A COMPREHENSIVE INSIGHT INTO THE DIGITAL ECONOMY AND SOCIETY INDEX

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Abstract:

The digital economy encompasses all industries or activities that directly participate in digital production or rely, in a crucial manner, on digital inputs. This approach is typically used in economic activity to attempt to quantify the contribution of the digital economy to total economic growth.

The primary objective of digitalization is to contribute to the profound transformation of the economy, public administration, and society, increasing performance and efficiency in the public sector by creating new types of value based on digitalization, innovation, and digital technologies.

The extremely rapid growth of the digital economy can be achieved by acting simultaneously and in a coordinated manner on four strategic axes, which ensure a digital ecosystem capable of functioning, innovating, and transferring innovative digital services and products for the benefit of society and the economy.

The digital economy no longer represents just an isolated sector, but a foundation upon which the entire economic activity rests. It quantifies the direct participation in digital production and the dependence of traditional industries on technological inputs. The profound transformation of administration and society aims, as its final goal, to increase performance and create value through innovation. However, DESI data show us that this value remains theoretical where the administrative "machinery" is not coupled with a functional human interface.

Keywords: *Digital Economy, digitization, digital economy and society index, optimization*

JEL Classification: *C80, O33*

1. Introduction and Context

With the advent of the Internet, our daily activities have evolved increasingly and improved considerably. The benefits are manifold, including rapid access to information, the possibility of remote transactions, and unprecedented connectivity between people. The process of digital transformation contributes significantly to increasing the quality of life for citizens and developing a prosperous socio-economic environment.

Digitization is the process that transforms analog data into digital data. Digitalization operates through the use of digital data. The digital transformation of public administrations represents a way to provide faster, cheaper, and better services.

The U.S. Bureau of Economic Analysis (BEA) defines the digital economy as the sum of digital infrastructure (the ICT sector), e-commerce activity, and digital media activities. Similarly, the McKinsey Institute takes into account the value of the ICT (Information and Communications Technology) sector, the e-commerce market—measured as online sales of goods—and offline consumer spending on digital equipment [3].

The digital economy encompasses all industries or sectors that utilize digital inputs as part of their production process. These inputs include digital infrastructure, equipment, and software, but can also include data as well as complementary skills. A broader perspective was utilized at the G20 Summit (2016), where the digital economy was defined as "a broad range of economic activities that use digitized information and knowledge as a key factor of production, modern information networks as an important activity space, and the efficient use of information and communications technology (ICT) as an important engine of productivity growth and economic structural optimization" [6].

According to the World Bank, "the digital economy transcends the ICT sector, encompassing most sectors of the economy and society; however, many governments continue to treat the digital

economy as a sector, with an exclusive focus on developing ICT infrastructure and creating an information technology (IT) workforce" [7].

Similarly, the OECD describes "the digital economy [as extending] beyond businesses and markets [because] it includes individuals, communities, and societies" [8].

Oxford Economics notes that the digital economy "comprises enterprises from all sectors of the economy, using digital technologies with increasing intensity to profoundly disrupt how value is created" [4].

A flexible approach to defining the Digital Economy is provided by UNCTAD in the "2019 Digital Report," which distinguishes between the extensive and intensive use of digital technologies to establish the boundaries of the digital economy.

The Digital Economy comprises all sectors that use digital technologies extensively (meaning the existence of these sectors depends on digital technologies). A distinction is made between these and sectors that use digital technologies intensively (meaning they apply digital technology only to enhance their productivity). For Bukht and Heeks (2017), the digital economy is defined by the share of production/output that "is derived exclusively or primarily from digital technologies with a business model based on digital products or services".

The Digital Economy incorporates all economic activities based on digital inputs or significantly enhanced by the use of digital inputs, including digital technologies, digital infrastructure, services, and digital data. The digital economy refers to all producers and consumers, including the government, who utilize these digital inputs in their economic activities (OECD, 2020) [2].

2. The Digital Economy and Society Index – A Brief History

The Digital Economy and Society Index (DESI) is a composite index that summarizes relevant indicators of Europe's digital performance and tracks the evolution of EU Member States in terms of digital competitiveness [9].

Since 2014, the European Commission has monitored the digital progress of Member States through the Digital Economy and Society Index reports. The index measures the progress that European Union Member States are making toward a digital economy and society.

Until 2020, DESI was calculated annually and was composed of five major dimensions: Connectivity, Human Capital, Use of Internet Services, Integration of Digital Technology, and Digital Public Services. Certain dimensions, sub-dimensions, and individual indicators hold greater significance than others, which is why they were assigned a higher weight in the calculation of the final index score for each country.

In 2021, the European Commission adjusted DESI to reflect two major policy initiatives that will impact the digital transformation in the UE in the coming years:

- The Recovery and Resilience Facility;
- The 2030 Digital Compass.

To align DESI with the four cardinal points (Digital Skills, Infrastructure, Business, and Public Services) and the targets within the Digital Compass, and to improve the methodology while accounting for the latest technological and policy developments, the European Commission introduced a series of changes to the 2021 edition of DESI.

In 2021, the DESI indicators were structured around the four main areas of the Digital Compass, replacing the previous five-dimension structure. These four dimensions carry equal importance and are weighted equally.

According to DESI 2021, Romania ranked 27th out of the 27 EU Member States. Regarding Human Capital, Romania ranked 26th, scoring below average on most indicators. Although Romania has a high number of ICT graduates (ranking 4th), the shortage of ICT specialists limits the country's capacity to innovate and take advantage of digital transformation. Conversely, regarding the number of female ICT specialists, Romania ranks 3rd..

In terms of Connectivity, progress continued in 2021 regarding fixed broadband coverage, though the adoption of broadband services advanced at a slower pace. However, Romania ranks 7th due to the high level of utilization of broadband of at least 100 Mbps (52%). Connectivity in Romania could be further improved by focusing on closing the digital divide between urban and rural areas, streamlining permitting procedures, updating the broadband strategy to reflect the 2030 gigabit targets, and transposing the regulatory framework in accordance with EU legislation.

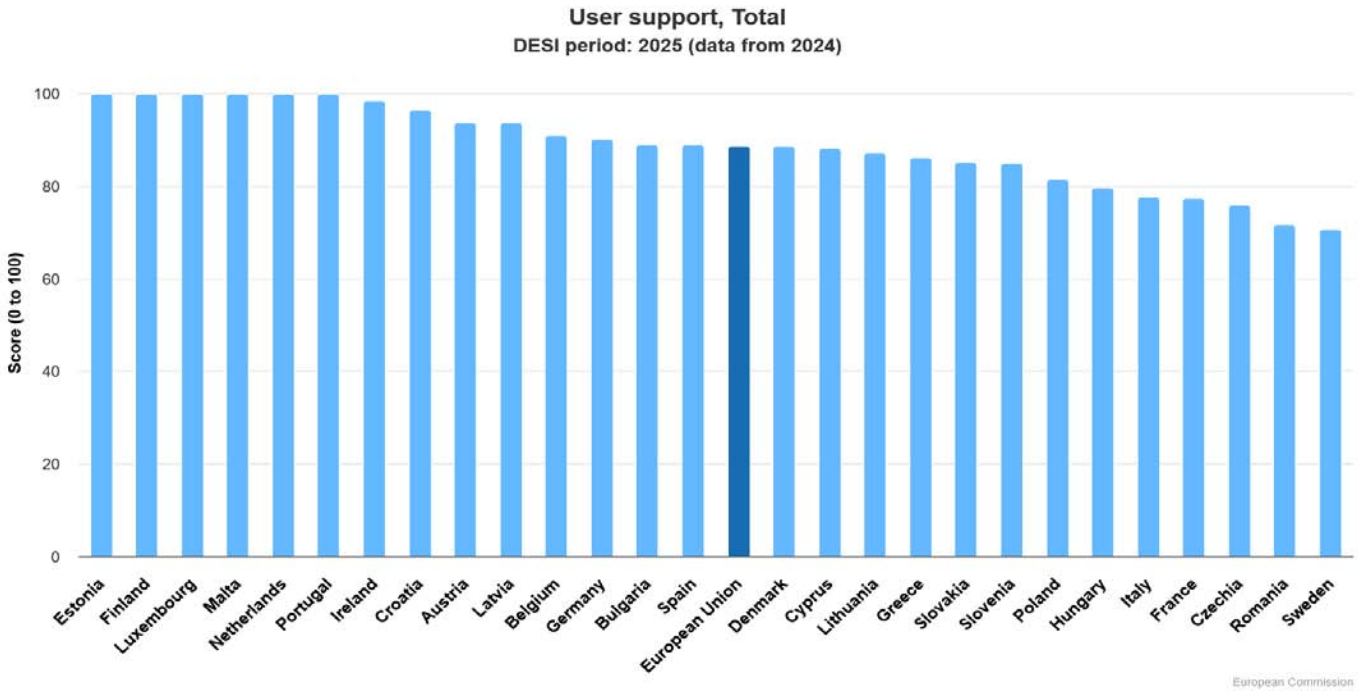
Romanian enterprises do not take full advantage of digital technologies (electronic information sharing, social media platforms, Big Data, and Cloud), with the exception of Artificial Intelligence.

3. The Digital Economy and Society Index – Present

In the following section, we present a comparative analysis of the Digital Economy and Society Index (DESI) for the year 2025 (based on data collected in 2024), focusing on the "User Support, Total" indicator within the digital public services of the European Union.

The data reveals a "two-speed Europe," not necessarily in terms of technology, but in terms of digital empathy..

FIGURE 1 – DESI – USER SUPORT, 2025



Source: https://digital-decade-desi.digital-strategy.ec.europa.eu/datasets/desi/charts/desi-indicators?period=desi_2025&indicator=desi_us&breakdown=total&unit=egov_score&country=AT,BE,BG,HR,CY,CZ,DK,EE,EU,FI,FR,DE,EL,HU,IE,IT,LV,LT,LU,MT,NL,PL,PT,RO,SK,SI,ES,SE

The "User Support" indicator in the DESI (Digital Economy and Society Index) methodology is not an opinion poll, but rather an audit of functionalities. A maximum score (such as those of Malta or Estonia) implies the cumulative existence of the following elements:

- The possibility of receiving help via live chat, telephone, e-mail, and well-structured FAQ (Frequently Asked Questions) sections;
- The "Once-Only Principle" (Data Pre-filling): This ensures the state does not request data it already possesses. A score of 100 implies that the system "assists" you by automatically completing 80% of the form..
- Web Accessibility: The interface is usable by persons with disabilities (compatible with screen readers, high contrast mode), a field where countries at the bottom of the ranking often fail.

A fascinating detail is Sweden's position at the tail end of the ranking, alongside Romania. This is an "anomaly" that teaches us about system design: Sweden has systems so advanced that human support has been reduced to a minimum. If the system encounters a logical error or the user does not fit the standard patterns, they remain stuck. The low score indicates a rigidity of support, rather than a lack of technology.

The Hybrid Model promoted by Malta and Portugal: These countries have understood that forced digitalization can alienate citizens. They have invested heavily in "assisted assistance"—physical centers where officials help you use digital platforms. Their scores of 100 reflect an inclusive transition, not just cold algorithms.

Why is Romania so low? A deep analysis reveals three structural barriers:

a. Administrative Fragmentation: Each institution has its own portal, with different support rules. The user must learn the "language" of each site, which drastically lowers the usability score.

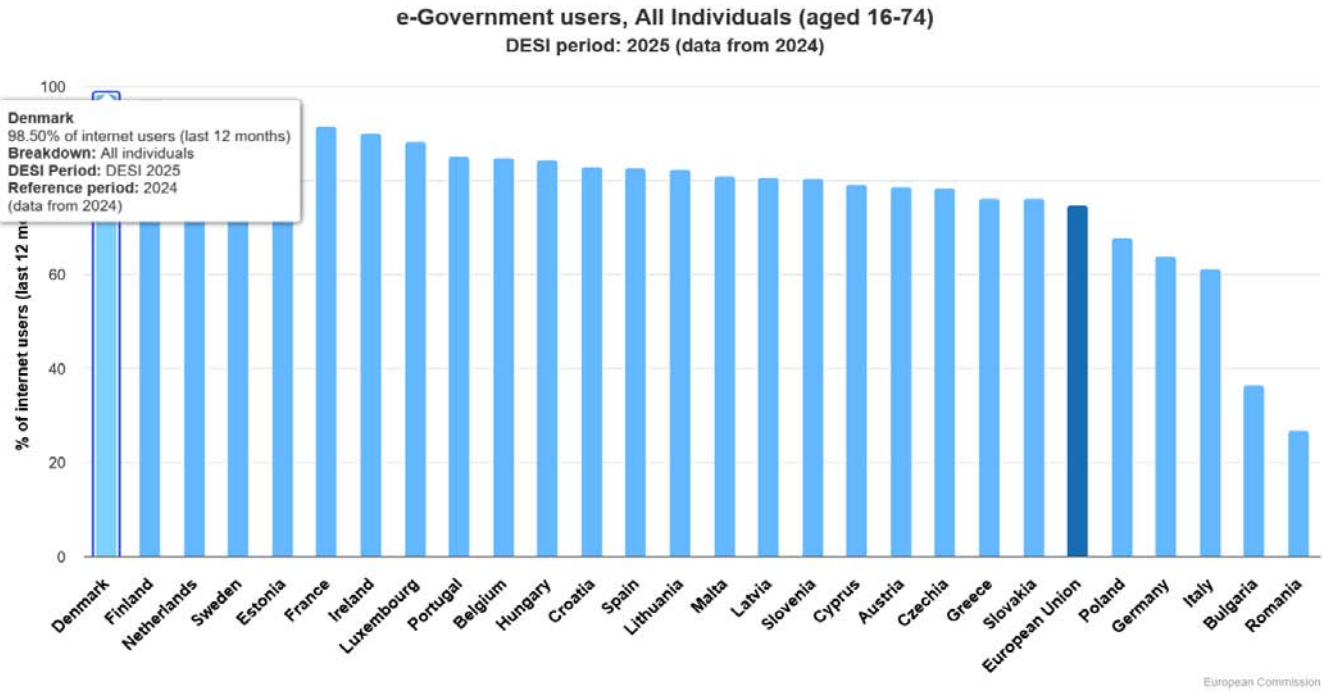
b. Digital "Legalese" (Bureaucratic Language): Instructions on Romanian public websites are often verbatim transcriptions of laws rather than step-by-step guides. Support fails because it is not "translated" into terms the citizen can easily understand.

c. Lack of Real-time Feedback: While in Finland a chatbot can resolve a login issue in 30 seconds, in Romania support often depends on an e-mail that is answered within the legal timeframe of 30 days.

This chart is, essentially, a measure of respect for the citizen's time. The countries on the left view the citizen as a client; the state competes with the private sector in terms of ease of use. If the support score is 100, it means the state assumes responsibility for any system error. Countries on the right view digitalization as an obligation. The state shifts the bureaucratic burden from the physical counter onto the citizen's shoulders in front of the monitor, but without providing the "assembly instructions." The difference between the two sides of the chart is not one of internet speed or more expensive servers. It is a difference in organizational culture. Top countries have digitalized the service, while countries at the bottom have only digitalized the bureaucracy.

Next, we will present a comparative chart of the DESI index for the 2025 period (based on data collected in 2024), focusing on the "E-Government Users" indicator.

FIGURE 2– DESI – E-GOVERNMENT USERS, 2025



Source:https://digital-decade-desi.digital-strategy.ec.europa.eu/datasets/desi/charts/desi-

indicators?period=desi_2025&indicator=desi_egov_users_anys&breakdown=ind_total&unit=pc_ind_ilt12&country=AT,BE,BG,HR,CY,CZ,DK,EE,EU,FI,FR,DE,EL,HU,IE,IT,LV,LT,LU,MT,NL,PL,PT,RO,SK,SI,ES,SE

To understand the chasm between 98.5% (Denmark) and 27.7% (Romania), we must view this chart as a story about trust and digital literacy, not just internet connections. This is the chronicle of a fragmented Europe, where digital identity is either a daily "superpower" or an insurmountable bureaucratic barrier. The Danish user knows that if they make a mistake, the system will immediately correct or assist them. Digitalization has become so natural that it has ceased to be "technology" and has simply become "the way things get done".

At the other end of the spectrum, in Romania, the story is one of frustration and analog resilience. Although the internet infrastructure is fast, a usage rate below 30% speaks of a citizen who feels abandoned by the system.

For example: Imagine a 55-year-old citizen from a rural area trying to access a public service. He encounters a support score of 71 (the lowest in the previous chart), which means the interface is unclear, instructions are in heavy legal jargon, and help is non-existent. This user is not "digitally illiterate," but rather a pragmatic person. He chooses to physically go to the counter, stand in line, and speak with an official because there he has the certainty that the problem will be resolved. In the Romanian digital environment, the uncertainty of failure is too high.

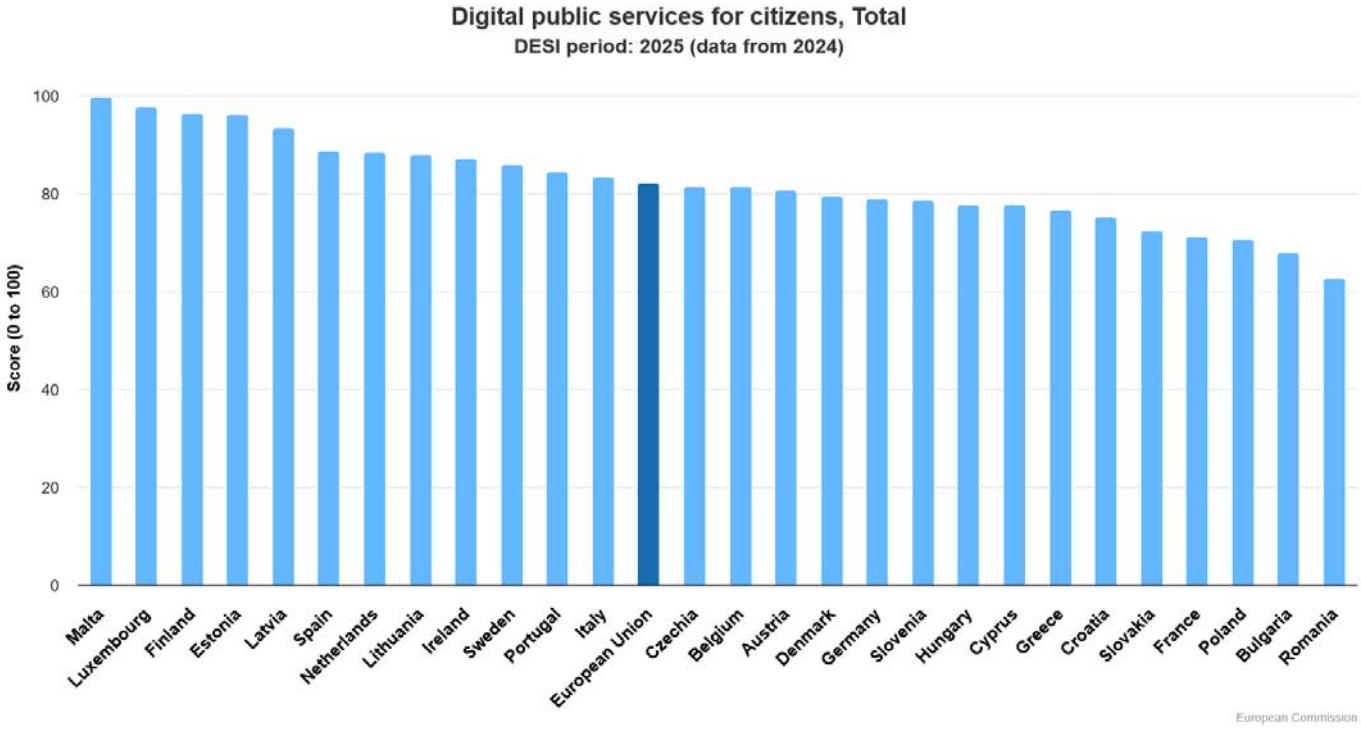
A closer look at the lower-middle of the ranking shows Germany and Italy. Here, the story is not about a lack of funds, but about a bureaucracy that refuses to die. Although they have resources, these countries have remained stuck in a tiring hybrid: the citizen must print a digital document, sign it by hand, and scan it back. This "halfway digitalization" dampens the enthusiasm for use, leaving many individuals outside the system due to sheer procedural exhaustion.

A deeper analysis shows that countries that have managed to cross the 80% threshold (such as Estonia, the Netherlands, or Spain) have invested in a new role: the state as a personal assistant. In these societies, if a citizen does not understand a form, there is an intelligent chatbot or an operator who can take control of the screen (with permission) to guide them..

In contrast, in the countries at the bottom of the ranking, the state behaves like a cold authority: "We have provided the platform; if you do not know how to use it, it is your fault".

Next, we will present a comparative chart of the DESI index (Digital Economy and Society Index) for the 2025 period (based on data collected in 2024), focusing on the "Digital public services for citizens" indicator.

FIGURE 3– DESI – Digital public services for citizen, 2025



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If we view this image as a story of the interface between the state and the individual, it reveals a Europe of technocratic contrasts.

At the top of the pyramid, we find Malta, with a nearly perfect score of 100. Malta's story is one of absolute efficiency; being a small country, it has managed to transform its entire administration into a unified digital ecosystem. It is closely followed by Luxembourg, Finland, and Estonia, all of which exceed the 95-point mark. For a citizen of these countries, the state is "invisible." Digital services are not only available but are designed to be intuitive, covering almost every life event, from birth to retirement.

It is fascinating to observe Germany (below 80 points) and France (approximately 70 points) positioned below the European average regarding the provision of services for citizens. Large states, with complex administrative structures deeply rooted in paper-based bureaucracy, face enormous difficulties in digitizing processes as agilely as the Baltic or Nordic countries. France sits in a surprisingly low position in this ranking, indicating that despite having a digitized population, the services offered by the state remain fragmented or incomplete.

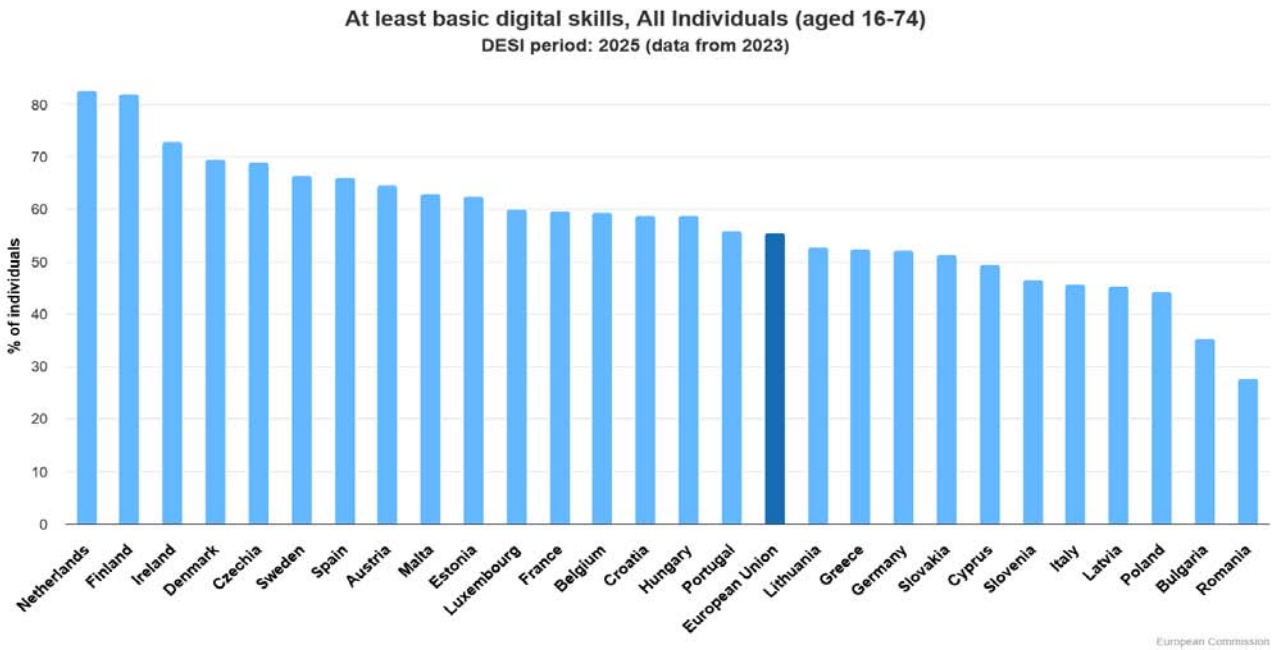
At the right end of the chart, Romania occupies the last position, with a score of approximately 63 points. This is the story of a state still struggling with the basics of administrative digitalization. Although we have seen in other charts that usage is low, this specific chart explains why: with a score of 63, the service offering is simply incomplet.

Many services in Romania are likely "only half-digital": you might be able to download a form but must submit it physically, or you can initiate a request but cannot track its status online. The distance from Bulgaria (the next ranked) and the EU average shows that Romania is not only in last place but is isolated in a performance zone where the citizen is still forced to act as a courier between state institutions.

The gap of nearly 40 points between the top and the bottom of the ranking shows that the European Union is still far from being a "Digital Single Market" from the perspective of public services, with Romanian citizens being, unfortunately, the most disadvantaged in their interaction with authorities.

Next, we will analyze a comparative chart of the DESI index (Digital Economy and Society Index) for the 2025 period, focusing on the "At least basic digital skills" indicator.

FIGURE 4 – DESI – At least basic digital skills, 2025



Source: https://digital-decade-desi.digital-strategy.ec.europa.eu/datasets/desi/charts/desi-indicators?period=desi_2025&indicator=desi_dsk_bab&breakdown=ind_total&unit=pc_ind&country=AT,BE,BG,HR,CY,CZ,DK,EE,EU,FI,FR,DE,EL,HU,IE,IT,LV,LT,LU,MT,NL,PL,PT,RO,SK,SI,ES,SE

The chart on basic digital skills provides the final key to the entire narrative. While we have previously analyzed the "machinery" (services) and the "assistance" (support), here we observe the human resource—the fuel without which the digital engine cannot start.

At the top of the ranking, the Netherlands and Finland cross the 80% threshold. In these countries, the story is one of absolute normality. For eight out of ten citizens, the digital environment is as natural as reading a book. This solid foundation of skills explains why these countries dominate the other metrics. A citizen with high digital literacy will use public services not because they are forced to, but because it is easier for them.

The European Union average stands at approximately 55%. This is a revealing figure: across the entire bloc, nearly half of the population does not possess basic digital skills. This is Europe's "great brake." It is futile for the state to offer top-tier services (as seen in the case of Malta, which holds an average score here) if the citizen does not know how to use a browser or identify a phishing attempt.

Once again, Romania concludes the ranking, sinking below the 30% mark. Paradoxically, although Romania has some of the best IT specialists in the world and high-speed internet, the majority of the population (over 70%) is digitally illiterate. This is the real reason why the e-government usage rate was only 27%. One cannot expect a population that has not mastered basic skills to use complex digital identity systems, regardless of how good the technical support might be.

It is interesting to observe the contrast with Estonia (over 60%) or Czechia (nearly 70%). These countries understood that digitalization begins in schools and adult training centers. Their story shows that the gap can be closed if there is a strategy for mass literacy, rather than just investments in servers..

4. Conclusion

A combined analysis of these charts demonstrates that digital excellence is not an accident, but the result of perfect alignment. States such as the Netherlands and Finland have managed to close a virtuous circle: they possess a population with high digital literacy (over 80%) that receives impeccable technical support (scores near 100), which naturally leads to a public service usage rate exceeding 95%.

In these societies, technology has become invisible. The state is no longer an entity one must visit, but a platform one uses—just like a social network or a banking application. Their success proves that when user support is treated as a priority, the barriers between the citizen and the administration vanish.

At the opposite pole, Romania's story is one of disconnection between investment and social impact. Romania presents a digital risk profile that is unique within the European Union. With a score of 63 in digital public services, the state has built the "walls" of a modern administration, but the interior remains uninviting. Having the lowest rate of basic digital skills (under 30%), the majority of the population views these services as a foreign alphabet.

At the same time, the lack of robust support (the lowest score in the EU, excluding Sweden which operates under a different dynamic) condemns the citizen to failure. The usage rate of 27.7% is evidence that a digital infrastructure lacking a massive component of education and assistance is a dead investment.

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