ReSPA
Regional School of Public Administration
BUILDING TOGETHER GOVERNANCE FOR THE FUTURE

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Use of emerging technologies in the administrations of the Western Balkans for more efficient delivery of public services

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The Regional School for Public Administration (ReSPA) is an inter-governmental organisation for enhancing regional co-operation, promoting shared learning and supporting the development of public administration in the Western Balkans. As such, it helps governments in the region develop better public administration, public services and overall governance systems for their citizens and businesses, and helps prepare them for membership and integration into the European Union (EU). The ReSPA members are Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, and Serbia.

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Summary

Executive Summary

The report examines how the governments of the Western Balkans are dealing with the challenges posed by outdated technology. It provides an overview of the region's current policies, development, and implementation of emerging technologies. The report also identifies strengths, weaknesses, opportunities, and challenges in the level of public administration digital ecosystem. To improve efficiency, leaders should conduct top-down assessments, save resources, optimize the workforce, and improve citizen experiences. Adoption of technologies such as AI, blockchain, IoT, data analytics, and VR/AR can revolutionize public administration.

Cross-border cooperation is essential for digitalization in the region. It offers numerous benefits such as enhanced regional stability, economic growth, improved infrastructure, and efficient resource utilization. The Western Balkans are increasingly integrating AI across various sectors, including healthcare, education, transportation, government services, finance, and more. AI has the potential to improve public safety, agriculture, tourism, legal systems, and social services, showcasing its diverse applications in advancing the region's governance and overall development.

The following document contains comprehensive "Economy Factsheets and Use Cases" about the six Western Balkan economies. It reports on the development of AI and other emerging technologies in Albania, Bosnia and Herzegovina, Kosovo[1], Montenegro, North Macedonia, and Serbia, highlighting their strategy, practices, use cases and the main issues they face.

The report highlights the challenges that the Western Balkan countries face in adopting Artificial Intelligence (AI) and emerging technologies. These challenges are mainly due to economic, educational, and infrastructural limitations. Limited resources, insufficient education, and regulatory gaps are slowing down the integration process. To overcome these hurdles, collaborative efforts are crucial. Governments must invest in digital infrastructure, offer financial incentives, and prioritise skilled workforce development.

Clear and adaptive regulations that address ethical concerns are crucial for responsible AI adoption. Collaborations at the regional and international levels can improve knowledge exchange. The Western Balkans can strategically develop best practices by learning from the EU. This can be achieved through focusing on ethical frameworks, R&D, skill development, digital infrastructure, public-private partnerships, and international cooperation.

1 *This designation is without prejudice to positions on status and is in line with UNSCR 1244 and ICJ Advisory opinion on the Kosovo Declaration of Independence.*

Introduction & Objectives

ReSPA has taken a strategic initiative by commissioning a network of experts and senior practitioners who specialize in Digital Transformation. This group's primary focus is to analyze the use of emerging technologies within the public administrations of the Western Balkans, with a special emphasis on Artificial Intelligence. The objective is to understand the role and impact of AI in streamlining and enhancing the delivery of public services. The outcome will be a comprehensive analysis that provides a detailed overview of the use cases of emerging technologies in public service delivery across the WB region.

The main objective of this overview is to present the latest advancements and state-of-the-art applications of emerging technologies in the public administrations of the Western Balkans. This insight is expected to play a key role in shaping discussions at the Western Balkans Digital Summit 2023. Moreover, the results of this analysis will also be incorporated into various ReSPA program activities, which include but are not limited to the Digital Transformation Seasonal School and other important capacity-building events.

The overview focuses on the current strategies and policies related to the adoption of emerging technologies, particularly AI. The experts have thoroughly evaluated the following:

1. Existing Strategies and Policies: This includes formalized governmental strategies or policies that promote the use of emerging technologies and how they align with global best practices.
2. Developed Practices: These are real-world applications and initiatives that are currently operational.
3. Practices Under Development: These are initiatives that are in their early stages, such as pilot programs or those waiting for full-scale deployment. The experts will assess potential challenges, expected benefits, and the roadmap for these practices.

After conducting a thorough analysis, we have come up with a set of recommendations that will help policymakers to make informed decisions. These recommendations are based on the current situation in the Western Balkans and are tailored to meet the unique challenges and needs of the region. Policymakers can use these insights to make strategic decisions and ensure that the region remains at the forefront of utilizing technology to enhance public service.

Emerging Technologies for Public Service Delivery

Governments are facing challenges in administering public services due to the high cost and limited effectiveness of their interventions. Moreover, the rapid obsolescence of technology adds to the problem. To address these challenges, government leaders should start by assessing the potential benefits of various public functions in a top-down manner. They should prioritize saving financial resources, optimizing manpower, or delivering better experiences to citizens.

Technological advancements have been beneficial for public organizations in terms of improving productivity while interacting with citizens. However, there is still a lot of potential for technology to enhance government functions and improve efficiency. Data sharing between governments and their organizations is now possible through the use of data centers and cloud technologies. These platforms ensure data safety while allowing for data to be shared. However, there is still a need for more work to make systems interoperable. Additionally, AI has the capability to automate decision-making, identify patterns from data sets, and detect anomalies and outliers. Although AI is not the only solution, it is shown to be one of the most effective in supporting decision-making and defining scenarios.

Governments can use similar technologies to:

- Securely exchange data
- Maintain privacy
- Gather information in real time

All Western Balkan economies have adopted robust plans to digitalize their activities. They have created documents of Strategy and Agendas of implementation, and have given the mandate to ministries and dedicated agencies to foster digitalization across the whole spectrum of government activities.

However, more streamlined and cohesive action is required to achieve additional signs of progress. This can be achieved by fostering e-literacy among public servants and the public, aligning public policies with the needs of citizens and firms, co-creating policies and solutions involving citizens and third-sector organizations as active stakeholders, and fostering stronger cross-border cooperation.

Cross-border cooperation is crucial for accelerating the digitization process of public administration in the Western Balkans. Enhanced cross-border cooperation and data exchange within the region offer multiple significant benefits:

- **Enhanced Regional Stability:** Greater cooperation among neighboring economies fosters trust and goodwill, which in turn reduces the potential for conflicts and disputes. This stability is crucial for peace and security in the region.
- **Economic Growth:** Collaboration allows for the pooling of resources, expertise, and infrastructure development, which can lead to improved economic conditions, increased trade, and investment opportunities.
- **Improved Infrastructures:** Joint efforts can lead to the development and maintenance of shared vital infrastructure, such as transportation networks and energy grids. This benefits all economies involved by reducing costs and improving connectivity.
- **Increased Resilience:** Collaborative disaster management and response strategies improve the region's ability to handle natural disasters and emergencies effectively. Sharing data and resources enables a more coordinated and rapid response to crises.
- **Efficient Resource Utilisation:** Cross-border data exchange can enable better resource management in areas such as healthcare, education, and environmental protection, leading to more efficient allocation of resources, reducing waste and improved services for citizens.
- **Cultural and Educational Exchange:** Closer cooperation can also promote cultural exchange and educational opportunities, fostering mutual understanding among citizens of different economies. This can lead to increased tourism and cultural enrichment.
- **Faster EU Accession Process:** For economies in the Western Balkans aspiring to join the European Union, increased cooperation and data exchange demonstrate a commitment to European values and norms, which can facilitate their accession process by demonstrating progress in areas such as the rule of law, governance, and economic convergence.
- **Improved Regional Diplomacy:** Collaborative efforts on regional issues such as refugee crises or transnational crime can enhance the region's diplomatic standing and enable more effective problem-solving on the global stage.

Increased cross-border cooperation and data exchange within the Western Balkans can bring numerous advantages, such as stability, economic growth, improved infrastructure, and enhanced resilience. These benefits are essential for the overall development of the region and its integration into the broader European community. In conclusion, it is crucial to prioritize and foster cooperation among the countries in the Western Balkans to achieve these advantages and contribute to the region's growth and prosperity.

Technology Domains

Artificial Intelligence (AI)

The trend of Interactive AI involves artificial intelligence algorithms that can process human input such as text and speech and respond appropriately. Advanced forms of this technology can interpret various writing styles and accents, and perform complex tasks beyond simple commands. There are multiple types of interactive AI emerging from the overarching trend of AI, with varying applications ranging from geolocation to speech-to-text dictation and e-payment. Artificial Intelligence offers numerous advantages for public administration:

1. AI can automate repetitive tasks, helping to improve efficiency;
2. AI can assist with data analysis, enabling officials to make better decisions based on data;
3. AI enables predictive analytics to predict and prevent issues such as fraud or disaster response;
4. AI enhances security by identifying and mitigating cybersecurity threats.

Blockchain

Blockchain is a shared, immutable ledger that makes it easier to record transactions and track assets in a business network. There are several advantages to using blockchain in public administration:

- **Transparency:** its ledger ensures transparency and immutability of records;
- **Security:** The cryptographic nature of blockchain enhances data security;
- **Efficiency:** Smart contracts can also automate administrative processes, improving efficiency;
- **Interoperability:** Blockchain enables interoperability between government agencies, streamlining data sharing and collaboration.

Internet of Things (IoT)

The Internet of Things (IoT) refers to a network of physical devices and objects that are interconnected through sensors, software, and internet connectivity. This enables them to collect and share data over the internet. The IoT has several benefits for public administration, some of which include:

- **Data-Driven Decision-Making:** The IoT generates vast amounts of data that can be used to make informed policy decisions and optimize resource allocation;
- **Public Safety:** The IoT enables better monitoring of disasters, traffic, and public spaces, which can improve emergency response times;
- **Environmental Sustainability:** By aiding in environmental monitoring, the IoT can help governments implement eco-friendly policies and reduce energy consumption;
- **Citizen Engagement:** The IoT can be used to create smart city initiatives that improve citizen services, mobility, and overall quality of life.

Data Analytics

Data analytics technology involves using advanced software and algorithms to process and analyse large sets of data, extracting valuable insights and patterns. It offers significant advantages for public administration:

- **Resource Optimization:** Public funds and resources are allocated more efficiently;
- **Performance Monitoring:** Analytics enables real-time monitoring of public services and programs, ensuring they meet established standards.
- **Transparency:** It enhances government accountability and transparency;
- **Faster Response:** Analytics facilitates quick responses to emergencies and crises.

Virtual & Augmented Reality (VR/AR)

Virtual and Augmented Reality (VR/AR) are advanced technologies that offer users an immersive experience in a computer-generated, interactive 3D environment. Typically, this is achieved through the use of headsets or goggles. VR/AR technology has a wide range of applications in areas such as gaming, education, training, and medicine, allowing users to explore and interact with virtual spaces or objects in real time. In public administration, there are several notable advantages to utilizing VR/AR technology:

- **Training and Simulation:** VR/AR can create realistic training scenarios for public servants, helping to improve their preparedness for various situations, from emergency response to urban planning;
- **Remote Collaboration:** Public servants can collaborate in virtual environments, reducing the need for physical travel and promoting efficiency;
- **Accessibility:** VR can make government services and information more accessible to individuals with disabilities.

Emerging technologies implementations in the Western Balkans (WB) region

The Western Balkans region, which includes Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia, and Serbia, has varying levels of government efficiency in their economies. The region has faced challenges related to bureaucracy, corruption, political instability, and democratic transition, which have historically affected governance. However, the Western Balkans are striving to enhance government efficiency to promote stability and economic growth, as they seek closer ties with the European Union. As a result, the region is gradually adopting the potential of AI technology to transform various sectors:

- **Healthcare:** AI facilitates the early detection of diseases through data analysis and predictive algorithms;
- **Education:** AI-powered e-learning platforms in education provide personalised learning experiences, adapt the curriculum to individual needs, and automate administrative tasks;
- **Transportation:** AI-driven traffic management systems reduce congestion, enhance road safety, and improve public transportation's efficiency;
- **Government Services:** AI streamlines administrative processes, such as document processing and citizen services, making the government institutions more efficient and responsive;
- **Finance:** AI is utilized for fraud detection, credit scoring, and investment analysis.

Apart from the current uses, AI and other emerging technologies have the potential to significantly enhance public administrations in the Western Balkans across various domains and sectors. Here are some of the areas where AI can make a positive impact:

- **Public Safety:** AI-powered video surveillance, predictive policing, and disaster response can strengthen public safety and emergency management efforts;
- **Agriculture:** Precision agriculture driven by AI can help farmers increase crop yields, reduce resource waste, and ensure food security;
- **Tourism:** AI-powered chatbots and virtual guides can enhance the tourist experience by providing real-time information and personalised recommendations;
- **Legal and Judicial Systems:** AI can assist in legal research, document analysis, and case management, thereby reducing backlogs and improving access to justice;
- **Social Services:** AI can optimise the distribution of social benefits, ensuring they reach those in need.

Economy Factsheets and Use Cases

Albania

Overview: Albania has established a National Agency for the Information Society, which is responsible for digitalization and e-government. The agency has around 389 positions across various departments. The new Government Program for 2021-2025 focuses on the digitalization and modernization of all sectors and services. The Digital Agenda of Albania 2022–2026 aims to attract investments in advanced computing, data processing, artificial intelligence (AI), cyber security, and advanced digital skills. The Strategy is based on six principles: innovation, governance, data, risk, standards, and transparency. Albania has made significant progress in e-government and is working towards integrating new emerging technologies into public administration activities.

Artificial Intelligence: The Director General of NAIS in Albania serves as the National Coordinator for the country on NATO's board for Artificial Intelligence. Currently, the National Agency for the Information Society has drafted a "Digital strategy for AI" which aims to position Albania as a leading center for artificial intelligence (AI) innovation in the region. This strategy aims to promote economic growth, social welfare, and sustainable development through the ethical and responsible use of AI.

The Albanian Government's AI strategy is based on five principles, which are as follows:

- Increasing the well-being of citizens.
- Ensuring sustainable economic and social development.
- Promoting transparency and accountability.
- Fostering international cooperation for reliable AI.
- Focusing on human values and social equality.

Albania has made significant progress in the field of Artificial Intelligence. The Albanian AI Association, established in 2017, has grown to become a central hub for AI enthusiasts and professionals. The association organizes various events and workshops to discuss the latest trends in AI. Additionally, several Albanian universities now offer AI programs.
Recently, the National Agency for Information Society and the Faculty of Economics at the University of Tirana signed a cooperation agreement. This agreement opens doors for students to participate in internships, mentorships, training sessions, and involvement in significant projects related to Artificial Intelligence and beyond. The partnership aims to strengthen mutual collaboration between the two institutions.

The Albanian government has acknowledged the potential of AI and is actively promoting its use in various sectors. In 2019, the government launched the "Albania 4.0" initiative that aims to promote the use of AI, robotics, and other advanced technologies in the country's economy. One of the areas where AI is making significant headway in Albania is healthcare. AI is being employed to enhance patient outcomes by providing precise diagnoses and personalised treatment plans.

There are several ongoing projects in progress:

- The "Virtual assistant" project aims to assist citizens in asking questions related to e-services. This project is still in progress as the development of a large linguistic model is required. Another program is the "EU Law Approximation Project", which is a multi-year initiative that uses AI in a responsible way to aid the process of Albania's accession to the EU. In order to accelerate the accession process, 3000 acts need to be assessed and streamlined with EU legislation. The system will automate the transposition process with high accuracy by analysing Albanian legislation, comparing it with that of the EU, and creating concordance tables to make the work of legal approximation experts easier and faster.

- The procurement system is undergoing a digital transformation, which will automate every stage of the public procurement procedures. This will eliminate the need for paper-based processes and minimize communication with different offices. Bidders will have access to their own virtual files and will only need to bring the project and offer as everything else will be provided through interaction with other state systems. The use of artificial intelligence and machine learning will enable the system to draft terms of reference, evaluation criteria, determine the limit fund, notify all businesses in the field, and automatically evaluate procurement procedures.

- Artificial Intelligence in the judicial system - Albania is partnering with Microsoft to develop an intelligent algorithm to assist decision-making in the judicial system. This algorithm will process and classify court documents, including structured and unstructured materials, as well as videos, audios, and images, and then provide recommendations to all actors of the judicial system based on historical data. This will significantly reduce the workload of staff and help judges make decisions based on Albanian laws and decisions taken in previous cases both domestically and internationally. The use of this technology will remove the emotional aspect of decision-making and reduce the number of cases left pending. Additionally, there will be a legal assistant integrated into the system to guide citizens and lawyers towards the appropriate legal assistance. The main goal of this initiative is to improve the justice system and uphold the rule of law in Albania.

Albania is actively working towards implementing AI technology in healthcare with the goal of saving lives. AI-powered examination of medical images, such as radiographs, CT-scans, and magnetic resonance imaging, will assist doctors in identifying serious diseases in the earliest stages. The AI will analyse the medical data of patients, personalize treatment plans for each individual patient, predict the progression of patients' diseases based on their medical history, and identify epidemics in the early stages.
This technology aims to eliminate emotions from decision-making and reduce the number of unresolved cases. Moreover, it will come with a legal assistant integrated into the system, which will guide citizens and lawyers towards the appropriate legal assistance. The primary objective of this initiative is to enhance the justice system and uphold the rule of law in Albania.

Blockchain: There is a collaboration between the Cadastre Agency and the National Agency for the Information Society to use blockchain technology to secure property rights and land contracts.

Data Analytics: Albania currently lacks a dedicated strategy for data analytics, but databases are widespread and interoperable through the Government Interoperability Platform. This platform enables electronic records to be interconnected and real-time data to be exchanged securely and reliably. The National Agency for Information Society is developing a "Big Data system for 10 main public services" to support decision-making activities through data analysis. Additionally, Albania is conducting a feasibility study to establish a High-Performance Computing (HPC) centre in the country with the help of WBIF. This will enable Digital Transformation by providing advanced digital technology to businesses, citizens and public administration through the use of supercomputing, Big Data, Machine Learning (ML) and Artificial Intelligence (AI), in line with the "The Digital Europe Programme".

Internet of Things: Research papers have shown that the Internet of Things (IoT) can be used in developing countries such as Albania and Kosovo to help achieve their sustainability goals based on Sustainable Development Goals (SDGs). Both countries are making significant efforts towards these objectives. The Minister of Culture has proposed the concept of "Smart Agriculture" which involves the use of sensors in agriculture. The sensors, drones, and cameras installed in farms will provide real-time information to farmers about plant diseases, damages, cultivation conditions, humidity, pH, and temperature. This data will be used by automated irrigation systems that use artificial intelligence to enable efficient irrigation, thereby saving water and energy. By integrating these technologies, Albania will enable farmers to more accurately apply pesticides and fertilizers, reducing pollution and costs. The data will also help predict crop yields based on historical data and current conditions, allowing better planning of resources.

Bosnia and Herzegovina

Overview: Bosnia and Herzegovina is currently undergoing a general reform in several areas, including digitalization, to modernize its public administration. However, the economy of the country is still in its early stages of developing e-government and e-services, and no significant endeavours on AI or blockchain are currently being pursued. The country is working on creating a legal and policy environment that will allow it to accelerate digital transformation in the public sector. The strategic approach is to pilot innovative approaches aimed at establishing e-services. The use of artificial intelligence, machine learning,lockchainn, and distributed ledger technology in the public sector is still being explored.

The Council of Ministers of BiH is preparing to draft a strategic document on Information Society, while the Ministry of Transport and Communication of BiH is currently working on a "Strategy for Cloud Computing for BiH Institutions". The only existing strategic document that includes measures related to digitalization is the "Strategic Framework for Public Administration Reform," along with a corresponding "Action Plan" for the period from 2018-2027.

Artificial Intelligence: Bosnia and Herzegovina has not yet produced any strategic document or launched any pilot project related to Artificial Intelligence. It would be helpful to receive guidance from the EU on how to approach the development of AI. Discussions on the policies and practices of using AI in the public sector take place at regional events dedicated to this topic.

Regarding Data Analytics, the "Action Plan" includes activities for introducing cloud services and strengthening data centres. However, there have been no significant recent actions to further improve the interoperability framework and structure (GSB) that was established in the previous period.

The following data initiatives have already yielded positive results:

- Master records in both FbiH and RS have been established and connected to each other as separate entities;
- An electronic ID system has been developed, although it is not yet operational;
- An electronic register has been created for vehicles;
- E-services for indirect taxes and customs have been introduced;
- The "Land Register" has been successfully digitized, with excellent special data infrastructure.

Kosovo*

Overview: Kosovo has collaborated with the E-Government Academy of Estonia to adopt a "Digital Agenda 2030". This document outlines the development of services that are adapted to Kosovo's level of development. The Agency of Information Society is responsible for implementing digital solutions across the government.

In addition, the government also approved an "E-governance Strategy", a "Cyber Security Strategy" to address security concerns, and an "Administrative Burden Reduction Strategy" aimed at making processes more cost-efficient by digitalization.

Artificial Intelligence: As for Artificial Intelligence, Kosovo has not yet produced any strategic document or launched any pilot project. The Public Administration does not feel ready to delve into this technology yet.

Data Analytics: For the strategic aims, Kosovo follows "Digital Agenda 2030". The government plans to create a "Data Government Team" to design a "Data Exchange Platform" to enhance interoperability amongst different institutions.

Regarding data management, some notable aspects of digitalization and good practices in big data usage in **Kosovo are:**

- The Ministry of Finance has an advanced IT department that provides quality services;
- The Customs department has digitised all its processes;
- The Tax Administration has several online services available.
- A cloud computing system has recently been introduced for the education sector, called the "Kosovo Research and Education Network." It provides an enabling environment for education and has involved a large deployment of fiber. The system was developed in partnership with the World Bank.
- Regarding open data, the government has set up an "Open Data Portal," but it is not updated frequently enough.

The government is launching the "Open Data Initiative" and "Open Government Partnership" for local governments. They are also developing a portal called "E-municipality" to serve municipalities.

Montenegro

Overview: Montenegro is currently implementing a "Digital Transformation Strategy" and a "Public Administration Reform Strategy", with the Ministry of Public Administration acting as the central hub for digitalisation within the context of public service delivery. The Ministry of Science has put in place a "Smart Specialisation Strategy", which is currently being revised to take a more holistic approach.

Artificial Intelligence: Artificial Intelligence is not currently being used in any concrete manner, although the Ministry of Health is planning to utilise AI for upcoming projects and proposals. The Association of Managers of Montenegro (AMM) has proposed six key points for activities in the field of digital transformation, which should be included in the work program of the executive power[2].

Blockchain: The Central Bank of Montenegro (CBCG) has agreed to collaborate with Ripple, an enterprise crypto and blockchain solutions provider, to develop a strategy and pilot program for the administration's first digital currency, which could take the form of a Central Bank Digital Currency (CBDC) or national stablecoin. This move aligns with CBCG's core objectives of digitising financial services and making them more accessible to Montenegro's citizens.[3]

Data Analytics: While there is an Open Data portal, many institutions do not provide open data.

Virtual Reality: Montenegro's government plans to invest 25.5 million euros ($29.6 million) to establish a virtual reality (VR) and augmented reality (AR) innovation centre to support the administration's economic recovery following the COVID-19 crisis.[4]

North Macedonia

Overview: The National ICT Strategy 2023-2027 of North Macedonia envisions a digital future that prioritizes key areas in the ICT sector to cater to society's increasing connectivity needs, enhance competitiveness, and make businesses smarter.[5]

Artificial Intelligence: On April 10, 2023, the government of North Macedonia announced the launch of ADA, its first digital assistant in the public sector. ADA is an artificial intelligence platform that provides companies with information about the conditions for investing in the economy.[6]

Internet of Things: Tech developers created a mobile phone application that uses open-source data to map pollution and relies on sensors and the Internet of Things (IoT). Citizens can use this app to avoid heavily polluted areas. Additionally, the government is implementing innovative policies, such as using drones to identify and sanction polluters.[7]

Data Analytics: "The North Macedonia National ICT Strategy 2023-2027" guides the data analytics field. A new investment project is being discussed between the government and the World Bank with the Data Innovations component, which will serve as a platform for the implementation of Open Data and Big Data analytics initiatives. The government has internalized the Open Data and Open Government agenda and has requested World Bank support for the implementation of Open Data and Analytics activities through the Minister of Finance.

Virtual Reality: Makedonski Telekom has established a trial 5G network in the centre of Skopje, which offers super-fast fixed-wireless internet, virtual reality (VR) 360^0 live video, VR gaming in real-time, and ultra-HD multi-video streaming[8].

2 https://en.vijesti.me/news/economy/670049/amm-to-the-new-government%2C-digital-transformation-and-new-technologies-are-a-great-opportunity-for-Montenegro

3 https://www.cbcg.me/en/public-relations/news/press-releases/central-bank-of-montenegro-signs-agreement-with-ripple-to-develop-a-digital-currency-strategy-and-pilot?id=2243

4 https://seenews.com/news/montenegro-to-invest-255-mln-euro-in-vr-innovation-centre-707512

5 https://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Publications/2023/Digital%20Innovation%20Profile%20-%20North%20Macedonia.pdf

6 https://www.intellinews.com/north-macedonia-s-government-launches-ai-digital-assistant-275396/

7 https://www.itu.int/hub/2020/02/how-skopje-north-macedonia-is-using-innovative-tech-to-clean-up-air-pollution/

8 https://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Publications/2022/Digital%20Development/Digital%20Development%20Country%20Profile_North%20Macedonia_%20final_02.22.pdf

Serbia

Overview: Serbia has an e-Government Development Programme for 2023-2025, which includes an Action Plan for implementation. The government has a political goal highlighted in "Keynote Political Addresses" and has developed several sectoral strategies. The Cabinet of the Prime Minister is the pivotal structure, with a Delivery Unit responsible for directing digitization efforts.

Artificial Intelligence: Regarding Artificial Intelligence, there is a dedicated AI strategy, the National AI Development Strategy 2020-2025, which aligns with the European Artificial Intelligence Initiative.

The National AI Institute was established in 2020, bringing together 40 experts and developers. An Ethical Framework for the development of AI has also been adopted.

The government is working towards eliminating obstacles for AI projects, such as legislation. Some of its initiatives include the National AI Development Strategy 2020-2025, a National Platform for AI (2021), and various chatbots such as the Immunization Management System, Viber chatbot COVID-19 Infor Serbia, Chatbot IVA for the Contact Centre of National Inspections, and Chatbot Municipal Intelligent Assistant in Sombor and Šabac. Additionally, there are chatbots on the e-government portal, websites of the Republic Geodetic Authority for cadastre services, and the Ministry of Education for scholarship and school enrolment. The City of Belgrade also has a parking control system called OKO SOKOLOVO.

Apart from its possible benefits, there are also important potential drawbacks of using AI, including personal data protection, the risk of inheriting bias and discriminatory factors, the rise of new occupations and the increased or decreased demand in existing occupations, and the challenges in the Serbian education system.[9]

Blockchain: in May 2020, the Ministry of Public Administration and Local Self-Government published the "Study on the Feasibility of Using Blockchain Technology in Public Administration of the Republic of Serbia". The study proposed the introduction of blockchain technology into the integrated administrative system, land administration, agricultural product management, and export customs clearance system.

Data Analytics: Regarding strategy, data analytics falls under the "E-government Development Programme". As for interoperability and data management, during COVID-19, the Government built a platform for processing Big Data to collect and analyse vaccination data and obtain live reports. The Country Health Information Systems and Data Use (CHISU) project supports the Office of the Prime Minister, the Ministry of Health, the Institute of Public Health, and the Office of e-Government and IT in the development and operationalization of the e-Health Strategy for the healthcare sector.[10] Regarding open data and Open Government partnership, several ongoing projects are related to the Open Data project, in line with the EU regulations.

Virtual Reality: This summer, the Innovation Centre at the University of Belgrade's School of Electrical Engineering unveiled three cutting-edge VR laboratories. This project was supported by the European Investment Bank, the EU's Pre-accession Assistance, the Council of Europe Development Bank, and the Serbian government.

Successful implementation of emerging technologies in the public sector

Strategies

Facilitating the swift adoption of emerging technologies in the public sector involves clear leadership, cross-sector collaboration, streamlined procurement, pilot projects, workforce training, open data policies, and cybersecurity measures. These strategies expedite digitalization, reduce risks, and foster innovation while enhancing public trust in government regulation through reliable data sharing.

Policies

Accelerating the effective integration of emerging technologies in the public sector requires forward-thinking policies and global best practices. The national "Digital Strategies" and "Smart Specialization" documents offer long-term guidance. Regional forums and international collaborations can help drive better digitalization experiences. Strengthening the role of the private sector through incentives and contracts can foster economic growth and efficiency. Clear intellectual property guidelines and data-sharing protocols can also encourage cooperation and interoperability.

9 https://www.undp.org/serbia/blog/serbia-prepares-ai-revolution
10 https://chisuprogram.org/where-we-work/serbia#:~:text=CHISU%20is%20strengthening%20Serbia's%20HIS,System%20Digitalization%20(2022%E2%80%932026)

Practices

Accelerating the adoption of emerging technologies in the public sector involves cross-agency collaboration, knowledge-sharing, and e-education platforms. Establishing international centres of excellence enhances specialised skills among public servants. Agile project management methodologies, cloud computing, and user-centric design thinking streamline development and improve efficiency. Continuous monitoring and benchmarking enable quick course correction. Embracing open-source software enhances flexibility and cost efficiency. These practices collectively create an environment conducive to rapidly evolving adoption and successful implementation of emerging technologies in the public sector.

Western Balkans overview

Artificial Intelligence is still under discussion in Albania, brainstorming ideas about using chatbots in PA. Montenegro has not found a concrete use of AI in PA yet; whereas the Ministry of Health plans to use AI tools for developing projects and proposals. Serbia is carrying on several pilot projects, such as AI for optimizing parking, and a company in the energy sector is using AI-driven forecasting tools for predictions of the current market trends.

No significant endeavours on **blockchain** are currently being pursued in Albania, although they are included in the Digital Strategy. Together with UNDP, Montenegro's government initiated several projects on the blockchain connecting with fintech but without any active project getting underway.

Also, no significant endeavours on **Internet of Things** are currently being pursued in Albania, although they are included in the Digital Strategy. Montenegro deployed only a few small projects regarding this topic.

Data Analytics constitutes a pain point in Albania. Databases are widespread and often not interoperable. There is also insufficient data for fostering significant operations. Regarding open data, the government of Kosovo has set up an "Open Data Portal," but it is not updated frequently enough. The government is launching the Open Data Initiative and "Open Government Partnership" for local governments. While there is an Open Data portal in Montenegro, many institutions do not provide open data. There are several ongoing projects in progress in Serbia regarding the Open Data project, in line with the EU regulations. During COVID-19, the Government built a platform for processing Big Data to collect and analyse vaccination data and obtain live reports.

No significant endeavours on **Virtual Reality** are currently being pursued in Albania, although they are included in the Digital Strategy, and there are several ongoing projects in progress regarding healthcare. Regarding VR, Serbia has no relevant ongoing projects, but during COVID-19, VR was used in hospitals and at public events.

Critical Challenges

Implementing AI in public administration faces several challenges. These challenges include data privacy and security, ethical considerations, skills and workforce challenges, interoperability and standardisation, public trust and acceptance, regulatory frameworks, resource constraints, etc.

Collaboration among policymakers, technologists, ethicists, and the public should include regular forums, consultations, and ongoing dialogue. Together, they can establish a responsible framework that ensures the ethical and responsible use of AI in public administration.

In Albania, the adoption of emerging technologies has brought about several positive effects on improved efficiency, reduction of corruption and the quality of online public services. However, several challenges remain in the adoption of emerging technologies especially in the field of the digital divide, inadequate policies for digital skills development, and cybersecurity risks. The digital divide creates problems of digital literacy and citizen engagement.

Bosnia and Herzegovina's public administration has witnessed positive outcomes from the growing digital literacy of its citizens and the government's commitment to digitalization. However, there are still significant challenges that need to be addressed, such as the need to foster the development of emerging technologies, particularly in rural areas. Additionally, bureaucratic inefficiencies and limited funding remain a concern in public administration. Integration into the EU, foreign investment from EU member states, and cross-border cooperation can offer opportunities for implementing AI and emerging technologies. However, data privacy and political instability remain a paramount concern.

While Kosovo's public administration has made strides in implementing digital services, particularly in the Ministry of Finance, the Customs Department, and the Tax Administration, there are significant challenges that hinder its full potential. Outdated solutions and technologies due to low funding and limited resources can hinder the adoption of more efficient and advanced solutions. Furthermore, the reliance on foreign donors for digitalization initiatives can lead to the resource dispersion and adoption of sub-optimal solutions.

In terms of AI and other emerging technologies, Montenegro has made significant progress in recent years. One notable development is the implementation of a Smart Specialization Strategy, the establishment of a Digital Academy and a Regional Centre for Cybersecurity which has led to cost savings in public administration due to the enhanced efficiency and effectiveness of digital processes. Trust in institutions, particularly in the fields of cybersecurity and data protection, has also grown in the last five years. However, despite these positive developments, concerns still exist regarding e-commerce and data protection.

North Macedonia's digital ecosystem has notable strengths in areas such as digital literacy, government commitment, and a tech-savvy workforce. However, weaknesses like rural infrastructure, bureaucratic inefficiencies, and limited funding must be addressed. EU integration presents both opportunities and challenges for the country's digital transformation, necessitating a focus on data privacy, cybersecurity, and political stability. Overcoming resistance to change will be vital in embracing new technologies and ensuring a thriving digital ecosystem in North Macedonia.

Serbia prioritises digitalization, AI and other emerging technologies with a strong political support, leading to increased budget and legislative efforts. However, cross-border e-government cooperation remains limited. Other issues include a) lack of user-centred approach in designing digital services making them less accessible and inclusive and b) diminishing interest in platforms aimed at transparency, accountability, citizen engagement, and participation.

Conclusions

General Findings

Overall, while the Western Balkans Region has made some advancements in AI and emerging technologies, challenges such as democratic transition, bureaucracy, corruption, and political complexities continue to affect their progress. In Albania and Kosovo, there has been significant progress in the development and employment of AI and emerging technologies. However, both countries still face challenges in public administration efficiency. Bosnia and Herzegovina's complex political structure negatively impacts government capabilities in enhancing ambitious technological developments. Montenegro and North Macedonia have made improvements in AI and emerging technologies, driven by their efforts to integrate into the European Union. Serbia is progressing rapidly in aligning with European technological developments. However, transparency and accountability issues persist, hindering the full realization of the country's potential.

The regional push towards improving government efficiency and increasing ties with the European Union in the Western Balkans has highlighted several areas of focus. One of the key areas is the need for improved e-literacy, co-creation of policies with active stakeholder involvement, and cross-border cooperation within the Western Balkans. However, there are additional challenges in the adoption of AI within public administration, including data privacy, the development of regulatory frameworks, and workforce upskilling. AI in public administration can drive automation, assist in service requests and data analysis, enabling faster and more accurate decision-making. AI can also enhance evidence-based policymaking, contribute to maintenance and security, improve optimization of resources, accessibility and fraud detection.

Regarding the emerging technologies for Public Service Delivery, technological advancements in PA can increase government efficiency through automation, whereas blockchain technology can strengthen the management of sensitive public data, thus offering better control over contracts and financial transactions. AI can also help with the decision-making process by deducing patterns from datasets.

AI Adoption Across Sectors is widespread in healthcare, education, transportation, government services, finance, and energy. AI has also vast potential in various sectors, including public safety, agriculture, tourism, legal system, and social services.

Some specific strategies for a successful implementation of emerging technologies involve coordination between ministries and agencies, involvement of industry experts, academia and international organisations, collaboration with third-sector entities, faster access to innovative solutions, overcoming resistance, aiming for higher efficiency, encouraging innovation, and building trust.

Among effective practices for AI development, the following can be highlighted: cross-agency collaboration, establishment of centres of excellence, use of Agile Project Management, cloud computing, implementation and use of open-source software.

Findings and Recommendations

The combination of economic, educational, and infrastructural challenges poses significant obstacles to the adoption of AI and other emerging technologies in the Western Balkan region. Restricted financial resources hinder investments in advanced technologies and constrain the implementation of AI systems. Additionally, there is a lack of investment in educational programs that develop AI skills and knowledge, which restricts the region's capacity to take crucial steps in effective development and integration of these technologies.

Furthermore, the Western Balkan economies face various challenges in adopting AI, ranging from infrastructural and regulatory gaps to skill shortages and funding limitations. Moreover, political and social concerns surrounding AI, such as fear of job displacement and ethical considerations also slow down the integration process.

Collaborative efforts among governments, businesses, and educational institutions are essential to address the challenges in harnessing the potential benefits of AI and emerging technologies in the Western Balkan region.

By actively collaborating and aligning their efforts, they can bridge the gaps in technology infrastructure, skills development, and regulatory environments. This collaborative approach will enable the Western Balkan region to fully utilize the potential of AI and emerging technologies for economic growth and societal development.

To expedite the adoption of AI and emerging technologies in the Western Balkans, a multi-pronged strategy is crucial. Governments should prioritise investment in digital infrastructure, ensuring reliable and affordable access to high-speed internet across urban and rural areas. Financial incentives, such as tax breaks or subsidies, can incentivize businesses to integrate AI solutions, promoting technological uptake.

Ultimately, fostering a skilled workforce in AI is essential for the development and adoption of cutting-edge technologies. Collaborations between governments, academic institutions, and industry partners can play a pivotal role in bridging the skills gap and equipping individuals with the knowledge and expertise needed to thrive in AI-related fields.

Creating an innovation-friendly ecosystem requires establishing streamlined regulatory frameworks. Governments should work collaboratively to develop adaptive and standardised regulations that facilitate technology adoption while addressing ethical concerns, data privacy, and security. Establishing clear guidelines will instil confidence among businesses and investors, encouraging them to embrace and invest in emerging technologies.

Fostering regional and international collaborations is crucial for the Western Balkans to enhance knowledge exchange and resource sharing. Establishing innovation hubs with the region and participating in cross-border initiatives is also essential for the region's collective capacity for technological advancement. By concurrently addressing infrastructure, education, regulation, and collaboration, the Western Balkans can position itself as a regional hub and for technological advancements in the era of AI and emerging technologies. This transformative leap will not only drive economic growth but also improve the quality of life for people in the region.

Looking at the positive examples of the European Union, we can report how it has strategically developed best practices to guide the adoption of AI and emerging technologies, thus reflecting a holistic approach to governance. Firstly, the EU has championed the development of ethical AI frameworks, emphasising principles of transparency, accountability, and fairness, ensuring that the deployment of AI aligns with societal values. A key aspect of EU policy involves regulatory harmonisation to create a consistent framework across its member states, addressing issues like liability and data protection.

The EU recognizes the importance of investing in research and development, thus fostering innovation through collaboration between academia, industry, and research institutions. To complement this, the EU places a strong emphasis on skills development. It has implemented targeted education and training programs to ensure that individuals have access to the necessary skills for the digital age. Additionally, the EU is committed to ensure robust digital infrastructure. This involves providing universal access to high-speed internet across member states, and recognizing the importance of data governance policies that strike a balance between promoting innovation and safeguarding privacy and security.

By leveraging resources and expertise from both the public and private sectors, the EU aims to maximize the potential of AI initiatives. The EU also actively engages in international cooperation to establish global norms and standards for AI, thus aiming to create a harmonised international landscape for AI development. Furthermore, the EU supports the establishment of innovation hubs and clusters, which serve as focal points for collaboration and development in the field of AI. Citizen engagement initiatives ensure that the public input is taken into account when designing AI policies. By implementing these interconnected best practices, the EU is well-positioned to lead in the responsible and inclusive adoption of AI and emerging technologies.

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Appendix A - Methodology

1. In-depth Research and Data Collection:
    a. Holistic Review: Begin with an exhaustive dive into existing materials, particularly leveraging findings from ReSPA's Regional Study on Digitalisation.
    b. Stakeholder Interviews: Organise focused group discussions and one-on-one interviews with key stakeholders in the Western Balkans to glean on-the-ground perspectives.
2. Stakeholder Engagement:
    a. Feedback Mechanism: Establish a consistent feedback loop with stakeholders. Their continuous involvement will ensure the relevance and feasibility of the recommended strategies.
3. Drafting the Snapshot Overview:
    a. Emerging Technologies Landscape: Detail the current status, potential integrations, and forecasts for technologies like AI, blockchain, IoT, and more.
    b. Case Studies: Incorporate real-world examples from both within the Western Balkans and internationally to illustrate the impact and benefits of emerging technologies.
4. Refinement and Validation:
    a. Iterative Feedback: Post the initial draft and share it with ReSPA for feedback. Emphasise iterative improvements to ensure the document aligns with ReSPA's vision and the region's needs.
    b. Peer Review: Engage external experts for an unbiased perspective on the overview. Their feedback can provide additional depth and validate the approach.
5. Dissemination & Presentation:
    a. Preparation: Develop a compelling presentation to succinctly convey the findings and recommendations from the overview.
    b. Regional Event: Ensure the final overview is not just theoretical but also action-oriented, ready for its regional presentation. Prepare to engage in follow-up discussions and debates that might arise post-presentation.
6. Post-Project Activities:
    a. Monitoring: Establish a framework to monitor the adoption and impact of recommendations made.
    b. Continued Engagement: Foster ongoing relationships with stakeholders, ensuring a long-term, sustained impact and adaptability of the project's findings.

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