

Digital Agenda of Kosovo 2030

Strategic orientation for transformation of Kosovo into a successful digital country

May 2023

# List of acronyms

AI Artificial Intelligence

ADA Austrian Development Agency

ARKEP Regulatory Authority of Electronic and Postal Communications

AIS Agency for Information Society

ccTLD Country Code Top Level Domain

CERT Computer Emergency Response Team

CSA Cyber Security Agency

DAK Digital Agenda of Kosova

DCAF Geneva Centre for Security Sector Governance

DESI Digital Economy and Society Index

EC European Commission

eID Electronic identification

eIDAS Electronic identification and trust services

ENISA European Network and Information Security Agency

GIZ Deutsche Gesellschaft für Internationale Zusammenarbeit

GPON Gigabit Passive Optical Network

ICANN Internet Corporation for Assigned Names and Numbers

ICT Information Communication Technology

IPA Instrument for Pre-Accession Assistance

KIESA Kosovo Investment and Enterprise Agency

KODE Kosovo Digital Economy

KREN Kosovo Research and Education Network

ME Ministry of Economy

MESTI Ministry of Education, Science, Technology and Innovation

OECD Organisation for Economic Co-operation and Development

R&D Research and Development

RCC Regional Cooperation Council

SIDA Swedish International Development Cooperation Agency

SME Small and Medium Enterprise

STIKK Kosovo ICT association

UNESCO United Nations Educational Scientific and Cultural Organization

USAID United States Agency for International Development

VHCN Very High-Capacity Networks

# Executive summary

This document - **Digital Agenda of Kosovo 2030** - is a strategic document covering the development of Kosovo towards a digitally developed society. Kosovo is already an information society, however, to become a gigabit society it requires additional investments in human capital as well as direct investment to generate development in all technical areas. The development of new technologies and services, which we have been witnessing in the last years, requires new skills and much more advanced infrastructure.

Structure of this document is the following: (A) problem evaluation; (B) defining solutions to detected problems; (C) proposal of objectives; (D) implementation, monitoring & evaluation; (E) indicative resource assessment (budget).

The *Digital Agenda of Kosovo 2030* (hereinafter referred to as DAK 2030) is a cross-sectoral horizontal agenda that defines the policy and priorities of Kosovo in the context of the ongoing digital transformation of the economy and society as influenced by innovative technologies and global digital trends. With DAK 2030, Kosovo will use the development opportunities of the advanced ICT technologies to become an advanced digital economy and society and to support economic growth and strengthening of national competitiveness.

TARGET DAK 2030 ACHIEVEMENTS

2025

FULLY DIGITALIZED FIXED BROADBAND INFRASTRUCTURE ATLAS

2026

AVAILABLE GIGABIT CONNECTION TO ALL PUBLIC INSTITUTIONS

2030

ADVANCED NATIONAL 5G COVERAGE

AVAILABLE GIGABIT CONNECTION TO ALL HOUSEHOLDS AND BUSINESSES

80% OF KOSOVO COMPANIES USING CLOUD / AI / BIG DATA

100% OF KOSOVO SMEs WITH BASIC LEVEL OF DIGITALISATION

100% OF KEY PUBLIC SERVICES ONLINE

90% OF KOSOVO CITIZENS USING DIGITAL ID

100% OF MEDICAL RECORDS AVAILABLE IN DIGITAL FORM ONLINE

5% OF ACTIVE POPULATION ICT SPECILISTS

95% 0F POPULATION WITH BASIC DIGITAL SKILS

Geographically Kosovo is a small country with one of the youngest populations in Europe which is a significant advantage in the sense of agility and adaptability to emerging trends in digitalisation. The exceptionally high rate of internet use among citizens, a well-developed ICT sector and the availability of broadband connections for all companies, households and educational institutions provide a good basis for further digital transformation of Kosovo. The overall demographic and educational profile of young people in Kosovo in combination with a rising interest in ICT studies represent an important competitive advantage for Kosovo’s ICT industry.

The DAK 2030 takes into consideration the strategic objectives of the National development strategy, National IT strategy, and other socioeconomic policy documents of Kosovo. The DAK 2030 is fully aligned with the most recent European Union’s strategies and recommendations, e.g., 2030 Digital Compass, Green Deal, Shaping Europe’s digital future, 2030 Policy Programme Path to the digital decade, Gigabit society strategy, 5G Action Plan, Cybersecurity of 5G networks, etc.

The ICT sector in Kosovo represents an important part of the economy on which Kosovo must build its development potential. Good practice of the ICT sector needs to be transferred to other sectors. The establishment of an ICT ecosystem is an important step towards a development-oriented business and education environment in Kosovo. In addition, the *National development strategy 2030*  *(NDS)* has emphasised that the use of IT in administrative, education and trade processes will help decrease operational costs and create efficiencies, consequently allowing both the state and private companies to channel resources into investments in other areas. The use of ICT will also boost innovation in operational processes in the private sector. Increased investments and innovation will raise economic growth rates.

**1.1. A short description summarising the nature of the problem**

An analysis of the Kosovo society, public services, industry and business, and a detailed analysis of the objectives of the previous *Digital Agenda for Kosovo 2013-2020* (hereinafter referred to as DAK 2013-2020) showed that the objectives set in the old digital agenda were partially met.

The DAK 2013-2020 identified three strategic priorities: (1) development of the ICT infrastructure, (2) development of the electronic content and services and promotion of the use thereof, and (3) enhancement of the Kosovo residents’ ability to use the ICTs. Review of the results achieved by the old strategy yielded the following findings: certain areas have made great progress, e.g., in 2022 99.8% of households had access to the internet, 100% of enterprises had opportunity to obtain access to broadband networks, and almost 98% of the population was using IC technologies. But unfortunately, some areas stayed underdeveloped, e.g., use of e-government and e-health services. Furthermore, privacy and security in the use of ICT services still represent a major challenge to the people of Kosovo in their private or business lives.

From the aforementioned facts, analysis of strategic documents, analysis of questionnaires and review of statistical data, it is found that there are still the following challenges:

* Moderate performance of the broadband networks 🡪 action: upgrade of existing networks.
* Mobile networks suffer from a lack of capacity and a low quality of services, largely due to lack of frequencies 🡪 action: allocation of new frequencies, 5G deployment.
* Gaps in the digital transformation of the country - poor digitalization of companies, and low engagement of the citizens in the digital economy 🡪action: increase of e-services in business and promotion of the digitalisation in business.
* The nature of internet use among Kosovo citizens requires some changes 🡪 action: more emphasis should be placed on electronic services.
* Poor digital skills of citizens’ 🡪 action: advance the digital skills among citizens and promote life-long learning.
* Lack of cybersecurity awareness among businesses, and citizens 🡪 action: preparation of the legislation on Networks and Information Security, Cybersecurity Strategy and other guidelines on information security.

Another problematic issue that need to be resolved (from DAK 2013-2020) is:

* Creation of a Country Code Top Level Domain (ccTLD) or Internet Country Code for Kosovo 🡪 action: application to ICANN for the allocation of the TLD “.ko” or “.ks”.

**1.2. A list of the key objectives**

The keys to success, and the lessons learned from the previous digital agenda DAK 2013–2020, including the gaps in development, have been incorporated into the objectives, priority areas and actions of the new digital agenda DAK 2030.

To fulfil the DAK 2030 vision and solve above listed issues, the following five strategic objectives have been defined:

* Strategic objective 1 – Advanced secure digital infrastructure
* Strategic objective 2 – Digital transformation of businesses
* Strategic objective 3 – Digitalization of public services
* Strategic objective 4 – Digital skilled population and innovative R&D ecosystem
* Strategic objective 5 – Sustainable cybersecurity ecosystem

The strategic objectives are broken down into specific objectives. Each specific objective is broken down into activities that contribute to the achievement of DAK 2030 objectives.

**1.3. A short summary of recommended actions**

Digital Agenda 2030 is one of the Horizontal Agendas within the new National Development Strategy. An important feature of the Horizontal Agendas is that the real actions will be implemented and financed by different Budget organizations in a number of sectors. Therefore, *such actions need to be planned and costed in the sector specific strategies* and included into the budget request by the organization responsible for the implementation of actions.

The exact activities for each strategic and specific objective specified in the DAK 2030 will be defined in the sectorial strategies. However, some of the indicative recommended actions are summarized in this DAK 2030 document. Measurable indicators, interim and final targets, and responsible authorities are summarized in the Annex I of the present document.

The first strategic objective (SO1) “Advanced secure digital infrastructure” consists of 4 specific objectives and 13 recommended indicative activities. The most important indicative activities include recommendations and procedures to develop and offer advanced public fixed and mobile networks and services, ensure sustainable green and secured fixed and mobile network infrastructure, and 5G-enabled mobile ICT for smart business verticals, smart communities, and public safety. There are detailed procedures described how to ensure spectrum and market conditions for modern 4G/5G public mobile networks, through preparation of a frequency spectrum allocation strategy for sub-1 GHz, mid-band and mm-Wave spectrum, and optimal building of modern, and green networks. Under this strategic objective, the following activities are also envisaged: pilot project for a smart factory 4.0 based on 5G non-public network in one of Kosovo’s industrial sites, ensuring pilot project 5G Corridor and 5G-enabled smart mobility, and promote development of critical applications on state-controlled PPDR network.

**MAIN SO1 ACHIEVEMENTS**

FULLY DIGITALIZED BROADBAND INFRASTRUCTURE ATLAS

AVAILABLE GIGABIT CONNECTION TO ALL PUBLIC INSTITUTIONS

ADVANCED NATIONAL 5G COVERAGE

AVAILABLE GIGABIT CONNECTION TO ALL HOUSEHOLDS AND BUSINESSES

The second strategic objective (SO2) “Digital transformation of business” consists of 3 specific objectives and 9 recommended indicative activities. This strategic objective is targeting digital enhancement of businesses, particularly SMEs, procedures to increase digital skills of employees, and ensuring support to the development of innovative ICT sector for stronger digital growth. The main indicative activities are related to improvement of the capacities of organizations to use the new digital technologies and transformation tools, assistance to the digital enhancement of SMEs to support e-commerce and e-business, establishment of Digital Innovation Hubs, support launching of new SME innovative digital transformation scheme and digital start-ups fund, support of sectorial improvement of digital transformation skills and practice/know-how sharing, and further maintenance of links with the diaspora working in ICT and other sectors.

**MAIN SO2 ACHIEVEMENTS**

80% OF KOSOVO COMPANIES USING CLOUD / AI / BIG DATA

100% OF KOSOVO SMEs WITH BASIC LEVEL OF DIGITALISATION

The third strategic objective (SO3) “Digitalization of public services” addresses 4 specific objectives and 11 recommended indicative activities. This strategic objective deals with upgrade of e-government portal, based on “once-only” principle, digitalisation of public administration in all segments, increase of government efficiency through the IT governance, and increase of the ICT skills among public sector employees.

**MAIN SO3 ACHIEVEMENTS**

100% OF KEY PUBLIC SERVICES ONLINE

100% OF MEDICAL RECORDS AVAILABLE IN DIGITAL FORM ONLINE

The fourth strategic objective (SO4) “Digital skilled population and innovative R&D ecosystem” is covered in detail in 5 specific objectives and 19 recommended indicative activities. This strategic objective works on learning opportunities to upgrade digital skills of citizens, transformation of the education system of Kosovo through digitalization, extensive education for innovative technologies in higher education, promotion of an intelligent ecosystem, and ensuring favourable environment for R&D in innovative technologies.

**MAIN SO4 ACHIEVEMENTS**

90% OF KOSOVO CITIZENS USING DIGITAL ID

95% 0F POPULATION WITH DIGITAL SKILLS

The fifth strategic objective (SO5) “Sustainable cybersecurity ecosystem” consists of 4 specific objectives and 9 recommended indicative activities. The focus is given to the cybersecurity resilience, cybersecurity awareness and competences, protection and sustainability of digitally dependent critical infrastructures, and establishment of the national cybersecurity maturity framework through development and improvement of the regulatory framework.

**MAIN SO5 ACHIEVEMENTS**

ESTABLISH CYBER SECURITY AGENCY

STRENGTHEN NATIONAL CERT

AND

ESTABLISHMENT OF OTHER SECTORIAL CERTs

**1.4. Key recommendations related to the sector**

ICT is one of the key sectors in Kosovo, but while this sector is well developed, gaps remain about the digital transformation of the country. A substantial increase is needed in the digitalisation of companies and an enhanced engagement of the citizens in the digital economy. Hence, increasing the use of e-services in business and among citizens constitute key areas of intervention addressed in this strategy. Kosovo has reached a very high level of internet use among citizens; however, the nature of this use still requires some development. Since most companies fall into the SME category, the focus must be on this segment as well.

To progress towards gigabit connectivity and enable the use of ever more advanced technologies and services, it is now necessary to further upgrade the performance of the broadband networks to so called “Gigabit connectivity”. Although mobile use has reached a very high level of penetration, the mobile networks suffer from both a lack of capacity and a low quality of service, largely because of lack of frequencies. One key challenge for the future regarding connectivity of mobile networks will be the upgrade of these networks to the next generation 5G networks as a foundation for economic development of Kosovo.

Since the drafting of the previous Digital Agenda (DA 2013-2020), much has changed regarding technology and the development of digital societies. Many of these changes have been addressed in the policies of the European Union. The EU has introduced policies to drive the development of the digitalisation of state services. *E-government* is now a central tenet of the digital transformation of societies, hence Kosovo’s new e-Government strategy is being prepared. The development of *e-commerce* and *e-government* services shall enhance the nature of internet use and increase the engagement in the digital world. Related to this is the need to develop the digital skills of the citizens, to promote life-long learning, digital inclusion, and private public partnerships (PPP) in this area.

The DAK 2030 is aligned with the *Education Strategy 2022-2026* which is developed to advance the digital skills of all levels of pupils and students and to increase the availability of a highly skilled ICT workforce. As the R&D sector in Kosovo receives the least investment in the region, special emphasis needs to be placed on developing favourable environment for research and development. Strategic approach for data driven development, and introduction of Artificial Intelligence will be of crucial importance.

The European Union recognised the importance of cybersecurity when big data, data analytics, and data processing are central to digital transformation. The use of e-services is strongly linked to the security of networks and services, while trust is one of the key factors in the use of the internet and services for both citizens and businesses. The Parliament approved the Law on Cybersecurity and the Government of Kosovo is preparing a new National Strategy for Cybersecurity.

Finally, very-high-capacity networks with reliable QoS are of paramount importance for the development of future digital services. Connectivity was identified as one of the 4 digital flagships of the *EU Digital Compass* with which the European Commission presented its vision for Europe's digital transformation by 2030 – the so-called EU’s digital decade (see Fig.1). Future use of services in Kosovo requires an exceptionally high capacity of broadband connectivity, low latency, and connectivity for a huge number of devices.

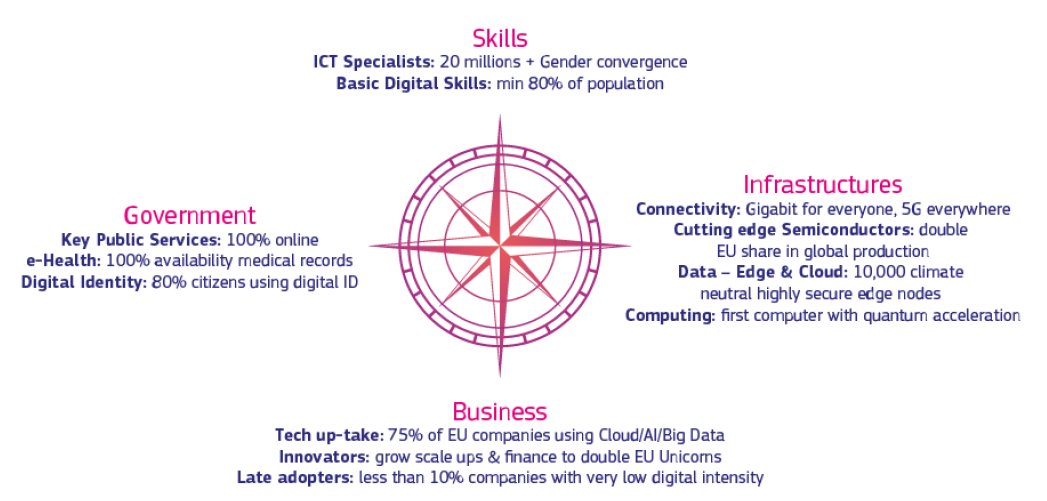


Fig.1. 2030 Digital Compass (EU, March 2021)

# Introduction

With the new *Digital Agenda of Kosovo 2030*, Kosovo will use the development opportunities of the advanced ICT technologies to become an advanced digital economy and society and to support economic growth and strengthening of national competitiveness. The DAK 2030 is overarching national digital agenda, following the *Electronic Communication Sector Policy –* *Digital Agenda for Kosovo 2013-2020*, adopted in 2013 as a mid-term and long-term Electronic Communications Sector Policy of the Government of Kosovo.

The priorities of the previous Digital Agenda (DA 2013-2020) focused on the development of the ICT infrastructure, the development of the electronic content and services and promotion of their use, and the enhancement of the digital skills of Kosovo citizens. Such goals continue to be among key elements of the DA 2030. Namely, process of achieving digital transformation is a long-term program often requiring review and update to adjust to new challenges and opportunities. At the level of the European Union similar goals exist regarding the new *2030 Digital Compass* addressing citizen skills, ICT experts, secure and substantial digital infrastructures, and the digitalization of business and the public sector.

The strategic objectives of the new DA 2030 are: (1) advanced secure digital infrastructure, (2) digital transformation of businesses, (3) digitalization of public services, (4) digital skilled population and innovative R&D ecosystem, and (5) sustainable cybersecurity ecosystem.

The drafting of this strategic document (DAK 2030) has been initiated by the Ministry of Economy (hereinafter: ME) through the *Kosovo Digital Economy Project* (KODE). The KODE project aims to improve access to better quality and high-speed broadband services, and to on-line knowledge sources, services and labour markets among citizens, public and academic institutions.

The digital transformation of economy and society directly affects all citizens of Kosovo. Reflecting this horizontal nature of the digital transformation, it is necessary to emphasize the interconnectedness of this document to other strategic documents, and national development plans of Kosovo, concerning digital agenda.

The DAK 2030 has been developed in the context of a wide range of other cross-cutting (horizontal) agendas and sector specific (vertical) national strategies. This strategic document (DAK 2030) has strong relation to several documents closely related to government priorities, as: *Government Program 2021-2025* (developing ICT infrastructure and capacities as potential for economic development by developing the digital economy and building human capital, working on fixed broadband and 5G mobile infrastructure; developing and implementing the e-ID system; training of young people in the field of information technology and their access to employment opportunities also in the online form; promoting PPP through capital projects); *Kosovo’s Economic Reform Programme 2023-2025* (human resource development and support businesses for their digitalisation; adapting and functionalizing the digital technology park for the needs of ICT businesses), *Kosovo National Development Strategy 2030* (deployment of information and communication technology infrastructure), *Kosovo IT Strategy* (promoting the development of the Kosovo IT industry to promote digital transformation and support Kosovo in becoming a knowledge-based economy), *Kosovo Digital Economy Project* (provide high-speed broadband infrastructure and support access to labour markets, new sources of knowledge, and public services to households and institutions in selected underserved rural areas; train and connect youth to online employment opportunities and improve access to knowledge sources, including better reach and collaboration opportunities for higher education institutions), and Draft *Strategy on Reform of Public Administration 2022-2026* (establishing an e-administration at the most advanced level possible and digitalization of administrative processes as broadly as possible); eGovernment Strategy, etc.

# Methodology

**3.1. Methodology used in the process for drafting the strategic document**

The new *Digital Agenda of Kosovo 2030* (DAK 2030) is fully aligned with established European strategies and policies. The most important international documents that have been used are:

* *Path to the Digital Decade* (EC, September 2021),
* *2030 Digital Compass* (EC, March 2021),
* *5G for Europe – An Action Plan* (EC, September 2016),
* *Digital Education Action Plan* 2021-2027 (EU, 2020),
* *National Cyber Security Strategy* *(ENISA)*
* *Digital Government Strategies for Transforming Public Services (OECD)*

Basis for the preparation of the DAK 2030 are recommendations of the EC strategy (adopted in February 2018): *A credible enlargement perspective for enhanced EU engagement with the WESTERN Balkans* (COM 2018/65).

The indicators collected in Annex 1 follow the parameters from the document *International Digital Economy and Society Index* (so-called DESI) which is regularly prepared for the European Commission. Kosovo is also planned to be included in this document in the future.

In preparing the DAK 2030 have participated all relevant public and private stakeholders assisted by the EU experts under the *Kosovo Digital Economy (KODE) Project*.

Basis for this project was the paper *Terms of Reference for consulting services to Ministry of Economy and Environment and Regulatory Authority of Electronic Postal Communication on Digital Agenda, Market Analysis and Regulatory Framework* (KODE/CS/1.1.2/2020). In the Article 1.3 this document prescribed two deliverables/documents: draft new Digital Agenda for Kosovo 2021-2030 and Action Plan.

Ministry of Economy with the support of the external consultants carried out the following actions:

* Review of the document Electronic Communication Sector Policy – *Digital Agenda for Kosovo 2013-2020*, March 2013 (findings applicable for 2021 and beyond).
* Workshop with relevant stakeholders (ARKEP, The Prime Minister Office, Tax Administration of Kosovo, Ministry of Local Government Administration, Ministry of Internal Affairs/ Agency for Information Society (ASHI), STIKK, Kosovo Agency of Statistics, IPKO, Telekom of Kosovo j.s.c.; Open Data Kosovo, Kosovo Customs, UNDP) associated to Digital Agenda for Kosovo on 15 July 2021 and two workshops with institutional and business relevant stakeholders on 15 September 2021.
* Questionnaire and web-based Questionnaire sent to relevant public and private stakeholders (answers received from ME/KODE/PIU, ARKEP, Tax Administration of Kosovo, Ministry of Internal Affairs/AIS, ICK, IPKO, Open Data Kosovo, Customs of Kosovo), etc.
* Face-to-face interviews with key stakeholders (Ministry of Economy, ARKEP, ASHI, Office of the PM, and Strategic Planning Office, STIKK, IPKO, TK, Ministry of Internal Affairs, Statistical Agency, Tax Administration).
* Analysis of publicly available Reports and Studies (Government Program 2021-2025, Kosovo’s Economic Reform Programme 2022-2024, Kosovo National Development Strategy 2030, Kosovo National IT Strategy, Kosovo Digital Economy Project, Draft Strategy on Reform of Public Administration 2022-2026, Draft Electronic Governance Strategy 2020-2025, Draft National Cyber Security Strategy and Action Plan, Strategy of Education in Kosovo 2022-2026).
* Five Country Analysis: Digital Agenda, July 2021 (Review of various options for Digital Agenda policy frameworks in the EU and beyond, countries included: Austria, Ireland, Lithuania, Israel, and Norway).
* Analysis of the relevant EU strategies and action plans (Gigabit Society Strategy, 5G Action Plan, Commission Recommendation on Cybersecurity of 5G Networks, Green Deal, Shaping Europe’s Digital Future, Industrial Strategy, etc.).

**3.2 List of institutions involved in the development of the strategic document**

Institutions involved in the development of this strategic document:

* Regulatory Authority of Electronic and Postal Communications (ARKEP).
* Ministry of Economy (ME) – Department of Information and Communications Technology.
* Other Public administration bodies and NGOs that participated in the completion of the questionnaire and face-to-face meetings.

# Background

The development and implementation of national digital agenda is a constantly evolving process whereby Kosovo government must react to both the evolution of technologies and global change, and to the developments and change in its own national system. These evolutions are brought about by technological innovation, market forces and consumer behaviours. However, government and policymaker can intervene and provide guidance, and directions to ensure that digital transformation can bring the optimal benefit to Kosovo’s society. In most European countries the digital transformation has also become the key element for recovery and resilience plans with which governments try to boost recovery and alleviate the consequences of the Covid-19 pandemic.

While the development of the previous *Digital Agenda of Kosovo 2013-2020* was driven by the Ministry of Economy, other tasks that needed to be addressed by other actors were partially addressed. In the future this situation is to be avoided as there is a broad range of complementary sectorial strategies aligned with the DAK 2030 which shall ensure the success of the digital transformation. A clear system of governance, responsibility, and coordination between the relevant ministries and agencies will also contribute to the success for the implementation of the new *Digital Agenda of Kosovo 2030*.

The previous DAK 2013 - 2020 did not provide corrective methods to adapt the activities in line with the findings of the intermediate objectives. The new DAK 2030 proposes processes and procedures for management and implementation of the agenda, which include periodic reviews and update of indicative actions based on the sectorial strategies. In addition, a focus on monitoring of development via agreed indicators (see Annex I), along with periodic reporting of all responsible agencies is foreseen in the strategy.

**4.1. Description of current state and definition of the problem**

The DAK 2030 addresses following problematic areas: semi-developed fixed and mobile infrastructure (broadband connectivity), low digitalization of businesses (e-business), limited e-public services and low IT governance among government employees, limited digital skills of Kosovo citizens (education system not aligned with labour market needs), poorly developed environment for research and development in innovative technologies (infrastructure investments needed), and incoherent approach for cybersecurity into different governance levels-public and private.

**4.2. Development of this problem over time**

Based on the analysis of the status of implementation of the *Digital Agenda 2013-2020*, a dominant part of the fixed network in Kosovo is Hybrid Fibre-Coax (HFC) technology. Currently, mobile networks use 2G, 3G and 4G technology. In the market analysis, it was found out that the problem of poor quality of mobile networks is due to unallocated frequencies and poor investment capacity of the national telecommunication operator Kosovo Telecom J.S.C. Given the key importance of the national telecommunications operator for the development of digitalization of Kosovo, the Government of Kosovo must pay special attention to the proper development of infrastructure owned by Kosovo Telecom J.S.C. Its diversified infrastructure can serve as a basis for the development of national PPDR services, and other services vital for the operation of Kosovo's critical infrastructure. The ultimate goal is to establish a resilient, secure, and reliable national infrastructure for the functioning of the state. The activities must be based on permitted state aid and must not affect competition in the market of public electronic communications services.

In the rural areas, marked as “white areas”, where there was no commercial interest for the construction of broadband networks, fibre networks were constructed with GPON technology. Fibre networks in “white areas” were set up with the financial support of the KODE project. Apart from that, the KODE project financed the connections of mobile networks in “white areas”. In addition, the KODE project financed the connection of mobile network towers in "white areas". There is no accurate data regarding the number of connections by available speeds, however, according to operators, it can be concluded that most users on coax networks can access broadband connections of 100 Mbps. Coaxial cable technology is the prevailing technology of fixed access in Kosovo which, however, is not enough for the development of a future gigabit society.

Connectivity is available to practically all companies in the country, while as of the second half of 2022 almost all households had basic broadband connections. The previous *Digital Agenda 2013 – 2020* has provided a solid basis of general connectivity. To be in-line with the expected trends in technological development it needs to be adequately upgraded. The goal will be achieved by the indicative activities proposed in this document which shall be defined in more detail in the sectorial strategy of the Ministry of Economy.

The problem with the lack of competent and skilled ICT staff is the same in all EU countries and elsewhere, as well as in Kosovo. There is a large mismatch between education and labour market needs (44% of companies identified an inadequately educated workforce).

The problem of R&D sector lies in low investments of the state in this area. There is also lack of established public-private-partnerships (PPP) that must be boosted in the short-term period.

The problem with the wider use of e-government services is the frequent change of policies and in coordination between ministries. However, it should be noted that due to the pandemics of COVID-19 online e-shopping and use of e-government services increased in the last two years , but the percentage of use is still low (e.g., only 5.3% citizens submit completed forms online).

A huge gap was identified in the area of e-health, because the e-health system in Kosovo is not developed.

Based on the status in July 2021 the use of the Internet among the citizens is above average (95.3%)[[1]](#footnote-1), although it is limited to basic communication purposes, entertainment and obtaining information. Advanced use for e-commerce, e-government, e-education, and e-health is rather limited. The existing networks prove sufficient capacity and speed for the current scale of use and type of users. However, considering coming technological trends in the development of networks and services and new type of users, that will not be the case anymore. The use of digital services is already moving from the segment of private end-users to industrial use. Factories, smart cities, smart transport, and other areas of use will require connectivity of a huge number of sensors and devices that will transfer a huge amount of data.

**4.3. Comparison with other countries in the region and international standards**

Issue of digital transformation is currently one of the most important activity in the process of building and managing strategies and visions for countries. Based on the latest studies, the most important ICT technologies from the global viewpoint are: (a) Artificial intelligence, (b) Internet of Things, (c) 5G technology, (d) Edge, and Cloud computing, (e) Big Data, and (f) Blockchain technology.

Connectivity was identified as one of the 4 digital flagships of the *EU Digital Compass* with which the European Commission presented its vision and avenues for Europe's digital transformation by 2030, the so-called *EU’s Digital Decade*. Based on the latest experience during the COVID-19 crisis the *EU Digital Compass* has set even more ambitious goals, namely, to provide gigabit connections for everyone and access to 5G networks everywhere by 2030.

Advanced very high-capacity broadband networks are the fundamental building block of any digital transformation. This networks with reliable QoS are essential for the development of future digital services. Very high-capacity broadband services are based on a fibre-optic networks, upgraded coax-cable networks, and 5G mobile networks. Reliable and fast telecommunication infrastructure is the key in securing competitiveness, sustainability, and timely digital transformation.

In July 2021 a consortium of international partners made a review of various options for Digital Agenda policy frameworks in the EU and beyond. Survey named “*Five Country Analysis: Digital Agenda”* was made for five countries: Austria, Ireland, Lithuania, Norway, and Israel. The last two countries have very young population, what is the fact also in Kosovo (50% of population is under 25). The digitalization is a circular process where one element depends on another. Example for this is, that schools can’t become digitalized without infrastructure and the economy can’t reap the rewards of digitalization without digitally skilled population and availability of skilled workers in ICT. The Five Country Analysis focused also on projects and initiatives for development of Digital Economy. Some use cases are: KMU Digital in Austria[[2]](#footnote-2) (support to SMEs in designing digitalisation projects), Trading Online & Entrepreneurship scheme for business in Ireland (voucher scheme helps small business to trade more online, boost sales and reach new markets), Digital21 in Norway (create a strategy across industries and competence environments), GovTech Lab in Lithuania (focused on encouraging the creation and use of innovative solutions for the government), Start-up Nation scheme in Israel (promotes innovation, entrepreneurship, and technological trends).

**4.4. Factors with a significant impact on the problem**

The basis for identifying the main problems and root causes for these was the analysis of the implementation progress of Digital Agenda of Kosovo 2013-2020 (report, July 2021). Furthermore, an analysis of key parameters important for the development of digital society was made. Some parameters were drawn from other sources, e.g., OECD[[3]](#footnote-3) (see Fig.2), Kosovo Agency of Statistics, The World Bank (World development indicators[[4]](#footnote-4)), DESI, Eurostat, etc. Fig.2 shows the values of the parameters that are important for the analysis, which are: “Digital society” 2.2 (average), “Science, technology and innovation” 1.1 (far below average), “Education policy” 3.2 (above average).

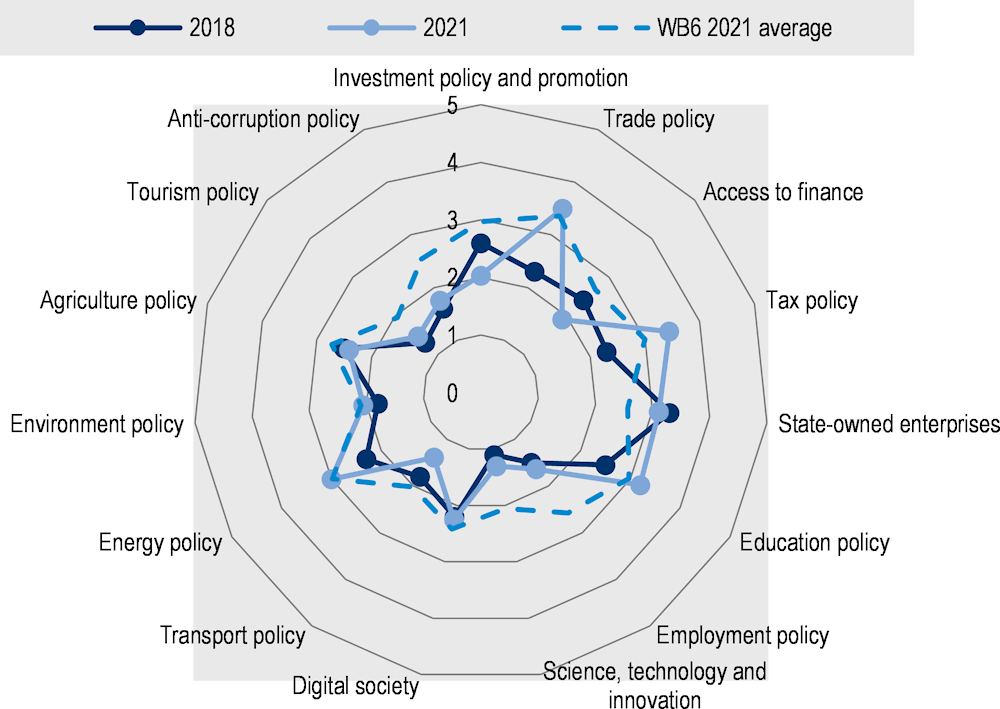


Fig.2, OECD scoreboard for Kosovo (WB6 – Six Western Balkan countries: Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia, and Serbia.)

Despite a well-defined strategy with measurable goals and defined implementation procedures, individual ministries (in charge of policy tasks) carried out their tasks very differently, which led to discrepancies in meeting some objectives.

In Kosovo there is a basic broadband infrastructure available to households and business, but internet access speed need to be improved. New services require very high bandwidth, connectivity of millions of devices and low latency. All these are the key elements of the new generation networks. Digitalization requires connectivity everywhere and anytime. Only 5G mobile networks and very-high-capacity fixed networks can meet these requirements. Lack of sufficient radio frequencies prevent operators to build mobile networks with high capacity and quality performance. Current fixed networks need to be upgraded with optical fibre very close to the mobile base stations or end customers with fixed access. Building new networks require high investments.

Even though ICT services are used by almost all citizens, negligibly few of them use e-government and e-commerce services. For example, only 5.3% of the internet users submitted forms online, and only 35% of the internet users purchased or ordered goods or services online (EU Average: 54%).

One of the major problems of Kosovo society is that users (private or business) are not aware of the importance of information security (cybersecurity), which is probably due to the openness of the society and lack of awareness of the citizens.

**4.5. Beyond the scope of this document**

The DAK 2030 aims to broadly cover the objectives and indicatively mention some of the key activities in all the areas of digital transformation in the government and economy, however all these areas are foreseen to be covered in detail in the sectorial strategies and their action plans. Some of these are as follows:

* E-government 🡪 relevant document: *E-governmental Strategy*
* Education 🡪 relevant document: Strategic Plan for  *Education in Kosovo 2021-2026*
* Innovation and R&D, IT education 🡪 relevant document: *Kosovo IT Strategy* (draft)
* Cybersecurity🡪 relevant document: *National Cybersecurity Strategy*

**4.6. Existing and planned activities related to the problem**

Government activities

The Government of Kosovo is active in preparing various strategies that partially or fully address any of the areas of the DAK 2030. Several Kosovo strategic documents and legislative activities are in the process or already adopted.

* *Strategy for Education in Kosovo* 2022 – 2026 (supported by the UK’s Foreign, Commonwealth and Development Office through the British Embassy in Pristina).
* *Kosovo IT Strategy* (supported by the German Agency for Internal Cooperation and the Norwegian Ministry of Foreign Affairs).
* *Law on measures to reduce the cost of deploying high-speed electronic communications networks -* already approved by the Parliament (transposition of Cost Reduction Directive into the national legislation).
* *Law on electronic Identification and trusted Services in electronic transactions* (eIDAS Regulation) approved by the Parliament of Kosovo.
* E-Government Strategy- draft ready
* National Cybersecurity Strategy- Draft ready

International community activities

International community is very much present in the development of Kosovo’s Digital Society.

Main donors active in the development of ICT sector are: World Bank, European Union, USAID, Government of Luxemburg, Austrian ADA, DCAF, GIZ, Helvetas Swiss Intercooperation, Norway, and Sweden (SIDA).

In 2020 the United Nations Development Programme (UNDP) in Kosovo launched an organization-wide digital transformation assessment. Title of the project is “*Inclusive Whole-of-Society Digital Transformation: Digital Readiness Assessment (DRA)*”.

Innovation & Training Park Prizren (ITP), former military camp, used by German Bundeswehr since 1999, was recently handed over to the Government of Kosovo. Governments of Kosovo and Germany are cooperating to develop ITP in Prizren.

Civil society

In July 2021 the Kosovo Resource Centre for Civil Society has published a Guideline for civil society organizations in Kosovo entitled “*Digital Transformation of CSOs*”. This document emphasizes the importance of using advanced ICT tools in the work processes (e.g., cloud services), the need to develop digital competencies, and offers tips how to use some online platforms. This guideline is implemented by the Kosovo Civil Society Foundation (KCSF) and Community Building Mitrovica (CBM) and financed by the EU and co-financed by Swedish International Development Cooperation Agency.

# Vision, objectives, and activities

**DAK 2030 VISION**: By 2030, Kosovo will become a digitally modern country, with advanced digital economy, effective public administration ensuring smart use of the territory and infrastructure, whose citizens will use digital tools and electronic services and live high-quality and secure lives in the digital era.

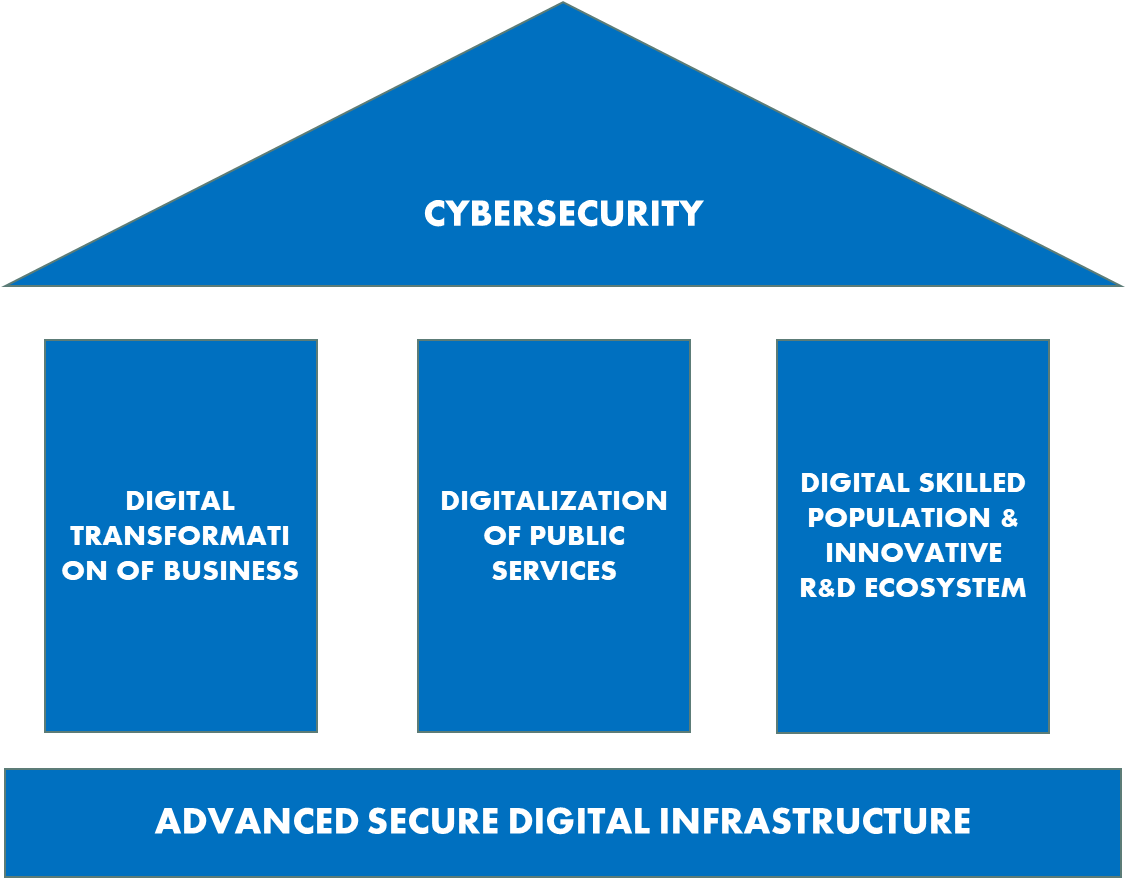


Fig. 3. Five Strategic objectives: infrastructure, e-business, digital public services, education and R&D, and cybersecurity

DAK 2030 has five strategic objectives (SOs), where each strategic objective addresses the key problem of respective thematic area. Advanced secure digital infrastructure (SO1) is a foundation for three pillars: e-business (SO2), digital public services (SO3), and digital skilled population and innovative R&D ecosystem (SO4). Above all, there is an umbrella objective, represented by cybersecurity (SO5). The graphical presentation of strategic goals can be seen in Fig.3. The strategic objectives are further broken down into specific objectives which correspond to the main causes of the relevant key problems and aim at more concrete results in the short-term, mid-term and long-term. For each specific objective, there are recommended indicative activities that lead to the achievement of the objectives.

**5.1. Strategic objectives**

The DAK 2030 is a cross-sectoral government strategy that defines the policy and particular priorities of Kosovo in the context of the on-going digital transformation of the economy and society as influenced by innovative technologies and global digital trends.

DAK 2030 has five (5) strategic objectives, where each strategic objective addresses the key problem of the respective thematic area.

Strategic objective 1 – ADVANCED SECURE DIGITAL INFRASTRUCTURE is targeting development of a secure, reliable, and sustainable fixed and mobile ICT networks and services for smart business verticals, smart communications, and public safety.

Strategic objective 2 – DIGITAL TRANSFORMATION OF BUSINESS will be achieved by the incorporation of digital technologies to all economic sectors, particularly SMEs, and by the enhancement of digital skills to engage with, contribute to, and benefit from the digital economy.

Strategic objective 3 – DIGITALIZATION OF PUBLIC SERVICES is targeting digitalisation of public administration in all segments of online public services that will be fully accessible for everyone, including persons with disabilities.

Strategic objective 4 – DIGITAL SKILLED POPULATION AND INNOVATIVE R&D ECOSYSTEM can be reached by transformation of the Kosovo education system to be prepared for digital era, by upgrading digital skills of citizens, promotion of intelligent ecosystem, and by enabling favourable environment for R&D in innovative technologies.

Strategic objective 5 – STRENGTHEN CYBERSECURITY ECOSYSTEM is the foundation for secure and reliable operation of infrastructure and services of the digital society. Cybersecurity resilience will be achieved by strengthening cybersecurity awareness and competences, and establishment of the national cybersecurity regulatory framework.

**5.2. Specific objectives**

STRATEGIC OBJECTIVE 1: ADVANCED SECURE DIGITAL INFRASTRUCTURE

Specific objective 1.1: Advanced public fixed and mobile networks and services

Specific objective 1.2: Sustainable green and secured fixed and mobile network infrastructure

Specific objective 1.3: 5G enabled mobile ICT for smart business verticals

Specific objective 1.4: 5G enabled mobile ICT for smart communities and public safety

STRATEGIC OBJECTIVE 2: DIGITAL TRANSFORMATION OF BUSINESSES

Specific objective 2.1: SME digital enhancement

Specific objective 2.2: Increase digital skills of employees

Specific objective 2.3: Support the development of innovative ICT sector for stronger digital growth

Specific objective 2.4: Develop sustainable environment for gaming industry and e-sports

STRATEGIC OBJECTIVE 3: DIGITALIZATION OF PUBLIC SERVICES

Specific objective 3.1: Upgraded e-gov portal based on "once-only" principle

Specific objective 3.2: Digitalisation of public administration in all segments

Specific objective 3.3: Improved governance of governmental IT services

Specific objective 3.4. Promotion of up-skilling ICT learning of public sector employees

STRATEGIC OBJECTIVE 4: DIGITAL SKILLED POPULATION AND INNOVATIVE R&D ECOSYSTEM

Specific objective 4.1: Increase learning opportunities to upgrade digital skills of citizens

Specific objective 4.2: Transformation of the education system for digital era

Specific objective 4.3: Innovative technologies in higher education adapted to specific market needs

Specific objective 4.4: Promotion of an intelligent ecosystem

Specific objective 4.5: Favourable environment for R&D in innovative technologies

STRATEGIC OBJECTIVE 5: SUSTAINABLE CYBERSECURITY ECOSYSTEM

Specific objective 5.1: Cybersecurity resilience

Specific objective 5.2: Cybersecurity awareness and competences

Specific objective 5.3: Protection and sustainability of digitally dependent critical infrastructures

Specific objective 5.4. Established national cybersecurity maturity framework through development and improvement of the regulatory framework

**5.3. Recommended Indicative Activities on specific objectives**

STRATEGIC OBJECTIVE 1: ADVANCED SECURE DIGITAL INFRASTRUCTURE

Proposed activities:

* Ensure spectrum and market conditions for excellent 4G/5G public mobile networks
* Ensure market conditions for building excellent broadband public fixed networks
* Monitor mobile and fixed broadband progress and promote future development
* Promote and ensure environment friendly modern 4G/5G networks
* Promote and ensure safe modern 4G/5G networks
* Promote and ensure modern, and green fixed networks
* Establish a test campus 5G network on the premises of the Technological Park (with the use of edge computing technology)
* Pilot project for a smart factory 4.0 based on 5G non-public network in one of Kosovo’s industrial sites
* 5G-enabled smart digitalization in vertical domains
* Pilot project 5G Corridor and 5G-enabled smart mobility (EV)
* Introduce 5G-enabled smart village and one smart city concepts
* Unmanned Aerial Vehicles (UAVs) in 5G for various public and private use cases
* Critical applications on state-controlled PPDR network
* Apply for country code top level domain (ccTLD)

STRATEGIC OBJECTIVE 2: DIGITAL TRANSFORMATION OF BUSINESSES

Proposed activities:

* Improve the capacities of businesses organizations to use the new digital technologies and transformation tools
* Assist the digital enhancement of SMEs to Support e-commerce and e-business
* Develop a common online portal with advice, tools, and other information for SMEs regarding digital transformation
* Establish Digital Innovation Hubs
* Launch the new SME digital transformation financing scheme
* Digitalization of Vocational Education and Life-Long ICT Learning for employees and facilitate Public Private Partnership linkages between education and private sector and know-how sharing
* Promote the ICT Experts‘ Advisory Scheme for Manufacturing and Exporting businesses
* Facilitate and support cross-sectorial B2B and matchmaking initiatives
* Continue promoting links with diaspora working in ICT and other sectors in other countries

STRATEGIC OBJECTIVE 3: DIGITALIZATION OF PUBLIC SERVICES

Proposed activities:

* Develop the Catalogue of Public Services for citizens, businesses and organizations grouped in life and business events
* Upgrade the E-GOV portal based on “Once-Only” Principle
* Support the implementation of new digital public services
* Promoting access to Open Governmental Data (OGD)
* Consolidate e-identity (eID) management in the state administration, and Kosovo’s Economy and Society
* Strengthen Interoperability among Government systems through implementation of the European Interoperability Framework guidelines
* Strengthen national data governance for a data-driven economy
* Finalise the establishment of the Disaster Recovery Data Center
* Implement an Integrated Health Information System based on Gigabit connectivity
* Continue the implementation of e-Justice systems
* Strengthen the capacity of Kosovo Institute for Public Administration (KIPA) to promote the up-skilling ICT learning of public sector employees
* Software developed which is funded using taxpayers’ money and includes intellectual property of the public sector is published with an open source license

STRATEGIC OBJECTIVE 4: DIGITAL SKILLED POPULATION AND INNOVATIVE R&D ECOSYSTEM

Proposed activities:

* Increase digital equality of citizens
* Stimulate innovative programs and projects aiming at high inclusion of Women in ICT and Online Work
* Provide free on-line trainings for improvement of digital skills of the citizens for usage of e-commerce and e-gov services
* STEM in primary schools
* Learning Management System for primary and secondary schools
* Educational Resources for schools prioritizing OER, to ensure digitally mature schools
* Introduction of Kosovo Digital Competence Framework
* School connectivity to KREN Network and access to GEANT services
* Revise current ICT programs in Kosovo’s universities with focus on Innovative Technologies
* Develop a semester course in university that teaches Artificial Intelligence (AI) fundamentals
* Plan the Kosovar MSc program on Innovation Technologies and provide “Innovation Technologies Opportunity Traineeships (ITOT)”
* Support the development of PhD program on Innovative Technologies
* Development of the Kosovo AI Strategy
* Development of the legal framework, rules, and norms for an intelligent/innovative ecosystem
* Further increase of capacities and portfolio of the Kosovo Research and Education Network (KREN) and its internationalisation and partnership with GÉANT Association
* Awareness raising of public and private sectors to ensure that the nation is ready for a future with Innovative Technologies
* Support the Innovation and Training Park (ITP) of Prizren to become leader in R&D in Innovative Technologies
* Promote Public-Private Partnerships for R&D in Innovative Technologies
* Develop a dedicated Innovation and R&D- ICT funding program for Universities and R&D / Innovation Centres in Innovative Technologies
* Foster adoption of digital public goods and the growth of digital commons

STRATEGIC OBJECTIVE 5: SUSTAINABLE CYBERSECURITY ECOSYSTEM

Proposed activities:

* Establish the Cyber Security Agency
* Strengthen the capacity of National CERT
* Strengthen the international cooperation with regular participation in international exercises on cybersecurity and organisation of national exercises
* Establish an efficient mechanism for information sharing
* Implement awareness raising programmes on cybersecurity on changing behaviours for state employees
* Provide conditions for secure and reliable operation of the key ICT systems in the event of major natural and other disasters including critical infrastructure
* Increase the resilience by reducing the vulnerability of communication and information systems
* Integration of the cybersecurity in electronic communications and energy sector- establish sectorial electronic communications CERT, and sectorial Energy CERT
* Defining the Process Maturity Models and Implementing Infrastructure Maturity
* Implementation of the International Standard for Security Risk Assessment

# Implementation, monitoring and reporting arrangements

**6.1. Implementation**

*Digital Agenda of Kosovo 2030* will be implemented in 8-year period, from 2022 to 2030.

The Office of the Prime Minister (hereinafter referred to as “OPM”) in collaboration with the Ministry of Economy (hereinafter referred to as “ME”) is responsible to continuously monitor the implementation of the agenda (DAK 2030), including details on reporting and interim reviews and the final evaluation of the implementation of this document.

The Government of the Republic of Kosova will establish a commission which will be responsible for the implementation of DAK 2030 and the sectorial strategies related to digital transformation. This commission will be headed by the Prime Minister (and coordinated by responsible person, appointed by the Prime Minister. The commission must be composed of representatives of the ministries/agencies that are owners or co-owners of the objectives. This commission will meet at least once a year. Technical support will be provided by the organizational unit designated by the Secretary of the OPM.

DAK 2030 consists of five strategic objectives that address different areas: connectivity, education, public services, business, information security. Therefore, close cooperation with all relevant ministries or agencies will be required. Progress is periodically reported to the OPM, which reports to the Government.

Implementation of the DAK 2030’s indicative activities is the responsibility of individual bodies/public authorities.

Relevant ministries/agencies responsible for implementation of the specific objectives are:

* SO1 – INFRASTRUCTURE: ARKEP, Ministry of Economy (ME), The Prime Minister Office, Ministry of Environment, Spatial Planning and Infrastructure (MESPI), Ministry of Internal Affairs (MIA), Ministry of Education, Science, Technology and Innovation (MESTI), Ministry of Industry, Entrepreneurship and Trade (MIET), Ministry of Agriculture, Forestry and Rural Development (MAFRD), Ministry of Local Government Administration (MLGA).
* SO2 – BUSINESS: Ministry of Industry, Entrepreneurship and Trade (MIET), Ministry of Economy (ME), The Prime Minister Office, Technopark Bërnica, Ministry of Finance, Labour and Transfers (MFLT), Ministry of Education, Science, Technology and Innovation (MESTI), Ministry of Foreign Affairs and Diaspora (MFAD), KIESA, ITP Prizren,.
* SO3 – PUBLIC SERVICES: The Prime Minister Office, Agency for Information Society (ASHI), Ministry of Health (MH), Ministry of Justice (MJ), Ministry of Interior (MoI), Ministry of Local Government Administration (MLGA), Ministry of Industry, Entrepreneurship and Trade (MIET), KIESA, Ministry of Finance, Labour and Transfers (MFLT).
* SO4 – EDUCATION/R&D: Ministry of Education, Science, Technology and Innovation (MESTI), Ministry of Economy (ME), The Prime Minister Office, Ministry of Industry, Entrepreneurship and Trade (MINT), Ministry of Finance, Labour and Transfers (MFLT), University of Prishtina.
* SO5 – CYBERSECURITY: Ministry of Internal Affairs (MIA), The Prime Minister Office, ASHI, ARKEP, Ministry of Economy (ME), KOSTT.

**6.2. Monitoring and reporting**

Monitoring should be understood as an ongoing process that aims to provide information to the government on the progress towards achieving strategic objectives and indicators.

Monitoring of the DAK 2030 will be performed at two levels:

1. Monitoring of activities. It must be determined whether the activities have been carried out at the right time and with the right quality. The activities will be monitored based on the Action Plans of the sectorial strategies.
2. Monitoring of objectives is based on their indicators. Indicators are set for each specific objective as baseline value (2022), interim target (2025), and final year target (2030). Indicators are listed in the Annex I.

The OPM in collaboration with the ME must prepare an Implementation progress report on an annual basis.

The progress report shall provide information on:

* achievements compared to objective through the indicators set
* timeline of actions undertaken
* use of financial resources
* main implementation obstacles
* any new factor affecting implementation
* suggested corrective measures, including provision of lacking funds.

**6.3. Evaluation**

Evaluation is the most detailed process of analysing the success of implementation of the agenda, identifying what went wrong, examining the reasons behind what went wrong, and then re-adapting the strategic direction accordingly. The design and execution of the evaluation stage is usually independent of the regular monitoring and reporting framework. Evaluation involves compiling evaluation questions, collecting, and analysing data to obtain answers to these questions, and gathering evidence to formulate conclusions and recommendations.

OPM and ME will seek the assistance of development partners to make two external evaluations of the DAK 2030, the first in the middle of the implementation period (2025) and the second when completing the implementation of the DAK 2030 (2030). The dimensions of the evaluations will be as follows:

* Relevance – alignment of the goals and objectives of the DAK 2030 with the needs of citizens and Government priorities.
* Effectiveness – matching the achieved results of the DAK 2030 with the planned results as well as the needs of direct and indirect beneficiaries.
* Efficiency – achieving results with the lowest costs - the ratio of results to costs (resources) required or used to achieve them, must be determined.
* Implementation – quality of the implementation process and structures.

Note:

The evaluation of the implementation of activities must be carried out by verification of the indicators listed in Annex 1. The status of the indicators can be verified by comparison with the statistical indicators of the Kosovo Agency of Statistics or DESI index. The latter is relevant when Kosovo becomes part of the DESI scheme.

# Budgetary impact of the agenda implementation

**7.1. Budget estimation by strategic objectives**

DAK 2030 estimated costing was produced based on the tool developed by the Strategic Planning Office, to determine the cost of implementing the Digital Agenda of Kosovo 2030 strategy in the 2022-2030 period. The actual budgets for the implementation of strategic and specific objectives will be determined in sectorial strategies.

The total estimated amount for the implementation of DAK 2030 is EUR 152,000,000, of which EUR 98,800,000 State Budget (65%), while EUR 53,200,000 (35%) Donor Budget.

The following table reflects the DAK 2030 estimated budget by years and strategic objectives:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **DAK 2030 - budget by strategic objectives** | | **Budget in thousands EUR (k€)** | | | |
| **2023 – 2025** | **2026 – 2030** | **Total (state/donor)** | **Total (k€)** |
|  |
| Strategic objective 1 | State budget | 9,100 | 16,250 | 25,350 | **28,150** |  |
| Donor budget | 550 | 2,250 | 2,800 |  |
| Strategic objective 2 | State budget | 5,400 | 9,770 | 15,170 | **31,620** |  |
| Donor budget | 5,950 | 10,500 | 16,450 |  |
| Strategic objective 3 | State budget | 10,450 | 18,200 | 28,650 | **52,650** |  |
| Donor budget | 10,750 | 13,250 | 24,000 |  |
| Strategic objective 4 | State budget | 10,490 | 12,760 | 23,200 | **32,700** |  |
| Donor budget | 2,700 | 6,750 | 9,450 |  |
| Strategic objective 5 | State budget | 4,460 | 1,920 | 6,380 | **6,880** |  |
| Donor budget | 500 | 0 | 500 |  |
| **Total (k€)** |  | 60,350 | 91,650 |  | **152,000** |  |
| **Capital expenditures** |  | 36,250 | 52,900 | 89,150 | 152,000 |  |
| **Current expenditures** |  | 24,100 | 38,750 | 62,850 |  |

**7.3. Funding sources**

Funding of the activities will be secured from two sources:

1. State Budget
2. Donors or foreign investors:

* The World Bank
* IPA and other EU funds,
* European Investment Bank (EIB)
* Western Balkan Investment Framework (WBIF)
* other (non-EU) donors and investors

# Annexes

#### 8.1 Annex 1 - Strategic/specific objectives, indicators, assessment criterions, target values and responsible authorities

## Annex I – Strategic/specific objectives, indicators, assessment criterions, target values and responsible authorities

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **No.** | **Strategic objectives, specific objectives, indicators** | **Assessment criterion** | **Baseline value (2022)** | **Interim target (2025)** | **Final year target (2030)** | **Authority responsible** |
| **Strategic objective 1: ADVANCED SECURE DIGITAL INFRASTRUCTURE** | | | | | | |
| 1 | Indicator: All households covered by a network of the 1 Gbps speed | % of households | 16.6% | 30% | 100% | ARKEP/ME |
| 2 | Indicator: All populated area covered by 5G | % of population | N/A | 50% | 100% | ARKEP/ME |
| **1.1 Specific objective: ADVANCED PUBLIC FIXED AND MOBILE NETWORK SERVICES** | | | | | | |
| 1 | Indicator: Necessary state aid/public support programs, for the areas with the lack of economic interest for investment, developed and adopted | Number of projects | N/A | 5 | 10 | ME/ARKEP |
| 2 | Indicator: Spectrum policy available and spectrum allocation strategy for 5G prepared (Swift and efficient allocation of spectrum) | Yes/No | No | Yes | Yes | ARKEP/ ME |
| 3 | Indicator: 5G Readiness increased - The amount of spectrum assigned and ready for 5G use within the so-called 5G pioneer bands | % allocated frequencies | 0% | 70% | 100% | ARKEP |
| 4 | Indicator: NGA/VHCN coverage (rural and urban) increased | % of territory | 58% | 80% | 100% | ARKEP |
| 5 | Indicator: 5G coverage (rural and urban) increased | % of territory | N/A | 30% | 50% | ARKEP |
| 6 | Indicator: Share of fixed broadband subscriptions >= 100 Mbps speed in total number increased | % fixed BB subscriptions | 44.5% | 70% | 100% | ARKEP |
| **1.2 Specific objective: SUSTAINABLE GREEN AND SECURED FIXED AND MOBILE NETWORK INFRASTRUCTURE** | | | | | | |
|  |  |  |  |  |  |  |
| 1 | Indicator: Rules from EU 5G cybersecurity toolbox implemented | No. of rules implemented | N/A | All | All | ARKEP/ National CERT/ME |
| 2 | Indicator: Effective multi-sector infrastructure sharing regulations implemented | Yes/No | N/A | Yes | Yes | ARKEP/ ME |
| **1.3 Specific objective: 5G ENABLED MOBILE ICT FOR SMART BUSINESS VERTICALS** | | | | | | |
| 1 | Indicator: Increased number of private 5G networks per verticals | No. of private networks | N/A | 2 | 10 | ARKEP |
| 2 | Indicator: 5G network slicing models offered by MNOs to enterprises | No. of models | N/A | 1 | 3 | ARKEP |
| **1.4 Specific objective: 5G ENABLED MOBILE ICT FOR SMART COMMUNITIES AND PUBLIC SAFETY** | | | | | | |
| 1 | Indicator: 5G PPDR network created | Yes/No | N/A | No | Yes | National Council for Security/ ARKEP |
| 2 | Indicator: Increased number of smart city solutions based on 5G | No. of solutions | N/A | 2 | 5 | ME |
| 3 | Indicator: Inclusion of Kosovo to EU 5G cross border corridors for testing of connected and automated driving | Yes/No | N/A | Yes | Yes | ME/ ARKEP |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **No.** | **Strategic objectives, specific objectives, indicators** | **Assessment criterion** | **Baseline value (2022)** | **Interim target (2025)** | **Final year target (2030)** | **Authority responsible** |
| **Strategic objective 2: DIGITAL TRANSFORMATION OF BUSINESS** | | | | | | |
| 1 | Indicator: 75% of enterprises take up cloud computing services, big data and AI | % enterprises | N/A | 30% | 75% | ME |
| 2 | Indicator: 90% of SMEs reach at least a basic level of digital intensity | % SMEs | N/A | 60% | 90% | KIESA/ME |
| **2.1 Specific objective: SME DIGITAL ENHANCEMENT** | | | | | | |
| 1 | Indicator: Establishment of the Digital Innovation Hubs and industrial clusters that should support digital transformation of both innovative and non-digital SMEs | DIH | 0 | Established DIH Kosovo | Consolidated DIH Kosovo | ME/MIET |
| **2.2 Specific objective: INCREASE DIGITAL SKILLS OF EMPLOYEES** | | | | | | |
| 1 | Indicator: Persons Employed with ICT Specialist skills | No of ICT employees | 7000\* | 20000 | 50000 | ME/ KIESA/ STIKK |
| 2 | Indicator: Enterprises providing training to their personnel to develop/upgrade their ICT skills | % enterprises | 1.13\* | 20% | 60% | ME/ STIKK |
| **2.3 Specific objective: SUPPORT THE DEVELOPMENT OF INNOVATIVE ICT SECTOR FOR STRONGER DIGITAL GROWTH** | | | | | | |
| 2 | Indicator: Enterprises with High levels of Digital Intensity | % enterprises | N/A | 20% | 60% | ME/ MIET |
| 3 | Indicator: Enterprises analyzing big data from any data source | % enterprises | N/A | 20% | 60% | ME/STIKK |
| 4 | Indicator: Tools to stimulate ICT Companies to utilize the opportunities of usage of new technologies (big data, blockchain, VA, AI and IoT for digital growth) | Advanced ICT technology in use (% business) | N/A | 20% | 60% | ME/STIKK |

\* Baseline value (2020)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **No.** | **Strategic objectives, specific objectives, indicators** | **Assessment criterion** | **Baseline value (2021)** | **Interim target (2025)** | **Final year target (2030)** | **Authority responsible** |
| **Strategic objective 3: DIGITALIZATION OF PUBLIC SERVICES** | | | | | | |
| 1 | Indicator: 100% online provision of key public services available for citizens and businesses | % online provisions | 25% | 50% | 100% | AIS |
| 2 | Indicator: 100% of citizens have access to medical records (e-records) | % citizens | 0% | 50% | 100% | MH |
| 3 | Indicator: 80% of citizens will use a digital ID solution | % citizens | 0% | 30% | 80% | ME |
| **3.1 Specific objective: UPGRADED E-GOV PORTAL BASED ON "ONCE-ONLY" PRINCIPLE** | | | | | | |
| 1 | Indicator: Digital Public Services for Citizens improved | % services increased | 25% | 60% | 95% | AIS |
| 2 | Indicator: Digital Public Services for Businesses improved | % services increased | 35% | 70% | 95% | AIS |
| **3.2 Specific objective: DIGITALISATION OF PUBLIC ADMINISTRATION IN ALL SEGMENTS** | | | | | | |
| 1 | Indicator: Open data | Yes/No | N/A | Yes | Yes | AIS |
| 2 | Indicator: Online Service Completion | No. of completed online services | 15% | 45% | 80% | AIS |
| **3.3 Specific objective: IMPROVED GOVERNANCE OF GOVERNMENTAL IT SERVICES** | | | | | | |
| 1 | Indicator: Individuals submitting completed forms to public authorities, over the internet, last 12 months | No. of individuals | 5,3%\* | 35% | 75% | AIS |
| 2 | Indicator: Individuals interacting online with public authorities, last 12 months | No. of individuals | 28%\* | 60% | 90% | AIS |
| **3.4 Specific objective: PROMOTION OF UP-SKILLING ICT LEARNING OF PUBLIC SECTOR EMPLOYEES** | | | | | | |
| 1 | Indicator: Employees with basic knowledge | No. of employees | 25% | 55% | 85% | IKAP |
| 2 | Indicator: Employees with advanced knowledge ICT/Digital | No. of employees | N/A |  |  | IKAP |

\* Baseline value (2020)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **No.** | **Strategic objectives, specific objectives, indicators** | **Assessment criterion** | **Baseline value (2022)** | **Interim target (2025)** | **Final year target (2030)** | **Authority responsible** |
| **Strategic objective 4: DIGITAL SKILLED POPULATION AND INNOVATIVE R&D ECOSYSTEM** | | | | | | |
| 1 | Indicator: 80% of adults with at least basic digital skills | % adults | N/A | 40% | 80% | MESTI/ME |
| 2 | Indicator: Increase in number of employed ICT specialists, with convergence between women and men | No. of employees | 3846 | 4000 | 5000 | ME |
| **4.1 Specific objective: LEARNING OPPORTUNITIES TO UPGRADE DIGITAL SKILLS OF CITIZENS** | | | | | | |
| 1 | Indicator: Individuals with above basic level of digital skills | % of no. of individuals | 14%\* | 25% | 40% | MESTI/ME |
| 2 | Indicator: Individuals with at least basic digital skills | % of no. of individuals | 13%\* | 40% | 80% | MESTI/ME |
| **4.2 Specific objective: TRANSFORMATION OF THE EDUCATION SYSTEM FOR DIGITAL ERA** | | | | | | |
| 1 | Indicator: Science and technology graduates | No. of graduates | N/A |  |  | MESTI |
| 2 | Indicator: STEM graduates | No. of graduates | N/A |  |  | MESTI |
| 3 | Indicator: ICT specialists | No. of ICT specialists (% total employment) | N/A | 3.5% | 5.5% | MESTI/ ME |
| **4.3 Specific objective: EDUCATION OF INNOVATIVE TECHNOLOGIES IN HIGHER EDUCATION ADAPTED TO SPECIFIC MARKET NEEDS** | | | | | | |
| 1 | Indicator: Implementation of Innovative technology courses | No. of courses | N/A | 2 | 4 | MESTI/ ME |
| **4.4 Specific objective: PROMOTOTION OF AN INTELLIGENT ECOSYSTEM** | | | | | | |
| 1 | Indicator: AI Strategy developed | Strategy developed (% implementation) | N/A | 100 | 100 | ME |
| 2 | Indicator: Legal and regulatory framework for an intelligent/innovative ecosystem developed | Adopted and amended legal acts (% legal acts) | N/A | 100 | 100 | ME/MIET |
| **4.5 Specific objective: FAVOURABLE ENVIRONMENT FOR R&D IN INNOVATIVE TECHNOLOGIES** | | | | | | |
| 1 | Indicator: Business R&D expenditure of the ICT sector | % total R&D expenditure | N/A |  |  | MIET/ME |
| 2 | Indicator: Public ICT R&D spending (GBAORD in the field of ICT) | Budget allocation on ICT R&D | N/A | 1,5 M EUR | 7 M EUR | ME / MFLT |

\* Baseline value (2019)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Strategic objectives, specific objectives, indicators** | **Assessment criterion** | **Baseline value (2021)** | **Interim target (2025)** | **Final year target (2030)** | **Authority responsible** |
|  | **Strategic objective 5: SUSTAINABLE CYBERSECURITY ECOSYSTEM** | | | | | |
| 1 | Indicator: Main provisions of the EU Cybersecurity Strategy implemented | % provisions | N/A | 50% | 100% | MIA |
| **5.1 Specific objective: CYBERSECURITY RESILIENCE** | | | | | | |
| 1 | Indicator: Individuals experienced financial loss | % individuals | 0.5% | 0.3% | 0.1% | MIA/CSA |
| 2 | Indicator: Individuals experienced abuse of personal information and/or other privacy violations | % individuals | N/A |  |  | MIA/CSA |
| 3 | Indicator: Individuals caught a virus or other computer infection resulting in loss of information or time | % individuals | 9.1%\* | 7.5% | 5.5% | MIA/CSA |
| 4 | Indicator: Security concerns kept individual from ordering or buying online | % individuals | 45.1% | 37% | 25% | MIA/CSA |
| 5 | Indicator: Individuals who know that cookies can be used to trace movements of people on the Internet | % individuals | 33.1% | 55% | 80% | MIA/CSA |
| 6 | Indicator: Individuals using anti-tracking software | % individuals | 3.4% | 25% | 40% | MIA/CSA |
| 7 | Indicator: Individuals not allowing use of personal information for advertising | % individuals | 11.1% |  |  | AIP |
| 8 | Indicator: Enterprises advertising online based on the geolocation of internet users | % enterprises | 6.7% | 15% | 30% |  |
| 9 | Indicator: Enterprises tracking internet users for targeted advertising | % enterprises | 4% | 25% | 40% |  |
| 10 | Indicator: Enterprises with a formally defined ICT security policy | % enterprises | 22% | 45% | 75% |  |
| **5.2 Specific objective: CYBERSECURITY AWARENESS AND COMPETENCES** | | | | | | |
| 1 | Indicator: Awareness raising programs implemented | No. programs | N/A | 5 | 10 | MIA/CSA |
|  | **5.3 Specific objective: PROTECTION AND SUSTAINABILITY OF DIGITALLY DEPENDENT CRITICAL INFRASTRUCTURES** | | | | | |
| 1 | Indicator: PPDR network created | Yes/No | No | No | Yes | MIA/CSA |
| **5.4 Specific objective: ESTABLISHED NATIONAL CYBERSECURITY MATURITY FRAMEWORK THROUGH DEVELOPMENT AND IMPROVEMENT OF THE REGULATORY FRAMEWORK** | | | | | | |
| 1 | Indicator: Cybersecurity regulatory framework implemented | Yes/No | No | Yes | Yes | MIA/CSA |
| 2 | Indicator: International Standard for Security Risk Assessment implemented | Yes/No | No | Yes | Yes | MIA/CSA |

\* Baseline value (2020)

1. https://ask.rks-gov.net/media/6522/tik-2021-ang.pdf [↑](#footnote-ref-1)
2. https://www.kmudigital.at/ [↑](#footnote-ref-2)
3. [https://www.oecd-ilibrary.org/sites/573f3543-en/index.html?itemId=/content/component/573f3543-en#](https://www.oecd-ilibrary.org/sites/573f3543-en/index.html?itemId=/content/component/573f3543-en) (OECD Kosovo Profile) [↑](#footnote-ref-3)
4. <https://databank.worldbank.org/source/world-development-indicators> (The World Bank) [↑](#footnote-ref-4)