National Digital Decade Strategic Roadmap of the Slovak Republic

MINISTRY
OF INVESTMENTS, REGIONAL DEVELOPMENT
AND INFORMATIZATION
OF THE SLOVAK REPUBLIC

Executive Summary

National Digital Decade Strategic Roadmap of the Slovak Republic is an umbrella document summarizing the activities of the Slovak Republic on its trajectory to meet the digital and general objectives and targets of the European Union. It sets out a plan for Slovakia's participation in achieving the European Union common objectives and targets on behalf of the Slovak Republic.

The objectives in the Digital Decade are divided into four dimensions, which bring together related areas of digital transformation. Each dimension has a set of concrete objectives and targets for 2030 that the European Union as a whole strives to achieve.

Digital Skills:

- min. 80% population aged 16 to 74 with at least basic digital skills;
- min. 20 million experts employed in in the EU ICT sector, while promoting ICT gender convergence and increasing the number of ICT graduates.

Secure and sustainable digital infrastructures:

- 100% households with gigabit connection;
- 100% populated areas with at least one 5G, regardless of the frequency band;
- revenue from semiconductor activities in the European Union at all stages of the value chain reaching 20% of the global production, relative to the value of the global market;
- at least 10,000 climate-neutral highly secure edge nodes in the European Union to guarantee access to data services with low latency (a few milliseconds) for all businesses regardless of their location;
- first computer with quantum acceleration in the EU.

Digital transformation of businesses:

- more than 90% SMEs reach at least a basic level of digital intensity;
- min. 75% of EU companies using one or more of the technologies:
    - Cloud computing;
    - Big Data;
    - Artificial Intelligence;
- grow innovative scale-ups and finance to double EU unicorns;

Digitalisation of public services:

- 100% key services online, citizens and companies will communicate online with public administration in relevant cases;
- 100% of EU citizens will have access to medical records online;
- 100% of EU citizens will have access to secure digital identification (eID) recognised across the EU granting citizens full control over their transactions and shared personal data.

This document brings an analysis of Slovakia's state of play, its strengths and challenges in each of the dimensions. Slovakia has long lagged below the European Union average in all key indicators. The main challenges in all dimensions remain the poor mathematical literacy of pupils (as well as the quality of education), low quality of graduates and the brain drain. A key challenge in the area of digital infrastructure rests in underinvestment in building gigabit connectivity. At the same time, Slovakia is plagued by a persistent lower rate of business productivity and insufficient up-take of digital technologies, especially in small and medium-sized enterprises. A main challenge in the dimension of digitalisation of public services remains the lack of a unified vision and its persistent fragmentation among ministries and stake-holders.

This document sets up ambitious trajectories in all dimensions and obliges the Slovak Republic to take an active approach to each of the targets and objectives. Despite Slovakia's lower starting position, the targets are set in such a way that by 2030 Slovakia will significantly contribute to the European Union's targets and objectives. The exact form of Slovakia's commitments need to be further discussed in the areas of quantum computing, semiconductor production and edge nodes.

Each of the dimensions sets up specific actions on individual digital targets, based either on documents already adopted by the Government of the Slovak Republic or on new measures that will be adopted by the Government in line with this document. Slovakia's ambition is to use the National Digital Decade Strategic Roadmap to achieve synergies between all actions and measures to easily identify areas where new actions will be needed. The document itself presents 96 actions, including 22 new and 74 already existing, which will contribute to the achievement of different digital targets of the Digital Decade.

The following table brings an overview of allocations and financial resources to the actions, breaking down the resources already allocated and the planned resources from the national budget and from the European Union.

Financial resources for the National Digital Decade Strategic Roadmap of the SR

	Allocated resources			**Planned resources**		
	State budget	**European funds**	**Total**	**State budget**	**European funds**	**Total**
TOTAL	**€ 178,128,052**	**€ 1,410,527,801**	**€ 1,588,655,853**	**€ 247,283,630**	**€ 37,231,625**	**€ 284,515,255**
Digital skills	**€ 4,073,552**	**€ 250,790,000**	**€ 254,863,552**	**€ 239,633,630**	**€ 0**	**€ 239,633,630**
Broken down to						
- target 1	€ 2,433,552	€ 211,060,000	**€ 213,493,552**	€ 234,053,630	€ 0	**€ 234,053,630**
- target 2	€ 1,640,000	€ 39,730,000	**€ 41,370,000**	€ 5,580,000	€ 0	**€ 5,580,000**
Digital infrastructure	**€ 762,500**	**€ 114,609,732**	**€ 115,372,232**	**€ 0**	**€ 4,000,000**	**€ 4,000,000**
Broken down to						
- target 1	€ 762,500	€ 114,609,732	**€ 115,372,232**	€ 0	€ 0	**€ 0**
- target 4	€ 0	€ 0	**€ 0**	€ 0	€ 4,000,000	**€ 4,000,000**
Digital transformation of businesses	**€ 173,292,000**	**€ 608,103,694**	**€ 781,395,694**	**€ 6,950,000**	**€ 30,656,000**	**€ 37,606,000**
Broken down to						
- target 1	€ 0	€ 83,274,000	**€ 83,274,000**	€ 1,750,000	€ 1,900,000	**€ 3,650,000**
- target 2	€ 116,302,000	€ 277,999,694	**€ 394,301,694**	€ 5,200,000	€ 28,756,000	**€ 33,956,000**
- target 3	€ 56,990,000*	€ 246,830,000	**€ 303,820,000**	€ 0	€ 0	**€ 0**
Digitalisation of public services	**€ 0**	**€ 437,024,375**	**€ 437,024,375**	**€ 700,000**	**€ 2,575,625**	**€ 3,275,625**
Broken down to						
- target 1	€ 0	€ 437,024,375	**€ 437,024,375**	€ 0	€ 2,575,625	**€ 2,575,625**
- target 2	€ 0	€ 0	**€ 0**	€ 700,000	€ 0	**€ 700,000**
- target 3	€ 0	€ 0	**€ 0**	€ 0	€ 0	**€ 0**

The resources marked as allocated correspond only to the costs of measures from existing strategic materials already approved by the Government of the SR. The resources marked as planned correspond to the costs of newly proposed measures, but these cannot be identified as allocated/approved at this stage, based on the national rules.

Slovakia also presents measures to achieve the Digital Decade general objectives divided by thematic headings. In this case, only existing measures from previous strategy documents are applied. Slovakia strives to cooperate at the European Union level through the involvement of partners in the various European Digital Infrastructure Consortia and through the development of digital diplomacy activities.

Introduction

The National Digital Decade Roadmap of the Slovak Republic is based on a Decision of the European Parliament and of the Council establishing a 2030 Policy Programme "Path to the Digital Decade". It is a comprehensive document summarising the current state and planned development of Slovakia until 2030 in the areas of digital skills, digital infrastructure, digital transformation of businesses and digitalisation of public services. The document follows the structure prescribed by the European Commission, describing the state of play and focusing on key challenges as well as the country's strengths and assets. In the second chapter of the document and in Annex 4, trajectories are proposed to reach the digital targets and general objectives, with the contribution of the Slovak Republic to the collective efforts to achieve the EU's Digital Decade digital targets. The third chapter presents a list of all (already adopted as well as planned) measures to reach the relevant digital target values. In section 3.2 the new proposed measures are described in depth, while the measures already adopted are described in more detail in the documents adopted by the Government of the Slovak Republic, as mentioned in section 3.1. The fourth chapter presents the measures meeting the general objectives of the Digital Decade, and the fifth chapter sets out the activities of Slovak organisations in multi-country projects. Given the need for more effective Slovak involvement in European and international cooperation on digital issues, this chapter emphasises the need for content and institutional anchoring of digital diplomacy in the Slovak Republic in the context of the current EU initiatives.

The document was prepared in cooperation of the Ministry of Investment, Regional Development and Informatization of the Slovak Republic with partners from the public, private and non-governmental sectors. The material was developed in active cooperation and with the involvement of a wide range of stakeholders from both the public and private sectors.

The following sections bring an analysis where the Slovak Republic stands in the field of each dimension, followed by the planned trajectories to reach the targets for the Slovak Republic by 2030 and an overview of the measures already taken and planned for 2030. In section 3.2, only new measures are then presented in more detail. Section 4 summarises the measures meeting the general objectives and targets of the Digital Decade Policy Programme and Section 5 presents the involvement of Slovak representatives in international cooperation projects.

Chapter 1: Analysis of the state of play in digital transformation in the Member State-specific context

1.1 Digital skills and ICT experts

State of play

Slovakia performs slightly better than EU average on basic digital skills but with the share of ICT professionals at 4.3%, it is slightly below the EU average of 4.6%. The proportion of ICT professionals in Slovakia has steadily increased since 2017 at a growth rate slightly above the EU average but is currently stagnating compared to the previous assessment period. Slovakia is above the EU average (4.2%) in ICT graduates with a value of 4.4%.

According to the Empirical research among industrial enterprises in Slovakia in 2022[1]: "More than 60% of the enterprises surveyed indicated that the digital skills of the enterprise's production job applicants among school leavers were worse than required by the enterprise. For graduates in administration, 40% of enterprises had experienced worse digital skills compared to their requirements.[2]"

On 14 December 2022, the Government of the SR, in its effort to contribute to the joint ambition of EU Member States to achieve the objectives and targets of the Digital Decade, approved the National Digital Skills Strategy of the Slovak Republic and the Action Plan for 2023-2026 (hereinafter as the "NSDZaAP") aimed at increasing at least the basic digital skills of individuals and increasing the number of ICT specialists. The NSDZaAP, as a cross-cutting strategy document based on the "no one can be left behind" principle, covers digital skills training for all population groups, all age and social background groups. The material provides for specific measures aimed at improving at least basic digital skills of young people and educators in the educational process, active labour market participants, people from disadvantaged groups, including e.g. children and young people from socially and economically disadvantaged backgrounds, public administration staff over 55 years of age, and seniors. At the same time, it specifically targets the increase in the number of ICT professionals through two separate chapters with corresponding action plan measures, with one chapter specifically devoted to ICT specialists gender convergence (including e.g. promoting a more active inclusion of women and girls in the digital society and economy, increasing the number of women in ICT fields of study).

Challenges

Universities and employers have registered declining levels of mathematical literacy among high school graduates in recent years. The situation is particularly critical in STEM fields of study at universities, for which the quality of mathematical knowledge, skills and capabilities of students affected by the post-2008 curriculum reform curriculum is insufficient to be properly trained for the current and future labour market needs[3]. Since 2009, our pupils' performance in mathematical literacy has significantly declined compared to the OECD average. The number of excellent pupils has been also decreasing and the number of so-called 'at-risk' pupils has increased. Unlike all neighbouring EU countries - Poland, Hungary, Austria and the Czech Republic (from 2021), Slovakia does not have a

[1] Research report "Vplyv robotizácie, automatizácie a digitalizácie na trh práce v SR. Výsledky empirického prieskumu" dostupná na: https://ivpr.gov.sk/vplyv-robotizacie-automatizacie-a-digitalizacie-na-trh-prace-v-sr-vysledky-empirickeho-prieskumu-daniela-keselova-rastislav-bednarik-daniel-gerbery-darina-ondrusova-2022/

[2] Research report "Vplyv robotizácie, automatizácie a digitalizácie na trh práce v SR. Výsledky empirického prieskumu" dostupná na: https://ivpr.gov.sk/vplyv-robotizacie-automatizacie-a-digitalizacie-na-trh-prace-v-sr-vysledky-empirickeho-prieskumu-daniela-keselova-rastislav-bednarik-daniel-gerbery-darina-ondrusova-2022/, p. 39

[3] Analysis of the requirements of universities and the labour market for secondary school graduates in terms of mathematical literacy and proposal of measures to improve the quality of mathematics education, p. 3

compulsory baccalaureate in mathematics. In a few years' time, these countries may gain a strategic advantage over Slovakia in fulfilling the vision of a knowledge-based economy. These countries are outperforming in recent international measurements and the gap is widening. The introduction of compulsory baccalaureate, in the context of the need to improve the quality of mathematics education in regional education, has been proposed or demanded primarily by employers and universities. The number of maths graduates has almost halved over the last 10 years, with the proportion of maths graduates falling from 15.2% to 12.8%. Mathematics education, particularly in terms of critical, logical and creative thinking, is necessary not only for STEM subjects but also for social science programmes, not least because the level of mathematical knowledge, skills and abilities predetermines an individual's ability in all areas of life[4].

Another urgent problem in Slovakia that needs to be properly addressed to achieve the objectives and targets of the Digital Decade is the brain drain in search of better education or living conditions. According to a survey conducted by the Institute for Public Affairs, up to 50% of young educated people - both university undergraduates and graduates - are considering leaving Slovakia. "In relation to the brain drain, the critical group constitutes around 137 thousand young and educated people. Of these, almost 39 thousand are considering permanent migration, and about 99 thousand temporary migration.[5]" Such brain drain can also have a serious societal impact causing Slovakia's underperformance in science and research, shortages of skilled labour in several sectors of the economy and income shortfalls in the social system.

The development of digital skills in Slovakia is not managed by a single responsible authority, but is divided between three central government bodies: MESRS SR, MLSAF SR and MIRDI SR.

For more than a decade, the digital competences framework also known as DigComp[6] provides a common language on how to identify and describe the key areas of digital competences and thus offers a common reference at European level. DigComp 2.2 (version 2022) has the potential to assist in the development of strategies, education and training initiatives to improve the digital skills of specific target groups and to improve the digital competence of citizens. DigComp 2.2 plays a key role in achieving the EU's ambitious objectives to increase the digital skills of the whole population and in the creation of the European Digital Skills Certificate. Despite its crucial role, DigComp 2.2 has not been translated into Slovak.

The European Framework of Digital Competences for Educators (DigCompEdu)[7] provides a framework to support the development of educator-specific digital competences in Europe. It aims to help Member States in their efforts to improve digital skills of their citizens and to enhance innovation in education. The framework is designed to foster national, regional and local efforts to promote educator specific digital competences by providing a reference frame with a common language and logic. Putting DigCompEd into practice would contribute to raising the level of digital competences of pedagogical and professional staff at all levels of education, undergraduates in pedagogical programmes and future educators, to enhancing the use of digital technologies in the educational process, including participants of secondary school supplementary pedagogical studies and students of secondary school pedagogical programmes. The implementation of DigCompEdu in Slovakia to

[4] Analysis of the requirements of universities and the labour market for secondary school graduates in terms of mathematical literacy and proposal of measures to improve the quality of mathematics education
[5] https://www.ivo.sk/buxus/docs//publikacie/subory/Unik_mozgov.pdf
[6] https://publications.jrc.ec.europa.eu/repository/handle/JRC128415
[7] JRC Publications Repository - European Framework for the Digital Competence of Educators: DigCompEdu (europa.eu)

promote digital technologies in schools and to improve and innovate education, has been hampered by the fact that DigCompEdu has not been translated into Slovak.

In order to enhance digital skills, further involvement in international network platforms dedicated to the development of digital competences in the whole population is desirable, e.g. in the ALL DIGITAL[8], as well as more active support for the Code Week[9] or Hour of Code [10] activities.

Slovakia is also the only EU country without a Safe Internet Centre.

There is no publicly funded system for the development of digital skills. Therefore, only 2% of citizens have acquired digital skills through public education programmes[11]. Education and development of digital skills are based on on-the-job training or on training paid for by the employer. The unavailability of publicly funded training programmes is a barrier to the development of digital skills, especially for seniors in post-working age.

Weaknesses in the educational infrastructure for digital skills development rest in the absence of digital learning platforms, unprepared educational staff, and no testing and certification sites. It is primarily the third sector that has been highlighting the threats resulting from this situation but the document "The robot profession, the impact of technological change on the labour market and the skills in demand in the Slovak Republic[12]" by the Education Policy Institute called for a change already in 2017.

Based on OECD data, up to 64.4% of jobs in Slovakia are threatened by automation[13] in the future (Slovakia has been leading this ranking several times in a row), which requires from employees continuous development of their knowledge and skills so that they can adapt to the ongoing change in the character of work an jobs. This is further reinforced by the growing teleworking trends even in professions that are less threatened by the onset of automation.

According to the research report "The Impact of Robotics, Automation and Digitalisation on the Labour Market in the Slovak Republic. Results of an empirical survey"[14], the introduction of new digital technologies in enterprises was associated more with the creation of new jobs than with their elimination. The highest demand was for workers with technical and IT education. Half of the enterprises participating in the survey experienced labour force shortages. Finding adequately skilled employees emerged in the survey as the most significant obstacle to the introduction of new technologies. Almost 54% of enterprises considered it to be a major problem.

Strengths

Slovakia's strength and assets in meeting the Digital Decade's human capital objectives is the work of the National Coalition for Digital Skills and Jobs of the SR[15]. The Coalition was established on 9 December 2019 primarily to support and ensure the activities aiming at strengthening digital skills in all population groups (general public, business sector, public administration and local government) and to support and ensure the activities of the EC Digital Skills and Jobs Coalition initiative in Slovakia.

[8] ALL DIGITAL • Enhancing Digital Skills Across Europe (all-digital.org)
[9] https://codeweek.eu/
[10] https://hourofcode.com/us/sk/learn
[11] https://www.planobnovy.sk/site/assets/files/1055/komponent_17_digitalne_slovensko_1.pdf
[12] https://www.minedu.sk/data/att/11077.pdf
[13] https://www.oecd.org/economy/surveys/Slovak-Republic-2022-OECD-economic-survey-overview.pdf
[14] https://ivpr.gov.sk/vplyv-robotizacie-automatizacie-a-digitalizacie-na-trh-prace-v-sr-vysledky-empirickeho-prieskumu-daniela-keselova-rastislav-bednarik-daniel-gerbery-darina-ondrusova-2022/
[15] Digitálna koalícia | (digitalnakoalicia.sk)

The members of the National Coalition for Digital Skills and Jobs Slovakia are: ITAS, MoF, MIRDI SR and MESRS SR[16].

National Coalition for Digital Skills and Jobs of the SR contributed to the development of the National Digital Skills Strategy and Action Plan (NSDZaAP) and became a key partner in its implementation. This partner is driving the agenda for promoting a robust model of public governance, management and oversight ("governance") in the field of digital education and digital skills, with the participation of representatives from public administration, business, academia and civil society.

An example of good practice of the National Coalition for Digital Skills and Professions of the Slovak Republic is the projects implemented by the Coalition to develop especially basic digital skills, such as the IT Fitness Test[17], which has already tested the digital skills of more than 400 thousand people in its 12th edition.

A successful pilot project is the Digital allowance for pupils of the SR[18] aimed to support the general development of digital skills by supporting the purchase of digital equipment. By supplying the target groups with the necessary digital equipment and software, the use of digital technologies in the educational process will also be actively promoted. The project also aims to improve social inclusion and access to digital technologies for pupils from socially disadvantaged backgrounds. Up to 152,000 primary, secondary and vocational school pupils can get a voucher to purchase a digital device to enhance their learning and develop their potential, acquire and improve their digital skills, and succeed in the digital age. The project has a great added value and a massive impact, as it will enable the reduction of social disparities between pupils, promote a more independent approach to education and at the same time create the conditions for the implementation of distance learning for all pupils.

Digital allowance for pupils from Ukraine is another similar project. Its aim is to supply digital devices to the project target groups. Pupils can benefit from a contribution of EUR 350 provided directly to the pupils from Ukraine with the status of temporary refuge, falling within the definition of the target group of the project. In 2023, or to their legal representatives. It is envisaged to support approximately 20,000 pupils. The project is implemented through the main activity, namely increasing access to education for children, pupils and students fleeing Ukraine[19].

National Coalition for Digital Skills and Jobs of the SR in collaboration with MIRDI SR is also dedicated to increasing the digital competences of seniors and disadvantaged groups in the public administration[20] through the use of an online learning platform . The project of the same name has succeeded in creating a wide network of trainers working across the country. Thanks to cooperating organisations such as libraries, municipalities, ministries, schools and universities, the project has the necessary number of fully equipped training rooms. Face-to-face training activities have been launched and more than 5,000 seniors have already tested their level of digital skills through a pilot aptitude test.

MIRDI SR works on improving digital skills of seniors in the framework of the project Improving digital skills of seniors and distribution of senior tablets[21]. As of 26 May 2023, a total of 2,004 seniors were trained in full-time training courses within the framework of the project on the topics of Basics of

[16] NSDZaAP, p. 21
[17] https://itfitness.eu/sk/
[18] https://digitalnyziak.sk/zakladne-informacie/
[19] https://ukrajinskyziak.sk/zakladne-informacie-sk
[20] https://digitalnekurzy.sk/
[21] https://www.digitalniseniori.gov.sk/

working with digital devices, Information search, Online communication, Information security, and a follow-up module aimed at Introduction to the use of digital devices (tablet).

The National Coalition for Digital Skills and Jobs of the SR is also engaged in activities aimed at increasing the number of ICT professionals.

One such activity is the Joint Ukrainian-Slovak Study Programme[22], strengthening relationships, structures and professional contacts between the academia in Slovakia and Ukraine. The aim of the programme is to develop a scheme of international joint Master's degree programmes with double diplomas for Ukrainian IT students. From the students' point of view it is a career development programme. For students from selected Ukrainian universities, the programme offers the opportunity to obtain two Master's degrees in IT-related fields, one in Ukraine and one in Slovakia. In addition to providing a unique combination of quality education over 14 months, the programme also includes parallel practical experience through mentored IT-focused training in a renowned enterprise in Slovakia with the possibility of subsequent employment. The programme has been an example of good practice since 2017 to the present with more than 50 programme graduates, focusing on software engineering, automation and integrated computer technologies, computer science, project management and others.

Digital Talents: a job mobility programme for ICT graduates for Slovakia, Ukraine and Moldova is a pilot project for ICT specialists. The programme is implemented by the EMA Development and Mobility Agency in cooperation with the National Coalition for Digital Skills and Jobs of the SR and the IT Association in Moldova. The aim of the project is to develop cooperation in the field of labour mobility and to promote economic exchange between the ICT sectors of the participating countries. It enables young Moldovan and Ukrainian talents to gain practical knowledge and experience in a professional environment in Slovakia and apply them later upon their return to their home countries. At the same time, the programme helps to fill shortage positions in the ICT sector in Slovakia, supports the development of business relations between private companies in the participating countries and contributes to the exchange of expertise and experience between the Slovak, Moldovan and Ukrainian ICT sectors. In the context of the ongoing war conflict in Ukraine, the programme focuses on female candidates and helps to strengthen their career development and position in the ICT sector.

The MESRS SR also contributes to improving digital skills in several steps. The first step is the investment in digital equipment in primary and secondary schools with the aim to provide for essential digital equipment in every school in Slovakia, according to a predefined standard[23]. This investment is a combination of ESF resources (EUR 40 million) and the Slovak Recovery and Resilience Plan (EUR 180 million). The second step is to nominate a School Digital Coordinator from among the school teaching staff. After its pilot validation and ESIF funding, its funding will continue until at least 2026, with the aim of reaching min. 900 participating schools. Last but not least, building strong partnerships with universities and businesses should bring new projects and measures funded through the Slovakia Programme.

Another strength of Slovakia in the field of digital skills is the activity of the Centre for Scientific and Technical Information of the SR (CVTI SR), which has managed to create a network of partner libraries across Slovakia, the so-called Libraries for Slovakia Consortium. Its long-term goal is to transform

[22] HOMEPAGE | 2ouble Degree (doubledegree.org)
[23] https://www.minedu.sk/data/att/23246.pdf

libraries into centres of digital literacy and skills for Industry 4.0, creativity and lifelong learning, which will at the same time provide new, innovative library and information services.[24].

The consortium's libraries[25] are already offering the opportunity for the general public to get acquainted with the digital era and the 4th Industrial Revolution, and to use the services for the promotion and development of digital literacy through workshops. On the basis of the National Strategy for Research, Development and Innovation 2030, fifty Slovak libraries are to be transformed into SmartLabs with upgraded technical equipment. Libraries, which have historically been a natural meeting place for people of all ages in Slovakia, will thus be able not only to attract new readers, but also to promote creativity and digital skills of their users.

It is also positive that the National Coordinator for Digital Skills in Slovakia is the Minister of Investment, Regional Development and Informatization, representing Slovakia in a structured dialogue with Member States and relevant stakeholders.

Proposed strategic trajectory

A key prerequisite for the successful adoption of digital skills and competences for Industry 4.0, is the improvement of the quality of mathematical education in primary and secondary schools in Slovakia. High-quality education will not only make it easier for the young generation to acquire digital skills, but will also naturally open the way to education in STEM fields. Well-prepared pupils and students will enable secondary schools and colleges to more effectively achieve their mission of educating professionals for the current and future labour market needs. Raising the level of education in mathematics and promoting mathematical thinking in society will foster the creation of a strong knowledge awareness and prepare citizens for a rapidly changing world, new jobs and, in many cases, changing careers.

In this background, and mainly in relation to the Digital Decade general objectives and digital targets, the Inter-ministerial Working Group on Digital Skills has prepared strategic recommendations, the implementation of which is conditioned by a significant improvement in the digital skills of human capital in Slovakia.

The key demand of experts is strengthening of the quality of teaching mathematics and informatics at the second level of primary schools, as well as the reintroduction of some form of baccalaureate or similar exams in mathematics. And also, in order to improve mathematics education itself, it is necessary to require the elaboration of diploma theses in teacher training programmes on didactic topics in such a way that they are directed towards the design and validation of concepts and methodologies.

An essential prerequisite for the required improvement in the quality of education (long advocated also by the Slovak Mathematical Society, a branch of the Union of Slovak Mathematicians and Physicists) is the effective motivation mathematics and computer science teachers and their remuneration. In this respect, the group of experts (members of Digital Skills WG) has recommended the reuse of the material of the State Pedagogical Institute (NIVAM): "Concept for improving the quality of mathematics education in primary and secondary schools in the Slovak Republic" and its inclusion in the currently ongoing curriculum reform.

In order to maintain the continuity of teaching, we recommend an increase of at least 1 lesson of computer science in the 3rd cycle of the Framework Curriculum of the state educational programme

[24] https://kniznicepreslovensko.cvtisr.sk/
[25] Konzorcium KPS by dvid8851 · MapHub

of primary education. It is also important to increase the number of computer science lessons continuously from year 3 to year 9 in primary schools. In particular, it is vital to encourage the interest of girls in mathematics and science during the 3rd cycle of primary school and their future choice of science studies.

The ability of teachers to help students acquire digital skills depends on how teachers develop their own digital competencies. The Digital Skills WG therefore recommended the translation and publication of DigCompEdu in Slovak, and the incorporation of the development of educators' digital competencies into professional development curricula. It is recommended that DigCompEdu be incorporated into the professional standards of teaching and professional staff (a condition for the implementation of DigCompEdu in practice according to the Action Plan of the Programme for Digital Education 2030), and into the requirements for filling the posts of university lecturers. DigComp 2.2 competences should also be included in the accreditation standards of higher education programmes.

Strengthening the care for mathematical talents, including the identification of above-average pupils and support for their development, should also become a strategic priority, starting from the first level of primary school.

Talents can be supported by promoting the teaching of mathematics, computer science and science subjects, by creating special classes focused on mathematics, computer science and science, by developing new innovative mathematics textbooks and teaching support materials or by making available EdTech applications such as Synthesis[26], by supporting Olympiads, competitions, camps and club activities, which are unaffordable for many parents. Caring for the talents is associated with extra costs but the returns on investment far outweigh the resources spent, as they are able to perform high value-added activities throughout their lives and support the development of the knowledge economy.

Also, it is of the utmost importance to take into account the importance of digital skills and to build them into the quality of early age education as well as lifelong learning in adulthood and to increase work opportunities in the labour market or to find or retain employment. The acquisition of digital skills must be accessible to all citizens of Slovakia, regardless of age, education or the fact that they belong to disadvantaged groups. Another area is gender convergence in ICT. Despite the fact that in Slovakia has recently managed to increase the proportion of female students in ICT programmes, more should be done to increase the attractiveness and potential of these fields among girls and women. There is a need to address the persistent lack of interest, to break down stereotypes in teaching and education and to empower women in the digital sector by effectively promoting ICT courses and job opportunities[27].

1.2 Digital infrastructure

Gigabit

State of play

As part of its vision to achieve Europe's digital transformation by 2030, the EU has proposed a Digital Decade Policy Programme 2030, which develops four key orientations. One of the key areas is the area of secure and sustainable digital infrastructures.

The National Broadband Plan

[26] https://www.synthesis.com/ (AI as individual education tutor)
[27] NSDZaAP, p. 7

The government approved the National Broadband Plan (NBP) in March 2021. The document has two main objectives – to cover all households with a connection speed of at least 100 Mbit/s with the possibility to increase it to 1Gbit/s, as well as to cover schools, institutions or authorities with a speed of at least 1 Gbit/s.

The NBP presents the notion of the investment gap for the SR as follows: The model for calculating the investment gap, which quantifies the amount of investment needed to meet the broadband targets based on the operators' plans until 2022, has been calculated as a maximum. This means that the result of the investment gap is considered to be the maximum amount needed to cover all households located in locations defined as white addresses in Slovakia with fibre access networks with FTTH and FTTB topologies. It is expected that the refinement and extension of the operators' plans, with the planned updating of the GI data for the given areas (always before the announcement of the calls for tenders), combined with the step change principle, will bring a reduction in the number of addresses that will need to be covered and thus in the total amount of the investment gap.

The NBP has identified an investment gap between the EU targets and the identified future situation.

Due to the high level of detail in the mapping, the gap between the projected 2022 state and the EU targets was identified with precision to the specific address of each household. Subsequently, two different models were used to calculate the estimated framework investment gap for both the last-mile and the regional backhaul networks that are routed underground. The investment gap, for a 100% fulfilment of the EU targets, has been estimated by these models together at around EUR 925 million. The investment gap in Slovakia, which is calculated on the basis of data from the 2019 public consultation, estimates the maximum budget needed to achieve the set targets. It is therefore the total financial effort that the private and public sectors need to make together to achieve the targets. However, the estimate of the investment gap does not imply that Slovakia will need EUR 925 million from the state budget or EU funds to invest in white jobs.

As the NBP says, these two objectives are best met by supporting the construction of passive infrastructure with fibre optic cables up to buildings, allowing ultra-high speed transmission of large amounts of data.

Target adjustment

The Digital Decade for Digital Connectivity aims for all European homes to be covered by a gigabit network by 2030, with all populated areas to be covered by 5G.

Feasibility study on a national broadband plan

Based on the modification of the targets, MIRDI SR updated the NBP by approving the Feasibility study (FS NBP) in 2Q 2023 by increasing the ambition of the targets to gigabit speeds and is currently preparing the implementation of the next steps (calls, implementations).

Building on the NBP, this document focuses on the bottleneck – the "last mile" of broadband, including addressing regional (backhaul) networks if those are also missing.

The vast majority of Internet infrastructure in supra-regional networks, but often also in networks before the last mile, is already implemented today over optical transmission media. And where they are lacking, white spaces remain. The current telecommunications technology environment in the SR indicates sufficient capacity, as well as competition, in the backbone fibre-optic networks that connect regional and local networks in every district and regional town across the Slovak Republic. In addition, cities in general, and also suburban areas with higher population densities, have already been covered

to a greater extent by the telecommunications market with local telecommunications infrastructure capable of achieving gigabit speeds.

The situation is different in areas with lower population density and/or greater geographical dispersion. This is also demonstrated by the mapping and public consultation of MIRDI SR of 2022. It is in such areas that the main areas of failure of the telecommunications market of the SR are evident, which for natural economic reasons leads to discrimination against the citizens of the SR on the basis of their geographic location.

The Feasibility study proposes a limit/maximum cost of the passive infrastructure defined in the FS NBP, Chapter 5.2, calculated per newly covered white address.

The maximum investment cost per newly covered white address (backhaul + FTTH) in terms of the minimum requirements defined in the FS NBP, Chapter 5.2 is EUR 2,000 (excluding VAT). This amount is based on the real experience of operators in building optical access networks in Slovakia, taking into account the fact that all investment-interesting addresses for private investment (with a payback period of up to 10-12 years) are currently covered.

Current estimate of the investment gap based on the 2022 mapping and the FS NBP

Based on the conclusions of the 2022 mapping, at the end of 2025 approx. 64.38% of the address points from operators' own investment funds. 1,069,398 address points out of 1,661,388 address points will have Internet meeting the EU coverage targets. This leaves 591 990 address points not covered. This estimate does not take into account possible growth – the addition of new address points on the basis of land development arising from construction.

For this rough estimate, it follows that to cover 591,990 address points x EUR 2,000 (the maximum investment cost per newly covered white address from the FS NBP) represents a maximum total investment gap for Slovakia of EUR 1,183,980,000. This is therefore the maximum total financial effort that the private and public sector must jointly make to achieve the targets.

This figure can be considered relevant if operators actually cover 1,069,398 addressable points from their own resources by the end of 2025. If they cover fewer, the investment gap increases by EUR 2,000 for each address not covered.

Estimate of the public resources needed to meet the 2030 Digital Decade target for Gigabit connectivity

Operators' plans for coverage from their own resources after 2025 will only be known to us from the mappings of the following years. Considering the trend of the mapping results, it can be assumed that operators will cover approx. 20% of the uncovered addresses with their own resources by 2030, i.e. that they will cover approx. 118,400 uncovered addresses, leaving 473,590 white addresses where public co-financing is needed.

Based on the Feasibility study of the NBP, the maximum investment cost per newly covered white address is EUR 2,000 (excluding VAT). Assuming that 50% of the costs will be borne by the operators and 50% of the costs will need to be co-financed from public sources, every EUR 1,000 used from this measure will cover at least 1 white address. However, there is an assumption that the coverage of the last 10% of white addresses will be the most financially demanding and will probably require an increase in investment costs of approx. 100% (approx. EUR 4,000 to cover one white address), this concerns approx. 47,359 addresses.

The estimated minimum impact of inflation will be an increase of approx. 20% on the amount of public resources calculated in this way. (In summary, only for the first half of 2023, consumer prices increased by 13.6% year-on-year – Source: The Statistical Office of the SR (SO SR))

Number of subsidy white addresses	Number of white addresses	Subsidy amount needed in EUR
Last 10%	47,359	113,661,600
First 90%	426,231	511,477,200
Total	473,590	625,138800

The Programme Slovakia 2021-2027 has a total allocation of EUR 112 100 000 (from EU sources) under Measure 1.5.1 Promotion of digital connectivity. The list of planned calls under this measure is presented in the table – Call schedule under Measure 1.5.1 Support for digital connectivity.

Out of the estimated amount of EUR 625,138,800 from public funds needed, EUR 112,100,000 is available in the Programme Slovakia, i.e. there is a shortfall of approx. EUR 513,038,800. Possible sources of this subsidy amount are the state budget of the Slovak Republic, the Programme Slovakia 2021-2027 or a combination of both.

Strengths

- The vast majority of internet infrastructure in supra-regional networks, but often also in networks before the last mile, is already currently implemented on optical transmission media.
- The current telecommunications technology environment in the SR indicates sufficient capacity, as well as competition, in the backbone fibre-optic networks that connect regional and local networks in every district and regional town across the Slovak Republic.

Challenges

- All neighbouring EU Member States have been investing billions of euros from their national budgets (as well as EU funds) for many years to eliminate geographical discrimination against their citizens and to achieve the coverage targets to which they have also committed themselves. And they have done this through demand-driven calls.
- Only the Slovak Republic has so far not contributed a single euro from public funds to cover even a single household.

5G

State of play

Slovak Telekom, a.s. was the first to launch a commercial 5G network in Bratislava in December 2020, meeting the EU target for the Slovak Republic to cover at least one major city with 5G by the end of 2020. In 2021 and 2022, the provider continued to expand its 5G network, adding more locations to the 5G coverage map. In August 2023, the 5G network of Slovak Telekom, a.s. covered 45% of the population of the SR and 284 locations – 61 towns and 223 villages.

The company O2 continues to build the 5G network, which in June 2023 was available to 53% of the Slovak population in 416 towns and villages in Slovakia.

The company Orange covered 35.9% of the population in 160 towns and villages in Slovakia with its 5G network in March. Further expansion of the high-speed 5G network will focus primarily on cities and locations with potential for enterprise customers, with the aim of maximising its availability to the widest possible range of users.

The company SWAN (4ka) operated a 5G network only in the cities of Bratislava, Trnava, Nitra and part of Banská Bystrica in March 2023.

In August 2023, O2 has the highest 5G network coverage – 53% (Slovak Telekom – 45%, Orange – 46.4%). Based on the definition of 5G coverage (at least one operator regardless of frequency band), it is realistic that 55% of the Slovak population will be covered by the end of 2023.

Strengths

- Presence of several strong international players in the introduction of 5G technologies,
- Active cooperation with private sector partners in planning future activities in this area,
- Cooperation across ministries to support this topic.

Challenges

- Very strong concentration of coverage on regional cities with more challenging coverage of regional centres,
- Economic regional disparities leading to different rates of return on investment in less developed cities.

Quantum computing

State of play

The construction of the quantum communication network is currently underway with funds from the directly managed Digital Europe programme and the Recovery and Resilience Plan of the SR. The network will connect 12 Slovak academic institutions from Bratislava to Košice and will also create the prerequisites for interconnection with neighbouring countries and for quantum transmission of encryption keys. In addition to building quantum infrastructure, the project will develop a single-photon detector with a cooling system and create an international training and education centre for quantum technologies. Slovak researchers are developing unique laser detectors that form the core of the quantum network's communication nodes.

However, the current development plans of QUTE.sk focus on quantum communication and not on quantum computers, as the practical implementation of quantum computing is demanding in terms of financial, material and personnel resources. In this context, researchers from the Faculty of Informatics and Information Technologies of the Slovak Technical University (STU FIIT) have come forward to articulate their interest in developing specifically the field of quantum computing.

Opportunities in the field of quantum computing for the Slovak Republic

Researchers from the Faculty of Informatics and Information Technologies of the Slovak Technical University (STU FIIT) have established cooperation with IBM, which offers the possibility to help with the quantum computing strategy for the Slovak Republic.

The era of technologies and algorithms that will be able to withstand the future risk of breaking today's encryption keys (RSA encryption) using quantum computers is coming. Today we know that RSA encryption will have to be replaced by a new type of encryption, which are generally referred to as post-quantum ciphers.

IBM is working with governments and commercial organisations on this topic in neighbouring countries as well. Poland is already a member of the Quantum Innovation Hub and is significantly increasing its capacity. In the Czech Republic, IBM has recently signed a memorandum in this area with the Czech Technical University in Prague (ČVUT).

Strengths

- Adoption of the Digital Transformation Action Plan of Slovakia for 2023-2026, where one of the key themes is the promotion of quantum communication infrastructure;
- Expert scientific capabilities in the areas of quantum communication infrastructure across scientific institutions;
- Engaging in international projects through EuroQCI membership.

Challenges

- The need to develop cooperation in the field of quantum computing and to involve Slovakia in teams collaborating on the development of the first quantum accelerated computer.

Semiconductors

State of play

VAIA, in cooperation with the ME SR, supports research and development in the field of digitalisation.

The current call allows support to entities that have been successful in the first phase of EIC Accelerator support (EIC Accelerator (europa.eu)), as well as entities that have received funding from institutional investors.

The Call for applications for Recovery and Resilience Facility funding to support projects that are part of an important project of common European interest (IPCEI) in the field of microelectronics.

The aim and purpose of the call is to improve the synergies of research, development and innovation measures between the national and EU levels by supporting the R&D and innovation phase and the first industrial deployment phase (or part thereof) of projects that are part of an Important Project of Common European Interest (IPCEI) in the field of microelectronics (hereinafter as "IPCEI projects"), in the framework of which the granting of state aid has been notified by the Slovak Republic and the notification has been decided by the European Commission. The call announced through VAIA will support projects implemented in the territory of the Bratislava Self-Governing Region (BSK), with an allocation of EUR 4 million.

EC-approved projects involved in the IPCEI ME/CT (information from the ME SR):

- Bizzcom s.r.o., Bučany (TTSK)
- Continium Technologies s.r.o., Košice
- SEMIKRON s.r.o., Vrbové
- Tachyum s.r.o., Bratislava.

Two companies are from the Bratislava Self-Governing Region (BSK), two from outside the BSK.

The call, which will potentially be launched by MIRDI SR, will support projects in all regions of the SR except the Bratislava Self-Governing Region (BSK) from the RRP SR Investment 4.

Strengths

- Presence of companies launching concrete activities in the field of semiconductors in Slovakia;
- Opportunity to build on these activities through linking these companies with other actors in the supply chain.

Challenges

- Need for a more proactive approach to the design of measures in this area to identify potential barriers to the development of this area.

Edge nodes

State of play

Edge Computing is a technology providing the ability to process data and compute operations directly in devices at the edge of the network. That is to say, at the very points where the data is also collected. Instead of transferring the data to a single central server where it would then be processed, these operations are performed directly at the edge of the network. The field of *Edge Computing* is well suited for applications such as sensors, IoT devices or autonomous vehicles. *Edge Computing* can also be used in healthcare, energy, manufacturing and other areas where fast and efficient data processing or computational operations are required. Another example of use cases are *smart cities*, where intelligently controlled intersections are located.

In all these areas, progress is being seen in Slovakia. But unfortunately, on the part of businesses, there is considerable reticence in relation to the use of cloud technologies. This is especially true for data directly from production, development and other data, the leakage of which could put the company at risk in a competitive environment. *Edge computing* may be the answer to these concerns.

Edge computing technology makes sense in places where standard networks cannot be used. Examples include transportation, healthcare, industrial buildings, and many other spaces or systems. *Edge Computing* solves the problem of processing data at the point where it is generated and evaluating it in real time. In this area, the security of the systems is critically important. Not just physical security at the actual location where these nodes are, but also in terms of capturing data within the network.

Strengths

- Presence of several major companies in the industry with know-how in the areas of sensors;
- Proactive approach of companies with regard to the need to modernise and remain competitive in an international context;
- Cooperation with industry representatives in the field across different working groups.

Challenges

- Lack of inclusion of this topic in existing strategic documents;
- The need to develop a strategic approach with regard to the potential use of these technologies across industry, but also in public sector areas (health, etc.).

1.3 Digital transformation of businesses

State of play

Slovakia has long shown significant shortcomings in the digitisation of businesses and the use of advanced digital technologies in businesses. On the one hand, some progress can be seen in terms of the latest DESI data, especially in terms of the share of SMEs with a basic level of digital intensity and the use of cloud solutions. In these two indicators, Slovakia is 9 and 3 percentage points behind the European Union average, respectively, and reaching the target figures by 2030 is not unrealistic in terms of the degree of underachievement of the final target (Slovakia is 30 and 31 percentage points behind in these two indicators, respectively). On the other hand, Slovakia is significantly behind the 2030 targets, especially in the use of AI technologies and Big Data analytics. We are currently 70 and 69 percentage points behind the 2030 targets in these two indicators, respectively, although the average of the EU Member States is also significantly lower in both of these indicators.

Slovakia's intention to introduce measures in this area is supported by several strategic and implementing documents over the last few years. In particular, it is the Strategy and Action Plan to improve Slovakia's position in the DESI by 2025, the Digital Transformation Action Plan of Slovakia

2023-2026 and the National Research, Development and Innovation Action Plan 2030. The first two documents in particular reflect Slovakia's efforts to improve its position in individual indicators that are relevant for achieving the goals of the Digital Decade Policy Agenda. The strategy and action plan for improving Slovakia's position in the DESI by 2025 has the objective of achieving at least the average overall EU score by 2025. The Digital Transformation Action Plan of Slovakia 2023-2026, adopted in December 2022, confirms Slovakia's intention to contribute to the collective effort within the EU to achieve the Digital Decade 2030 target of at least 75% of enterprises using Cloud, Artificial Intelligence and/or Big Data. National targets for 2026 are set at the corresponding level.

In addition to the main measurable indicators, Slovak businesses show a low level of use of modern technologies in other areas. Only 31% of businesses (compared to the EU average of 38%) reported that they use an ERP (enterprise resource planning) software package to share information between different functional areas. Only 21% of businesses (compared to the EU average of 29%) reported using two or more social media tools. Similarly, the use of e-invoicing for automated processing is also very low in Slovakia. The share of SMEs in Slovakia providing e-sales to other EU countries, at 7%, is also below the EU average of 9%. The strategic objectives of the Slovak Republic in the field of AI include in particular the promotion of (i) cooperation between academia and business, (ii) the use and deployment of AI in medicine, and (iii) the creation of an ecosystem for the deployment of AI using data.

In accordance with a survey by the smart industry association Industry4UM and Trexima (2022), only 23% of businesses are undergoing digital transformation (compared to EU27 – 31%). In a three-year view of the share of digitally transforming businesses, we see a continuous decline (2020 – 35%, 2021 – 26%). As the survey results show, only 8% of businesses are preparing an implementation strategy today. A third of enterprises are still only gathering information about digitalisation and trying to get oriented in the issue (35%). Despite the still low share of businesses digitising, 58% of the surveyed enterprises consider it important for their future. In terms of internal processes, businesses plan to digitise mainly production (66%) and logistics (46%). For external processes, they see the most urgent digitalisation as communication with customers (68%) and communication with the supply chain (52%).

Slovakia also supports the development of an institutional base for the development of digital capabilities. Slovakia has four European Digital Innovation Hubs (EDIHs) funded under the Digital Europe programme (co-financing under the Recovery and Resilience Plan of the SR is also foreseen) and one EDIH funded directly by the national government. The EDIHs cover a wide range of technologies and sectors, including critical digital technologies, healthcare, manufacturing, automotive and mobility. They will support SMEs mainly through (i) investor identification, (ii) digital skills training, (iii) pre-investment testing, and (iv) ecosystem creation for innovation and networking.

Strengths

- The main strength of Slovakia is the export orientation of the Slovak economy and the presence of several multinational companies that have brought several key digital technologies across supply chains to Slovakia.
- The existence of a number of strategic materials that precisely describe the problems in the areas of digitisation in Slovakia with regard to the objectives set out in the Digital Decade Policy Agenda.
- A broad network of stakeholders with active access and participation in working groups and councils of the Slovak government in the areas of digitalisation, R&D and business environment.

- Development of a Slovak Fintech ecosystem that can prepare institutional support and available capital resources for innovative projects in the field of digitalisation.

Challenges

- **Challenge 1:** Increasing the long-term productivity growth and competitiveness of SMEs requires targeting the least digitised enterprises and supporting SMEs across Slovak regions.
- **Challenge 2:** The need to support technology transfer and share examples of good practice between successful enterprises and the rest of Slovakia's SMEs.
- **Challenge 3:** The need for an accessible financing and regulatory environment for the development of innovative enterprises in Slovakia.
- **Challenge 4:** Communicate the need to implement digital transformation through senior business managers who understand the internal processes of businesses.

Proposed strategic direction

In the area of the business environment, technological advances create a number of significant challenges in the near term for which Slovakia and businesses need to prepare. Together with the development of digital infrastructure, which is a key driver of digital transformation, one of the key factors is the introduction of digital transformation applications into business, and in particular into SMEs. SMEs in particular face many barriers related to size, awareness, and finance to adopt new digital solutions and implement complementary operational and organisational changes.

Slovakia's vision for the digital transformation of businesses is to develop the potential of the Slovak business environment by removing all the barriers that prevent them from doing so, while supporting them to become leaders in the European Union. Slovakia must become a country where innovation is not only created, but becomes part of business practice as quickly as possible. In addition to achieving a basic digital intensity for all market players, it is essential to focus on those areas where Slovakia has the potential to be a successful international player and where the potential to be an international leader already exists today.

Slovakia needs to take advantage of its significant strengths stemming from the openness of the Slovak economy and the presence of international players, its strong technical and industrial focus and its business services position. It is on these foundations that Slovakia will build its future and future priorities. The activities so far have revealed the areas of Artificial Intelligence, robotics, the Internet of Things and Big Data analytics as priority topics. Slovakia needs to follow key trends and adapt its support to areas of key importance for the business environment. One of the areas for strategic development is to change the approach to regulatory burden through the introduction of better monitoring of impacts on the digital environment and through the continuous identification of regulatory barriers that interfere with the business environment.

1.4 Digitalisation of public services

State of play

Slovakia has made steady progress in recent years in providing **digital public services to citizens and businesses**. However, other countries in the EU have made faster progress in the area of digital public services. However, citizens and businesses still face difficulties in using digital public services, which are reported to have limited usability and limited transparency. Slovakia has put in place a number of measures to support progress in this area. The overall objective is to ensure that e-government services are secure, easily accessible and usable by every citizen and respect human rights. Sustained

efforts are therefore needed to contribute to achieving the targets of the Digital Decade 2030 and, at the same time, to keep in mind the required security safeguards that will lead to trust in these services when simplifying them.

Digital public services in Slovakia often appear at the tail end of rankings in international comparisons. Given that the fifth dimension of DESI (Digitalisation of Public Services) is closely intertwined with the eGovernment Benchmark, meaningfully targeted measures will contribute to improving Slovakia's ranking in both indices in parallel.

In terms of the combined scores for digital public services for both citizens and businesses, Slovakia remains below the EU average, but shows an increase compared to previous years: for digital public services for citizens, the score increased from 65% in 2021 to 67% in 2022, still well below the EU average. The EU average is 77%. For digital public services for businesses, the score has increased from 75% in 2021 to 78% in 2022, still below the EU average of 84%.

Supporting the creation of a participatory environment involving the non-profit, private and scientific research sectors has played an important role in the process of digitalising public services.

The Digitalisation of Public Services dimension aims to map the supply of and demand for digital public services across the EU. Their assessment is intended to serve as an incentive to exploit the full potential of modern technologies in public administration. The expected outcome is greater efficiency, cost and time savings for both the state and users, while promoting transparency and openness in the exercise of public authority.

Strengths

In its short journey so far, the Slovak Republic has also achieved successes that represent strengths and assets, which certainly include:

1. The willingness of the state to improve public services in cooperation with third parties (private, non-profit, scientific and research sector);
2. Support for the topic at strategic-legislative and methodological level, including incentives (IDSK, challenges);
3. Support for selected life situations and current challenges/needs (e.g. korona.gov.sk);
4. Support for capacity, knowledge and experience transfer (BRISK).

Their further support and development will help to create new opportunities such as:

1. Expanding the range and quality of public services,
2. Linking government services with third party services (financial sector, service sector),
3. Strengthening the capacity – expertise – credibility of the state,
4. Improving the ranking of the SR in the assessments (DESI, UX/CX maturity levels).

Slovakia has already achieved and develop it taking into account local specificities. There is a need to take into account what has already worked and to identify and address Slovakia's requirements in a sensitive way, taking into account the potential for cross-border and international benefits. Digital public services that realistically and broadly help officials, businesses and citizens to address their needs will help to narrow the gap in scores between Slovakia and the EU average, not just those that numerically increase the score slightly. It is therefore key to address Slovakia's shortcomings in its approach to digital transformation that bring other countries to a higher level of digital maturity and therefore a better position in the DESI.

However, active and systematic management of Slovakia's digitalisation requires clear prioritisation and stability beyond electoral periods, given the large scale of the issue.

As part of its intention to improve digital government services, Slovakia has also joined the Berlin Declaration on Digital Transformation of the European Union, which follows the original Tallinn Declaration on eGovernment from 2017. The Berlin Declaration on Digital Society and Value-Based Digital Government identifies concrete measures to improve the digital services of the state, based on principles such as respect for fundamental rights and democratic values, social participation, and strengthening the digital literacy of citizens. Measures include Supporting the use of eIDs not only in public administration but also in the private sector, improving the transparency of state services, inclusive digitalisation of state services (also targeting disadvantaged citizens), organising workshops and trainings focused on digital skills, supporting the introduction of the "once is enough" principle, implementing common standards and, where appropriate, open source software, sharing experiences with the use of Artificial Intelligence in public services, considering measures to increase the transparency of the energy consumption of digital tools and infrastructure and how to improve their efficiency.

The digitalisation of public administration in Slovakia is also implemented through the National Concept for the Computerisation of Public Administration of the SR (NKIVS), which continues to develop the concept of strategic priorities as a driving force to achieve the desired eGovernment objectives. The strategic priorities of the NKIVS represent cross-cutting themes in which specific initiatives will be developed to achieve the objectives of this concept. The strategic priorities describe the future state and the main initiatives to achieve it: for government cloud, user-centric eServices, data transformation, digital transformation and digital office, government procurement, cyber and information security, and IT human resources support. An important aspect of all strategic priorities is the prioritisation of efforts, which is based on priority government services and priority life situations. An important part of the strategy is to set IT governance right. An important part of the strategy is to set IT governance right. The new NKIVS setup foresees five dimensions of cooperation: strategy governance, IT resource governance, risk management, change management and transparency of actors. For each dimension, tools, actors and processes are identified, including the definition of relationships and responsibilities. The architecture of public administration digitalisation defines architectural principles for user-centricity, transparency in public administration, inherently digital public administration, data as assets, reusability and security. In addition, it defines the transformational effects of the different components of the architecture. The implementation of the National Concept for the Computerisation of Public Administration will be ensured by the Action Plan for the Implementation of the National Concept for the Computerisation of Public Administration of the Slovak Republic (AP NKIVS). The AP NKIVS defines and maintains a roadmap of measures and milestones for achieving the necessary changes. Part of the AP NKIVS will be the so-called parallel transformation. This consists of two parallel tracks: iterative improvement of priority services and service lifecycles on the basis of today's rules, and parallel preparation and implementation of fundamental changes to the environment to enable a deep digital transformation of public administration. The 8 measures under Target 1: 100% of key public services will be available online and, where relevant, EU citizens and businesses will be able to communicate online with public authorities, are also based on the forthcoming AP NKIVS.

Challenges

Slovakia faces many challenges despite its efforts to strengthen the relevance and usability of digital challenges. The most significant barriers and weaknesses limiting progress include:

1. Unclear vision and ambiguous leadership;

2. Changing the mindset of the state to a pro-client orientation;
3. Persistent focus on the needs of its own ministry;
4. Lack of competent capacity on the part of the state.

The main factors behind these challenges can be identified as:

1. Political influences and rivalries instead of seeking synergies;
2. Difficult to understand central infrastructure components;
3. Complex strategic-legislative framework;
4. Level of ICT and knowledge readiness of the different public authority bodies.

Failure to address these weaknesses increases the risk of threats, the most serious of which may be:

1. Undermining trust in the state and its democratic orientation;
2. Failure to exploit the potential to improve the quality of life and the satisfaction index;
3. Lagging behind neighbouring countries;
4. Highly skilled people drain.

In order to eliminate the identified challenges, it will mainly be necessary to “distil” an essential vision of what exactly digital public services should be to meet the needs of both the state and its citizens. This vision must then be clearly communicated and managed through competent governance, supported by a clear strategic-legislative framework and, most importantly, implemented in a way that restores proper credibility and trust to the state.

Chapter 2: National trajectories and target values to contribute to the EU's digital targets

Including: national target values and projected yearly data points for each year until 2030.

2.1 Digital skills and ICT experts

DESI YEAR	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
At least basic digital skills	55%	55%	56%	57%	59%	60%	63%	66%	70%
DESI YEAR	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
More than basic digital skills	21%	21%	22%	24%	25%	27%	28%	29 %	30%
DESI YEAR	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
ICT experts	4%	4%	4%	5%	5%	6%	6%	6%	6%
DESI YEAR	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
ICT female experts	15%	15%	16%	17%	19%	20%	22%	24%	25%

2.2 Digital infrastructure

Gigabit

The Digital Decade 2030 goals for digital connectivity are: by 2030, all European homes will be covered by a gigabit network, with all populated areas covered by 5G.

This is a political commitment resulting from European Parliament and Council legislation. Even with public intervention, 100% coverage is not considered realistic by the expert community or by telecom operators.

Year	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Gigabit (%)	24	36	49	64	71	76	83	94	100

5G

The coverage trajectory will depend on downlink transmission speeds (30 Mbit/s or 100 Mbit/s).

For different frequency bands for 5G, operators have designated different channel widths (e.g. for the 700 MHz band, the channel width is 10 MHz, which allows to provide downlink speeds of 30 Mbit/s).

To provide higher speeds (min. 100 Mbit/s), it will be possible to provide sufficient 5G channel width (min. 40 MHz) e.g. in the frequency bands 3400-3800 MHz or 26 GHz (but of course also other).

Taking into account that a 5G network coverage of 30 Mbit/s will be considered, a realistic trajectory could be as follows:

Year	2023	2024	2025	2026	2027	2028	2029	2030
5G coverage (%)	55*	65	74	83	91	94	97	98.5

The Ministry of Transport does not consider 100% coverage of populated areas to be realistic, not only from a technological point of view, but also from the point of view of economic costs as well as their return.

Semiconductors

Our share of the European Union target will be achieved through the development of measures whose exact impact cannot be quantified in advance.

Quantum computing

Our share of the European Union target will be achieved through the development of measures whose exact impact cannot be quantified in advance.

Edge nodes

Our share of the European Union target will be achieved through the development of measures whose exact impact cannot be quantified in advance.

2.3 Digital transformation of businesses

The targets and trajectories set for the Slovak Republic are very ambitious and the achievability of these targets may be influenced by a number of external factors beyond the reach of the measures.

DESI YEAR	2023	2024	2025	2026	2027	2028	2029	2030
Baseline intensity SME	60%	62%	65%	70%	77%	82%	86%	90%
DESI YEAR	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Cloud	31%	34%	39%	46%	56%	64%	70%	75%
DESI YEAR	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Big Data	6%	10%	18%	29%	42%	56%	66%	75%
DESI YEAR	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
AI	5%	9%	18%	29%	42%	56%	66%	75%
DESI YEAR	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Unicorns	0	0	1	1	1	2	2	3

2.4 Digitalisation of public services

DESI YEAR	2023	2024	2025	2026	2027	2028	2029	2030
Digital public services for citizens	67%	70%	76%	90%	92%	94%	98%	100%
DESI YEAR	2023	2024	2025	2026	2027	2028	2029	2030
Digital public services for businesses	78%	84%	87%	92%	95%	97%	100%	100%
DESI YEAR	2023	2024	2025	2026	2027	2028	2029	2030
Digital public services (total)	73%	77%	82%	91%	94%	96%	99%	100%
DESI YEAR	2023	2024	2025	2026	2027	2028	2029	2030
Access to electronic health records	45%	50%	55%	65%	80%	90%	100%	100%
DESI YEAR	2023	2024	2025	2026	2027	2028	2029	2030
Access to electronic identification (eID)	64%	72%	85%	100%	100 %	100 %	100 %	100 %

Chapter 3: Policies, measures and actions to achieve the digital targets

The following chapter presents a list of measures fulfilling each of the targets in the four dimensions of the Digital Decade. Following the setting of these targets, the plan is to request a change of allocation in some of the financial instruments (e.g. the Programme Slovakia 2021-2027) in order to be able to direct sufficient resources to meet the specific targets. This will result in an even broader range of measures with EU funding in the future.

3.1 General overview of measures per digital target

Digital skills and ICT experts

At least basic digital skills

Target: A digitally skilled population with the aim of achieving a gender balance where at least 80% of 16-74 year olds have at least basic digital skills

- **National baseline value (latest available historical data point):** 55%;
- **EU baseline value (latest available historical data point):** 54%

Overall timeline:

	2023	2024	2025	2026	2027	2028	2029	2030
Measures that contribute to the target								
Measure 1.1.1: Strengthening the institutional background by further supporting the activities and actions of the National Coalition for Digital Skills and Jobs of the SR (NSDZaAP, Measure 0A, pp. 43-44)								
Measure 1.1.2: Establishment of an effective model for the management and coordination of digital skills activities among relevant public administration authorities (NSDZaAP, Measure 0B, pp. 44-45)								
Measure 1.1.3: More effective networking between public administration authorities, the National Coalition for Digital Skills and Jobs of the Slovak Republic and the Alliance of Sector Councils in the field of digital skills								

development (NSDZaAP, Measure 0C, pp. 45-46)								
Measure 1.1.4: Identification of the central competencies for the 21st century to be developed by schools at primary, secondary and higher education levels and their incorporation into curriculum documents as part of the ongoing curriculum reform (NSDZaAP, Measure 2A, pp. 49-50)								
Measure 1.1.5: Creation of space for primary and secondary schools to develop competences for the 21st century in formal education as part of the planned educational content reform (NSDZaAP, Measure 2B, pp. 50-51)								
Measure 1.1.6: Creation of a training offer for pedagogical and professional staff in the field of increasing digital skills and competences according to the DigCompEdu standard and their use in the teaching process through cooperation with universities and directly managed organisations of the MESRS SR (NSDZaAP, Measure 2C, pp. 51-52)								
Measure 1.1.7 Introduction of a system of transparent incentive mechanisms for teaching and professional staff who, through innovative digital learning practices and concepts, improve the results of the educational process and actively improve their own digital competences (NSDZaAP, Measure 2D, p. 52)								
Measure 1.1.8: Improvement of the support system for pedagogical and professional staff in the use of digital								

technologies in the educational process through the newly created position of school digital coordinator, provision of full-time or part-time funding for this position (NSDZaAP, Measure 2E, pp. 53-54)								
Measure 1.1.9: Implementation of educational content in relation to the digital transformation of society in curriculum education at all three levels of higher education (NSDZaAP, Measure 2F, p. 54)								
Measure 1.1.10: Promotion of the use of open resources, the development of innovative educational content and pedagogical practices, support for best practices and educational programmes developed in cooperation with employers with a focus on the development of an information and digital culture impacting on the widest possible group of schools, teachers and pupils (NSDZaAP, Measure 2G, p. 55)								
Measure 1.1.11: Establishment of a National Centre for Digital Transformation of Education (NCDTV) in an environment of academic departments with a long-term focus on the implementation of digital transformation of education, with two centres in Bratislava and Košice, involving experts from HEIs and practitioners (NSDZaAP, Measure 2H, pp. 55-56)								
Measure 1.1.12: Support for the development of basic digital skills of employees,								

jobseekers, jobseeker candidates and self-employed persons through Individual Learning Accounts (ILA) (NSDZaAP, Measure 3A, p. 58)								
Measure 1.1.13: Support for the development of digital skills of the active workforce by employers – support for reskilling and upskilling training (NSDZaAP, Measure 3B, pp. 58-59)								
Measure 1.1.14: Support for the development of digital skills of jobseekers and jobseeker candidates – support for reskilling and upskilling training according to employer demand (NSDZaAP, Measure 3E, pp. 61-62)								
Measure 1.1.15: Increase access to inclusive education and e-inclusion of citizens of all ages and social backgrounds (NSDZaAP, Measure 5A, pp. 67-68)								
Measure 1.1.16: Increase the level of digital skills of seniors and representatives from other disadvantaged groups (NSDZaAP, Measure 5B, pp. 68-69)								
Measure 1.1.17: Analysis and implementation of an appropriate approach to building digital literacy, digital education and the use of digital solutions (including eGovernment) by people from marginalised Roma communities (NSDZaAP, Measure 5C, pp. 69-70)								
Measure 1.1.18: Increase the level of digital skills of children and young people from socially and economically disadvantaged backgrounds (NSRDaAP, Measure 5D, pp. 71-72)								

Measure N1.1.19: Strengthening the institutional background by further supporting the activities and actions of the National Coalition for Digital Skills and Jobs of the SR after 2026 (new measure)								
Measure N1.1.20: Functioning of an effective model for the management and coordination of digital skills activities among relevant public administration authorities (new measure)								
Measure N1.1.21: Linking public administration authorities, the National Coalition for Digital Skills and Jobs of the SR and the Alliance of Sector Councils in the field of digital skills development (new measure)								
Measure N1.1.22: Improving the digital skills of seniors 55+ and disadvantaged persons (new measure)								
Measure N1.1.23: Promoting Industry 4.0 skills for all population groups – investment in education (new measure)								
Measure N1.1.24: Support for youth work (new measure)								
Measure N1.1.25: Digitalisation of youth work and non-formal education (new measure)								
Measure N1.1.26: Continuous support for the position of School Digital Coordinator in schools (new measure)								
Measure N1.1.27: Creation and pilot implementation of digital technologies to increase young people's interest in sports activities in order to improve their								

physical activities in educational content as well as in extracurricular activities in relation to the digital transformation of society (new measure)								

- **Budget of all the measures that can be attributed to the target**
    - Public investment:
        - already allocated: EUR 213,493,552
        - planned: EUR 234,053,630
    - Thereof from national sources:
        - already allocated: EUR 2,433,552
        - planned: EUR 234,053,630
    - Thereof from regional sources:
        - already allocated:
        - planned:
    - Thereof from EU sources:
        - already allocated: EUR 211,060,000
        - planned use:
    - Private investment (if known):

Target: At least 20 million ICT experts will be employed in the EU, promoting women's access to ICT and increasing the number of ICT graduates

- **National baseline value (latest available historical data point):** 4.3%;
- **EU baseline value (latest available historical data point):** 4.5%

Overall timeline:

	2023	2024	2025	2026	2027	2028	2029	2030
Measures that contribute to the target								
Measure 1.2.1: Application of the legislation for the granting of national visas (type D) to simplify the conditions for the employment of foreigners and in particular ICT specialists, as well as simplification of the regime for the recognition of educational qualifications and professional qualifications for the exercise of a regulated profession (NSDZaAP, Measure 1A, pp. 46-47)								
Measure 1.2.2: Supporting the development of specific digital skills to meet the objectives of the Research and Innovation Strategy for Smart								

Specialisation of the SR (SK RIS3 2021+) (NSDZaAP, Measure 1B, pp. 47-48)								
Measure 1.2.3: Increasing the quality of studies and the number of graduates in ICT fields of study in secondary vocational schools and IT high schools and universities (NSDZaAP, Measure 1C, pp. 48-49)								
Measure 1.2.4: Promoting the development of digital skills of the active workforce by employers – support for reskilling and upskilling education (NSDZaAP, Measure 3B, pp. 58-59)								
Measure 1.2.5: Support for training of public administration employees – with regard to RIS3 domains (NSDZaAP, Measure 3C, pp. 59-60)								
Measure 1.2.6: Retraining hard-to-employ NEET graduates to be able to take up ICT jobs in lower and medium skill levels (NSDZaAP, Measure 3D, pp. 60-61)								
Measure 1.2.7: Promoting girls' and women's motivation for ICT in close cooperation with the National Coalition for Digital Skills and Jobs of the SR (NSDZaAP, Measure 4A, pp. 63-64)								
Measure 1.2.8: Increasing the number of girls and women in ICT fields of study in secondary schools and universities (NSDZaAP, Measure 4B, pp. 64-65)								
Measure 1.2.9: Establishment of a scholarship and internship programme for top students (APDTS, Measure 2.2.2.3, p. 42)								
Measure 1.2.10: Establishment of a scholarship and internship programme for								

top students (APDTS, Measure 2.2.2.3, p. 42)								
Measure 1.2.11: Trainings for the public sector on practical applications of quantum technologies (APDTS, Measure 2.3.1.2, p. 51)								
Measure 1.2.12: Expert trainings on quantum technologies (APDTS, Measure 2.3.1.3, pp. 51-52)								
Measure 1.2.13: Involvement of the Slovak Republic in European initiatives related to AI (APDTS, Measure 3.1.1.6, p. 60)								
Measure 1.2.14: Building data literacy (APDTS, Measure 3.1.3.1, p. 62)								
Measure 1.2.15: Promoting awareness-raising campaigns to increase positive perceptions and awareness of career opportunities for women in the ICT sector (APDTS, Measure 4.1.1.1, pp. 68-69)								
Measure 1.2.16: Call for the establishment of summer internships for secondary school girls to support expressed interest in STEM studies (APDTS, Measure 4.1.1.2, pp. 69-70)								
Measure 1.2.17: Study mapping the current state of EU legislation to promote the creation of opportunities for women's participation in decision-making roles in the ICT sector (APDTS, Measure 4.1.1.3, p. 70)								
Measure 1.2.18: Support for training aimed at capacity building and the development of competences and skills arising from the needs and necessary to meet the objectives of the digital and green transformation (APDTS, Measure 4.3.2.2, pp. 80-81)								

Measure 1.2.19: Improving the Performance of Slovak Universities (Strategy and action plan to improve Slovakia's position in the DESI index by 2025, Measure II.4, pp. 61-62)								
Measure 1.2.20: Adoption of legislative measures facilitating entry and establishment in Slovakia (National Strategy for Research, Development and Innovation Action Plan, Measure 2.2.2.5, p. 83)								
Measure N1.2.21: Support for talents and their participation in international events (new measure)								
Measure N1.2.22: Increasing the level of digital skills and competences of ICT experts to apply SportsTech solutions to support young people's motivation for sport and physical activities and health prevention through HUBs (new measure)								

- **Budget of all the measures that can be attributed to the target**
    - Public investment:
        - already allocated: EUR 41,450,000
        - planned: EUR 5,580,000
    - Thereof from national sources:
        - already allocated: EUR 1,640,000
        - planned: EUR 5,580,000
    - Thereof from regional sources:
        - already allocated:
        - planned:
    - Thereof from EU sources:
        - already allocated: EUR 39,730,000
        - planned use:
    - Private investment (if known):

Digital infrastructure

5G

Input from the Ministry of Transport of the Slovak Republic has been provided for this area:

The National policy for electronic communications by 2030, which was approved by the Government of the SR by Resolution No 204/2023 of 3 May 2023, defines tasks focused in particular on the area of spectrum to ensure its availability for the further development of 5G and subsequent technologies for the purpose of building broadband wireless networks. The document is available on the website of the MT SR under Strategic documents Strategické dokumenty (mindop.sk).

The document "National policy for electronic communications by 2030" is the basis for determining the future direction of Slovakia in the field of development of electronic communications. It focuses on technological trends and market development tendencies in the provision of electronic communications networks and services and the identification of possibilities of influencing them by means of instruments of state intervention.

Further details are provided in the document in question, which is published on the website of the MT SR in both Slovak and English versions: (https://www.mindop.sk/ministerstvo-1/elektronicke-komunikacie-8/strategicke-dokumenty) (https://www.mindop.sk/en).

In addition, the national regulator (the Regulatory Authority for Electronic Communications and Postal Services) imposes specific indicators and conditions on mobile operators to achieve coverage of the territory, transport corridors and population of the Slovak Republic in tenders for frequency bands designated for 5G technologies.

The aim is to ensure that the Slovak Republic is covered by high quality and fast broadband wireless networks, while at the same time promoting effective competition, efficient use of spectrum and service to end-users.

Specific development criteria (coverage of the population and transport corridors) were already established in the 2020 700 MHz frequency band tender, which were imposed in the individual licences issued for the use of frequencies from the 700 MHz frequency band.

Similarly, such development criteria are also proposed in the forthcoming tender procedure for the issuance of individual authorisations for the use of frequencies from the 900 MHz band, which will take place by means of an electronic auction (https://www.teleoff.gov.sk/10807-sk/verejna-konzultacia-z-frekvencneho-pasma-900-mhz-a-2100-mhz/).

Existing and new measures

	2023	2024	2025	2026	2027	2028	2029	2030
Measures that contribute to the target								
Measure 2.1.1: Establishment of the Broadband Competence Office (APDTS, Measure 2.1.1.3, p. 33)								
Measure 2.1.2: Preparation and implementation of calls for funding for connectivity in the light of the principles of the Feasibility study of the								

NBP (APDTS, Measure 2.1.1.4, p. 31)								
Measure N2.4.1: Call for proposals for Recovery and Resilience Facility funding to support projects that are part of an Important Project of Common European Interest (IPCEI) in the field of microelectronics								

- **Budget of all the measures that can be attributed to the target**
  - Public investment:
    - already allocated: EUR 115,372,232
    - planned: EUR 4,000,000
  - Thereof from national sources:
    - already allocated: EUR 762,500
    - planned: EUR
  - Thereof from regional sources:
    - already allocated:
    - planned:
  - Thereof from EU sources:
    - already allocated: EUR 114,609,732
    - planned use: EUR 4,000,000
  - Private investment (if known):

Digital transformation of businesses

Basic digital intensity

Target: More than 90% of SMEs with at least a basic level of digital intensity

- **National baseline value (latest available historical data point):** 60%; **EU baseline value (latest available historical data point):** 69%
- **Overall timeline:**

Implemented measures

	2023	2024	2025	2026	2027	2028	2029	2030
Measures that contribute to the target								
Measure 3.1.1: – *Co-financing of investments in basic technological tools and processes in SMEs* (Location of the measure – Digital Transformation Action Plan of Slovakia 2023-2026, Measure 1.1.1.1)								
Measure 3.1.2: *Overview of support and adoption of a basic tool to diagnose the digital readiness of an enterprise* (Location of the measure – Digital Transformation Action Plan of Slovakia 2023-2026, Measure 1.1.1.2)								
Measure 3.1.3: *Promoting a toolkit for financing innovation projects and initiatives in SMEs* (Location of the measure – Strategy for Research, Development and Innovation Action Plan, Measure 1.3.5.5)								

Planned measures

Measure N3.1.4: *Dissemination of education on the use of digital technologies in business in Slovakia*								
Measure N3.1.5: *Establishment and support for the National Centre for Digital Economy and Society (NCDES)*								

- **Budget of all the measures that can be attributed to the target**
    - Public investment:
        - already allocated: EUR 83,274,000
        - planned: EUR 3,650,000
    - Thereof from national sources:
        - already allocated:
        - planned: EUR 1,750,000
    - Thereof from regional sources:
        - already allocated:
        - planned:
    - Thereof from EU sources:
        - already allocated: EUR 83,274,000
        - planned use: EUR 1,900,000
    - Private investment (if known):

Advanced digital technologies (cloud, AI, Big Data)

Target: More than 75% of EU companies using cloud/AI/Big Data

- **National baseline value – Cloud (latest available historical data point):** 31%; **EU baseline value (latest available historical data point):** 34**%**
- **National baseline value – AI (latest available historical data point):** 5%; EU baseline value (latest available historical data point): 8%
- **National baseline value – Big Data (latest available historical data point):** 6%; **EU baseline value (latest available historical data point):** 14%
- **Overall timeline:**

Implemented measures

	2023	2024	2025	2026	2027	2028	2029	2030
Measures that contribute to the target								
Measure 3.2.1: *Investment in advanced technology tools including supply chains* (Location of the measure								

– Digital Transformation Action Plan of Slovakia 2023-2026, Measure 1.1.2.1)								
Measure 3.2.2: *Provision of digital and innovation vouchers* (Location of the measure – Digital Transformation Action Plan of Slovakia 2023-2026, Measure 1.1.2.2)								
Measure 3.2.3: *Support for R&D projects in line with the Research and Innovation Strategy for Smart Specialisation of the SR (RIS 3)* (Location of the measure – Digital Transformation Action Plan of Slovakia 2023-2026, Measure 1.1.2.3)								
Measure 3.2.4: *Co-funding of projects involved in Testing and Experimentation Facilities* (Location of the measure – Digital Transformation Action Plan of Slovakia 2023-2026, Measure 1.1.2.4)								
Measure 3.2.5: *Tailor-made digital and technical solutions for clients through CDI/ECDI* (Location of the measure – Digital Transformation Action Plan of Slovakia 2023-2026, Measure 1.1.2.4)								
Measure 3.2.6: *Functional and capacity strengthening of the Executive Agency of the ME SR (SARIO)* (Location of the measure – Strategy for Research,								

Development and Innovation Action Plan, Measure 3.3.1.2)								
Measure 3.2.7: *Building transformation and innovation consortia* (Location of the measure – Strategy for Research, Development and Innovation Action Plan, Measure 3.4.1.1)								
Measure 3.2.8: *Building transformation and innovation consortia Expanding the knowledge of non-ICT experts, companies in the field of AI* (Location of the measure – Digital Transformation Action Plan of Slovakia 2023-2026, Measure 3.1.1.1)								
Measure 3.2.9: *Promoting an AI specialised course focused on professional lifelong learning* (Location of the measure – Digital Transformation Action Plan of Slovakia 2023-2026, Measure 3.1.1.2)								
Measure 3.2.10: *Creation of an AI information point (AI point* (Location of the measure – Digital Transformation Action Plan of Slovakia 2023-2026, Measure 3.1.1.3)								
Measure 3.2.11: *AI popularisation campaign* (Location of the measure – Digital Transformation Action Plan of Slovakia 2023-2026, Measure 3.1.1.4)								

Measure 3.2.12: *Support for the digitalisation of businesses through SIH financial instruments* (Location of the measure – Recovery and Resilience Plan, Component 9, Investment 5)								

Planned measures

Measure N3.2.13: *Cloud popularisation campaign*								
Measure N3.2.14: *Big Data popularisation campaign*								
Measure N3.2.15: *Expert workplaces for data science*								
Measure N3.2.16: *Sharing data to support digital transformation*								
Measure N3.2.17: *Increase allocation for digital and innovation vouchers*								

- **Budget of all the measures that can be attributed to the target**
  - Public investment:
    - already allocated: *EUR* 394,301,694.39
    - planned: *EUR* 33,956,000
  - Thereof from national sources:
    - already allocated: *EUR* 116,302,000
    - planned: *EUR* 5,200,000
  - Thereof from regional sources:
    - already allocated:
    - planned:
  - Thereof from EU sources:
    - already allocated: EUR 277,999,694.39
    - planned use: EUR 28,756,000
  - Private investment (if known):

Promoting innovative businesses

Objective: growing scale-ups and finance to double EU unicorns

- **National baseline value (latest available historical data point):** 0;
- **EU baseline value (latest available historical data point): 174;**
- **Overall timeline:**

Implemented measures

	2023	2024	2025	2026	2027	2028	2029	2030
Measures that contribute to the target								
Measure 3.3.1: *Support for the development of venture capital funds in Slovakia* (Location of the measure – Digital Transformation Action Plan of Slovakia 2023-2026, Measure 1.1.3.1)								
Measure 3.3.2: *Creation of a National Strategy for the Promotion of Financial Innovation (FinTech)* (Location of the measure – Digital Transformation Action Plan of Slovakia 2023-2026, Measure 4.4.1.1)								
Measure 3.3.3: *Introduction of a more efficient, modern and digital approach to capital markets* (Location of the measure – Digital Transformation Action Plan of Slovakia 2023-2026, Measure 4.4.1.6)								
Measure 3.3.4: *Digitalisation of the information obligations of the Central Securities Depository* (Location of the measure – Digital Transformation Action Plan of Slovakia 2023-2026, Measure 4.4.1.7)								
Measure 3.3.5:								

Digitalisation of selected core and non-core services of the Central Securities Depository (Location of the measure – Digital Transformation Action Plan of Slovakia 2023-2026, Measure 4.4.1.8)								
Measure 3.3.6: *Reforming the taxation of income from capital assets of domestic firms* (Location of the measure – Strategy for Research, Development and Innovation Action Plan, Measure 1.3.5.1)								
Measure 3.3.7: *Increase the venture capital volume in the economy through the financial instruments of the Slovak Investment Holding and the support of business angels* (Location of the measure – Strategy for Research, Development and Innovation Action Plan of the Office of the Government of the SR, Measure 1.3.5.2)								
Measure 3.3.8: *Testing and implementation of digital identity* (Location of the measure – Digital Transformation Action Plan of Slovakia 2023-2026, Measure 4.4.1.3)								
Measure 3.3.9: *Performance of the Analysis of the legal environment for the use of DLT technology in the financial market*								

(Location of the measure – Digital Transformation Action Plan of Slovakia 2023-2026, Measure 4.4.1.5)								
Measure 3.3.10: *Support for projects with Seal of Excellence* (Location of the measure – Recovery and Resilience Plan of the Slovak Republic, Component 9, Investment 1)								
Measure 3.3.11: *Support for RDI projects in the field of digitalisation from the Recovery and Resilience Plan*								

- **Budget of all the measures that can be attributed to the target**
  - Public investment:
    - already allocated: *EUR* 303,820,000
    - planned:
  - Thereof from national sources:
    - already allocated: *EUR* 56,990,000
    - planned:
  - Thereof from regional sources:
    - already allocated:
    - planned:
  - Thereof from EU sources:
    - already allocated: EUR 246,830,000
    - planned use:
  - Private investment (if known):

– Very brief description: how and to what extent the measures are expected to address Member State-specific challenges (see point 2.1):

- **Challenge 1 - Increasing the long-term productivity growth and competitiveness of SMEs requires targeting the least digitalised enterprises and supporting SMEs across Slovakia's regions**
- *The measures Overview of support and adoption of a basic tool for diagnosing the digital readiness of an enterprise and Supporting a toolkit for financing innovation projects and initiatives in SMEs are expected to primarily promote awareness among SMEs in terms of quality SME diagnostics and knowledge regarding their further development, and to support*

*the transformation of these enterprises in general into the introduction and development of digital technologies in SMEs in approximately **10% of SMEs**.*

- **Challenge 2 – The need to support technology transfer and sharing of good practice examples between successful enterprises and the rest of SMEs in Slovakia**
- *The measures Provision of Digital and Innovation Vouchers, Tailored Digital and Technical Solutions for Clients through CDI/ECDI, Functional and Capacity Strengthening of the Executive Agency of the ME SR (SARIO), Establishment of Transformation and Innovation Consortia, Promotion of AI Specialised Course for Professional Lifelong Learning, and Establishment of an AI Information Point are expected to support the introduction of advanced digital technologies in businesses in a total of **20% of businesses**.*

- **Challenge 3 – The need for availability of funding and regulatory environment for the development of innovative businesses in Slovakia**
- *Measures Supporting the development of venture capital funds in Slovakia and Increasing the volume of venture capital in the economy through the financial instruments of the Slovak Investment Holding and the support of business angels are expected to help address the lack of capital available for business development and the growth of innovative businesses, thereby contributing to the development of **hundreds of businesses in this area**.*

Digitalisation of public services

EU institutions and Member States are working together to achieve the following digital targets for **the digitalisation of public services** in the EU by 2030:

1. 100% of key public services[2] will be available online and, where relevant, citizens and businesses in the Union will be able to interact online with public administration authorities;
2. 100% of Union citizens will have access to their electronic health records;
3. 100% of Union citizens will have access to a means of secure electronic identification (eID) that will be recognised throughout the Union, allowing users to have full control over identity transactions and shared personal data.

Target 1: 100% of key public services[3] will be available online and, where relevant, EU citizens and businesses will be able to interact online with public administration authorities

- **National baseline value (latest available historical data point): 73 %;**
- **EU baseline value (latest available historical data point): 81 %[28]**

[28] European Commission (2023) *Digital Decade Country Report 2023 Slovakia*. Available at: https://s-circabc.europa.eu/ui/group/573d5467-e78d-41bb-b8c3-9ab32354b022/library/99862053-c626-41fa-8164-1cf5cf35c016

Digital public services for citizens and businesses

The availability of atomised e-services in Slovakia is very high and the public administration has managed to create thousands of services. However, the use of e-services by citizens and businesses remains very low. Additional new services will not change the situation. The number of activated mailboxes for delivery, which can be interpreted as the number of citizens actively using electronic communication with the public administration, is low compared to the potential (eIDs issued). Therefore, the objective is to make e-services user-friendly both for citizens and entrepreneurs. The increase in the quality of services and the introduction of mobile access to e-services will be reflected in an increase in citizen satisfaction and motivation to use public e-services.

Increased use of cloud services to accelerate digital transformation that is not dependent on paper-based processes will certainly contribute to the achievement of this objective. Optimising the competences, processes and organisation of public administration departments and removing assigned local competences will speed up, automate and optimise processes, reduce costs and create a better digital office environment for the public administration staff on whom the success of the digital transformation depends. In Slovakia, new legislation will gradually be introduced into practice to eliminate the need to send and process documents, the obligation for officials to make decisions based on these documents, and the obligation for citizens and businesses to request procedural actions even where public administration could act without these requests. The reviewability of decisions will not be based solely on the validity of the document issued, but on the data in force at the time. The new information systems architecture will be based on data sharing, not data forwarding, and will provide tools for automation of operations. An environment based on data sharing will be built that is accessible to the public and within the public administration.

Thanks to the project *"Single Digital Gateway - services of the national eIDAS node and the Central Public Administration Portal"*, Slovakia plans to arrange:

- creation of conditions for faster access to electronic messages and services;
- simplified and unified access to electronic services of EU countries for citizens of Slovakia and to electronic services of Slovakia for citizens of other countries;
- provision of a set of enumerated services that will be fully online and barrier-free for cross-border users including the authentication of foreigners and the introduction of a system for the implementation of the "once is enough" principle for cross-border services;
- implementation and adaptation of shared components to the needs of cross-border service provision;
- solution of the problems of identification and authentication of cross-border users, as well as the exchange of evidence using the technical system under the Regulation;
- provision of the electronic service through the new data platform in an optimal way.

Overall timeline:

	2023	2024	2025	2026	2027	2028	2029	2030
Measures that contribute to the target								
Measure 4.1.1:								

Increasing the share of electronic communication with public administration (Location of the measure - National Concept of Informatisation of Public Administration)								
Measure 4.1.2: *Increasing the satisfaction and trust of persons and public administration entities with electronic services* (Location of the measure - National Concept of Informatisation of Public Administration)								
Measure 4.1.3: *Reducing the personal interactions and complexity in the use of public administration services* (Location of the measure - National Concept of Informatisation of Public Administration)								
Measure 4.1.4: *Simplifying the access to e-services in the form of complex life situations of public administrations* (Location of the measure - National Concept of Informatisation of Public Administration)								
Measure 4.1.5: *Streamlining the implementation of the state's IT service architecture by leveraging cloud native services* (Location of the measure - National Concept of Informatisation of Public Administration)								

Measure 4.1.6: *Increasing the openness and transparency of public administration data* (Location of the measure - National Concept of Informatisation of Public Administration)								
Measure 4.1.7: *Completing the digital environment based on data sharing in public administration* (Location of the measure - National Concept of Informatisation of Public Administration)								

Planned measures

Measure N4.1.8: *Developing a long-term digital transformation strategy and start its implementation without delay*								

- **Budget of all measures that can be attributed to the target**
  - Public investment:
    - already allocated: EUR 437,024,375
    - planned: EUR 2,575,625
  - Thereof from national sources:
    - already allocated: EUR 0
    - planned:
  - Thereof from regional sources:
    - already allocated:
    - planned:
  - Thereof from EU sources: from the Recovery and Resilience Plan of the Slovak Republic and Programme Slovakia (RRP SR and P SK)
    - already allocated: EUR 437,024,375
    - planned usage: EUR 2,575,625
  - Private investment (if known):

Target 2: 100% of Slovak citizens will have access to their electronic medical records

- **National baseline value (latest available historical data point): 45%**
- **EU baseline value (latest available historical data point): 71%**[29]

Access to electronic medical records

An electronic medical record (hereinafter as "EMR") is a patient's health record accessible online. For the security and protection of the records, the patient accesses the EMR through an electronic ID card with an electronic chip (eID) or an electronic residence permit (eDoPP) via the National Health Portal. Thanks to the EMR, the patient can access his/her medical information online at any time.

The eID is a basic prerequisite for citizens' access to their electronic records. It can be concluded that the existing targets set out in the eID section apply equally to the Digital Decade targets in digital health, i.e. the target of 100% of citizens with access to their electronic medical records.

Slovakia performs much worse when it comes to access to electronic medical records. There is considerable room for improvement in this area to ensure that all citizens of the Slovak Republic have 100% access to all their medical records online. Healthcare professional can access **electronic health records** (hereinafter as "EHR"). Their access is defined by the law[1] and differentiated according to their expertise and field of healthcare.

To achieve 100% access to electronic health records, the Slovak Republic needs to address 2 main areas:

- **The first area is the need to provide patients with access to their electronic health records.** In Slovakia, every citizen with activated ID card with a chip has access to electronic medical records. However, there is little awareness of this possibility. According to estimates, only a little over 2% of the population in Slovakia has used access to their electronic medical records so far. It is therefore necessary to carry out an awareness-raising campaign and inform citizens about the possibility of using this service, as well as other e-health services. Citizens should have easy access to their EMRs and understand the information contained, which will enable them to take better care of their health. To facilitate access to selected electronic medical records for citizens, it would be appropriate to develop a specific mobile application.
- **The second area is ensuring access to electronic health records for health professionals.** Given the fact that only 60% of physicians register patient examinations in their EHRs, there is a need to positively incentivise physicians to maintain electronic health records. Maintaining and sharing health records will contribute to improved quality of healthcare provided.

Access to the eHealth system needs to be reformed as it is limited for medical specialists and hospitals, given that doctors cannot access selected patient health records without having immediate access to the patient's ID card. Access to medical records needs to be regulated, both legislatively and technically, with regard to granting access to health professionals other than doctors.

Full access to EHR data is available to:

- the attending physician of the general outpatient care provider and other attending physicians within the scope of their own records, based on confirmation of receipt of a physician referral

[29] European Commission (2023) *Digital Decade Country Report 2023 Slovakia*, at https://s-circabc.europa.eu/ui/group/573d5467-e78d-41bb-b8c3-9ab32354b022/library/99862053-c626-41fa-8164-1cf5cf35c016

record for specialist outpatient care or an attending physician referral record for admission to inpatient care.

- Access to the medical records is also possible on the basis of the citizen's eID or by making the records available to citizens in the EMR via the national health portal.

In the reform of digitalisation in the context of keeping and accessing medical records, there is a need to raise awareness of the current access options as well as to adjust the approaches of health professionals with regard to their competences and responsibilities in the provision of healthcare.

As an example of good practice in the field of digitalisation of healthcare, Poland has already implemented several e-health solutions. There, e-prescribing, e-applications, e-certificates of incapacity for work and an e-health index are operational. Patients have online personal accounts and a mobile application. There is also a nationwide electronic waiting list in Poland. Poland is moving further towards the computerisation of healthcare, towards integrated healthcare and individual data-driven prevention plans. These digital tools make life easier for healthcare professionals, who are currently in short supply, so that they can make better use of their capacities. In recent years, Poland has been working hard to implement an eHealth data platform and related eHealth tools. The response to the pandemic has shown that the successful deployment of these tools is closely linked to the level of digital skills of both providers and users.

Overall timeline:

	2023	2024	2025	2026	2027	2028	2029	2030
Measures that contribute to the target								
Measure N4.2.1: *Information campaign aimed at doctors on the obligation to keep electronic health records*								
Measure N4.2.2: *Information campaign aimed at patients on the possibility of accessing their electronic medical records via eID*								

- **Budget of all measures that can be attributed to the target**
  - Public investment:
    - already allocated: *EUR 0*
    - planned: EUR 700,000
  - Thereof from national sources:
    - already allocated: *EUR 0*
    - planned: *EUR 700,000*
  - Thereof from regional sources:
    - already allocated: *EUR 0*
    - planned: *EUR 0*
  - Thereof from EU sources:
    - already allocated: *EUR 0*

- planned use: *EUR 0*
- Private investment (if known):

Target 3: 100% of EU citizens will have access to a means of secure electronic identification (eID) that will be recognised across the Union, allowing users to have full control over identity transactions and shared personal data

Access to electronic identification (eID)

Public and private services via digital wallet on a mobile device will be compatible with the new Regulation (EU) No. 910/2014 of the European Parliament and of the Council of 23 July 2014 on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC (hereinafter as "the eIDAS Regulation"), which aims to reduce risks and costs through a more harmonised approach to digital identification by allowing citizens and businesses to identify themselves online in a convenient and uniform way across the EU. Slovakia has an announced eID scheme, available to over 72% of the population, and is also involved (through public and private entities) in a large-scale pilot project testing the European Digital Identity Wallet across multiple types of life finances under the Digital Europe programme.

- **National baseline value (latest available historical data point): 64%**
- **EU baseline value (latest available historical data point): 64%**

Overall timeline:

	2023	2024	2025	2026	2027	2028	2029	2030
Measures that contribute to the target								
Measure 4.3.1: *Digital identity testing and deployment* (Location of the measure - Action Plan for Digital Transformation of Slovakia 2023-2026, measure 4.4.1.3)								

- **Budget of all measures that can be attributed to the target**
  - Public investment:
    - already allocated: *EUR 0*
    - planned: *EUR 0*
  - Thereof from national sources:
    - already allocated: *EUR 0*
    - planned: *EUR 0*
  - Thereof from regional sources:
    - already allocated: *EUR 0*
    - planned: *EUR 0*
  - Thereof from EU sources:
    - already allocated: *EUR 0*
    - planned use: *EUR 0*

- Private investment (if known):

We recognise that all of the above targets will require an appropriately set regulatory environment and associated institutional design for their successful delivery. The EU Technical Support Instrument (TSI) assists Slovakia in this area. The output of this process, including a proposal for appropriate regulatory and institutional arrangements for the wider digitalisation of Slovakia, will be submitted for approval by the Slovak Government in the second quarter of 2024 at the latest.

3.2 Description of measures

In this section we offer a detailed description of the new measures that are presented within this document. Other measures that were already present in previous strategic documents and action plans are referred in the previous section to documents approved by the Government of the Slovak Republic.

Digital skills and ICT professionals

At least basic digital skills

Measure N1.1.19 - Strengthening the institutional background by further supporting the activities and actions of the National Coalition for Digital Skills and Jobs of the SR after 2026

New measure	**yes**
Short description of the measure Coordination of activities of key partners in fulfilling the tasks of the National Coalition for Digital Skills and Jobs of the SR and in raising the level of digital skills, increasing the number of ICT specialists and facilitating the transition of the Slovak workforce to digital jobs	Ensuring the continued funding of the National Coalition for Digital Skills and Jobs SR as a national platform. MIRDI SR, MESRS SR and MF SR are members of the National Coalition for Digital Skills and Jobs of the SR, an interest association of legal entities, which acts as the secretariat of the Digital Coalition initiative as a national platform. In order to ensure the sustainability of the activities of the National Coalition for Digital Skills and Jobs of the SR and to support its further development, it is necessary to ensure adequate public funding from all its members representing the interests of the public administration. The resources required for 2027-2030 will be provided as follows: • EUR 150,000 per year for MIRDI SR • EUR 250,000 per year for the MESRS SR through the NSDZaAP • EUR 150,000 per year for the MF SR The sponsor of the measure is MIRDI SR.
Budget allocated or planned and, if relevant, other resources – including human resources – allocated:	• National (budget to be planned): EUR 2,200,000 • Mobilised human resources
Expected impact and related timing:	2027-2030

Measure N1.1.20 - Functioning of an effective model for the management and coordination of digital skills activities among relevant public administration entities

New measure	**yes**
Short description of the measure	The coordination and management of support for the development of digital competences and skills across education is highly fragmented. Competences in this area are mainly divided between the MESRS SR,

Ensuring the functioning of the governance model within the public administration for more effective coordination and management of the promotion and development of digital competences and skills in Slovakia	MLSAF SR and MIRDI. Given the importance of the status of digital competences and skills, their growing importance and in the pursuit of the set objectives, it is necessary to ensure that an effective mechanism is in place to be responsible for the governance of this area. Required resources: 2027-2030 – 1 FTE at MIRDI SR (EUR 50,000 per year) The sponsor of the measure is MIRDI SR.
Budget allocated or planned and, if relevant, other resources – including human resources – allocated:	• National (budget to be planned): EUR 200,000 • Mobilised human resources: 1 FTE (making up the content of the budget above)
Expected impact and related timing:	• 2027-2030

Measure N1.1.21 - Linking public administration entities, the National Coalition for Digital Skills and Jobs of the SR and the Alliance of Sector Councils in the field of digital skills development

New measure	**yes**
Short description of the measure Continuation of a broader format of cooperation between public administration entities, representatives of sector councils in the field of digital skills development, as well as other representatives of the professional public	In order to continue to make effective use of the professional expertise and resources available to the Sector Councils, the outputs of the National Coalition for Digital Skills and Jobs of the SR, the Alliance of Sector Councils in the field of digital skills development and to facilitate the implementation of their outputs related to the development of digital skills, the measure will continue the active cooperation of the Alliance of Sector Councils, the relevant entities of the public administration, in particular MIRDI SR, MESRS SR and MLSAF SR, and the National Coalition for Digital Skills and Jobs of the SR. The sponsor of the measure is MIRDI SR.
Budget allocated or planned and, if relevant, other resources – including human resources – allocated:	• National (budget to be planned): N/A • Mobilised human resources

Expected impact and related timing:	• 2027-2030

Measure N1.1.22 - Improving the digital skills of seniors 55+ and disadvantaged people

New measure	**yes**
Short description of the measure The aim of the measure is to increase the level of digital skills of seniors 55+ from disadvantaged groups through face-to-face training, e-learning and counselling in the field of ICT and to create material and staffing for the provision of training activities and counselling in the regions of the SR. Purchase of the necessary HW and SW digital equipment and material and personnel support in the form of digitalisation for pensioners' clubs, day centres, digital hubs, social services homes, libraries, community centres. Training 79 trainers in the field of digital skills for seniors and disadvantaged people.	Call: In Slovakia, there is not yet a systematic approach to the implementation of adult education in the field of digital skills and its funding from public sources/by the state. Only 2% of Slovaks have acquired digital skills through public education programmes. Digital skills education is largely dependent on on-the-job training or employer-funded programmes. This is particularly problematic for people of post-working age, who thus have very limited access to digital skills development. Slovakia ranked 23rd out of 27 EU Member States in the 2022 Digital Economy and Society Index (DESI). Slovakia is just below or around the EU average on human capital indicators. 55% of Slovaks have basic digital skills, which is slightly above the EU average of 54%. The level of digital literacy of the elderly in the Slovak Republic is low. The share of people in the 65-74 age group with at least basic digital skills for Slovakia in 2021 was 12%, which was below the EU average (28%) and ranked Slovakia at the bottom of the 27 member states. "Seniors have a persistent problem not only with sophisticated but also with many common skills such as using common peripherals, downloading and uploading files/data, setting up internet connection or using electronic services on the Internet. For some, using common applications - programmes - is also a problem, and more than a third report problems with using a desktop computer, laptop or operating a smartphone or tablet.[30]" "According to the outcomes of satisfaction with government e-services and knowledge, awareness of government e-services worsened in 2022. In particular, the proportion of those who indicated the extreme of the 11 options, i.e. "I am not informed at all" (16%), has increased. Knowledge of the ability to handle all of the state's most well-known and long-measured services via the internet has surprisingly declined year-on-year. People are still dealing with many of the tasks needed to interact with the government in a different way than online.[31] " Content of the measure:

[30] Marián Velšič, Digital Literacy in Slovakia 2023 – Focused on Seniors, Institute for Public Affairs
[31] MEASUREMENT OF DEVELOPMENT AND SATISFACTION INDICATORS Target segment: population of the Slovak Republic WITH SELECTED E-GOVERNMENT SERVICES 2022

Provision of professional workshops, consultancy on ICT and digitalisation, security, active ageing topics. Providing online training on digital skills support, media literacy, critical thinking, mental health. Provided support and training on the use of ICT resources to address online needs and protect against cyber threats. Ensuring user support for citizens to use eGovernment services (life situations). Supporting lonely seniors/disadvantaged persons by creating a platform that takes on the task of communicating and caring for the social needs of lonely seniors and seniors aged 70+. Indicator: number of graduates of digital skills development training, number of users involved in online learning, number of created digital info-centres, number of trainers trained, increase in the use of e-Government 55+ services, number of calls for proposals launched. Output: min. 80,000 seniors/disadvantaged groups trained through	The long-term intention of the activity is to continue pursuing the set programmes within the framework of the RRP SR 3.5.2 Investment 7: Improving digital skills of seniors and distributing senior-tablets, 3.1.3 Investment 1: Better services for citizens and businesses, NP Improving digital skills of seniors and disadvantaged groups in public administration by creating the synergy effect between the implemented investments. Promoting digital literacy of people 55+ and disadvantaged people, developing a lifelong learning ecosystem in the SR is important if the objectives of the Digital Decade 2030 are to be met. Link to the digital targets: National Digital Skills Strategy and Action Plan 2023-2026: measures 5A Increase access to inclusive education and e-inclusion of citizens of all ages and social backgrounds and 5B Increase digital skills of seniors and representatives from other disadvantaged groups. Link to the National Programme for Active Ageing 2021-2030: Objective 3: Age-friendly education for older people to strengthen their employability or retention in the labour market accepting the key trends of the fourth industrial revolution: measure 1: Supporting the design and implementation of education programmes promoting key competences for lifelong learning with an emphasis on digital literacy, personal development and mental health in the context of labour market and employment requirements; and measure 2: Implementation of the Digital Skills Development Programme for Older People within the Digital Coalition and through the IT Fitness Test. Tentative timeline: 09/2026-12/2030 The sponsor of the measure is MIRDI SR.

online/offline training courses, at least 79 entities supported in terms of technology, material, personnel, training to provide assistance, counselling ICT training.	
Budget allocated or planned and, if relevant, other resources – including human resources – allocated:	• National (budget to be planned): 1. Purchase of the necessary HW and SW digital equipment and material and staffing of training places (79 districts) EUR 108,625.00 (acquisition of a laptop set, tablet with accessories, interactive whiteboard) 2. Provision of training of trainers in digital skills training for seniors and disadvantaged persons (remuneration for trainers who will train 4 groups of 20 trainers + costs for renting training places and other related costs) EUR 6,400.00 3. Provision of online and face-to-face training leading to the training of min. 80,000 seniors/disadvantaged (40,000/40,000) EUR 13,728,000.00 4. Creation of a platform - the role of communication and care for the social needs of lonely seniors and seniors aged 70 and beyond EUR 10.000,00 5. Where applicable, other costs directly related to the activities of the measure (provision and operation of IT systems, creation of an application, etc.) **TOTAL** EUR 16,623,630 (EUR 13,853,025.00 excluding VAT)
Expected impact and related timing:	• 2026-2030

Measure N1.1.23 - Promoting Industry 4.0 skills in all population groups - investment in education

New measure	**yes**
Short description of the measure With the objective of promoting lifelong learning activities, computer and Industry 4.0 skills, developing creativity, fostering innovation and	Content of the measure: The long-term objective of the activity is to support the preparation of the public for the near future, in which the labour market will be strongly influenced by the 4th industrial revolution, Artificial Intelligence and the consequences of economic change and climate change. CVTI SR will provide libraries with full cooperation in methodological training of digital literacy of users. The activity is to be implemented in the framework of the network of regional libraries of the CPS[32]. The expert staff of the FabLab of the CVTI SR will be fully used in the implementation of the measure. CVTI SR will provide training of

[32] Libraries for Slovakia (cvtisr.sk)

entrepreneurship for all age groups of the population the measure is to be implemented within the Libraries for Slovakia (hereinafter as "KPS") network of more than forty regional libraries from all over Slovakia. CVTI SR within the association also acts as a guarantor of educational programmes and further personal development of citizens aimed at promoting creativity, digital literacy and Industry 4.0 skills.	trainers in individual regions and methodological coordination for the development of innovative potential of all population groups in the form of non-formal and lifelong learning, in particular preparation for the coming challenges of Industry 4.0, increasing digital and information literacy and creative thinking. Pupils will learn how to code in a playful way, seniors who will acquire the basics of working with ICT technologies, and other residents will be enabled to develop new digital skills that will help them find their place in the new labour market. Thanks to the availability of production technologies such as 3D printers, the libraries can also serve as creative workshops, which will be used not only by students of technical disciplines but also by start-ups. In doing so, it will allow small enterprises and start-ups, as well as the general public - potential entrepreneurs, the opportunity to creatively test theory with practice and learn about progressive digital manufacturing technologies. Link to the digital target: – training in introduction to AI; – preparing for the coming Industry 4.0 challenges; – developing innovative potential through non-formal and lifelong learning; – increasing digital literacy and creative thinking; – validating theory with practice - small enterprises and start-ups, but also the general public; – principles of digital production; – courses in 2D vector drawing, 3D modelling; – courses on working with 3D printer, CNC cutter, vinyl and laser cutter, arduin, micro:bit, electronic embroidery machine and courses on creativity, invention and systems thinking for different age groups; – advice and training for the use of ICT tools and eGovernment services for all age; – community projects focusing on improving life in the counties (involving volunteers from the region); – courses for seniors - using the Internet and working on a PC; – courses on production skills for middle age group; – place for individual self-development of university students; – special playful science courses for pre-schoolers; – special courses for the physically challenged. Tentative timeline Training programmes will begin in Q1/2024 with trainings for library staff and continue with training courses and innovative services in Q2/2024. Purchase of necessary HW and SW will be secured in Q2/2024. By the end of 2024, more than 10 training sites will be established in selected regions. In each of the following years, an additional 20 training sites will be equipped and trained. The project will be completed in 2026 with a total of 50 sites equipped and trained.

	The sponsor of the measure is CVTI SR.
Budget allocated or planned and, if relevant, other resources – including human resources – allocated:	• National (budget to be planned): 2023 for CVTI SR: EUR 240,000 2024 for KPS libraries (10 libraries): EUR 650,000 2025 for KPS libraries (30 libraries): EUR 1,650,000 2026 for KPS libraries (50 libraries): EUR 2,350,000
Expected impact and related timing:	• 2023-2026

Measure N1.1.24 - Support for youth work

New measure	**yes**
Short description of the measure Support for gifted and talented children and youth in the field of Olympiads and competitions, in which pupils participate from home, school, district, regional, national and international rounds. The current Olympiads and competitions need to be modernised in order to support the selection of the best talents, for which the current funding is not sufficient. The budget is unchanged since 2008. The measure will strengthen the Olympiads in mathematics and computer science, linking them to a modern system for organising such competitions and better preparing them for	– promoting the recognition of non-formal learning and the importance of systematic youth work; – provision of subject Olympiads and competitions for children and young people, transfer of all school rounds of Olympiads and competitions to the digital space; – supporting the activities and implementation of the Slovak Youth Strategy 2021-2028; – supporting the establishment and functioning of youth parliaments; – training of entities working with youth; – implementation of the programme of the Slovak Republic Youth Delegate to the United Nations; – working with the Pupil Advisory Committee; – European Commission Youth Wiki project with other EU member states [https://tinyurl.com/youthwiki2]; – implementation of the Ministry of Education's subsidy scheme to support youth work; – ensuring the activities of the Accreditation Commission in the field of youth work; – final activities of the European Year of Youth project. The sponsor of the measure is NIVAM.

international representation in international rounds of competitions and Olympiads	
Budget allocated or planned and, if relevant, other resources – including human resources – allocated:	• National (budget to be planned): EUR 800,000 per year and EUR 200,000 per year for 3 FTE per year • Mobilised human resources: EUR 200,000 for 3 FTE per year (as mentioned above)
Expected impact and related timing:	• 2024-2030

Measure N1.1.25 - Digitalisation of youth work and non-formal education

New measure	**yes**
Short description of the measure Within the measure, areas from the Slovak Youth Strategy 2021-2028 will be digitalised, and an online implementation methodology for cities and other entities will be created. Online training of entities working with youth, Youth Parliaments and the Pupil Advisory Committee will be carried out. A digital map of opportunities for youth in Slovakia will be prepared, which is currently missing and would contribute to a better overview of opportunities for young	The current opportunities for youth work provide insufficient space for the digitalisation of processes and the development of digital skills of the different target groups involved in youth work, be they youth workers, youth leaders, young leaders, coordinators of school and youth parliaments, or members of the Pupil Advisory Committee. The measure will include workshops focusing on digital skills, cyber security, preventing online extremism and online communication with young people. Through a better set-up in working with young people in both physical and online spaces, the radicalisation of young people can be successfully prevented and alternative opportunities for active leisure and self-development can be provided. To enable young people across the country to have better access to information, the measure will also create a platform on which a live map of youth opportunities will be placed. Once approved, individual organisations and youth workers will add their activities to the map. These will be communicated to young people in a comprehensible way at a single online location. The sponsor of the measure is NIVAM.

people in all regions of Slovakia.	
Budget allocated or planned and, if relevant, other resources – including human resources – allocated:	• National (budget to be planned): EUR 100,000 per year and EUR 30,000 for 1 FTE per year • Mobilised human resources: EUR 30,000 for 1 FTE per year (as mentioned above)
Expected impact and related timing:	• 2023-2030

Measure N1.1.26 - Continuous support for the position of School Digital Coordinator in schools

New measure	**yes**
Short description of the measure The role of the School Digital Coordinator is to coordinate computerisation and education through digital technologies to support the transformation of education and schools for the 21st century or digital future. The job description of a school digital coordinator is not the same as what constitutes the job description of an ICT network administrator. In terms of the needs of digital transformation in education, the digital coordinator has to operate in three main areas: • school vision • school as a community of stakeholders	In order to improve the digital skills of teaching and professional staff and, through them, the digital skills of pupils, financial support for the position of School Digital Coordinator in primary and secondary schools will continue, with a potential extension to kindergartens. The sponsor of the measure is MESRS SR.

• school as a learning environment	
Budget allocated or planned and, if relevant, other resources – including human resources – allocated:	• National: EUR 40,000,000 per year
Expected impact and related timing:	• 2026-2030

Measure N1.1.27 - Creation and pilot implementation of digital technologies to increase young people's interest in sports activities in order to improve their physical activities in educational content as well as in extracurricular activities in relation to the digital transformation of society

New measure	**<u>yes</u>**
Short description of the measure The measure is aimed at applying state-of-the-art digital systems and solutions to increase the physical and sporting activities of young people in the formal education system as well as in extra-curricular activities.	The application of new digital SportsTech technologies to increase the interest and motivation of young people to be active and to significantly change the physical education curriculum in primary and secondary schools in terms of promoting active movement, monitoring and analysing it in terms of prevention of health and social risks and challenges. Main focus on the critical period for young people (15-17 years old, at the transition from primary to secondary school) when, according to statistics, the interest and motivation for physical activity among young people (organised/unorganised) decreases significantly. List of planned activities and actions: Activity 1 Study and evaluation of current best practices in the use of Sportstech in teaching physical education to promote active movement and sport among young people in EU countries and qualitative improvement of the content of education Analysis of the motivational factors associated with the application of the SportsTech digital environment for the development of physical activity and healthy lifestyles for pupils Implementation 2023 Activity 2 Creation of methodological procedures and design of physical education curriculum for primary and secondary schools with application of SportsTech, including design of pilot verification Implementation 2024 Activity 3 Pilot validation of SportsTech solutions on a sample of schools: 15 secondary schools, 30 primary schools Implementation: 2025

	Activity 4 Pilot validation of SportsTech solutions in a sample of additional schools: 35 secondary schools, 70 primary schools and development of a final report and recommendations for the inclusion of SportsTech in the Physical Education curriculum of primary and secondary schools Implementation: 2026 Co-operating entities: MESRS SR, the Slovak Sports Innovation Centre, the Association of Principals of State Grammar Schools, the Slovak Sport for All Association The sponsor of the measure is MIRDI SR.
Budget allocated or planned and, if relevant, other resources – including human resources – allocated:	• National (budget to be planned): Budget EUR 2,100,000 • 2023 – EUR 50,000 Activity 1 • 2024 – EUR 250,000 Activity 2 • 2025 – EUR 850,000 Activity 3 • 2026 – EUR 950,000 Activity 4
Expected impact and related timing:	• 2023-2026

ICT experts

Measure N1.2.21 - Supporting talents and their participation in international events

New measure	**yes**
Short description of the measure An annual call for applications to support the participation of individuals and groups in international ICT-events (e.g. robotics, coding, hackathons, cybergames, etc.). Eligible beneficiaries will be public educational institutions	The measure will provide funding for pupils' outstanding results in competitions, subject Olympiads and for the school's participation in international projects or programmes. The sponsor of the measure is MIRDI SR.
Budget allocated or planned and, if relevant, other resources – including human resources – allocated:	• National (budget to be planned): EUR 500,000 per year and EUR 50,000 for 1 FTE per year • Mobilised human resources: EUR 50,000 for 1 FTE per year (as mentioned above)

Expected impact and related timing:	• 2024-2030

Measure N1.2.22 - Increase the level of digital skills and competences of ICT professionals to apply SportsTech solutions to support young people's motivation for sport and physical activities and health prevention through HUBs

New measure	**yes**
Short description of the measure The objective is to promote lifelong learning of persons, applying in practice the SportsTech implementation for the development of sport and physical activities of citizens in order to meet the digitalisation of services related to the field. SportsTech is an extremely growing segment of the application of digital solutions with significant positive impacts and effects for the promotion of movement and sport activities. This segment is a new application area in the conditions of the SR with significant effects of the impacts of digitalisation. Therefore, it is extremely necessary and indispensable to prepare specialists and experts for this segment, both on the side of creating solutions and on the side of the application area.	The SportsTech HUB space is flexible in its activities, relevant in its offering and holistic in its approach. It gives people the space to develop their potential, their skills and their knowledge in a way tailored to the needs of SportsTech development and application in practice. The core pillar of the SportsTech HUB is the education segment based on the Campus System. The SportsTech HUB will be the place where theoretical knowledge will be expanded and also the place where it will be taken to the piloting phase. Especially through experimentation, organising hackathons, mentoring by a team of experienced professionals and experts the Digital SportsTech HUB can be integrated into already existing services and facilities. SportsTec HUB equipment: – WiFi, so that people can use the place for their needs free of charge; – tablets - computers and accessories placed so that people are able to use them free of charge; – sportsTech wearables, video motion analysis systems; – workspace, office space, common areas and start-ups and companies working on sports tech projects; – high Speed Internet; – labs and workshops for prototyping, testing and developing sports-related technologies; – conference and event spaces; – education and consultancy services; – campus-like accommodation services; – innovation services and support for intellectual property management, patent filing and commercialisation strategies; – 3D printer prototyping tools, electronics prototyping tools and other hardware resources; – data analysis tools. SportsTech HUB staffing: – SportTech HUB management, which ensures its activities; – professional staff who are proficient in digital technologies and working with people from disadvantaged groups; – the founder (provides public or private resources for the SportsTech HUB's activities);

The measure is profiled for the creation and establishment of the so-called digital Sports Tech HUBs, where educational activities are linked together with the conditions and infrastructure for the development, customisation and creation of digital solutions.	– volunteers who are willing to participate in the activities of the HUBs; – support for professional staff to work with digital technologies is foreseen in the form of a call for applications. The National Coalition for Digital Skills and Jobs would be considered as the implementer of the project. Cooperating entities: Slovak Sports Innovation Centre, HTUs, National Sports Centre The sponsor of the measure is MIRDI SR. 2023 - Analysis, documentation, establishment and certification of a pilot digital SportTech HUB 2024 - Establishment of pilot digital SportTech HUBs 2025 - Establishment of 3 digital SportTech HUBs in the regions of the Slovak Republic 2026 - 10 digital SportTech HUBs in operation in the regions of the Slovak Republic
Budget allocated or planned and, if relevant, other resources – including human resources – allocated:	National (budget to be planned): EUR 1,730,000 total • 2023 – EUR 30,000 • 2024 – EUR 180,000 • 2025 – EUR 520,000 • 2026 – EUR 1,000,000
Expected impact and related timing:	• 2023-2026

Digital infrastructure

Call schedule under Measure 1.5.1 Promoting digital connectivity

No.	Specific target	Call title	Type of project	Eligible applicants	Indicative date of call	Indicative amount of funds available for the call (EU source)
1.	RSO1.5/ 1.5.1 Support for digital connectivity	"Pilot project - Promoting digital connectivity in a selected region"	demand-driven call	providers of electronic communications networks	Q1/2024*	EUR 15,000,000
2.	RSO1.5/ 1.5.1 Support for digital connectivity	Promoting digital connectivity in selected regions	demand-driven call	providers of electronic communications networks	Q2/2024*	EUR 50,000,000

3.	RSO1.5/ 1.5.1 Support for digital connectivity	Promoting digital connectivity in selected regions	demand-driven call	providers of electronic communications networks	Q2/2025*	EUR 47,100,000
4.	RSO1.5/ 1.5.1 Support for digital connectivity	Social vouchers	national project	tbc	Q1/2024*	EUR 30,000,000

* indicative schedule of dates of calls

Quantum computing

The ambition by 2030 is to develop theoretical research in mathematical models of algorithms for quantum computers and basic research on the physical realisation of quantum bits stored in magnetic ions. Practical cooperation can be established between Slovak researchers and EU centres building physical quantum accelerators and quantum simulators within the framework of the joint European research initiative Quantum Flagship. Research results in Slovakia may also contribute to the realisation of the first European quantum computer, a common objective of the Digital Decade 2030.

Semiconductors

MIRDI SR is planning to launch a call that will support projects in all regions of the Slovak Republic except BSK from the RRP SR Investment 4. The allocation of funds for individual ongoing and planned projects from RRP SR is currently under review. After positive approval by NIKA (National Implementation and Coordination Agency), a call will be launched for IPCEI projects in the field of microelectronics in the rest of Slovakia.

Measure N2.4.1 - Call for applications for Recovery and Resilience Facility funding to support projects that are part of an important project of common European interest (IPCEI) in the field of microelectronics

New measure	**yes**
Short description of the measure	**The Government Office of the Slovak Republic, as the implementing entity of component 9 of the Recovery and Resilience Plan, informs that under Investment 5: Research and Innovation for the Digitalisation of the Economy, the call focuses specifically on promoting the transition to the digital economy.** **Call opening date:** *19 April 2023* **Eligible applicants:** *legal entities authorised to do business under Article 2(2)(a) of the Commercial Code, i.e. persons registered in the Commercial Register, whose IPCEI projects in the field of microelectronics were part of a notification of state aid submitted by the Slovak Republic and decided by the European Commission.* The application shall be completed in the Information System of the Recovery and Resilience Plan (ISPO) before submission, where all annexes to the application shall also be uploaded. The ISPO requires registration of the applicant in order to submit the application.

Budget allocated or planned and, if relevant, other resources – including human resources – allocated:	• National: EUR 4,000,000 • EU EUR 0
Expected impact and related timing:	2023: EUR 4,000,000

Edge nodes

In order to address the accelerating development of IoT platforms, the Slovak Republic will support the development of *edge computing*. The objective for Slovakia is not only the deployment of end devices themselves, such as smart sensors and actuators with integrated computing capacity, but also the development of *edge nodes*, which will also have their own storage capacity and can run work packages and services of enterprise applications. They can have integrated *Gateway* functionality or be directly connected to such communication nodes.

In this way, Slovakia will achieve well-known benefits such as higher speed of operations, network scalability and low latency. However, such an integrated architecture will also help ensure higher security and reliability, which is an issue of growing importance for many industrial enterprises. It will support an "all-in-one" methodology for multiple API integrations, flexible storage along with IoT and AI enablement to ease operations and create a connected ecosystem. It is also a key element of the cost saving strategy.

Digital transformation of businesses

Supporting a baseline level of digital intensity

Measure N3.1.4 - Dissemination of education on the use of digital technologies in business in Slovakia

New measure	**yes**
Short description of the measure	**Raising awareness of the use of digital technologies in business** Content of the measure: addressing the general public through a targeted communication and marketing campaign, the task of which will be to present, as simply as possible, what the transition to the digital economy means for SMEs, and what consequences should be expected if entrepreneurs are not prepared for these changes. Raising awareness is the first prerequisite for starting to implement the changes that are necessary in the context of the transition from a knowledge-based to a digital economy. Target group: whole business community, especially late adopters Types of measures/outputs: online campaigns, media content (e.g. surveys, videos, graphics, podcasts, good practice examples, brochures, etc.), digi road shows with major players across Slovakia, various networking opportunities, etc. The sponsor of the measure is the ME SR.
Budget allocated or planned and, if relevant, other resources – including human resources – allocated:	EU (planned) EUR 1.9 million Mobilised human resources: 2 FTE
Expected impact and related timing:	The funds will be used to create a minimum of 80 outputs of a marketing and information campaign, which will contribute to the promotion of the spread of digitalization in the conditions of the Slovak Republic, especially among companies with zero or minimal level of digitalisation Tentative timeline: The programme will start in 2024 and the review of the programme terms will take place in early Q2/2023. The programme is expected to be available at least by the end of 2027 with at least following outputs: 2024: 20 outputs 2025: 40 outputs (cumulative) 2026: 60 outputs (cumulative) 2027: 80 outputs (cumulative)

Measure N3.1.5 - Establishment and support of the National Centre for Digital Economy and Society (NCDES)

New measure	**yes**
Short description of the measure	**Establishment and support of the National Centre for Digital Economy and Society (NCDES)** Establishment and support of the NCDES interest association of legal entities, which will be mainly focused on: • Supporting and contributing to the implementation of the measures of the National Roadmap within its different dimensions for the promoters of each measure; • Providing support and coordination activities for the EDIH and promoting them at home and abroad; • Awareness-raising activities in relation to the introduction and use of digital technologies as well as the promotion of Slovakia on digital issues; • Support for the removal of barriers to the uptake and use of technology; • Cooperation with the public sector in the implementation of projects aimed at digital progress in the dimensions of the Digital Decade. NCDES should bring together key stakeholders for the progress of digitalisation in Slovakia within both the public and private sectors. The sponsor of the measure is MIRDI SR.
Budget allocated or planned and, if relevant, other resources – including human resources – allocated:	• National: EUR 1,750,000 • EU EUR 0
Expected impact and related timing:	***2024 – EUR 250,000*** ***2025 – EUR 250,000*** ***2026 – EUR 250,000*** ***2027 – EUR 250,000*** ***2028 – EUR 250,000*** ***2029 – EUR 250,000*** ***2030 – EUR 250,000***

Support for advanced digital technologies

Measure N3.2.13 - Cloud popularisation campaign

New measure	**yes**
Short description of the measure	**Cloud popularisation campaign** Media campaign promoting cloud solutions and their benefits, aimed at the general population and the business environment in Slovakia. 2023 - mapping the attitude of the business public towards the cloud, the level of knowledge about the cloud and mapping areas suitable for the application of cloud solutions 2024-2026 - development of an outline for the promotion of the possibilities of using the cloud among entrepreneurs in Slovakia, launching a popularisation campaign in the media. The sponsor of the measure is MIRDI SR.
Budget allocated or planned and, if relevant, other resources – including human resources – allocated:	In view of the planning period, funding from the state budget has been provisionally proposed, while the update and the biennial update will also take into account the current funding possibilities from the European Commission. • National – state budget: EUR 100,000 • EU EUR 0 The sponsor of the measure is MIRDI SR.
Expected impact and related timing:	***2023 – EUR 25,000*** ***2024 – EUR 25,000*** ***2025 – EUR 25,000*** ***2026 – EUR 25,000***

Measure N3.2.14 – Big Data popularisation campaign

New measure	**yes**
Short description of the measure	**Big Data popularisation campaign** Media campaign promoting Big Data and the benefits of Big Data analyses, aimed at the business environment and business community. 2023 - mapping the attitude of the business community towards Big Data analyses, the level of knowledge about Big Data analyses and mapping the areas suitable for the application of Big Data solutions 2024-2026 – outlining media activities to promote the use of Big Data among entrepreneurs in Slovakia, launching an awareness campaign in the media The sponsor of the measure is MIRDI SR.
Budget allocated or planned and, if relevant, other resources –	In view of the planning period, funding from the state budget has been provisionally proposed, while the update and the biennial update will take into account the current funding possibilities also from the European Commission. • National – state budget: EUR 100,000

including human resources – allocated:	• EU EUR 0
Expected impact and related timing:	***2023 – EUR 25,000*** ***2024 – EUR 25,000*** ***2025 – EUR 25,000*** ***2026 – EUR 25,000***

Measure N3.2.15 - Expert workplaces for data science

New measure	**yes**
Short description of the measure	**Expert workplaces for data science** According to the European Data Strategy, the volume of data produced in the world is growing rapidly, expected to increase from 33 zettabytes in 2018 to 175 zettabytes in 2025. The increase in data production is directly linked to the development of digital transformation, the onset of AI, autonomous mobility, green agreements, digital market, agile economy or the data economy. In Slovakia, data production will increase, and in addition to addressing data storage and sharing, experts and workplaces are needed to perform these tasks related to data creation, standardisation, storage, archiving, access, sharing and the actual provision of data-driven services. Valuable data, including research data, is produced by many sites in both the public and private sectors, but there is no mutual understanding of what data is available, where it is stored, what it is licensed for use, etc. This current state of affairs, which can be expressed in the words “we don't know”, needs to be changed to a statement “we know”. This requires the creation of a network of expert workplaces at all ministries, including a central expert unit, which will be in charge of the whole issue of data management, from creation to access and sharing, in a coordinated manner and according to common procedures, including international cooperation. The units will ensure cooperation with important international organisations and projects in this field, e.g. EOSC, EDIC, DSSC, GAIA-X, Europeana, EIT manufacturing, etc. The following will be necessary: - Developing an analysis of the current staff capacities in the different ministries, proposing organisational integration, gradually developing task plans and methodologies, and operationalising the sites; - Staffing of the workplaces - the workplaces will be staffed with 2 to 4 employees per workplace and 8 to 10 employees for the central workplace. The sponsor of the measure is MESRS SR together with the Government Office of the SR.

Budget allocated or planned and, if relevant, other resources – including human resources – allocated:	In view of the planning period, funding from the state budget has been provisionally proposed, while the update and the biennial update will also take into account the current funding possibilities from the European Commission. National - state budget Leveraging funding through projects from Horizon Europe, Digital Europe Programme, etc. and cascading funding
Expected impact and related timing:	*Established expert workplaces in each ministry* *The workplaces will ensure that the Digital Transformation of Slovakia addresses the issues and all key areas of work with data. They will know what data is available and will be able to provide data support and data services.* *Q3/2024 – expert workplaces established in each department* *Q1/2025 - Q4/2026 - routine operation of the expert workplaces* ***2024 – EUR 1,000,000*** ***2025 – EUR 2,000,000*** ***2026 – EUR 2,000,000***

Measure N3.2.16 - Sharing data to support digital transformation

New measure	**yes**
Short description of the measure	**Sharing data to support digital transformation** Slovakia does not have secure tools for sharing and reusing data, which, with the current rapidly growing amount of valuable data, may mean a long-term reduction in the ability to know what data exists and where it is stored. This causally progresses to an inability to share data, reuse it and deploy new technologies and Artificial Intelligence that need the data. The European Union, recognising the need for IT tools and infrastructure to exist for accessing and sharing data for the successful implementation of digital transformation, has provided countries with a progressive solution for data sharing in the form of decentralised data spaces called European Common Data Spaces and an associated framework for linking heterogeneous data sources in data spaces into a data federated ecosystem, such as the Gaia-X solution. The use of the above infrastructure will relieve us from developing similar tools in-house, which means great financial, time and personnel savings for us. In order to participate in the dataspaces and ecosystem initiative, we will need to: - engage expert(s) in the Data Space Support Centre (DSSC) community to establish a collaborative, methodical or hands-on involvement through the DSSC community in the creation of data spaces in different departments, to understand the functioning of the whole ecosystem and to obtain the support services provided by the DSSC organisation; - intensify and foster collaboration with organisations that provide rule frameworks for integrating data spaces into a federated network of data spaces, e.g. Gaia-X and others;

	- allocate funding for the near term to develop a financial analysis and implementation plan for our data resources in data spaces and funding for mentoring; - participate in international programmes and consortia based on Gaia-X (Horizon Europe, Digital Europe Programme, EIT and others). The sponsor of the measure is the MESRS SR together with the Government Office of the SR.
Budget allocated or planned and, if relevant, other resources – including human resources – allocated:	• EU (CDCP internal resources, Recovery and Resilience Plan (Component 9), other EU resources) • Leveraging funding through Horizon Europe, Digital Europe Programme, etc. projects and cascading funding
Expected impact and related timing:	*Created 9 data spaces for data sharing and practical data sharing to support digital transformation* *European Union support to address the lack of data sharing* *Q1/2024 – collaboration with DSSC, Gaia-X and others arranged* *Q3/2024 – mapping of data sources in both public and private sectors completed* *Q3/2024 – financial analysis completed* *Q4/2024 – plan developed for the first phase of implementation of data sources in data spaces and federated network* *Q2/2025 – plan developed for the second phase of implementation of data sources in data spaces and federated network* *Q4/2025 – plan developed for the third phase of implementation of data sources in data spaces and federated network* ***2024 – EUR 80,000*** ***2025 – EUR 40,000*** ***2026 – EUR 40,000***

Measure N3.2.17 - Increase allocation for digital and innovation vouchers

New measure	**yes**
Short description of the measure	**Increase in allocation for digital and innovation vouchers** Innovation and digital vouchers serve to support the cooperation of Slovak businesses with innovation ecosystem actors and improve the transfer of knowledge and technology into practice in the form of innovation. The definition of the vouchers is based on the description in the RRP SR, Component 9, Investment 2. It is proposed to increase the targets for the number of supported businesses and to extend the provision of this form of support until 2030, as it is an efficient and administratively simple form of support. The sponsor of the measure is the Government Office of the SR.

Budget allocated or planned and, if relevant, other resources – including human resources – allocated:	• RRP SR until 2026 • Programme Slovakia Estimated planned financial increase of EUR 8.466 million (in case of extension until 2030)
Expected impact and related timing:	***We recommend extending the support scheme to the same extent until 2030 as currently approved until 2026*** *2027 – EUR 7,149,000* *2028 – EUR 7,149,000* *2029 – EUR 7,149,000* *2030 – EUR 7,149,000*

Supporting growing innovative businesses

No new measures

Digitalisation of public services

Description of measures according to the objectives of the Digital Decade:

Target 1: 100% of key public services will be available online and, where relevant, citizens and businesses in the Union will be able to interact online with public administrations

Measure N4.1.8: Developing a long-term digital transformation strategy and start its implementation without delay

New measure	**yes**
Short description of the measure	**Measure: Developing a long-term digital transformation strategy and start its implementation without delay** We want to create a strategic document that will describe the key changes at the technical, procedural and legislative levels that the Slovak public administration will have to go through in order to be able to fully utilize the potential brought by the digital age. The document will take into account both the current state of development of Slovakia's digitization, as well as the experience gained by the "digital leaders" in this area during the digital transformation. Through the digital transformation of public administration, we will implement a qualitative change in public administration processes (including internal services) - oriented towards citizens, entrepreneurs and officials - built on the principles of digitization, automation, proactivity, reliable shared data and open interfaces. The digital transformation is supposed to bring about a fundamental change compared to today's situation, namely that the EU e-Government principles will be fulfilled (e.g. the Berlin Declaration). As a result, the goal will also be to:

	• introduce separate tools and procedures for electronic processes, independent, reviewable and not tied to paper procedures and tools, • achieve that the citizen will have to submit only information that the state does not have, • ensure that the result of the procedure is available to all concerned authorities, which will enable the automatic start of processing in other agendas in order to operationalize the proactive procedures of public authorities, • Introducing a method of presenting reliable data through online platforms, • use of public administration data by the commercial sector with strict consideration of personal data protection The gestor of this measure is Ministry of investments, regional development and informatisation of the Slovak republic.
Allocated or planned budget and other allocated resources - including human resources:	• EÚ: Recovery and resilience plan of the Slovak republic and Program Slovakia 2021-2027: 2 575 625 €
Expected impact and its timing:	• The result of the changes should be the improvement of services and processes measured by specific parameters (KPI), which are: o Time of processing the decision, i.e. the average time of the cycle of processing the decision o Productivity, i.e. the number of processed decisions for the available hours o Customer satisfaction, i.e. the results of a survey of customer satisfaction with the office's services **Year 2024 –** 858 541 € **Year 2025 –** 858 541 € **Year 2026 –** 858 541 €

Target 2: 100% of citizens in the EU will have access to their electronic medical records

Action N4.2.1: Information campaign aimed at doctors on the obligation to keep electronic health records

New measure	**yes**
Short description of the measure	**Information campaign aimed at doctors on the obligation to keep electronic medical records** Online seminars for doctors with training on keeping electronic medical records. Raising awareness that keeping electronic medical records is

	mandated by national legislation[33]. Introduction of benefits associated with the publication of electronic medical records. Building better data accessibility within the network of hospitals and health facilities. The sponsor of the measure is MIRDI SR.
Budget allocated or planned and, if relevant, other resources – including human resources – allocated:	• National: EUR 400,000 • EU (please indicate if budget is allocated or planned): EUR 0
Expected impact and related timing:	**2024 –** EUR 80,000 **2025 –** EUR 80,000 **2026 –** EUR 80,000 **2027** – EUR 80,000 **2028** – EUR 80,000

Measure N4.2.2: Patient information campaign on the possibility of accessing electronic medical records via eID

New measure	**yes**
Short description of the measure	**Information campaign aimed at patients about the possibility of accessing their electronic medical records via eID** An information and media campaign to raise awareness of the availability of electronic medical records for patients. Facilitating access to electronic medical records through a mobile app. Presentation of other benefits of using eHealth. Communicating the benefits of using mID. The sponsor of the measure is the MIRDI SR.
Budget allocated or planned and, if relevant, other resources – including human resources – allocated:	• National (please indicate if budget is allocated or planned): EUR 300,000 • EU (please indicate if budget is allocated or planned):
Expected impact and related timing:	**2026 –** EUR 60,000 **2027 –** EUR 60,000 **2028 –** EUR 60,000 **2029 –** EUR 60,000 **2030 –** EUR 60,000

[33]Act No. 153/2013 on the National Health Information System Zákon č. 153/2013 o národnom zdravotníckom informačnom systéme

Target 3: 100% of Union citizens will have access to a means of secure electronic identification (eID) that will be recognised across the Union, allowing users to have full control over identity transactions and shared personal data

No new measures

Chapter 4: Main policies, measures and actions to contribute to the achievement of the general objectives

Focusing on key actions and examples of best practice, this chapter should set out the main actions, policies and measures planned or implemented that are expected to help achieve the general objectives, taking into account the Statement on Digital Rights and Principles. Actions that have already been shown to contribute to digital targets should not be repeated.

Inputs should be short and concise, focusing on the most relevant key steps, policies and actions, and your contribution should be limited to the essential elements, including a description of the actions and their timing, human resources and budget involved (where appropriate), and the expected impact.

In order to structure the description of the actions, the Member State may use the breakdown suggested in the table below and, where appropriate, organise it into high-level policy headings as outlined below, i.e. ”digital citizenship”, “fostering leadership and sovereignty” and “contributing to the green transformation”.

General objectives
Digital citizenship: a) to promote an inclusive, transparent and open digital environment that is human-centred and based on fundamental rights, in which secure and interoperable digital technologies and services respect and reinforce the principles, rights and values of the Union and are accessible to everyone, everywhere in the Union; b) to strengthen the collective resilience of Member States and bridge the digital divide, achieve gender and geographical balance by promoting sustainable opportunities for all individuals, develop basic and advanced digital skills and competences, including through vocational education and training and lifelong learning, and promote the development of high-performance digital capacities in horizontal education and training systems; e) to develop a comprehensive and sustainable ecosystem of interoperable digital infrastructures in which high-performance computing, edge, cloud, quantum computing, Artificial Intelligence, data management and networking work in synergy, in order to support their deployment in businesses in the Union and to create opportunities for growth and jobs through research, development and innovation, and to ensure that the Union has a competitive, secure and sustainable data cloud infrastructure with high standards of security and privacy that complies with Union data protection rules; g) to ensure that everyone has the opportunity to participate online in democratic life and that public, health and care services are also accessible in a trusted and secure online environment for everyone, in particular for disadvantaged groups, including people with disabilities and people in rural and remote areas, and that inclusive, efficient, interoperable and personalised services and tools with high standards of security and privacy are offered;
Promoting leadership and sovereignty: c) to ensure the digital sovereignty of the Union based on openness, in particular through secure and accessible digital and data infrastructures capable of efficiently storing, transmission and processing of large volumes of data, enabling further technological developments, fostering the competitiveness and sustainability of the Union's industry and economy, in particular SMEs, and the resilience of the Union's value chains, as well as strengthening the start-up ecosystem and the smooth functioning of European digital innovation hubs; d) to promote the deployment and use of digital capabilities to reduce the geographical digital divide and enable access to digital technologies and data under open, accessible and fair conditions in order to achieve a high level of digital intensity and innovation in Union enterprises, in particular in start-ups and SMEs; f) to promote a digital regulatory environment of the Union to support the ability of Union businesses, in particular SMEs, to compete fairly in global value chains; i) to create a fair and non-discriminatory playing field for users during the digital transformation across the Union by fostering synergies between private and public investment and the use of Union and national funding and by establishing predictable regulatory and support approaches that include regional and local levels;

k) to improve resilience to cyber-attacks, contribute to raising risk awareness and information on cybersecurity processes, and enhance the efforts of public and private organisations to achieve at least basic levels of cybersecurity
Contributing to the green transformation: h) to ensure that digital infrastructures and technologies, including their supply chains, become more sustainable, resilient and energy and resource efficient, in order to minimise their negative environmental and social impacts and contribute to a sustainable circular and climate-neutral economy and society in line with the European Green Deal, including by supporting research and innovation that contributes to this objective and by developing methodologies to measure energy and resource efficiency in the digital space; j) to ensure that all policies and programmes relevant to achieving the digital targets set out in Article 4 are taken into account in a coordinated and coherent manner so that they can contribute fully to Europe's green and digital transformation, while avoiding overlaps and minimising administrative burdens;

Digital citizenship

Measure 5.1.1: Coordination of activities in the area of digital transformation impact on mental health

Measure description:	**Measure location Action Plan for Digital Transformation of Slovakia for 2023-2026: 4.2.2.1 Measure: Coordination of activities on the impact of digital transformation on mental health** Coordination of activities among relevant government entities and provision of assistance to help secure the benefits and minimise the impacts of digital transformation, particularly on the mental health of the population. This action responds to action 1.1.9 of the Slovak Digital Transformation Action Plan 2019-2022, *1.1.9 Initiate activities leading to an assessment of the impacts of the use of smart systems and digital technologies on human development, health and behaviour*
Deadline:	Q4/2026
Milestones:	Q2/2023 – Establishment of the Inter-Ministerial Working Group (IMWG), 1st meeting of the IMWG and initiation of its activities 2024-2026 – a minimum of 2 IMWG meetings per year, ongoing coordination of activities
Costs:	Not expected.

Measure 5.1.2: Creating a digital platform bringing together validated sources of mental health-related information

Measure description:	**Measure location Action Plan for Digital Transformation of Slovakia for 2023-2026: 4.2.2.2 Measure: Creation of a digital platform bringing together validated sources of information related to mental health** The platform is designed to help citizens access verified, trusted sources of information and assistance when they need it. It will be a web portal with comprehensive information listed and easily accessible across the entire field of mental health care (apps, support programmes, online forms, links to mental health actors, support, sources of specific information)
Milestones:	Q3/2023 - preparation of the assignment, contracting the contractor Q2/2024 - work on the platform and launch of the platform 2025 - operation of the platform, measurement of success 2026 - platform operation, success measurement
Costs:	2023 - EUR 25,000 2024-2026 - EUR 10,000 per year to ensure the operation and up-to-datedness of the content TOTAL EUR 55,000
Funding source:	State budget

Measure 5.1.3: Promoting awareness-raising campaigns to increase positive perception and awareness of career opportunities for women in the ICT sector

Measure description:	**Measure location Action Plan for Digital Transformation of Slovakia for 2023-2026: 4.1.1.1.1 Measure: Support awareness campaigns to increase positive perception and awareness of opportunities for women in the ICT sector** Expanding a number of awareness-raising campaigns to help increase positive perception and awareness of career opportunities for women in the ICT sector.
Main expected output:	After three years of experience with the flagship Girls Day initiative, expand support for awareness-raising campaigns for secondary school girls and other age groups.
Deadline:	Q4/2026
Milestones:	2022 - 15.8% for 2020 (data published two years back) 2023-2026 - to approach the EU average of 18.5%, which is expected to grow. Bulgaria leads the ranking with 28.2%.
Costs:	2023 – EUR 35,000 2024 – EUR 35,000 2025 – EUR 35,000 2026 – EUR 35,000 Total – EUR 140,000
Funding source:	State budget

Measure 5.1.4: Call for summer internships for secondary school girls to support expressed interest in STEM studies

Measure description:	**Measure location Action Plan for Digital Transformation of Slovakia for 2023-2026: 4.1.1.2 Measure: Call for the establishment of summer internships for high school girls to support expressed interest in STEM studies** Launching a call for specialised summer internships to support high school girls who have shown an active interest in STEM subjects in the commercial sector and in public and government administration.
Sponsor:	MIRDI SR
Main expected output:	4 implemented calls
Indicator:	Number of summer internship participants - minimum of 20
Data source for indicator:	Internal database
Deadline:	Q4/2026
Milestones:	2023 - implementation of a pilot call with the participation of at least 5 secondary school girls 2024 - implementation of the second call 2025 - implementation of the third call 2026 - implementation of the fourth call
Costs:	2023 – EUR 25,000 2024 – EUR 25,000 2025 – EUR 25,000 2026 – EUR 25,000
Funding source:	State budget

Measure 5.1.5: A study mapping the current state of EU legislation to promote the creation of opportunities for women's participation in decision-making roles in the ICT sector

Measure description:	**Measure location Action Plan for Digital Transformation of Slovakia for 2023-2026: 4.1.1.3 Measure: A study mapping the current state of EU legislation to support the creation of opportunities for participation of women in decision-making roles in the ICT sector** A study mapping the current state of EU legislation to promote the creation of opportunities for participation of women in decision-making roles in the ICT sector
Sponsor:	MIRDI SR

Co-Sponsor:	MLSAF SR
Main expected output:	Analysis of known public sector measures in other countries and evaluation of their effectiveness, e.g. legislative quotas on the number of women on boards in Norway, specific tax regimes of Ireland, Poland, Romania, etc. in the ICT sector and proposal of recommendations that can be implemented in Slovakia.
Indicator:	A qualitative assessment of existing legislative measures in EU countries to promote opportunities for participation of women in decision-making positions
Data source for indicator:	Internal database
Deadline:	Q4/2023
Milestones:	2023 – Defining the study, implementation and evaluation of the analysis
Costs:	EUR 50,000
Funding source:	State budget

Promoting leadership and sovereignty

Measure 5.2.1: Building a national HPC infrastructure

Measure description:	**Measure location Action Plan for Digital Transformation of Slovakia for 2023-2026: 2.2.1.1 Measure: Building a national HPC infrastructure** Building a national high-performance computing infrastructure, which may consist of multiple systems installed in stages. This includes the refurbishment of the computing centre facility. The details have been established in a separate feasibility study. The commissioning of the first phase of the HPC infrastructure with a capacity of 0.8 PFLOP/s was financed by OPII PO7. The implementation of the other phases is being carried out through a project in RRP SR, Component 17, Investment 3.
Milestones:	2023 - commissioning of the pilot phase of the HPC system 2024 - commissioning of phase 1 of the HPC system 2026 - commissioning of phase 2 of the HPC system
Costs:	Total of max. EUR 45,000,000
Funding source:	RRP SR, component 17, investment 3

Measure 5.2.2: Ensuring the operation of the national HPC infrastructure

Measure description:	**Measure location Action Plan for Digital Transformation of Slovakia for 2023-2026: 2.2.1.2 Measure: Ensuring the operation of the national HPC infrastructure**

	Ensuring the operation of the national HPC infrastructure of installed systems with an emphasis on green technologies through the National Call Programme. The proposed computing capacity and Costs are derived from MIRDI SR Feasibility Study for the project to build a supercomputer in the RRPSR. Costs to be covered will be mainly for power, service personnel and system maintenance.
Milestones:	2023 - pilot phase of HPC system with 95% availability 2024 - commissioning of phase 1 of the HPC system with 95% availability 2026 - commissioning of phase 2 of the HPC system with 95% availability
Costs:	Total max. EUR 25 million
Funding source:	RRP SR, component 17, investment 3

Measure 5.2.3: HPC user access support services

Measure description:	**Measure location Action Plan for Digital Transformation of Slovakia for 2023-2026: 2.2.1.3 Measure: HPC user access support services** HPC user access support services are an integral part of the HPC field development in Slovakia. In addition to operations management and implementation of access policy using peer-review processes, this includes support for networking, projects, outreach, user recruitment.
Milestones:	2023 – min. 2 general calls for project approach under the NSCC 2024 – min. 2 general calls for the project approach under the NSCC 2025 – min. 2 general calls for the project approach under the NSCC 2026 – min. 2 general calls for the project approach under the NSCC
Costs:	NSCC Staff Costs and Remuneration for Assessors

Measure 5.2.4: Development and implementation of HPC Development Programme in Slovakia

Measure description:	**Measure location Action Plan for Digital Transformation of Slovakia for 2023-2026: 2.2.1.6 Measure: Development and implementation of HPC Development Programme in Slovakia** Systematic and coordinated activities of actors and relevant organisations at the national level are important for the development of high-performance computing in Slovakia. The elaboration of the HPC Development Programme in Slovakia is a basic point for the implementation of further activities and development. This will include a plan for regular renewal of HPC infrastructure and ensuring its sustainable operation, including financial coverage. It will also include monitoring and evaluation of implementation and updating of the strategy.
Milestones:	Q2/2024 - first version of the document ready for comments

	Q2/2025 - public and expert comment process completed
Costs:	not quantified
Funding source:	State budget - separate chapter MIRDI SR

Measure 5.2.5: Support for pilot research and development of customised HPC solutions through the free services of the National Competence Centre for HPC

Measure description:	**Measure location Action Plan for Digital Transformation of Slovakia for 2023-2026: 2.2.3.1 Measure: Support for pilot research and development of customised HPC solutions through the free services of the National Competence Centre for HPC** Free access to use HPC infrastructure and expert services to implement pilot solutions for start-ups and SMEs. The provider will be the National Competence Centre for HPC. The services also include expert consultation and counselling.
Milestones:	2023 - publication of the call and 5 access permissions issued 2024 - 10 access permissions issued 2025 - 15 access permissions issued 2026 - 10 access permissions issued
Costs:	In 2023-2025, funding is provided by measure 2.2.2.4 and professional services are funded by the EURoCC 2 project. 2026 – EUR 600,000 - NCC staff and direct expenditure for HPC
Funding source:	Programme DIGITAL and RRP SR, component 17, investment 4

Measure 5.2.6: Supporting the development of advanced customized HPC solutions through the National Supercomputing Centre

Measure description:	**Measure location Action Plan for Digital Transformation of Slovakia for 2023-2026: 2.2.3.2 Measure: Supporting the development of advanced customized HPC solutions through the National Supercomputing Centre** Access to leverage HPC infrastructure and expert services in the development and implementation of advanced solutions in the areas of AI/ML, HPDA, and simulation through NSCC sponsored grant solicitations. Solutions can be implemented within the framework of open R&D principles. Calls for support will be launched at least once a year, focusing on the profile areas of the smart specialisation. The support provided will not be financial, but will be in the form of experts and computing time to develop data processing algorithms for users.
Milestones:	2023 - 2 implemented projects 2024 - 4 additional projects implemented 2025 - 6 additional projects implemented 2026 - 8 additional projects implemented

Costs:	Funding for computing time is covered by the Digital Europe grant and professional services are covered by the NSCC budget.

Measure 5.2.7: Promoting the adoption of HPC in public administration

Measure description:	**Measure location Action Plan for Digital Transformation of Slovakia for 2023-2026: 2.2.3.3 Measure: Promoting the adoption of HPC in public administration** Some public entities process large volumes of data and, based on positive examples from abroad, it is known that HPC has the potential to improve the functioning of the state, for example, in the field of tax administration, health data processing, modelling of traffic flows on roads and in air traffic, but also in specialised topics such as meteorology, hydrology, demography, etc. Access to free use of HPC infrastructure and expert services in the development and implementation of solutions in the areas of AI/ML, HPDA and simulation through grant calls under the NSCC specifically for public administration institutions. Solutions can be implemented within the framework of open R&D principles. Synergies with measure 2.2.3.2 and close cooperation with university R&D centres in the field of HPC are also foreseen.
Milestones:	2023 - 1 implemented project 2024 - 2 additional projects implemented 2025 - 3 additional projects implemented 2026 - 4 additional projects implemented
Costs:	Computing time is provided free of charge and professional services are covered by the NSCC budget.

Measure 5.2.8: Information campaign focusing on the use of HPC in business and industry

Measure description:	**Measure location Action Plan for Digital Transformation of Slovakia for 2023-2026: 2.2.3.4 Measure: Information campaign focusing on the use of HPC in business and industry** The information and marketing campaign will target different stakeholder groups, from businesses to public administrations and public universities. The aim is to create demand for digital solutions built on HPC technologies across sectors, communicate successful case studies and continuously inform about available support mechanisms for the target groups.
Milestones:	2023 - 20 outputs 2024 - 20 additional outputs 2025 - 20 additional outputs 2026 - 20 additional outputs

Costs:	Costs covered by NSCC budget.
Funding source:	Own NSCC budget

Measure 5.2.9: Creation of a network of regional HPC service intermediaries in cooperation with public universities, ECDI and regional innovation centres

Measure description:	**Measure location Action Plan for Digital Transformation of Slovakia for 2023-2026: 2.2.3.5 Measure: Creation of a network of regional HPC service intermediaries in cooperation with public universities, ECDI and regional innovation centres** Although the national HPC infrastructure will be accessible to users across sectors and regions, local brokering of support tools and expert advice can be an important factor in the development of the HPC ecosystem in Slovakia. The ECDI network, regional innovation centres and university R&D centres in HPC appear to be the most appropriate platforms for such regional support, which will be purposefully coordinated by the NSCC. In addition to their own activities, the regional networks of facilitators will support the participation of users in lectures, workshops and training activities as described in Action 2.2.2.2.
Milestones:	2023 - 5 projects brokered 2024 - 5 additional projects brokered 2025 - 5 additional projects brokered 2026 - 5 additional projects brokered
Costs:	Costs covered by NSCC and ECDI budgets
Funding source:	RRP SR, component 17, investment 3 and DIGITAL

Measure 5.2.10: HPC software application development support

Measure description:	**Measure location Action Plan for Digital Transformation of Slovakia for 2023-2026: 2.2.3.6 Measure: HPC software application development support** Application software for use in HPC environments is another essential part of the HPC ecosystem. Measure aims to support the development of scalable applications for different domains within scientific, research and innovation projects. The measure will include events focused on the development of software solutions based on the use of existing open frameworks, such as hackathons organised by the NSCC. The measure will make it possible to procure licences for the use of standard software tools for HPC. This includes making available software to exploit quantum computing to exploit the potential of quantum computers and remote access to quantum accelerators and quantum simulators on EURoHPC Joint

	Undertaking. The measure is not a grant scheme nor is there any reallocation of funds, but it provides expert time and computing time for the HPC system.
Milestones:	2023 - 1 brokered projects 2024 - 2 additional projects brokered 2025 - 2 additional projects brokered 2026 - 2 additional projects brokered
Costs:	Costs covered by NSCC budget and measure sponsors

Measure 5.2.11: Support for start-ups using HPC technologies

Measure description:	**Measure location Action Plan for Digital Transformation of Slovakia for 2023-2026: 2.2.3.7 Measure: Support for start-ups using HPC technologies** Start-ups using HPC technology as an innovative element will require all-round support in the creation and development of their business, in addition to the technical, application and professional support provided by the NSCC and the NCC for HPC. Therefore, in collaboration with the MoH, SBA and other organisations, it is necessary to support interested entrepreneurs, start-ups and existing enterprises that use HPC technologies. Measure should link expert support in HPC with entrepreneurship support by coordinating NSCC with national projects and state programs (e.g. start-ups, Sharks, etc.). We expect involvement of existing associations, acceleration hubs, VC and seed funds, incubators that work with and provide services to high-growth companies in the private sphere, including in HPC, and are well versed in the market requirements for expert advice on financing, product development, and expansion into foreign markets for such companies.
Milestones:	2023 - 1 enterprise supported 2024 - 2 additional enterprises supported 2025 - 2 additional enterprises supported 2026 - 2 additional enterprises supported
Costs:	Personnel costs related to counselling, covered by NSCC budget

Measure 5.2.12: Support for the development of software solutions for quantum communication networks

Measure description:	**Measure location Action Plan for Digital Transformation of Slovakia for 2023-2026: 2.3.1.4 Measure: Support for the development of software solutions for quantum communication networks** Involving the private IT sector - a collaboration of public and private entities - in the development of software solutions for quantum key management and user applications for quantum cryptography. Support will be mediated by the National Centre for Quantum Technologies (QUTE.SK) by funding

	personnel involved in the development of software applications for quantum communication.
Sponsor:	MIRDI SR
Main expected output:	min. 5 involved workers annually from 2024
Indicator:	number of private sector workers
Data source for indicator:	annual reporting by the implementer
Deadline:	Q2/2026
Milestones:	2023 - publication of a call with terms of reference for interested partners 2024 - Involvement of at least 5 private sector staff 2025 - Involvement of at least 5 private sector staff 2026 - Involvement of at least 5 private sector staff
Costs:	Total EUR 100,000 (of which 50% DIGITAL)
Funding source:	DIGITAL and co-funding from RRPSR, component 17, investment 3

Measure 5.2.13: Establishment of cross-border communication lines

Measure description:	**Measure location Action Plan for Digital Transformation of Slovakia for 2023-2026: 2.3.1.5 Measure: Establishment of cross-border communication lines** Establishment of land communication lines to the neighbouring countries of the Czech Republic, Hungary, Poland, while the existing line to Austria will also be used. (Follow-up to the Connecting Europe Facility grant).
Sponsor:	MIRDI SR
Main expected output:	3 cross-border lines
Indicator:	number of cross-border quantum lines
Data source for indicator:	annual reporting by the implementer
Deadline:	Q2/2026
Milestones:	2024 - conclusion of the grant agreement with the EC 2024 - commissioning of the quantum communication line to the Czech Republic

	2025 - commissioning of the quantum communication line to Poland 2026 - commissioning of the quantum communication line to Hungary
Costs:	total EUR 2,000,000 (of which 50% CEF)
Funding source:	CEF and co-funding from RRP SR, component 17, investment 3

Measure 5.2.14: Creation of a quantum communication satellite node

Measure description:	**Measure location Action Plan for Digital Transformation of Slovakia for 2023-2026: 2.3.1.6 Measure: Creation of a quantum communication satellite node** Establishment of a ground station of the satellite communication link to the EUSPA satellites and promotion of the use of the satellite communication link in line with the objectives of the European EURoQCI initiative. The grant application to the European Commission will be submitted by the FU SAV on behalf of the Slovak Republic.
Sponsor:	MIRDI SR
Main expected output:	min. 1 transmission/day quantum-secured communication min. Bitrate 10 kbit/s
Indicator:	Bitrate in kbit/s
Data source for indicator:	annual reporting from the project implementer (PI SAS)
Deadline:	Q2/2026
Milestones:	2024 - conclusion of grant agreement with the EC 2025 - commissioning of the satellite earth station
Costs:	Total EUR 700,000 (of which 50% CEF)
Funding source:	CEF and co-funding from RRP SR, component 17, investment 3

Measure 5.2.15: Supporting high-end production in the field of quantum technologies in Slovakia

Measure description:	**Measure location Action Plan for Digital Transformation of Slovakia for 2023-2026: 2.3.1.7 Measure: Supporting high-end production in the field of quantum technologies in Slovakia** Support for the development and production of prototypes of technological components for quantum communication (single-photon detectors, photon sources for quantum key distribution) - consult with SBA or APVV on the possibilities of support through QUTE.SK.

Sponsor:	MIRDI SR
Main expected output:	6 devices built
Indicator:	Number of quantum communication devices built
Data source for indicator:	QUTE.SK annual report
Deadline:	Q4/2025
Milestones:	2023 - conclusion of grant agreement with the EC 2025 - construction of at least 6 prototype devices
Costs:	Total EUR 1,200,000 (of which 50% DIGITAL)
Funding source:	DIGITAL and co-funding from RRPSR, component 17, investment 3

Measure 5.2.16: Establishment of a virtual institute for quantum information research

Measure description:	**Measure location Action Plan for Digital Transformation of Slovakia for 2023-2026: 2.3.1.8 Measure: Establishment of a virtual institute for quantum information research** Development of cutting-edge research in the field of quantum technologies in cooperation with neighbouring countries (Austria, Czech Republic, Hungary, Poland) through the establishment of a virtual institute for quantum information research, where top researchers from the region will work in cooperation with invited world experts. The activities of the institute will focus on multi-month internships focused on research cooperation. The National Centre for Quantum Technologies (QUTE.SK) will cover the activities.
Sponsor:	MIRDI SR
Main expected output:	100 seminar participants per year. 20 publications in top scientific journals per year.
Indicator:	Number of participants in the seminars. Number of publications in top scientific journals.
Data source for indicator:	QUTE.SK. annual report
Deadline:	Q2/2026
Milestones:	2023 - Establishment of the Institute 2025 - First 50 participants in the seminars. First 10 research publications from the previous year.
Costs:	Total EUR 300,000 2023: EUR 0

	2024: EUR 100,000 2025: EUR 100,000 2026: EUR 100,000
Funding source:	DIGITAL and co-funding from RRPSR, component 17, investment 3

Measure 5.2.17: Promoting user involvement in the national quantum internet network

Measure description:	**Measure location Action Plan for Digital Transformation of Slovakia for 2023-2026: 2.3.1.9 Measure: Promoting user involvement in the national quantum internet network** Grant support for the construction of connections to the terrestrial network of quantum communication infrastructure in Slovakia for public sector entities that apply by submitting a project to the National Centre for Quantum Technologies (QUTE.SK). Once the project is approved, QUTE will prepare the implementation of the connection at the applicant's premises and provide assistance in the commissioning of the quantum network node.
Sponsor:	MIRDI SR
Main expected output:	5 public and private sector institutions involved in the use of quantum communication infrastructure
Indicator:	Number of public and private sector users involved
Data source for indicator:	QUTE.SK annual report
Deadline:	Q2/2026
Milestones:	2023 - public consultation with potential partners and identification of early adopters of a national quantum internet network 2024 - implementation of the first project 2025 - implementation of two projects 2026 - implementation of two projects
Costs:	total: EUR 500,000 2024: EUR 100,000 2025: EUR 200,000 2026: EUR 200,000
Funding source:	State budget

Contribution to the green transformation:

Measure 5.3.1: Coordination of green and digital transformation activities in public administration

Measure description:	**Measure location Action Plan for Digital Transformation of Slovakia for 2023-2026: 4.3.2.1 Measure: Coordination of green and digital transformation activities in public administration** Coordination of activities between relevant government entities and provision of assistance to help secure the benefits and minimise the negative environmental impacts of digital and green transformation. As part of the above action, consideration will be given, beyond inter-ministerial cooperation, to developing systemic and institutional support for the use of digital technologies to address green challenges. MIRDI SR and MoE SR will also cooperate closely in the actual implementation of this APDTS, both through coordination of individual activities, support in their implementation as well as monitoring of the implementation of individual measures.
Main expected output:	Establishment of an inter-ministerial working group (IWG) with representation from a central public authority and its subordinate organisations Establishment of a list of contact persons within the relevant public administration entities to represent a contact list for the purpose of coordinating activities in the field of green and digital transformation Developing a proposal for systemic and institutional support for the use of digital technologies to address “green” challenges
Milestones:	Q2/2023 - creation of a list of contact persons of public administration entities, establishment of the IWG, 1st meeting of the IWG and initiation of its activities 2024 - 2026 - min. 2 meetings of the IWG per year, ongoing coordination of activities
Costs:	Not expected.

Measure 5.3.2: Support for training aimed at capacity building and the development of competences and skills arising from the needs and necessary to meet the objectives of the digital and green transformation

Measure description:	**Measure location Action Plan for Digital Transformation of Slovakia for 2023-2026: 4.3.2.2 Measure: Support for training aimed at capacity building and the development of competences and skills arising from the needs and necessary to meet the targets of the digital and green transformation** Digital and green transformation require new competences and skills, especially in the context of the challenges posed by these two megatrends. The economy, public administrations and individuals

	themselves are not sufficiently prepared. The aim is to support measures (e.g. projects, courses and training) aimed at capacity building and the development of competences and skills arising from the needs and necessary to meet the digital and green transformation targets, both for the purposes of public administration and the economy. This is also reflected in the EC's Pact for Skills, where Measure: Action 6: Skills to support the twin transitions.
Costs:	Not quantifiable - related to the number of projects supported and the amount of financial support allocated
Funding source:	Grant from DIGITAL and co-funding from RRPSR, component 17, Investment 4

Measure 5.3.3: National project Digital skills for a green future of Slovakia

Summary information on the national project

Total eligible NP expenditure (in EUR)	6,205,882.35 EUR
Place of project implementation (at regional or national levels)	Bratislava Region Nitra Region Trenčín Region Trnava Region Žilina Region Banská Bystrica Region Prešov Region Košice Region
Identification of main target groups (if relevant)	Business sector producing in RIS3 domains Local Governments, Relevant Public Authorities

Inclusion of the national project in the structure of the Programme Slovakia 2021-2027[2]

Cohesion policy target[3]	1 A more competitive and smarter Europe by promoting innovative and smart economic transformation and regional ICT connectivity
Priority	1P1 Science, research and innovation
Specific target	RSO1.4 Skills development for smart specialisation, industrial transformation and entrepreneurship
Measure (if relevant)	1.4.2 Digital skills adapted to RIS3 domains and the needs of industrial and green transformation
Related types of actions[4]	4011010080120 - Domain 1: Programmes (including support for pilot projects and schemes) to develop the training of specific target groups, company managers and public and private sector executives and their management competences that are essential for the

	digital transformation and innovation of companies for the RIS3 domains; 4011010080122 - Domain 1: support for training and upskilling of trainers in digital skills strictly focused on meeting the needs of the RIS3 domains 4011010080123 - Domain 1: support for green transformation training activities, programmes and pilot projects, linked to the requirements of digital transformation, including support for skills development and the use of trusted smart technologies and data handling strictly for the needs of the RIS3 domains 4011010080124 - Domain 3: support for training initiatives, activities and programmes (including pilot activities) based on the European Commission's Digital Skills and Jobs Coalition initiative strictly for the needs of the RIS3 domains

Chapter 5: Cooperation at EU level

Multinational projects

Overview 1.a - Multinational projects included in the list of fields of action for multinational projects in the Annex to the Decision to which the Member State is committed or plans to commit in the future

EBSIC-EDIC - Observer status for the Ministry of Investment, Regional Development and Informatization of the Slovak Republic - Observer status for the Ministry of Education, Science, Research and Sport of the Slovak Republic - Observer status for the National Platform for the Development of Artificial Intelligence in Slovakia	- Create, operate and improve the infrastructure to deliver cross-border public services across the EU, serving citizens and businesses and facilitating the implementation of EU policies. Enable the cross-border exchange of trusted and secure verifiable credentials or other tokenised information between citizens, businesses and public authorities, thereby improving cross-border cooperation between public authorities, facilitating interoperability, decentralised solutions, smart contracts and applications, and innovation.
Vehicle of the future - Observer status for the Ministry of Investment, Regional Development and Informatization of the SR	- Multi-country programme to develop an agreed strategy for the development of microelectronic, semiconductor and microprocessor technologies for the automotive industry.
EDIC-Local Digital Twins - Observer status for the Ministry of Education, Science, Research and Sport of the Slovak Republic - Observer status for the City of Bratislava - Observer status for the National Platform for the Development of Artificial Intelligence in Slovakia	- Integration of future city-related projects using technologies such as AI, virtual reality and augmented reality (i.e. "Citiverse", which allows citizens and other stakeholders to virtually navigate and interact with their surroundings).
EDIC-Language - Observer status for the Ministry of Education, Science, Research and Sport of the SR	- A pan-European technology centre to develop a common infrastructure in natural language processing and to develop a Large Multilingual Model (Large Language Model) to address the lack of data training in European languages.
EDIC Mobility Data Space - Observer status for the City of Bratislava	- The EDIC for Mobility Data seeks to facilitate the creation of a common European mobility data infrastructure. The aim is to help bridge the gap

- Observer status for the Ministry of Transport. Industrial Innovation Cluster - Observer status for the National Platform for the Development of Artificial Intelligence in Slovakia	between project experimentation and development and the long-term availability and sustainability of a common data infrastructure.
EDIC Connected Public Administration - Observer status for the City of Bratislava	- The "Accelerating the best use of technology" call aims to fund large-scale pilot use cases of the European Digital Identity Wallet. The theme of the call will support the development and deployment of the EUDI wallet in priority cross-border use cases, including mobile driving licence (mDL), eHealth, payments and educational/professional qualifications, as well as other use cases. The Commission has recently announced the results of the evaluation of the call topic with 4 proposals evaluated as oversubscribed for funding, and is progressing to the grant contract preparation phase. These proposals cover the majority of Member States and all high priority use cases.
Q-Europe - Observer status for the National Platform for the Development of Artificial Intelligence in Slovakia - Observer status for the National Centre for Quantum Technologies	- The aim of participation is: Exploiting synergies between EURoQCI JU and national initiatives, better cooperation between Member States and the EU, building new and improving existing supply chains, sustainability of projects, services and infrastructure.
Digital Commons - Observer status for the National Platform for the Development of Artificial Intelligence in Slovakia	- The EDIC would help to achieve four objectives: (i) Create strong PPPs and participate in the development of sustainable open data and open source ecosystems; (ii) Promote the use and creation of digital commons across the EU and Member States; (iii) Improve the competitiveness of digital commons to enable large-scale adoption; (iv) Increase the public contribution to strategic commons; and (v) Increase the public contribution to strategic commons.
Genomes - Observer status for the National Platform for the Development of Artificial Intelligence in Slovakia	- The EDIC for the 1+ Million Genomes Initiative and its European Genome Data Infrastructure seeks to establish a framework of trust that enables efficient and secure cross-border access to personal genome dataset repositories between participating regions.

	- EDIC will ensure the sustainability of the work initiated by the Genomic Data Infrastructure project (GDI).
Europe Start-up Nations Alliance - Observer status for the Slovak Alliance for Innovative Economy	- The vision of ESNA is to contribute to putting Europe at the forefront of the global start-up ecosystem. To this end, it will build and connect with national entrepreneurial ecosystems across Europe, adding robustness, ambition and a physical layer to the current framework.

Overview 1.b – Any new multinational projects not already included in the list of fields of action for multinational projects in the Annex to the Decision which the Member State considers need to be implemented

Currently, the SR is not proposing any new multinational projects.

Overview 2 – Common commitments that this Member State is making or plans to make in the future

Currently, the SR is not proposing any joint commitments.

Facilitating factors at EU level

Currently, the SR is not proposing any new measures that the EU could support or that could best be implemented in cooperation with other Member States.

However, in view of the increasingly intensive processes of globalisation and interconnectedness of individual states and their groupings, and also taking into account the broader digitalisation of society as a whole, we propose that Slovakia make effective use of the tools of digital diplomacy. In this context, and in the context of the EU initiative on digital diplomacy topics, it will be necessary to cover and set up the digital diplomacy topics in content and institutional terms in cooperation with the EU as well as the Ministry of Foreign and European Affairs of the SR. We also plan to translate this intention into a strategy for digital diplomacy within the SR at government level, and the paper should be submitted for approval in the course of 2024.

Chapter 6: Stakeholder feedback

The background documents, draft trajectories as well as the list of measures were developed with the involvement of public and private sector partners. Each dimension has been assigned to a working group whose members are representatives of key actors in the field. Two meetings of each working group were held to prepare the chapters for each dimension. The first meeting introduced Digital Decade, the necessary background for the preparation of the National Digital Decade Plan, targets within the dimension addressed by the working group and the list of actions from existing strategic documents. Subsequently, the partners were invited for discussion and given time to comment on the proposals presented and to propose their own measures.

A second meeting of each working group was then held within one month, where the input of the actors as well as the new measures identified by the Digital Decade Sponsor were presented. In addition to the formal working group meetings, informal meetings were also held with individual stakeholders among the PAB to give feedback.

The preparation of the document was negatively affected by the late delivery of background documents by the European Commission. In this respect, the need for more active cooperation and achievable deadlines should be appealed for in order to be able to work effectively with stakeholders and to prepare better quality measures.

Chapter 7: Overall impact and conclusion

Taking into account the ambitious targets and objectives of the European Union, the SR has tried in this document to present an approach to the development of digitalisation that is based on a number of key action plans and strategic materials from recent years. The referenced documents replicate the key dimensions of the Digital Decade Policy Agenda. These are specific strategies and action plans approved in the areas of digital skills, digital transformation of businesses, key digital technologies and society, digital infrastructure and digitalisation of public administration (Strategy and Action Plan to improve the position of Slovakia in the DESI index by 2025, National Broadband Plan, Strategy and Action Plan for the Digital Transformation of Slovakia for 2023-2026, National Digital Skills Strategy of the Slovak Republic and Action Plan for 2023-2026, National Concept of Informatization of Public Administration and National Policy for Electronic Communications until 2030). In the preparation of the document, the backbone of the approach was built on the analyses and measures of these documents, which were prepared in cooperation with key actors in these areas and had passed the standard approval process at the national level.

Beyond the above, four inter-ministerial working groups were activated, bringing together key actors within the four dimensions, and the targets of the Digital Decade in each relevant area were presented to the members. At the first meeting, members were asked to contribute to the proposals for complementary actions beyond the existing documents. Following their comments, a discussion was held with partners from the other PABs to set concrete actions. Subsequently, a second WG meeting was organised and new measures were presented to the WG members for their comments.

Given the number of partners involved and the overlap of partners between the different dimensions, synergies and cooperation between measures across the different dimensions is expected. At the same time, actions fulfilling the general targets of the Digital Decade provide the necessary basis on which the actions fulfilling the digital targets can be built.

Slovakia needs to build on its individual strengths and the measures presented seek to combine the use of strengths with efforts to catch up with the European Union in areas where Slovakia has long been lagging behind. Beyond the documents adopted by the Government in recent years, which build on these objectives, new measures have been prepared to ensure that Slovakia maximises its activities and responsibilities in pursuit vision and common objectives of the European Union.

List of Annexes

- Annex 1: List of abbreviations
- Annex 2: List of materials used
- Annex 3: List of graphs, tables and visualizations

Annex 1: List of abbreviations

List of abbreviations

AI	Artificial Intelligence
AP DTS 2023-2026	Action Plan for Digital Transformation of Slovakia for 2023-2026
AP NKIVS	Action Plan for the Implementation of the National Concept Public Administration Informatisation of the Slovak Republic
API	Application Programming Interface
API GW	Application Programming Interface Gateway
APVV	Agency for Research and Development
BRISK	Behavioural Research and Innovation Slovakia
BSK	Bratislava Self-Governing Region
CDI/ECDI	Centres of Digital Innovation / European Centres of Digital Innovation
CEF	Connecting Europe Facility
CGA	Central government authorities
CVTI SR	Centre of Scientific and Technical Information of the Slovak Republic
ČVUT	Czech Technical University in Prague
DESI	Index Digital Economy and Society Index
DIGITAL	Digital Europe Programme
DSSC	Data Space Support Centre
EC	European Commission
EDIC	European digital infrastructure consortia
EDIH	European digital innovation hubs
EHR	Electronic Health Records
EIC	European Innovation Council
eID	Electronic identification
eIDAS	electronic Identification, Authentication and trust Services
EIT	Engineering and Industrial Technology
EMA	European Migration Agency
EMR	Electronic Medical Records
EOSC	European Open Science Cloud

ESIF	European Structural and Investment Funds
ESNA	Europe Start-up Nations Alliance
EU	European Union
EUDI	European Union Digital Identity
EURoQCI	European Quantum Communication Infrastructure
EUSPA	European Union Space Programme Agency
FS NBP	Feasibility study of the National Broadband Plan
FTE	Full-time equivalent
FTTB	Fiber to the Building
FTTH	Fiber to the Home
FÚ SAV	Institute of Physics of the Slovak Academy of Sciences
GDI	Genomic Data Infrastructure
HPC	High-performance computing
HPDA	High-performance data analysis
HTU	Higher Territorial Unit
ICT	Information and Communication Technologies
IDSK	Unified Design Manual for e-Services
ILA	Individual Learning Accounts
IPCEI	Important Project of Common European Interest
IS CAMP	Information System Central API Management Platform
ISPO	Information System of the Recovery and Resilience Plan of the SR
IT	Information Technology
ITAS	IT Association of Slovakia
KPI	Key performance indicators
MT SR	Ministry of Transport of the Slovak Republic
mDL	Mobile drivers licence
ME SR	Ministry of Economy of the Slovak Republic
ME/CT	Microelectronics and communication technologies
MESRS SR	Ministry of Education, Science, Research and Sport of the Slovak Republic
MetaIS	Central metainformation system of public administration
MF SR	Ministry of Finance of the Slovak Republic
MoI SR	Ministry of the Interior of the Slovak Republic
mID	Mobile ID
MIRDI SR	Ministry of Investment, Regional Development and Informatisation of the SR

ML	Machine Learning
MLSAF SR	Ministry of Labour, Social Affairs and the Family of the Slovak Republic
MoE SR	Ministry of the Environment of the Slovak Republic
MPS	Interdepartmental Working Group
NBP	National Broadband Plan
NCC	National Competence Centre
NCDES	National Centre for Digital Economy and Society
NCDTV	National Centre for Digital Transformation of Education
NEET	Designation of young people who are neither in employment nor in education, employment, or training
NICA	National Implementation and Coordination Agency
NIVAM	National Institute for Education and Youth
NKIVS	National Concept for the Computerisation of Public Administration
NP	National Project
NSA	National Security Authority
NSCC	National Supercomputing Centre
NSDZaAP	National Digital Skills Strategy and Action Plan
OECD	Organisation for Economic Co-operation and Development
OPII	Operational Programme Integrated Infrastructure
PAB	Public authority bodies
PO	Priority Axis
RIA	Research and Innovation Authority
RDI	Research, Development and Innovation
RRP SR	Recovery and Resilience Plan of the Slovak Republic
RSA encryption	Rivest, Shamir, Adleman (cipher authors)
SARIO	Slovak Investment and Trade Development Agency
SBA	Slovak Business Agency
SIH	Slovak Investment Holding
SME	Small and medium-sized enterprises
SO SR	Statistical Office of the Slovak Republic
SR	Slovak Republic
SSI	Self-Sovereign Identity
STEM	Science, Technology, Engineering and Mathematics
STU FIIT	Faculty of Informatics and Information Technologies STU

SWOT analysis	Analysis of strengths, weaknesses, opportunities and threats
TTSK	Trnava Self-Governing Region
UNI	Higher education institutions (Universities)
UX/CX	User Experience/Customer Experience
VAT	Value added tax

Annex 2: List of materials used

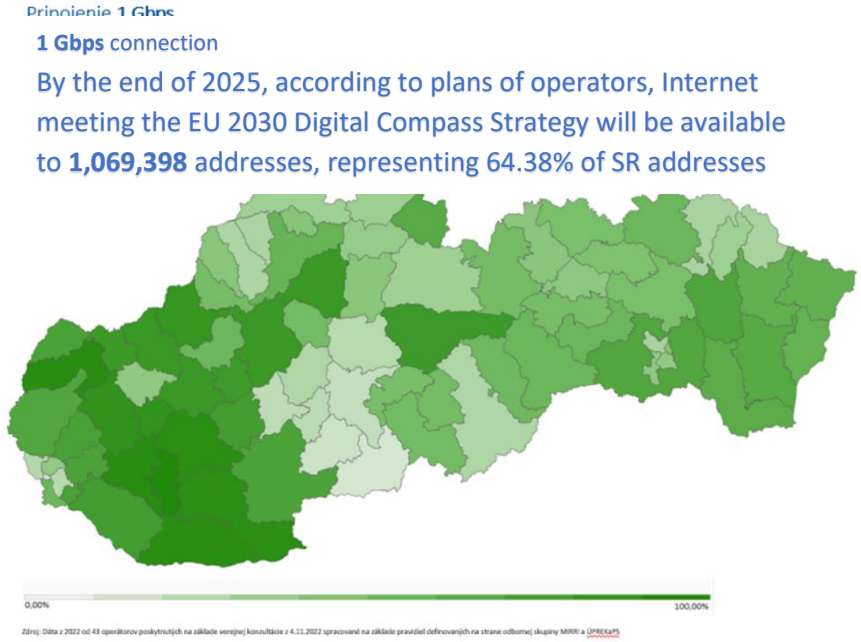
The preparation of the material has been based on a number of existing or forthcoming materials which have provided background material for the individual chapters. In particular:

- 2023 Report on the state of the Digital Decade: Slovakia
- Digital Transformation Action Plan of Slovakia 2023-2026
- National Research, Development and Innovation Action Plan 2030
- eGovernment Benchmark 2022
- National Concept of Informatisation of Public Administration
- National policy for electronic communications by 2030
- National Digital Skills Strategy of the Slovak Republic and Action Plan for 2023 - 2026
- National Strategy for Research, Development and Innovation 2030
- National Broadband Plan
- Draft Action Plan for the Implementation of the National Concept of Informatisation of Public Administration
- Recovery and Resilience Plan of the Slovak Republic
- Programme Slovakia 2021-2027
- Decision (EU) 2022/2481 of the European Parliament and of the Council of 14 December 2022 establishing the Digital Decade 2030
- Strategy and action plan to improve Slovakia's position in the DESI index by 2025
- Digital Transformation Strategy of Slovakia 2030
- Feasibility Study - National Broadband Plan

Annex 3: List of graphs, tables and visualisations

Visualisations for the analytical part for the Digital Infrastructure dimension

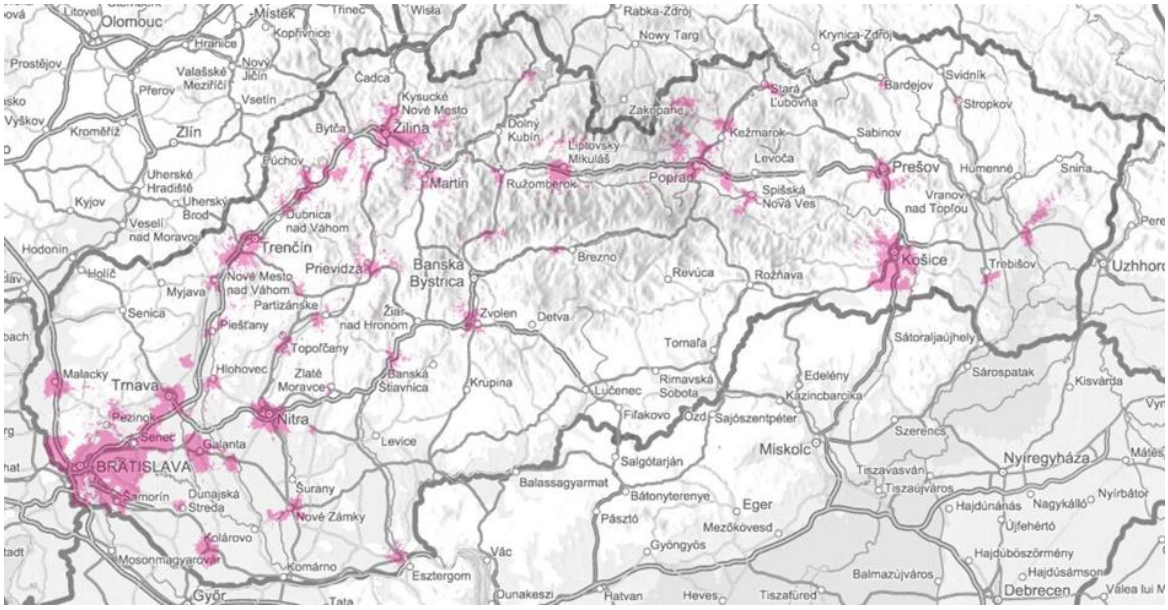
1 Gbps coverage rate across Slovak regions by the end of 2025



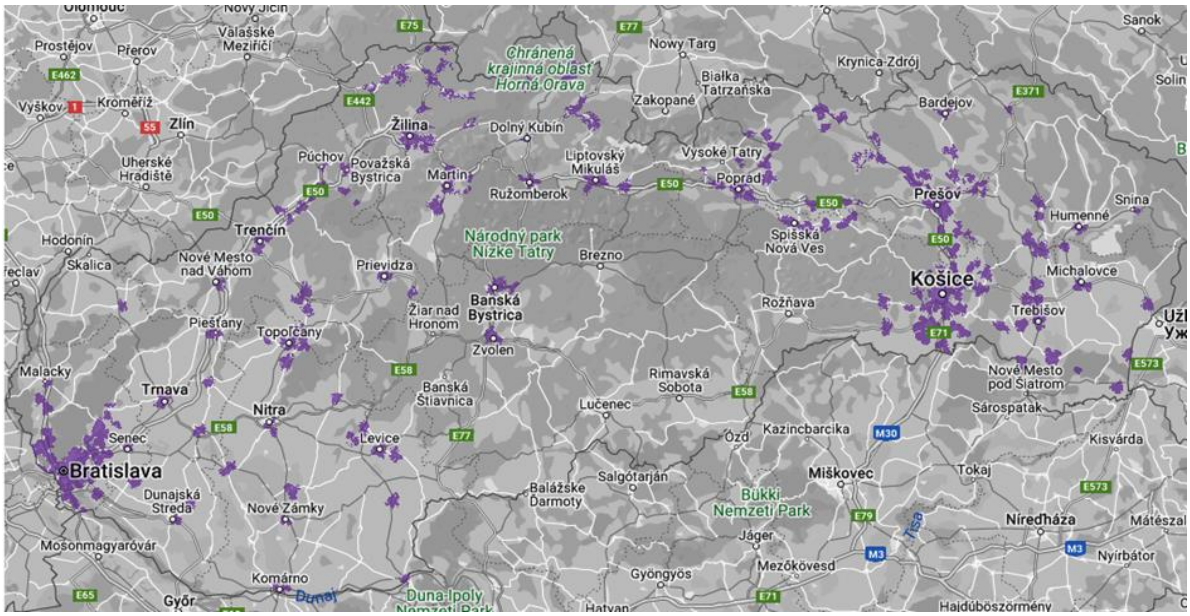
Okres	Pokrytie	Okres	Pokrytie
Šaľa	99,75%	Poltár	56,00%
Galanta	96,84%	Poprad	55,90%
Senica	96,32%	Ilava	55,41%
Komárno	95,90%	Spišská Nová Ves	54,70%
Nitra	95,16%	Detva	53,61%
Nové Zámky	94,70%	Prešov	53,41%
Trnava	91,80%	Stará Ľubovňa	53,05%
Hlohovec	91,41%	Sabinov	50,62%
Trenčín	88,84%	Košice III	47,96%
Nové Mesto nad Váhom	86,99%	Kysucké Nové Mesto	47,43%
Prievidza	86,55%	Púchov	46,19%
Martin	86,51%	Ružomberok	45,96%
Topoľčany	86,25%	Kežmarok	45,75%
Myjava	85,26%	Levoča	44,54%
Brezno	85,03%	Piešťany	43,28%
Partizánske	84,48%	Košice II	42,77%
Dunajská Streda	82,19%	Košice IV	42,24%
Zlaté Moravce	82,10%	Bratislava III	41,39%
Pezinok	78,85%	Dolný Kubín	40,27%
Skalica	78,34%	Námestovo	37,50%
Senec	77,88%	Stropkov	36,60%
Levice	77,14%	Liptovský Mikuláš	36,44%
Vranov nad Topľou	75,53%	Čadca	36,37%
Malacky	74,79%	Košice I	32,32%
Košice - okolie	74,15%	Svidník	31,83%
Michalovce	72,20%	Medzilaborce	31,81%
Tvrdošín	71,08%	Bytča	30,37%
Trebišov	69,15%	Považská Bystrica	30,13%
Snina	65,73%	Rimavská Sobota	29,55%
Humenné	65,62%	Žiar nad Hronom	28,33%
Sobrance	64,82%	Bratislava IV	26,97%
Žilina	62,64%	Banská Bystrica	26,06%
Bardejov	60,63%	Bratislava II	24,86%
Rožňava	60,37%	Banská Štiavnica	24,04%
Gelnica	60,36%	Žarnovica	22,73%
Bánovce nad Bebravou	60,02%	Zvolen	20,49%
Bratislava V	59,48%	Krupina	16,09%
Revúca	58,39%	Bratislava I	16,04%
Lučenec	56,27%	Veľký Krtíš	12,90%
Turčianske Teplice	56,09%		

5G coverage by individual operators in Slovakia

5G coverage by Slovak Telekom a.s., in 2023



5G coverage by O2 in 2023



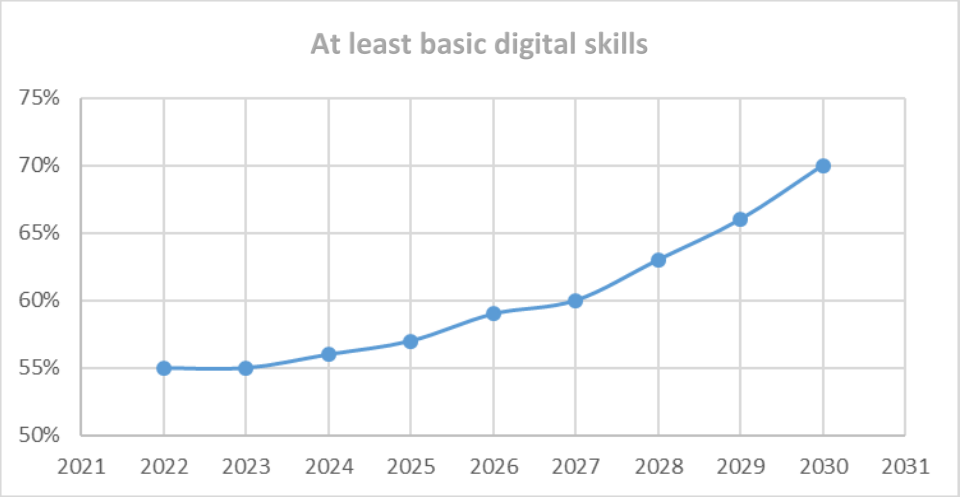
5G coverage by Orange in 2023

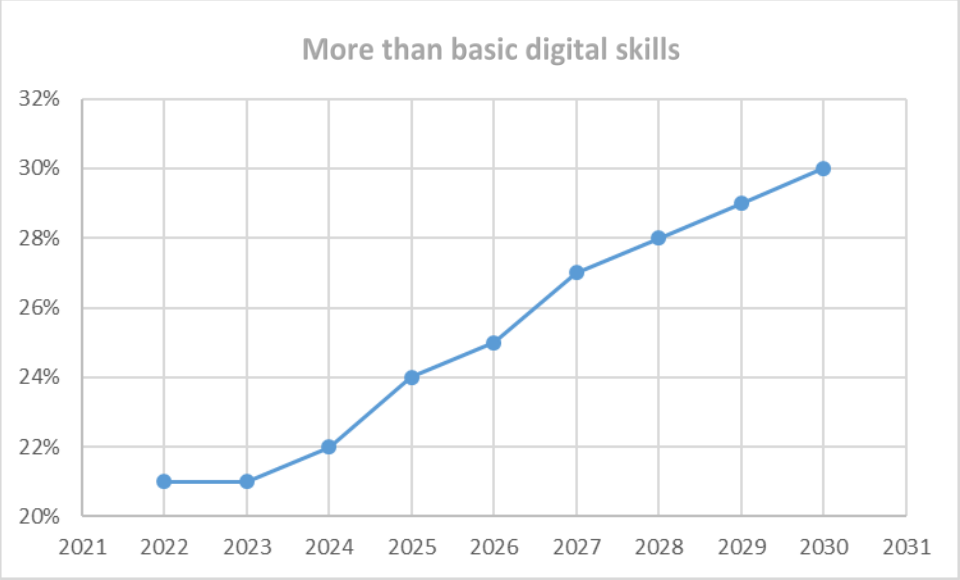
Tables and charts for digital target trajectories

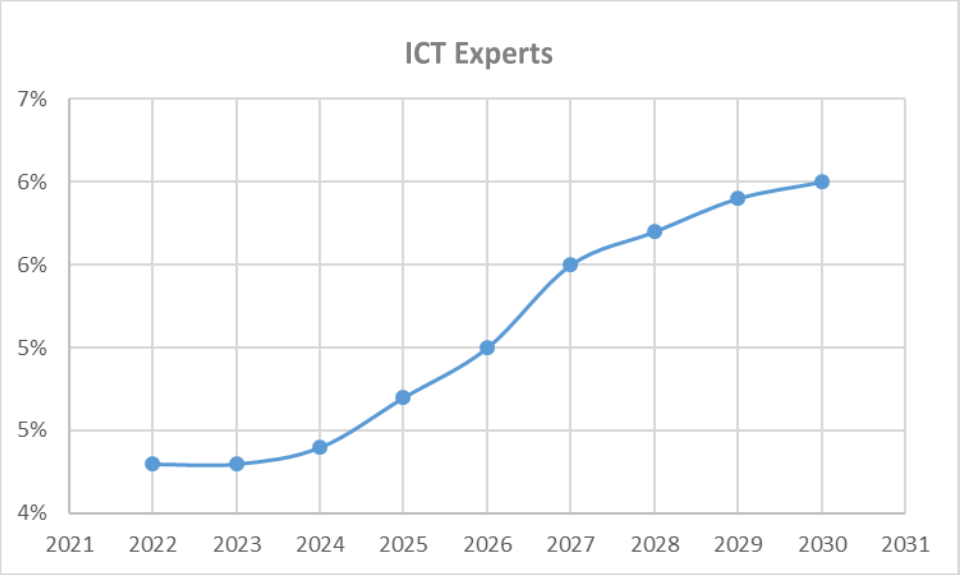
Digital skills and ICT professionals

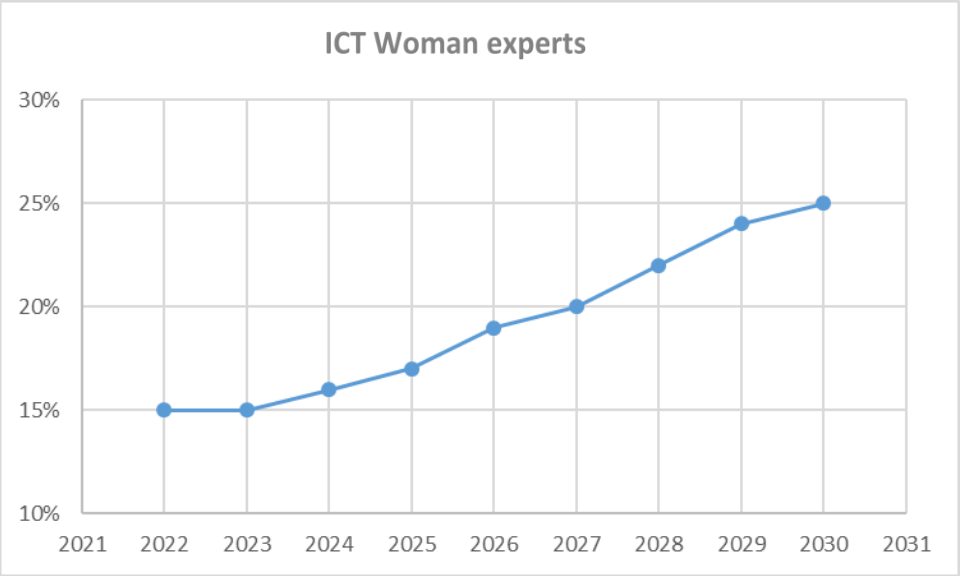
DESI YEAR	2022	2023	2024	2025	2026	2027	2028	2029	2030
At least basic digital skills	55%	55%	56%	57%	59%	60%	63%	66%	70%
DESI YEAR	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**

More than basic digital skills	21%	21%	22%	24%	25%	27%	28%	29%	30%
DESI YEAR	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
ICT experts	4%	4%	4%	5%	5%	6%	6%	6%	6%
DESI YEAR	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Women ICT experts	15%	15%	16%	17%	19%	20%	22%	24%	25%







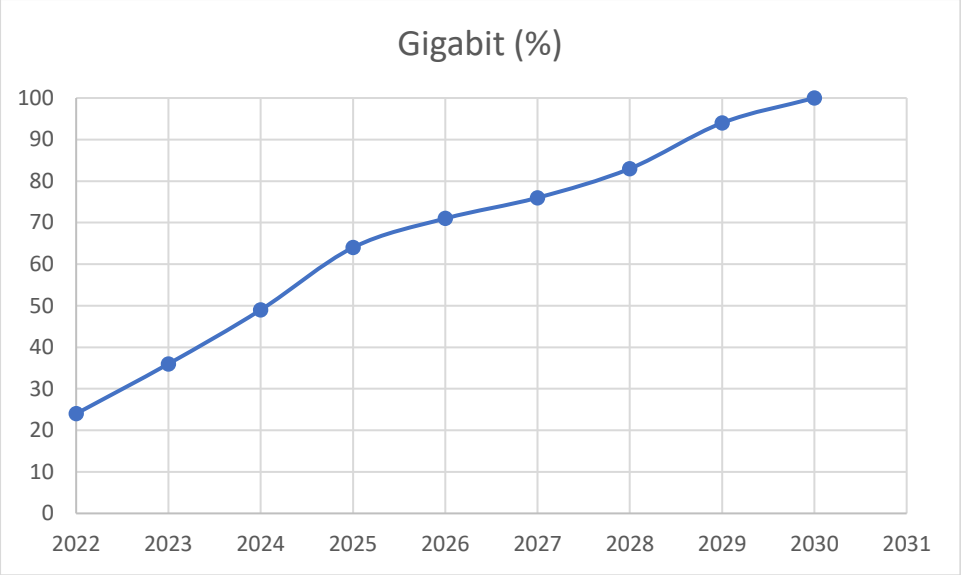


Digital infrastructure

Gigabit

The Digital Decade 2030 targets for digital connectivity are: by 2030, all European homes will be covered by a gigabit network, with all populated areas covered by 5G.

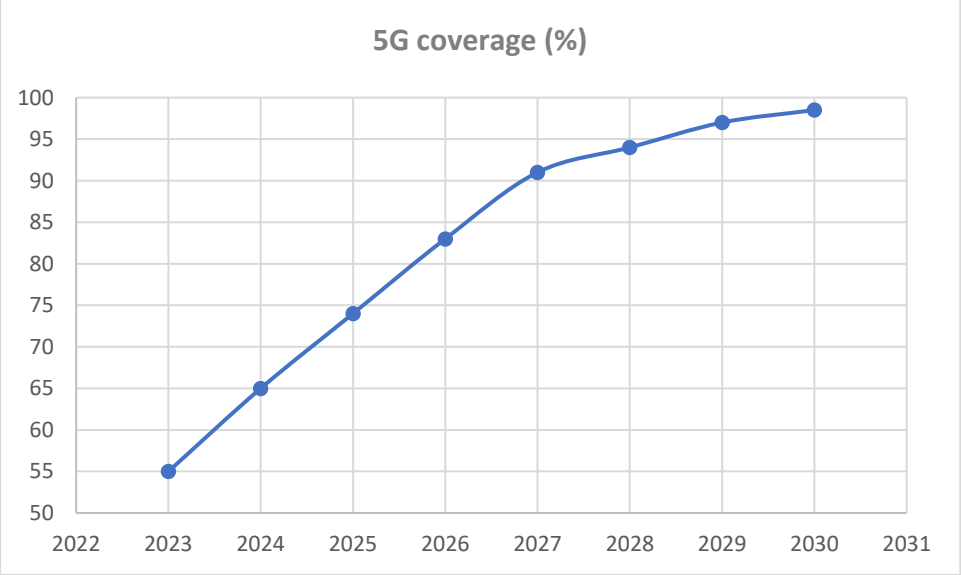
Year	2022	2023	2024	2025	2026	2027	2028	2029	2030
Gigabit (%)	24	36	49	64	71	76	83	94	100



5G

Taking into account that 5G network coverage at 30 Mbit/s will be considered, a realistic trajectory could be as follows:

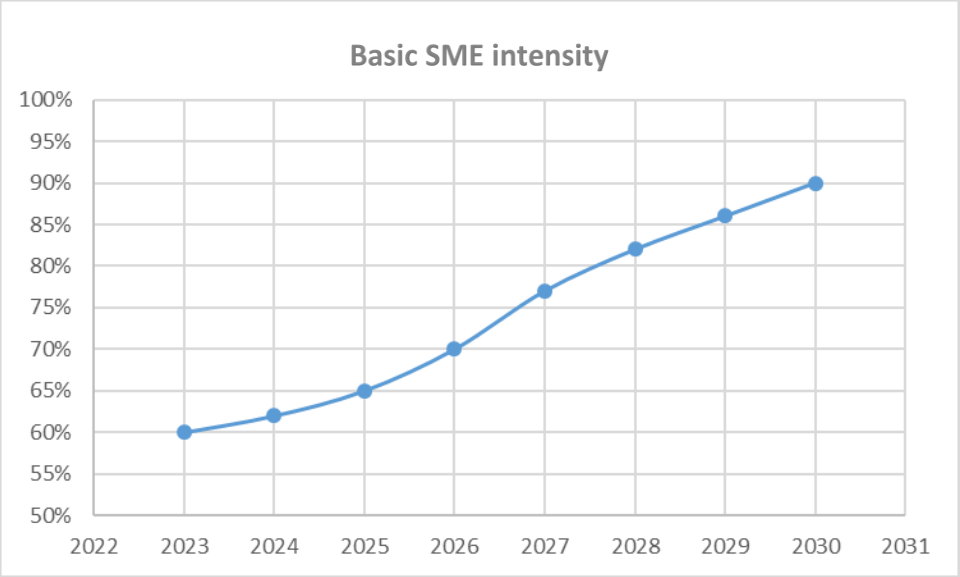
Year	2023	2024	2025	2026	2027	2028	2029	2030
5G Coverage (%)	55*	65	74	83	91	94	97	98-99

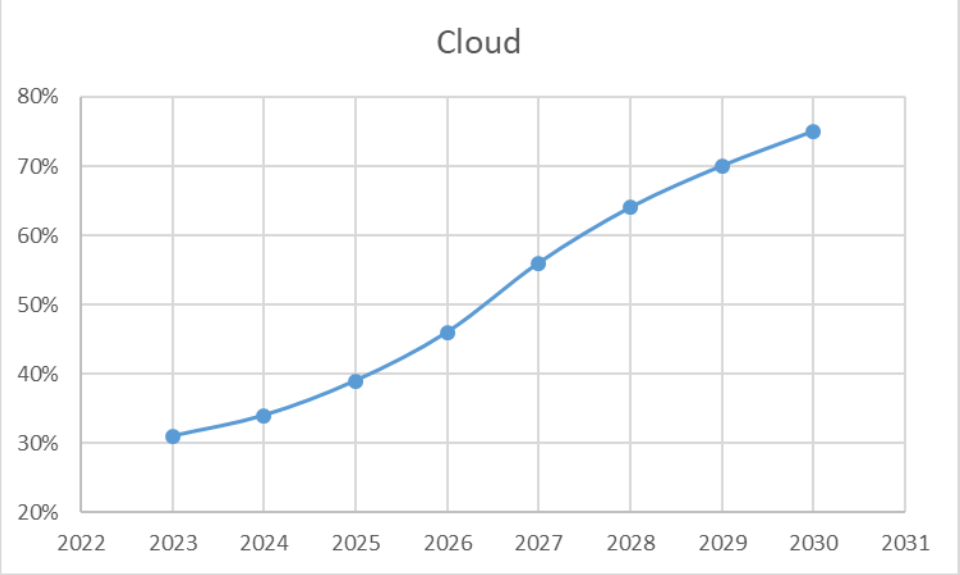


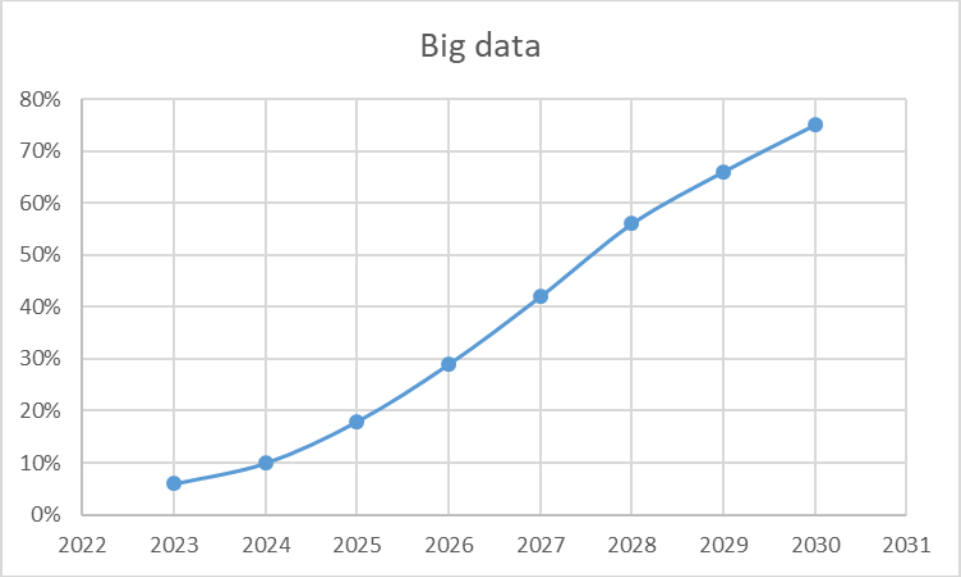
Digital transformation of businesses

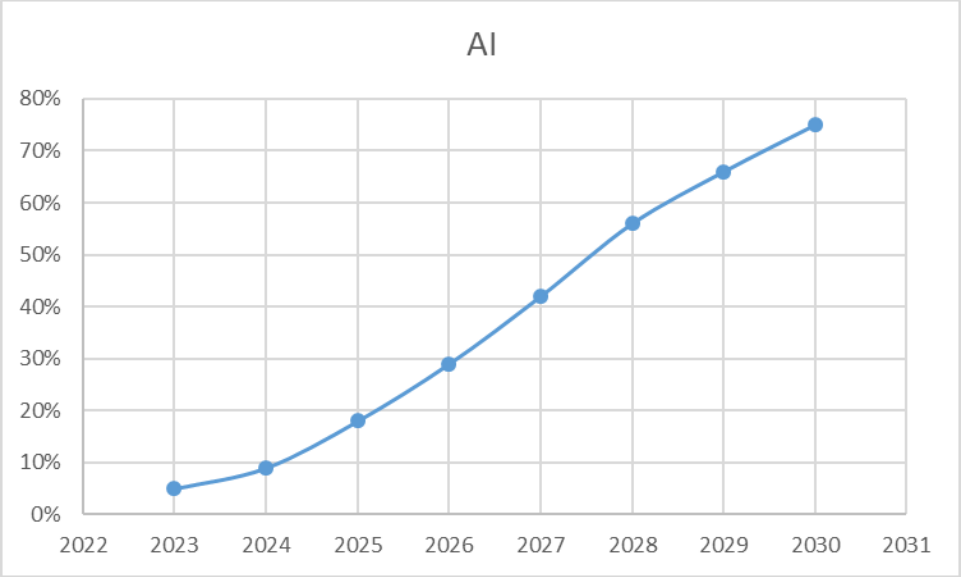
DESI YEAR	2023	2024	2025	2026	2027	2028	2029	2030
Basic SME intensity	60%	62%	65%	70%	77%	82%	86%	90%
DESI YEAR	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Cloud	31%	34%	39%	46%	56%	64%	70%	75%

DESI YEAR	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Big Data	6%	10%	18%	29%	42%	56%	66%	75%
DESI YEAR	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
AI	5%	9%	18%	29%	42%	56%	66%	75%
DESI YEAR	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Unicorns	0	0	1	1	1	2	2	3





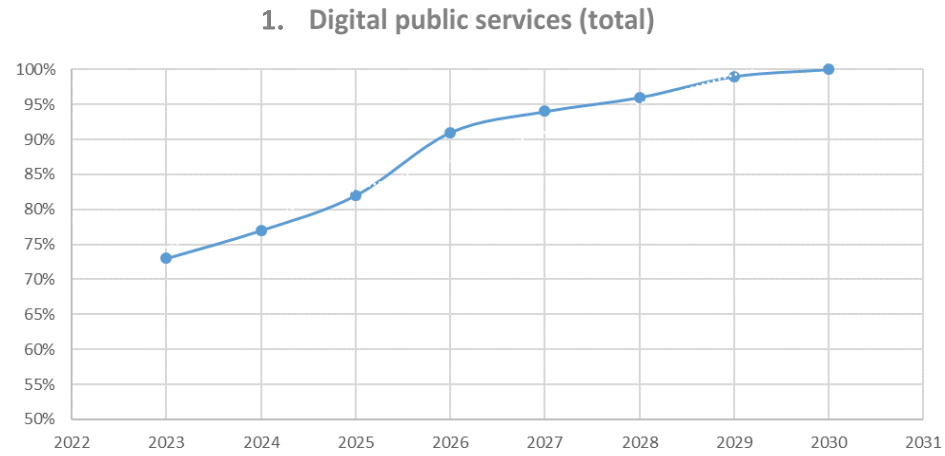


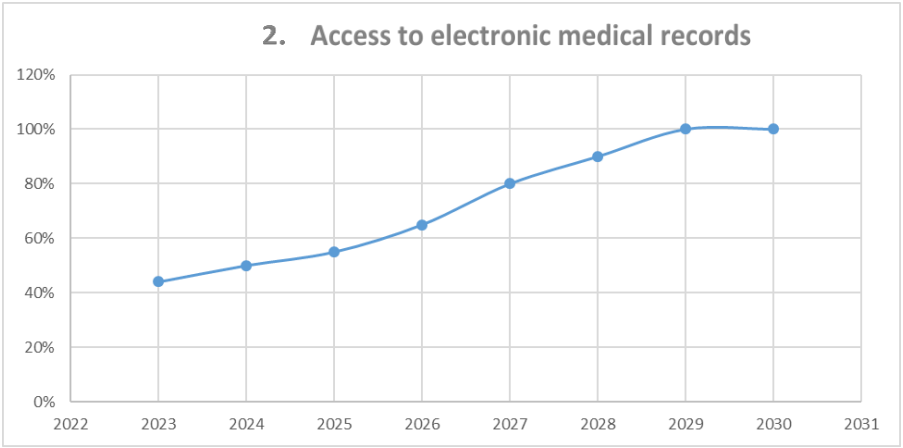


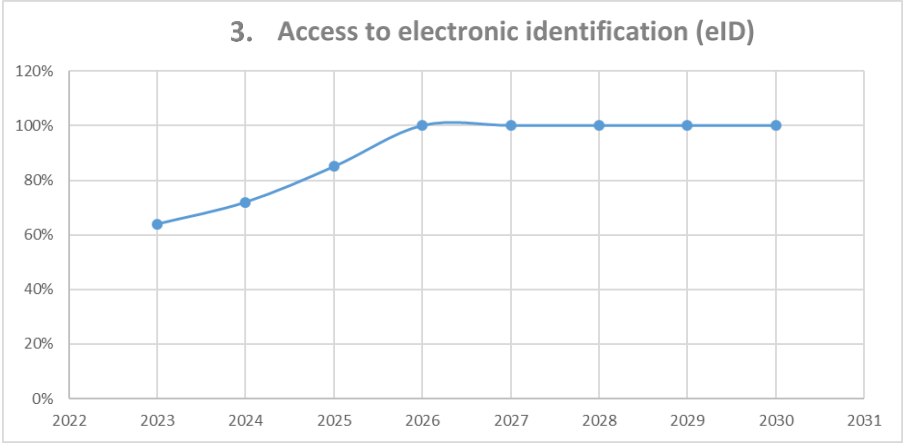
Digitalisation of public services

DESI YEAR	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Digital public services for citizens	67%	70%	76%	90%	92%	94%	98%	100%
DESI YEAR	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Digital public services for businesses	78%	84%	87%	92%	95%	97%	100%	100%
DESI YEAR	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Digital public services (total)	73%	77%	82%	91%	94%	96%	99%	100%

DESI YEAR	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Access to electronic medical records	45%	50%	55%	65%	80%	90%	100%	100%
DESI YEAR	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Access to electronic identification (eID)	64%	72%	85%	100%	100%	100%	100%	100%







SWOT Analysis for the Digitalisation of public services dimension

The work of the Digital Skills Working Group has led to a short SWOT analysis for digital skills:

Strengths

- Established public administration information systems which, although poorly interconnected, cover a vast majority of public administration agendas;
- involvement of the professional public and the willingness of the public administration to take their views into account;
- existence of key laws governing the digitalisation of public administration (with the exception of the non-existent Data Law) and the willingness of the Sponsor to make flexible amendments to these laws.

Weaknesses

- Procedural legislation does not yet take into account the potential of digital technologies; similarly, substantive laws are still largely based on the paper world;
- legacy architecture of information systems, which does not favour flexible interconnection and data sharing;
- administrative barriers in public administration, including the public procurement system, which are at odds with the flexibility and agility required by the digital age.

Opportunities

- Introduce data sharing mechanisms instead of sending documents and support this concept by amending key laws;
- build a repository of data and application components in a cloud infrastructure that will be shared fully by public administration and to a lesser extent by the public in the sense of open data and open interfaces;
- extend the digital transformation targets to business targets common in the commercial world, such as speeding up processes or saving staff;
- focus on the public administration client as the focal point, building both rapidly available atomic services for professionals and comprehensive services for occasional public administration users with massive integration of background processes and advanced support services at the user interface.

Threats

- Protectionism among ministries, which hinders effective building of comprehensive and interconnected services and, unfortunately, is often backed by law;
- Lack of understanding of the potential of digital technologies by political leaders of government ministries, business owners and users of government information systems.


Skills
Public services
Infrastructures
Business