

Assessing Romania's Ranking in the Digital Quality of Life Index (DQL) 2023

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Abstract

The Digital Quality of Life Index (DQL) assesses digital quality of life based on five essential pillars: internet accessibility, internet quality, electronic infrastructure, electronic security, and digital government. Romania has made remarkable progress in certain areas, such as internet accessibility, but challenges remain in electronic infrastructure and digital government. This article aims to analyze Romania's results in the DQL 2023 and compare them with previous years, highlighting both advancements and challenges in digital development.

Key words: digitalization, cybersecurity, digital economy, internet accessibility, electronic infrastructure

J.E.L. classification: M15, O40, C43, F63

1. Introduction

The Digital Quality of Life Index (DQL) has emerged as a pivotal framework for evaluating how digitalization impacts citizens' well-being across the globe. Developed by Surfshark, the index examines five key dimensions: internet affordability, internet quality, electronic infrastructure, electronic security, and electronic government. Each dimension reflects critical aspects of how digital resources are leveraged to improve quality of life. Romania's 2023 performance in the DQL Index provides a valuable lens for understanding the country's digital development trajectory within a global context, especially in comparison with other European Union (EU) nations.

Romania's position in the 2023 DQL Index reflects both progress and ongoing challenges. Despite being one of the EU's leaders in internet affordability, the country struggles in areas such as digital governance and e-security. This mixed performance highlights the complexities of digital transformation, where advancements in one area may coexist with stagnation or regression in others. Understanding these dynamics is crucial for identifying targeted interventions that can strengthen Romania's digital ecosystem.

In the context of the Digital Government pillar, Romania faces significant hurdles. The 2023 DQL data indicates limited access to e-government services and low adoption rates, particularly in rural areas. These shortcomings are further compounded by disparities in digital literacy and infrastructure development. Comparatively, neighboring countries like Hungary and Bulgaria have made notable strides in digital governance, demonstrating that regional collaboration and policy alignment could offer pathways for improvement.

Global rankings like the DQL Index are not merely diagnostic tools; they also serve as benchmarks for policy-making. Romania's placement underscores the need for strategic investments in technology and human capital to foster a more inclusive digital society. By addressing gaps in

electronic infrastructure and enhancing cybersecurity frameworks, the country could improve its overall DQL ranking, aligning more closely with international standards.

2. Literature review. Preliminary considerations

The Digital Quality of Life Index (DQL) is a comprehensive framework designed to evaluate countries' digital performance across key areas such as internet affordability, internet quality, e-government, e-security, and e-infrastructure. A robust analysis of Romania's ranking in the DQL 2023 requires contextualizing its digital evolution within these pillars. Digitalization has become a critical determinant of socio-economic development, influencing access to services, economic opportunities, and overall quality of life. Romania's position in the index reflects its strengths and challenges in achieving a balanced digital ecosystem.

In recent years, Romania has made progress in improving its internet affordability and quality, positioning itself competitively within the European Union. The cost of broadband and mobile internet in Romania is among the lowest globally, facilitating widespread access to online services. However, while affordability is a key factor, other dimensions, such as speed and stability, remain areas for improvement. Studies emphasize the role of robust infrastructure investments in narrowing the digital divide, a challenge Romania continues to face in rural and underserved areas (European Commission, 2023).

The Digital Government pillar, a focal point of Romania's DQL ranking, highlights the nation's ability to deliver public services through digital platforms. Although Romania has adopted various e-government initiatives, such as electronic filing systems and online public services, its adoption rates lag behind European averages. Factors such as digital literacy and trust in government services impact user uptake, demonstrating the need for more user-centric and secure systems.

Romania's performance in e-security further impacts its DQL ranking. Cybersecurity remains a critical concern, as weak protections deter users from engaging fully with online platforms. The 2023 National Cybersecurity Strategy outlines Romania's plans to strengthen its digital defenses, but gaps remain in public-private collaboration and investment in cybersecurity research.

3. Research methodology

This study employs a mixed-methods approach to assess Romania's ranking in the Digital Quality of Life Index (DQL) 2023. The research combines quantitative data analysis with qualitative contextualization to provide a comprehensive understanding of the factors influencing Romania's performance. The primary dataset for the analysis is the 2023 DQL report, which evaluates countries across multiple dimensions of digital quality of life. Secondary data, such as national statistics and policy documents, are incorporated to triangulate findings and enhance reliability.

The quantitative component involves statistical analysis of Romania's performance in the DQL's five key pillars—Internet Affordability, Internet Quality, Electronic Infrastructure, Electronic Security, and Digital Government. For the Digital Government pillar, specific indicators such as online services accessibility, digital public participation, and government transparency were examined. Comparative analysis was conducted to benchmark Romania's scores against those of other countries in the European Union and globally.

The qualitative component includes a literature review of academic articles, policy papers, and reports on Romania's digitalization initiatives. This provides a contextual background to understand the systemic and policy-related factors influencing the country's DQL ranking. Key themes, such as regulatory frameworks, investment in e-governance, and public adoption of digital services, were identified and explored in depth.

Finally, the methodology acknowledges limitations, such as potential inconsistencies in data reporting across countries and the evolving nature of digital quality of life indicators. These limitations are mitigated through robust data triangulation and sensitivity analysis. The findings aim to inform policymakers and stakeholders about actionable insights to improve Romania's performance in the DQL rankings and foster a more inclusive digital society.

4. Findings

This article delves into Romania’s 2023 performance in the Digital Quality of Life Index, with a focus on the Digital Government pillar. By analyzing key indicators and comparing them to regional and global benchmarks, the study aims to provide actionable insights for policymakers and stakeholders. The findings contribute to the broader discourse on digital transformation and its role in fostering sustainable development, emphasizing the interplay between digital accessibility, security, and governance.

Digitalization has become a key element in economic and social development, providing significant opportunities for countries that invest in digital infrastructure and technologies. Romania has made significant strides in the past decade regarding digital connectivity and accessibility. However, Romania's performance in the Digital Quality of Life Index (DQL) varies by domain, underscoring areas where further improvements are needed.

This article aims to analyze Romania's evolution in the DQL 2023 compared to previous years, based on the five evaluated pillars: internet accessibility, internet quality, electronic infrastructure, electronic security, and digital government. The analysis is based on the data presented in Table 1, which summarizes Romania's performance from 2020 to 2023.

Table no. 1. Results of the Digital Quality of Life Index (DQL 2023) Report. Romania

Nr.	DQL pillars	2023		2022		2021		2020	
		rank	index	rank	index	rank	index	rank	index
DQL 2023 RO		14	0.69	34	0.58	34	0.60	39	0.58
1.	Internet affordability	3	0.59	18	0.15	27	0.10	52	0.05
2.	Internet quality	12	0.52	13	0.52	18	0.67	28	0.71
3.	Electronic infrastructure	61	0.73	53	0.71	54	0.70	43	0.72
4.	Electronic security	6	0.97	20	0.87	22	0.87	30	0.78
5.	Electronic government	62	0.65	58	0.66	56	0.66	59	0.63

Source: (DQL 2023). România. <https://surfshark.com/dq12023>

Romania ranks 14th globally in terms of digital quality of life, up 20 places from the previous year. The Digital Quality of Life Index is an annual study that examines and evaluates 121 countries based on the performance of digital services, based on 5 main pillars. In this ranking, Romania stands out for its remarkable accessibility of fixed internet. Now in its 5th edition and produced by Surfshack, the report places Romania in 3rd place for fixed internet. In terms of other indicators, Romania is in 6th place for cybersecurity, 12th place for internet quality and 61st place for digital infrastructure. Although the country achieves good results in some areas, digital infrastructure and digital governance remain significant challenges, ranking 61st and 62nd.

4.1. Internet affordability

Internet accessibility is a critical component of digital quality of life, affecting both the affordability and availability of internet services. According to the Digital Quality of Life Index (DQL) 2023, Romania has made significant strides in improving its internet accessibility, though challenges remain. This synthesis explores the data provided for Romania, comparing it across the years 2020 to 2023, and evaluates the implications for the country's digital landscape.

Table no. 2. Internet affordability (DQL 2023). Romania

Nr.	DQL 2023 RO	2023	2022	2021	2020
INTERNET AFFORDABILITY					
1	Time to work to afford the cheapest mobile internet	64	18	27	52
2	Time to work to afford the cheapest broadband internet	1	21	22	30

Source: (DQL 2023). România. <https://surfshark.com/dq12023>

In 2023, Romania achieved a remarkable improvement in internet accessibility, ranking 3rd globally, up from 18th in 2022 and 52nd in 2020. This significant leap reflects substantial progress in making internet services more accessible and affordable to its population.

Work Time for Cheapest Mobile Internet: In 2023, Romania ranked 64th, a sharp decline from 18th place in 2022 and 62nd in 2020. This metric measures the average time required to earn enough to afford the cheapest mobile internet plan. The deterioration suggests that while internet access has improved, the affordability of mobile internet has decreased relative to other countries.

Work Time for Cheapest Fixed Internet: Romania excelled in this area, ranking 1st in 2023, compared to 21st in 2022 and 30th in 2020. This improvement indicates that the cost of the cheapest fixed internet plan has become significantly lower, making fixed internet highly affordable for Romanians.

The data shows a mixed but largely positive trend for Romania's internet accessibility:

Improved Fixed Internet Accessibility: Romania's top ranking in work time for the cheapest fixed internet in 2023 demonstrates a successful reduction in costs associated with fixed internet services. This could be attributed to increased competition among internet service providers, government initiatives to expand broadband infrastructure, or both. Enhanced affordability of fixed internet is crucial as it supports broader access to digital services, contributing to overall digital inclusion.

Challenges with Mobile Internet Affordability: Despite improvements in fixed internet accessibility, Romania's declining position in mobile internet affordability is concerning. The significant drop in ranking from 18th to 64th over the past year suggests a growing disparity in mobile internet costs. Possible factors include higher data prices, increased consumption, or slower advancements in mobile network infrastructure compared to fixed internet.

4.2. Internet quality

The Digital Quality of Life Index (DQL) provides a comprehensive evaluation of various aspects of digital life, including internet quality. In 2023, Romania achieved significant improvements in its internet quality ranking compared to previous years. This analysis focuses on the "Internet Quality" pillar, examining Romania's performance in aspects such as mobile and fixed internet speed and stability, as well as investments in improving internet infrastructure.

Table no. 3. Internet quality (DQL 2023). Romania

Nr.	DQL 2023 RO	2023	2022	2021	2020
INTERNET QUALITY		12	13	18	28
1	<i>Mobile speed</i>	44	39	36	35
2	<i>Fixed speed</i>	7	2	3	28
3	<i>Mobile internet stability</i>	46	19	20	1
4	<i>Fixed internet stability</i>	50	56	35	1
5	<i>Mobile speed improvement</i>	37	40	34	-
6	<i>Fixed speed improvement</i>	21	19	59	-

Source: (DQL 2023). România. <https://surfshark.com/dql2023>

Overall Ranking and Trends: In 2023, Romania's overall ranking in the "Internet Quality" pillar improved to 12th place, up from 13th in 2022 and 18th in 2021. This signifies a notable enhancement in the quality of internet services available in the country. The improvement can be attributed to various factors, including advancements in infrastructure and increased investment.

Mobile Internet Speed: Romania's ranking for mobile internet speed was 44th in 2023, which is a slight decline from 39th in 2022. Despite this decline, the ranking is relatively stable compared to 2021 and 2020. The decline might indicate a lag in the rapid technological advancements seen in other countries or slower progress in network enhancements.

Fixed Internet Speeds: Romania's performance in fixed internet speed has seen significant improvement. The country ranked 7th in 2023, a dramatic rise from 2nd place in 2022 and 3rd in 2021. This improvement reflects Romania's successful investments in upgrading fixed internet infrastructure and technology. The rise from 28th place in 2020 to 7th place in 2023 suggests a robust growth trajectory in fixed broadband capabilities.

Mobile Internet Stability: The stability of mobile internet in Romania has decreased substantially, with the country falling to 46th place in 2023 from 19th in 2022. This decline is particularly concerning as it contrasts with the overall improvement in other areas. The instability

may be due to increased network congestion, insufficient updates in network technology, or regional disparities in mobile internet service quality.

Fixed Internet Stability: Romania's fixed internet stability ranking also saw a decline, with the country positioned 50th in 2023 compared to 56th in 2022. The drop from 1st place in 2020 indicates challenges in maintaining consistent service quality despite overall improvements in speed. This could be a result of scaling issues, infrastructure strain, or maintenance challenges as the user base grows.

Investments in Internet Improvement: Investment in mobile internet infrastructure ranked Romania 37th in 2023, a slight improvement from 40th in 2022. This indicates that while there are efforts to enhance mobile internet services, they are not sufficient to match the pace of technological advancements seen globally.

For fixed internet infrastructure, Romania's investment rank improved to 21st in 2023 from 19th in 2022. This improvement aligns with the notable rise in fixed internet speed, suggesting that investments are translating into tangible benefits for users.

4.3. Electronic infrastructure

Romania's performance in the Digital Infrastructure pillar of the DQL has seen fluctuations over the past few years. This analysis focuses on the specific results for 2023, comparing them with previous years, and provides insights into the factors influencing these changes.

Table no. 4. Electronic infrastructure (DQL 2023). Romania

Nr.	DQL 2023 RO	2023	2022	2021	2020
ELECTRONIC INFRASTRUCTURE		61	53	54	43
1	Individuals using the internet	75	69	65	58
2	Network readiness	50	45	47	24

Source: (DQL 2023). România. <https://surfshark.com/dql2023>

In 2023, Romania ranked 61st in digital infrastructure, a decline from 53rd in 2022 and 43rd in 2020. This drop highlights a critical area of concern in Romania's digital landscape. To better understand these results, it is essential to break down the key indicators within this pillar: the percentage of people using the internet and the country's readiness in Information and Communication Technologies (ICT).

Internet Usage: The percentage of individuals using the internet is a crucial indicator of digital inclusivity and access. Romania's ranking in this category was 75 in 2023, down from 69 in 2022 and 58 in 2020. This increase in ranking (where a higher number indicates a worse position) suggests that although more people are using the internet, the growth rate has not been sufficient to improve Romania's relative position compared to other countries.

The increase in the number of internet users is positive, but Romania's lagging position highlights issues in bridging the digital divide. Factors contributing to this include disparities in internet access between urban and rural areas and potential socio-economic barriers that limit internet adoption.

Network readiness: Romania's ranking for ICT readiness in 2023 was 50, down slightly from 45 in 2022 but still significantly lower than the 24th position in 2020. ICT readiness reflects how well a country is prepared to utilize and implement new technologies and digital tools. The improvement in ICT readiness indicates some regress in the country's digital strategy and infrastructure. However, Romania's position remains below its previous ranking, suggesting challenges in maintaining and expanding its ICT capabilities. Factors such as investment in technology, training, and infrastructure development play a crucial role in enhancing ICT readiness.

4.4. Electronic security

In the 2023 DQL report, Romania has shown significant improvement in digital security compared to previous years. This synthesis will focus on the "Digital Security" pillar, analyzing Romania's performance in cybersecurity and data protection laws, and discussing the implications of these results.

Table no. 5. Electronic security (DQL 2023). Romania

Nr.	DQL 2023 RO	2023	2022	2021	2020
ELECTRONIC SECURITY		6	20	22	30
1	Cybersecurity	6	27	22	65
2	Data protection laws	VG	VG	VG	VG

Source: (DQL 2023). România. <https://surfshark.com/dql2023>

Cybersecurity: In 2023, Romania achieved a notable ranking of 6th place in cybersecurity, a significant improvement from 27th place in 2022 and 65th place in 2020. This sharp rise highlights Romania's enhanced capabilities and investments in cybersecurity infrastructure and practices.

Romania has implemented a robust national cybersecurity strategy, which includes regular updates to policies and frameworks aimed at combating emerging cyber threats. The National Cybersecurity Strategy of Romania, updated in 2021, outlines comprehensive measures for improving national cybersecurity resilience (National Cyber Security Strategy, 2021). Also, the Romanian government has increased investments in cybersecurity technologies and personnel training. This includes collaboration with international cybersecurity organizations to enhance threat intelligence and response capabilities (European Union Agency for Cybersecurity, 2022).

Data Protection Laws: Romania's data protection laws have consistently been rated as "Very Good" (VG) in the DQL reports for 2020 through 2023. This rating indicates that Romania complies well with the European Union's General Data Protection Regulation (GDPR), which sets high standards for data protection and privacy.

Romania's adherence to GDPR ensures strong protections for personal data, which is critical for maintaining public trust in digital services and preventing data breaches (European Commission, 2023).

The National Supervisory Authority For Personal Data Processing (NSAPDP) plays a crucial role in enforcing data protection regulations and addressing violations. The authority's effective oversight contributes to Romania's high rating in this category (NSAPDP, 2023).

Romania's performance in digital security, as reflected in the 2023 DQL report, demonstrates substantial progress in both cybersecurity and data protection. The country's strong position in cybersecurity and consistent adherence to GDPR underscores its commitment to protecting digital environments and personal data. Ongoing efforts to address emerging threats and enhance public awareness will be crucial for sustaining and advancing Romania's digital security performance in the future.

4.5. Electronic government

Romania's performance in the "Digital Government" pillar has shown some fluctuations over the years, reflecting ongoing challenges and incremental improvements. This synthesis examines Romania's standing in the "Digital Government" pillar as reported in the DQL 2023, exploring the implications of the rankings and suggesting potential areas for enhancement.

Table no. 6. Electronic government (DQL 2023). Romania

Nr.	DQL 2023 RO	2023	2022	2021	2020
ELECTRONIC GOVERNMENT		62	58	56	59
1	Online Service Index	66	58	47	68
2	AI readiness	56	54	50	50

Source: (DQL 2023). România. <https://surfshark.com/dql2023>

According to the DQL 2023, Romania ranked 62nd in the "Digital Government" pillar. This represents a slight decline from its 58th position in 2022 and a deterioration from its 56th position in 2021, although an improvement from the 59th position in 2020. The Digital Government pillar is crucial as it assesses the effectiveness and accessibility of online government services and the country's readiness to leverage artificial intelligence (AI) for governmental functions.

Online Services Romania's position in the online services category fell to 66th place in 2023, compared to 58th in 2022 and 47th in 2021. This decline suggests a slowdown in the development and deployment of digital public services. The ranking of 68th in 2020 indicates that while Romania has made some progress, the rate of improvement has not kept pace with other countries.

The decrease in Romania's ranking for online services may be attributed to several factors, including inadequate integration of digital solutions within public administration, slow adaptation of new technologies, and inconsistent service delivery. To improve its ranking, Romania needs to enhance the efficiency, accessibility, and user-friendliness of its online government services, ensuring that they meet international standards and user expectations.

AI Readiness Romania's position regarding AI readiness improved slightly to 56th in 2023 from 54th in 2022 and 50th in both 2021 and 2020. This indicator reflects the country's preparedness to utilize AI technologies in governmental operations and decision-making processes. Despite a modest improvement, Romania's AI readiness remains below average. The country must focus on developing a robust AI strategy that includes investing in AI research and development, creating a supportive regulatory environment, and fostering partnerships between the government, academia, and the private sector. Enhancing AI capabilities can significantly improve public sector efficiency and service delivery.

Romania's performance in the Digital Government pillar of the DQL 2023 highlights both achievements and areas needing improvement. To enhance its digital government capabilities, Romania must address the challenges identified and implement strategic initiatives that will foster growth and innovation in its digital public services.

5. Conclusions

Romania's performance in the Digital Quality of Life Index (DQL) 2023 highlights both notable progress and areas requiring improvement. One of the country's strongest points is internet accessibility, particularly in fixed internet services, where Romania achieved a top global ranking for affordability. However, the growing disparity in mobile internet affordability points to an imbalance in digital inclusivity. Efforts to reduce the cost of mobile internet should be prioritized to ensure that all segments of the population can benefit from Romania's digital advancements.

In terms of internet quality, Romania's ranking has improved, reflecting successful investments in fixed internet infrastructure. However, the decline in mobile internet stability indicates a need for more targeted investments in mobile network enhancement. The deterioration in this area could hinder the country's ability to fully capitalize on the benefits of digitalization, particularly as mobile connectivity becomes more crucial for businesses and individuals alike.

Romania's challenges with digital infrastructure are evident, as its ranking in this pillar has steadily worsened over the years. While internet usage is increasing, the rate of adoption is insufficient to close the digital divide, especially between urban and rural areas. Enhancing ICT readiness and increasing investments in internet infrastructure are essential to improve the country's digital inclusion and competitiveness on the global stage.

Romania's remarkable progress in electronic security is an encouraging trend. The significant improvements in cybersecurity rankings demonstrate that the country is effectively addressing growing cyber threats. Sustaining this level of performance will require continued investments in cybersecurity infrastructure, workforce development, and international cooperation to combat emerging risks.

Finally, Romania's digital government performance highlights ongoing struggles with the implementation of online services. While AI readiness is improving, the country still ranks relatively low in this area. To boost its digital governance, Romania must focus on modernizing public administration processes, expanding access to digital services, and fostering innovation through AI technologies. By addressing these challenges, Romania can enhance its digital resilience and ensure sustainable growth in the future.

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