

# Intrinsic aspects of e-Government consolidation across the European Union. Case study: Romania

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**Abstract:** The article presents a brief analysis of the concept, characteristics and dimension of e-Government at European level, while the aim of the authors is to x-ray the measure of digital transformation at EU level, based on a brief mapping of the measures taken so far and the stage of elaboration and implementation of e-government solutions throughout Europe and in subsidiary, in Romania. The article presents the characteristics of e-Government as a tool to improve the interaction between the government and the citizens, as well as with the business environment and even with the administrative staff, within the central and local public administration authorities, through information technologies. Also, opportunities and challenges of the process of consolidating e-Government in Romania can be identified. The conclusions aim, among other things, to highlight e-Government as a modern tool and premise for fulfilling the favorable conditions for e-democracy.

**Keywords:** e-governance; transparency; accountability; efficiency; effectiveness; inclusiveness, digitalization

## Aspecte intrinseci ale consolidării e-Guvernării la nivelul Uniunii Europene. Studiu de caz: România

**Rezumat:** Articolul prezintă o scurtă analiză a conceptului, caracteristicilor și dimensiunii e-Guvernării la nivel european, în timp ce scopul urmărit de autori este acela de a radiografia măsura transformării digitale la nivelul UE, pe baza unei scurte cartografieri a măsurilor luate până în prezent și a stadiului elaborării și implementării soluțiilor de e-guvernare în toată Europa și în subsidiar, în România. Articolul prezintă caracteristicile e-Guvernării ca instrument de modificare a interacțiunii guvernului cu cetățenii, cu mediul de afaceri și chiar cu personalul administrativ, din cadrul autorităților administrației publice centrale și locale, prin intermediul tehnologiilor informaționale. De asemenea, pot fi identificate oportunitățile și provocările procesului de consolidare a e-Guvernării în România. Concluziile își propun, printre altele, să reliefeze e-Guvernarea ca instrument modern și premisă pentru îndeplinirea condițiilor favorabile e-democrației.

**Cuvinte cheie:** e-Guvernare, transparență; eficiență, incluziune, transformare digitală.

### 1. International context

In a rapidly changing world, in which societies develop under the auspices of globalization, **the ICT intervention** has completely revolutionized people's way of living. Thus, the digital revolution imposed a paradigm shift in public administration theories and practices towards a different approach of public management, namely the New Public Management. This approach targets the implementation of decentralization, transparency, debureaucratization, flexibility, efficiency and efficacy, sustainability and market-oriented public services.

The deepening of democratization requires redefining the role of the nation state in relation to its citizens and, additionally applying necessary reforming measures according to the EU societal standards.

In this context, we can note that e-Governance is one of the necessary and rather essential reforming measures, which involves the digitalization process of the public sector, by means of information technology applications, in order to facilitate several types of interactions/exchange of information, namely: G2G (government to government), which include also G2E (government to government's employees), G2S (government to state, municipal or local agencies); G2C (government to citizens) and G2B (government to businesses), as one can see in the chart below.

**Table 1.** E-Governance particularities of the interactions/exchange of information types

Nr. Crt.	Types of interactions/exchange of information	Particularities of the interactions	Areas of interaction
1.	G2G, which includes G2E and G2S	Sustains the exchange of information between the computer systems of public entities, for different levels of security.	Fingerprints scanning and verification Electronic entry of paper works and reports e-Secretariat, e-Police, e-Court
1.1.	G2E	All online interactions between government and its employees, with the help of electronic technologies and Internet (intranet included)	e-learning methods share of knowledge among the employees
1.2.	G2S	All online interactions between government and municipal or local agencies, with the help of electronic technologies and internet (intranet included)	Intranet platforms of communication Complex databases for cases of good practice in different fields of activity
2.	G2C	Interactive, bidirectional exchange of information hosted by public institutions on websites or various governmental portals, with the aim of providing different online public services	Transportation Hospitals Education Online job portals
3.	G2B	Interactive, bidirectional exchange of information, with the aim of providing various online public services to companies	e-taxation getting a license secure electronic transactions

*Source:* Authors adaptation, based on the data collected and processed from [www.schoolofpoliticalscience.com](http://www.schoolofpoliticalscience.com)

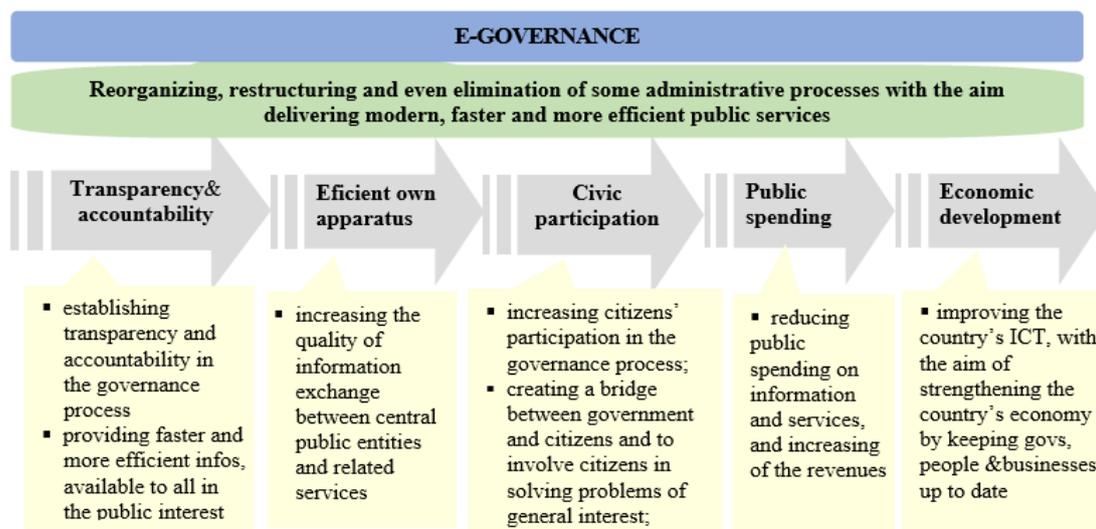
If one should summarize, the main features of e-Governance envisage reducing bureaucracy, increasing the efficiency of the administrative mechanism by providing e-services (on national as well as on international level), enhancing transparency and citizens' access to public information and therefore citizen's participation in public decisions making, supporting the economic development.

Access of information is the key factor for making democracy successful. Therefore, according to (Ailioaie et al, 2002), citizens can exercise some of their fundamental rights by means of efficient tools provided by the government, such as: involvement in the decision-making process (decision-making transparency), online sending of complaints, petitions, feedback, paying taxes etc.

In this context, an essential aspect must be clarified, namely that e-Government is governance by electronic means, regulated by means of regulations, laws and policies necessary for developing cooperation between government units, citizens and the business sector, providing electronic services. In fact, E-Governance is a component of e-Government alongside e-Democracy, e-Administration and e-Government services.

Thus, E-government provides the institutional basis for the development and implementation of information policy, while e-Governance aims to manage the information of the administrative system in the virtual space. However, in practice, all three concepts are commonly used as a single term with integrative semantics.

In Figure 1, below, one can very well observe the main generally accepted objectives of E-Governance (Transparency and accountability, Civic participation, Public spending and Economic development) and their subsequent features.



**Figure 1.** E-Governance Scope and Objectives

One can conclude that the implementation of e-Governance measures and actions is done based on the state-citizen (“*top down*”) approach.

## 2. E-Governance development in the European Union – Public administrations - digital transformation state-of-the-art

At EU level, E-Governance is seen as a prerequisite of the future, which can bring a variety of digital benefits to both citizens and businesses, fostering resilience. Moreover, the E-Government strategy is European Commission’s (The Commission/COM) requirement for all Member States, since 2000, willing to include all social categories as beneficiaries of E-governance services, in order to use the technology for more effective governance and to create a trusted and secure European electronic identity.

In fact, *The Digital Agenda for Europe*, the first e-Government Strategy of the EU was released in 2010. Ten years later, in September 2020, the President of the European Commission announced the Commission’s goal to deliver a trusted and secure digital identity to all EU citizens (see the *State of the Union* address)-

The European vision of the digital transformation (Commission's Digital Strategy of February 2020) is based on three main pillars, each comprising measures in the benefit of citizens, business and of government apparatus itself:

- I. *Technology that works for the people* (investing in digital skills of EU citizens; protecting people from cyber threats to personal and sensitive data; developing a “human-centric” AI; expanding the ultra-rapid broadband for households, schools, hospitals; enlarging Europe’s super-computing capacity)
- II. *A fair and competitive digital economy* (supporting the expanding of innovative and rapid developing start-ups and SMEs, protecting customers’ interests in relationship to online service suppliers (online platforms), while strengthening platforms responsibility by proposing certain rules for online services, meant to ensure equitable competition of all enterprises across Europe.
- III. *An open, democratic and sustainable society* (making use of technology able to sustain climate-neutral targets set by 2050; reducing carbon emissions of the digital sector; granting citizens a much higher control and protection of personal data; creating a “European health data space” to support research, diagnosis and targeted treatment; fighting online disinformation).

Likewise, European Commission's Communication "*Shaping Europe's Digital Future*", from March 2021, is based on a previously published document of the Commission, namely the *EU Digital Strategy* (February, 2020) and it represents an innate outcome of the European Council's call for a 2030 "Digital Compass", claiming for a series of digital principles, the so-called four cardinal points to be achieved by 2030, as presented in the chart below:

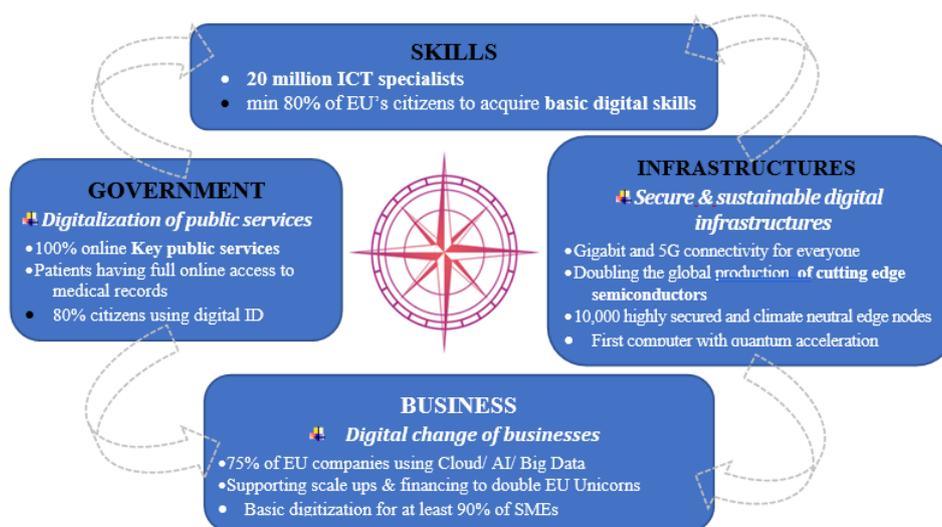
**Table 2.** Cardinals points and objectives of EU's 2030 "Digital Compass"

Cardinal points	Objectives by 2030
<b>Digitally skilled citizens and highly skilled digital professionals</b>	<ul style="list-style-type: none"> <li>▪ at least 80% of adults should have basic digital skills</li> <li>▪ 20 million ICT specialists employed in the EU</li> <li>▪ Increasing the number of women in ICT sector</li> </ul>
<b>Secured, performing and sustainable digital infrastructures</b>	<ul style="list-style-type: none"> <li>▪ gigabit connectivity should be available in all EU households</li> <li>▪ 5G coverage in all populated areas across the EU</li> <li>▪ owning 20% of the worldwide production of durable semiconductors and processors</li> <li>▪ implementation of 10,000 marginal nodes, climate-neutral and with a very high level of security</li> <li>▪ developing the first quantum computer made in EU;</li> </ul>
<b>Digital transformation of businesses</b>	<ul style="list-style-type: none"> <li>▪ cloud computing services, big data and AI usage in ¾ of EU companies</li> <li>▪ more than 90% of SMEs having basic level digitization</li> <li>▪ doubling the number of EU unicorns</li> </ul>
<b>Digitalization of public services</b>	<ul style="list-style-type: none"> <li>▪ 100% of key public services should be available online</li> <li>▪ granting full access to personal e-medical records for all citizens</li> <li>▪ 80% of citizens should be using an e-ID solution</li> </ul>

*Source: own source, based on the information collected from EU's "Digital Compass"*

The "**Digital Compass**" provides a targeted monitoring system, which generates annual reports based on indices /traffic lights in areas such as: digital skills, digital infrastructures, digitalization of businesses and public services.

The Commission shall review the targets by 2026 in order to adapt them to technological, economic and social developments. Additionally, in September 2021, the COM proposed a practical Plan to achieve EU's digital ambitions for 2030, the so-called "*Path to the Digital Decade*", in order to reinforce the digital leadership of the European Union, to empower citizens and businesses and to promote sustainable "human-centred" digital policies.



**Figure 2.** Vision and avenues for EU's digital transformation by 2030 (TARGETS)

*Source: Adapted by authors, based on the data available on the COM website [https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030\\_en](https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en)*

Since the launching of *The Digital Agenda for Europe*, which was the first e-Government Strategy of the EU released over 10 years ago, the EU Member States issued various political strategies, action plans or roadmaps to digitize their public services and promote interoperability and the overall functioning of public administrations, in order to cope with the changing technological landscape.

Thus, the majority of the Member States have already focused on developing strategies and the legislative framework to further support the infrastructure for e-Government (e.g.: implementing/improving e-ID and e-Signature solutions, e-Delivery for document and data exchange, Re-use of Public Sector Information, introducing of e-Procurement systems as a tool for efficiency and transparency).

In the following, the main achievements of the public administrations of the EU Member States will briefly be presented, in terms of creating and implementing the strategic and legislative framework for E-Governance, by means of electronic public services delivery.

## 2.1. E-Government infrastructure

Most EU MS worked on adopting the basic infrastructure building blocks for e-ID, e-Signature, e-Invoicing, e-Procurement, e-Delivery, as follows:

- **e-ID** – at the moment, at EU level, there is a draft *Regulation establishing a framework for a European Digital Identity* amending *e-IDAS Regulation*, under negotiation. The proposed amendments will strengthen the Single Market by introducing a unique electronic identification for businesses and citizens allowing them to identify themselves online and to securely access digital public services. The new *European Digital Identity* aims to improve, by 2030, the amount of EU citizens able to access key public services by using a digital ID solution. In the same time, the ID solution should grant citizens and business full confidence regarding the protection of their digital identity data and offer them the tools to control access and sharing of their digital data by using the *European Digital Identity Wallet*. By now, only Belgium, Denmark, Hungary, Ireland, Luxembourg, Norway, Portugal and Slovakia, out of all 28 EU Member States, succeeded to introduce the national e-ID. The others, including Romania, are working on identifying the tools and the necessary infrastructure to introduce a single e-ID for citizens and businesses, based on the final agreement of the COM and the Member States on the final form of the text of the *Regulation establishing a framework for a European Digital Identity* to be adopted by 2023.
- **e-Signature** – at the moment, the e-Signature is regulated by the *e-IDAS Regulation* in force. Starting 2018, all Member States have introduced this digital feature for the citizens and businesses, as a way to sign documents in virtual interactions. Since 2016, Romania introduced the obligation for public institutions to accept documents issued by public/private entities electronically, having a qualified or advanced electronic signature;
- **e-Invoicing** – e-Invoicing is regulated across EU since 2018, by the Directive 2014/55/EU on electronic Invoicing in public procurement, which significantly contributed to simplifying public procurement procedures and improving transparency. For Slovenia the introduction of mandatory use of electronic invoices for any goods and services, in 2015, represents, as it declares, one of its main achievements in the domain of e-Government in the past 10 years. Finland is among the EU Member States, which introduced mandatory e-Invoicing since 2010, so that at present over 95% of Finland's invoices for public procurement are being electronically issued. Its aim is to reach the 100% issuance. Even though Romania has already transposed Directive 2014/55/EU through the Law 199/2020 on electronic invoicing in public procurement, since September, 2020, there are no centralised platforms to process e-Invoicing in Romania yet. Therefore, Romanian economic operators have no limitations to choose their service provider to submit e-Invoices to contracting authorities.
- Fiscal Code, in force starting the 1st of January 2016, and its implementing rules approved by Law 227/2015 are governing the electronic invoicing (e-Invoicing) in Romania.
- **e-Procurement** – thus including all its features e-Notification, e-Access to tender docs, e-Submission- was implemented across EU, since 2016, through Directive 2014/24/EU on public procurement which reformed public procurement procedures, by simplifying them and

by increasing their transparency and efficiency. In this regard, Greece considers the establishment of its National Electronic Public Procurement System to be one of its main digital achievements in the past 10 years. Since 2015, Romania has been concerned with aligning to European standards, thus the first strategy in the field (for 2015-2020) aimed at reforming the national public procurement system, as well as by implementing mandatory, phased, electronic procurement. Thus, the core of the Romanian public procurement legislation consists of Law 98/2016 on public procurement, Law 99/2016 on utilities procurement and Law 100/2016 on works concession contracts and services concession contracts and the corresponding secondary legislation. Thus, starting 2006, contracting authorities are obliged to conclude 40% of their annual public procurement contracts worth more than EUR 30,000 through electronic methods

- **e-Delivery** – is an important step in achieving interoperability and developing e-Government and it was implemented by most of the EU Member States by now, to a greater or lesser extent. E-Delivery contributed to facilitating the electronically exchange of data and documents. In this regard, Belgium with its *Federated Service Bus* and Portugal with its *Public Administration Interoperability Platform* consider their e-Delivery projects as their greatest digital achievements in the last decade, which delivered dematerialization of public services through certain standards that allow technical and semantic interoperability between different information systems. The Romanian Virtual Payment Office (Ghiseul.ro), an operational and still under development platform, which was launched in 2006, allows citizens to make electronic payment of fines, taxes and other fiscal obligations via bank cards. The platform was upgraded with an access point called e-Delivery, responsible for the interconnection with other information systems for data exchange.

## 2.2. E-Government platforms

All European public administrations have already developed platforms to interact with their citizens and businesses. Usually, the majority of EU Member States implemented a one-stop shop type of portal, where all necessary services can be accessed, while the rest of them have separate portals, dedicated to citizens or businesses, in some cases to the judiciary or even to health system.

E-Government platforms are considered key enablers of e-Government, granting citizens and businesses access to secure online public services through their e-ID and by signing any documents using e-Signature. A good practice example is the Lithuanian Government's platform SIRIP, both a central electronic service delivery portal and a data exchange platform, which unites 200 institutions and provides access to over 610 services. Malta, for example has focused on improving its public services by providing a large proportion of its digital public services for its citizens through mobile applications. Both countries consider the creation of e-Government platform as their main achievements in the field in the last decade.

## 2.3. The publication of Open Data

All EU countries make constant efforts to open up their public data and make it easy to reuse, share and understand. In fact, all EU Member States had to transpose *The Open Data Directive*, replacing the Public Sector Information (PSI) Directive, by 16 July 2021. So, the efforts might further contribute to a larger extent of opening the public information data in EU Member States and facilitating its reuse by different entities.

Additionally, Member States' performances are being monitored through The European Data portal, based on the following main categories: (1) Open Data readiness in terms of Policy and Use – policy (presence policy, national coordination, licensing norms), use of data; portal maturity (usability, reusability of data and spread of data across different domains); and (2) Open Data readiness in terms of Impact – political, social, economical impact. Sweden adopted its *Law on the Re-use of Public Sector Information* in 2010 built around two key strands of the internal market: transparency and fair competition. Austria and Cyprus delivered good performing projects of

E-Government portals and thus they are among the countries which consider the creation of their open government portals as one of their main eGovernment achievements in the last 10 years.

## **2.4. The strengthening of digital skills**

It is obvious that a lack of digital skills restrains the digital transformation of a society, as electronic provided services cannot be accessed to their real extent, due to this limitation.

The COVID-19 crisis, which equated to restricted mobility, has proved once again that adequate digital skills empower citizens to access crucial information and services. Moreover, it deals with a bidirectional situation, as it also affects the service providers such as: public servants who virtually interact with citizens and businesses, professors holding online lectures, medical staff providing online assistance and data processing).

In 2019, at EU level, the percentage of people having at least basic digital skills had reached 58% (an increase of 3% compared to 2015 data), but unfortunately there is a large amount of EU population lagging behind in terms of basic digital skills. In this regard, Finland, Sweden and Estonia are the best performing EU countries according to the Human capital dimension of the DESI index. Portugal is also a good example in terms of dedicated Citizen Spots meant to increase citizens' skills to access its digital public services, regardless of their age, social and economic background or geographical distribution.

According to the I-DESI 2020 Report, there is a shortage of ICT specialists on the labour market: "64% of large enterprises and 56% of SMEs that recruited ICT specialists during 2018, reporting hard to fill vacancies for ICT specialists" (e.g.: 80% of companies in Romania and Czech Republic that recruited or tried to recruit ICT specialists were confronted with this problem).

## **2.5. E-Government services delivered to citizens**

Prior to the COVID-19 crisis, the quality and usage of digital public services followed an uptrend, already proving the convenience of electronic documents and procedures over paper-based ones. Moreover, the COVID-19 pandemic proved the importance of continuous governmental activities in times of social distancing. Progress has been achieved, but there is more to do in this area, including e-health services (telemedicine, electronic prescriptions and medical data exchange) and implementing innovative solutions based on AI technologies. Still, there are some success stories such as that of Czech Republic, Latvia or Spain, where the e-Prescription is already well delivered to citizens, while Hungary has successfully implemented the Electronic Health Cooperation Service Space, providing access to medical data by patients and medical staff, among many other services. This process has to be extended to other EU Member States as soon as possible, especially since according to the results of the Eurobarometer (2020), more than 50% of European citizens desire full online access to their own medical and health record.

Commonly e-Government services delivered to citizens in most of the EU countries are spread between other life-event categories, with a predominance of services related to "Residence and other formalities" and "Work and Retirement". Estonia, Spain, Denmark, Finland and Latvia are top performers in terms of e-Government services delivery to citizens.

## **2.6. E-Government services delivered to businesses**

All Member State governments aim to provide digital public services to the private sector, in order to facilitate their functioning and reduce administrative burden. Furthermore, the use of advanced digital technologies, such as artificial intelligence, internet of things, cloud computing and big data analysis will enhance efficiency and productivity and will deliver new opportunities for European businesses in all sectors, all of which are crucial for the economic recovery after the COVID-19 pandemic will be over.

The Single Digital Gateway (SDG) Regulation as well as the e-IDAS Regulation are two important tools for sustaining the digital transformation of governments and the creation of cross-

border services as part of the Digital Single Market. Cross-border digital public services are essential for businesses in order to operate to their full potential. The results were not long in coming, so that in the last year, 14 new online public services have been made available to businesses across European Member states (e.g.: The online registration of businesses in Sweden, the Greek Business Portal, Czech web Business portal etc).

Further progress still needs to be done on cloud computing and big data applications for private sector, especially for SMEs, as in 2020 only 17% of SMEs relied on cloud services, while other 12% on big data applications. Finland is the leading country in terms of cloud services with more than 50% of companies, while Malta is a leader in terms of big data applications – a quarter of companies making use of such services.

Top performer countries registering the most significant progress in the analysed timeframe is Ireland, followed by the Netherlands, Malta and Spain. What these states have in common is sustainable and targeted policies and efficient investment in the five areas covered by the DESI analysis.

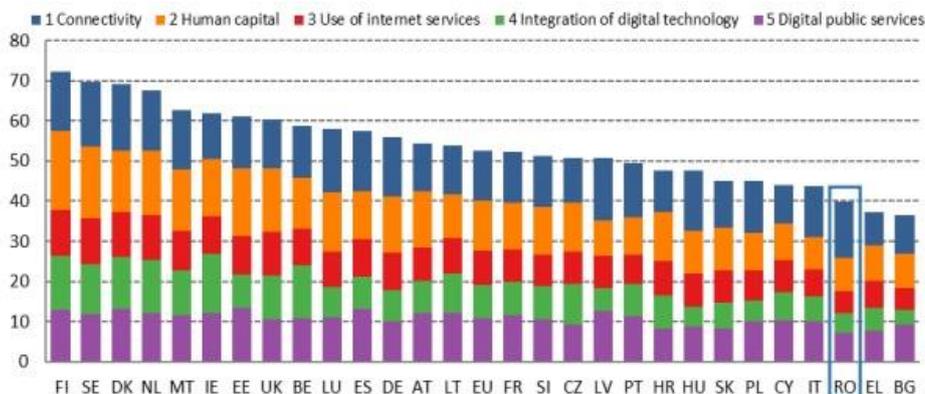
Finland, Sweden, Belgium and Germany are amongst the leaders in overall performance in digital transformation, but over the last five years, their progression slightly overpasses the EU average. Estonia, Denmark and Luxembourg remain amongst the well performing Member States in the overall DESI ranking, even if they registered low progression in the analysed timeframe. Even if Estonia is well known for being a success story in digital transformation and providing online public services, its weakness is related to connectivity and the digitization of businesses. Digitization of businesses is also relatively low in Luxembourg. Regarding Bulgaria, Greece and Romania, which are considered the worst performers in terms of digitization level, no significant progress could be seen in the last five years, but fortunately, they have recently launched several reforms and results may be visible in the near future.

### 3. The current stage of e-Governance development in Romania

As mentioned in the previous sub-chapter, according to the DESI Report, Romania is among the worst performers among EU Member States and it is ranked the last but one place regarding the level of overall digitization. There are various reasons for that, perpetuated over time, starting from slow overall progress and continuing with incoherent and unsustainable measures due to political instability.

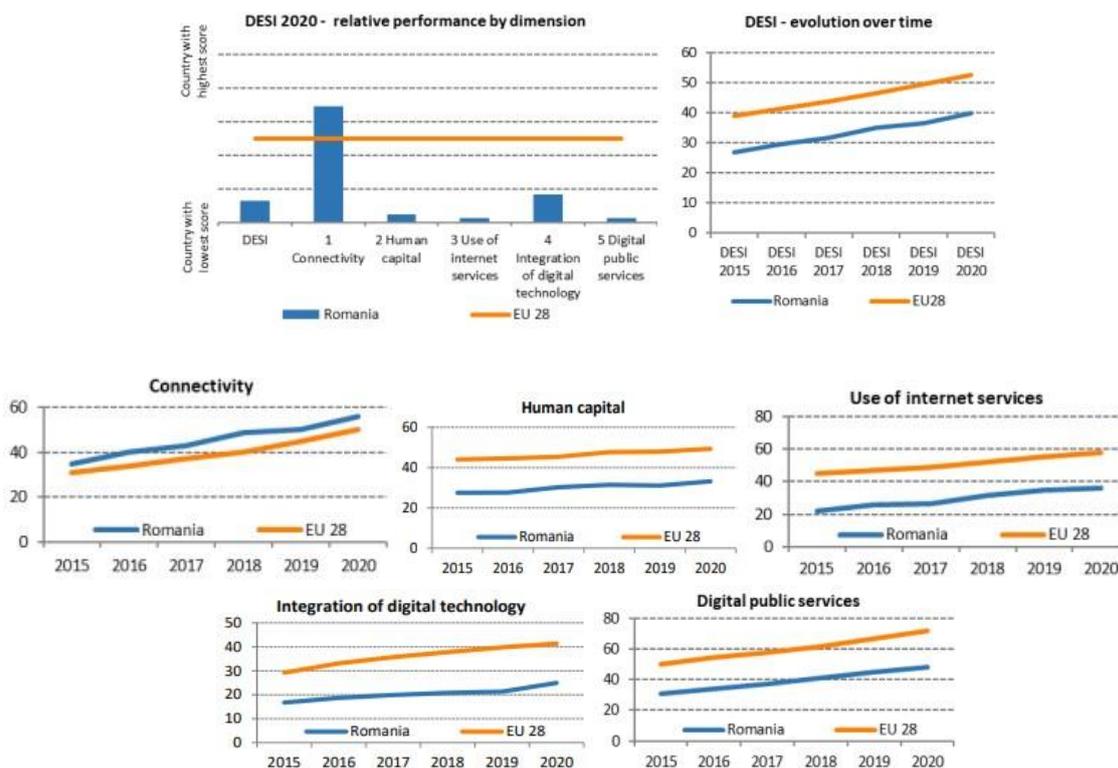
Next, we will briefly analyse Romania's performance in terms of the five DESI indices.

As a general overview, we can see from the chart below that Romania has registered the most significant performances in terms of connectivity, also due to the fact that the implementation of ultra-fast broadband and fixed networks of very high capacity has been outstanding, especially in urban areas.



**Figure 3.** Digital Economy and Society Index, 2020

*Source: I-DESI Report Romania*



**Figure 4.** Romania's performance, according to Digital Economy & Society Index, 2020

*Source: I-DESI Report Romania*

(1) Regarding the **Connectivity dimension** (fixed broadband services, mobile broadband services and prices), Romania ranks 11<sup>th</sup> among Member States. Main features:

- fast broadband coverage increased to 82%, but still poor compared to EU average of 86%;
- in recent years, the use of broadband remained at the same level of 66% of all households, compared to the EU average of 78%.
- 68% coverage of VHCN (fixed very high capacity network) and 49 % coverage of at least 100 Mbps fixed broadband take-up;
- 39% of rural areas are VHCN covered, compared to EU average of 20%;
- 21% 5G readiness, the same as the EU average.

The well performance in terms of VHCN coverage is related to the strong infrastructure-based competition, mainly in urban areas.

(2) Regarding the **Human Capital dimension** (Internet use, basic and advanced digital skills), Romania ranks 27<sup>th</sup>. Main features:

- 1/5 of the Romanian population has never used the internet;
- 1/3 of Romanians aged 16-74 have at least basic digital skills, compared to EU average of 58%;
- 35% of Romanians aged between 16 and 74 have at least basic software skills, compared to the EU average of 61%;
- 2.2% of workforce are ICT specialists, against an EU average of 3.9%;
- Women, ICT specialists, represent 1.2% of total women employment;
- 5.6% ICT graduates of all graduates, ranking 5 among the EU Member States.

There are some important measures in this area, taken by the Romanian authorities, among which the following are worth mentioning: the project aimed at simplifying the administrative area of the national education system, being under implementation; The "Wi-Fi Campus" project, in its implementation phase, which will provide wireless internet access service for schools, with priority for secondary schools and The EDULIB – Virtual Library open educational resources, digital

platform projects, mainly for high schools, facilitating free access to electronic textbooks and other electronic educational resources.

**(3) Regarding the Use of internet services** (use of content, communications and online transactions for citizens), the behaviour of the Romanian citizen reveals:

- 18% of the population aged 16-74 never used the Internet, compared to EU average of 9%; Thus, Romania has the lowest usage of internet services among the EU Member States;
- 3% of Romanians use the internet for online selling;
- 4% follow online courses;
- The usage of social networks is 82%, versus an EU average of 65%;
- The usage of video calls is 67%, compared to EU average of 60%;
- The lowest usage of online banking (11%), shopping (29%), reading news (55%), as well as the consumption of music, videos and online games (63%), among the Member States.

**(4) Regarding the Integration of digital technology** (digitization of companies and e-commerce):

- Only 23% electronic information sharing among the Romanian enterprises;
- 8% of Romanian enterprises use social media, compared to EU average of 25%;
- 11% of SMEs sell online, compared to 18%, the EU average;
- 6% of SMEs sell online across the border, compared to 8%, the EU average;
- No national digital transformation strategy for enterprises;
- Start-up Nation Program supports start-ups that produce innovations or integrate them into new product and service developments. Romania holds 3 hubs for digital innovation (HDIs), one in Bucharest and two in Cluj-Napoca;
- ICI Bucharest (The Romanian Institute for Research and Development in the field of Informatics) established the European Centre for Excellence in Blockchain (ECEB), a hub for sharing experience between experts, academics, students and entrepreneurs. Also, ICI Bucharest has developed substantial 'in vitro' pilot projects for system-of-systems architectures, based on blockchain technology.

**(5) Regarding the Digital public services** (e-Governance and e-Health), Romania is the worst performer among all 28 Member States and the reasons are:

- no improvement in digital public services for businesses;
- lack of interoperability of IT systems in the public administration;
- a systemic problem with the quality and usability of the services offered for pre-filled forms and online service completion.

A paradox is represented by the fact that Romania ranks 8<sup>th</sup> for e-government users, with 82% of Internet users, versus a 67% EU average, but this can be explained by the fact that the interaction concerns only those internet users who need to submit forms. Compared to the average salary in the Romanian economy, an estimated cost of €40/year per user for a qualified digital signature represents a substantial challenge in terms of providing citizen's digital identity.

Even if Romania lacks performance at many of the reference chapters used in the DESI analysis, since the beginning of the COVID-19 pandemic, the Romanian authorities have been forced by circumstances to implement several measures in the field of digitization. Among them, it is worth mentioning:

- in the field of e-Health, launching a platform in order to centralize all medical data caused by the COVID-19 virus;
- setting up a website for companies in order to electronically submit the necessary documentation for granting technical unemployment;
- launching a platform which grants support to Romanian citizens living abroad;
- the acquisition of 250,000 laptops for scholars living in disadvantaged areas, who are enrolled in pre-university education units, in order to ensure their access to online learning.

## 4. Opportunities and challenges of e-Governance

There is no doubt that the Romanian Government has to speed up the e-Governance reform, but the fact that this is a complex and challenging process must not be neglected. In fact, European Commission's experts themselves recognize that the digital transformation involves both benefits and risks and the subject itself is a sensitive one, with many facets. One of them is the size of the digital revolution and its impact on people. That is why the EU is constantly working on promoting a positive and human-centred digital approach within international organizations and also by means of solid international digital partnerships, as alternative tools.

Romania needs a reshaping of the e-government policies designed based on a shifted strategic framework approach, based on Business Process Re-engineering (BPR) and New Public Management concepts. Based on (Wimmer's, 2002); (2008) findings and on our own research of specialized literature in the field, we can conclude that a valuable strategy in the field has to follow a long-term plan of action and it should consequently be implemented, in stages and under supervision, through sustainable programs and projects.

**Table 3.** Opportunities and Challenges of e-Governance implementation in Romania

Opportunities	Challenges
➤ Improving general economic competitiveness by: increasing the efficiency of activities and the profitability of provided public services	➤ Public digital transformation faces complex challenges from economic issues, social and political matters, to technology innovation
➤ There is a positive link between labour productivity and the degree of digitalization of a country, therefore the increasing of the degree of digitization exponentially equals to an increase in labour productivity, due to: <ul style="list-style-type: none"> <li>- efficiency of activities and creating the possibility to continuously optimize and innovate</li> <li>- reduced time to provide various services through digital technologies, thus allowing faster development of human capital (more skilled workforce and higher innovation skills).</li> <li>- facilitated interaction between economic agents, reducing transaction costs, as well as integrating markets into the value chain.</li> </ul>	➤ The major challenge is the emerged constraints of the general context in which public digital framework operates such as changing political, economic and social dynamics, lack of funding
	➤ Addressing digital initiatives as a very complex challenge, both for central and mostly for local public administration authorities, due to poor coordination between public stakeholders in setting up digital public services.
	➤ The cost of implementing and developing e-governance.
	➤ Lack of citizen's engagement is a key challenge facing e-governance. Most of the people are unaware of the benefits of e-governance services.
➤ Creating a more attractive environment for investment, including foreign investments	➤ The high migration rates of IT specialists from public administration to private entities or even to other countries ( <i>brain drain phenomenon</i> )
➤ Optimizing the use of material and human resources, as well as the time required to provide services	➤ Sniffing packs, probing and cyberattacks still represent major threats to e-Governance. Therefore, any initiative in the field of electronic governance needs a robust security policy;
➤ Decreasing tax evasion by increasing the share of electronic payments (according to estimates - Zandi et al., 2016, the increase in electronic payments could have a 10% impact on GDP over a 5-year period)	➤ The relatively high cost of electronic signature certificates (approximately 40 Euros/year per user);
➤ Designing systems, which clearly reflect on users' needs, ensuring usability and successful adoption	➤ The overall lack of digital skills (alphabetization in terms of digital technologies and access to ICT should be available for all)

## 5. Conclusions

No doubt that the COVID-19 pandemic accelerated the digital transformation and revealed the existing gap between well and poor-connected urban, rural and remote areas, since digital progress in the Member States has been quite uneven in the last years. Moreover, the pandemic proved us that ensuring the continuation of both governmental and business activities, under social distancing measures or even lockdown, is extremely important.

Digital technologies have the strong potential to become a key differentiator in the transition process to a sustainable economy and society, in the post-pandemic context.

One should keep in mind that achieving a high level of digital transformation implies also a certain level of digital skills, as for Romania there is a real challenge as regards the lack of digital skills of the citizens, which makes it rather complicated to access the digital public services. Besides, Romanians compared to other EU citizens tend to be reluctant to changes brought by authorities, also due to their lack of trust in public institutions.

Nonetheless, while there are obvious opportunities available in terms of e-Governance implementation, there are also some concerns. Thus, E-government should be based primarily on added value and, in subsidiary, on technology. The aim is to implement and provide citizens and businesses-centric online public services, having in mind strict principles related to data dissemination, personal data protection, information storage, personal data sharing, big data management.

In conclusion, the challenges of e-Governance implementation confirm once again that e-Governance plays a key role in the current and future development of any country. If governments make the most of the opportunities it offers, e-Governance can greatly improve the efficiency and effectiveness of governance and offer future legitimacy.

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