HELLENIC REPUBLIC

MINISTRY OF DIGITAL GOVERNANCE

Digital Transformation Strategy 2019-2023

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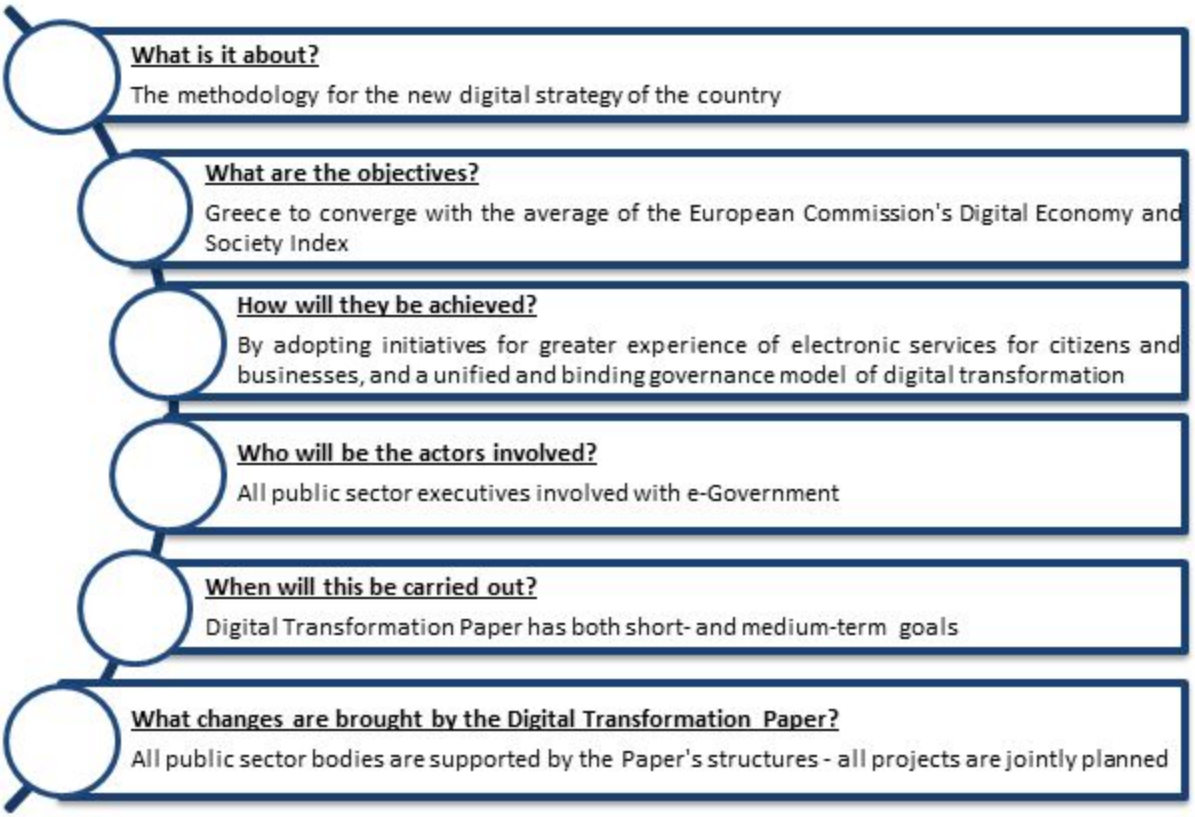
The Digital Transformation Strategy at a Glance:

The Digital Transformation Strategy presents the necessary processes and actions aimed at developing horizontal policies for digital transformation in the public sector of Greece, with measurable goals and measurable quarterly results. The Strategy is the answer to the fragmentation of responsibilities for eGovernment in the public sector, the often overlapping fragmented actions of different actors and organizations and the lack of comprehensive and measurable targeting for digital transformation.
The Digital Economy and Society Index (DESI) of the European Union confirms the common view today: the poor digital experience of those doing transactions daily with the wider Greek public sector. The aim of the Strategy is to describe processes that will lead to more, better and more useful online services for citizens and businesses, with measurable results. **Greece needs to improve its position in the DESI ranking in the European Union, and this is a national target. Modernizing the public administration is not just a matter of bureaucracy or better service; it is a question of transparency and better functioning of democracy. It is also a lever of economic development and is directly related to the field of knowledge and research.** The incision to be made has the dimensions of a national target and requires the coordination of forces from both the public and the private sectors.

At a glance:
What is it about? A guide that identifies the main principles, methodology and implementation plan for digital transformation.

What are the objectives? It aims at the adoption of immediate initiatives that will upgrade the experience of electronic services for citizens and businesses, so that Greece converges with the average of the Digital Economy and Society Index.

How will they be achieved? By implementing a unified and binding governance model of the digital transformation that covers horizontally all the bodies of the central and general government. The coordination is carried out from a central point of administration and supported by appropriate administrative structures and coordination bodies, so as to ensure an efficient cooperation among the institutions of public administration and the effective implementation of this horizontal government priority.



Who will be the actors involved? Everyone, the public sector executives involved with the implementation and support of eGovernment services, in cooperation with the private sector through efficient and transparent procedures.

When will this be carried out? The implementation of the Strategy is based on an effective intervention plan, which includes short- and medium-term goals.

What changes are brought by the Digital Transformation Strategy? All public sector bodies are supported by the Ministry of Digital Governance and all interventions are jointly planned, following transparent procedures. Thus, we overcome the pathogens that arise from the fragmentation of responsibilities, the fragmented actions of different agencies and organizations, and the lack of comprehensive and measurable targeting and implementation for the governmental digital policy.

1. What the Digital Transformation Strategy is about

The Digital Transformation Strategy is a practical guide that identifies the basic principles and the implementation plan of the governmental digital policy, so that to better serve citizens and businesses and to modernize the functioning of the public administration. The Strategy lays down the principles that are required to govern any horizontal or sectoral initiative taken by public administration bodies within the context of implementing this government policy.

The Strategy is not limited to the definition of key principles, but it is practical in nature, focusing on the effective implementation of strategic planning, the fulfillment of concrete and measurable goals, and the improvement of the country's ranking in relevant European and global indexes. This approach is ensured by identifying specific interventions that include (a) improvements to existing systems, (b) short-term priority actions implemented in 6-18 months, and (c) medium-term interventions concerning concrete actions that implement essential services on all policy axes, holding long-term contracts with joint ventures of IT companies.

The adoption of a unified and binding model of governance is a prerequisite for the effective implementation of digital transformation. To ensure this, the Strategy defines all the necessary processes, structures and interactions that guarantee the effective implementation of digital transformation and the promotion of innovation at all levels of public administration.

The Digital Transformation Strategy is updated annually, through an open and cooperative process, so as to meet the needs of public administration, support the strategic priorities of government digital policy, and follow the institutional and technological developments in the fields it deals with.

The Horizontal List of Interventions constitutes a main annex; this further specializes the Strategy by identifying specific interventions per policy axis that implement the digital transformation. The Horizontal List of Interventions is open and dynamic, as it is co-edited and updated every six months in cooperation with the relevant public administration bodies. The regular update of the List is based on a structured cooperative process that ensures its constant adaptation to the rapidly changing technological environment, as well as to the needs and strategic priorities of the public administration. The first edition of the List will be issued in September 2019 through a collaborative consultation process with the eGovernment Directors of all Ministries and the central agencies providing and supporting digital services.

2. Current status in Greece

2.1 Use of online services and internet in Greece

Approximately 8 out of 10 households have access to the Internet, according to the most relevant survey of ELSTAT (Hellenic Statistical Authority) in 2018. 76.5% of households across the country are recorded as having access to the internet, showing a slight increase over the previous year. The same figures reflect the geographical gap in broadband access across major geographic areas of the country. While in Attica the share of households with internet access is 85.3%, the corresponding figure in the Aegean Islands and Crete is just 69.2%, remaining stable compared to 2017.

The principle of "mobile first", as a daily practice of citizens, is confirmed for Greek internet users, too. 81% of internet access devices are smartphones, while tablets also account for a significant share (32%). More generally, it is clear that portable means of access dominate over more traditional ones.

Looking for information is the most common use of internet (90%), according to ELSTAT, followed by chat/ exchange of messages and access to social media. Banking transactions remain relatively low (37%). Nearly half of the respondents declared they use the internet to get information about public sector operations, while only 29% receive actual digital services at least once a year. It is clear that the concept of online services in Greece for 2018 refers to a great extent to information search, rather than real, remote service of the citizens.

40% of respondents in the survey have bought at least one product from the web, of which the vast majority used Greek online stores. Electronics, clothing and tourist services are the most popular goods in this context.

2.2 Greece's ranking in Europe - DESI Index

The Digital Economy and Society Index (DESI) is an annual composite index published every year by the Directorate-General for Communications Networks, Content and Technology of the European Commission (DG Connect).

The figures of DESI over the past 5 years reveal that targeted investments and focused digital policies can have a significant impact on the performance of individual countries. As it happened, for instance, in Spain with the development of ultra-fast broadband connections, in Cyprus with connectivity, in Ireland with digitization of businesses, and in Latvia and Lithuania with digital public services. In

Greece, connectivity has been improved, but remains insufficient to meet the rapidly growing needs.

The report is structured around five chapters:

1. Connectivity	Fixed broadband, mobile broadband, broadband speed and prices
2. Human capital	Internet use, basic and advanced digital skills
3. Use of Internet	Citizens' use of content, communication and online transactions
4. Integration of Digital Technology	Business digitization and electronic commerce
5. Digital Public Services	Electronic government and online health services

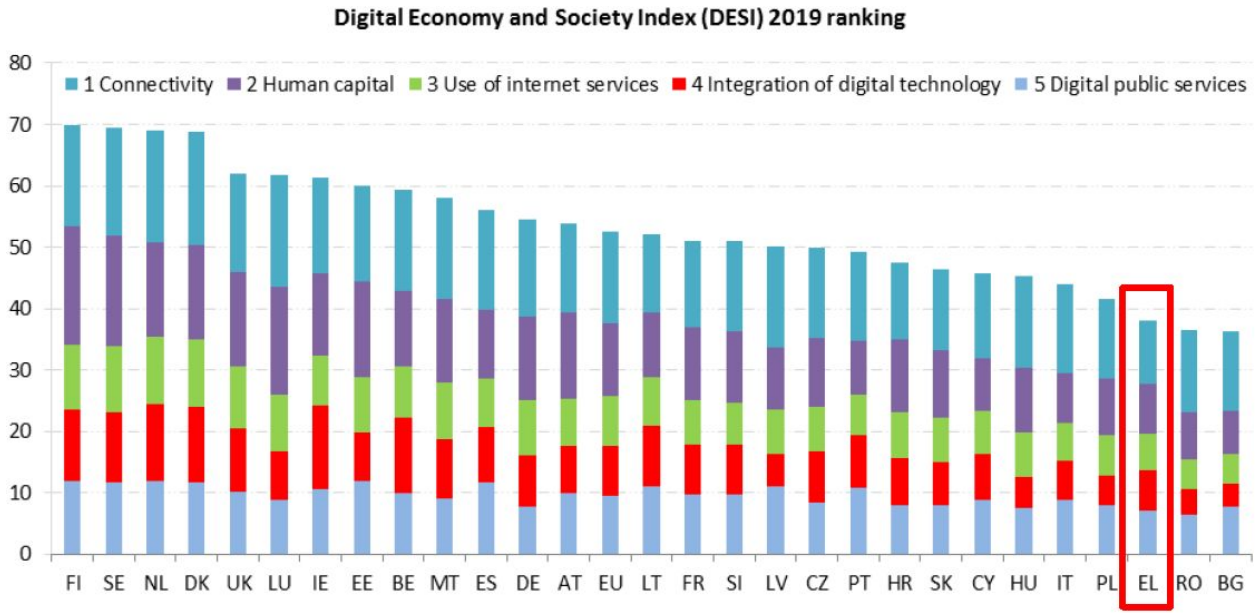
The European Commission has been monitoring Member States' digital competitiveness with the Digital Economy and Society Index (DESI) reports since 2015. The set of reports includes both country profiles and thematic chapters.

The DESI country reports combine quantitative evidence from the DESI indicators across the five dimensions of the index with country-specific policy insights and best practices.

To improve the methodology and take account of the latest technological developments, a number of changes have been made to the DESI for 2019. **The DESI now also covers:**

- ❏ 5G readiness,
- ❏ Above basic digital skills,
- ❏ At least basic software skills,
- ❏ Female ICT specialists,
- ❏ ICT graduates,
- ❏ People who have never used the internet,
- ❏ Professional social networks,
- ❏ Doing an online course,
- ❏ Online consultations and voting,
- ❏ Individuals selling online,
- ❏ Big data,
- ❏ Medical data exchange, and
- ❏ e-Prescriptions.

The DESI was re-calculated for all countries for previous years to reflect the above changes in the choice of indicators and corrections to the underlying data. Country scores and rankings may thus have changed compared with previous publications.



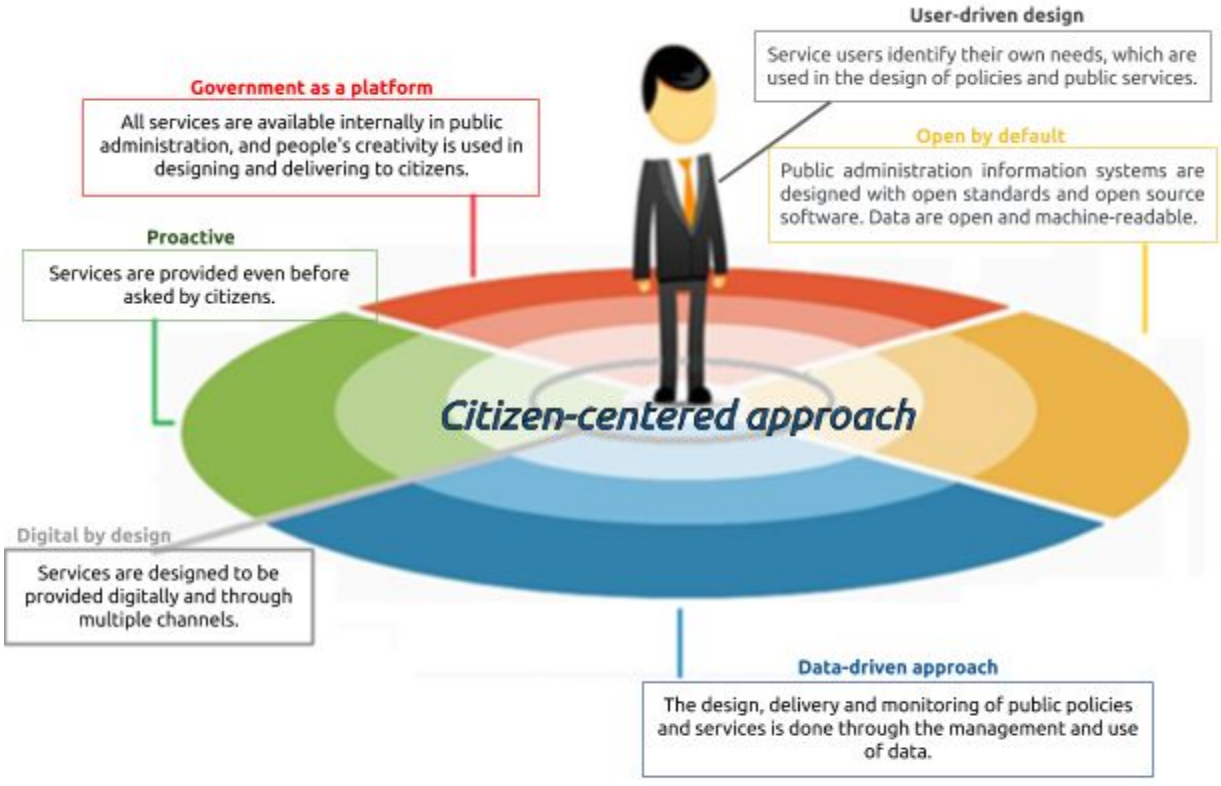
Greece ranks 26th out of the 28 EU Member States in the European Commission Digital Economy and Society Index (DESI) 2019.

3. Design principles of the Strategy

3.1 Core principles for design and development

The achievement of the main objective for the digital transformation of the Greek public administration presupposes the adoption of specific core principles. These principles have to start from the top and be developed at all levels of public administration, so that the transformation to become an integral part of the operation of public sector bodies in the country.

The Digital Transformation Strategy is based on the principles of electronic government as prompted by initiatives taken by both European Commission and OECD. Relevant studies prepared specifically for the Greek public administration, which analyze additional main principles to be met in the design of each new electronic service or information system in public administration, as well as previous years' strategy plans, are also key sources.



Source: OECD

The **”once only principle”** is one of the main principles of government policy on digital transformation. That is, the introduction of information into the public sector strictly once, its placement at a "single" point in public computing systems and, ultimately, the avoidance of repeated input of information and data from different points, which is associated with increased risk of errors and costs for both the citizen/ business and the public sector. Based on this principle, public administration ensures that citizens and businesses submit the same information "only once". The public administration takes measures for the internal further use of these data, with due regard for the rules on data protection, so that citizens and businesses do not bear additional burdens. This process involves:

- a simple and functional **authentication system**,
- the **interoperability** among the services of the narrow and wider public sector,
- the **multiple channels** of service delivery to citizen/ business, but also
- the unified **management of human resources**, and
- the substantial **participation of citizens** in decision-making.

In this context, some main principles that are considered important for achieving the objective of an effective digital transformation of the Greek public administration are summarized:

Digital service

Digital service lies in the heart of the experience of citizens and businesses when interacting with the public sector. Limiting the movement of physical documents and promoting the use of digital data among government bodies, but also while these bodies serve citizens and businesses, is a key objective of this transformation. In any case, citizens stop handling the documents concerning them from one Greek government body to another.

Priority to citizen/ business service through new mobile devices

The provision of services is based on the use of all service channels, with a particular focus on the provision of content and services via mobile devices. Serving citizens and businesses is done, in order, first through smartphones, then through computers, and finally via phone calls (for all those who cannot access the aforementioned options), or by physical presence in the Citizen Service Centers (KEP).

Citizen-centered approach in digital service design

The redesign of digital services is citizen-centered, aiming at providing integrated services that are closer to the beneficiary and respond to their needs. The

public administration must treat its citizens with a similar level of service and principles as in the private sector, in order to cease functioning as a series of individual, unrelated services. Citizen is the main "beneficiary" of public administration, so their service is considered to be its main priority. Citizens require integrated services -and not supporting documents- so as to be served by a public authority.

Transparency, integrity and accountability

Public administration, in order to regain the citizens' trust, must be able to meet their expectations. It must be resource-efficient, unbiased in its operation and transparent. Therefore, it must follow technological trends, habits and the required levels of service. Open and effective management of public information and data, with respect to anonymity and privacy, can provide real content to the state by supporting **evidence-based decision making at administrative and political levels**, and more effective design of public policies and services.

Furthermore, further promotion and adoption of the principles of transparency, integrity and accountability in the operation of public administration bodies, as well as in the transaction procedures between public and private sectors, is a key priority. The use of public data also contributes to the development of innovative value-added services, as well as to the development of the local and national economy.

Reuse of building blocks and solutions

The implementation of digital services is based on a modular development model that ensures the reuse of building blocks and solutions that adopt widespread standards and follow specific quality standards. In addition, the design and implementation of digital interventions takes advantage of the directions and solutions promoted by the European Commission's ISA² program, supporting the development of digital solutions that enable European public administrations, businesses and citizens to benefit from interoperable, cross-border and cross-sectoral public services. The development of the required interventions also taps into the reusable building blocks provided by the European Commission's funding instrument Connecting Europe Facility (CEF), which can facilitate the delivery of digital public services across borders and across all sectors (e.g., eDelivery, eID, eInvoicing, eSignature, Context Broker).

Participation/ Involvement

The involvement of any interested party in the evaluation and design of public services, as well as the application of cooperative models for designing model

solutions, which are implemented with crowdsourcing and through designthons and hackathons, are an important implementation tool and contribute significantly to the initial formulation of these models solutions. A designathon is similar to a hackathon; however, instead of IT specialists meeting to address a given issue, in the former the participants are business designers and designers of citizen-friendly solutions working on a widely-defined challenge for the social good.

Facilitating cross-border service for citizens

Public administration should facilitate the mobility of citizens, especially within the context of the European Union and under conditions of increased mobility of its citizens. For example, millions of European tourists visit our country every year and tens of thousands of immigrants and refugees have settled, while hundreds of thousands of Greeks work abroad in recent years. The public administration must be able to provide all the above groups with the required level of service and the necessary security, transparency and meritocracy.

In more detail, the main principles and the crucial means of applying these principles, including those set out in the European Commission's eGovernment Action Plan 2016-2020, are outlined below:

1. Digital services by default.
2. Cross-border services by default.
3. Inclusive/ integrated services by default.
4. Once-only principle for the provision of citizen and business data to the public sector.
5. Privacy and data protection, incorporating them from the design phase (Personal Data Protection by design and by default).
6. Interoperability by default, ensuring when designing public services for their seamless operation across organizational silos and the Single Market, on the basis of free movement of data and digital services in the EU.
7. Openness and transparency by default, designing projects with open standards, open source software, exchange of data among public bodies, and providing citizens and businesses with the opportunity to control access to and/ or modification of their data and monitor administrative procedures that concern them, as well as involving stakeholders in the design and provision of services.
8. Focus on citizen service: design of services, ICT systems and user interfaces based on citizens' needs (citizen-centered approach).
9. Focus on usability of services, and their availability on a 24/7 basis.

10. Institutionalization and implementation of bilingual access to extrinsic interfaces interfaces of information systems (possibly with the use of automated translation systems and infrastructures).
11. Data collection from the base or source, instead of afterwards data entry.
12. A unique source for each element (DRY principle — Don't Repeat Yourself).
13. Collection of only encoded data.
14. A single point of entry and multi-channel services.
15. Adoption of open standards.
16. Information systems implementation exclusively on cloud computing services.
17. Adoption of a horizontal plan for recording, managing, using and interconnecting base and other registries of public bodies.
18. Continuous evaluation of electronic services by both each body's competent service and their end users (citizens and/ or other bodies).

3.2 Main principles of information management

The new approach "My data"

Personal data has an increasing social, economic and practical value. "Personal Data" becomes a new asset, a valuable productive resource for the 21st century that affects all aspects of society. The wider application and use of personal data, however, presents a series of opportunities and challenges, regarding not just their protection but also their use by the data subject.

The goal is to provide citizens with the means to access and use data sets containing their personal information, such as population-registry data, financial data, medical records, property data (real estate, vehicles), etc., originating from various digital services.

In short, "*My Data*" is:

- An approach for infrastructure to ensure interoperability and secure data exchange; and
- Consent-based data management and control - it is not necessary for an individual to store all his data in central repositories in order to control the data flow,

and is based on the following rights:

- Right to know which information is stored in which systems,
- Right to see the actual content of personal information,
- Right to correct misconceptions of personal information,
- Right to control who gets access or modifies personal information, and why,
- Right to receive personal information and freely use it,
- Right to share or transfer personal information to third parties,
- Right to remove or delete personal information.

All certified users will have access to their personal data through the new single access point **my.gov.gr**.

Secure data exchange

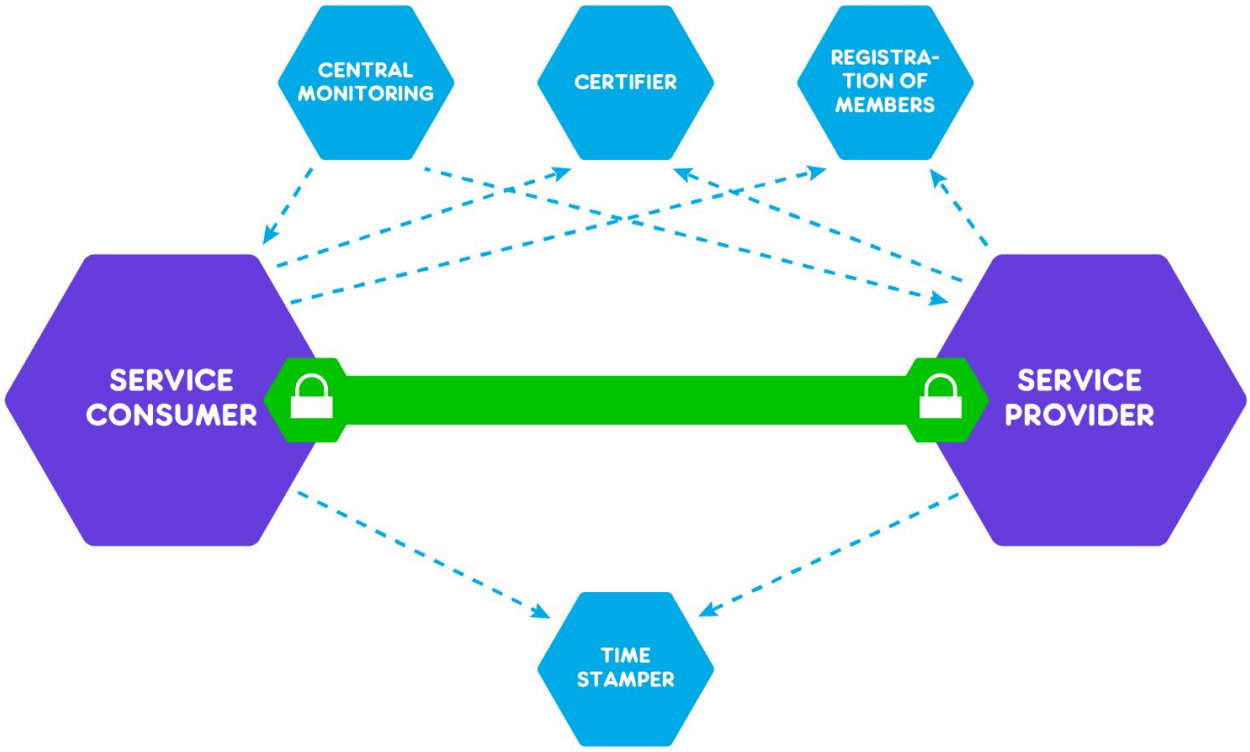
Content Mediator is an architectural abstraction and can be implemented virtually through open standards of data exchange or as an actual system.

Data exchange through Content Mediator allows organizations to exchange information through a modular solution, which is easy to use and safe. It constitutes a standardized, cohesive, cooperative, interoperable and secure level of data exchange that provides public administration bodies with the opportunity to develop service oriented to citizens, businesses and civil servants. Creating entities that combine multiple services and data sources is easy and cost effective.

Main qualities of Content Mediator:

- Improves the quality of existing services,
- Enables new types of innovative services,
- Saves costs in infrastructures, archiving, etc.,
- Enhances data security and privacy,
- Characterized by easy implementation, data access through interfaces - after connecting all the available services.
- Ensures confidentiality, integrity and interoperability among the bodies that exchange data.

To support and facilitate data exchange, Content Mediator implements a number of common features such as address management (of bodies), message routing, access rights management, organization-level certification, registry-level and information system-level certification, data encryption, time stamp, digital signature of messages, etc.



This implementation is a key element of digital infrastructure in Greece and **allows the transition from interoperability between two agencies (where it exists today) to updating the respective Registers when any change in the data of citizens/ businesses emerges.**

4. Digital interventions of the Strategy

The interventions, i.e. the projects, actions and initiatives that contribute to the convergence of Greece with the European average, are divided into three (3) categories: actions improving the operation of **existing systems**, **short-term actions** that can be implemented within 18 months and deliver fast results (quick wins), as well as **long-term actions** that are shaped on the main directions of the Strategy. All the interventions of the Strategy are formulated with the participation of all involved executives of both the public and the private sector.

4.1 Improvements to existing systems

Priority is given to **supporting all the productive central information systems that offer services to citizens, businesses and internally to the public administration by allocating the appropriate resources.** The aim is to improve all existing main information systems, which are critical for the public administration operation, in a measurable way for their users on a semi-annually basis.

Conducting micro-studies for all areas of public administration, in order to optimize existing systems and procedures and to specify the next day of the digital transformation of the Greek state, constitutes an immediate priority of the Digital Transformation Strategy. These micro-studies will specify, by sector, what actions are needed to make existing systems operationally up-to-date, more productive and useful to the public administration, citizens and businesses.

In practice, this design includes all the necessary actions for the proper management and use of information systems that are in production mode.

4.2 Short-term interventions

Short-term interventions concern improvements in existing information systems of the public sector, which are implemented in 6-18 months by project teams consisting of public sector executives, supporting companies and groups of experts. The interventions are open source projects, designed and developed under open and transparent procedures using flexible methodologies (**AGILE/SCRUM**) and open standards, in line with the **Connecting Europe Facility** projects and with a public consultation with all stakeholders.

The Digital Transformation Strategy is directly linked to the country's higher education institutions through the Digital Excellence Centers, where young scientists are able to use and tap into open public data, test ideas for new electronic services by participating in hackathons and develop model solutions using open standards and

software in constant cycles. Therefore dynamic model solutions for the digital transformation of the country are formed. These actions are centrally coordinated within labs.opengov.gr.

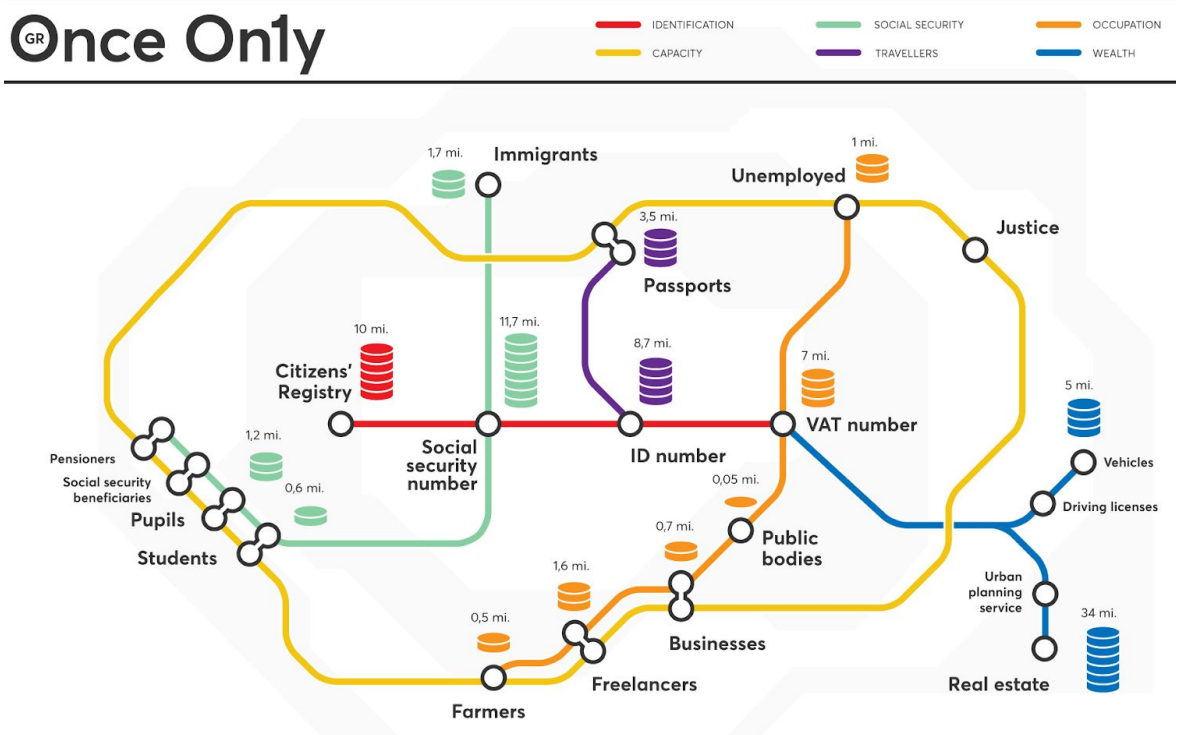
Indicative interventions follow, which will be finalized with public consultation centrally and by policy area:

For citizens:

- A central web portal (**gov.gr**) is set up, where all the information that whoever makes transactions with the public sector (employees, businessmen, foreign investors, visitors/ tourists, citizens) should know. This constitutes the central entry and reference point for citizens and other interested parties about public administration services and relevant information. This portal will include:
  - **Redesigned processes** so that citizens can make many of their transactions electronically **from their home or using their smartphone**, in line with the "mobile first" principle, and on a 24/7 basis.
  - The Greek version of the **Single Digital Gateway**, introduced by European Commission. The portal will provide practical information on the rights and obligations of citizens and businesses in all EU Member States, and access to services available electronically.
  - The **new single digital "identity" (credentials)** for citizens' access to electronic services, provided from both the public and the private sector. Citizens and businesses will be able to access all e-government services using these credentials.
  - Services will be structured and presented on the basis of **life-cycle** events. Any interested individual will be able to search for the services they want based on their own needs, and not on the internal perspective of the relevant public administration body.
    1. Family/ Citizen
       a. Birth/ Loss in the family
       b. Change of marital status (e.g. marriage, divorce, civil union)
       c. Personal details and identification (e.g. national identity, driving licence, "I lost my wallet", address/ house moving)
       d. Residence in the country (e.g. rights, residence permit, asylum), immigration for non-EU or EU nationals (e.g. work guide, social security recognition)
       e. Travel (e.g. passport, European Health Insurance Card)
    2. Wealth management and Tax issues

   a. Real estate (e.g. urban planning, declarations, transfers, inheritance, rent)
   b. Vehicle (e.g. driving licence, insurance, registration)
3. Health, people with disabilities and elderly (e.g. rights, compensation, appointment, medical records)
4. Education and youth
   a. Education (e.g. educational curriculum)
   b. Sports
5. Military service
6. Justice
7. Work
   a. Finding a job/ Unemployment
   b. Social security
   c. Retirement
   d. Employing (e.g. social security coupons, apartment building management)
8. Doing business/ Business activity
   a. Business identity (e.g. company statutes, clearance certificates), and foundation-dissolution-changes
   b. Taxation
   c. Human resources
   d. Permits and product specifications
   e. Dealing with customer

- The communication between citizens and the public administration will take place **once only**. Thereafter, the public administration will internally exchange the required data in a secure way for serving citizens and businesses. The public administration will now carry out processes that will be identified by citizens' needs and not by its own internal needs.



- The **birth** of each new child will be **declared once**. Without any further action by the citizen, their family record will be informed, the child will receive social security coverage and the new birth benefit will be issued. Accordingly, a death will be declared once and the public administration will automatically be informed of the remaining proceedings. The public administration will now act based on citizens' needs rather than on its own internal bureaucratic demands.
- **Changing mailing address** is no longer an issue for citizens and businesses. All public organizations and certified private businesses will be automatically notified through the new service for Address Change. In addition, every citizen will have the opportunity to declare a **certified e-mail address** so that the public administration can communicate with them in an electronic format about the affairs that concern them.
- A **child's enrollment in education** will take place only once in the first grade (kindergarten). An electronic "educational CV" will be created, where all degrees awarded will be automatically added. The enrollment in the following grade will be done automatically. Parents will have access to their child's performance and educational curriculum until this reaches adulthood. In the future, it will not be necessary to validate whether a degree certificate is genuine or not.
- The popular **solemn declaration and authorization document** are converted in an **electronic format**. Following the removal of the requirement for the

exact copy certification in 2014, we proceed to the elimination of the requirement of certifying the *authenticity of a signature* if citizen holds digital signature.

- Every employee can electronically be informed of their **long-term social security profile** (working stamps), coverage and future benefits he will receive from the social security system.
- Citizens will be able to electronically issue the **European Health Insurance Card**; a card offering access to medically necessary state healthcare during their temporary stay in another EU member states, under the same conditions and cost (in some countries, free of charge) as the insured citizens of that country.
- **Transparency initiative "Diavgeia" is expanded** to become a central repository for all the decisions taken by all public administration bodies. An integrated model ensuring validity and completeness of decisions uploaded on Diavgeia will be institutionalized and applied, so that Diavgeia can stand as a complementary decision-support system and improve the Greek government operation.
- Citizens, businesses and public administration bodies will have direct and free online access to **up-to-date and codified national, legislative and regulatory texts of the Greek Legislation** through a central web portal.
- The use of approved **digital signature and stamps** is extended where a strong authentication is required (e.g. contract signing), aiming at completely eliminating the corresponding Strategy-based processes.
- **Greek citizens living abroad** will be able to get certified to vote electronically or by postal vote in the elections of their region.
- In addition to the corresponding service providers (i.e. public administration bodies), end users (citizens and/ or other bodies) will be able to **evaluate** the electronic services provided to them. Citizens will have the opportunity to submit comments, report a problem or suggest an improvement, either centrally or directly at the corresponding webpage.
- **Public administration's human resource management** will be conducted electronically and transparently, by introducing procedures of uploading online all relevant decisions, and thus creating an *internal Diavgeia* (Transparency initiative) about the status of all public administration employees.
- **Priority queuing management** at public administration offices will be held through a transparent system interoperable with the electronic protocol. Each citizen will know when and where they can be served.
- At the same time, an **electronic lottery service** will be developed to draw the members of those committees requiring transparency in their composition.

For businesses:

- Banks, telephone companies and other private operators will be able to **automatically receive the information required** by law and are now asked from citizens.
- The **universal application of electronic invoices** will lead to significant cost savings for businesses and public administration, facilitate partnerships with markets abroad (exports) and offer an opportunity for increased tax revenues.
- Businesses will **automatically register the data required** by law, from their own information systems to those of the public administration once only, with no need for further registration of identical data on multiple systems.
- The supporting documents required from businesses for public procurement and transactions will be directly **retrieved from the source**, so that they are not re-submitted each time (once only principle for businesses).
- With the cooperation of public administration systems, **undeclared work will be addressed**, and the collectability of social security contributions will be improved, so as to strengthen the social security system and ensure its sustainability.
- Digital transformation for a transparent and more competitive business environment with priority on:
  - Accelerating the expansion of digital company foundation for all types of businesses (and freelancers) with additional services.
  - Immediate application of the Open Data Act to base registers. For instance, the number of employees, possible audits and fines of each company can be published on its profile on GEMI (General Commercial Registry) webpage, as they will be retrieved by ERGANI information system and the Ministry of Development and Investments respectively.
  - Re-activating the Price Observatory with automatic price transmission from businesses' information systems for specific categories of goods; basic necessities, and industries with low competition.

In cooperation with corporate bodies, simplifications of processes requiring additional institutional arrangements will be recorded. The goal is to reduce administrative costs for businesses and the public sector by gradually digitizing the most costly processes.

For public sector:

- **Greek Metadata Registry (GMR)**. Introducing a central Greek Metadata Registry to reduce the cost of developing e-government applications and systems, by

coordinating activities in the metadata field. GMR provides access to a commonly accepted repository - registry of reusable data and semantic interoperability resources. GMR includes both content that has been created by public administration bodies, and links to content that is necessary for the development of interoperable services with third parties (e.g. Eurostat) created by them. Reference data include code lists (e.g. post codes) and taxonomies to treasures and ontologies. GMR will operate on the basis of the collaborative governance metadata model developed by the European Commission (ISA program).

4.2.1 Governance model of short-term actions

A small and flexible business unit for the digital transformation of selected public services will be created, with the participation of public and private sector executives. Its purpose is to design, develop and deliver targeted digital interventions in a short period of time and with high added value for the **citizen-centered/ data-driven digital transformation of the public administration**. This unit consists of executives with interdisciplinary experience (IT, management, law, design, communication), having a short-time exclusive employment (1-3 years) and adequate funding. **Its sustainable operation is ensured by the proven savings resulted by its interventions.**

4.3 Medium-term interventions

The digital convergence of Greece with the European Union's average requires a series of medium-term initiatives and actions under the processes and principles of the Strategy. These actions are based on the need to improve specific indicators and sub-indicators of the Digital Economy and Society Index (DESI) and aim at a better digital environment for citizens and businesses in the country.

The Digital Transformation Strategy is directly linked to the country's higher education institutions through the Digital Excellence Centers, where young scientists are able to use and tap into open public data, test ideas for new electronic services by participating in hackathons and develop model solutions using open standards and software in constant cycles. Therefore dynamic model solutions for the digital transformation of the country are formed. These actions are centrally coordinated within labs.opengov.gr.

The interventions are divided in three categories:

1. Digital service projects, which will cover the central information systems in all key policy areas and follow the governance model of the Digital Transformation Strategy.
2. Institutional interventions, aimed at the digital growth of the country.
3. Model solutions, which are oriented horizontally to public administration bodies, local authorities, schools, hospitals, etc.

By sector, based on DESI, the following initiatives or directions are emphasized:

- **Better internet access for citizens.** Protecting the right of internet access is a priority; though, improving this access in qualitative and quantitative terms is a necessity. Gigabit society and mobile and wireless networks are challenges that serve as a prerequisite for any other action of this Strategy. Better mobile and fixed broadband, and ultra fast internet access in cities and remote rural areas result in more jobs, businesses and growth.
    - Fiber optic networks and 5G are the major challenges of the next decade regarding citizens' internet access. The institutional framework must favor and encourage investments in next generation networks, while protecting competition and consumer rights.
    - Open wireless networks constitute a public infrastructure for everyone to access the internet. The Greek state must ensure that free access to the internet is available in public places and wherever is supported by public infrastructure.
    - In line with Single Digital Market priorities, schools and educational facilities should be the first public interest buildings to proceed to Gigabit society.
- **Human capital.** Access to technological tools and the content of the new era should be targeted at a broad population, focus on skills building, provide professionals, businesses and scientists with the appropriate knowledge, and provide knowledge tools to students of all levels. Thus, the appropriate digital education of human capital leads to citizens who are aware and resistant to fake news, skilled workers, students that are facing major technological challenges, STEAM knowledge, as well as less isolated social groups.
    - Skills development in education: A rapid reform of teaching computer science is required at all levels of education. The introduction of the 4th Industrial Revolution in primary and secondary education is an absolute priority, which in turn results in the creation of Open Labs in schools.
    - Skills development in unemployed: Digital technology offers opportunities for upgrading and enriching skills for unemployed people

of all ages, through specialized training programs. A network of partnerships with universities and businesses will allow over 50.000 unemployed people to be re-trained with certified skills and return to the labor market.
    - Skills development in elderly. Access of citizens to technological tools should be on equal terms and the Greek state must ensure that no new inequalities emerge. Local authorities and businesses should be encouraged to provide digital education to senior citizens.
- **Use of online services**
    - Enhancing use of e-banking services. The use of electronic banking services should be stepped up, through appropriate institutional interventions, thus creating a short roadmap for the Greek public sector, banks and large companies so as to get closer to the European average. The banking sector should provide more integrated electronic services, whereas the public sector and large businesses should provide all their basic services through e-banking.
    - Consumer protection in e-commerce. Consumer confidence in e-commerce should also be strengthened, through interventions in the postal market, too.
- **Digital technology integration**
    - Adopting electronic invoice. The widespread adoption of electronic invoice can increase the security protection in business, by eliminating incidents of counterfeit or falsified invoices, enhancing transparency and confidence in the trade, and strengthening cross-border transactions.
    - Supporting (national and cross-border) e-commerce. In conjunction with the enhancement of e-banking, the strengthening of e-commerce (e.g. agri-food sector) will bring considerable benefits to sectors of the Greek economy.
    - Encouraging businesses to adopt new tools (Cloud services, RFID, etc.). Greek businesses are lagging behind in adopting new technologies and it is necessary to cover the lost ground. The transition to Cloud services offers increased security, cost savings and technological flexibility to local businesses.

- **Digital public services**
    - Open data. The Greek public administration should radically change the model of generating and sharing primary data as open data. In addition to the availability of open public administration data, open data should be generated from each new project across the entire activity spectrum

of the public sector. Thus, any new infrastructure project (building, road, hydraulic) will have the obligation to install and maintain the necessary technology to produce open data.

- Telemedicine services. The geographical landscape of the country requires telemedicine solutions that support isolated communities in island or mountain regions. Enhancing the use of existing tools, expanding them and institutionalizing medical operations are a medium-term priority.

These are the main guidelines of the Digital Transformation Strategy, which will be expanded and enriched through the procedures outlined in the next chapter.

5. Digital transformation governance model

In order to effectively implement the digital transformation in the entire public administration, the Ministry of Digital Governance applies a **unified and binding governance model that horizontally covers all the institutions of the central and general government.** The coordination of the design and implementation of digital transformation is carried out by a central administration point and supported by appropriate administrative structures and coordination bodies that ensure the efficient cooperation among public administration bodies and the effective implementation of this horizontal governmental priority.

The new governance model **promotes innovation in the public sector**, supporting the government to respond effectively to modern challenges and take advantage of the opportunities offered by new information and communication technologies. The aim is to better serve citizens and businesses and the efficient operation of the public administration bodies. Emphasis is also given to the **development of the required digital skills for the public sector staff that will undertake the implementation and support of the Strategy's actions**.

5.1 Administrative structures and roles

5.1.1 Ministry of Digital Governance

The Strategy and the **Horizontal List of Interventions** (see the annex that will outline the major interventions by policy area) constitute the main tools for implementing digital transformation. The responsibility for implementing the Strategy lies with the Ministry of Digital Governance. The new governance model adopted by the Ministry ensures the coordination of government action for applying the Strategy, the collection and evaluation of proposals on its improvement and updating. It also ensures the continuous monitoring and evaluation of the implementation of the interventions included in the Horizontal List of Interventions, and the inclusion of new actions implementing the digital transformation in all government policy areas.

The digital transformation is planned, implemented and managed by the Ministry of Digital Governance, which among others:

- Undertakes the strategic planning and management of government actions implementing digital transformation,
- Undertakes the supervision, recording, redesign and digitization of administrative procedures in the public sector,

- Supervises and supports the central government information systems, and the related infrastructure, covering the entire government activity in all policy areas,
- Holds responsibility for managing and supporting central telecom infrastructures, digital communications and postal services.
- Holds responsibility for monitoring and evaluating the progress of the Strategy interventions, conducting studies and findings based on analytical processing of data from use and dissemination digital services. It also monitors and coordinates the convergence of the country with the average of the Digital Economy and Society Index.

5.1.2 Executive actors - Supervised Bodies of the Ministry

The implementation of the key interventions of the digital transformation is supported by supervised bodies of the Ministry, which mainly assume the following roles, being the main executive actors of this government policy:

- Model implementation of small-scale actions in a short period of time, following flexible and efficient models that cover the cycle of design, development, evaluation and feedback of ICT projects.
- Execution and management of large-scale actions and projects that implement digital transformation in the context of the Strategy and of the Horizontal List of Interventions.
- Implementation and support of information systems and digital services in social security and healthcare.

5.1.3 Horizontal coordination - Coordinating Committee on Digital Transformation

Effective coordination and horizontal communication among the eGovernment Directorates of the Central Government are ensured through the establishment and operation of a central coordinating body: the Coordinating Committee on Digital Transformation. The Coordinating Committee is composed of all the relevant Directors from all the Ministries of Government and the Heads of relevant organizations (Information Society SA (KtP), e-Government Center for Social Security SA (IDIKA), Greek Research and Technology Network (GRNET), Hellenic Cadastre, Athens Urban Transport Organization (OASA), Payment and Control Agency for Guidance and Guarantee Community (OPEKEPE), Hellenic Agency for Local Development and Local Government SA (EETAA), National Center for Public Administration and Local Government (EKDDA), Hellenic Telecommunications and Post Commission (EETT), National Center of Audiovisual Media and Communication SA (EKOME), Hellenic Space Agency (ELDO), etc.) that play an instrumental role in

implementing government policy on digital transformation. Its core responsibility is to ensure the horizontal adoption and application of Digital Transformation Strategy and the effective implementation of Horizontal List of Interventions that specifies the Strategy in particular ICT projects and actions. The main objective of the action undertaken by the Coordinating Committee is to ensure that public administration bodies adopt the main principles set out in the Strategy and implement the actions of the List of Interventions in a coordinated and effective manner. In addition, the Coordinating Committee undertakes the design of legislative proposals and policy initiatives in the context of digital transformation, and the evaluation and selection of new actions for the regular updating of both the Strategy and the List. It meets every three months under the coordination of the Ministry of Digital Governance.

5.1.4 Implementation support to bodies - Digital Transformation Officer

The role of Digital Transformation Officer, who is a member of the management team of each organization, is set up in central bodies of the wider public sector. This role has executive responsibilities and works with the relevant bodies to coordinate the required actions that effectively implement the digital transformation at the organization level.

5.2 Procedures of the organization and administration model

5.2.1 Updating the Digital Transformation Strategy

The adoption and horizontal adoption of the Strategy is governed by the competent administrative unit of the Ministry of Digital Governance. In cooperation with the Coordinating Committee on Digital Transformation, the Ministry updates the Strategy on an annual basis, based on the needs, opportunities and strategic priorities.

5.2.2 Updating the List of Interventions

The effective implementation of the Horizontal List of Interventions, which is an annex of the Strategy, is governed by the competent administrative unit of the Ministry, in cooperation with the Coordinating Committee on Digital Transformation. The List is updated every six months through a structured, con-formation process, which ensures the active involvement of each stakeholder. The regular updating of the List is a key prerequisite for ensuring its constant adaptation to the rapidly changing technological environment, and also to the needs and strategic priorities of the public administration in each policy area. In order to meet this objective, the List of Interventions is dynamic

and open, enabling stakeholders to suggest adaptation and updates via a digital application. The Coordinating Committee, in collaboration with the competent Ministry units, evaluates the proposals and decides on the relevant update of the List. Feedback on the evaluation and adoption of proposals is communicated via the same digital application.

5.2.3 Monitoring the adoption and implementation of the Strategy

The effective implementation of the Strategy requires the constant monitoring of both the application of its principles and actions, and the implementation of the road map that specifies it. In order to ensure its successful execution, coordination is needed at two levels: horizontal coordination for the whole government, and vertical coordination on government policy areas. The Coordinating Committee on Digital Transformation monitors and records the application progress of the Strategy by public administration bodies, and identifies problems, challenges and opportunities. In parallel, it monitors the developments in the relevant actions by the European Commission and at a global level. The Coordinating Committee, in collaboration with competent Ministry units, submits a Progress Report to the competent administrative body of the Ministry on an annual basis. This report presents the implementation of the Strategy by the public administration and proposals for improvement.

5.2.4 Implementing interventions within the Strategy context

The implementation model of the Strategy ensures the participatory design and monitoring of actions and projects, with emphasis on the horizontal communication and cooperation at the level of the Central Government, and more widely among the General Government bodies.

The implementation process is based on the following general flow: The organizational units of Ministries and other organizations prioritize their needs and make recommendations on interventions per policy area to the Ministry. The bodies propose actions for the simplification and digitization of procedures, as well as the management of base registries, aiming at the examination of possible revisions to business flows. This step is considered necessary so as to avoid digitization of existing bureaucratic and ineffective procedures. The competent administrative unit of the Ministry then undertakes to turn the new, redesigned procedure to an under planning project. The project specifications are given to the executive actors of the Digital

Transformation Strategy and the project is implemented and delivered for usage to the administrative unit that undertakes the maintenance and support of the project, and to the body that undertakes the operating. In short, the main implementation steps are the following:

1. The e-Government Directorates of Ministries and other central bodies recommend the action stressing its necessity to the Ministry, through the Coordinating Committee on Digital Transformation.
2. The Ministry, with the assistance of the competent General Secretariat, redesigns the procedure under digitization.
3. The Ministry, with the assistance of the competent General Secretariat, transforms the redesigned procedure into a project, identifying the required functional specifications that necessarily include measurable evaluation elements.
4. The project is implemented by the executive actors for the Digital Transformation Strategy (supervised bodies of the Ministry), whilst it is monitored and managed by the competent administrative unit of the Ministry.
5. The project is delivered for usage to the administrative unit of the Ministry that undertakes the maintenance and support, and to the competent e-Government Directorate that undertakes the operating.

The first revision of the Strategy will specify the time limits within which the aforementioned 5 steps are strictly followed.

It is important to note that the design of e-Government and digital infrastructure projects in the public sector is now governed and supported by the competent Ministry of Digital Governance, the bodies of which are responsible for the design, implementation and monitoring of these projects. In addition, the design of necessary interventions follows bottom-up processes, with horizontal communication channels among the General Government bodies, so as to avoid overlaps and errors in design stemming from the lack of timely communication among public bodies.

The processes of the Digital Transformation Strategy are compulsorily followed for all e-government and digital infrastructure actions, and support the e-Government Directorates in an integrated way.

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Annex A - Information Systems / Applications

The following table lists the main information systems and applications that are currently in use in public administration bodies and provide services per policy area. **The recording will be completed/ updated in cooperation with the competent bodies.**

S/N	TITLE - DESCRIPTION	COMPETENT MINISTRY	URL
1	Ermis (Hermes) Portal - EU-GO Portal - eKEP	Ministry of Administrative Reconstruction	www.ermis.gov.gr www.eu-go.gr ekep.ermis.gov.gr
2	Digital Signature	Ministry of Administrative Reconstruction	www.aped.gov.gr
3	Diavgeia (Transparency) Initiative	Ministry of Administrative Reconstruction	diavgeia.gov.gr mef.diavgeia.gov.gr
4	Open Data Portal	Ministry of Administrative Reconstruction	opengov.gr
5	Human Resources Registry (Census)	Ministry of Administrative Reconstruction	apografi.gov.gr
6	Open Government - Consultation	Ministry of Administrative Reconstruction	data.gov.gr
7	Electronic Registry of Candidates	Ministry of Administrative Reconstruction	www.asep.gov.gr
8	National Typography Electronic System	Ministry of Administrative Reconstruction	www.et.gr
9	Public Sector Network & Syzefxis II project	Ministry of Administrative Reconstruction	www.ktpae.gr/ΥΠΗΡΕΣΙΕΣ/ΤΗΛΕΠΙΚΟΙΝΩΝΙΕΣ/ΣυζευξιςII
10	G-cloud Services	Ministry of Administrative Reconstruction	www.gcloud.ktpae.gr

11	Citizens' Registry	Ministry of Interior	https://www.ypes.gr/astiki-dimotiki-katastasi/oloklirimeno-pliroforiako-sistima-mitroo-politon
12	Interoperability Hub for providing financial data of local authorities	Ministry of Interior	https://www.ypes.gr/parakoloythisi-dimosionomikon-stoicheion/
13	Asset Registration System - POTHEN	Inspector of Public Administration and other State Auditing Bodies	www.pothen.gr
14	Digital Single Payroll Services - Single Payments Authority	Ministry of Finance	https://www.minfin.gr/web/guest/-/epharmoge-eniaias-arches-pleromes
15	Taxation(Taxis, Taxisnet, Property Declaration System E9)	Independent Public Revenue Authority, General Secretariat of Information Systems / Ministry of Finance	www.aade.gr www.gsis.gr
16	Customs (ICISnet)	Independent Public Revenue Authority, General Secretariat of Information Systems / Ministry of Finance	https://portal.gsis.gr/portal/page/portal/ICISnet/
17	e-Administrative Fee	Ministry of Finance	http://www.gsis.gr/gsis/info/gsis_site/Services/Polites/eparavolo.html
18	Interoperability Center	Ministry of Finance	https://www.minfin.gr/web/guest/-/kentro-dialeitourgikotetas-k e-d-tou-ypourgeiou-oikonomikon
19	Digital Services for Public Property and National Legacies)	Ministry of Finance	https://minfin.gr/web/guest/-/psephiakes-yperesies-ethnikon-klerodotematon
20	Information system for extrajudicial settlements of business debts	Special Secretariat for Private Debt Management	https://www1.gsis.gr/dsae/ocwrequest/faces/pages/mainmenu/index.xhtml http://www.keyd.gov.gr/np_ocw_aithsh-link/
21	Government Cloud Services	Ministry of Finance	https://www.minfin.gr/parechomen

	(G-Cloud)		es-yperesies-g-cloud
22	National Electronic Public Procurement System (ESIDIS) Central Electronic Public Procurement Registry (KIMDIS)	Ministry of Economy and Development	http://www.promitheus.gov.gr
23	Notification of commencing economic activity	Ministry of Economy and Development	https://notifybusiness.gov.gr/assets/index.html
24	e-YMS - Company establishment	Ministry of Economy and Development	https://eyms.businessportal.gr
25	General Commercial Registry	Ministry of Economy and Development	http://www.businessportal.gr/
26	Armed for services	Ministry of National Defence	http://www.stratologia.gr/ https://katataxi.army.gr/
27	Electronic Prescription	Ministry of Health	https://www.e-prescription.gr
28	Hellenic Health Atlas, Direct access to all health data	Ministry of Health	https://healthatlas.gov.gr
29	Primary Healthcare System, Family doctors application, Electronic application for appointments	Ministry of Health	https://www.e-syntagografisi.gr/p-rv/p
30	Health Insurance Record	Ministry of Health	https://www.eopyy.gov.gr/insuredguide/doc
31	Social Income of Solidarity	Ministry of Labor, Social Security and Social Solidarity	https://keaprogram.gr/
32	Social residential invoice	Ministry of Labor, Social Security and Social Solidarity	https://www.idika.gr/kot/
33	Child benefits	Ministry of Labor, Social Security and Social Solidarity / Welfare Benefits and Social Solidarity Organization	https://www.idika.gr/epidomapaidiou/
34	Housing benefits	Ministry of Labor, Social Security and Social Solidarity / Welfare	https://www.epidomastegasis.gr

		Benefits and Social Solidarity Organization	
35	Farmers' Welfare Account: Electronic services	Ministry of Labor, Social Security and Social Solidarity / Welfare Benefits and Social Solidarity Organization	https://opeka.gr/agrotiki-estia/ilektronikes-ypiresies/
36	e-Ticket, the ATH.ENA Card Fee Management for Unemployed and Disabled	Athens Urban Transport Organization (OASA)	https://www.idika.gr/athenacard/
37	One-stop digital services portal	Ministry of Labor, Social Security and Social Solidarity / Welfare Benefits and Social Solidarity Organization	https://aplo.yeka.gr
38	Integrated System for Pension Audit and Payments - Helios	Ministry of Labor, Social Security and Social Solidarity	http://www.idika.gr/esepsyntax
39	ERGANI - Business service information system	Ministry of Labor, Social Security and Social Solidarity	https://eservices.yeka.gr
40	Labor Inspection Body services	Ministry of Labor, Social Security and Social Solidarity	www.sepenet.gr
41	Entitlement to social security Tracking of lifetime social security	Ministry of Labor, Social Security and Social Solidarity	https://www.atlas.gov.gr
42	Unified Social Security Fund - Electronic services for insured and pensioners	Ministry of Labor, Social Security and Social Solidarity / Unified Social Security Fund (EFKA)	https://www.efka.gov.gr/
43	Unified Fund of Supplementary Insurance and Lump-sum Benefits - Electronic services for pensioners	Ministry of Labor, Social Security and Social Solidarity / Unified Fund of Supplementary Insurance and Lump-sum Benefits (ETEAEP)	http://www.eteaep.gov.gr/
44	Social security registry (AMKA)	Ministry of Labor, Social Security and Social	https://www.amka.gr

		Solidarity	
	Welfare Benefits and Social Solidarity Organization	Ministry of Labor, Social Security and Social Solidarity	https://opeka.gr/
45	National Criminal Records Portal	Ministry of Justice, Transparency and Human Rights	http://www.ncris.gov.gr
46	Electronic lodging and tracking of applications	Ministry of Justice, Transparency and Human Rights	https://portal.olomeleia.gr/el
47	Detention centers' electronic services	Ministry of Justice, Transparency and Human Rights	http://www.sofron.gov.gr
48	Civil and Criminal Justice - Integrated Judicial Case Management System (OSDDY-PP)	Ministry of Justice, Transparency and Human Rights	https://www.solon.gov.gr
49	Police - electronic services)	Ministry of Citizen Protection	https://portal.astynomia.gr
50	National Cadastre	Ministry of Environment and Energy	https://www.ktimanet.gr/
51	Electronic issue of building permits	Ministry of Environment and Energy	http://portal.tee.gr/portal/page/portal/TEE/MyTEE/adeies
52	Electronic registry of building inspectors	Ministry of Environment and Energy	http://portal.tee.gr/portal/page/portal/TEE/MyTEE/adeies/inspectors
53	Electronic submission of diagrams	Ministry of Environment and Energy	http://portal.tee.gr/portal/page/portal/TEE/MyTEE/ekxa/
54	Management of declarations for unauthorised buildings (laws 4495/2017 and 4178/2013)	Ministry of Environment and Energy	http://portal.tee.gr/portal/page/portal/TEE/MyTEE/auth4495
55	Application of Regulation on Building energy performance	Ministry of Environment and Energy	http://portal.tee.gr/portal/page/portal/SCIENTIFIC_WORK/GR_ENERGEIAS/kenak
56	Integrated information system for IT support of schools and administrative	Ministry of Education, Research and Religious Affairs	https://myschool.sch.gr/

	bodies in education		
57	Integrated information system for electronic submission of applications and human resource management of primary and secondary education	Ministry of Education, Research and Religious Affairs	https://opsyd.sch.gr/
58	Electronic enrollment in higher education	Ministry of Education, Research and Religious Affairs	https://eregister.it.minedu.gov.gr/
59	Transfers in higher education	Ministry of Education, Research and Religious Affairs	https://transfer.it.minedu.gov.gr/
60	Provision of academic books EUDOXUS	Ministry of Education, Research and Religious Affairs	https://grnet.gr/services/digital-services/eudoxus/
61	Academic ID	Ministry of Education, Research and Religious Affairs	http://academicid.minedu.gov.gr/
	Payment and Control Agency for Guidance and Guarantee Community	Ministry of Rural Development and Food	https://www.opekepe.gr/

Annex B - Analysis on indicators of the Digital Economy and Society Index

The Digital Economy and Society Index (DESI) is an annual composite index published every year by the Directorate-General for Communications Networks, Content and Technology of the European Commission (DG Connect).

As it is quoted by the European Commission's press release, Digital Economy and Society Index figures over the last 5 years show that targeted investment and robust digital policies can have a significant impact on the performance of individual countries. For example, this is the case for Spain, in the deployment of ultrafast broadband, Cyprus in broadband connectivity, Ireland for digitizing businesses and Latvia and Lithuania in digital public services. Connectivity has improved, but remains insufficient to address fast-growing needs.

Digital Economy and Society Index indicators show that the demand for fast and ultrafast broadband is on the rise, and is expected to further increase in the years in view of the growing sophistication of internet services and business needs. Ultrafast connectivity of at least 100 Mbps is available to 60% of households, and the number of broadband subscriptions is increasing. 20% of homes use ultrafast broadband, a number that is four times higher than in 2014.

The EU has agreed on the reform of the EU telecoms rules to meet Europeans' growing connectivity needs and to boost investments. Sweden and Portugal have the highest take-up of ultrafast broadband, and Finland and Italy are the most advanced on the assignment of the 5G spectrum.

More than one third of Europeans in the active labour force do not have basic digital skills, even though most jobs require at least basic digital skills, and only 31% possess advanced internet user skills. At the same time, there is an increased demand for advanced digital skills across the economy, with employment of Information and Communication Technology specialists growing by 2 million over the last 5 years in the EU. Finland, Sweden, Luxembourg and Estonia are the leaders in this dimension of the index.

Universal Internet use is growing

83% of Europeans surf the internet at least once per week (up from 75% in 2014). On the other hand, a mere 11% of the EU population have never been online (down from 18% in 2014). The use of video calls and video on demand, available on various computer programmes and smartphone applications, increased most. To better protect users' trust in the online environment, EU rules on data protection entered into force on 25 May 2018.

Businesses are becoming more digital, but e-commerce is growing slowly. Overall, the top EU performers in this domain are Ireland, the Netherlands, Belgium and Denmark, while Hungary, Romania, Bulgaria and Poland need to catch up. An increasing number of companies use cloud services (18% compared to 11% in 2014) and social media to engage with their customers and other stakeholders (21% compared to 15% in 2013). However, the number of SMEs who sell their goods and services online has stagnated over the past few years at 17%.

In order to boost e-commerce in the EU, the EU has agreed on a series of measures from more transparent parcel delivery prices to simpler VAT and digital contract rules. Since 3 December 2018, consumers and companies are able to find the best online deals throughout the EU without experiencing discrimination based on their nationality or place of residence.

Trend towards convergence among the Member States in digital public services

64% of internet users who submit forms to their public administration now use online channels (up from 57% in 2014), showing the convenience of online procedures over bureaucracy. In April 2018, the Commission adopted initiatives on the re-use of public sector information and on e-health, which will significantly improve cross-border online public services in the EU. With regards to the use of digital public services, including e-health and e-government, Finland and Estonia registered the highest scores in the index.

The Women in Digital Scoreboard report shows that EU countries who are digitally competitive are also leaders in female participation in the Digital Economy. Finland, Sweden, Luxembourg and Denmark have the highest scorers regarding the participation of women in the digital economy. The gender gap, however, persists at EU level in the areas of internet use, digital skills, and ICT specialist skills and employment with the largest inequalities in the latter: only 17% of ICT specialists are women, and they still earn 19% less than what men earn. In addition, only 34% of

STEM (science, technology, engineering and mathematics) graduates are women, a figure we need to increase in the years to come.

The annual report on the DESI index records the progress made by Member States in digitization. The report is structured around five chapters:

1. Connectivity	Fixed broadband, mobile broadband, broadband speed and prices
2. Human capital	Internet use, basic and advanced digital skills
3. Use of Internet	Citizens' use of content, communication and online transactions
4. Integration of Digital Technology	Business digitization and electronic commerce
5. Digital Public Services	Electronic government and online health services

The European Commission has been monitoring Member States' digital competitiveness with the Digital Economy and Society Index (DESI) reports since 2015. The set of reports includes both country profiles and thematic chapters.

The DESI country reports combine quantitative evidence from the DESI indicators across the five dimensions of the index with country-specific policy insights and best practices.

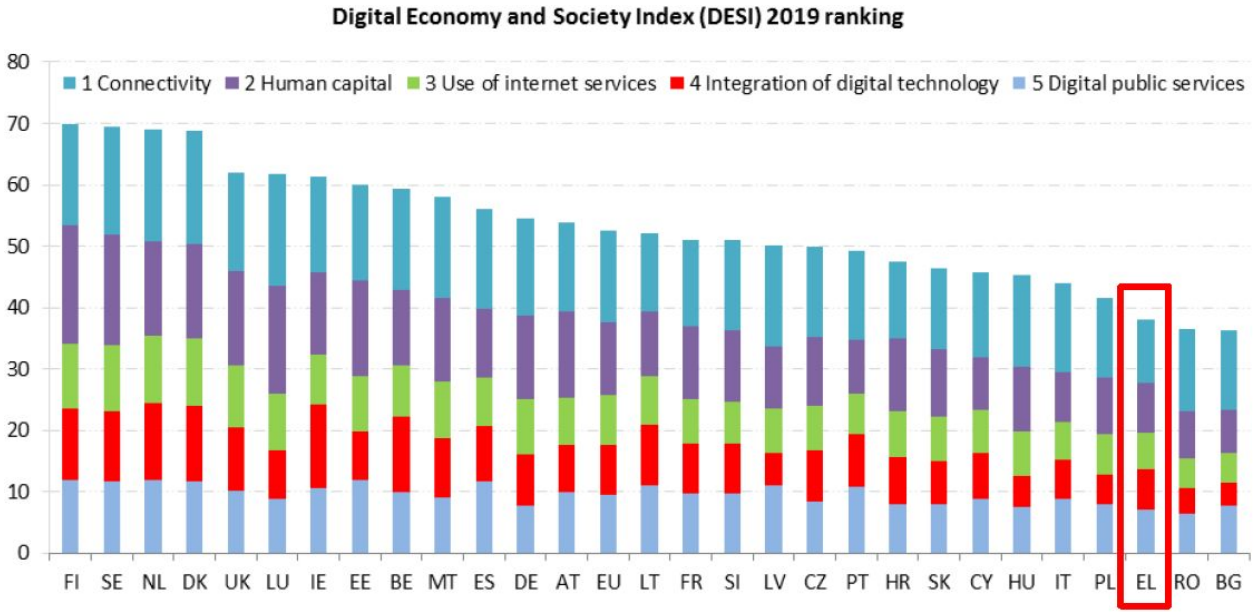
To improve the methodology and take account of the latest technological developments, a number of changes have been made to the DESI for 2019. The DESI now covers:

- 5G readiness,
- Above basic digital skills,
- At least basic software skills,
- Female ICT specialists,
- ICT graduates,
- People who have never used the internet,
- Professional social networks,
- Doing an online course,
- Online consultations and voting,
- Individuals selling online,
- Big data,
- Medical data exchange, and

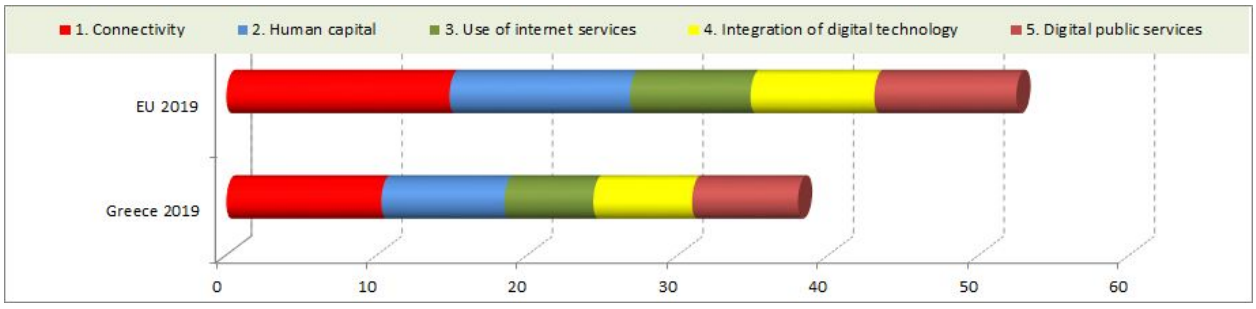
- e-Prescriptions.

The DESI was re-calculated for all countries for previous years to reflect the above changes in the choice of indicators and corrections to the underlying data. Country scores and rankings may thus have changed compared with previous publications.

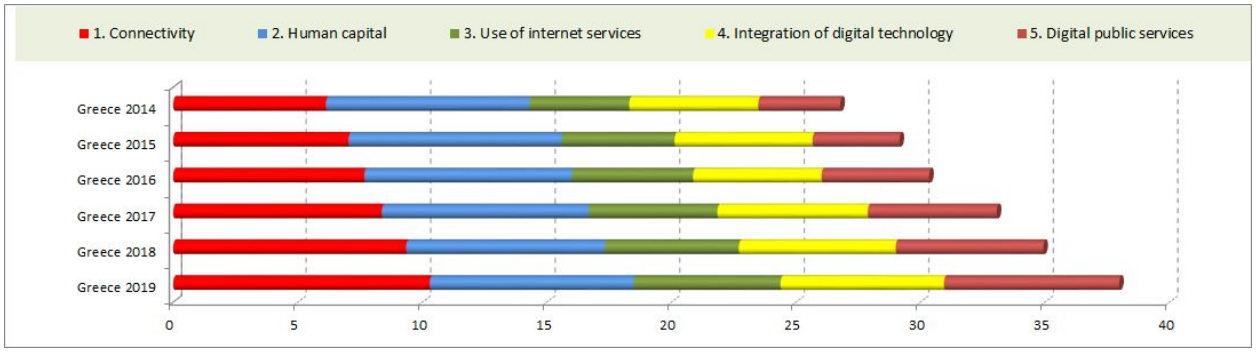
For further details, you are referred to DESI website https://ec.europa.eu/digital-single-market/en/desi.



Greece ranks 26th out of the 28 EU Member States in the European Commission Digital Economy and Society Index (DESI) 2019.



DESI 2019

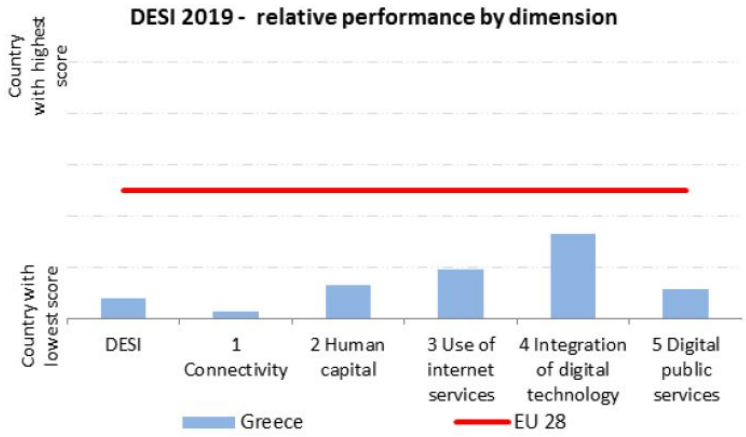


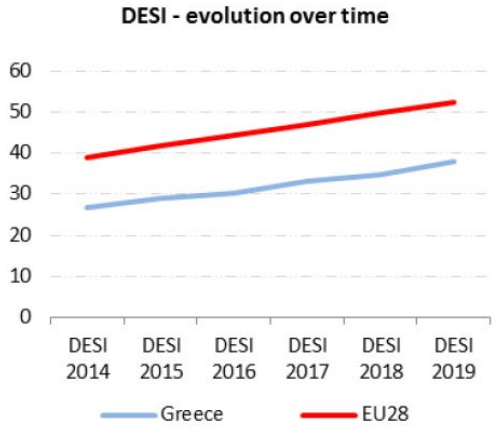
DESI for Greece 2014 - 2019

Over the last year, Greece progressed slightly more than the EU average increase. The improvement of its score is due to an improved performance in some of the DESI dimensions measured. Greece marginally improved its performance as regards Human capital increasing the percentage of Information and Communication Technology (ICT) specialists in total employment for the third consecutive year, and increasing the number of ICT graduates for the second year running. It also improved the supply side of digital public services. However, the country still scores below the EU average.

In connectivity, the transition to fast and ultrafast broadband is much slower than in the rest of Europe. Although the national broadband plan has been updated, there are still considerable delays in project implementation and the absorption of the funds allocated. Speeding up 5G development will also help improve Greece's digital status. On the positive side, the number of internet users is growing. Greeks are active users of internet services such as video calls and taking online courses. However, progress with integrating digital technology into business has been slow, apart from the use of big data by enterprises, which is higher than the EU average.

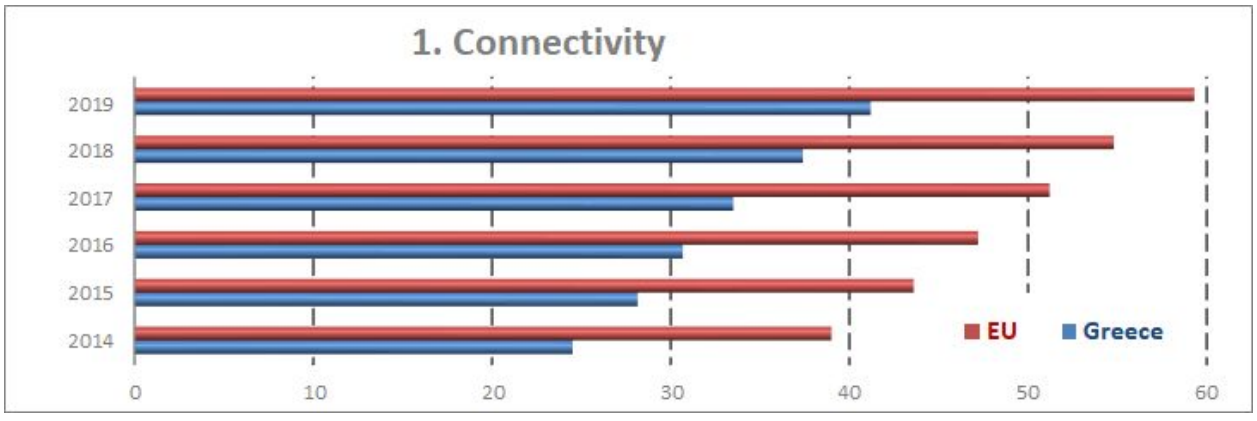
Among all dimensions, Greece ranks highest in the integration of digital technology. However, the best progression compared to last year is in the Digital public services dimension where there has been an increase of 7.4 points.





Connectivity

	Greece		EU
1. Connectivity	**Rank**	**Score**	**Score**
DESI 2019	**28**	**41.2**	**59.3**
DESI 2018	28	37.4	54.8
DESI 2017	28	33.5	51.2
DESI 2016	28	30.7	47.2
DESI 2015	28	28.2	43.6
DESI 2014	26	24.5	39.0



With an overall connectivity score of 41.2, Greece ranks last among EU countries; there has been no improvement in rank since 2017. It features wide availability of fixed broadband (96% coverage, slightly lower than the 97% EU average), but take-up is still progressing slowly, reaching 74% (below the EU average of 77%). This could be linked to prices, which remain relatively high compared with the EU average; as Greece now ranks last among EU countries on the broadband price index as well. Despite a progress of 13 percentage points, Greece ranks 26th amongst EU countries in NGA coverage per household, far below the EU average of 83%. Moreover, the country has almost no ultrafast broadband networks. Despite the 8-point increase in mobile broadband take-up, the current figure is 74 subscriptions per 100 people, well below the EU average of 96 subscriptions per 100 people. While subscriptions to fast broadband have increased by 4 percentage points to 11%, they remain well below the EU average of 41%. Greece's 4G performance is better, with coverage reaching 92%, close to the EU average of 94%.

"Connectivity" sub-indices:

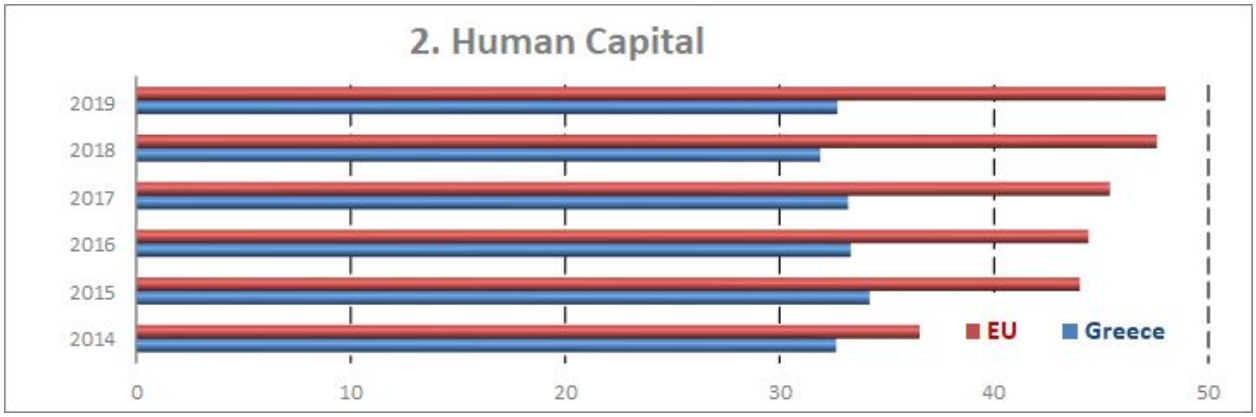
	Ελλάδα				EE
	DESI 2017	**DESI 2018**	**DESI 2019**		**DESI 2019**
	value	**value**	**value**	**Rank**	**value**
1a1 Fixed broadband coverage	**96%**	**96%**	**96%**	***17***	**97%**
% households	2016	2017	2018		2018
1a2 Fixed broadband take-up	**66%**	**69%**	**74%**	***15***	**77%**
% households	2016	2017	2018		2018
1b1 4G coverage	**77%**	**86%**	**92%**	***23***	**94%**
% households (average of providers)	2016	2017	2018		2018
1b2 Mobile broadband take-up	**50**	**66**	**74**	***25***	**96**
Subscriptions per 100 people	2016	2017	2018		2018
1b3 5G readiness	**NA**	**NA**	**0%**	***13***	**14%**
Assigned spectrum as a % of total harmonised 5G spectrum			2018		2018

1c1 Fast broadband (NGA) coverage	**48%**	**53%**	**66%**	***26***	**83%**
% households	2016	2017	2018		2018
1c2 Fast broadband take-up	**5%**	**7%**	**11%**	***28***	**41%**
% households	2016	2017	2018		2018
1d1 Ultrafast broadband coverage	**NA**	**0.4%**	**0.4%**	***28***	**60%**
% households		2017	2018		2018
1d2 Ultrafast broadband take-up	**0.01%**	**0.01%**	**0.10%**	***28***	**20%**
% households	2016	2017	2018		2017
1e1 Broadband price index	**70**	**70**	**65**	***28***	**87**
Score (0 to 100)	2016	2017	2018		2017

Despite the update of the national broadband plan and the progress of the vectoring implementation, remaining sizeable delays in implementing the projects and in the absorption of the funds allocated have meant that Greece has not improved its connectivity score; it sill ranked last among EU countries in 2018. Greece hopes to benefit from addressing these delays by creating the right conditions for private investment in order to improve its digital competitiveness. Tackling the significant delays in proceedings for antenna permit granting and promoting 5G development will improve the country's digital status. In addition to this, the Regulator could continue to secure the timely and correct implementation of regulatory decisions. Moreover, it is important that Greece take appropriate measures and address the issues concerning the implementation of the European emergency number 112 without further delay.

Human Capital

	Greece		EU
2. Human Capital	**Rank**	**Score**	**Score**
DESI 2019	**25**	**32.7**	**48.0**
DESI 2018	26	31.9	47.6
DESI 2017	25	33.2	45.4
DESI 2016	24	33.3	44.4
DESI 2015	22	34.2	44.0
DESI 2014	23	32.6	42.4



In the Human capital dimension, Greece's performance remains well below the EU average, but it is making progress. In 2017, only 46% of individuals between 16 and 74 had at least basic digital skills (57% in the EU). Among the 54% who do not have basic digital skills, 31% of individuals have no digital skills at all (the EU average being 17%). In addition, Greece continues to have the lowest share of ICT specialists in total employment in the EU: 1.6% in 2017, compared with an EU average of 3.7%, but there has been some slight progress in the last three years. Nevertheless, a significant gender gap is also observed with only 10.9% of employed people in the ICT sector being women. Furthermore, the proportion of ICT specialists in total female employment is also very low, at 0.4% compared with the EU average (1.4%), and it has stagnated over the last three years. Referring to the proportion of ICT graduates in

the total pool of graduates (3.2%) means that Greece is performing below the EU average.

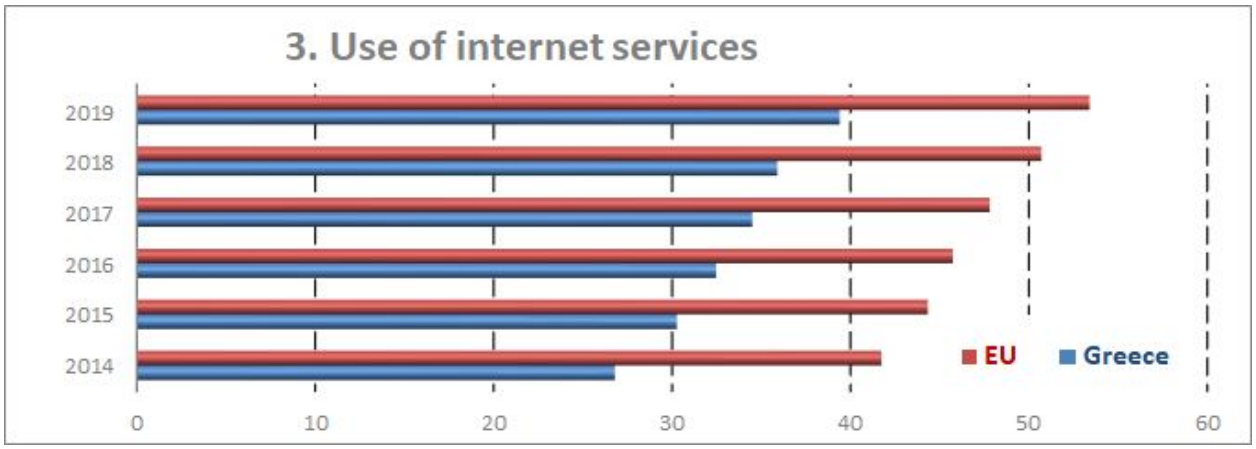
“Human Capital” sub-indices:

	Greece				EU
	DESI 2017	**DESI 2018**	**DESI 2019**		**DESI 2019**
	value	**value**	**value**	**Rank**	**value**
2a1 At least basic digital skills	**46%**	**46%**	**46%**	***25***	**57%**
% individuals	2016	2017	2017		2017
2a2 Above basic digital skills	**19%**	**22%**	**22%**	***23***	**31%**
% individuals	2016	2017	2017		2017
2a3 At least basic software skills	**53%**	**52%**	**52%**	***21***	**60%**
% individuals	2016	2017	2017		2017
2b1 ICT specialists	**1.2%**	**1.4%**	**1.6%**	***28***	**3.7%**
% total employment	2015	2016	2017		2017
2b2 Female ICT specialists	**0.4%**	**0.4%**	**0.4%**	***28***	**1.4%**
% female employment	2015	2016	2017		2017
2b3 ICT graduates	**4.4%**	**3.0%**	**3.2%**	***18***	**3.5%**
% graduates	2014	2015	2016		2015

The shortfall of digital skills remains a major obstacle for Greece if it is to achieve its goals in terms of growth opportunities and the digital society and economy. Upscaling existing initiatives will be crucial in this respect. Increasing the number of Greek ICT specialists and closing the gender gap are very important if the country is to benefit fully from the digital economy.

Use of internet services

	Greece		EU
3. Use of internet services	**Rank**	**Score**	**Score**
DESI 2019	**26**	**39.4**	**53.4**
DESI 2018	26	35.9	50.7
DESI 2017	26	34.5	47.8
DESI 2016	26	32.5	45.7
DESI 2015	26	30.3	44.3
DESI 2014	25	26.8	41.7



Overall, the Use of internet services in Greece is well below the EU average. However, the number of internet users is growing and a large percentage of them - above the EU average - are keen to engage in a variety of online activities. The most popular of these are reading news online, making video calls, using social networks and taking online courses. 87% of Greek internet users read news online, which is well above the EU average of 72%. Use of video calls reached 61% in 2018 (48% in 2017) and is more widespread than in other EU countries (49% in 2018). However, although the use of online banking is growing for the third year in a row (38%), the percentage remains far below the EU average of 64%. The same applies to shopping online, which is progressing with 49% of internet users, but remains below the EU average of 69%.

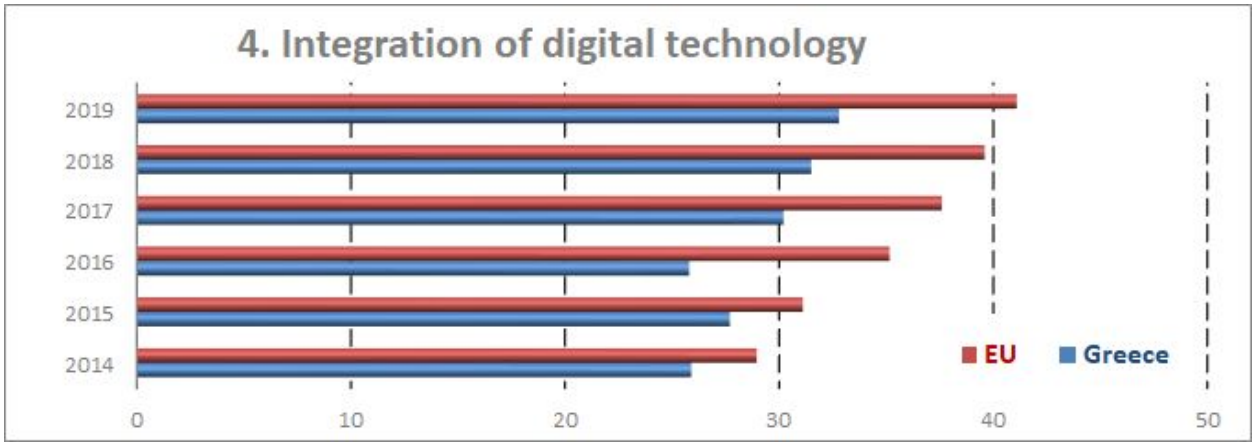
"Use of internet services" sub-indices:

	Greece				EU
	DESI 2017	DESI 2018	DESI 2019		DESI 2019
	value	value	value	Rank	value
3a1 People who never used the internet	**28%**	**28%**	**25%**	***27***	**11%**
% individuals	2016	2017	2018		2018
3a2 Internet users	**66%**	**67%**	**70%**	***26***	**83%**
% individuals	2016	2017	2018		2018
3b1 News	**85%**	**87%**	**87%**	***8***	**72%**
% internet users	2016	2017	2017		2017
3b2 Music, videos & games	**77%**	**77%**	**79%**	***18***	**81%**
% internet users	2016	2017	2018		2018
3b3 Video on demand	**12%**	**12%**	**11%**	***25***	**31%**
% internet users	2016	2017	2018		2018
3b4 Video calls	**46%**	**48%**	**61%**	***7***	**49%**
% internet users	2016	2017	2018		2018
3b5 Social networks	**68%**	**72%**	**73%**	***13***	**65%**
% internet users	2016	2017	2018		2018
3b6 Professional social networks	**7%**	**8%**	**8%**	***23***	**15%**
% internet users	2015	2017	2017		2017
3b7 Doing an online course	**8%**	**7%**	**7%**	***13***	**9%**
% internet users	2016	2017	2017		2017
3b8 Online consultations and voting	**8%**	**5%**	**5%**	***21***	**10%**

% internet users	2015	2017	2017		2017
3c1 Banking	**28%**	**36%**	**38%**	***26***	**64%**
% internet users	2016	2017	2018		2018
3c2 Shopping	**45%**	**45%**	**49%**	***22***	**69%**
% internet users	2016	2017	2018		2018
3c3 Selling online	**3%**	**3%**	**5%**	***27***	**23%**
% internet users	2016	2017	2018		2018

Integration of digital technology

	Greece		EU
4. Integration of digital technology	**Rank**	**Score**	**Score**
DESI 2019	**22**	**32.8**	**41.1**
DESI 2018	22	31.5	39.6
DESI 2017	22	30.2	37.6
DESI 2016	23	25.8	35.2
DESI 2015	20	27.7	31.1
DESI 2014	19	25.9	29.0



On the Integration of digital technology by businesses, Greece ranks 22th among EU countries, well below the EU average. While the country's ranking has stayed the same, there has been some slight progress with some indicators. The enterprises in Greece are increasingly taking advantage of the opportunities provided by big data: 13% of them report using big data (above the EU average of 12%). 21% of enterprises use social media, as much as the EU average. However, only 7% of enterprises use cloud computing; while this represents a 2% increase since last year, it remains below the EU average (18%). SMEs selling online in 2018 stagnate at 11%, the same as in 2017. Their e-commerce turnover also remains low at a mere 4% of total turnover.

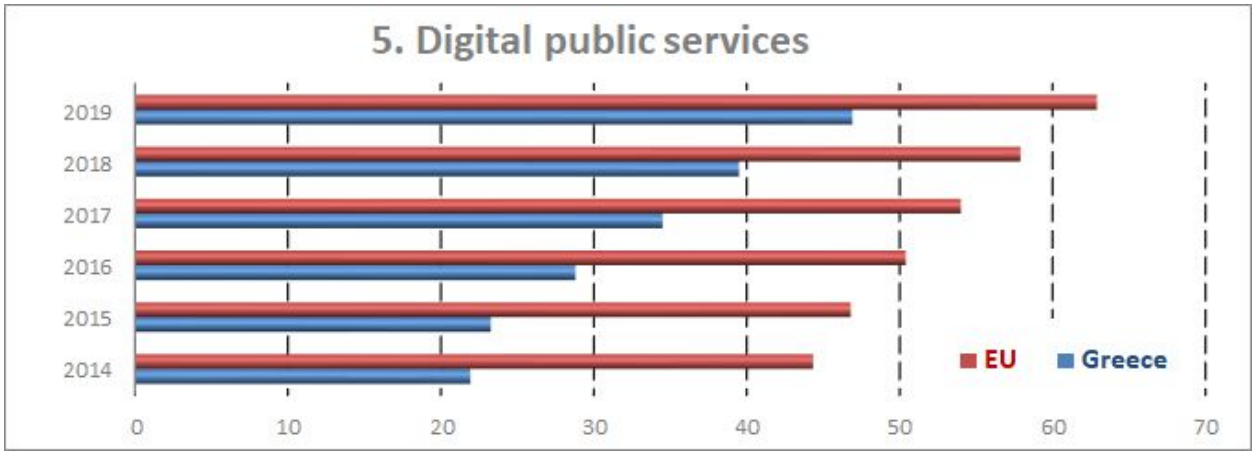
"Integration of digital technology" sub-indices:

		Greece			EU
	DESI 2017	DESI 2018	DESI 2019		DESI 2019
	value	value	value	Rank	value
4a1 Electronic information sharing	**37%**	**37%**	**37%**	***12***	**34%**
% enterprises	2015	2017	2017		2017
4a2 Social media	**20%**	**21%**	**21%**	***12***	**21%**
% enterprises	2016	2017	2017		2017
4a3 Big data	**11%**	**11%**	**13%**	***13***	**12%**
% enterprises	2016	2017	2018		2018
4a4 Cloud	**6%**	**5%**	**7%**	***26***	**18%**
% enterprises	2016	2017	2018		2018
4b1 SMEs selling online	**10%**	**11%**	**11%**	***24***	**17%**
% SMEs	2016	2017	2018		2018
4b2 e-Commerce turnover	**6%**	**3%**	**4%**	***26***	**10%**
% SME turnover	2016	2017	2018		2018
4b3 Selling online cross-border	**3%**	**7%**	**7%**	***21***	**8%**
% SMEs	2015	2017	2017		2017

To boost the digital transformation of the Greek economy and capture the full range of benefits from the adoption of digital technologies, it is important to speed up the implementation of measures relating to the digitisation of the economy for which the National Digital Strategy makes provision.

Digital public services

	Greece		EU
5. Digital public services	**Rank**	**Score**	**Score**
DESI 2019	**27**	**44.7**	**62.9**
DESI 2018	28	37.5	57.9
DESI 2017	28	32.8	54.0
DESI 2016	28	28.8	50.4
DESI 2015	28	23.3	46.8
DESI 2014	28	21.9	44.3



In the Digital public services dimension, Greece ranks 27th among EU countries, well below the EU average, but it is progressing at a rate above the EU average; Greece's score rose by 7.4 points in 2018 while the average EU increase, over the same period, was only 5 points. Greece is performing very well as regards the Open data maturity indicator, with a total of 74% well above the EU average of 64%. On the supply side (in the provision of online public services), Greece continued to progress in 2018, with 23/100 pre-filled forms compared with 14/100 in 2017, however, it still scores well below the EU average. Moreover, only 36% of internet users are active users of e-government services, against an EU-wide average of 64%. The availability of digital public services for businesses, on the other hand, increased significantly with a score of 65. This compares favourably with the increase between 2016 (59) and 2017 (60).

For e-health services, Greece ranks below the EU average; only 10% of people have used health and care services provided online.

“Digital public services” sub-indices:

	Greece				EU
	DESI 2017	**DESI 2018**	**DESI 2019**		**DESI 2019**
	value	**value**	**value**	**Rank**	**value**
5a1 e-Government users	**42%**	**38%**	**36%**	***28***	**64%**
% internet users needing to submit forms	2016	2017	2018		2018
5a2 Pre-filled forms	**5**	**14**	**23**	***26***	**58**
Score (0 to 100)	2016	2017	2018		2018
5a3 Online service provision	**63**	**76**	**82**	***22***	**87**
Score (0 to 100)	2016	2017	2018		2018
5a4 Digital public services for businesses	**59**	**60**	**65**	***26***	**85**
Score (0 to 100) – including domestic and cross-border	2016	2017	2018		2018
5a5 Open data	**NA**	**NA**	**74%**	***8***	**64%**
% of maximum score			2018		2018
5b1 e-Health services	**NA**	**10%**	**10%**	***23***	**18%**
% individuals		2017	2017		2017
5b2 Medical data exchange	**NA**	**NA**	**25%**	***18***	**43%**
% of general practitioners			2018		2018
5b3 e-Prescription	**NA**	**NA**	**NA***		**50%**
% of general practitioners			2018		2018

*Data has been removed due to potential inconsistencies

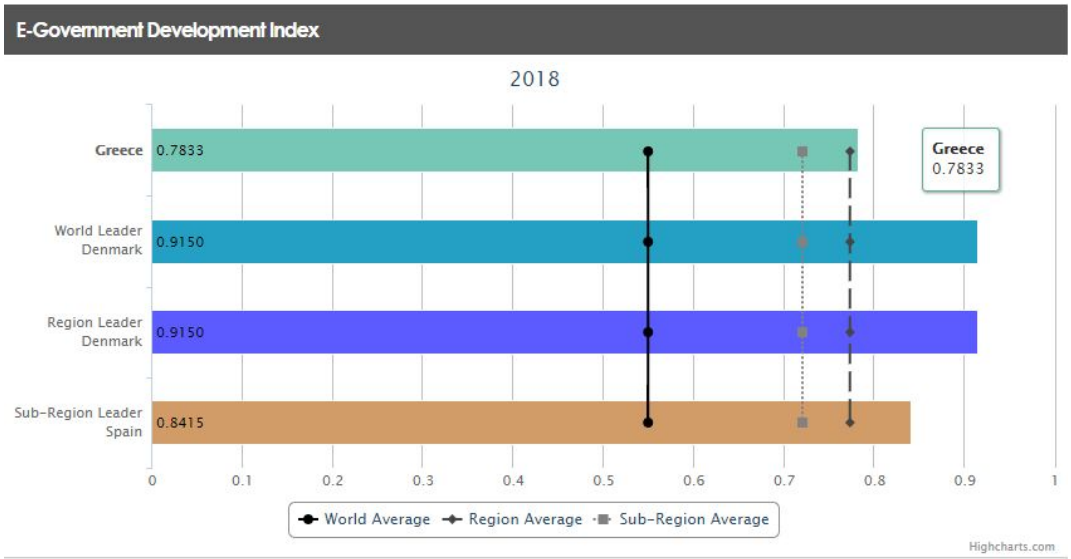
Continuing and speeding-up the implementation of digital solutions to modernise the Greek public sector and offer a comprehensive e-government system that works well, including e-health services, will improve the provision of public service.

The position of Greece in the world

The United Nations e-Government Survey 2018 provides an analysis of a country's progress in the use of eGovernment, how it can help address emerging issues of public administration, and support the implementation of internationally agreed development goals. It is also the only global report assessing the status of e-government implementation in all UN member states.

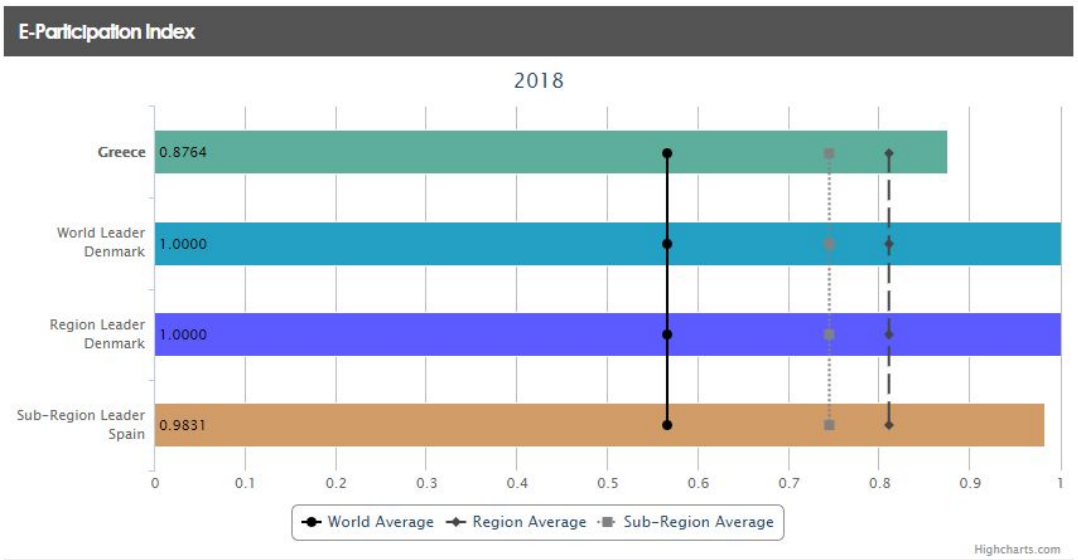
The survey monitors the progress of eGovernment development through the E-Government Development Index (EGDI). As a composite index, EGDI is used to measure the readiness and capacity of a Member's public administration to use technology in public service. This measurement is also a tool for governments to better understand the relative position of a country in the use of e-government to provide public services.

Based on the results of the 2018 survey, Greece is placed in the group of developed countries (World e-government leaders with very high E-Government Development Index (EGDI) levels). The country went up 8 positions in the ranking of the General Index (35th, compared to 43th in 2016).



EGDI Rank	2018	2016	2014	2012	2010	2008
Greece	35	43	34	37	41	44

In the E-Participation Index Greece is ranked 34th. This index index is a complementary indicator of the UN e-Government Survey. It extends the scope of research, focusing on the provision of e-government services to citizens, on electronic consultation and on participation in the decision-making process.



EPART Rank	2018	2016	2014	2012	2010	2008
Greece	34	65	17	45	48	98

Annex C- Interoperability Map of Base Registries

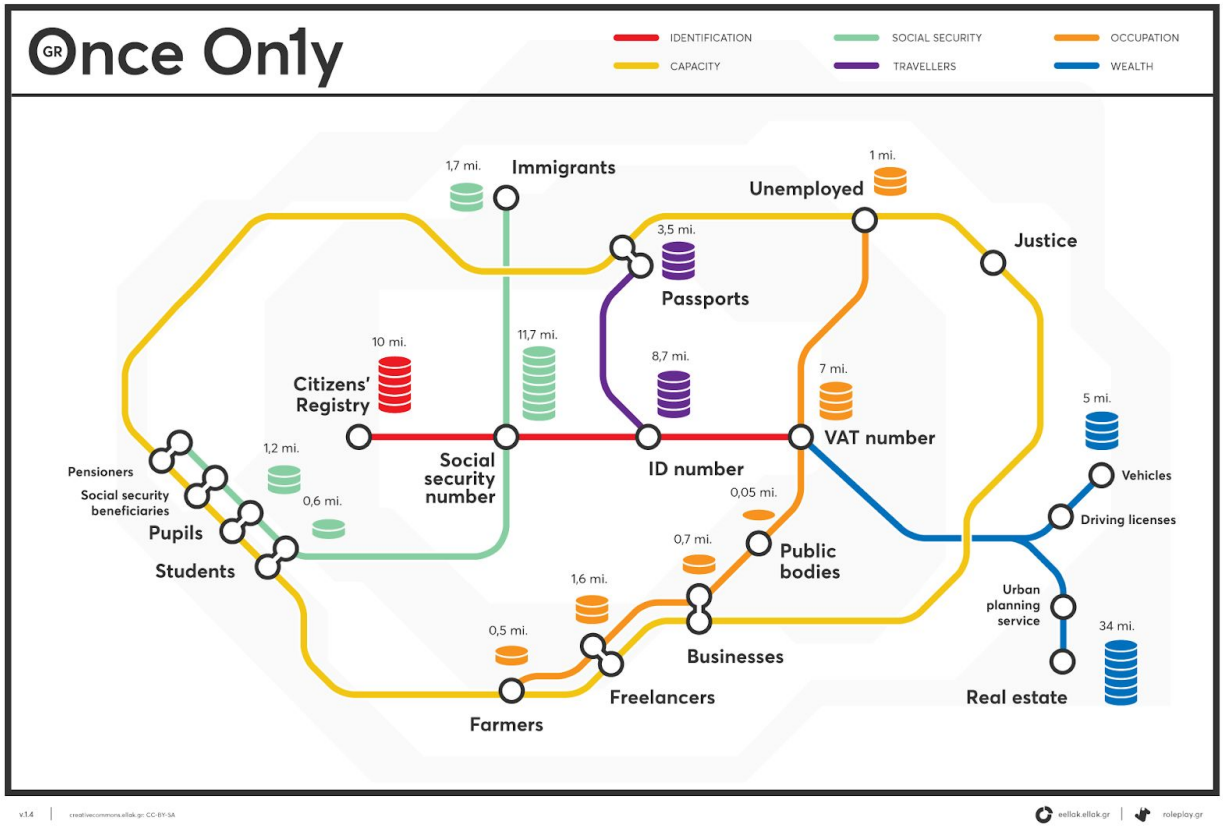
Base registries are the cornerstone of public service delivery. According to the European Interoperability Framework, they are **“reliable sources of basic information on data items such as people, companies, vehicles, licences, buildings, locations and roads” and are “trusted and authoritative”**.

Their main differentiating feature, compared to other registries, is the reuse of the data contained in them from a large number of applications and systems, while the organization managing the registry is responsible and accountable for collecting, using, updating and maintaining its data. The information held in the base registries are the master data. “Authoritative here means that a base registry is considered to be the source of information, i.e. it shows the correct status, is up-to-date and is of the highest possible quality and integrity”.

In summary, base registries have the following characteristics:

1. A basic register concerns data and attributes of entities such as individuals, companies, vehicles, licenses, buildings, locations and roads.
2. The registry information is primary and authentic, and is use or repeated multiple times in other registries and online services.

We define 2 types of Base Registries: Horizontal Base Registries and Sectoral Base Registries. Their difference lies in the fact that in the Horizontal Base Registries the information contained concerns the creation and commencement of a life cycle of a significant entity for public organization; e.g. individuals, companies, locations, vehicles. Due to this feature, Horizontal Base Registries do not receive information, or receive secondary or limited information, from other registries (base or not), whereas Sectoral Base Registries may receive significant information from other Horizontal or Sectoral Base Registers. **All these registries (Horizontal and Sectoral) should interoperate and provide authentic data to the entire public administration, businesses and citizens, under a single framework of standards and availability**, while respecting the privacy and security policies.


Once Only
GR
IDENTIFICATION
CAPACITY
SOCIAL SECURITY
TRAVELLERS
OCCUPATION
WEALTH
1,7 mi.
Immigrants
1 mi.
Unemployed
3,5 mi.
Passports
Justice
10 mi.
Citizens' Registry
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VAT number
5 mi.
Vehicles
Driving licenses
1,2 mi.
0,6 mi.
Pensioners
Social security beneficiaries
Pupils
Students
Social security number
ID number
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0,7 mi.
Public bodies
1,6 mi.
0,5 mi.
Businesses
Freelancers
Farmers
Urban planning service
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