

## **EXECUTIVE SUMMARY**

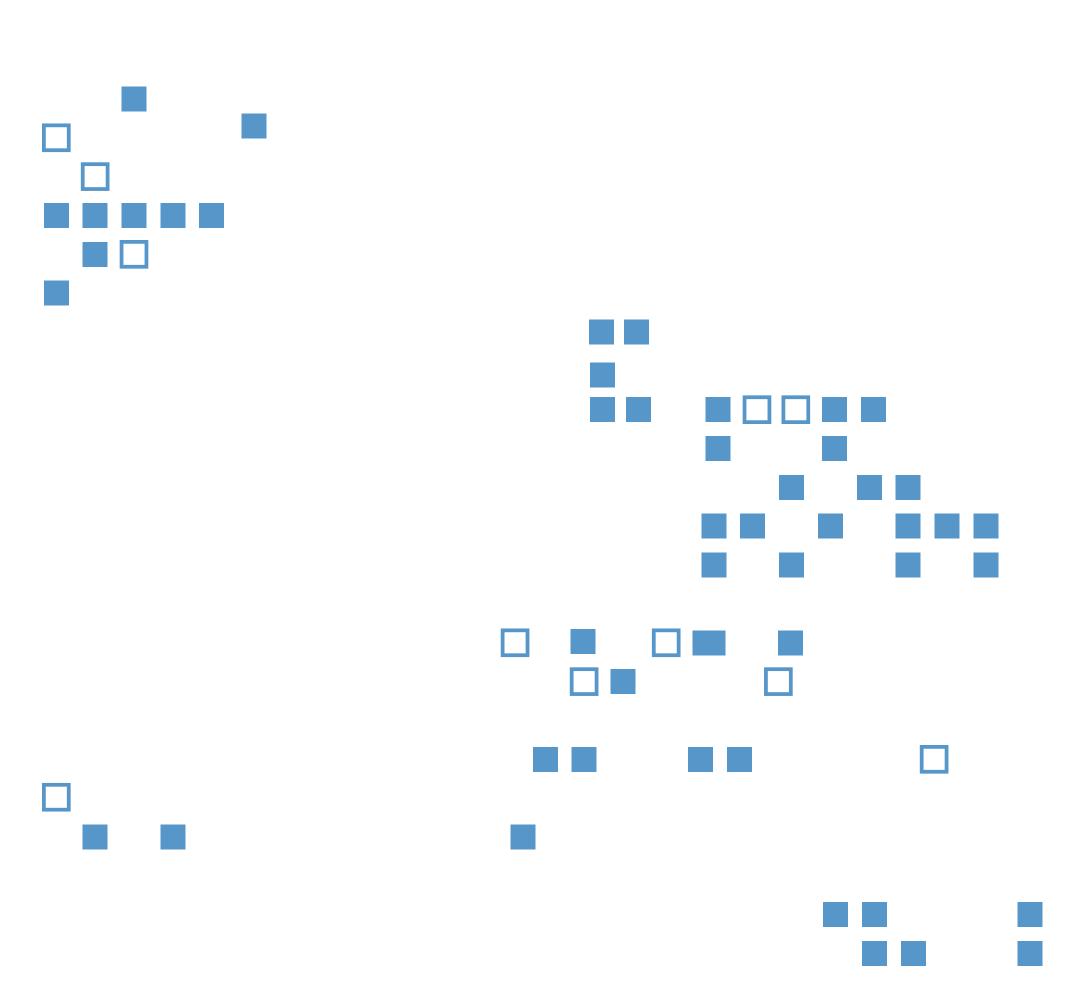
- This assessment was carried out in 2023
- North Macedonia is making considerable strides in its digital transformation journey, impacting multiple facets including infrastructure, government, regulation, the business sector, and society in general. The country has successfully rolled out near-ubiquitous 3G and 4G coverage, with 5G coverage now accessible in 16 cities, and ranking 30th globally for mobile broadband speeds. Digital governance, guided by EU-aligned frameworks, is also seeing progress, as is the country's startup ecosystem centered primarily in the capital, Skopje. However, despite these advances, challenges like the high cost of digital services, limited public awareness, digital skill gaps, and regulatory hurdles persist, with innovation largely concentrated in Skopje.
- North Macedonia has made significant progress in digital infrastructure, achieving near-ubiquitous internet access and ranking 30th globally in mobile broadband speeds. Much of the country's technological innovation is centered in the capital, Skopje, which leads the way in advancements. However, challenges persist in ensuring the affordability of these digital services and in extending connectivity to the public sector. Efforts to make digital services more affordable through multilateral talks on pricing structures are recommended, along with strategies to improve public sector connectivity.
- The Government has made advances in digital governance and public procurement, following frameworks that align with EU standards. However, there are shortcomings in terms of public engagement and the level of digital skills among civil servants. To address these issues, plans are being established for a comprehensive Monitoring and Evaluation (M&E) framework. Additionally, recommendations include launching targeted digital literacy programs aimed specifically at civil servants, and fostering public awareness through awareness campaigns.

- North Macedonia has seen progress in regulatory transparency, e-commerce, and cybersecurity. Despite these advancements, key challenges such as public awareness, data privacy, and the effective implementation of regulatory reforms remain. For better compliance and public understanding, the country could benefit from a regulatory review focused on open data, e-commerce, and cybersecurity. Public awareness campaigns designed to educate citizens about these regulatory changes are also advised.
- About half of the country's businesses are currently utilizing online tools and e-commerce. Financial aids for agricultural innovation and an €85 million Green Economy Financing Facility are in place. However, the startup ecosystem faces obstacles due to talent scarcity and regulatory barriers. Recommendations for the business sector include establishing a dedicated helpdesk for entrepreneurs and creating alliances with tech giants for national training programs. Sector-specific plans for textiles and apparel to leverage e-commerce through tax benefits or subsidies could also prove beneficial.
- Approximately 80% of North Macedonia's population is connected to the internet. However, only 32% possess basic digital skills, revealing a significant digital divide that particularly affects older and vulnerable populations. Progress is being made in gender equality within the IT sector, where women make up 33% of the workforce. To address the skills gap, a comprehensive Digital Skills Development Strategy, especially targeted at marginalized communities, is recommended. By adopting these and other measures, North Macedonia has the opportunity to address existing challenges and establish itself as a regional leader in digital transformation.

**UNDP DIGITAL** 

## ■ WHAT IS THE DIGITAL READINESS ASSESSMENT?

- The UNDP Digital Readiness Assessment is a survey-based tool to provide rapid, high-level insights into a country's digital strengths and opportunities. It is intended to serve as an "entry point" for increased engagement between governments, UNDP Country Offices, a broad range of UNDP experts, and other international development partners.
- The assessment has been designed to be used in conjunction with other tools and existing research. It is founded on several key principles: easy to complete, drawing on a mixed-method approach; providing real-time insights related to the 2030 Agenda, recognising that technology is a foundation and an enabler; providing iterative, tailored, and actionable results; and founded on inclusivity.
- The Digital Readiness Assessment also aims to improve coordination and clarity to drive a whole-of-government and whole-of-society approach to digital transformation. This is crucial in achieving digital inclusion, ensuring that no one is left behind from the potential of digital, and enabling countries to leverage digital to achieve the Sustainable Development Goals.





# ■ UNDP's objective is to help countries strategically and holistically address inclusive digital transformation

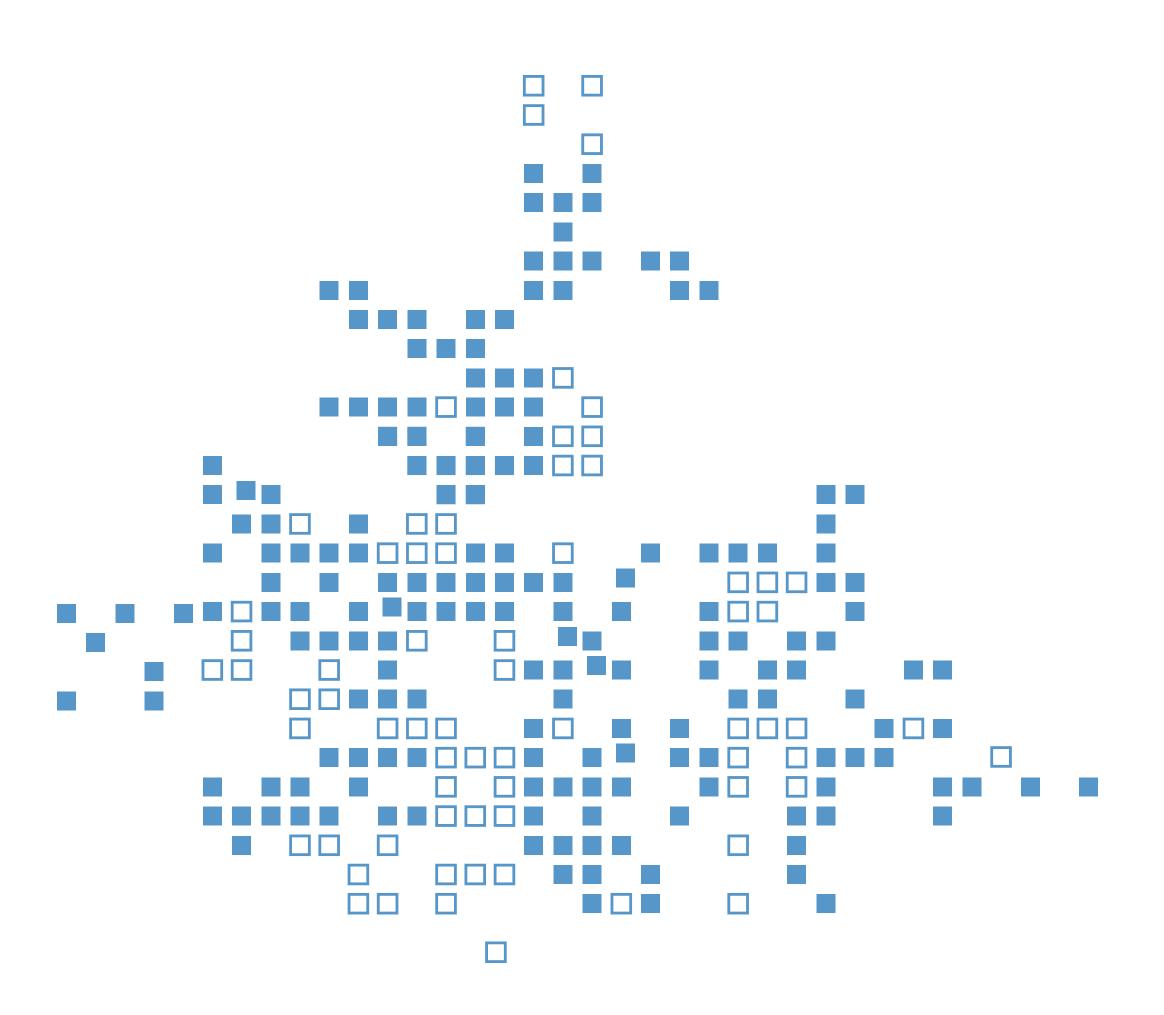
Our vision is to support countries to become **open and inclusive digital countries**. This requires us to plan and build digital ecosystems at the national level that are:

- Universal: All parts of society have access to and are able to use digital technologies and services.
- Responsible: people are protected from the adverse effects of digital technology.
- **Equitable**: The gains from digital transformation are distributed evenly.
- **Open**: The policy-making process is transparent and online participation is meaningful and safe.



## METHODOLOGY

- The Digital Readiness Assessment is a non-representative digital survey-based tool to provide rapid, high-level insights into a country's digital strengths and opportunities. It features more than 140 single-choice, multiple-choice, and free-text responses. The Digital Readiness Assessment was developed by the UNDP Chief Digital Office.
- The survey is split into seven sections: perspectives on the digital foundational catalysts, infrastructure, government, regulation, business, people, and socio-demographic questions. The survey is targeted at stakeholders in government (both national and local government), the private sector (including business associations), civil society organizations, and private citizens. Several questions are only asked of those from particular sectors.
- In North Macedonia, responses to the Digital Readiness Assessment were collected in May 2023 with invitations sent to stakeholders across government, the private sector, civil society, academia, and the international development community. Outreach included emails to the above stakeholders by UNDP, distribution through the Ministry of Information Society and Administration (MISA) and the Office of the Prime Minister via email and social media posts. The survey was available in both Macedonian and Albanian.
- 497 survey responses were received, from over 722 invitations. Members of the UNDP Chief Digital Office led on survey analysis and reporting. Analysis was conducted in July and August 2023.

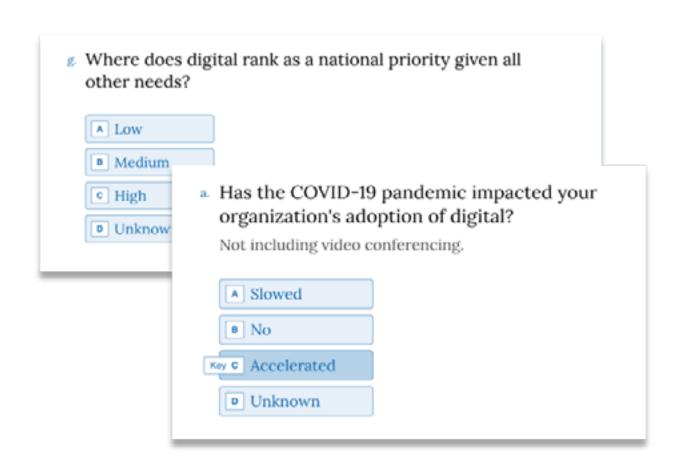


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# ■ The combination of survey results, external data and desk research provides a holistic view

## **Rapid Country Survey**



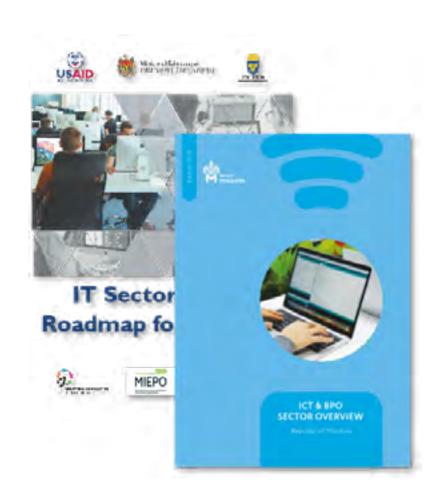
Online survey completed by 497 participants representing the public sector, private sector and civil society.

## Inclusive Digital Data Repository



Integration with 30 relevant external open data sources to build a complete picture.

## Research Review Database



Desk Research – 102 documents were reviewed in the literature review





**Rapid Country Survey** 

Calendar: Survey responses were collected between May 23rd and June 5th, 2023

#### Distribution: 722 invitations were sent

- Number of Surveys: 497 surveys were completed
- Public Sector: 410 surveys completed- breakdown per institutions (185 from central Government and 225 from local governments)
- Civil Society: 18 surveys completed
- Private Sector: 15 surveys completed
- Academia: 26 surveys completed
- Other: 28 surveys completed

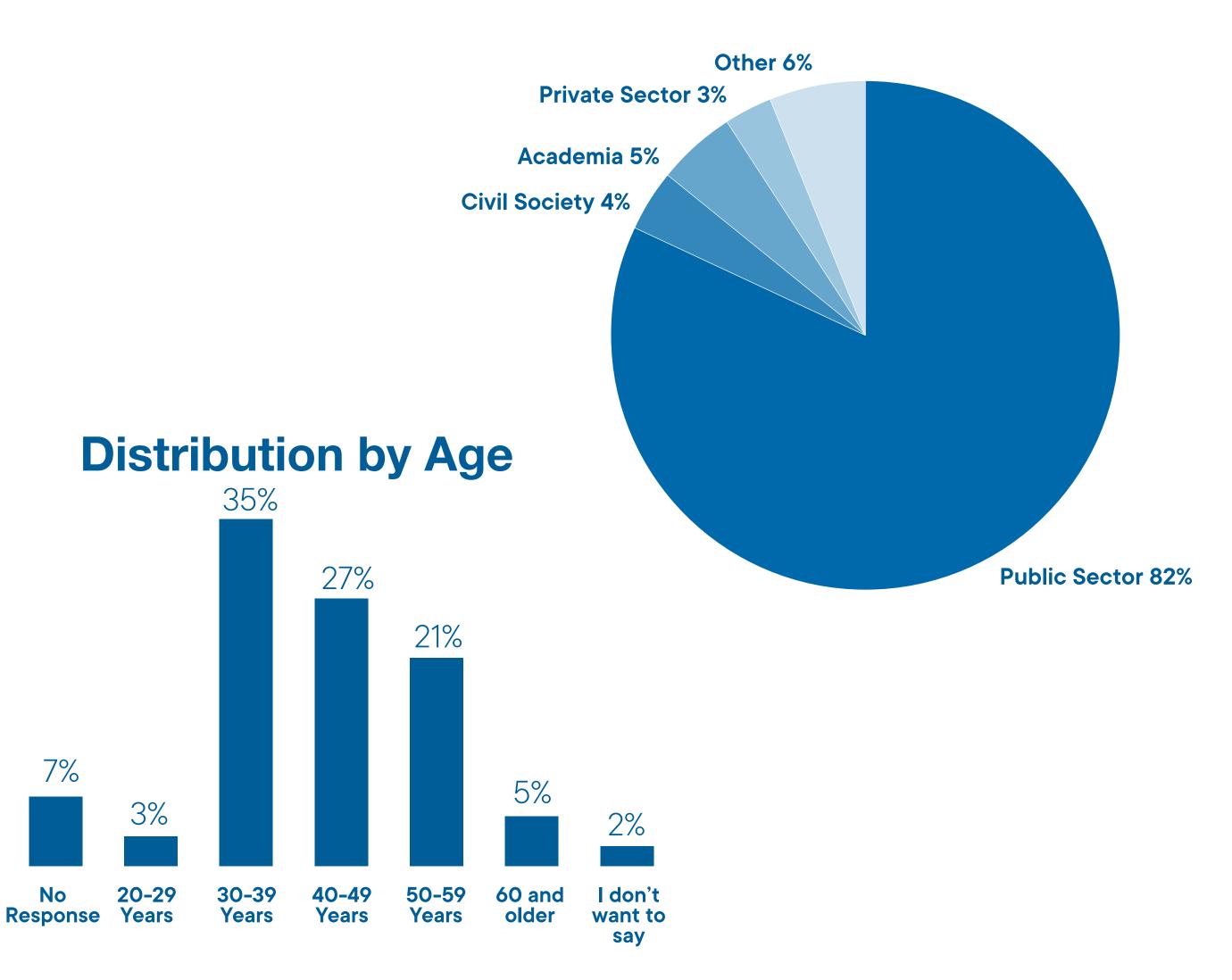
#### Survey Language: Macedonian and Albanian

- Emails to preset participants sent from the UNDP Office
- Dissemination through the Ministry of Information Society and Administration (MISA)
- Distribution among members of business associations
- Social Media Posts

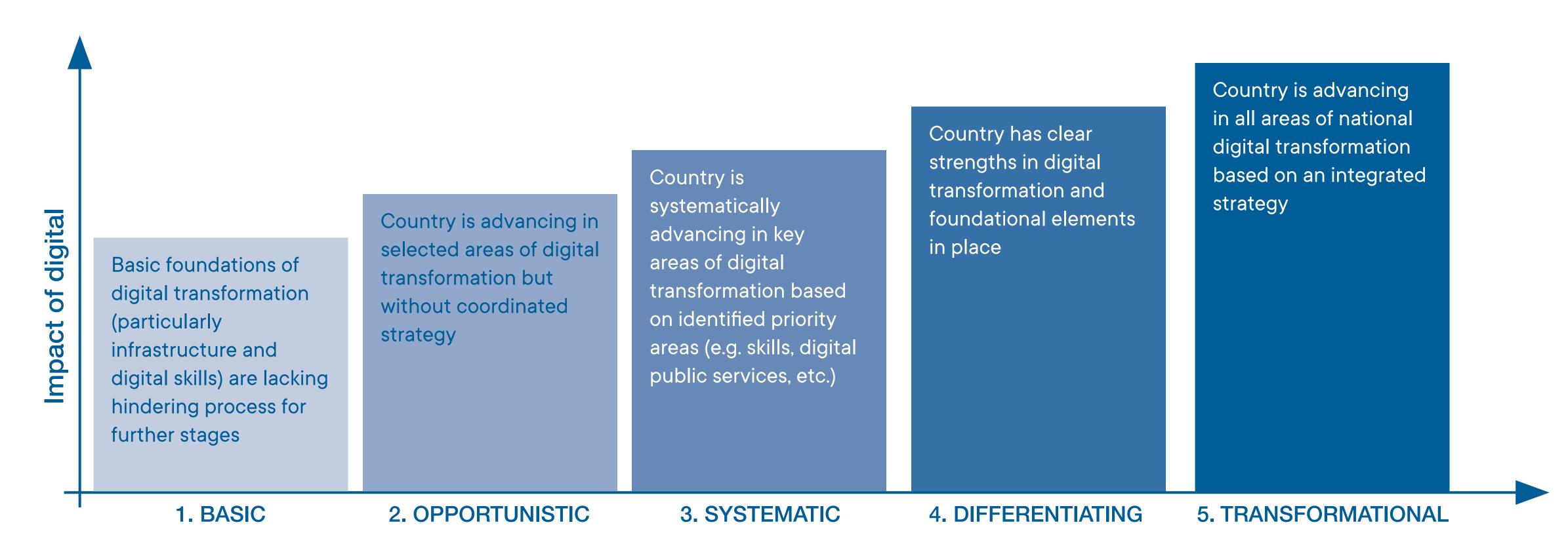
## **Distribution by Gender**

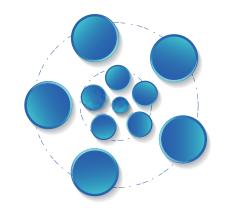
56% Female 33% Male 8% No Response

## **Distribution by Sector**



The relevant digital interventions for each country depend on the stage of "digital readiness". The Digital Readiness Assessment positions North Macedonia as a country systematically applying digital tools and approaches.





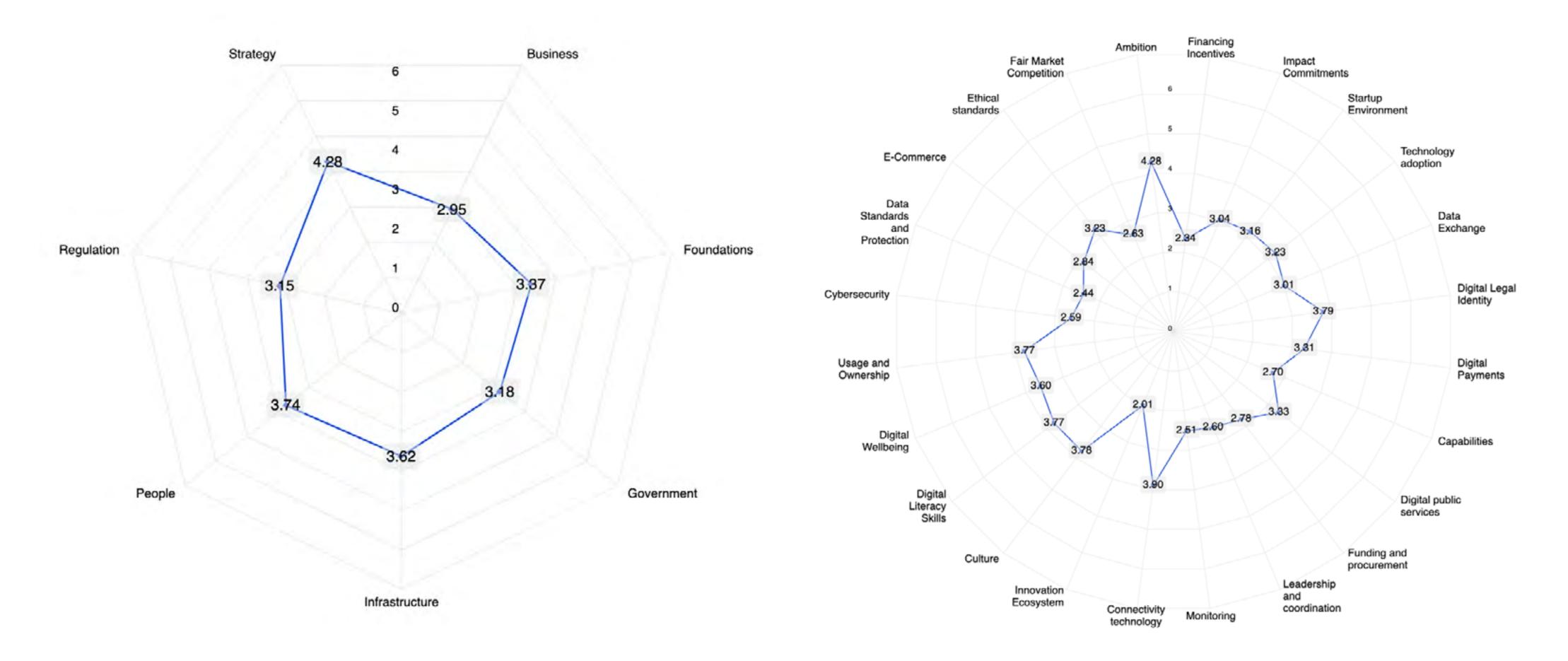
To enhance their digital readiness, countries can support each part of the transformation framework. North Macedonia finds itself in the Systematic stage across four pillars and the Foundations. Notably, there is progress in all pillars, although there remains an opportunity for improvement in the Business Pillar, which presently resides in the Opportunistic stage.

FOUNDATIONS	Siloed to operate independently and/or missing key elements entirely	Partially synchronized to operate together	Fully synchronized to operate together while protecting user privacy and control.	Using open standards and ensuring vendor and technology neutrality.	Ensuring universal coverage for individuals from birth to death without discrimination
INFRASTRUCTURE	Limited infrastructure. Access to undersea internet cables.	Growing internet service provider & mobile networks.	Growing connectivity. Limited developer & business ecosystems.	Affordable connectivity. Strong supply chains. Growing tech hubs.	Universal broadband. IoT. Inclusive ecosystems.
GOVERNMENT	Limited capacity	First digital initiatives in siloes. Limited political support.	Shared vision and strategy. Vocally encouraged.	Embedded in decision- making. Codified in administrative acts.	Culture of innovation.  Codified in legislation.
REGULATIONS	Limited legal capacity	Regulations support fundamentals.	Initial policies and laws established.	Regulations enable innovation. Transparently online.	Foundations enabled. Regulations integrated.
BUSINESS	Limited digital integration across sectors	Growing technology penetration in key sectors	Cross-sector collaboration. Seed financing.	Digital coordinated across sectors. Venture financing.	Digital industry. Enacting digital responsibility standards.
PEOPLE	Limited literacy. Cultural aversion to technology.	Limited digital literacy. Consumption-focused. Deep digital divide.	Growing digital literacy. Production increases. Technology embraced.	High levels of digital literacy. Online financial transactions.	Limited digital divide.
Stages of Digital Readiness	1. BASIC	2. OPPORTUNISTIC	3. SYSTEMATIC	4. DIFFERENTIATING	5. TRANSFORMATIONAL



## The country has made strong progress in building digital foundations, and a focused strategy.

However, further efforts are needed in shaping a digital business culture.





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## DEFINITIONS

## 1 FOUNDATIONS

Data Exchange (Interoperability): Open government data, private data, personal records, etc.

**Digital Legal Identity:** National system of digital legal identity covering the entire population; potential for use by relevant actors for access to digital services and transactions.

**Digital Payments:** Digital payments ecosystem including digital financial service providers, support services, regional and global interoperability.

### 2 INFRASTRUCTURE

**Connectivity Technology:** Availability, affordability, and quality of access to broadband Internet, mobile Internet, mobile devices and services, electricity, etc.

**Innovation Ecosystem:** Business interest groups, local universities and research institutions, local innovation associations, local digital workforce, technology centers, etc.

#### **3 GOVERNMENT**

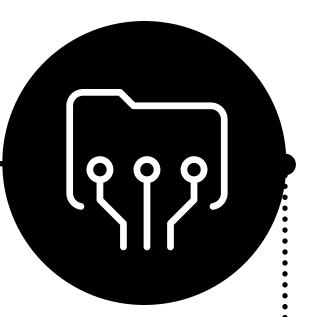
**Digital Public Services:** Strategies/programs for digitizing critical public services, including e-participation, standards for service design and delivery, general data governance framework, open government data strategy, data center strategy, etc.

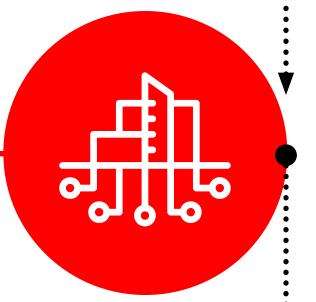
Funding and Procurement: System-based approach to ICT acquisition, digital transformation financing strategy/budget.

Leadership and Coordination: High-level political mandate, clear responsibilities.

Capabilities: Technological talent, technology adoption, ways of working with technology.

Monitoring: Indicators/strategies for monitoring digital transformation processes (KPIs).







## DEFINITIONS

## 4 REGULATION

Data Protection Standards: Open data, data access, data storage, privacy and data protection.

E-commerce: Consumer protection, digital transactions and payments, e-signatures.

Cybersecurity: Security standards and risk management, cybercrime.

Ethical Standards: Standards/guidelines for emerging technology, particularly the use of Al.

Fair Market Competition: IP law, competition and taxes, common operator, etc.

### **5** BUSINESS

Financing Incentives: Financing mechanisms, access to capital, crowdfunding, etc.

Startup Environment: Time to start a business, ease of doing business, strength of legal system, etc.

Technology Adoption: Payments, ERP and CRM system adoption, technology adoption, online platforms, etc.

Impact Commitments: Digital technology standards, transparency requirements, reporting methods.

#### 6 PEOPLE

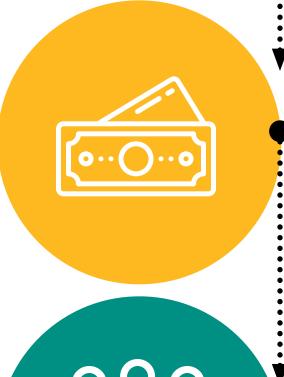
Digital Literacy Skills: Ability to use digital technology across all segments of society, particularly for marginalized groups.

Culture: Trust in digital technologies, attitudes towards risk, social norms, etc.

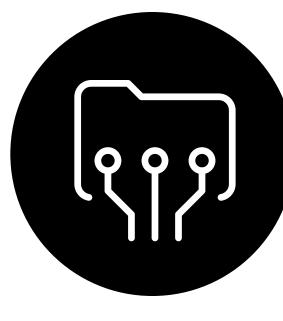
**Digital Well-being:** Understanding and mitigating harm caused by new technologies such as addiction, cyberbullying, misinformation, physical impacts, etc.

Usage and Ownership: Use of digital technology by different segments of society









## **FOUNDATIONS**

#### SYSTEMATIC PHASE

#### Data Exchange / Interoperability:

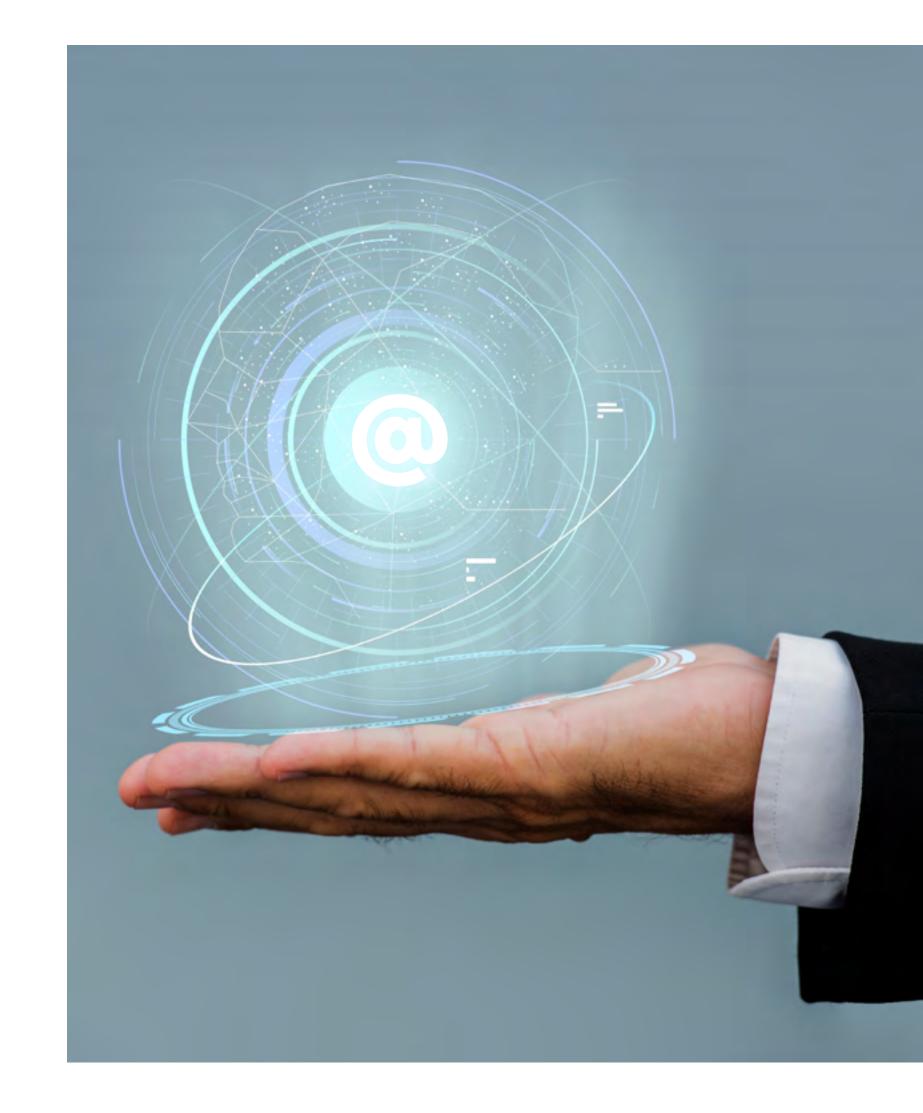
- 1. The interoperability platform in North Macedonia, modeled after the European Union's framework, is highlighted, emphasizing legal, organizational, semantic, and technical components.
- 2. The need for more agencies to integrate their systems with the platform is mentioned, indicating challenges in software readiness and institutional willingness.
- 3. The text discusses the legal infrastructure for digital services, including laws on central population registers, electronic management, electronic services, electronic documents, electronic identification, and trust services.

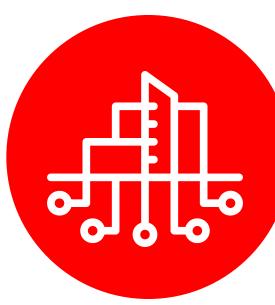
#### **Digital Legal Identity:**

- 1. The importance of a digital legal identity is emphasized for ensuring participation in the digital and broader economy.
- 2. The adoption of laws related to electronic documents, electronic identification, and trust services, as well as the establishment of a Unique Electronic Number for Citizens (UENC), are discussed.
- 3. The launch of North Macedonia's first National Digital Identity Service, compliant with eIDAS standards, is highlighted as a significant step towards e-government and digital transformation.

#### **Digital Payments Ecosystem:**

- 1. The significance of a digital payments ecosystem for enabling e-commerce and financial inclusion is discussed.
- 2. The growth of digital and e-money usage in North Macedonia is highlighted, with insights into the adoption rates among different population segments.
- 3. The passage of the Law on Payment Services and Payment Systems in 2022 and its impact on modernizing and securing the national payment system is discussed, including its alignment with EU directives.





## INFRASTRUCTURE SYSTEMATIC PHASE

- 1. Connectivity Progress and Challenges: North Macedonia has made substantial strides in enhancing connectivity infrastructure, boasting nearly 100% coverage by 4G and 3G networks and achieving competitive global rankings in mobile and fixed-line broadband speeds. The telecommunications sector's rapid expansion, driven by regulatory reforms and alignment with EU standards, has resulted in impressive internet accessibility. However, stakeholder surveys reveal potential challenges related to mobile data affordability, emphasizing the need for a comprehensive review of pricing and regulatory frameworks. Addressing these challenges, along with leveraging initiatives like the National Operational Broadband Plan (NOBP), will be pivotal in ensuring affordable and inclusive connectivity.
- 2. Innovation Ecosystem Dynamics and Opportunities: Skopje emerges as a vibrant hub for innovation, concentrating a significant portion of the start-up community and hosting a diverse Technology Ecosystem. Entities like MASIT, Startup Macedonia, and Macedonia2025 play crucial roles in bridging sectors and advocating for private enterprises, contributing to North Macedonia's global innovation rankings. To strengthen the broader innovation ecosystem, it is imperative to increase funding for research and development (R&D), as highlighted by the low allocation (0.38% of GDP) in 2020. Moreover, developing a comprehensive strategy that focuses on digital technologies, collaboration among diverse stakeholders, and the translation of research into practical applications will be instrumental in further propelling the nation's innovation landscape. In the Global Innovation Index, North Macedonia is ranked 66th out of over 130 countries. It excels in Market Sophistication (34th) and Infrastructure (49th), but lags in Institutions (88th) and Human Capital & Research (75th), according to the World Intellectual Property Organization. This highlights the country's strong infrastructure and market, but points to the need for improvements in human capital and institutional frameworks to enhance innovation.
- 3. Strategic Partnerships and Funding for Sustainable Impact: North Macedonia actively collaborates with the EU and the World Bank, securing substantial investments for the Information and Communication Technology (ICT) sector through initiatives like the Fund for Innovation and Technology Development (FITD) and the Smart Specialization Strategy. The North Macedonia Green Financing Facility and partnerships like "We Effect" underscore the country's commitment to sustainable economic growth. To capitalize on these strategic partnerships, there is an opportunity to increase Research and Development (R&D) funding, ensuring that the innovation ecosystem remains dynamic and adaptable. Strengthening global collaborations and exploring diverse funding sources will contribute to enduring impacts on the country's developmental trajectory.

#### Global Innovation Index Rankings (2022) - WIPO

	North Macedonia	Albania	Bosnia and Herzegovina	Montenegro	Serbia
Overall ranking	66	84	70	60	55
Institutions	88	84	94	59	53
Human capital and research	75	89	67	61	52
Infrastructure	49	57	55	44	38
Market sophistication	34	91	25	53	83
Business sophistication	59	56	98	58	65
Knowledge and technology outputs	57	96	63	72	42
Creative outputs	93	82	83	71	76

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## GOVERNMENT

#### **SYSTEMATIC PHASE**

- 1. Advancements in Digital Public Services: North Macedonia has made significant strides in the realm of digital public services, marked by the adoption of the Public Administration Reform (PAR) Strategy. This strategy, spanning from 2018 to 2022, aimed to revamp administrative functions and align with European integration goals. The country prioritized the creation of a robust digital environment through the enactment of the Law on Electronic Documents, Electronic Identification, and Confidential Services in 2019. The subsequent rise in UNDESA e-Government index scores demonstrates the commitment to e-government initiatives. Despite a dip in the Online Service Index (OSI), North Macedonia is actively addressing challenges such as low public uptake and institutional hesitance, aiming to enhance public engagement and fully leverage technology for efficient public service delivery and citizen engagement.
- 2. Diverse Digital Services Landscape: North Macedonia's digital services landscape extends beyond the main E-services portal, offering a broad range of services to citizens and businesses. These encompass essential public services categories such as travel, work and retirement, vehicles, residence formalities, education, health, family, and more. The country also actively supports businesses through various digital services, covering patents, business registration, statistical services, VAT refunds, excise duties, customs declarations, and more. While efforts are underway to digitize local governments and improve overall service delivery, challenges persist due to resource disparities among municipalities. The country's Open Government Index (OGI) ranking and participation in the Open Government Partnership (OGP) highlight its commitment to transparency, anti-corruption, and public-service delivery.
- 3. Potential and Challenges in Artificial Intelligence (AI) Integration: Artificial Intelligence (AI) holds promise for North Macedonia's digital transformation, with the government launching the ADA platform to attract investment and increase transparency. However, the untapped potential of Al raises concerns, as highlighted by the delayed progress in establishing a National Strategy for Al. While survey respondents recognize AI as a key tool for public service enhancement, the absence of a comprehensive strategy poses risks. Challenges include job displacement, bias, and privacy breaches. International funding and support, particularly from the European Union and the World Bank, play a crucial role in funding digital initiatives. The focus on financial incentives through the Fund for Innovation and Technology Development (FITD) and external investments underscores the commitment to sustaining North Macedonia's digital progress.





## REGULATION

#### **SYSTEMATIC PHASE**

#### **Data Protection Standards**

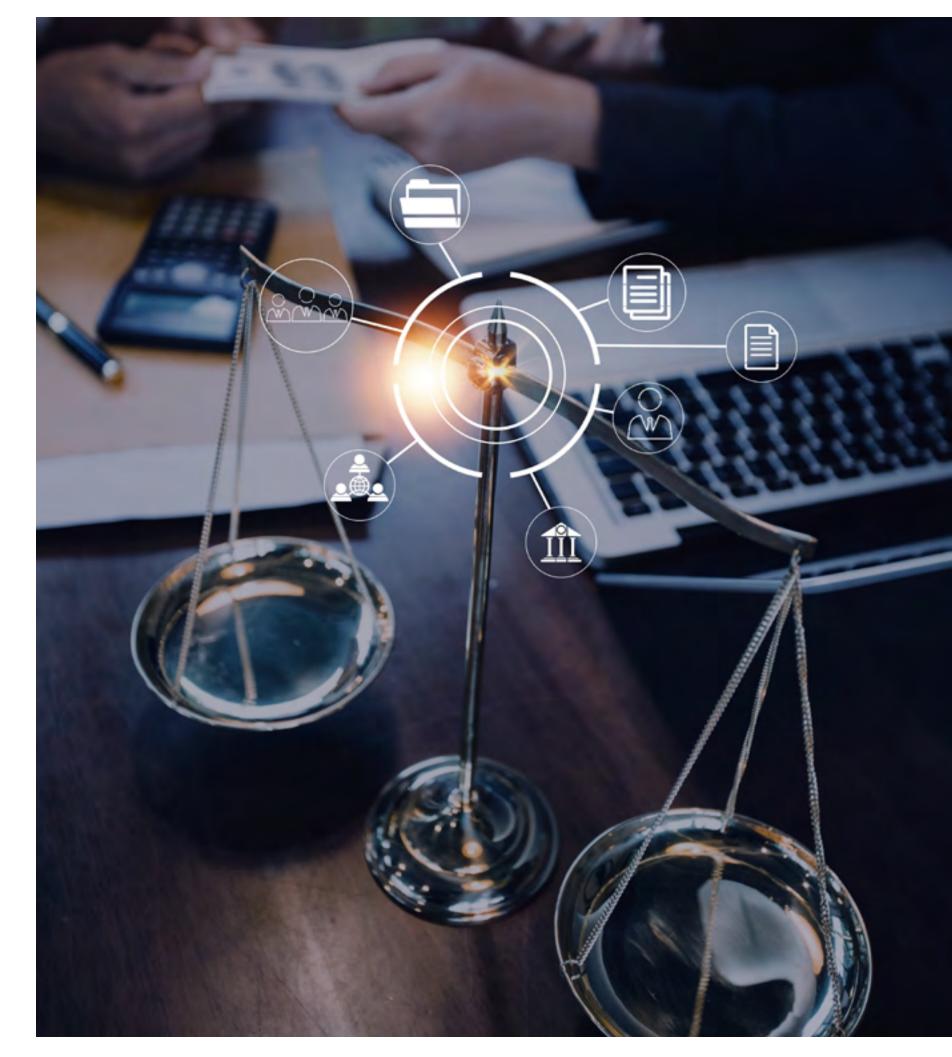
The legal framework for data protection in North Macedonia is multifaceted, comprising several laws aimed at promoting transparency and accountability. The "Law on Free Access to Public Information" and the "Law on Public Sector Data Use" mandate the publication of data by authorities. However, a significant portion of survey participants lacks awareness of open data laws. The Open Data Inventory (ODIN) ranks North Macedonia 52nd globally, with challenges in data accessibility, especially concerning privacy concerns. The "Law on Personal Data Protection" aligns with the GDPR, but survey results reveal limited awareness of its existence among participants. Privacy concerns, coupled with challenges in data storage practices and awareness of international data standards, highlight areas for improvement in data protection.

#### Cybersecurity

North Macedonia's cybersecurity landscape exhibits positive progress, marked by a slight decline in the Global Cybersecurity Index ranking but an improved score. The country's proactive approach includes the adoption of a National Cybersecurity Strategy and engagement with international partners like the USAID and NATO. While the Budapest Convention on Cybercrime is ratified, challenges remain in aligning domestic laws with convention provisions. Public concerns revolve around account hijacking and data privacy, emphasizing the need for targeted initiatives and education.

#### **Ethical Standards**

The EU supports North Macedonia in aligning its smart specialization strategy with the EU Green Deal, emphasizing sustainability. Survey results indicate uncertainty among participants regarding the existence of a content filtering law. North Macedonia's media landscape faces challenges in market plurality and political independence. The telecommunications sector is regulated by the Agency for Electronic Communications, promoting fair competition through market analyses and regulatory measures. Intellectual property protection aligns with global standards, but increased awareness is needed.

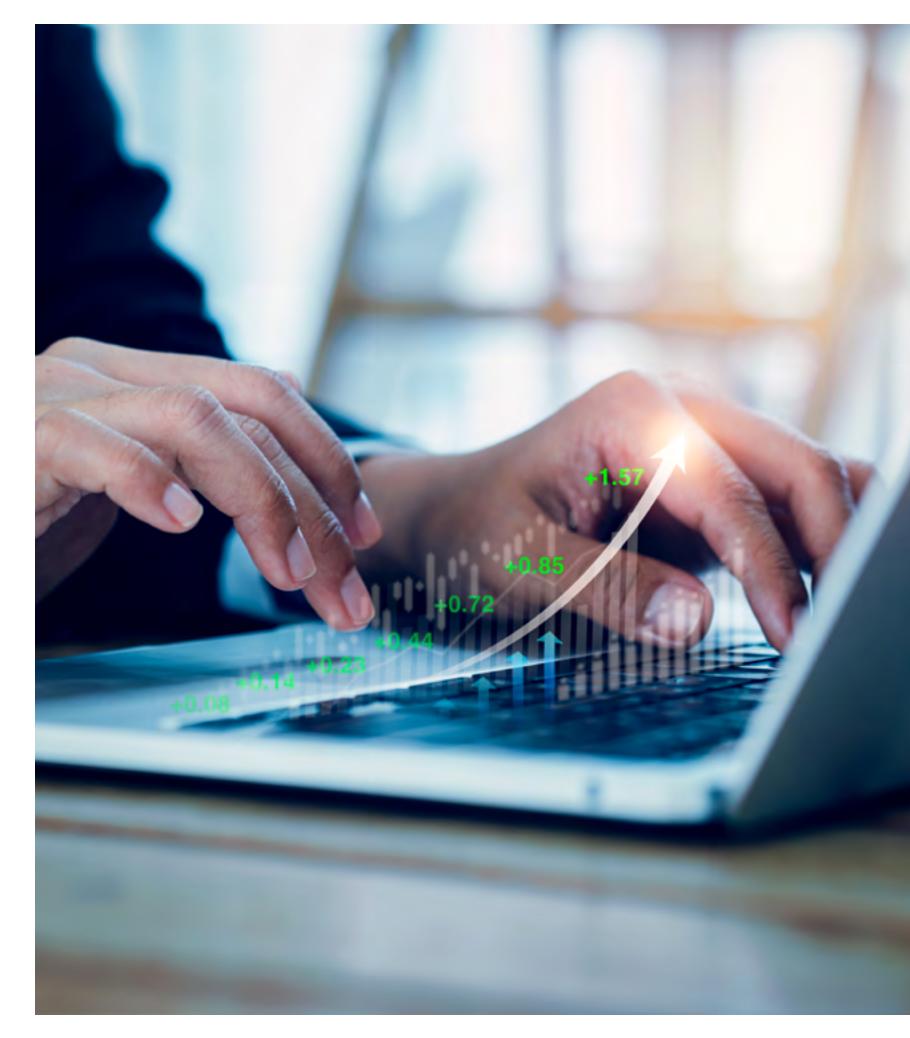




## **BUSINESS**

#### **OPPORTUNISTIC PHASE**

- 1, Private Sector's Crucial Role in Digital Transformation: The private sector, ranging from startups to Big Tech, is identified as a vital partner in North Macedonia's digital economy. Their products and services, particularly digital infrastructure and payments, serve as foundational elements, driving digital inclusion and citizen uptake. The adoption of technology by businesses, such as payment infrastructure and cloud services, not only accelerates government digital transformation but also leads to the improvement of products and services for consumers. The private sector also plays a prominent role in impact measurement, adhering to transparency requirements, and contributing to environmental, social, and governance (ESG) reporting.
- 2. Challenges in Financing and Startup Ecosystem: Despite North Macedonia's favorable ranking in the Global Innovation Index for credit accessibility, there is a notable lack of awareness among survey respondents regarding financial mechanisms that incentivize corporate digital transformation. The government is a significant provider of financing for startups, but there is a need for increased involvement from the private sector. Startups often rely on grants, raising concerns about transparency and oversight. Additionally, the survey reveals challenges such as limited access to financing, particularly from private investors, hindering the digital competitiveness of North Macedonia. The country's startup ecosystem faces hurdles in accessing funds for growth, necessitating a more active role from private investors.
- 3. Technology Adoption Challenges and Opportunities: The text outlines challenges and opportunities in technology adoption. There is a limited capacity in the private sector to adopt new technologies, with survey respondents expressing concerns about budget constraints, lack of support, and insufficient local digital skills. While most businesses in North Macedonia have an online presence, there is room for growth, especially in fully exploiting online opportunities. The text also highlights the importance of addressing the scarcity of human capital with advanced digital skills, emphasizing the need for ongoing training and upskilling initiatives within companies. Furthermore, it notes the government's commitment to smart agriculture through financial aid and the adoption of advanced agricultural practices.





## **PEOPLE**

#### **SYSTEMATIC PHASE**

- 1. Digital Literacy Skills Discrepancy: The data reveals a significant gap in digital skills between North Macedonia and the European Union countries. Only 32% of the North Macedonian population possesses basic or average digital skills, contrasting with the EU average of 56%. Moreover, a mere 3% of individuals in the country have more advanced digital skills. This emphasizes the urgent need for targeted efforts to enhance digital literacy and competency, especially in advanced areas like programming, machine learning, and IoT. The National ICT Strategy of North Macedonia outlines dedicated pillars to address these challenges and elevate the digital skills of the populace.
- 2. Internet Access and Affordability: North Macedonia exhibits widespread internet access, with approximately 80% of the population connected. However, despite high connectivity rates, about 19% of the population, particularly those aged 60 and above, remain disconnected. The affordability of digital devices is mixed, with smartphones relatively expensive compared to monthly income, while the cost of cellular data is remarkably low. Addressing barriers to internet adoption, especially among older individuals, is crucial for ensuring equitable access to information and opportunities. The findings highlight the importance of prioritizing affordability, particularly in terms of device costs, to bridge the digital divide effectively.
- 3. Online Violence and Digital Well-being: Online violence, particularly against women, emerges as a significant concern in North Macedonia. A survey indicates that 81.6% of female journalists in the country face online harassment, surpassing the global average. The government's efforts, including the partnership with UNDP on a cybercrime prevention project, underscore the importance of addressing online violence for overall digital well-being. Enhancing awareness, education, and coordination among stakeholders are essential to effectively tackle the issue. This finding emphasizes the need for a comprehensive approach to digital well-being that includes strategies to combat online violence and harassment.



**GSMA Mobile Connectivity Index (2023)** 

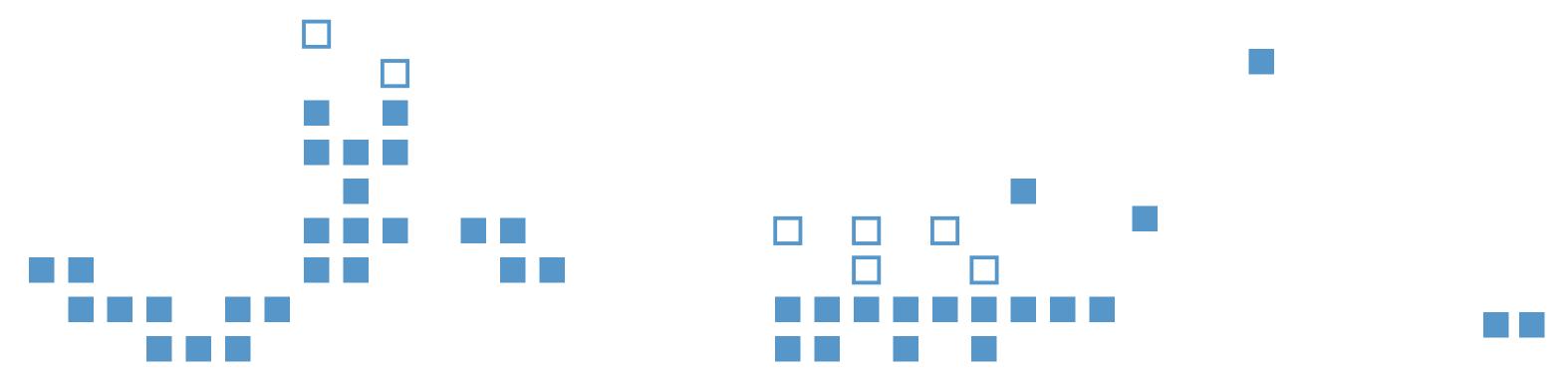
	North Macedonia	Albania	Bosnia and Herzegovina	Montenegro	Serbia
Infrastructure	71.7	67.9	61.3	69	64.6
Affordability	65.1	54.5	54	52.3	63.5
Consumer Readiness	82.1	86.8	75.7	83	80.3
Content and Services	67.9	59.5	59.1	71.1	74.7

Scores are ranged 0 to 100, with a higher score representing stronger performance - GSMA Mobile Connectivity Index (2022 data)

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**Database List** 



- Open Knowledge Foundation: Global Open Data Index
- World Bank: World Development Indicators
- ITU: Digital Development Dashboard
- GSMA: Mobile Connectivity Index
- Sustainable Development Report
- ITU: Global Cybersecurity Index
- Ookla: Speedtest Intelligence
- World Bank: Logistics Performance Index
- e-Governance Academy Foundation: National Cyber Security Index
- UN: E-Government Survey
- World Bank: Global Findex database
- Coursera: Global Skills Reports
- IMF/The Global Economy: Bank assets to GDP Country rankings
- World Bank/LinkedIn: Digital Data For Development
- The Global Entrepreneurship and Development Institute: Digital Platform Economy Index
- WIPO: Intellectual Property Statistics

- Global Innovation Index/App Annie Intelligence: Mobile app creation/bn PPP\$ GDP
- Global Innovation Index/WIPO: Patents by origin/bn PPP\$ GDP
- Global Innovation Index/Clarivate, Web of Science: Scientific and technical articles/bn PPP\$ GDP
- World Justice Project: Rule of Law Index
- World Bank: GovData
- Global Innovation Index/World Bank: Ease of Getting Credit
- Global Innovation Index/World Bank: Regulatory Quality
- Portulans Institute: Network Readiness Index
- UNCTAD: Business-to-Consumer (B2C) E-commerce Index
- UNDP: Human Development Data Center
- ITU: The Global E-Waste Statitics Partnership
- UN Sustainable Development Solutions Network: World Happiness Report
- World Population Review: Facebook Users By Country
- Chainanalysis: Global Crypto Adoption Index



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