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ASSESSING DIGITALIZATION LEVELS WITHIN ARMENIAN GOVERNMENT, BUSINESS, AND SOCIETY

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Abstract: This paper assesses digitalization levels within Armenia's government, business, and society, focusing on each sector's readiness for digital transformation. Using the Global Innovation Index (GII), E-Government Development Index (EGDI), and ICT Development Index (IDI), the study compares Armenia's progress with other post-Soviet countries for 2018 and 2020. Findings indicate that Armenia's business sector shows moderate growth in digital adoption, while the government sector remains a lower performer. Societal digital readiness falls in the middle tier, with gradual improvement but limited access across all groups. The study highlights the need for targeted policies to enhance digital infrastructure, skills, and regulatory support, aiming to foster a cohesive digital environment that strengthens Armenia's innovation and competitiveness.

Keywords: Digitalization, government digital transformation, business innovation, societal digital adaptation, digital infrastructure, technology adoption, digital readiness

JEL codes: O30, C80

Research aims: To assess the digitalization levels within Armenian government, business, and society, identifying barriers and opportunities for integration, to guide policy development and foster a cohesive national digital transformation.

Research novelty: This research uniquely examines digitalization across Armenia's government, business, and society, providing a comprehensive, sector-specific analysis that reveals distinct challenges and opportunities for cohesive digital advancement.

Introduction

The digital transformation of the global economy has been termed the "Fourth Industrial Revolution" or "Industry 4.0" (McKinsey & Company). These sweeping transformations have touched nearly all layers of society and economy. In response to global shifts, various countries have had to devise strategic digitalization programs to face new economic challenges and leverage emerging opportunities. Nations like Germany, the United Kingdom, Canada, China, and others have integrated such initiatives into their agendas. Singapore's "Smart Nation" concept (Smart Nation Singapore), encompassing pillars of a "Digital Society," "Digital Economy," and "Digital Government," has also become a focal point of research and discussion. The Eurasian Economic Union has formulated a similar agenda (Eurasian Economic Commission 2017)

The Republic of Armenia also adopted a policy to integrate with digital transformation trends, leading to the introduction of the "Armenian Digital Transformation Agenda 2018-2030" framework

document by the Digital Armenia Foundation and Strategic Initiatives Center in 2018 (Government of Armenia. (2018, November 16). The Armenian Digital Transformation Agenda 2018-2030 introduced by the Digital Armenia Foundation and Strategic Initiatives Center. Subsequently, in 2021, the Armenian government approved the "Digitalization Strategy of Armenia 2021-2025" (Government of Armenia. (2021, February 11). Digitalization Strategy of Armenia 2021-2025 (Appendix 1 of Armenian Government Decision N183-L). Government of Armenia). Digital technologies began permeating Armenia's economy as early as the 1990s, profoundly influencing nearly every economic sector. Digital business solutions, especially within Armenia's commercial banking sector, became widely applied in the regulation and management processes of the Armenian banking system.

Adopting digital technologies has influenced both the organizational hierarchy of Armenian commercial banks and the interactions among various stakeholders, including shareholders, managers, suppliers, and customers.

Research results

There are various indicators used to assess the level of digitalization in countries and economies. Among the most widely applied indicators are the Global Innovation Index (GII) (Cornell University, INSEAD, & World Intellectual Property Organization, 2020), the Digital Adoption Index (DAI) developed by the World Bank (World Bank. 2016), and the Digital Economy and Society Index (DESI) (European Commission. (2020). Additionally, the ICT Development Index (IDI), developed by the International

Telecommunication Union (International Telecommunication Union.2017) evaluates information and communication technology infrastructure and access, assessing a country's readiness to participate in the digital economy. Another key measure is the E-Government Development Index (EGDI), which is produced by the United Nations to evaluate the development and accessibility of digital government services, indicating the extent of a government's digital engagement with its citizens (United Nations. With addendum on COVID-19 response. (2020).

These indices provide comprehensive metrics to evaluate digital integration, technology adoption, and the overall readiness of economies and societies for digital transformation.

This paper utilizes the Global Innovation Index (GII), ICT Development Index (IDI), and E-Government Development Index (EGDI) to evaluate digitalization levels. The GII measures innovation capabilities, the IDI assesses ICT infrastructure and digital readiness, and the EGDI examines the accessibility and advancement of digital government services. A comparative analysis of these indicators is conducted for the years 2018 and 2020 across post-Soviet countries to understand regional digital progress over time. This approach highlights variations in digital transformation, technological adoption, and innovation capacity, offering valuable insights into the readiness and development of each country's digital infrastructure within a shared historical and socio-economic context.

The comparison of **Global Innovation Index (GII)** scores between 2018 and 2020 for post-Soviet countries reveals both stability and shifts in innovation capabilities across the region.

The Figure 1 presents the GII growth rate (%) from 2018 to 2020 for post-Soviet countries, offering insights into the progress each country has made in its innovation capacity and digital transformation over this period.

1. **Top Performers in Growth:**

✓ Turkmenistan stands out with the highest GII growth rate, indicating a significant push toward innovation, likely starting from a lower base. This improvement suggests new initiatives or investments in digital infrastructure and policy.

✓ Uzbekistan follows closely, also showing a high growth rate, which may reflect recent reforms aimed at enhancing innovation capabilities, technology adoption, and governmental support for digital transformation.

2. **Moderate Growth:**

✓ Georgia, Kyrgyzstan, and Armenia are next in growth rates, demonstrating steady progress. Armenia, for example, has implemented policies to foster a digital economy and improve ICT infrastructure, reflected in its moderate GII growth.

✓ Lithuania and Belarus also show moderate increases, signaling continued investment in innovation and digitalization but from a more developed starting point than lower-ranked nations.

3. **Slow or Minimal Growth:**

✓ Countries like Estonia, Kazakhstan, and Russia exhibit relatively slower GII growth rates. This slower pace could be due to already high levels of innovation infrastructure, meaning that improvements in GII scores may require more advanced or specialized advancements.

✓ Latvia and Ukraine show the lowest growth rates, which could suggest either a plateau in innovation efforts or challenges in further enhancing innovation frameworks and infrastructure.

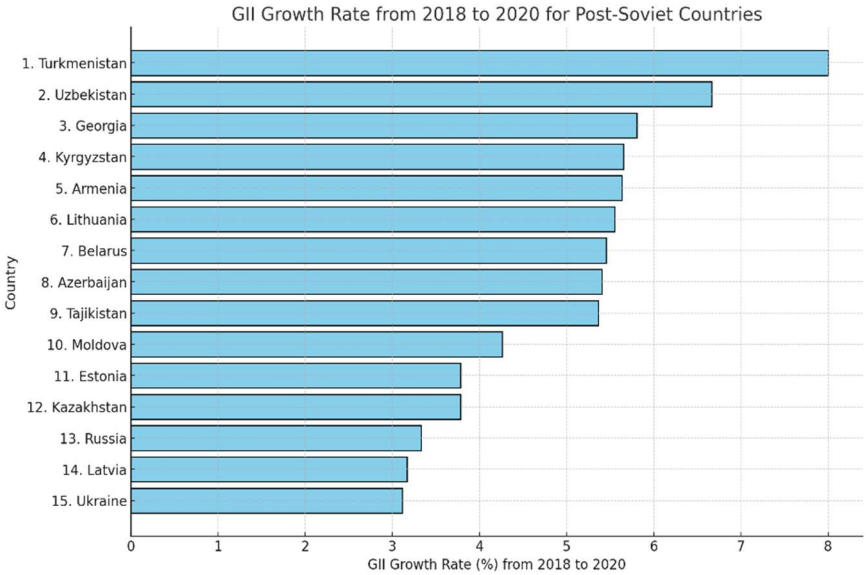

Figure 1. GII Growth Rate Analysis from 2018 to 2020 for Post-Soviet Countries[2]

4. Overall Trends:

✓ The growth rates illustrate a clear divide between countries starting from a lower innovation base, which are seeing higher growth percentages, and those with more established innovation systems, where growth is more incremental.

✓ The data highlights the dynamism in countries like Turkmenistan and Uzbekistan, which may be laying the groundwork

[2] Composed by author

for long-term innovation, while countries with already mature systems like Estonia and Russia experience slower but steady development.

Now by examining the EGDI scores of post-Soviet countries in 2018 and 2020, we can observe the evolution of government digital adoption and pinpoint specific areas for further advancement. The EGDI evaluates both the capacity and preparedness of governments to implement digital solutions for public service delivery. This index combines three main components: the Online Service Index (OSI), which assesses the extent and quality of e-government services accessible online; the Telecommunication Infrastructure Index (TII), which evaluates the availability of ICT infrastructure, such as internet and mobile connectivity; and the Human Capital Index (HCI), which measures the population's digital skills, education level, and literacy, all vital for effectively engaging with digital government services.

The comparison of **E-Government Development Index (EGDI)** scores for post-Soviet countries between 2018 and 2020 highlights the progress in digital government initiatives across the region.

1. **Top Performers**:

✓ Estonia remains the leader in e-government across both years, reflecting its highly developed digital government ecosystem and advanced infrastructure. Estonia's consistent top ranking shows its commitment to innovative digital public services.

✓ Lithuania, Russia, and Latvia also hold high positions, maintaining strong scores in both years. These countries have well-established online government services and infrastructure, which support steady digital adoption in public administration.

2. **Moderate Growth and Stability**:

✓ Kazakhstan and Belarus rank in the middle tier but show modest improvements from 2018 to 2020, indicating ongoing efforts to strengthen e-government services.

✓ Georgia and Ukraine also show moderate scores, suggesting that while these countries have developed some digital infrastructure, there may be room for further enhancement in service accessibility and public adoption.

3. **Lower Performers**:

✓ Armenia, Azerbaijan, and Kyrgyzstan rank in the lower-middle tier, with relatively modest EGDI scores. While Armenia shows some improvement, its position remains limited by infrastructure or digital literacy challenges that may slow broader e-government adoption.

✓ Tajikistan and Turkmenistan continue to occupy the lowest ranks, with limited progress. These scores reflect ongoing difficulties in developing digital government frameworks, likely due to economic or structural constraints impacting ICT infrastructure and service delivery.

4. **Key Trends and Insights**:

✓ Overall, Estonia and the Baltic states lead the way in e-government development, with other post-Soviet countries at varying stages of digital adoption. The gap between leading and trailing countries highlights a digital divide within the region.

✓ Some countries, like Kazakhstan and Georgia, are steadily advancing but may need focused investments to reach higher EGDI levels, particularly in terms of online services and telecommunication infrastructure.

✓ The data reveals that countries with already high EGDI scores tend to show stable growth, while lower-ranked countries are struggling to make significant progress, indicating a need for more foundational improvements in ICT and human capital.

We will now begin assessing the level of societal digitalization using the IDI score. The **ICT Development Index (IDI)** scores for 2018 and 2020 provide insights into the levels of societal digitalization among post-Soviet countries. The IDI reflects a country's access to, use of, and skills in information and communication technologies (ICT), giving a broad picture of digital readiness within society.

1. **Top Performers**:

✓ Estonia consistently ranks as the leader, with the highest IDI scores in both 2018 (78.2) and 2020 (80.0). Estonia's high scores reflect its advanced digital society, supported by strong ICT infrastructure and widespread digital literacy.

✓ Latvia and Lithuania also remain near the top, demonstrating well-developed ICT infrastructure and high digital adoption among citizens. Both countries show slight increases from 2018 to 2020, with Latvia reaching 77.0 and Lithuania 75.5 in 2020.

2. **Steady Improvements**:

✓ Kazakhstan maintains its position in the upper-middle range, with a small improvement from 70.0 in 2018 to 72.2 in 2020. This indicates ongoing efforts to strengthen ICT access and digital engagement.

✓ Belarus and Russia also show incremental improvements, moving from scores of 67.0 and 68.0 in 2018 to 70.5 and 70.3 in

2020, respectively. These countries benefit from relatively robust digital infrastructures but may face challenges in expanding digital skills and access across all societal segments.

3. **Middle-Tier Countries**:

✓ Ukraine, Georgia, and Armenia occupy the middle ranks, with scores that reflect moderate levels of ICT adoption and societal digitalization. Ukraine moves from 66.2 in 2018 to 68.5 in 2020, while Georgia and Armenia show steady growth, reaching 67.8 and 66.0, respectively, in 2020.

4. **Lower Performers**:

✓ Azerbaijan, Uzbekistan, and Kyrgyzstan display lower IDI scores, suggesting limited digital infrastructure and adoption levels. Azerbaijan, for example, moves from 55.5 in 2018 to 57.0 in 2020, reflecting slow but steady progress.

✓ Tajikistan and Turkmenistan remain at the bottom of the list, with minimal changes. Tajikistan shows a slight increase from 50.1 in 2018 to 52.2 in 2020, while Turkmenistan's score remains largely stagnant, moving only from 48.0 to 50.0, indicating persistent challenges in ICT development.

5. **Trends and Observations**:

✓ Incremental Growth across the Region: Most countries show modest growth in their IDI scores between 2018 and 2020, indicating gradual improvements in ICT infrastructure, access, and skills development.

✓ Digital Divide: A significant gap remains between the top-performing countries (Estonia, Latvia, and Lithuania) and lower-ranking nations (Tajikistan, Turkmenistan), highlighting disparities in digital access and adoption across the region.

✓ Impact of ICT Policies: Countries with consistent investments in ICT infrastructure, such as Estonia and the Baltic states, show sustained high levels of digitalization. In contrast, countries with limited ICT initiatives, like Turkmenistan, struggle to keep pace.

Conclusion

This study examined the digitalization levels in government, business, and society across post-Soviet countries, focusing on Armenia, using key indicators: the **Global Innovation Index (GII), E-Government Development Index (EGDI)**, and **ICT Development Index (IDI)**. The results show a clear difference in digital progress within the region. Countries like Estonia, Latvia, and Lithuania lead due to strong digital infrastructures, effective policies, and high digital skills among citizens. On the other hand, countries such as Tajikistan and Turkmenistan show minimal growth, pointing to structural and economic obstacles to digital adoption.

Armenia has made promising progress, especially in e-government and societal digitalization, though it remains in the middle range compared to neighboring countries. Despite some success in digital business solutions, Armenia still faces challenges in fully adopting digital practices across all areas. There is a clear need for more investment in ICT infrastructure, digital skills training, and focused policies to improve digital readiness.

This study suggests that a coordinated digital strategy across the region could improve competitiveness and resilience. By narrowing the digital gap and sharing successful practices, post-Soviet countries can use digitalization to support sustainable

development goals. Future research could look into how specific digital policies impact economic growth and explore ways for different sectors to work together to speed up digital transformation in less advanced regions.

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ԹՎԱՅՆԱՑՄԱՆ ԱՍՏԻՃԱՆԻ ԳՆԱՀԱՏՈՒՄԸ ՀՀ ՊԵՏԱԿԱՆ ԿԱՌԱՎԱՐՄԱՆ ՀԱՄԱԿԱՐԳԵՐՈՒՄ, ԲԻԶՆԵՍՈՒՄ և ՀԱՍԱՐԱԿՈՒԹՅՈՒՆՈՒՄ

Տիգրան Այվազյան
Հայաստանի պետական տնտեսագիտական համալսարան,
ասպիրանտ

Բանալի բառեր - թվայնացում, կառավարության թվային փոխակերպում, բիզնեսի նորարարություն, հասարակության թվային ադապտացում

Հոդվածում գնահատվում է ՀՀ պետական կառավարման համակարգի, բիզնեսի և հասարակության թվայնացման մակարդակները՝ ընդգծելով յուրաքանչյուր ոլորտի պատրաստվածությունը թվային փոփոխությունների համար: Գլոբալ Նորարարության Ինդեքսի (GII), Կառավարման Թվայնացման Ինդեքսի (EGDI) և ՏՀՏ Զարգացման Ինդեքսի (IDI) միջոցով ուսումնասիրությունն համեմատում է Հայաստանի առաջընթացը այլ հետխորհրդային երկրների հետ 2018 և 2020 թվականներին: Արդյունքները ցույց են տալիս, որ Հայաստանի բիզնես ոլորտում գրանցվել է թվային ընդունման միջին աճ, մինչդեռ պետական հատվածը շարունակում է մնալ ցածր ցուցանիշով: Հասարակության թվային պատրաստվածությունը գտնվում է միջին մակարդակում՝ ցուցադրելով աստիճանական զարգացում, սակայն սահմանափակ հասանելիություն բոլոր խմբերի համար:

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