategy is to improve the quality of life of the Slovenian population in a sustainable and trustworthy way through the digital transformation of society, the state, local communities, and the economy.

With the accelerated digital transformation of society, government, local communities, and the economy, we will seize the development opportunities of digital technologies and become one of the leading digital societies. We will strive for balanced and innovative use of digital technologies in all segments of society and to provide opportunities for the greater inclusion of every citizen in the information society.



The overarching objective of the strategy is to promote Slovenia's digital transformation in all segments: society, government, local communities, and the economy.

In order to achieve this, effective **management of the strategy is crucial.**

The Digital Slovenia 2030 strategy is the foundational document of the Government of the Republic of Slovenia in the area of Slovenia's digital transformation by 2030. The management of the strategy must ensure a systematic approach to regulating this area, the cooperation and involvement of stakeholders and ministries, regular communication, the independent evaluation of effectiveness as feedback, and, crucially, a systematic approach to the provision and allocation of development resources to enable the achievement of common goals.

The management system must ensure:

- That stakeholders are brought together and trust is built.
- A clear demarcation of responsibilities.
- The completeness of area coverage.
- Independent external monitoring of the implementation of the strategy.
- Continuity throughout the lifetime of the strategy.
- Raising awareness.
- Funding in this area.

The ministry responsible for digital transformation is responsible for managing the implementation of the Digital Slovenia 2030 strategy. The Government of the Republic of Slovenia shall appoint a consultative body, the **Strategic Council for Digital Transformation**, for the horizontal and inter-ministerial coordination of digital transformation.

The Council is to be made up of ministers or state secretaries from all ministries and government departments, as well as representatives from the economy, NGOs, research (academia), and local communities. It will be chaired by the Minister or, in his or her absence, the state secretary responsible for digital transformation. At least once a year, the members of the Strategic Council shall review the key orientations prepared by the ministry responsible for digital transformation and make suggestions for improvements.

In order to ensure the effective inter-ministerial coordination of digital transformation projects and to pursue multiplier synergistic development effects, the ministry responsible for digital transformation shall appoint an inter-ministerial working group on digital transformation projects.

This working group is to be made up of the general directors of the directorates (or heads of sectors) of the ministries or government departments involved in any way with digital transformation. It is to be chaired by the state secretary of the ministry responsible for digital transformation or, in his or her absence, by one of the directors of the ministry responsible for digital transformation. The Inter-Ministerial Working Group on Digital Transformation Projects shall meet at least three times a year.

It is important to add that the effectiveness of the implementation and evaluation of the strategy and the search for opportunities for further improvement will also be examined by the European Commission, which will monitor the national project programmes of EU Member States and advise them, where necessary, on how to take action to make more visible progress towards the set objectives.

In accordance with the results of the contributions from the Strategic Council and the European Commission, the ministry responsible for digital transformation may propose a review of the strategy and its strategic orientations, objectives, and implementation modalities.

Measurable indicators, including the monitoring period, are defined in this strategy, and for priority areas also described in the sectoral strategies, they are further defined and specified in these strategies in the context of individual action plans (which may also be programmes, strategies, etc.).

The national programme of projects, which we see as the Action Plan for the Digital Slovenia 2030 strategy, will be prepared within one year of the strategy's adoption.

Digital Slovenia 2030 has no direct financial implications, as it is a strategic document that guides further development activities and actions in the field of the information society. The financial implications will be defined in the Action Plan in line with the actions set out. The means to achieve the objectives will be provided through the national budget, European cohesion, recovery and resilience funds, cross-border, transnational, or interregional European funds, and funds from other European programmes, e.g. Horizon Europe, DIGITAL, and others.

HORIZONTAL PRINCIPLES OF ACTION

General awareness of the importance of digital transformation

One of the key barriers to faster digital transformation is the lack of awareness among the general public of the importance of digital technologies and the Internet for the development of the economy, the country, and society as a whole. As everyone is involved in digital transformation, regardless of their role, this has a negative impact on development efforts at a societal level. Comparable EU competitors have managed to secure a better societal attitude towards digitalisation and can therefore invest more systematically and more heavily in digital transformation, which is reflected in their faster development progress. To harness the development potential of digital technologies and the Internet, public awareness of the importance of digitalisation needs to be raised, and managers' expertise as regards the benefits of digital transformation needs to be improved. A more enabling social environment needs to be created for the faster and more coordinated digital transformation of societal sectors and for more digital growth.

The Internet as a strategic tool for digital transformation

The Internet is fundamentally changing the way we communicate, access information, and function in modern society, and access to the Internet is seen as a human right for individuals to function as equals in the new digital environment. It offers tremendous development opportunities in public and private life, in business, the public sector, and civil society. It is a key factor in economic and social development and thus is of strong public interest. In digital transformation, it is a strategic instrument for increasing productivity, creating innovative business models, products, and services, communicating more effectively, integrating into globalisation flows, and increasing the overall efficiency of society. Stimulating development measures should harness the potential of the Internet to foster innovation, openness, and access to knowledge, create employment opportunities, improve productivity and competitiveness in all sectors of the economy, and improve the quality and efficiency of public services. To accelerate the development of an open, neutral Internet, the deployment of the IPv6 Internet address space should be promoted. The Internet and digital technologies have great potential to support the deployment of clean technologies and the efficient use of energy and raw materials, making them indispensable for green solutions in all sectors of the economy and thus a key element of the green transition. They are needed to reduce the environmental impact of economic and social activities and to pursue sustainable economic growth based on innovative and intensive use of digital technologies, hence the term digital growth.

Protecting a free and open Internet

The Internet's enormous ubiquity and its importance for society and the economy make its operation and governance in the public interest. In order to maintain its development potential and positive societal impact, the Internet must remain unified, free and open, neutrally inclusive, secure, trustworthy, and transparently managed. It is therefore necessary to support the existing global multi-stakeholder governance structure of the Internet and to oppose the efforts of some countries to impose a multilateral governance structure within the framework of the International Telecommunication Union. The Internet's major social role requires that legislation follow the principle: what is illegal in the real world is illegal on the Internet. Regulation should not unduly restrict the development and use of the Internet in order to maintain a low entry threshold for new innovative content and service providers. Restricting the use of the Internet is legitimate in principle only if it is in line with international norms and standards essential for the

functioning of a democratic society, guarantees human rights, and is regulated by law. As enshrined in the current Electronic Commerce Market Act (ECMA), the Internet can generally only be interfered with on the basis of a court decision. The rights of users and providers of information society services are best protected by a prior judicial decision. Even under Regulation (EU) 2022/2065 (Digital Services Act), EU Member States can continue to determine by national law which authority has the power to act against illegality on intermediary platforms. This can be the courts or administrative authorities with the competence to issue inspection decisions. Where the constitutionally protected rights to freedom of expression and information, or the right to free economic initiative with a third party, could be interfered with, *lex specialis* legislation should follow the rule that the Internet can only be interfered with after a prior judicial decision, i.e. on the basis of a court decision. In cases where only the free economic initiative of the infringer is interfered with, e.g. for the sale of a dangerous product, the acting against illegality may be sought directly by the inspection body. In addition, intermediary online platforms should be encouraged to restrict harmful content, even if legal, or content whose illegality is not clear, e.g. hate speech, intimidation, defamation, misleading content, and content that is highly polarising and provokes strong reactions among users and in society, on the basis of their terms of service. This takes account of the reality of the proliferation of intermediary platforms and increases their accountability, while at the same time clarifying the powers of the inspection bodies to tackle illegality and preserving the role of the courts where this is necessary to protect constitutionally protected rights. The unambiguous division of competences will allow illegal content to be dealt with effectively without adversely affecting the protection of an open and free Internet and human rights.

Pursuing cross-sectoral synergistic development effects

Digital transformation across all sectors of society is cross-sectoral and interdisciplinary, making it challenging to organise and implement. On the other hand, it is precisely in more complex development projects involving different sectors of society that opportunities for faster digital transformation should be sought. The success of digital transformation depends on the ability to integrate stakeholders, development policies, actions, and development resources. With limited development resources, inter-ministerial and cross-sectoral cooperation is therefore essential, involving businesses, ministries, the public sector, service and content providers, users, educational and research institutions, and NGOs. Digital transformation can make a significant contribution to the efficient use of energy and raw materials, reducing the carbon footprint, and, in general, minimising the environmental impact of human activities, and the role of digital technologies and the Internet should therefore be systematically integrated into strategic planning for the green transition. It should be borne in mind that digital growth can make an important contribution to decoupling economic growth from growth in the use of natural resources. The cross-sectoral synergies and multiplier development effects of the dual digital and green transition should be pursued through cross-sectoral integration and joint projects. A Strategic Council for Digital Transformation and an inter-ministerial working group on digital transformation projects shall be established, which shall respect the norms as regards consultation with the interested public and the principles of transparency and good governance.

Use of the Slovenian language and the preservation of cultural identity

The predominance of the English language on the Internet makes it particularly challenging to ensure and preserve Slovenian cultural characteristics and identity. The

high cost of developing and offering e-content and e-services forces online platforms to achieve economies of scale and reduce costs by offering their services only in languages with a large number of users, which puts smaller language groups such as Slovenian at a disadvantage. This is not an option, as digital content and services in Slovenian are increasingly a key element of formal education, lifelong learning, and research, contributing to the development of creative content and the promotion of the cultural heritage and country. Digital cultural content is one of the most effective instruments for strengthening Slovenia's visibility in Europe and elsewhere in the world. In order to promote the use of the Slovenian language on the Internet, the digital transformation must include measures to create digital content in the Slovenian language, in culture, science, education, and, last but not least, for graphical interfaces in technical products. The development of digital language technologies and resources as well as the use of machine translation should be encouraged. In line with the possibilities provided for in the Digital Services Act, the possibility of signing agreements with online platforms to offer services in the Slovenian language should be legislated, with particular attention devoted to the accessibility of user interfaces and the conditions of use of services for children.

Promoting research on and the development of digital technologies and their applications

The digital economy contributes to digital and overall economic growth and supports the digital transformation and the green transition. A competitive high-tech digital economy has strong positive spillover effects on other sectors of the economy and should be supported in particular through dedicated support mechanisms. The digital transformation of society and the economy will be more feasible if domestic companies are involved with competitive products that are the result of their own research and development. In order to expand into foreign markets, advanced digital solutions, e.g. for Internet-based services of the collaborative economy or for Internet-based business, need to have proven installations in a national context. The digital economy should be supported by making publicly accessible databases available and by providing a development and testing environment in which innovative ideas and solutions can be tested. Stimulus measures should support the research and development of artificial intelligence technologies, photonic technologies, and nanoelectronics, platform services based on peer-to-peer or distributed application architectures, platform services of the collaborative economy, and the development of new innovative business ideas on the Internet. We need to exploit the infrastructure of high-performance computing through R&D activities and invest in a focused way in future Internet technologies, quantum technologies for computing and communications, and the development and niche production of advanced semiconductor chips. Cooperation in international R&D projects should be encouraged, and cross-sectoral synergies should be pursued, such as in the case of an integrated approach to the development of secure terrestrial and satellite communications using quantum technologies and advanced semiconductor chips. Multiplier synergies should also be pursued by promoting research on and the development of semiconductor chips and sensors for the electrification of the automotive and robotics industries, with the objectives of minimising the use of primary and secondary raw materials, reducing the carbon footprint, and promoting the efficient use of energy. Slovenian researchers and companies should be supported in their efforts to integrate into international high value-added value chains in good time.

Strategic autonomy, the Digital Single Market, and digital sovereignty

Overdependence on global competitors in terms of technology and industry is a strong risk factor for the competitiveness of European industry. The indiscriminate outflow of knowledge, advanced technologies, and high-tech manufacturing from the EU in

previous decades is increasingly showing long-term negative consequences for the position of European companies on world markets. The strategic planning of European actors at all levels has clearly been too short-term and even naïve, while global competitors have acted in the longer term and targeted their investments more correctly. Examples highlighted include the uncritical divestment of European high-tech companies with key technologies for the production of electric cars and a passive attitude towards access to raw materials essential for the electrification of cars. The same applies to the microelectronics and semiconductor chip industries. In response to this unsatisfactory situation, the EU is taking a number of measures to ensure greater technological and industrial independence and autonomy. In these efforts by like-minded countries (EU Member States and other Western democracies), we must assume our share of responsibility and participate to the best of our abilities. In the areas of research and development, the production of digital technologies, Internet governance, and access to key raw materials for digital technologies, we need to strengthen cooperation with like-minded countries and contribute to an acceptable level of interdependence with key global competitors. In this context, European science and, in particular, industry need to reap the benefits of a large digital internal market and advocate for the reform of EU competition law to ensure that the internal single market is fully operational and includes the markets of all EU Member States, including smaller ones. The interests of Slovenian agents as regards having equal access to digital content, services, and products in the EU Digital Single Market need to be pursued at a systemic legislative level, and, where necessary, the issues should be dealt with directly on a case-by-case basis with the providers.

The digital transformation of society and the economy must take into account the issue of proprietary ICT standards, which are in the interest of large multinational companies, are the drivers of their development, and which they use to consolidate their business position. The creation of open ICT standards in an inclusive decision-making process involving all stakeholders, which are mostly free of charge and without restrictions on reuse, is therefore key to maintaining the competitiveness of the European digital industry. In line with the interests of the Slovenian economy, the participation of Slovenian stakeholders in these efforts should be encouraged. Especially in new technological areas, this will enable the faster development and take-up of innovation.

A democratic digital society

In today's digital society, digital technologies and the Internet are changing the way everyone engages. Change is constant and is part of our society, whether we are working, doing private activities, having fun, or studying. The innovative use of modern digital technologies is fundamentally changing familiar models of action in almost all areas of human activity. What worked yesterday must adapt today if it is to survive. What was considered innovative yesterday is now being superseded by the newer, more efficient model of working over the Internet. Such intense dynamics of change pose complex evolutionary challenges for individuals, businesses, and entire societal subsystems. The legislature is constantly late in updating legislation, and the rush to do so requires particular attention to inter-ministerial coordination to ensure the consistency of legislative solutions and to create a development-friendly regulatory environment for the digital transformation of the economy and society. Constant adaptation is a constant that we cannot and must not resist if we want to participate equally in the modern digital society. One of the main guiding principles in these processes must be the protection of the rights of every individual in accordance with established human rights standards. The extraordinary capabilities of digital technologies and the relativised attitude to privacy on Internet-based intermediary platforms must not interfere with the integrity of individuals, their privacy, and their ability to make informed, sovereign decisions, regarding either

the use of Internet services or the decision to use a digital technological environment. Action must be taken to prevent users from being trapped in Internet information bubbles and from being locked into the closed digital environments of individual providers. Measures to integrate individuals into the digital society must take due account of the social aspect of accessibility to digital technologies, infrastructure, and services. Digital transformation must be based on the European Declaration on Digital Rights and the Principles for a Digital Decade, which promotes respect for European values, and digital technologies must be used for the benefit of all individuals, businesses, and society as a whole. The digitalisation of society must promote and protect privacy, individual control over data, equal access to services and education, fair and equitable working conditions, participation in the public sphere, and freedom of choice. The digital society must harness digital technologies to make democratic social processes more accessible and bring them closer to new, native digital generations. Efforts must be made to create a cyberspace that is comparable in value to democratic and human rights standards in the real world. The transfer of a significant part of social activities from the real world to cyberspace and the increasing role of digital technologies and the Internet in the functioning of social subsystems pose security risks. Systemic measures must therefore be taken to ensure the reliable operation of digital systems as critical infrastructure and essential services for the functioning of society in emergencies and exceptional states.

Achieving Slovenia's development goals through digital transformation

The digital transformation must pursue the overarching strategic development goals of Slovenia and individual sectors, as well as support sustainable development as defined in the 2030 Agenda for Sustainable Development.

The digital transformation must support the green transformation, as it is an important tool for achieving the climate goals of all systems, sectors, or value chains that make a key contribution to a carbon-free society through their own transformation (energy, mobility, manufacturing, food, and construction). It must be implemented with the smallest possible environmental and carbon footprint. To this end, the guidelines for decarbonising the digital chain will be set out in the Action Plan.

PRIORITY AREAS

Below follows an overview of the six priority areas addressed by this strategy. We have tried to define the areas as concisely and clearly as possible; some of them are defined in more detail in the sectoral strategies (The National Programme for the Promotion of the Development and Use of Artificial Intelligence in the Republic of Slovenia by 2025, The Strategy for the Digital Transformation of the Economy, The Gigabit Infrastructure Development Plan, The Digital Public Services Strategy). The Digital Slovenia 2030 strategy identifies key areas and leaves open space for future technologies, approaches, models, processes, etc.

The priority areas of the Digital Slovenia 2030 strategy are:

- 1. Gigabit infrastructure**
- 2. Digital competences and inclusion**
- 3. The digital transformation of the economy**
- 4. The road to Smart Society 5.0**
- 5. Digital public services**
- 6. Cybersecurity**

The strategic definition of each priority area is set out below.

1. GIGABIT INFRASTRUCTURE

On 25 August 2022, the Government of the Republic of Slovenia adopted the Gigabit Infrastructure Development Plan 2030, which is a strategic plan of the Republic of Slovenia for the deployment – and partly for the promotion of the deployment – of an infrastructure that will enable gigabit connectivity to all Slovenian households, homes or dwellings⁹, businesses, and the main drivers of socio-economic development¹⁰, as well as continuous 5G network coverage of all urban and other populated areas and major terrestrial transport paths. The Plan is fully aligned with the EU's Digital Connectivity Headline Targets.

Broadband Internet access brings positive socio-economic impacts for the country and its citizens. It enables even development throughout the country, reduces the digital divide, and increases everyone's participation in modern social flows. It opens up new opportunities in business, private, and public life: learning, employment, access to public

⁹ Different European policies and legal documents use different terminology to refer to the communities of people to be connected. The European Commission's Communication "Connectivity for a Competitive Digital Single Market – Towards a European Gigabit Society" uses the statistically commonly used term "household". The Commission-delegated Regulation (EU) 2021/2106 of 28 September 2021, supplementing Regulation (EU) 2021/241 of the European Parliament and the Council establishing a Recovery and Resilience Facility by laying down common indicators and the detailed elements of a scoreboard of recovery and resilience indicators, uses the term 'dwelling' and defines it as a room or several rooms in a permanent building or a separate part thereof designed for the residence of a single private household throughout the year. The Digital Compass by 2030 and the proposal for a decision of the European Parliament and of the Council establishing a policy programme "The Road to the Digital Decade" by 2030 use the term "home". The term "household" is generally used in the Roadmap as it is an established term and is used as a neutral term that is also interchangeable with "home" and "dwelling". Notwithstanding the above, the Plan also uses the term "home" or "dwelling" in some places when referring to national or EU documents that use the former or the latter, as a different designation in the Plan could cause confusion.

¹⁰ According to the European Commission's Communication "Connectivity for a Competitive Digital Single Market – Towards a European Gigabit Society", the main drivers of socio-economic development are schools, transport hubs, digitally intensive businesses, and main providers of public services, such as primary and secondary schools, railway stations, ports, and airports, local authority buildings, universities, research centres, medical clinics, hospitals, and stadiums. The plan also explicitly identifies gigabit connectivity for cultural institutions as a strategic objective of the Republic of Slovenia.

information and services, access to various content and social networks, productivity gains, the creation of innovative business models, products, and services, more effective communication, etc.

Broadband Internet access infrastructure is a key enabler of economic and social development, and its construction and promotion are therefore in the public interest.

Of particular note is the 5G network, which represents a technological breakthrough, enabling gigabit data speeds, very short latencies allowing real-time data transmission, and mass communication between devices in the context of the Internet of Things. 5G technology is dramatically improving the capabilities of mobile communication networks for all types of personal, public, and business mobile communications. 5G networks will drive industrial automation (so-called Industry 4.0), automated transport, smart cities, smart homes, smart buildings, and so on. 5G and 6G technologies are expected to enable major advances in the deployment of autonomous vehicles and next-generation transport.

Achieving the targets will create the gigabit infrastructure needed to use modern digital content and services and lay the foundations for the double digital and green transformation of the economy and society. The development of the information society or rather knowledge society is based on the ubiquitous use of ICT and the Internet in all areas of life. This requires a ubiquitous and powerful electronic communications infrastructure, accessible electronic communications services, and appropriate digital skills and knowledge. Economic and overall development in the modern digital society is directly linked to the development of high-quality broadband infrastructure, which underpins the development and use of the Internet. Strategic planning should therefore pursue the development of a ubiquitous, high-capacity broadband infrastructure (fixed, mobile, and satellite) that is open and accessible to all end users, otherwise there may be unequal opportunities for integration into the information society. Accessible broadband infrastructure throughout the country enables balanced development, reduces the digital divide, and increases everyone's participation in modern societal flows. In terms of guiding development, the use of the Internet is a strategic instrument for increasing productivity, enhancing digital competences, and creating innovative business models, products, and services, and for more effective communication and the overall efficiency of society.

The objectives in the area of digital infrastructure are ambitious and set out to fully exploit the opportunities offered by ICT to achieve lasting social and economic benefits, such as, in particular, increased competitiveness, new quality jobs, and balanced rural and urban development. The objectives are fully aligned with the European Union's Digital Agenda's overarching digital connectivity objectives. They are based on the baseline situation of broadband deployment in the Republic of Slovenia, on significant private investment with high investment stakes to be directed towards the future construction of fixed and mobile networks, and on public co-financing of the construction of broadband infrastructure in areas of white spots where there is no market interest for private investment in the next three years.

The strategic objectives of the Republic of Slovenia in the development of gigabit infrastructure are:

1. Gigabit connectivity¹¹ for all main drivers of socio-economic development, such as schools, cultural institutions, transport hubs and main providers of public services, and digitally intensive businesses, by the end of 2025
2. Uninterrupted 5G coverage for all urban areas and all major terrestrial transport paths¹² by the end of 2025
3. Internet access of at least 100 Mbps per user (downlink), upgradable to gigabit speeds, for all rural and urban households by the end of 2025
4. Gigabit connectivity for all households, businesses, and other drivers of socio-economic development in rural and urban areas by the end of 2030
5. 5G coverage of all populated areas¹³ by the end of 2030



Objectives:

	To ensure household connectivity	To ensure the connectivity of socio-economic development drivers	To ensure 5G network coverage
Baseline (2022)	88% of households have access to Internet speeds of at least 100 Mbps per user, which can be upgraded to gigabit speeds.	40% of primary and secondary schools, 99% of cultural facilities and stadiums, 20% of transport hubs, 30% of railway stations, and 100% of ports and airports, local authority buildings, universities, and research centres, as well as doctors' surgeries, hospitals, and digitally intensive businesses.	Urban areas have 75% coverage, motorways and national roads 24%, and railways 20%.
Targets for 2025	The provision of Internet access of at least 100 Mbps per user (downlink), upgradable to gigabit speeds, to all rural and urban households.	Ensuring gigabit connectivity for all main drivers of socio-economic development, such as schools, cultural institutions, transport hubs, major public service providers, and digitally intensive businesses.	Ensuring uninterrupted 5G coverage for all urban areas and all major terrestrial transport routes.
Targets for 2030	Ensuring that all households are covered by a gigabit network.	Ensuring that all businesses and other drivers of socio-economic	Ensuring 5G coverage in all populated areas.

¹¹ Gigabit connectivity should be understood as cost-effective symmetrical internet connectivity providing connection speeds to and from the user of at least 1 Gb/s (taken from the European Commission Communication "Connectivity for a Competitive Digital Single Market – Towards a European Gigabit Society").

¹² The main terrestrial paths are motorways, national roads, and railways, as defined by the trans-European transport networks (taken from the European Commission's Communication "Connectivity for a Competitive Digital Single Market – Towards a European Gigabit Society").

¹³ A unit of inhabited area is a settlement within the meaning of a municipality as defined by the Local Self-Government Act (Official Gazette of the Republic of Slovenia, No. [94/07](#) – Official Consolidated Text, [76/08](#), [79/09](#), [51/10](#), [40/12](#) – ZUJF, [14/15](#) – ZUUJFO, [11/18](#) – ZSPDLS-1, [30/18](#), [61/20](#) – ZIUZEOP-A, and [80/20](#) – ZIUOOPE), and has at least one inhabitant.

		development are covered by gigabit networks.	
--	--	--	--

We do not want to limit the deployment of new technologies when setting strategic targets. Gigabit speed as a 2030 target is aligned with the EU's digital objectives, but terabit speed will also be available in line with technological developments and end-user needs. The Republic of Slovenia will also ensure sufficient radio spectrum for the development of 6G technology and will proactively participate in working committees at the EU and ITU level where issues related to 6G technology will be discussed.

In addition to *ex ante* and *ex post* measures to ensure the proper functioning of the electronic communications market, thereby ensuring a level playing field and, consequently, adequate private investment in the network, the following in particular should be highlighted as key state measures to achieve the objectives:

- Legislative measures (notably to ensure the proper implementation of the EU regulatory framework)
- Strategic measures (including stimulating demand for broadband services)
- Financial measures (notably, but not exclusively, to ensure the public co-financing of the construction of broadband networks in white spots)

In terms of ensuring adequate digital infrastructure, the concept of universal service is particularly relevant. Its fundamental purpose is to prevent digital exclusion by providing a safety net for users who are unable to obtain universal service at an affordable price on the market. Universal service guarantees, among other things, adequate broadband access to the Internet for all, at a download speed set by the Agency for Communications Networks and Services of the Republic of Slovenia, currently 10 Mbps. Consumers with special needs are offered pricing options or packages that differ from those provided by the universal service provider under normal commercial conditions, so that they are not prevented from accessing the network and using the universal service.

2. DIGITAL COMPETENCES AND INCLUSION

By participating in today's technology-enabled and information-rich environment, citizens are co-creating a digital environment that is central to democratic processes and practices, where intercultural dialogue is possible, and citizens increasingly exercise their rights to social, economic, and political participation.

Digitalisation is thus almost no longer a choice but an expectation that is becoming a necessity. To be truly effective, it requires the development, deployment, and accessibility of technologies, together with the appropriate skills and equal participation of individuals in the evolving digital society (digital inclusion).

Digital inclusion¹⁴ is understood as the ability of individuals to access, use, trust, and participate competently and safely in the information society, using available ICT and digital technologies, solutions, and services.

¹⁴ Promotion of Digital Inclusion Act, Article 3. Available at: <https://www.uradni-list.si/glasilo-uradni-list-rs/vsebina/2022-01-0653/zakon-o-spodbujanju-digitalne-vkljucenosti-zsdv>.

The state of digital inclusion in Slovenia

In Slovenia, 93% of households had access to the Internet¹⁵ from home in the first quarter of 2022. On average, 89% of people use the Internet, 84% of whom use it several times a day.

Based on Eurobarometer data, the Institute of Macroeconomic Analysis and Development notes that people's attitudes towards digitalisation have improved significantly in recent years: in 2017, Slovenia had the lowest share of people who had a positive view of the impact of digital technologies on society (but not on the economy), and in 2021 Slovenia had the sixth highest share of people who had a positive view of the impact of the digital transformation on the economy and society.¹⁶

However, the Institute of Macroeconomic Analysis and Development¹⁷ notes that Slovenia is increasingly moving away from the strategic objectives set out in the Slovenian Development Strategy 2030¹⁸ in the area of the digitalisation of the economy and society. It points out that in order to accelerate the digital transformation of society and the economy, it is necessary to improve digital skills, which are too weak, especially in terms of advanced skills.

The Statistical Office's analysis concludes that in 2021 only 20% of the population in Slovenia had very well-developed (advanced) digital skills. The proportion of the population with at least basic digital skills is also relatively low, at 50%, according to the latest data (EU average: 54%). The proportion of people without digital skills was highest in the 65–74 age group, at 45%, which is above the EU–27 average (41%).¹⁹

In Slovenia, 18.4% of adults said they had no experience with computers or basic computer skills.²⁰ Of adults with computer experience, 49.2% had only reached level 1 or below in solving problems in technology-rich environments. At level one, adults were only able to use widely used and familiar technology programmes, such as email and web browsers, and to solve problems involving few steps, simple reasoning, and little or no navigation between programmes.

Of particular concern is the finding of the Organization for Economic Co-operation and Development (OECD) that individuals with weak digital skills and inactive people (retired and other inactive) in Slovenia are already at risk of digital exclusion.²¹

¹⁵ Statistical Office of the Republic of Slovenia, Usage of the Internet in Households and by Individuals, 2022. Available at: <https://www.stat.si/StatWeb/News/Index/10572>.

¹⁶ Institute of Macroeconomic Analysis and Development, Productivity Report 2021. Available at: https://www.Institute_of_Macroeconomic_Analysis_and_Development.gov.si/fileadmin/user_upload/publikacije/Porocilo_o_produkтивности/2021/slovenski/PoP_2021.pdf.

¹⁷ Institute of Macroeconomic Analysis and Development, Development Report 2022. Available at: https://www.Institute_of_Macroeconomic_Analysis_and_Development.gov.si/fileadmin/user_upload/razvoj_slovenije/2022/slovenski/POR2022_splet2.pdf.

¹⁸ Slovenian Development Strategy 2030. Available at: https://www.gov.si/assets/vladne-sluzbe/SVRK/Strategija-razvoja-Slovenije-2030/Strategija_razvoja_Slovenije_2030.pdf.

¹⁹ Statistical Office of the Republic of Slovenia, Internet use in households and by individuals, detailed data, 2021. Available at: <https://www.stat.si/StatWeb/news/Index/10255>.

²⁰ MoEYS, Resolution on the National Adult Education Programme for the period 2022–2030. Available at: <https://www.pisrs.si/Pis.web/pregledPredpisa?id=RESO138>.

²¹ OECD, Digitalization of the economy in Slovenia, 2022. Available at: <https://www.oecd-ilibrary.org/docserver/9167aa58en.pdf?expires=1671007186&id=id&accname=guest&checksum=C8917131A5D4560037CD344DFBAD85AB>.

The Institute of Macroeconomic Analysis and Development's Development Report shows that there is almost no gender gap in digital skills, but that the digital skills of the elderly, the low-educated, low-income, immigrants, unemployed, and inactive are weak.

Almost half of the working-age population in Slovenia is struggling with a lack of digital skills, with younger, more highly educated, and higher-income people having digital skills at the EU average.

The Statistical Office of the Republic of Slovenia notes that 36% of companies in Slovenia (34% of small, 45% of medium-sized, and 55% of large companies) are facing a lack of adequate staff or skills in the context of the digital transformation. In 2021, 9% of companies recruited or attempted to recruit ICT professionals. Of these, 78% faced a recruitment problem: too few candidates applied (81%), candidates did not have relevant work experience (76%), candidates expected a higher salary (60%), candidates did not have relevant education, e.g. formal education, or relevant training (56%).²²

This is confirmed by the latest Productivity Report of the Institute of Macroeconomic Analysis and Development, which states that the lack of ICT professionals in Slovenia is a problem for 69% of companies. Only the Czech Republic, Austria, and the Netherlands have greater challenges in this area in the EU, and the Institute of Macroeconomic Analysis and Development sees the lack of ICT graduates as a reason for these problems (in 2020, only 4.1% of all graduates in Slovenia were ICT graduates).²³

A similar pattern is also evident as regards the inclusion of women in the digital economy, more specifically in the lack of women in ICT professions, as indicated in the Women in Digital Scoreboard.²⁴ The scoreboard, which covers three areas: (i) Internet usage, (ii) Internet skills, and (iii) professional skills and employment in this area, shows that Slovenia is ranked 14th, below the average of EU Member States. Compared to 2019, it has fallen five places. It is in terms of professional skills and employment that we have seen the biggest decline, with Slovenia falling from an excellent 3rd place in 2019 to 11th place in 2021.

The results of the survey on the impact of the Internet on teenagers' well-being and mental well-being are also a cause for concern.²⁵ It shows that 45% of teenagers in primary school already compare their face and body with the perfect images of influencers and celebrities online and are dissatisfied with their appearance as a result. It is worrying that a third (33%) of female students consider improving their appearance by means of surgery, while a quarter (24%) of female students consider this in the last trimester of primary school.

Slovenia needs to improve on the current situation, and a strong focus on all pillars of digital inclusion is needed for the period ahead:

i. The availability and accessibility of infrastructure

²² Statistical Office of the Republic of Slovenia, The digital transformation of business operations is hampered by a lack of adequate staff or skills. Available at: <https://www.stat.si/StatWeb/News/Index/10766>.

²³ Institute of Macroeconomic Analysis and Development, Productivity Report 2022. Available at: https://www.Institute_of_Macroeconomic_Analysis_and_Development.gov.si/fileadmin/user_upload/sporocila_za_javnost/2022/Sporocila_za_javnost/Konferenca_PoP22/PoP_2022.pdf.

²⁴ Women in Digital Scoreboard, 2021. Available at: <https://digital-strategy.ec.europa.eu/en/news/women-digital-scoreboard-2021>.

²⁵ Safe.si, Impact on the well-being and mental well-being of teenagers. Available at: <https://safe.si/raziskave-in-trendi/safesi-2022>.

The first condition for digital inclusion is the availability of basic infrastructure, such as fixed, very high capacity networks and computers or other electronic devices. It is of the utmost importance to ensure equal opportunities for all, which is a major challenge in societies where we are witnessing the challenges of overcoming socio-economic and other disparities, even in the real world. It is therefore important for the state to play its part in this area, alongside education on solidarity in society and the effects thereof.

In particular, Slovenia still needs to further expand very high capacity fixed networks and increase the availability of mobile communications networks at affordable prices.²⁶ At the very least, individuals who cannot afford to buy equipment to participate in the digital environment should be able to borrow working equipment.

In order to successfully overcome the digital deficit, the use of Internet-connected computing facilities at public points, e.g. libraries, administrative units, municipalities, post offices, associations, multi-generational centres, and rural digital innovation hubs²⁷, which operate according to the principle of the digital innovation ecosystem²⁸, and can be seen as a combination of the provision of digital infrastructure together with associated digital skills and competences according to the needs of individual communities, should be further encouraged and facilitated to successfully overcome the digital deficit.

Once the necessary infrastructure and equipment are in place, the accessibility of technologies, services, and content must also be ensured in pursuit of the digital inclusion goal. In addition, freely accessible, open-source, and user-friendly digital services adapted to different social groups must be developed. In this context, special attention and care should be devoted to adapting tools, services and content for the elderly, people with disabilities, people with long-term mental health problems, and people with intellectual and other disabilities.²⁹ A particular challenge is the provision of content in Slovenian language and Slovenian sign language.

- Slovenia needs to further expand fixed very networks of very high capacity and increase the availability of affordable mobile communications networks.
- Individuals in social need should at least be able to borrow working equipment.
- The accessibility of technologies, services, and content as well as developing digital services that are freely available, open source, and tailored to different social groups should be ensured.

ii. Trust

From a trust perspective, it is about online users knowing that the Internet can be a safe place that will not harm them but will make a concrete contribution to their quality of life.

In the context of rapid technological change, fostering digital inclusion requires continuous efforts to create an environment in which citizens and organisations are safe and understand and benefit from digitalisation. This requires care in evaluating the impact of the digital transformation on children and adolescents (including in terms of issues related to safe and responsible use of the Internet for children and adolescents),

²⁶ The strategy explains this in more detail in the Gigabit Infrastructure chapter.

²⁷ Rural Digital Innovation Hubs. Available at: https://enrd.ec.europa.eu/sites/default/files/tg_rural-businesses_case-study_rural-digital-hub_0.pdf.

²⁸ A digitally innovative ecosystem. Available at: <https://projects2014-2020.interregeurope.eu/carpedigem/>.

²⁹ Web and Mobile Accessibility Act, WMA, Available at: <http://www.pisrs.si/Pis.web/pregledPredpisa?id=ZAKO7718>.

the elderly, people with disabilities, people with long-term mental health problems and intellectual and other disabilities, and others.

Despite the positive trend in attitudes towards the digital world in Slovenia, there is a risk that the negative processes of this environment, such as online violence, hate speech, fake news, and misleading content, will again shake the trust of individuals or society as a whole in the coming period. As the digital world continues to evolve more and faster, it faces increasing vulnerabilities and threats. Cyberattacks, digital espionage, and sabotage are increasingly becoming tools in international relations and are also affecting the individual's experience of the digital world. Cybersecurity infrastructure and measures must ensure resilience to attacks and protect citizens,³⁰ and – in addition to building digital competences, strengthening media literacy³¹ – regulation and international cooperation in the development of new international legal rules are of paramount importance to address this challenge.

Just as it is important to regularly educate children and adolescents on how to use the Internet safely and responsibly, it is also crucial to raise awareness regularly and persistently among all citizens regarding the benefits of the digital transformation for them in specific terms, the use of digital devices and services, and ways to identify and prevent risks in the digital environment.

The responsibility for building trust cannot be attributed to one group alone, but it is important that individuals are actively involved, and that private and public organisations must work together with local authorities, while support from public authorities is also important. NGOs and supportive environments with a mission to foster the digital transformation (the European Digital Innovation Hub) have an important role to play in advocating for the information society.

- We need to continuously foster an environment in which citizens and organisations feel safe and understand as well as benefit from the advantages of digitalisation.
- Infrastructure, cybersecurity measures, appropriate legislation, and digital competences must also be geared towards building resilience to attacks and protecting citizens.

iii. Digital competences

Digital competences are defined as the ability of an individual to use and co-create digital technologies, solutions, and services competently and safely.³² Digital competences³³ are part of the European Reference Framework of eight key competences for lifelong learning and comprise a wide range of knowledge, skills, and attitudes that enable individuals to use digital technologies confidently, critically, and safely to access information, communicate, and perform basic problem solving in all life situations.

³⁰ The Strategy explains this in more detail in the Cybersecurity chapter.

³¹ Media literacy is understood as the ability to reflect critically on media content, and is therefore a cornerstone for citizens to become informed, aware, and active.

³² Digital Inclusion Promotion Act. Available at: <https://www.uradni-list.si/glasilo-uradni-list-rs/vsebina/2022-01-0653/zakon-o-spodbujanju-digitalne-vkljucenosti-zsdv>.

³³ Digital competence, as defined by the European Council in May 2018, "involves the confident, critical and responsible use of, and engagement with, digital technologies for learning, at work, and for participation in society. It includes information and data literacy, communication and collaboration, media literacy, digital content creation (including programming), safety (including digital well-being and competences related to cybersecurity), intellectual property related questions, problem solving and critical thinking." Available at: [https://eur-lex.europa.eu/legal-content/SL/TXT/PDF/?uri=CELEX:32018H0604\(01\)&from=NL](https://eur-lex.europa.eu/legal-content/SL/TXT/PDF/?uri=CELEX:32018H0604(01)&from=NL).

Awareness of the need for a policy framework for the development and measurement of digital competences at the EU level has been growing steadily for more than a decade. In 2010, DigComp³⁴ was launched and has been used since 2013 for several purposes, including the development of competency assessment tools, the design of courses and training materials, and the identification of ICT professional profiles.

DigComp 2.2 (March 2022) breaks down digital competences into five key areas: (i) information and data literacy, (ii) communication and collaboration in the context of digital technologies, (iii) digital content creation, (iv) security, and (v) problem-solving competences. DigComp 2.2 identifies eight levels of digital competences, while the Road to the Digital Decade policy programme reduces the understanding of the levels of digital competences to two key levels:

- *Basic digital skills*, which means the ability to perform at least one of the following activities using digital means: information, communication, and collaboration, content creation, security and personal data, and problem solving
- *Advanced digital skills*, which means the skills, professional competences, and professional qualifications that require the knowledge and experience needed to understand, design, develop, manage, test, deploy, use, and maintain digital technologies, products, and services

The Digital Agenda for Europe stresses that improving education and skills is a key part of the overall vision for the digital transformation in the EU.³⁵

The need for digital competences has been particularly acute since the COVID-19 pandemic when gaps in the use of digital tools for working and learning from home and for distance communication became apparent. But there is no doubt that the digital and green transitions also call for adapting and strengthening competences more broadly.

Broad-based digital skills should also be the foundation of a society that can trust digital products and services, create in the digital world, identify misinformation and fraud attempts, protect itself from cyberattacks, online scams, and fraud, and where individuals learn to understand and navigate the wealth of information the web has to offer.

Digitalisation trends also require continuous skill acquisition in the labour market. Digitalisation offers huge potential³⁶ to increase productivity and improve the well-being of individuals worldwide, but concerns remain as to whether the digital transition and the future of work will be inclusive for all individuals. Businesses need digitally literate employees in order to be successful in a world of technology. Workers also need digital competences to succeed in an increasingly digitalised and fast-changing labour market.

Good integration and adaptation to the digital challenges of both formal and non-formal education are crucial.

a. Formal education

Education is a key human right and a driver of economic success, and the education system must be a means to ensure equal opportunities and inclusion for all.

³⁴ DigComp Digital Competence Framework. Available at: https://joint-research-centre.ec.europa.eu/digcomp_en.

³⁵ A European Digital Strategy. Available at: <https://digital-strategy.ec.europa.eu/si>.

³⁶ OECD, Skills for the Digital Transition, 2022. Available at: <https://www.oecd.org/employment/skills-for-the-digital-transition-38c36777-en.htm>.

It is therefore important that the education system is first accessible to all and that it includes the comprehensive development of digital competences in curricula.

Without appropriate systemic solutions in the field of digital education, young people could be deprived of high-value jobs, especially compared to their peers from other EU Member States. If young people in Slovenia are not given the opportunity to acquire digital competences in public education, this will lead to further stratification and inequality. In order to prevent this, the necessity to renew education and study programmes by embedding the acquisition of digital competences is foreseen in the Digital Education Action Plan 2021–2027³⁷ and the Action Plan for the Implementation of the Resolution of the National Higher Education Programme 2030 in the period 2022–2024, which also address the area of digitalisation with related objectives and actions.

For all young learners in formal education, electives and extracurricular activities that present basic ICT skills in an interesting way should be promoted. The co-financing of programmes, especially for the socially disadvantaged and persons with disabilities and other intellectual or other handicaps, also makes sense as an incentive for parents. Young people need these skills to effectively participate in the information society and effectively enter the labour market, which will contribute to Slovenia's competitiveness.

One of the objectives of the Promotion of Digital Inclusion Act³⁸ highlights increasing interest in secondary, tertiary, and higher education programmes that include professional digital competences and reducing gender gaps in this area. In this context, it is crucial to encourage girls, in particular, to participate in ICT education.

The competitiveness of the country and of individuals will also be boosted by reskilling the workforce for the digital environment and by education geared towards developing ICT professionals, in particular in computer science. It is important to train more ICT professionals, and we will also address the gender gap in ICT skills.

In Slovenia, measures should be introduced to increase enrolment in and completion of the tertiary level, and promotion should be stepped up to raise the profile of engineering, especially ICT-related career paths, in society, especially among young people.

A fundamental prerequisite for all of the above is, among other things, the comprehensive provision of pedagogical digital competences for educators and a sufficient number of such educators, which can be meaningfully achieved through the thoughtful introduction of micro-credentials.

- The education system must be a means to ensure equal opportunities for and the inclusion of all and must include the acquisition of digital competences.
- Optional and interest-based content should be promoted that introduces young people to basic ICT skills in an interesting way.
- Measures should be put in place to increase enrolment in and the completion of the tertiary level, and promotion should be stepped up to raise the profile of engineering, especially ICT-related career paths, in society, especially among young people.

³⁷ MoEYS, Digital Education Action Plan 2021–2027. Available at: <https://www.gov.si/assets/ministrstva/MIZS/SDIG/JR-NOO-usposabljanja-303-35/2022/Akcijski-nacrt-digitalnega-izobrazevanja-2021-2027.pdf>.

³⁸ Promotion of Digital Inclusion Act. Available at: <http://www.pisrs.si/Pis.web/pregledPredpisa?id=ZAKO8516#>.

- More ICT professionals need to be trained, both in mainstream education and through retraining and reskilling of the workforce, including using micro-credentials, thus the gender gap will be reduced.
- Investment is needed to ensure that educators have comprehensive digital pedagogical competences.

b. Non-formal education

We see non-formal education as an opportunity for everyone, regardless of their profession, social status, or age, to acquire digital competences – not necessarily because they are required to do so by the workplace, but also because they want to build on these skills.

In this context, adults need to be informed of and encouraged to participate in digital literacy programmes. Micro-credentials as shorter courses focused on responding to short- and medium-term labour market needs, can reasonably meet the above orientations.

Slovenia is lagging behind the EU average in terms of the share of individuals with at least basic digital competences, and non-formal education, if adapted to formal education, can effectively contribute to improving this result.

The Resolution on the National Programme of Adult Education points out that non-formal education in general can address two key challenges facing Slovenia, one of which is the rapidly ageing society, which dictates the learning and education of older people, with a focus on improving digital skills.³⁹

It is crucial that everyone (regardless of age or other characteristics) who wants to do so has the opportunity to identify and evaluate the development of their digital competences and to acquire at least basic digital competences through quality training programmes. This should not overlook the possibility of acquiring skills online, where appropriate.

Taking into account the programmes already developed in this field, an excellent training programme for acquiring basic digital competences needs to be developed in a unified way in Slovenia and promoted effectively. This should take particular account of the working population, the elderly – people in the third stage of life – people with disabilities, people with long-term mental health problems, people with intellectual and other disabilities, the unemployed, and others. Particular attention should be devoted to people living in rural areas, whose geographical remoteness makes it more difficult to access training programmes, and to NGOs, which can make an important contribution to improving the digital competences of the population. It also makes sense to develop a training programme for advanced digital competences.

In the future, the content of training and education programmes for the unemployed and those in employment must be defined in a way that takes into account changes in the labour market, both in terms of content and forms of work. Digital training should also equip individuals with advanced digital skills and knowledge that will enable them to find quality jobs and a satisfying career path.

Digital literacy training for decision-makers or managers and other key personnel (HR staff) in all spheres (government, local authorities, business, NGOs, and researchers) is essential to achieving a general awareness of the importance of the information society.

³⁹ Ministry of Education, Science, and Sport, Resolution on the National Programme for Adult Education in the Republic of Slovenia for the Period 2022–2030. Available at: <http://www.pisrs.si/Pis.web/pregledPredpisa?id=RESO138>.

Additional training on the digital transformation is needed, which should be attended by all decision-makers and managers.

A decision should be made to use a single tool to assess the level of digital competences.⁴⁰ This tool will allow the level of digital skills to be assessed and learning objectives to be set and it will continuously be updated to ensure that it takes account of changes in the rapidly changing digital world.

In order to equip as large a share of the population as possible with at least basic digital competences as quickly as possible, Slovenia will need to develop an ecosystem for training providers, starting with those who will then share their digital competences with others. The provision of a regular help desk is also of utmost importance.

In terms of extending the working lives of older workers, it makes sense to allow companies to obtain financial incentives to strengthen digital competences, while at the same time tackling stereotypes about older workers and empowering employers to manage the ageing workforce.

Stakeholder cooperation and networking are important in identifying, addressing, and responding to digitalisation needs in the public interest. Alongside their own professionalisation, NGOs and public adult education organisations have a prominent role to play.

- All those who wish to do so should be able to identify and evaluate the development of their own digital competences.
- Taking into account the programmes already developed in this field, an excellent training programme for basic digital competences should be developed in a unified way and promoted effectively.
- Further training on the digital transformation is needed, which should be attended by all decision-makers or managers.
- A training ecosystem should be developed to train the trainers, including regular support points for assistance.

iv. Bridging the digital divide and promoting active social inclusion

In both real life and online, it is essential that every citizen has the opportunity to actively, continuously, and responsibly participate in a community (local, national, global, and online) at all levels (political, economic, social, cultural, and intercultural).

Particular attention should be devoted to the fact that, while digital technology brings opportunities for the rapid development of society and individuals, it can also widen the gap with those who are unable to take advantage of the benefits of digital technology, with the consequent impact of increasing economic and other inequalities.

Our vision is to ensure that modern information technology provides adequate opportunities for the integration of all citizens into the information society, and to promote their effective participation in modern social and technological flows, from which they will benefit concretely.

⁴⁰ The European Commission is exploring the development of a European Digital Skills Certificate, as announced in the [Digital Education Action Plan 2021–2027](#). This certificate would simplify the way governments, employers, and other stakeholders across Europe certify and recognise digital skills. It will be based on the European Digital Competences Framework for Citizens. This framework provides a tool for citizens to self-assess their digital skills and set learning objectives, and is continuously updated to ensure that the competence areas reflect the changes and realities of the rapidly changing digital world.

Particular attention should be devoted to people most at risk in this area. The Institute of Macroeconomic Analysis and Development classifies them into the following groups: the elderly, the low-educated, the low-income, immigrants, the unemployed, and the inactive.⁴¹ In this context, particular attention should also be devoted to the digital inclusion of people with disabilities and other intellectual and other disabilities.

In order to ensure the highest level of digital inclusion of the individuals from these groups, it is important to first identify the barriers and constraints that prevent them from accessing the web or using online services. The findings need to be integrated into planned actions in a manner that will most effectively overcome barriers to and limitations on the use of online tools and services.

This should not neglect to respect the difference between those who are at risk of digital exclusion and those who make a conscious choice to be digitally excluded. Particular attention must also be devoted to the digital transition in order to create a more humanist society, in which we will strive to overcome the consequences of the alienation of people and the dependence of young people on modern technical and technological aids.

- In both real life and online, it is essential that every citizen has the opportunity to actively, continuously, and responsibly participate in the community at all levels.
- Special attention must be devoted to the most disadvantaged in order to persistently bridge the digital divide.



Objectives:

- To ensure that every citizen has digital rights⁴²
- To introduce digital competences into the compulsory curriculum of the school system
- To develop a single training programme for basic digital competences and promoting it accordingly
- To ensure the pedagogical digital competences of all educators
- To improve the digital literacy⁴³ of the population
- To increase the number of ICT staff
- To reduce the gender gap in ICT

Indicators:

	Year 2021	Year 2025	Year 2030
The proportion of the population with at least basic digital competences	50%	60%	80% (EU target: 80%)
The share of ICT professionals in the total workforce	4,8%	6%	10% (EU target: 10%)
The proportion of female ICT professionals	17%	20%	25%

⁴¹ Institute of Macroeconomic Analysis and Development, Development Report 2022. Available at: https://www.Institute_of_Macroeconomic_Analysis_and_Development.gov.si/fileadmin/user_upload/razvoj_slovenije/2022/slovenski/POR2022_splet2.pdf.

⁴² European Declaration on Digital Rights and Principles for the Digital Decade: Digital rights allow individuals to enjoy the same rights offline as they do in the digital environment.

⁴³ Digital literacy versus digital competence: digital literacy is the fundamental ability of an individual to navigate the digital world. Available at: <https://epale.ec.europa.eu/si/blog/digitalna-pismenost-nasproti-digitalni-kompetenci>.

The proportion of the population receiving education online	37%	43%	50%
---	-----	-----	-----

3. THE DIGITAL TRANSFORMATION OF THE ECONOMY

In January 2022, the Government of the Republic of Slovenia adopted the Digital Transformation Strategy⁴⁴. The strategy addresses the widest possible integration of advanced digital technologies in businesses. It also addresses the challenges of introducing advanced digital technologies, in particular in relation to the skills and digital competences needed to implement these technologies in business processes as quickly as possible. Prior to this, in June 2021, it adopted the Slovenian Industrial Strategy 2021–2030⁴⁵, which sets out a vision for the development of Slovenian industry as green, creative, and smart. The Slovenian Industrial Strategy will ensure the competitiveness of the economy by promoting all three components of sustainable development (society, the environment, and the economy) in a balanced way and will create the conditions for the restructuring of industry by strengthening knowledge, creativity, and innovation to create new and better-quality jobs with higher added value and the transition to a green, creative, and smart economy.

OVERVIEW OF THE CURRENT SITUATION

The rapidly changing environment in which businesses operate is facilitating accelerated technological advances combined with digitalisation and increasing information processing capacity. The challenges faced in the context of the energy crisis further reinforce the need for advanced digital solutions for economic transformation, strengthening supply chains, and the green transition.

The deployment and use of more complex technologies remains a challenge, especially for micro-, small-, and medium-sized enterprises (SMEs), but for cloud services, this is true for all businesses. Slovenia continues to be one of the more competitive countries, including for SMEs, but this is not enough to prevent Slovenian companies from falling further behind in terms of digital intensity. In fact, they were still ranked fifth in 2018 and tenth in the EU in 2021. Preliminary data on the maturity of companies in adopting Industry 4.0 also points to a decline. Between 2018 and 2022, the share of companies showing high readiness even dropped from 26.3% to 24.4%.

The gap between ICT investment in Slovenia and the EU average is widening, with the result that we have been very slowly closing the productivity gap with the EU average over the last decade. The Institute of Macroeconomic Analysis and Development Productivity Report 2021 concludes that digitalisation and the digital transformation are key to improving the productivity and competitiveness of the economy.

To accelerate productivity growth, Slovenian companies will not only need to accelerate the adoption of individual (more complex) technologies, but will also need to approach (digital and) business transformation more holistically and ambitiously, in terms of both digitalisation and sustainability and the strengthening of organisational factors, with a stronger focus on agility, creativity, and innovation.

⁴⁴ Strategy of Digital Transformation of the Economy. Available at: <https://www.gov.si/assets/ministrstva/MGTS/Dokumenti/DIPT/Digitalizacija/Strategy-of-digital-transformation-of-the-economy.pdf>.

⁴⁵ Slovenian Industrial Strategy. Available at: <https://www.gzs.si/Portals/206/Slovenska%20industrijska%20strategija.pdf>.

Public investment in R&D, which is key to smart transformation, and ICT have been increasing since 2017, but have largely been stagnant over the longer term.

A lack of relevant skills or staff is the most common problem companies face when digitally transforming their businesses. It is noticeable that Slovenian companies rarely invest in skills (HR) themselves, as this has to be done by the process owners. It is usually not defined who the process owners are or who owns the data. Until this is resolved, the problems with digitalisation will continue to grow. The key question therefore is how to meaningfully accelerate investment in ICT and digital competences for all employees, regardless of their job.⁴⁶

WHAT DOES THE DIGITAL TRANSFORMATION OF THE ECONOMY BRING?

The digital transformation of the economy is bringing about changes in business models, processes, products, competences, the performance of companies and individuals, and customer relations using modern ICT and concepts. It enables businesses to be more competitive, efficient, flexible, and grow by increasing value added per employee. Digital transformation is also crucial in traditional industries, as growth can only be increased by upgrading existing business models using advanced digital technologies. The effects of a successfully implemented digital transformation are reflected in the increased international competitiveness of SMEs.

The digital transformation of both large and small businesses is having a significant impact on the flexible adaptation of processes to consumer needs and on the production of different and more complex products based on the principle of mass customisation. Customisation is important both in terms of the consumer experience and in order to increase consumer safety. Digital technological solutions that enable transparency and the traceability of materials, products, and services further contribute to consumer safety. An important element is to raise consumer awareness of the expectations, obligations, and potential dangers that migrate from real life to virtual life. In this context, both the company and the individual need to be alert to situations that they were not used to before and that may lead to harm, especially in terms of the use of personal and other critical data.

Advanced digital technologies are creating new business models. These can only take hold with an advanced regulatory framework that still allows business to develop and compete in an international (including non-European) environment. The European market is striving to unify into a Digital Single Market to help it compete with the global economy. This provides Slovenian companies with new opportunities, but at the same time it brings strong international competition. Digital transformation makes it easier for Slovenian companies to compete in the Single Market, as they can take advantage of the reach of customers and business partners to build international value chains supported by digital channels.

The state is also involved in this process by participating in cross-border and multi-country projects at the EU level, which enable Slovenian companies to integrate into global value chains, thereby improving the competitiveness of the Slovenian economy. Another important aspect is the use of active investment (mainly state and EU funds), which stimulates the innovation and dynamism of many companies and thus enables the creative creation of (new) markets. We support the focus on the development of advanced products and technologies that, in the field of digitalisation, represent

⁴⁶ Taken from the Institute of Macroeconomic Analysis and Development Productivity Reports 2021 and 2022.

breakthrough solutions for end markets, thus contributing to the establishment of Slovenian industry and R&D partnerships in the global competitive environment.

The digital transformation of the economy should also be based on the concept of Industry 4.0 and the increased use of advanced digital technologies (The Internet of Things, Big Data, artificial intelligence, quantum computing, blockchain technology, cybersecurity, predictive analytics and intelligent forecasting, high-performance computing, virtual and augmented reality (metaverse, extended reality), WEB 3.0, 5G technologies, etc.). The digitalisation of the economy should also take into account service activities.

Advanced digital technologies can create a number of new and emerging risks from an occupational safety and health perspective, and measures must be put in place to reduce or eliminate such risks when they are introduced.

The use of advanced digital technologies is conditioned by two fundamental factors: connectivity, or the level of coverage with high-speed broadband connections, and the skills and competences available for the effective implementation of these technologies in enterprises.

New digital technologies are now widespread globally and could help tackle social, environmental, and economic issues. New technologies and business models affect almost every aspect of our lives, societies, and markets and create new challenges, for example in the protection of fundamental and human rights and cybersecurity. Yet a handful of private and state actors are disproportionately influencing this global transition and are also exploiting new technologies for malicious activities. The degree of digitalisation of an economy or society is not only key to economic and social resilience, but is also becoming a factor in Europe's strategic autonomy and global influence.

In addition to adapting business processes by strengthening technological capabilities, two elements in particular will be important for the effective digital transformation of enterprises: strengthening the digital competences of employees to use and adapt to the new requirements arising from advanced technologies, and links with innovative SMEs and start-ups or enterprises in the expansion phase.

For the successful digital transformation of the economy, the public sector, and civil society, Slovenia needs to strengthen its ICT sector to enable it to play its role, and cover all needs with its workers, competences, services, and solutions. The creation of interdisciplinary teams with both content-specific, domain-specific, and digital skills, supported by leaders, is a good starting point for a successful digital transformation. At the same time, processes need to be put in place to continuously train employees to use new technologies effectively and creatively. It is therefore essential to have a link between the development and sale of solutions, and the provision of training on how to use them.

The procedures for recruiting highly qualified professionals from abroad who have the necessary skills exclusively in areas where there is a market demand should be simplified and accelerated. The establishment of a talent visa will encourage the positive migration of talented individuals to Slovenia to work in Slovenian companies, while the establishment of a digital nomad visa will allow ICT professionals to spend a period of time in Slovenia during which the economy and public authorities (e.g. SPIRIT) can carry out a number of activities to promote Slovenian companies and their opportunities.

Slovenia already has a number of support environments that can be considered institutional or non-institutional. In general, these are the business support environment, the research and development support environment, and the financial support environment. In particular, the business support environment includes chambers, hubs (such as digital innovation hubs, and European digital innovation hubs), technology parks, start-up associations and initiatives, accelerators, incubators, co-working spaces, and laboratories. In addition to institutional R&D support environments (universities, public research organisations), R&D support environments include technology and knowledge transfer offices, private development centres, and strategic R&D and innovation partnerships. Financial support environments include not only institutional ones (public institutions – ministries, agencies, funds, the SID Bank), but also other providers of financial services for businesses. European and international associations, alliances, and collaborations can make an important contribution to accelerating the digital transformation of the economy and society. It is the role of the state to formulate policies, strategic orientations, and actions, and to guide, promote, and support the stakeholders of the enabling environment to achieve the common objectives of the digital transformation strategy. The strategic orientations of the enabling environment are further defined in the sectoral strategy.

Ultimately, digitalisation is key to a successful green transition, circular business models, and the achievement of the Sustainable Development Goals.

STRATEGIC OBJECTIVES FOR THE DIGITALISATION OF THE ECONOMY BY 2030

Slovenia needs to harness its intellectual potential and, as a small economy, build its success on knowledge.

The key is therefore to continue to focus on the knowledge society and thus the prosperity of all Slovenian citizens, and the accelerated digital transformation of the economy is key to this.⁴⁷ The digital transformation of the economy is the foundation for improving the productivity, competitiveness, resilience, and sustainable development of the economy and society as a whole. In order to achieve this acceleration, investments in digital technologies (in digital technologies and solutions, digitalisation and digital business transformation projects, etc.) and in improving the digital competences of employees should be promoted, as should the strengthening of the ICT sector and the increase in the number of ICT professionals in Slovenia for the advancement of all sectors. In order to strengthen the competitiveness of the Slovenian economy, it is essential to reduce administrative barriers and harmonise legislation. This is the only way to make the digital economy an important economic sector in Slovenia with a high share of exports.

Slovenia is also pursuing the Digital Compass objectives in the digital transformation of the economy, through strategic documents, action plans, and financial resources (budgetary, cohesion, and Recovery and Resilience Plan resources).

⁴⁷ Institute of Macroeconomic Analysis and Development: Productivity Report 2021. Available at: https://www.Institute_of_Macroeconomic_Analysis_and_Development.gov.si/publikacije/porocilo-o-produktivnosti/.



OBJECTIVES:

1. To increase the competitiveness of Slovenian companies and value added per employee
2. To support the growth of the ICT sector, which is key to the successful digitalisation of the economy
3. To increase the share of investments in research, development, and innovation in advanced digital technologies in companies to 2% of total costs per year by 2030
4. To increase grants to support the digital transformation, especially for SMEs
5. To support the improvement of digital competences among employees (regardless of profiles), including opportunities for retraining (micro-credentials)
6. To support an enabling environment, which is an important element of the overall enabling environment to support the digitalisation of the economy (including chambers, Digital Innovation Hubs, European Digital Innovation Hubs, Strategic Development, innovation partnerships, etc.), in addition to direct action by ministries

Indicators:

	Baseline for 2022	Target for 2025	Target for 2030
Value added per employee	EUR 53,057	EUR 64,000	EUR 88,000
The share of companies using artificial intelligence*	12%	35%	more than 75%
The share of companies hiring cloud computing services**	38%	50%	more than 75%
The share of companies using Big Data*	7%	30%	more than 75%
The proportion of companies with 10 or more employees and self-employed persons reaching a high or very high level of digital maturity	33%	39%	53%
The proportion of SMEs reaching at least a basic level of digital maturity (digital compass)*	55%	65%	90%
The proportion of enterprises providing training in the use of ICT	26%	40%	90%
The share of revenue generated by SMEs through sales via a website or computerised data exchange	12.5%	15%	more than 20%
The percentage of SMEs that generated at least 1% of their turnover from sales via a website or computer data exchange	19%	25%	more than 30%
Gross domestic product per capita in purchasing power parity terms (EU average)	90%	92%	95%

* The target is for at least 75% of EU companies to use one or more of the following as part of their business activities: i) cloud computing services, ii) Big Data, or iii) artificial intelligence.

** The rental of email or office software as a cloud computing service is excluded.

4. THE ROAD TO SMART SOCIETY 5.0

In the information society, it was common practice for data and information to be collected in various environments, accessed, and analysed by data analysts. In the 5.0 society, however, people and systems are connected in a virtual space, and the optimal results obtained by advanced technologies, which go beyond the capabilities of humans, are sent back to the real environment. This process brings new value to industry and society in ways that were not possible before.

Definition of Society 5.0:

A society that will be able to balance economic progress with solving societal issues through a high degree of convergence of cyberspace and physical space by providing goods and services that satisfy various hidden needs in detail.⁴⁸

We intend to achieve the transition to Smart Society 5.0 by incorporating advanced technologies into various industries and social activities, as well as by fostering innovation to create new value. Whether the road to Smart Society 5.0 will bring more positive or negative effects depends primarily on us, our willingness, and our ability to adapt to future challenges.

Slovenia, through comprehensive support for Slovenian research and innovation stakeholders in the development of advanced digital technologies and solutions, by introducing and establishing reference solutions in collaboration with all social groups, both domestically and in the field of foreign policy, aims to pursue a trustworthy, human-centred approach based on human rights in the development and use of new and emerging technologies, as well as a vision for the future of digital development, with the goal of accelerating economic growth and social development. Based on this, we aim to establish Slovenia's recognition as a trustworthy partner in furthering the introduction and regulation of the data economy and artificial intelligence in society, in a human-centred and beneficial manner.

In this regard, both the green and digital transitions are at the top of the EU's political agenda, and their interaction will be of great importance for the future. The success of the green and digital transitions will also be crucial for achieving the United Nations' sustainable development goals.

On the road to Smart Society 5.0, we will adhere to the following principles:

Ethics and legislation

1. **Respect for ethics:** Utilising and enhancing current ethical codes to monitor and assess the consequences of data usage, artificial intelligence, and various technologies in the operation of Smart Society 5.0, with a focus on human beings and the environment. Establishing appropriate safeguards to protect public data as a public good⁴⁹ and to ensure the protection of human rights.

2. **Implementation of Legal Powers and Responsibilities:** Implementing effective data stewardship and management, ensuring their highest standards of protection, adhering to best practices, and respecting the relevant legislation. Ensuring promised confidentiality and providing adequate access to and use of data. Committing to openness by default, subject to the constraints imposed by the protection of intellectual

⁴⁸ From the book Society 5.0, A People-centric Super-smart Society, 2020. Available at: https://library.oapen.org/bitstream/handle/20.500.12657/41719/2020_Book_Society50.pdf?sequence=1#page=18.

⁴⁹ Law of Property Code. Available at: <http://www.pisrs.si/Pis.web/pregledPredpisa?id=ZAKO3242#>.

property, the protection of personal data, the security of persons, and the security of the state.

3. Promoting transparency: To gain public trust, it is necessary to adequately describe the purpose and use of data, artificial intelligence, and advanced digital technologies. To inform users appropriately, documenting processes and services in detail, striving for the greater accessibility of data on codes, service providers, and license owners in the context of promoting transparency, it makes sense to make data findable, accessible, interoperable, and usable, following principles to improve the findability, accessibility, interoperability, and reuse of digital assets⁵⁰

Data governance.

4. Ensuring data adequacy and accessibility: Establishing a cross-sectoral data access governance framework, ensuring trustworthy data, and ensuring appropriate standardisation and interoperability to facilitate sharing across data spaces.⁵¹ Ensuring that data is comprehensive, relevant, of good quality, accessible, usable, understandable, and available in a timely manner. Modern infrastructure for working with data should be ensured.

5. The reuse of existing data: Enabling the reuse of data through a centralised point, such as a national catalogue of datasets and application programming interface. In collaboration with stakeholders, it is necessary to determine which data needs to be opened for reuse and how to improve existing open data. Identifying which data is important for implementing policies and addressing broader societal challenges for the entire society. Regulating the use of appropriate licensing models for open access and use of data. Establishing a data laboratory for experimenting with the use of data with artificial intelligence and various technologies for the operation of Smart Society 5.0.

6. Proper planning for the future use of data: It is recommended to approach data modelling thoughtfully, considering the potential added value in data reuse and striving to collect data in the most granular form possible. The interoperability of data and service interoperability principles should be taken into account from the beginning of the planning process.

7. Ensuring responsiveness and improvement: Based on user feedback on data and services that utilise artificial intelligence and various technologies for the operation of Smart Society 5.0, efforts should be made to ensure continuous improvements and to promote collaboration with stakeholders and citizens.

Learning culture

8. Investing in a data culture: With the help of data owners and data stewards,⁵² it is necessary to raise awareness of the value of data reuse, to promote interdepartmental collaboration, and to nurture an appropriate data culture at all levels by investing in training and the development of data-driven approaches in both the public and private sectors.

9. Investing in human resource training: Ensuring education for the acquisition of relevant skills, promoting a culture of intergenerational collaboration and lifelong learning, and fostering collaboration among stakeholders, with an emphasis on the use of data, artificial intelligence, and various technologies for the operation of Smart Society 5.0.

10. Ensuring accountability improvements: It is important to review the use of data, artificial intelligence, and various technologies for the operation of Smart Society 5.0, and, based on these insights, implement the necessary changes or improvements.

⁵⁰ For more on the principles, see: <https://www.go-fair.org/fair-principles/>.

⁵¹ Staff Working Document on Data Spaces. Available at: <https://digital-strategy.ec.europa.eu/en/library/staff-working-document-data-spaces>.

⁵² Wanted: Data Stewards: (Re-)Defining the Roles and Responsibilities of Data Stewards for an Age of Data Collaboration. Available at: <https://medium.com/data-stewards-network/wanted-data-stewards-re-defining-the-roles-and-responsibilities-of-data-stewards-for-an-age-of-274c2d5f033a>.

The following are key highlights of the areas of data and data infrastructure, artificial intelligence, and smart cities and communities.

4.1 Data for the Benefit of Society

Data is crucial for economic growth, competitiveness, innovation, job creation, and social progress. Digital data is generated and collected in all the activities of our lives. It is created in the traditional way (e.g. document creation), during the digitalisation process (e.g. scanning), in smart products and devices, or in online services using web tools (e.g. one's digital footprint). The creation, integration, and utilisation of data to connect the physical and digital environment, including within the Internet of Things ecosystem, can enable the transformation of business processes, organisation and work methods, learning, and life itself, thereby profoundly changing the public and private sectors and society as a whole. Data-driven digital services can benefit citizens, businesses, cities, and local communities in many ways.

With them it is possible to improve healthcare, make transport systems safer and more efficient, reduce costs, and increase access to public services, improve energy efficiency, and contribute to important societal goals such as accountability, equity, and transparency. At the same time, their use can also create some undesirable effects on social relations (e.g. inequalities, social, religious, racial, and gender discrimination, and information bubbles), democratic standards, and human rights and freedoms (e.g. the violation of privacy).

In the latest OECD Open Government Data Maturity 2019 (the OURData Index⁵³), Slovenia ranked 10th among the countries in the world that have implemented an advanced open data policy in their systems, with a well-developed portal and mechanisms for national coordination.

Non-personal industrial data and public data should be made available for reuse as much as possible, thus ensuring the protection of legitimate public and private interests, personal data, critical infrastructure, trade secrets, etc. Freely accessible data should be made available to all stakeholders (public and private sectors, start-ups, NGOs, journalists, and academic and research communities). To this end, data governance structures should be developed, and quality reusable datasets should be made available in the form of "shared data spaces". The Data Governance Act⁵⁴ is also important for the EU's single market for data, and there is a legislative proposal for the reuse of data in business (the Data Act⁵⁵).

The central access point for metadata from the central catalogue and public sector open data is the national open data portal OPSI⁵⁶. The portal acts as a central catalogue of the country's databases and is also dedicated to publishing data in open and machine-readable formats.

⁵³ Open, Useful and Re-usable Data (OURdata) Index: 2019 – Policy Paper. Available at: <https://www.oecd.org/gov/digital-government/policy-paper-ourdata-index-2019.htm>.

⁵⁴ Regulation (EU) 2022/868 on European Data Governance. Available at: <https://eur-lex.europa.eu/legal-content/SL/TXT/HTML/?uri=CELEX:32022R0868&qid=1671823251550&from=EN>.

⁵⁵ Regulation on harmonized rules for fair access to and use of data. Available at: <https://eur-lex.europa.eu/legal-content/SL/TXT/HTML/?uri=CELEX:52022PC0068&qid=1671823366233&from=EN>.

⁵⁶ Open Data Slovenia (OPSI). Available at: <https://podatki.gov.si>.

The Directive on Open Data⁵⁷ also includes public infrastructure companies in the framework of data reuse and data opening. Where possible, it encourages the provision of dynamic, real-time data (high-value datasets to be made available free of charge by countries via an application programming interface). The Directive also requires the opening up of publicly funded research data.

Following the example of the public sector, it is appropriate to encourage the private sector to open up and share data where it makes sense and is appropriate to do so. In Slovenia, the first step of this kind was the establishment of the Open Data Hub of Slovenia (OPSI Hub), founded by Technology Park Ljubljana d.o.o. and the Chamber of Commerce and Industry of Slovenia (Association of Informatics and Telecommunications), with the support of the Ministry of Public Administration. The OPSI portal serves as a solid foundation for transparently presenting and making available datasets, including those from the private sector, under various conditions (such as different licenses and service level agreements). The goal is to facilitate voluntary public data disclosure by companies and accelerate the use of data as a raw material for the digital society.

The process of data opening by individual data-holding entities is the final phase of a broader data management process. In addition to the obligations regarding open data, the Public Information Access Act⁵⁸ imposes requirements on public institutions to maintain a metadata description⁵⁹ for each database, whether or not it contains publicly available data. Data governance includes privacy concerns (the anonymisation and pseudonymisation of data⁶⁰) and data quality in order to achieve the widest possible reuse. Following the example of the Handbook for Opening Public Sector Data⁶¹ (2016), it would therefore be advisable to draw up uniform data governance guidelines to standardise data governance rules in both the public and private sectors.

The creation of data spaces, as foreseen by the European Commission, will also allow the networking and sharing of best practices in public and private sector data management and across borders. In the longer term, the aim is to create a dynamic ecosystem of data, data standards, and tools, bringing together data providers, data analysts, and application developers to work in collaboration and partnership to develop applications that offer digital services in response to current societal challenges (e.g. the COVID-19 Tracker⁶²). The data ecosystem will need to identify data owners and custodians across all stakeholders, who will be the linchpin of the ecosystem, following the principles of collaboration and partnership. This would also enable innovation and entrepreneurship to flourish. Thus, we will also follow one of the objectives of the European Data Strategy, which aims to create a single data space in the European Union, consisting of a number of content-based data spaces.⁶³

The Digital Slovenia 2030 strategy identifies data as a strategic raw material and a driver of Smart Society 5.0 and underlines the importance of providing up-to-date, timely, and

⁵⁷ Directive on open data and the reuse of public sector information. Available at: <https://eur-lex.europa.eu/legal-content/SL/TXT/HTML/?uri=CELEX:32019L1024&from=EN>.

⁵⁸ Public Information Access Act. Available at: <http://pisrs.si/Pis.web/pregledPredpisa?id=ZAKO3336>.

⁵⁹ Metadata. Available at: <https://www.e-prostor.gov.si/metapodatki/>.

⁶⁰ The processing of personal data for scientific research purposes. Available at: <https://www.ip-rs.si/mnenja-gdpr/obdelava-osebnih-podatkov-v-znanstveno-raziskovalne-namene>.

⁶¹ Manual for the opening of public sector information. Available at: https://podatki.gov.si/sites/default/files/attachments/OPSI_Prirocnik_1_izdaja_junij_2016.pdf.

⁶² COVID-19 Tracker. Available at: <https://covid-19.sledilnik.org/sl/stats>.

⁶³ Staff Working Document on Data Spaces. Available at: <https://digital-strategy.ec.europa.eu/en/library/staff-working-document-data-spaces>.

comprehensive data. It also follows the European Data Strategy⁶⁴ and the regulations governing data. Among these, we would highlight the Open Data Directive, which has defined a set of high-value data in six thematic areas: geospatial data, Earth and environmental observation, meteorological data, statistics, business and business ownership, and mobility. The Data Strategy aims to facilitate data sharing and thus accelerate data use.

- We aim to accelerate economic growth and social development by providing comprehensive support to Slovenian research and innovation stakeholders in the development of advanced digital technologies and solutions, by introducing and establishing reference solutions in cooperation with all social groups in Slovenia, and by supporting the establishment of Slovenian stakeholders in the international environment.
- Data management structures need to be fine-tuned, and quality datasets need to be extended for reuse in the manner of common data spaces.
- Following the example of the public sector, it is appropriate to encourage the private sector to open up and share data where it makes sense and is appropriate to do so.
- Infrastructure investments based on sustainable, innovative business models should be supported. The mutual cooperation of decision-makers at the local and national levels and financial institutions is key to making investments happen.

4.2 The ecosystem of artificial intelligence and new technologies

Artificial intelligence (AI) is a general-purpose technology that, unlike other technologies, attempts to maximise the performance of activities that have until recently been limited to human capabilities and intelligence. In doing so, it has the immense potential to deliver benefits to individuals, society as a whole, and the environment. Systems using artificial intelligence methods make it possible to find new answers and solutions in fields ranging from medicine, transport, engineering, finance, insurance, communication, and entertainment to judicial procedures and military activities.

Slovenia is very ambitious in the field of artificial intelligence and has joined the EU initiative to coordinate all support activities in this field by signing the EU Declaration of Cooperation on Artificial Intelligence. It draws on more than 40 years of experience in AI research and education and has a relatively large number of specifically trained AI experts relative to its population who can be involved in research, development, and the deployment of AI in society through targeted and smart support mechanisms. This will create a comprehensive innovation ecosystem and trigger a spiral of supply and demand in selected key sectors of the national economy, in non-economic activities, and in government, and will also offer these ecosystem solutions as reference activities in the international environment. While Slovenia is large enough to have the interdisciplinary knowledge needed to understand and solve the problems of AI deployment in selected segments of society, it is also small enough that such projects, although comprehensive, remain manageable as regards time and within the limited resources available.

Key to this is an understanding of the broader role of AI in future society and the concept of human coexistence with AI systems. Slovenia is committed to AI as a tool that should be useful primarily to people in order to ensure their quality of life, and thus joins the EU Member States with a vision of the human-centric development and deployment of AI for the benefit of people and society. To this end, it is crucial to ensure that AI is embraced

⁶⁴ European Data Strategy. Available at: <https://eur-lex.europa.eu/legal-content/SL/TXT/PDF/?uri=CELEX:52020DC0066&from=SL>.

by the public, and this must be based on confidence that the deployment of AI will indeed have a positive impact on the lives of individuals and society as a whole. This requires the provision of an appropriate legal and ethical framework that preserves and guarantees the acquisition of and continued respect for human rights and fundamental freedoms, and thus the personal, civil, political, economic, and social rights of each individual.

The strategic vision and orientations for AI and the link to EU policies, orientations, and support measures (the Coordinated Plan on AI⁶⁵) are further defined in the National Programme to Promote the Development and Use of Artificial Intelligence in the Republic of Slovenia by 2025⁶⁶ (hereafter: NpAI).

With the Digital Slovenia 2030 strategy, we want to build on more than 40 years of research achievements in the field of artificial intelligence in Slovenia and become internationally recognised for our competence in transferring knowledge and cutting-edge, ethical, and secure technologies in the field of artificial intelligence into human-friendly and trustworthy services and products while ensuring the national cultural identity.

In addition to artificial intelligence, the use of other new technologies for which data is a key raw material will be key to achieving the transformation towards Smart Society 5.0. Current applications include blockchain, enhanced reality, virtual reality, augmented reality, the metaverse, the Internet of Things, Big Data, data mining, machine learning, and digital twins. It will be important to follow the trends in this field and to ensure that the latest technologies are transferred and used as quickly as possible in the Slovenian environment.

- Slovenia is committed to AI as a tool that should be useful primarily to ensure the quality of people's lives and thus joins EU Member States with a vision of human-centric development and the deployment of AI for the benefit of people and society.
- The key is to ensure that AI is embraced by the public, and this must be based on confidence that the deployment of AI will actually have a positive impact on the lives of individuals and society as a whole.
- An appropriate legal and ethical framework must be put in place to preserve and guarantee the acquisition of and continued respect for human rights and fundamental freedoms, and thus the personal, civil, political, economic, and social rights of everyone.

4.3 Smart cities and communities

Cities and communities are becoming the starting points for the digital transformation of society as a whole. A smart city or community is able to manage resources efficiently to meet social, economic, and environmental needs for the benefit of its citizens. Addressing these areas ensures that cities and communities are sustainable. At the heart of digital transformation is the human being. The digitalisation of cities and communities is leading the way to a complex transformation involving social, economic, urban, mobile, educational, technological, and cultural change.

⁶⁵ Coordinated Plan for AI, COM(2018) 795, https://eur-lex.europa.eu/resource.html?uri=cellar:22ee84bb-fa04-11e8-a96d-01aa75ed71a1.0015.02/DOC_1&format=PDF.

⁶⁶ National Programme to Promote the Development and Use of Artificial Intelligence in the Republic of Slovenia by 2025 (NpAI). Available at: <https://www.gov.si/assets/ministrstva/MJU/DID/NpUI-SI-2025.docx>.

A smart city or community addresses four key elements: digital infrastructure, social challenges, technological challenges, and governance.

Digital infrastructure provides the foundation for building a smart city or community. Fostering the development of business-friendly ecosystems for investment in smart physical infrastructure, such as broadband networks (fixed very high-capacity networks, 4G, and 5G), is key. Sensor networks provide data sources for smart and sustainable governance. Co-development spaces (e.g. Fab Labs) enable innovation and experimentation at the local/regional level, bring cities and communities together, and allow strategic partnerships to form. Infrastructure investments based on sustainable, innovative business models should be supported. The interaction between local and national decision-makers and financial institutions, e.g. development agencies, banks, private investors, financial institutions, NGOs, etc., is crucial for the implementation of investments.

Technological challenges in the local environment can be addressed through access to data and advanced digital technologies. Cities and communities should be encouraged to adopt a systematic approach, as the unsystematic deployment of digital technologies can greatly reduce the potential to reap benefits from the outset based on connectivity, openness, and accessibility, the use of standard solutions, interoperability rules, Big Data analytics, and the sharing of digital infrastructure.

The goal of deploying smart cities and communities must be based on the management of integrated entities, going beyond silo governance. System solutions, platforms, and solutions based on common data models, unified standards, open data, and real-time data are needed. This increases cost efficiency, transparency, and accountability. At the same time, it can be a good example for SMEs to embark on the digitalisation journey. This data is the basis for experimentation and innovation to develop new solutions.

We need skilled staff to tackle the technological challenges outlined above. Developing the right human resources takes several years, so a long-term approach and the right environment are needed. Local companies need to be developed to retain local talent and attract global talent. Local governments should be encouraged to join national activities to improve digital competences.

Effective governance of smart cities and communities requires systemic integration at the national level. Integrated planning and management in relation to the local/regional environment is also key. Strategic guidance for the digital transformation and further development of cities and communities should be based on long-term development strategies and partnerships, which should allow for seamless cooperation between key stakeholders, e.g. between local communities, researchers, business, and value chains at the local level, and in alliances between geographically or interest-related municipalities.

Smart cities are cross-ministerial, so cooperation between the relevant ministries will be key. In practice, this means that further funding for the deployment of smart city technology solutions needs to be arranged, where it is important to continue opening up data, setting up platforms and solutions in specific smart city and community verticals, and building human capacity at the local level.

- Cities and communities need to be encouraged to take a systematic approach to digital transformation. The goal of deploying smart cities and communities must be based on the governance of integrated entities, moving beyond silo

governance. System solutions, platforms, and solutions based on common data models, unified standards, open data, and real-time data are needed.

- Adequate training for local authority staff is important.
- Effective governance of smart cities and communities requires systemic integration at the national level.



Objectives:

- To deploy digital technologies and innovative services and products based on the creation of a data infrastructure and open access to public data, for the development of the economy, civil society, and the public sector, including public administration
- To accelerate the use of artificial intelligence and other advanced technologies in priority areas (security, health, medicine, and social care, industry 4.0 and robotics, language technologies, cultural identity, cultural heritage and arts research, digital public administration services, sustainable food production and the environment, and spatial planning)
- To accelerate the development of smart cities and communities that are in line with our values and for the benefit of the individual, the wider society, and the environment

Indicators:

	2022	2025	2030
Number of staff who have received at least one training course in data (analytics, data mining, etc.)	50	1,500	5,000
Number of data custodians	2	50	150
Implementation of the measures contained in the IEAP	0%	50%	100%
Local DESI ⁶⁷	23.44	28	35

5. DIGITAL PUBLIC SERVICES

In December 2022, the Government of the Republic of Slovenia adopted the Digital Public Services Strategy 2030⁶⁸, whose vision is that citizen- and business-centric digital public services will enable citizens and businesses to interact with public administrations in an integrated, coordinated, secure, and efficient way.

The digitalisation of public services is one of the key elements of Slovenia's digital transformation by 2030. The experience of the pandemic has shown the urgent need to digitalise all areas, including public administration, as a digital public administration is a prerequisite for the efficient delivery of services to its users (citizens, businesses, municipalities, schools, etc.) in times of emergency and in normal situations, which contributes to a better quality of life.

The Digital Public Services Strategy sets out a clear direction for the development of digital public services, putting people and businesses at the heart of digital

⁶⁷ The Local DESI is a composite index of the digital economy and society at the municipal level, made up of different indicators that reflect the state of four dimensions in each municipality, based on available data: human capital, connectivity, the integration of digital technologies, and digital public services. The indicator reflects the calculated average of all 212 municipalities for 2022 and the growth target for 2025 and 2030.

⁶⁸ Digital Public Services Strategy. Available at: <https://nio.gov.si/nio/asset/strategija+digital+public+services?lang=en>.

transformation. Simple services must be enabled, and their widespread use must be encouraged. This requires a single digital identity, the efficient use of modern IT and infrastructure, and a digitally empowered public sector. Our ambitious goals will be achieved through processes involving the co-creation of public services in cooperation with all stakeholders, more active integration of local government services, the promotion of digital services and highlighting the benefits of using them, as well by ensuring the security of users' data.

The Digital Public Services Strategy covers all digital public services provided to users by public administration providers (the central government, municipal administrations, and public authority holders) and providers from the wider public sector.

The Strategy is an umbrella document that guides digital public service providers to develop actions in line with its contents included in the action plan for the implementation of the Strategy, at national, regional, and local levels.

- Citizen- and business-focused digital public services should enable citizens and businesses to interact with public administrations in an integrated, coordinated, secure, and efficient manner.
- Simple services must be developed, and their widespread use must be encouraged. This requires a single digital identity, the efficient use of modern IT and infrastructure, and a digitally empowered public sector.



Objectives:

Three strategic priorities for digitalizing public services have been identified, which represent digital objectives at the highest level and are also aligned with the strategic context of the European Union:

1. **By 2030, all key⁶⁹ public services will be provided online and be accessible to all users.**
2. **At least 80% of key public services that are digitally accessible will be also performed digitally.**
3. **At least 80% of users of public services will use their digital identity.**

Indicators:

	2022	2025	2030
Key public services provided online and accessible to all users	79%	85%	100%
Key public services that are digitally accessed will also be performed digitally	no data	15%	80%
Percentage of users of public services using their digital identity	30%	40%	80%

The strategic priorities are translated into five strategic objectives that will help us achieve the priorities. The five strategic objectives are linked to 23 carefully designed, specific objectives. Each of them has concrete steps defined in an action plan. The action

⁶⁹ The set of key public services is taken from the EU policy programme Path to the Digital Decade

plan will be updated every two years to reflect current actions and take stock of actions already implemented.

Strategic priorities	I. 100% key public services are provided online and accessible to all		II. At least 80% key public services, that are accessible digitally, are also performed digitally		III. At least 80% of users of public services use their digital identity
Strategic objectives	1. An efficient and secure environment for the delivery of digital services is ensured	2. All digital services are co-created with users and user centric.	3. Widespread use of digital identification solutions	4. Modern information technology for trusted data management	5. Public administration is interoperable and digitally empowered
Specific objectives	1A All key public services are digitally accessible	2A Digital services are co-created with users	3A User-friendly solutions for digital identification	4A Modern information technology	5A Digitally equipped employees in the public sector
	1B Harmonising access to digital services	2B Digital services are simple to use	3B Single service for user identification and signing	4B Management processes have been put in place for trusted data	5B Use of advanced tools and data for effective management and decision-making
	1C Access to the contents and use of your own personal data	2C Systematic monitoring of the performance of digital services	3C Ensuring modern and user-friendly trust services	4C Establishing national and cross-border data interoperability	5C Interoperability, optimisation, and digitalisation of processes
	1D Communication between service users and public administration is digital	2D Digital services promotion, trainings, and support for users		4D Data catalogue and the introduction of data processing standards	5D The legal and organisational framework supporting the deployment and use of digital services
	1E Introduction of combined digital services	2E Digital services are inclusive for all users		4E Setting up public administration data spaces	5E Organisation and management adaptations

Figure 1: Graphical representation of the strategy structure.⁷⁰

The strategic objectives are as follows:

An efficient and secure environment for the delivery of digital services is ensured

- the aim of which is to build an environment in which digital public services can be developed and deployed. It addresses the need to digitalise key public services, to harmonise access to digital services, to allow users to see the content and use of their data across the whole cross-section of records, regardless of the body managing the records, to communicate with users digitally and to introduce combined digital services.

All digital services are co-created and user-centric - this objective underlines the need to co-create digital services with their users, to make services simple, to monitor the performance of digital services, to systematically measure user satisfaction, to promote, train and support users, and to involve everyone in the use of digital services.

Widespread use of digital identification solutions - a single digital identification of users when using services is a prerequisite for the mass use of services. The objectives are therefore defined as user-friendly digital identification solutions, cross-border interoperability, a single service for user identification and electronic signatures, and the provision of modern and user-friendly trust services.

Modern IT for trusted data management - the objective aims at providing modern IT infrastructure and governance processes for trusted data, establishing interoperability of data between institutions and across borders, upgrading the catalogue of databases and introducing standards for data processing, and establishing data spaces.

An interoperable and digitally empowered public administration - the objective addresses the conditions on the part of the state that need to be met for the successful digitalisation of public services - public sector employees need to be digitally equipped, trained to use innovative methods, aware of the importance of quality of performance, using advanced tools and methods and data to enable effective management and decision-making, business processes must be optimised and integrated into the digital environment at the same time as they are digitalised; legislation must be developed in a digital business environment and must also support the introduction and use of digital services in terms of content, in a way that does not hinder the continuous progress of digital solutions and distances itself from the regulation of technological and technical issues that are not normative.

⁷⁰ Digital Public Services Strategy. Available at: <https://nio.gov.si/nio/asset/strategija+digital+public+services?lang=en>.

6. CYBERSECURITY

In today's world, the uninterrupted operation of information and communication systems and networks is essential for the normal functioning of society and the economy. The ever-faster development of ICT is providing benefits to modern society while at the same time impacting the emergence of new and increasingly sophisticated technological cyber threats. There is a growing trend towards using ICT as a hybrid tool to operate in all domains of hybrid action, with the aim of influencing the state, political decision-makers, and society to achieve political, economic, and/or military dominance. There is no doubt that cyberattacks are one of the most important security threats to the modern world, and this has contributed to cybersecurity becoming an important and integral part of the national security of states some time ago.

With the adoption of the first Cybersecurity Strategy in 2016, the Republic of Slovenia has a basis for strengthening the national information and cybersecurity assurance system and its systemic regulation. The Information Security Act (ZInfV) was adopted in 2018 and its amendment (ZInfV-A) in 2021. The ZInfV, which transposed Directive (EU) 2016/1148 on measures for a high common level of network and information system security in the Union into the national legal framework, regulates the field of information security and measures to achieve a high level of network and information system security in the Republic of Slovenia, which are crucial for the smooth functioning of the state in all security situations and provide essential services for the preservation of key social and economic activities in the Republic of Slovenia. It establishes minimum security and incident notification requirements for its obligated parties. It also regulates the competences, tasks, organisation, and functioning of the competent national information security authority, the single contact point for information security, the national CSIRT, and the CSIRT of public administration bodies. The newly established Government Information Security Office of the Republic of Slovenia (hereinafter: URSIV) became the competent national authority for information security and the single point of contact for international cooperation in the field of information security. The role of the national CSIRT was taken over by the SI-CERT incident response centre at the Academic and Research Network of Slovenia (ARNES), while the role of the CSIRT of public administration bodies was taken over by the SIGOV-CERT incident response centre within the URSIV. This is a key step towards achieving one of the strategic objectives, i.e. the strengthening and systemic regulation of the national cybersecurity assurance system. In addition, the operational capacities of the Security and Operations Centres of the Ministry of Defence, the Ministry of Public Administration, the Police, and the Slovenian Intelligence and Security Agency have been progressively strengthened.

By adopting the Resolution on the National Security Strategy of the Republic of Slovenia (ReSNV-2)⁷¹ in September 2019, the National Assembly of the Republic of Slovenia committed all key actors to continuously adapting and upgrading resources, mechanisms, and processes at the strategic and implementation levels in order to ensure the effective functioning of the national cybersecurity and defence system. The ReSNV-2 identifies the threat to the National Information and Communication Infrastructure and the Critical Information and Communication Infrastructure⁷² and the data within them, cyberattacks and intrusions, cyberespionage, intellectual property theft, the spread of disinformation, cybercrime and terrorism, and other forms as a key threat, which can have a significant negative cross-cutting impact on the economy and

⁷¹ Resolution on the National Security Strategy of the Republic of Slovenia. Available at: <http://www.pisrs.si/Pis.web/pregledPredpisa?id=RESO124>.

⁷² In the 2017 Critical Infrastructure Act, this is the Information and Communication Networks and Systems Division. Available at: <http://www.pisrs.si/Pis.web/pregledPredpisa?id=ZAKO7106#>.

financial system, the functioning of the political system and the international reputation of the country, the functioning of critical infrastructure, public safety, defence capability, the security of citizens, the provision of the basic necessities of life, and the functioning of the system for protection against natural and other disasters.

In addition, a number of documents have been adopted at the European Union level, both strategic, such as the EU's Cybersecurity Strategy for the Digital Decade⁷³, and binding, such as Directive (EU) 2022/2555 on measures for a high common level of cybersecurity across the Union⁷⁴, the Cybersecurity Act⁷⁵, and the emerging Cyber Resilience Act⁷⁶. A regulation establishing a European Cybersecurity Industrial, Technology and Research Competence Centre and a Network of National Coordination Centres⁷⁷ was also adopted, establishing a Competence Centre in Bucharest, Romania. The role of the National Coordination Centre in Slovenia will be assumed by the Government Information Security Office.

We want to ensure a safe, resilient, and secure cyberspace for all, thereby improving cybersecurity in the Republic of Slovenia in all segments of society.

The above is also the starting point for the development of a new cybersecurity strategy.



The cybersecurity goal of Digital Slovenia 2030 cybersecurity is to rank Slovenia among the top 20 countries in the National Cybersecurity Index by 2027. The global goal includes the following objectives and the measures and activities to achieve them:

1. **Developed security incident response plans**, including a revamp of the National Cyber Incident Response Plan
2. **Strengthened security incident response capabilities and notification mechanisms**, including the strengthening of cybersecurity response centres and the establishment of a single platform for security incident notification, analysis, and information sharing capabilities
3. **A high level of resilience to cyberthreats for entities essential for the security and continuous operation of the state and society**, including strengthening the resilience to cyberthreats of critical infrastructure operators, operators of essential services, digital service providers, and public administrations
4. **A high level of public awareness of cybersecurity**, which includes raising public awareness by introducing cybersecurity topics into the curricula of primary and secondary schools and by carrying out awareness-raising programmes for different target groups
5. **Continuous human resources development in the field of cybersecurity**, including the establishment of a network of secondary schools to integrate cybersecurity content into their curricula and to carry out complementary

⁷³ An EU's Cybersecurity Strategy for the Digital Decade. Available at: <https://eur-lex.europa.eu/legal-content/SL/TXT/PDF/?uri=CELEX:52020JC0018&from=EN>.

⁷⁴ Directive on measures for a high common level of cybersecurity across the Union. Available at: <https://eur-lex.europa.eu/legal-content/SL/TXT/PDF/?uri=CELEX:32022L2555&qid=1672908543697&from=en>.

⁷⁵ Regulation on the European Union Agency for Cyber Security (ENISA) and on information and communications technology cybersecurity certification. Available at: <https://eur-lex.europa.eu/legal-content/SL/TXT/PDF/?uri=CELEX:32019R0881&from=sl>.

⁷⁶ Regulation on horizontal cybersecurity requirements for products with digital elements. Available at: <https://eur-lex.europa.eu/legal-content/SL/TXT/?uri=CELEX:52022PC0454>.

⁷⁷ Regulation establishing a European Cybersecurity Industrial, Technological and Research Competence Centre and a Network of National Coordination Centres. Available at: <https://eur-lex.europa.eu/legal-content/SL/ALL/?uri=CELEX:32021R0887>.

cybersecurity activities, and a network of faculties to develop new college and university degree programmes in the field of cybersecurity, the training of experts, and the conduct of national and international cybersecurity exercises

6. **Strengthened cybercrime and cybersecurity capabilities**, including the establishment of cybercrime suppression and cyber defence capabilities
7. **The launching of R&D in cybersecurity**, including promoting cybersecurity research, development, innovation, and cooperation to better connect education, research, and development organisations and industry
8. **The use of cybersecurity standards and certification**, which includes the promotion of greater use of cybersecurity standards and certification
9. **Established international cooperation on cybersecurity**, which includes strengthening global security through bilateral and multilateral cooperation in the field of cybersecurity
10. **Strengthened cybersecurity in the economy**, which includes supporting activities to help organisations and companies improve their cybersecurity

Cooperation between stakeholders in the cybersecurity system, which includes fostering better cooperation between stakeholders in the national cybersecurity system in order to optimise the use of scarce resources, including through cooperation with the private sector.

The actions and indicators for achieving the objectives will be detailed in the Cybersecurity Strategy and the Action Plan for its implementation.

RELATED CONTENT

Digital transformation is indisputably linked to climate change in all its aspects. In designing development policies for digital transformation, special attention must therefore also be devoted to reducing risks and protecting the health and well-being of citizens from the dangers that will arise from a changing environment and its impacts. In order to tackle the causes of climate change and prevent its consequences, thinking about digital transformation must therefore focus on sustainable and green development, which is also one of the fundamental orientations at the EU level.

In addition, the supporting environment should not be overlooked among the related content. The rapid development of digital technologies and the lack of adequate digital skills require adequate support from actors who are familiar with digital technologies. This is where companies, municipalities, representatives of society, and others can find guidance, information, new skills, or the opportunity to try out digital technologies.

7. GREEN TRANSITION

The way society works today, the natural environment is severely overstressed in much of the world, especially in Europe and thus also in Slovenia. Climate change and the associated extreme heat, floods and droughts, water scarcity, and forest fires are having a major impact on individuals, the economy, and society as a whole. Without slowing down and adapting our lifestyles, we can expect huge negative consequences in many areas, including human health and labour productivity. The transition to low carbon and circularity (the green transition) is therefore very important.

In the European Cohesion Policy programming period 2021–2027, the upgraded Smart Specialisation Strategy for Slovenia also sets as an objective a green transition, which is understood as the innovative, low-carbon, digital, and knowledge-based transformation of the economy and society.

There can be no effective green transition without a digital transition. In fact, successful digital transformation provides important support for smart planning and the implementation of the green transition, which is why green transition planning is a double transition.⁷⁸

The European Green Deal aims to transform the EU into a fair and prosperous society with a modern, competitive, and resource-efficient economy that produces no net greenhouse gas emissions by 2050 and decouples growth from resource use. A green digital transformation can play a central role in achieving this ambitious goal.

The Digital Agenda for Europe states that the use of digital technologies will help meet the objectives of the European Green Deal while reducing the digital sector's carbon footprint, which has been growing steadily in recent years. This illustrates one of the most important characteristics and challenges of the ICT industry, which is characterised by its dual role: it contributes to environmental protection but also has a major impact on environmental degradation.

⁷⁸ The twin green & digital transition: How sustainable digital technologies could enable a carbon-neutral EU by 2050. Available at: https://joint-research-centre.ec.europa.eu/jrc-news/twin-green-digital-transition-how-sustainable-digital-technologies-could-enable-carbon-neutral-eu-2022-06-29_en.

The Institute of Macroeconomic Analysis and Development⁷⁹ points out that the acquisition of green skills is crucial for a successful green transition, enabling employees in all sectors and professions to reduce the negative impact of their activities on the environment as well as the acquisition of technical skills related to green technologies.

Artificial intelligence and Big Data (the environmental data space) are key levers for identifying and predicting climate change and for designing policies and mitigation actions. They can also contribute to reducing pollution, optimising energy and resource efficiency, developing a circular economy, promoting precision farming, and helping to combat biodiversity loss. To this end, common standardised and interoperable data spaces will be set up at the European level, which will be used to develop data analysis models and energy-efficient solutions based on artificial intelligence. This will include the creation of an accurate digital model of the Earth to monitor and simulate natural and human activity, which will be carried out under the Destination Earth initiative.

8. A SUPPORTIVE ENVIRONMENT

A supportive environment is crucial for the successful realisation of digital transformation in society, business, and public administration. This is particularly crucial for entities that have less contact with and fewer opportunities to learn about and adopt digital technologies and to recognise the benefits that such technologies can bring to their daily lives.

The strategic basis for a supportive environment is already identified in the Slovenian Development Strategy 2030⁸⁰, which states the need for an effective supportive environment in order for Slovenia to achieve its goals. The need for support services to enable the use of digital technologies is also mentioned in Digital Slovenia 2020⁸¹. The need to create a support ecosystem, including hubs, strategic development and innovation partnerships, testing platforms, and sectoral integration, was also identified in the Slovenian Smart Specialisation Strategy S4 and is identified in the Slovenian Smart Specialisation Strategy S5.

The European Commission also stresses the need to provide adequate support to entities on the digital transformation journey and sees an important role for European Digital Innovation Hubs after 2020 (Digital Agenda for Europe, European Digital Innovation Hub and Digital Europe Programme⁸², the European Digital Education Hub⁸³, and the Digital Education Action Plan (2021–2027)⁸⁴). It stresses the importance of proximity to the user and identifies key tasks: pre-investment testing environments, skills and training, investor matching support, and an innovation ecosystem and networking.

⁷⁹ Institute of Macroeconomic Analysis and Development: Productivity Report 2021. Available at: https://www.Institute_of_Macroeconomic_Analysis_and_Development.gov.si/publikacije/porocilo-o-produktivnosti/publikacija/news/porocilo-o-produktivnosti-2021/?tx_news_pi1%5Bcontroller%5D=News&tx_news_pi1%5Baction%5D=detail&cHash=1f3ca4793e80e144f1bd22b6726496ef.

⁸⁰ Slovenian Development Strategy 2030. Available at: https://www.gov.si/assets/vladne-sluzbe/SVRK/Strategija-razvoja-Slovenije-2030/Strategija_razvoja_Slovenije_2030.pdf.

⁸¹ Digital Slovenia 2020 Strategy. Available at: <https://www.gov.si/assets/ministrstva/MJU/DID/Strategija-razvoja-informacijske-druzbe-2020.pdf>.

⁸² European Digital Innovation Hubs and the Digital Europe Programme. Available at: https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=70324.

⁸³ European Digital Education Hub. Available at: <https://education.ec.europa.eu/sl/focus-topics/digital-education/action-plan/action-14-european-digital-education-hub>.

⁸⁴ Digital Education Action Plan (2021–2027). Available at: <https://education.ec.europa.eu/sl/focus-topics/digital-education/action-plan>.

The Digital Single Market and the Digital Innovation Hubs Network also make a similar point.⁸⁵ The European Digital Innovation Hubs Network brings together and connects entities in this field. The need for a coordinated ecosystem of excellence, including training, testing centres, and others, is also covered in the White Paper on Artificial Intelligence.⁸⁶

The new Cohesion Policy 2021–2027 is about developing a smarter, greener, more inclusive, and more connected Europe. To accelerate EU competitiveness and build stronger innovation models, national and regional support ecosystems need to be empowered to integrate digital technologies.

Support can be provided by digital innovation hubs, chambers, civil society representatives, and supportive environment actors that already have the relevant knowledge and infrastructure in the digital field and will provide access to government, local representatives, businesses, institutions, civil society, and other target groups.

A key role of such an ecosystem is to ensure the acquisition and upgrading of digital competences in the adoption of digital technologies and to be familiar with new business models and approaches that use digital technologies to simplify day-to-day business and activities. They will also be tasked with raising awareness, carrying out promotional activities on the use of digital technology solutions, their benefits and safe use, and bringing together the widest range of stakeholders to ensure comprehensive inclusion, the transfer of knowledge and good practices, and international networking.

⁸⁵ The Digital Single Market, available at: <https://www.europarl.europa.eu/factsheets/sl/sheet/43/vsesplosno-razsirjen-digitalni-enotni-trg>, and the Digital Innovation Hubs Network, available at: <https://european-digital-innovation-hubs.ec.europa.eu/home>.

⁸⁶ White Paper on Artificial Intelligence – A European Approach to Excellence and Trust. Available at: <https://op.europa.eu/sl/publication-detail/-/publication/aace9398-594d-11ea-8b81-01aa75ed71a1>.

NEXT STEPS

Digital Slovenia 2030 sets the vision and goals for the digital transformation of Slovenia in the wider society. Social progress and development provide guidelines for the further and necessary development of society, which must keep pace with global developments and trends.

Stakeholder involvement and long-term cooperation are essential to achieving our goals. To this end, the proposed governance model will be used to bring together ministries and other stakeholders in the field of digital transformation and to enable regular communication between them on the topic of digital transformation in Slovenia, while at the same time allowing development funding to be allocated appropriately to the relevant content.

This strategy aims to bring stakeholders together in a common, systemic approach to digital transformation. In doing so, we are delivering on our commitments in the European Union, strengthening the country's competitiveness, and enabling the benefits of digital technologies to be fully realised in Slovenia.

The Strategy sets the path, and all the steps have been and will continue to be followed by sectoral documents, strategies, programmes, and action plans, which will define in more detail each specific area and the actions that will enable the objectives to be achieved.

The Action Plan will be adopted within a year at the latest after the adoption of the Digital Slovenia 2030 strategy. It will set out the path (annual values) towards achieving the objectives set out in the strategy, with indicators. It will identify the actions and their expected impact on the achievement of the objectives, the planned public financial resources for this purpose, and the human resources to carry out these tasks.

In 2026, the ministry responsible for digital transformation will carry out a mid-term review of the achievement of the objectives and indicators set out in this strategy, after which the content of the strategy may be revised if necessary. The changes will be approved by a decision of the Government of the Republic of Slovenia.

It is important to add that the effectiveness of the implementation and evaluation of the strategy and the search for opportunities for further improvement will also be examined by the European Commission, which will monitor the national project programmes of EU Member States and advise them, where necessary, on how to take action to make more visible progress towards the objectives set.

A common path is the only way forward for effective digital transformation in an ever more quickly changing society!

ANNEXES

Annex 1

Analysis of strengths, weaknesses, opportunities, and threats (SWOT analysis)

Annex 2

Digital Slovenia 2020 – a brief overview of implementation

Annex 3

Overview of objectives and indicators

Annex 4

Strategic positioning

ANNEX 1: ANALYSIS OF STRENGTHS, WEAKNESSES, OPPORTUNITIES, AND THREATS (SWOT ANALYSIS)

The SWOT analysis was prepared as part of the activities of the project group for the preparation of the Digital Slovenia 2030 strategy.

STRENGTHS	WEAKNESSES
<p>Gigabit infrastructure</p> <ul style="list-style-type: none"> • A competitive electronic communications market • A well-developed, high-performance electronic communications infrastructure: fixed, very high-capacity networks • A well-developed mobile communications infrastructure, suitable for the further development and deployment of 5G networks <p>Digital competences and inclusion</p> <ul style="list-style-type: none"> • Wide access to and supply of formal and non-formal education • Good results of previous preventive measures for the safe use of the Internet (awareness-raising programmes) • Experience in the advanced use of ICT in education <p>Digital transformation of the economy</p> <ul style="list-style-type: none"> • A well-trained and agile digital economy • Successful integration of digital technologies into business processes (in this DESI area, we are in the top half of EU Member States, in 8th place in 2021) • Measures for the digital transformation of businesses and the integration of advanced digital technologies have been consistently implemented over the last five years through calls and support instruments (demo pilots II and III, the digital transformation of the economy, research, development, and innovation) and are already showing results in terms of the increased productivity and efficiency of businesses and the economy <p>The road to Smart Society 5.0</p> <ul style="list-style-type: none"> • A good starting point for the development and use of artificial intelligence, the data economy, the Internet of Things, quantum computing, and blockchain • A public sector data catalogue launched • High maturity in opening up public sector data • More than 40 years of experience in AI research and education • A relatively high number of specifically trained AI professionals, given the size of the population 	<p>Gigabit infrastructure</p> <ul style="list-style-type: none"> • The high cost of building high-capacity broadband infrastructure in white spaces <p>Digital competences and inclusion</p> <ul style="list-style-type: none"> • Geographic, age, and other types of digital divides in the supply and use of digital services • A lack of digital literacy in the population • The compulsory education curriculum does not include computing and informatics for all <p>Digital transformation of the economy</p> <ul style="list-style-type: none"> • Few high-tech companies • Low levels of early entrepreneurial activity and a lack of adaptation of incentive measures to the specificities of digital technologies and the Internet • A lack of appropriate experts in specific areas of digital transformation and ICT <p>The road to Smart Society 5.0</p> <ul style="list-style-type: none"> • Slovenia is lagging behind in investment, both in ICT equipment and in software and databases. • Traditional IT companies are slow to embrace digital transformation through the introduction and integration of advanced digital technologies. • Digital intensity is relatively low, especially in small and medium-sized enterprises, as we are in the group of countries with a low Digital Intensity Index. • Low levels of digital and data literacy • Data management is not organised in a systematic way. • There is no detailed data management strategy. • A low level of use of artificial intelligence and new technologies • Low uptake of smart city and community technologies <p>Digital public services</p> <ul style="list-style-type: none"> • A lack of awareness among authorities of the benefits of digital business • Siloed action by ministries and bodies in digitalising content under their responsibility • Some IT systems are separated and poorly compatible.

<ul style="list-style-type: none"> • Awareness of the rapid advances in artificial intelligence and massive datasets (data warehouses) • Protection and safeguarding of personal, sensitive, confidential, and business data • High awareness of the importance of smart cities and communities • Involvement in international cooperation in research and development projects in the field of digital technologies <p>Digital public services</p> <ul style="list-style-type: none"> • Centralised registers • IT is fairly developed and centralised. • Experience in the development of e-services, central building blocks, data management, and various pilot projects (eGovernment, Slovenia Business Point, Pladenj, Skrinja, Electronic Procedures Core, OPSI, the National Interoperability Framework, Big Data, EU cross-border e-services) • Central Communications Network (HKOM), Data Centre, and the National Trust Service Authority (SI-trust) • Access to EU funding for development projects • Good system starting points (IT Development Council, IT Solution Development Guidelines, and Procurement Guidelines for the Procurement of IT Services and Products) • Alignment of systems with EU legislation (Personal Data Protection Act – GDPR, web accessibility, Public Information Access Act – open data) • The Digital Public Services Strategy 2030 has been adopted. <p>Cybersecurity</p> <ul style="list-style-type: none"> • Systemic regulation in the area of cybersecurity, with an established competent national authority (the Government Information Security Office) at the strategic level and established national and government CSIRTs and security operations centres in individual organisations in the public and private sectors at the operational level • Improvement in the level of cybersecurity following the adoption of the Information Security Act (ISA), due to additional security requirements for obliged parties under the Act and an increase in the general visibility of the cybersecurity assurance field. 	<ul style="list-style-type: none"> • A lack of awareness and poorly thought-out legislation • Staffing and financial shortfalls to develop and maintain IT solutions and infrastructure • Inadequate human resource policies and pay systems for young IT professionals (average age over 50) • There is no digital regulation or law on the digitalisation of the civil service. • A focus on programmes, less on data and end-user needs • Too little strategic thinking and too much operational thinking • No operational levers: ITD Council, coordination with line ministries, finance • Digitalisation without prior process optimisation and the involvement of end users in the design of e-services • Slow centralisation of the digitalisation of public administration using cloud computing technology <p>Cybersecurity</p> <ul style="list-style-type: none"> • Significant staffing and technology shortages in bodies and organisations at both strategic and operational levels of the system • There is no systemic regulation of cybersecurity education at all levels of the education system, few cybersecurity courses and study programmes at Slovenian universities, and, consequently, few future cybersecurity professionals. • There is a large mismatch between the presence of and demand for cybersecurity professionals in all segments of society. • There is still insufficient awareness of the importance of ensuring a high level of cybersecurity.
OPPORTUNITIES	THREATS
Gigabit infrastructure	Gigabit infrastructure

<ul style="list-style-type: none"> • Reducing the cost of building digital communications infrastructure by working with the various public utility infrastructure providers <p>Digital competences and inclusion</p> <ul style="list-style-type: none"> • Digitalising education and research, culture, and media. Increased production of digital media content • Adapting formal education to the new generations by systematically integrating digital content and services • Improving advanced digital skills by integrating digital competence programmes into primary and secondary school curricula • Improving digital and media literacy through lifelong literacy <p>Digital transformation of the economy</p> <ul style="list-style-type: none"> • Raising awareness among businesses of the importance of integrating advanced digital technologies into their business processes, and encouraging SMEs to integrate more of the individual elements of digital intensity into their business processes • Intense opening, reuse, and integration of industrial, public, and research data • Accelerating the use of next-generation digital technologies to properly address data handling (ownership of data, related products and services) • Accelerated integration of next-generation digital technologies into business processes to increase added value at all stages of the business process (production: IoT and digital twins for smart factories, marketing and merchandise, and the metaverse for industrial design, branding) • Creating tailor-made funding support programmes for such integration • Strengthening the ecosystem for digitalisation and cross-border connectivity <p>The road to Smart Society 5.0</p> <ul style="list-style-type: none"> • Integrating digital transformation into sectoral investments • Clear political support for development efforts and a high level of awareness of the importance and development opportunities of new technologies • Improving the well-being/quality of life in smart cities and communities through the innovative and intensive use of new technologies and the Internet – a horizontal strategic priority • Inter-ministerial and inter-sectoral cooperation for a complementary 	<ul style="list-style-type: none"> • Rural areas are lagging behind due to inadequate digital infrastructure <p>Digital competences and inclusion</p> <ul style="list-style-type: none"> • The negative impacts of deepening digital divides • Poor use of Slovenian among native speakers and a loss of cultural identity in the digital environment • A decline in digital content creation in Slovenian <p>Digital transformation of the economy</p> <ul style="list-style-type: none"> • ICT R&D capacity is eroding, mainly due to the globalisation of R&D and global competition. • Unresolved issues of cybersecurity, the integration of cybersecurity elements into digitalised business processes, and the related vulnerability of corporate databases • The Slovenian economy is becoming less competitive, and jobs are being lost. <p>The road to Smart Society 5.0</p> <ul style="list-style-type: none"> • The continued negative impact of organisational and political instability and insufficient sources of funding for the digital transformation of society • Lagging behind the digitalisation of society due to a failure to grasp the development opportunities of the digital society and insufficient political support • Insufficient stakeholder interest to take the necessary action • A reluctant attitude towards the introduction of artificial intelligence and new technologies • Under-investment in digital transformation <p>Digital public services</p> <ul style="list-style-type: none"> • Weak cooperation and rivalries between authorities • Young people are not interested in a career in the civil service. • A focus on short-term objectives and neglecting strategic orientations • The dependence of development projects on (temporary) EU funding, with no maintenance or staffing for operational activities • The authorities' disinterest in cooperation • An increased risk of poor public e-services due to poor data quality and availability • The poor responsiveness of end users of digital services • The dependence of the functioning of the state informatics system on successive changes of the Government of the Republic of Slovenia
---	--

<p>development approach and the pursuit of multiplier development effects</p> <ul style="list-style-type: none"> • Positioning Slovenia as an advanced reference environment for the deployment of new technologies (artificial intelligence) • Harnessing the business opportunities of new Internet business models and the network effect of the Internet • Positioning Slovenia as an advanced reference environment for data management through a network of data custodians • Positioning Slovenia as an advanced reference environment in ensuring an appropriate ethical framework for the use of data, artificial intelligence, and new technologies <p>Digital public services</p> <ul style="list-style-type: none"> • Strengthening cooperation with industry, academia, the OECD, and the European Commission on pilot projects and conferences • The implementation of the principles digital by default, interoperable, one-time only • Use NIO and already developed trust services across borders and for the private sector • Giving citizens a single view of their personal data and encouraging data cleansing in public records • Applying Regulation (EU) 2020/852 on the Sustainable Development Goals⁸⁷, the OECD findings, and the COVID-19 pandemic as an opportunity to accelerate digitalisation • Establishing an ecosystem of stakeholders to support the stability of the digitalisation of government and resilience to political disruption • Increasing public awareness of the opportunities and benefits of digital business • Introducing a process optimisation and digitalisation impact assessment when legislation is adopted <p>Cybersecurity</p> <ul style="list-style-type: none"> • The transposition of Directive (EU) 2022/2555 into the new law on information security will increase the number of obliged entities that will have to comply with the increased security requirements, which will have a positive impact on the level of cybersecurity 	<ul style="list-style-type: none"> • Poor preparedness of public authorities to deliver public services in emergency situations (e.g. the COVID-19 pandemic) <p>Cybersecurity</p> <ul style="list-style-type: none"> • Cybersecurity professionals move abroad due to the unstimulating business environment in the country or because of unparalleled advantages elsewhere. • Young people are not interested in a career in cybersecurity. • The disinterest of target groups in awareness-raising programmes • Mistrust in cyberspace, security, and privacy, and thus in the use of e-services on the Internet, thus undermining the commercial potential of digitalisation and weakening citizens' trust in the state • In the changed geopolitical circumstances, Slovenia may become more exposed to cyber threats from various cyberthreat actors.
--	---

⁸⁷ Regulation (EU) 2020/852 of the European Parliament and of the Council of June 18, 2020, establishing a framework to promote sustainable investments. Available at: <https://eur-lex.europa.eu/legal-content/SL/TXT/HTML/?uri=CELEX:32020R0852&from=IT>.

<ul style="list-style-type: none">• Holding organisations' leaders accountable in the event of non-compliance will increase the willingness to invest in measures to strengthen resilience to cyber threats.• By creating a network of secondary schools and universities offering education and training in cybersecurity and attracting young people into the field, the number of future professionals will increase.• Including target groups not yet covered in awareness-raising programmes• The National Cybersecurity Coordination Centre will facilitate access to EU funding for research and development in this area.• Promoting the use of standards and the certification of ICT products, services, and processes will reduce costs for providers and increase the supply of safer products for end users.• Getting more women involved in cybersecurity• There are still many untapped opportunities to make better use of scarce resources through better cooperation between all stakeholders, including through public-private partnerships.• Increased cybersecurity will increase user confidence in the use of the Internet and e-services, which will have a positive impact on the digitalisation of society.	
--	--

ANNEX 2: DIGITAL SLOVENIA 2020 – A BRIEF OVERVIEW OF IMPLEMENTATION

In Digital Slovenia 2020 – Strategy for the Development of the Information Society by 2020 (hereinafter: Digital Slovenia), adopted by the Government of the Republic of Slovenia in March 2016, indicators by area were adopted to monitor the objectives of the strategy. An overview of the indicators and their current values, taking into account developments and changes in methodologies, is provided below. At the end of the validity of the Strategy, we are also adding an overview of the measures implemented, with comments, that have contributed to the achievement of the objectives and indicators.

A review of the indicators listed in Table 1 shows that most of them did not reach the values set when the strategy was adopted. Overall, Slovenia's ranking in the Digital Economy and Society Index⁸⁸ (DESI⁸⁹) measurement area shows growth, with an overall improvement of seven places between 2016 and 2022, but we see stagnation in the areas of human capital and digital technology integration. Slovenia shows the most progress in the area of digital public services. We see from this that it would be prudent and right to further regulate this area in a systemic and systematic way, as one area influences the others and vice versa. The piecemeal approach we have taken so far has brought us some good solutions, but these need to be integrated into a complete system.

Table 1: Overview of Slovenia's ranking, DESI 2014–2019⁹⁰

	Slovenia's ranking according to DESI								
DESI thematic areas	2014	2015	2016	2017	2018	2019	2020	2021	2022
Slovenia's overall ranking	20	18	18	16	15	16	16	13	11
PO 2/1 Connectivity	24	20	19	19	20	17	16	9	10
PO 10/2 Human capital	15	16	13	14	15	15	15	13	17
PO 2/3 Use of the Internet	16	16	24	23	23	21	22		
PO 3/4 Integration of digital technology	18	19	11	7	8	15	15	8	9
PO 11/5 Digital public services	20	19	21	16	16	14	17	15	13

⁸⁸ DESI is a composite index that summarises important indicators of digital progress and monitors EU Member States' development in digital competitiveness.

⁸⁹ European Commission: Digital Economy and Society Index, Slovenia 2019. Available at: <https://ec.europa.eu/digital-single-market/en/news/digital-economy-and-society-index-desi-2019>.

⁹⁰ Digital Economy and Society Index, DESI, Slovenia 2014–2019. Available at: <https://ec.europa.eu/digital-single-market/en/desi>; due to changes in indicators, Slovenia's rankings have changed, so final rankings may vary and it is difficult to compare across years.

In the area of electronic communications infrastructure, we are approaching the targets, but the biggest gap is in the indicator for the share of households with access speeds of at least 100 Mbps or more, where we are well behind the target. In the area of innovative data-driven services, we see an increase in the use of online banking, while in other categories we are still behind the target. In the area of digital business, we have seen increased online sales and shopping, but we have not yet fully exploited the potential of new online services. More worrying is that the ICT sector's share of GDP is not increasing, which would indicate the necessary development of entrepreneurship to compete in global markets. In the area of cybersecurity, as one of the keys to the safe introduction of advanced technologies into everyday life, indicators are improving, but such efforts need to be continued as the targets are not yet met and the area is increasingly exposed. The last area covers the wider society and shows an increase in the use of the Internet, but still no increase in the recruitment of ICT professionals, which also has an impact on the slower uptake of cutting-edge technologies in the wider society and business.

Table 2: Indicators from the Digital Slovenia 2020 strategy

INDEX	SI 2014	EU-28 2014	SI 2020	DESI 2020
Digital growth – general				
Digital growth performance according to the Digital Economy and Society Index (DESI)	Low performance		Medium or high performance	Low performance
DESI ranking (rank in the EU-28)	20 th		12 th	16th
Broadband and other electronic communications infrastructure				
Percentage of households with broadband access	75%	78%	100%	98% (DESI, 1a1)
Percentage of households with home Internet access	77%	81%	100%	89% (Statistical Office) 90% EU-27
Percentage of households covered with fast broadband (NGA) access	-	-	96%	87% (DESI 1b1)
Percentage of households with access speeds of at least 100 Mbps or more (take-up)	5%	9%	60%	21% (DESI 1a2)
Innovative data-driven services				
Percentage of individuals aged 16–74 who have used public institutions' websites in the last 12 months	53%	47%	> 60%	53% (Statistical Office) 53% EU-27
Percentage of enterprises (with 10 or more employees and excluding financial sector enterprises) that rent cloud computing services	15%	18%	> 20%	26%⁹¹ (Statistical Office) 24% EU-27
Percentage of individuals aged 16–74 who have used online banking in the last three months	32%	44%	≥ 44%	47% (Statistical Office) 55% EU-27

⁹¹ The figure refers to 2018.

				53% (3c1 DESI)⁹²
Digital entrepreneurship				
The ICT sector as a share of GDP	3.59%	-	> 7%	3.68%⁹³
Annual growth of the ICT sector's share of the economy as a share of GDP	0.03%	-	0.6%	0.09%
Percentage of individuals aged 16–74 who have purchased goods or services online in the last 12 months	37%	50%	> 60%	56% (Statistical Office) 60% EU-27
Percentage of individuals aged 16–74 who purchased goods or services online from sellers in other EU countries in the last 12 months	18%	15%	≥ 20%	45 % (Statistical Office) 35% EU-27
Percentage of enterprises (with at least 10 employees and excluding financial sector enterprises) that received orders via websites or via computer data exchange in an agreed format (for business-to-business sales – old methodology)	18%	18%	≥ 20%	25% (Statistical Office) 20% EU-27
Share of enterprises (with at least 10 employees and excluding financial sector enterprises) that sold or received orders for products or services via websites	14%	14%	≥ 20%	21% (Statistical Office) 16% EU-27
Percentage of enterprises (with at least 10 employees) that have a website	84%	74%	≥ 90%	83% (Statistical Office) 77% EU-27
Percentage of enterprises (with at least 10 employees) that use social media	39%	36%	≥ 50%	50% (Statistical Office) 50% EU-27
Percentage of businesses (with at least 10 employees) that pay for advertising on the internet	22%	25%	≥ 30%	27% (Statistical Office) 22% EU-27⁹⁴
Cybersecurity				
Percentage of regular internet users aged 16–74 who have backed up private data from their computer in the last 12 months	49% ⁹⁵	55%	70%	52%⁹⁶ (Statistical Office) 53% EU-27

⁹² The figure refers to 2018 and the share of e-banking users among regular Internet users (EU-27: 61%). In 2019, 57% of regular Internet users aged 16–74 used e-banking (EU-27: 64%).

⁹³ The figure refers to 2017. Source: Eurostat.

⁹⁴ The figure for Slovenia is for 2019 and for the EU-27 for 2018.

⁹⁵ The figure refers to 2015.

⁹⁶ The indicator changed in 2019 and refers to individuals aged 16–74 who have used the Internet in the last 12 months and backed up their data (e.g. private documents, photos) and stored it on external storage media (e.g. an external hard drive, USB flash drive) or in an Internet storage space.

Percentage of enterprises (with at least 10 employees) that have a formal strategy for the safe use of ICT equipment	35%	32%	50%	35% (Statistical Office)⁹⁷ 33% EU-27
Percentage of enterprises (with at least 10 employees) that have a formally defined strategy for the safe use of ICT equipment and have defined or reviewed it in the last 12 months	27%	19%	45%	26% (Statistical Office)⁹⁸ 24% EU-27
An inclusive digital society				
Percentage of 16–74-year-olds who used the Internet at least once per week in the last 3 months (regular Internet users)	68%	75%	> 75%	83% (Statistical Office) 86% EU-27
Percentage of 16–74-year-olds who used the Internet almost every day in the last 3 months (frequent Internet users)	58%	65%	> 70%	74% (Statistical Office) 77% EU-27
Proportion of 16–74-year-olds who have never used the Internet	24%	18%	< 15%	13% (Statistical Office) 10% EU-27
Proportion of individuals aged 16–74 with at least basic computer skills ⁹⁹	56%	59%	≥ 60%	55% (Statistical Office)¹⁰¹
Proportion of 16–74-year-olds with at least basic digital skills	51% ¹⁰⁰	54%		56% EU-27
Proportion of individuals aged 16–74 with an intermediate or high level of computer skills	52%	51%	≥ 55%	It is no longer monitored in this form.
Percentage of enterprises (with more than 10 employees) employing ICT professionals	20%	20%	> 20%	18% (Statistical Office) 19% EU-27

NB: For some indicators, the deviation from the target value is also due to a change in the methodology and/or structure of the company and the number of companies.

⁹⁷ The indicator changed in 2019 and refers to enterprises (with at least 10 employees) that have a document(s) on security measures, practices, or procedures for the safe use of ICT in the company (an information security policy in place).

⁹⁸ The indicator changed in 2019 and refers to enterprises (with at least 10 employees) that have a document(s) on security measures, practices, or procedures for the safe use of ICT in the company (an established information security policy) that have established or updated these documents in the last 12 months.

⁹⁹ The e-skills indicators were revised in 2015 and replaced by a digital skills indicator consisting of: information e-skills, communication e-skills, problem-solving e-skills, software e-skills.

¹⁰⁰ The figures for the SI and EU-27 refer to 2015.

¹⁰¹ The figure refers to 2019.

In addition to the indicators, the strategy sets out the overall objectives of Digital Slovenia 2020, which are linked to priority areas for action. The priority areas are:

- Broadband and other electronic communications infrastructure
- Innovative data-driven services
- Digital entrepreneurship
- Cybersecurity
- An inclusive information society

In the table of strategic objectives and implemented measures, measures that were not included in the original Slovenia 2020 strategy document have also been added since they were considered by the individual ministries to have contributed to the achievement of the set objectives. This is an extremely dynamic area, so Digital Slovenia's intention from the outset to monitor trends and add new measures is certainly justified, as it is crucial to follow the set objectives. The data for the performance review was contributed by a number of line ministries and their constituent bodies, as well as a number of independent institutions that play a key role in achieving the objectives in this area.

An overview of the implementation of the measures shows that the performance is 55%. It should be added that a further 28% of the measures are still under implementation, which means that they will be implemented but will be completed after 2020, mostly in 2023, which is in line with the absorption of European funds, in particular the R&D Fund. Taking into account the measures that are under implementation, the performance of the measures will be 83%, which shows that the measures were realistically set and thus mostly implemented. Table 3 provides an overview of the performance of Digital Slovenia in terms of numbers and percentages.

Table 3: Overview of the implementation of all actions of the strategy in figures and percentages

All measures	Implemented	Outstanding	Still in progress
60 (100%)	33 (55%)	27 (45%)	17 (28%)

A more detailed sectoral overview provides an overview of the implementation of the actions in the five priority areas. The best performance is in the area of cybersecurity, where at the end of the period all actions in the DSI2020 will have been implemented, i.e. the implementation rate will be 100%. The worst performance is in the area of digital entrepreneurship, at only 22%, and even taking into account the actions under implementation, it will not exceed 48%. In this area, a thorough review of the reasons for the underperformance will be needed in the future to identify new or alternative actions for the coming period, as this is an important area where digital transformation is key.

Also in the area of the recognition of the advantages of the use and knowledge of new technologies, approaches, business processes/models, etc., future activities will need to be reinforced and adapted, as the implementation rate is only 42%. This is because measures are foreseen in this segment for the promotion and awareness-raising of the whole of Slovenian society, which is important in terms of both future new competences

and the involvement of all population groups in the new opportunities offered by technologies.

Performance in the areas of electronic communications infrastructure and innovative data services is similar: 75% and 67%, respectively. In the area of infrastructure, a minor part remains open, namely the coverage of areas where there is insufficient market interest to build the corresponding infrastructure. However, in the area of data-driven services, the need and demand for more data-driven services to facilitate data management and the creation of new services for businesses and citizens are growing with the introduction of new technologies. Such services offer time and cost savings.

Table 4: Overview of the implementation of actions by priority area in figures and percentages

Area	Broadband and other electronic communications infrastructure		Innovative data-driven services		Digital entrepreneurship		Cybersecurity		An inclusive information society	
	No. of all actions	Percentage	No. of all actions	Percentage	No. of all actions	Percentage	No. of all actions	Percentage	No. of all actions	Percentage
No. of all actions	12	100%	15	100%	14	100%	7	100%	12	100%
Implemented	9	75%	10	67%	3	22%	6	86%	5	42%
Outstanding	3	25%	5	33%	11	78%	1	14%	7	58%
Still in progress	2	16%	2	14%	6	26%	1	14%	6	50%

ANNEX 3: OVERVIEW OF OBJECTIVES AND INDICATORS



Digital Slovenia 2030 overarching objective

Promoting Slovenia's digital transformation in all segments: society, government, local communities, and the economy.

OBJECTIVES by area:

Area	Objective
Gigabit infrastructure	To ensure that all households are covered by a gigabit network.
Gigabit infrastructure	To ensure that all businesses and other drivers of socio-economic development are covered by gigabit networks.
Gigabit infrastructure	To ensure 5G network coverage in all populated areas.
Digital competences and inclusion	To ensure digital rights for every citizen.
Digital competences and inclusion	To introduce digital competences into the compulsory curriculum of the school system.
Digital competences and inclusion	To develop a common training programme for basic digital competences and promoting it accordingly.
Digital competences and inclusion	To ensure pedagogical digital competences for all educators.
Digital competences and inclusion	To improve the digital literacy of the population.
Digital competences and inclusion	To increase the number of ICT staff.
Digital competences and inclusion	To reduce the gender gap in ICT.
Digital transformation of the economy	To increase the competitiveness of Slovenian companies and the value added per employee.
Digital transformation of the economy	To support the growth of the ICT sector, which is key to the successful digitalisation of the economy.
Digital transformation of the economy	To increase the share of business investment in R&D and innovation in advanced digital technologies to 2% of a company's total costs per year by 2030.
Digital transformation of the economy	To increase non-refundable costs to support digital transformation, especially for SMEs.
Digital transformation of the economy	To support the development of digital competences among employees (regardless of profiles), including opportunities for retraining.
Digital transformation of the economy	To support the enabling environment, which is an important element of the overall enabling environment to support the digitalisation of the economy (including chambers, Digital Innovation Hubs, European Digital Innovation Hubs, etc.), in addition to direct action by ministries.
The road to Smart Society 5.0	The deployment of digital technologies and innovative services and products, based on the creation of data infrastructures and open access to public data, for the

	development of the economy, civil society, and the public sector, including public administration.
The road to Smart Society 5.0	To accelerate the use of artificial intelligence and other advanced technologies in priority areas (security, health, medicine, and social protection; Industry 4.0 and robotics; language technologies, cultural identity, cultural heritage, and the arts for research; digital public administration services; sustainable food production and the environment; and spatial planning).
The road to Smart Society 5.0	To foster the development of smart cities and communities that are consistent with our values and for the benefit of the individual, the wider society, and the environment.
Digital public services	An efficient and secure environment for the provision of digital services.
Digital public services	All digital services are co-created and user-driven.
Digital public services	Widespread use of digital identification solutions.
Digital public services	Modern IT for trusted data management.
Digital public services	An interoperable and digitally empowered country.
Cybersecurity	Security incident response plans are in place.
Cybersecurity	Strengthened security incident response capabilities and notification mechanisms.
Cybersecurity	A high level of resilience to cyber threats for entities essential for the security and continuity of government and society.
Cybersecurity	A high level of public awareness of cybersecurity.
Cybersecurity	The continuous development of human resources in the field of cybersecurity.
Cybersecurity	Strengthened cybercrime and cybersecurity capabilities.
Cybersecurity	Kick-starting developments in cybersecurity.
Cybersecurity	Applying cybersecurity standards and certification.
Cybersecurity	Well-established international cooperation on cybersecurity.
Cybersecurity	Better cybersecurity in the economy.
Cybersecurity	Cooperation between stakeholders in the cybersecurity system.

INDICATORS by area:

Area	Indicator
Gigabit infrastructure	Gigabit connectivity for all major drivers of socio-economic development, such as schools, cultural institutions, transport hubs, major public service providers, and digitally intensive businesses, by the end of 2025.
Gigabit infrastructure	Continuous 5G coverage for all urban areas and all major terrestrial transport routes by the end of 2025.
Gigabit infrastructure	Internet access of at least 100 Mbps per user, upgradable to gigabit speeds, available to all rural and urban households by the end of 2025.
Gigabit infrastructure	Gigabit connectivity for all households, businesses, and other drivers of socio-economic development in rural and urban areas by the end of 2030.
Gigabit infrastructure	5G coverage of all populated areas by the end of 2030.
Digital competences and inclusion	80% of the population with at least basic digital competences.

Digital competences and inclusion	10% of ICT employed professionals.
Digital competences and inclusion	25% of female employees as a proportion of all ICT employees.
Digital competences and inclusion	50% of people learn online.
Digital transformation of the economy	An increase in value added per employee to EUR 88 000.
Digital transformation of the economy	More than 75% of companies use artificial intelligence.
Digital transformation of the economy	More than 75% of companies use cloud computing services.
Digital transformation of the economy	More than 75% of companies use Big Data.
Digital transformation of the economy	The digital maturity rate in companies with more than 10 employees and the self-employed is 53%.
Digital transformation of the economy	The proportion of SMEs achieving at least a basic level of digital maturity is 90%.
Digital transformation of the economy	90% of companies provide training in the use of ICT.
Digital transformation of the economy	The percentage of turnover generated by SMEs through sales via a website or computerised data exchange is greater than 20%.
Digital transformation of the economy	The percentage of SMEs that have generated at least 1% of their turnover from sales via a website or computerised data exchange is greater than 30%.
Digital transformation of the economy	Gross domestic product per capita in purchasing power (EU average) is 95%.
The road to Smart Society 5.0	The number of employees who have received at least one training course in data (analytics, data mining, etc.) is at least 5,000.
The road to Smart Society 5.0	There are at least 150 data custodians.
The road to Smart Society 5.0	100% implementation of the measures set out in the IEAP.
The road to Smart Society 5.0	The local DESI value is 35.
Digital public services	By 2030, all key public services will be online and accessible to all users.
Digital public services	At least 80% of key public services that are digitally accessible will be delivered digitally.
Digital public services	At least 80% of public service users will use a digital identity.
Cybersecurity	The Republic of Slovenia ranks among the top 20 countries in the National Cybersecurity Index by 2027.

ANNEX 4: STRATEGIC POSITIONING

The following is a brief summary of the areas relevant to the content of this strategy, taking stock of the key European and national documents. The European Commission considers that digital technologies and related content are key to the longer-term progress and competitiveness of the European area.

The overarching strategic development document in Slovenia, which defines further development, is the **Slovenian Development Strategy 2030**¹⁰². The document lists as a strategic orientation a highly productive economy, which creates added value and requires lifelong learning, cooperation, etc. The Strategy also highlights the importance of technological progress and development, innovation, and harnessing the digital potential enabled by digital technologies. Digital Slovenia 2030 is subordinate to and consistent with some of the key objectives of the Slovenian Development Strategy 2030.

The Slovenian Smart Specialisation Strategy (S5)¹⁰³ is a development document and is the starting point for focusing development investments on areas where Slovenia has a critical mass of knowledge, capacity, and competences and where it has innovation potential. The Smart Specialisation Strategy identifies ten priority areas, which are in a heterogeneous relationship. These include (i) Smart Cities and Communities, (ii) Horizontal ICT Network, and (iii) Factories of the Future. Digital Slovenia 2030 is consistent with the key objectives of the Smart Specialisation Strategy.

The Slovenian Industrial Strategy 2021–2030¹⁰⁴ sets out the guidelines for the development of industry and the wider economy under a common denominator: green, creative, and smart development. Smart development emphasises the strengthening of digitalisation and smart solutions, as the modernisation of the economy must be focused on the use of the most modern technologies, the highest process safety, increasing the level of automation and robotics, and the use of digital technologies and artificial intelligence. Digitalisation must also support the green transition of the economy. Digital Slovenia 2030 is consistent with some of the key objectives of the Slovenian Industrial Strategy.

The Digital Slovenia 2030 overarching strategy links and complements the Plan for the Development of Gigabit Infrastructure by 2030, the Strategy of the Digital Transformation of the Economy, the National Programme to Promote the Development and Use of Artificial Intelligence in the Republic of Slovenia by 2025, and the Digital Public Services Strategy 2030, the strategic focuses of which are described below.

With the approval of the **National Programme to Promote the Development and Use of Artificial Intelligence in the Republic of Slovenia by 2025 (NpAI)**¹⁰⁵, Slovenia has joined the ranks of EU Member States that have already prepared national strategic orientations for artificial intelligence and have committed to joint cooperation in this field at the EU level. The aim of the NpAI is to ensure people's confidence in AI, limit its negative impacts on individuals and society, and reap the benefits that AI can provide so that we can all benefit from AI, especially in improving living conditions and standards of living.

At the beginning of 2022, the Slovenian Government adopted the **Strategy of Digital Transformation of the Economy**¹⁰⁶, which was prepared in parallel with the

¹⁰² Strategy for the Development of Slovenia. Available at: https://www.gov.si/assets/vladne-sluzbe/SVRK/Strategija-razvoja-Slovenije-2030/Strategija_razvoja_Slovenije_2030.pdf.

¹⁰³ Slovenian smart specialisation industry. Available at: <https://evropskasredstva.si/slovenska-strategija-pametne-specializacije/>.

¹⁰⁴ Slovenian industrial strategy. Available at: <https://www.gzs.si/Portals/206/Slovenska%20industrijska%20strategija.pdf>

¹⁰⁵ National Programme to Promote the Development and Use of Artificial Intelligence in the Republic of Slovenia by 2025. Available at: <https://www.gov.si teme/digitalizacija-druzbe/>.

¹⁰⁶ Strategy of Digital Transformation of the Economy. Available at: <https://www.gov.si/assets/ministrstva/MGTS/Dokumenti/DIPT/Digitalizacija/Strategy-of-digital-transformation-of-the-economy.pdf>.

digitalisation, informatisation, and Digital Single Market processes already underway in the EU. It highlights current advanced digital technologies such as artificial intelligence, the Internet of Things, Big Data technologies, blockchain technologies, high-performance computing, quantum computing, and 5G technologies, which will be drivers of economic growth and competitiveness. It addresses three main or priority areas. The first is advanced digital technologies that enable the digital transformation of the economy in the first place, the second focuses on an efficient ecosystem for a competitive economy, and the third focuses on an open and sustainable society as the basis for the growth of the digital economy.

In August 2022, the **Gigabit Infrastructure Development Plan 2030**¹⁰⁷ was approved, which is considered a long-term strategic document of the Republic of Slovenia. It is primarily aimed at establishing an infrastructure that will ensure gigabit connectivity for all Slovenian households and socio-economic development drivers, while ensuring uninterrupted 5G coverage of all populated areas and major terrestrial transport routes.

The Digital Public Services Strategy 2030¹⁰⁸ has also recently been adopted and is structured as a pyramid, translating strategic priorities into five strategic objectives that will achieve the set priorities. The five strategic objectives are further defined by 23 carefully designed, specific objectives. Each of the objectives will have concrete steps defined in an action plan. This action plan will be updated every two years and is not directly part of this Strategy.

Digital Slovenia 2030 is also consistent with some of the key objectives of **the Resolution on the Slovenian Climate Long-term Strategy 2050**¹⁰⁹, which states that the immediate implementation of policies and measures already adopted to reduce greenhouse gas emissions is essential in all relevant sectors, and with the Resolution on the National Environmental Action Programme 2020–2030¹¹⁰, which aims to preserve nature and a healthy environment in Slovenia and beyond, enabling a good quality of life for present and future generations.

Digital Slovenia 2030 is also in line with some of the key objectives of European documents on digital transformation:

At the beginning of 2020, the European Commission presented its **Europe Fit for the Digital Age** strategy¹¹¹, which aims to make Europe a global player in the digital field, while maintaining high security and ethical standards. Under the new strategy, the European Commission has published three key documents. The first is **Shaping Europe's Digital Future**¹¹², which sets out that over the next five years the Commission will focus on three key objectives to ensure that digital solutions, while respecting our values, will help Europe on the path to a digital transformation that works for people: technology that works for people, a fair and competitive economy, and an open, democratic, and sustainable society. The second key document of the Digital Agenda for

¹⁰⁷ Gigabit Infrastructure Roadmap 2030. Available at: <https://www.gov.si/assets/vladne-sluzbe/SDP/Dokumenti/Nacr.pdf>.

¹⁰⁸ Digital Public Services Strategy. Available at: <https://nio.gov.si/nio/asset/strategija+digital+public+services?lang=en>.

¹⁰⁹ Resolution on the Slovenian Climate Long-term Strategy 2050. Available at: <http://www.pisrs.si/Pis.web/pregledPredpisa?id=RESO131>.

¹¹⁰ Resolution on the National Environmental Action Programme 2020–2030. Available at: <http://www.pisrs.si/Pis.web/pregledPredpisa?id=ODLO1985>.

¹¹¹ A Europe fit for the digital age. Available at: https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age_sl.

¹¹² Shaping Europe's Digital Future. Available at: <https://digital-strategy.ec.europa.eu/sl>.

Europe is the **European Data Strategy**¹¹³, which aims to create a single European data space, a true single market for data, open to data from all over the world, where personal¹¹⁴ and non-personal data, including sensitive business data, is secure and businesses can easily access an almost infinite amount of high-quality industrial data, thereby stimulating growth and creating value while reducing the carbon and environmental footprint of human activities. The third pillar of the European Digital Strategy is the **White Paper on Artificial Intelligence: A European Approach to Excellence and Trust**¹¹⁵. Therein, the Commission sets out its determination to enable scientific breakthroughs, maintain the EU's technological leadership, and ensure that new technologies benefit all Europeans by improving their lives and respecting their rights. The aim is to maximise the impact of investment in research, innovation, and deployment, to assess national AI strategies, and to build on and extend the coordinated AI Roadmap with EU Member States.

The European Commission also presented a **European New Industrial Strategy** in 2020¹¹⁶ and updated it in 2021 in the light of the post-Covid-19 crisis. The strategy focuses on the green and digital transitions, which are interlinked and complement each other. Digital solutions, such as digital twins in advanced manufacturing, can make a key contribution to optimising the processes of different ecosystems and, consequently, to the green transition.

Back in September 2016, the European Commission announced in the document **Connectivity for a Competitive Digital Single Market – Towards a European Gigabit Society**¹¹⁷ the still relevant objectives for the future Gigabit Society and the 5G Action Plan, which set out the EU's strategic objectives for 2025: Gigabit connectivity for all major drivers of socio-economic development, uninterrupted 5G coverage for all urban areas and all major terrestrial transport routes, access to Internet connectivity of at least 100 Mbps, upgradable to gigabit speeds, for all European households in rural or urban areas.

In December 2020, the European Commission presented a new **EU's Cybersecurity Strategy for the Digital Decade**¹¹⁸, which aims to strengthen the EU's resilience to cyberthreats, at both the individual and corporate levels. The strategy will allow the strengthening of, in particular, the security of services and connected devices, capabilities against cyberattacks, and cooperation with partners around the world.

In July 2020, the European Commission launched the **European Skills Agenda for Sustainable Competitiveness, Social Fairness and Resilience**¹¹⁹, which sets ambitious and measurable targets for upskilling (i.e. improving skills) and reskilling (training to acquire new skills) to be achieved over the next five years.

¹¹³ European Data Strategy. Available at: https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/european-data-strategy_sl#documents.

¹¹⁴ We understand that personal data is not subject to a market but is properly regulated, anonymised, and collected for a specific purpose. However, non-personal (industrial) data can have significant market potential in the European market.

¹¹⁵ White Paper on Artificial Intelligence – A European Approach to Excellence and Trust. Available at: <https://op.europa.eu/sl/publication-detail/-/publication/ac957f13-53c6-11ea-aece-01aa75ed71a1>.

¹¹⁶ European Industrial Policy. Available at: https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/european-industrial-strategy_sl.

¹¹⁷ Principles and values. Available at: https://european-union.europa.eu/principles-countries-history/principles-and-values_sl.

¹¹⁸ The EU's Cybersecurity Strategy in the Digital Decade. Available at: <https://ec.europa.eu/digital-single-market/en/news/eus-cybersecurity-strategy-digital-decade>.

¹¹⁹ European Skills Agenda for Sustainable Competitiveness, Social Fairness and Resilience. Available at: <https://eur-lex.europa.eu/legal-content/SL/TXT/PDF/?uri=CELEX:52020DC0274&>.

In September 2020, the European Commission adopted the **Digital Education Action Plan** for 2021–2027¹²⁰, which sets out a shared vision for quality, inclusive, and accessible digital education in Europe and supports the adaptation of education and training systems to the digital age in the Member States.

In March 2022, the renewed European Digital Competences Framework for Citizens, **DigComp 2.2**¹²¹, was published, providing a common understanding of digital competences and offering more than 250 new examples of knowledge, skills, and attitudes that help citizens engage confidently, critically, and safely with digital technologies.

In March 2021, the European Commission set out its vision, goals, and options for the successful digital transformation of Europe by 2030 in the document **Europe's Digital Decade: Digital Goals for 2030**, which proposes agreement on a set of digital principles for the rapid deployment of major multi-country projects and preparing a legislative proposal setting out a robust governance framework to monitor progress – a **digital compass**. This is based on four main points: a digitally empowered population and highly skilled digital professionals; secure, efficient, and sustainable digital infrastructures; the digital transformation of businesses; and the digitalisation of public services.

In September 2021, the European Commission published a **proposal for a Decision of the European Parliament and of the Council establishing a policy programme "The Road to the Digital Decade" by 2030**¹²², which aims to achieve, accelerate, and shape the successful digital transformation of the EU economy and society.

In November 2022, EU Member States, the European Parliament, and the Commission agreed on a **European Declaration on Digital Rights and Principles for the Digital Decade**, designed to promote European values in a digital transformation that puts people at the heart of the process and where digital technology benefits all individuals, businesses, and society as a whole. The text highlights all the rights to be taken into account in the digital transformation, stressing that people must always be at the centre of this transition, solidarity and inclusion must be supported, connectivity, digital education, training, and skills must be ensured, and access to digital services online must be ensured. The Declaration stresses the importance of freedom of choice when interacting with algorithms and artificial intelligence systems and of a fair digital environment and calls for greater safety and security in the digital environment, especially for children and youth.

In March 2021, the Ministerial Declaration on the **Green and Digital Transformation of the EU**¹²³ was adopted, highlighting the use of clean digital technologies as a key enabler to support climate action, environmental sustainability, and the achievement of the UN Sustainable Development Goals. The Declaration sets out the intention to make Europe a key player in the global market for green technologies, in particular by promoting the

¹²⁰ Digital Education Action Plan. Available at: <https://education.ec.europa.eu/sl/focus-topics/digital-education/action-plan>.

¹²¹ DigComp 2.2: The Digital Competence Framework for Citizens. Available at: <https://publications.jrc.ec.europa.eu/repository/handle/JRC128415>.

¹²² Proposal of the European Parliament and of the Council establishing a policy programme "The Road to the Digital Decade" 2030. Available at: https://eur-lex.europa.eu/resource.html?uri=cellar:6785f365-1627-11ec-b4fe-01aa75ed71a1.0017.02/DOC_1&format=PDF.

¹²³ Ministerial Declaration: A Green and Digital Transformation of the EU. Available at: <https://www.portugal.gov.pt/download-ficheiros/ficheiro.aspx?v=%3D%3DBQAAAB%2BLCAAAAAAABAAzNDQxMwMAT7AwdwUAAAA%3D>.

development, deployment, and use of innovative digital technologies, the development of low-energy electronic components, and environmentally friendly, sustainable ICT solutions. To achieve this objective, EU Member States have at their disposal a financial mechanism for recovery and resilience that is designed to support reforms and investments in support of the green and digital transformation. The Ministerial Declaration also established a European Green Digital Coalition to accelerate the ICT sector's transition to a sustainable, climate-neutral, circular, and pollution-free economy.