

## Research Article

# Digital Government Platforms in Greece. Current Trends: The Case of Gov.gr

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Digital platforms have become essential tools for the operational transformation of organizations over the last few decades. Governments have realized their advantages and are making progress in incorporating them into their infrastructure, especially during the COVID-19 era. This paper examines digital government platforms (DGPs), their value, and their characteristics. Previous research has identified a variety of factors that affect e-government or DGPs in differentiated cases and regions. The lack of a general list of elements that influence DGPs led to the creation of a general framework of factors that may contribute to a successful launch and operation. These 16 factors were categorized into 3 segments, information technology, government, and user. Their relationship is based on coordination/support, interaction, and feedback. In order to initially evaluate the proposed framework, it was tested through the application on the Greek public sector platform Gov.gr, and initial findings were presented. A contemporary mapping of Greece's digital status and the Greek government's efforts for a modern digital state were presented. Gov.gr is Greece's official master platform that offers a significant number of governmental services to citizens and companies quickly, remotely, and efficiently. The utilization of the framework that is developed in this paper against Gov.gr offers valuable conclusions about DGP's operation and its focus on bureaucracy reduction, accuracy, and satisfactory service. The paper concludes with research limitations and the identification of future research pathways.

**Keywords:** digital government pPlatforms, factors, framework, Greece, Gov.gr**jel classification codes**

H1, O33, O38

## 1. Introduction

Digital transformation is a trend for the last decades that affects the way that digital technologies offer solutions for individuals, organizations, and society as a whole. The need for digital transformation became more urgent with the coronavirus crisis where automated processes and remote working became necessary [5, 20, 57].

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**1.1. Digital platforms are a significant foundation for digital transformation and they have become a major tool for managing various human activities, including economic, social, and political interactions [33, 69]. Digital platforms offer a variety of positive effects on an entity and they accomplish economic cutbacks in transactions, logistics, search, and other organizational costs [17, 56].**

The government sector has realized the positive effects of ICT in the last three decades and has started incorporating it into its structure in order to become more efficient and provide better service to citizens [43, 53]. A series of studies have proved its ability to offer positive outcomes in bureaucracy [9, 31], transparency, political participation [1, 3], revenues, and transaction costs. [30,46]. The outcome of this incorporation of ICT technologies into the governmental structure and the solutions it provides to various social, economic, cultural, and other forces is called digital government. [31, 58].

The coronavirus pandemic forced the majority of countries and municipalities to rapidly pursue more and new digital government strategies. It has reinvented the role of digital government, in terms of digital services and innovative attempts into managing the crisis' outcome. [74].

This paper investigates digital government platforms (DGPs), a major component of a government's digital strategy. An extended literature review of DGPs showed that they offer valuable reengineering to a government's structure, operation, and provided services. There are various factors that influence a DGP, its design, management, and operation. These factors must be recognized and dealt with in a way that is in line with the government's strategy, users' needs, and technological evolution.

Some of the previous studies about DGPs and the factors that affect them tend to analyze a specific digital platform in the form of a case study. So, they examine its environment and characteristics or the way it was created in a local, regional, or even governmental environment. Other studies tend to inspect the factors that affect an e-governmental policy or initiative without addressing the factors that affect a DGP specifically. Some also tried to map a few of the factors that lead to the success of this platform from the technological or governmental or managerial point of view. This acknowledgment maps the gap that exists in the previous literature

So the purpose of this paper is originally the development of a generalized framework of factors that affect DGP's success in a manner that can be applied to a plethora of cases. Factors such as transparency, public trust, security, social influence, planning, funding, and management are reported in this paper's body. More than 60 factors were

identified and were concentrated into 16 which were categorized into 3 basic categories: Information Technology (IT), Government, and User. IT and Government should have continuous coordination and feedback whereas between IT, Government, and User, comments and reactions offer valuable information. The usage of the proposed framework on a DGP completes the aim of the paper. The analysis of the external and internal environment in which Gov.gr operates links the proposed framework to the DGP's results. The following chapters provide the literature review that analyzes DGPs and a series of factors that were reported of influencing them. After a detailed literature review, the methodological framework is analyzed, its stages, and the steps of content analysis. The analysis continues with a framework of factors that affect DGPs and a detailed presentation of the categories and terms.

But what is the current situation in the Greek public sector? Is there a digital strategy, does the coronavirus affect it, and are there any successful Greek DGPs? These questions are being answered in the next section. Gov.gr is the main platform that concentrates the majority of public services. A detailed presentation of the steps of a case study is presented here. Finally, the suggested framework of factors is being implemented in order to explain and justify the success of Gov.gr. The analysis of these factors proves that Greece with Gov.gr performs a coordinated and continuous effort to digitize a major amount of its services, in a user-friendly master platform, under careful consideration of its needs and status. The added value of this chapter is the implementation of the framework of factors that were previously explained on Gov.gr and the findings that are obtained.

Finally, this paper concludes with an overview of the literature, the methods that were applied, the framework that was proposed, and its implementation on Gov.gr. Limitations and future works are also described.

## 2. Literature Review

### 2.1. Digital government platforms (DGPs)

Governments use DGPs as a foundation of their digital transformation practices. Users of these platforms can be citizens, businesses, public servants, other local or governmental bodies, and non-profit organizations. Governments can function as owners, providers, managers, or users of DGPs that occurred under public, private, or mixed authority [76]. So, digital governments rely on DGPs as part of their strategy, in order to create public value. This value depends on a digital government ecosystem that incorporates

government and non-governmental entities into exchanging and producing information, services, and products [30, 62, 65].

Digital platforms that operate in the private sector and their effects have been studied for many years and there is a substantial number of relative papers and studies [13]. Unfortunately, this is not the case with the public sector and DGPs. Parker et al. [56] highlighted the need for relevant research because of the differences between private and public sector organizations and structures. DGPs for example tend to be in a less advanced lifecycle point in comparison to private digital platforms. [75].

The existing studies of DGP examine the stages of platform acceptance with case studies in various countries [35]. It points out different characteristics and outcomes of DGPs between more and less developed economies [8, 61]. According to Amankwah-Amoah [4], less developed economies are faced with digital, operational, economic, and other problems.

Van Gansen et al. [76] reported that DGPs exist mainly for sharing public sector data, designing an ecosystem around valuable information, governmental transparency, effective interaction, creation of new revenue streams and services, and democratization of data usage. Toomere et al [71] examined the architecture of a digital government interoperability platform. They suggested that these platforms grant the power to govern who can enter their databases securely.

Also, there are studies that examine how channels such as media strengthen citizens' partnership [37] and others that propose a strategic alignment framework for screening the various motivations of partners [21]. Klievink et al. [37] performed empirical research that affirmed that government entities can develop public-private digital platforms that offer businesses positive outcomes whilst serving public interests' values. The main key is to be accepted by all the participants. Millard [51] suggested that open government initiatives facilitate non-governmental stakeholders in contributing to public value through DGPs. De Blasio and Selva [11] analyzed various open DGPs in France, Italy and the UK. They proposed that open government implementation offers a transnational convergence.

Finally, various new government types such as lean government [32], government as a platform [8, 54] and internet plus government platform [39] focus on minimizing the public sector complexity by reducing organizational problems and maximizing stakeholders' innovation. Here DGPs, AI, big data, etc. aim to facilitate innovation and interactions with other participants by orchestrating the whole procedure with modern government operations and services.

## 2.2. Factors affecting DGPs

The key factors that were identified in recent literature are indicated below. The methodology followed to access these papers is described in the methodology section.

TABLE 1

Author	Year	Independent factors	Dependent factors	Methodology
Wang et al. [78]	2021	Perceived functional benefit, Personalization, Long-term orientation.	Usage behavior in DGPs	Quantitative analysis (survey)
Vanderbeker [77]	2021	Platform model value, leadership, governance, accountability, measurement, culture, law, collaboration.	DGPs practices	Qualitative method (case study)
Brown et al. [8]	2017	Collectively visualized organizational form, market dynamic, architectural structure.	Impact and role of DGP	Literature review
Meiyanti et al. [48]	2018	Budgeting, laws, legislation, human resources, IT infrastructure, management, digital culture.	DGPs implementation challenges	Qualitative analysis (PRISMA, 29 studies)
Lombardo [40]	2021	Architectural design, operational approaches, economic properties, government structure, outcome monitoring.	Effective implementation of DGPs.	Literature review
Senshaw, and Twinomurinzi [66]	2021	Governance model policy, self-learning, collaborative, adaptive capabilities.	DGP's implementation in low-income country	Qualitative method (case study)
Sapraz, and Han [64]	2021	Universal usability, fairness, accountability, informed consent, autonomy, human welfare, trust.	Human values in DGPs	Qualitative research method (interview)
Young [81]	2020	Orientation toward service or administrative activities, availability of appropriate data, core mission, administrative capacity.	Implementation of open-data gov. platforms	Quantitative analysis (survey)
Peña-López [58]	2020	Governance, public value, trust, user-driven services.	DGP's policy	Qualitative method (case study)
Van Gansen et al. [76]	2018	Expenses, revenues, services, personalization, effort costs, quality of data standards, open and public data, intellectual property, brand awareness, user experience.	DGP's governance	Qualitative method (case study)
Senyo et al. [67]	2021	Automation, process re-engineering, operational improvement, inter-organizational collaboration, digital service innovation, distributed collaboration.	Key elements for a successful DGP.	Qualitative method (case study)
Dong et al. [16]	2012	E-government strategic planning, governmental leadership, PPP, modular promotion.	Development of a DGP	Qualitative method (case study)
Marino and Pariso [44]	2021	Connectivity, human capital, digital public services, investment, digital divide.	DGP's effectiveness	Quantitative analysis (EU countries)
Lovelock [40]	2018	Interoperability, privacy and data protection, strategy, measurement.	Policy for DGPs	Literature review
Gil-Garcia et al. [24]	2018	E-democracy, e-management, e-services, e-policy.	Factors that affect DGP applications	Literature review
Hafseld et al. [27]	2022	Project idea, the decision of digital enabler, financial funding, technology, dependency on external stakeholders, government structure, project leader and manager.	Factors of DGP's successful operation	Qualitative method (case study)

Other studies also mention social media, performance expectancy, the citizens' capability, social influence, media anxiety, age, gender, education, corruption, favoritism, perceived ease of use, perceived info quality, perceived functional benefit and shared responsibility [28, 42,49, 52, 63].

So, relative literature reports various factors that affect DGP but not in a disciplined structure. These factors were sometimes seen from a specific point of view, or in a specific case study of a country. This lack of a unified framework guided the authors into summarizing all the relevant factors in a methodical procedure, as it is stated below. Also, the usage of this framework in a Greek case study will also offer prized results.

### 3. Methodology.

This paper chose to perform a literature review about DGPs and more specifically with factors affecting their success. This approach was decided in order to collect all the previous knowledge on the chosen theme. A literature review can be described as an organized procedure of collecting and evaluating previous research in a specific theme [72]. Templier and Paré [70] stated that literature reviews offer valuable outcome in the following ways: by recognizing what has been written on a specific issue; by mapping the area that expresses any trends or design; by generating findings that answers a research question or questions; by creating new frameworks and theories; and by showing theory gaps that can be answered by other papers or research.

The stages of conducting this literature review were the following:

1. Problem or research question formulation
2. Data collection (search of the extant literature)
3. Data evaluation (screening for inclusion and assessment of the quality of primary data).
4. Analysis and interpretation
5. Presentation.

1. Problem or research question formulation.

This paper's research area is DGPs, their internal and external environment, their function and their outcome.

The coronavirus outbreak demonstrated the necessity of more DGPs for providing faster and more efficient services to the entities in need (citizens, enterprises, organizations etc.) But which are the factors that can lead to a successful DGP? A universal

framework of these factors could be a valuable map for public authorities that wish to create or manage such a DGP.

So the research question that can answer the existing needs is: Which factors affect a DGP's successful creation, operation and outcome?

#### 2. Data collection (search of the extant literature).

The second step for conducting this literature review is data collection.

The initial string of keywords according to the first research question was: "factor\* and success or effectiveness and digital and government and platform\*". The search terms were developed using the BOOLEAN operators [7]. Scopus, the top 5 government journals according to Scimago ranking, Science Direct, Business Source Complete (EBSCO) and Google Scholar are selected as the most appropriate data sources for this literature search. The research was conducted from January to April 2022 and English papers from 2012 to 2022 were searched out. Finally, the search was based on the title, abstract, and keywords of each source. This step produced 286 papers.

#### 3. Data evaluation (screening for inclusion and assessment of the quality of primary data.

In this stage of literature review, the literature that was initially found was screened and duplicated papers or papers whose titles were not relevant or could not be uploaded for various reasons were excluded from the process.

Also, after the initial screening, the authors read the abstract and only suitable papers continued to be assessed. The remaining papers that were relevant were entirely read and only 75 were assessed of value for this paper.

#### 4. Analysis and interpretation

The chosen papers were examined more carefully and from each paper, the noted key factors that affect the success of DGPs were noted.

By performing content analysis, there was an initial coding of all the factors that were gathered from relevant literature and affect DGPs success. Content analysis is a general term used to analyze text [60]. By systematic coding and categorization of similar terms, content analysis can lead to understanding trends and patterns of words used their frequency and their relationship. A final framework of significant value can be created [22, 45].

The steps of content analysis that are followed as described by Elo and Kyngäs [19] are

##### 4.1 Preparation

The authors engrossed the data and obtained a sense of the terms, selected the most appropriate literature for data analysis and decided the specific direction for analysis which was the creation of a framework of terms that affect DGPs successful function and outcome.

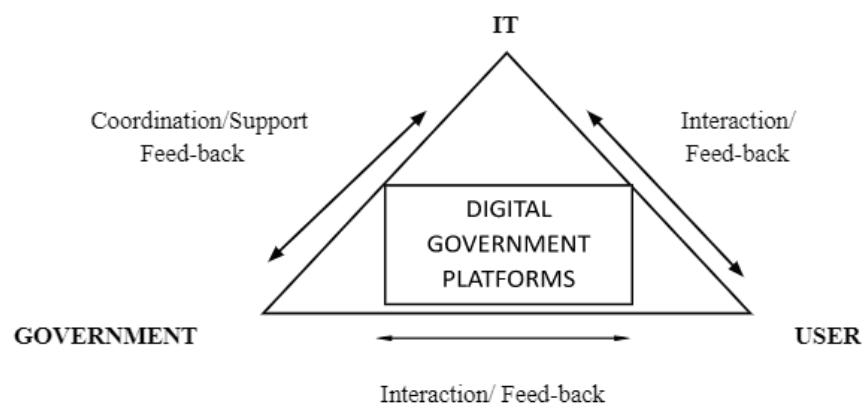
#### 4.2 Organizing

The authors created categories by merging factors with similar meanings. Then they grouped these factors under higher categories and formulated a more generic description of the research theme by developing categories and subcategories as the meaning was abstracted.

#### 4.3. Reporting

Finally, the author reported the process of the outcome through a framework or a map with categories and sub-categories (factors) [75].

The outcome of this process formed a unified framework of factors that affect a DGP. A framework is not only a collection of concepts but, rather, a construct. Miles and Huberman [50] suggested that a framework identifies the key factors, constructs, or variables, and understand their relationships. The framework that is proposed is the following:



Source: Authors compilation

**Figure 1:** Framework of factors that affect a DGP.

#### • Information Technology (IT)

The structure of a DGP is based on information activities that will improve present public infrastructure and provision of old and new services. IT aims to aid in a series of processes from creating the platform, capturing, processing, storing data and offering final services to the platform user. IT can be operated by the same government body, a different one, private companies, a private-public-partnership or another mixed mode.



Low-variety components, stable interfaces and high-variety components are the architectural conditions that offer a complete digital platform ecosystem. The mix of them must offer an effective digital interaction between the government, platform users and platform specialists.

Some of the factors that belong to this category can be decided by other parties (such as the government) but because of their nature, the authors chose to include them in this category. Such examples are security, privacy, etc. The choice for these factors can be made by the government or the managerial unit but the mode for realizing this choice is based on IT.

The factors that belong to this category are the following, as seen in Table 1.

1. Choice of technology/ Architecture
2. Privacy/Security/Data protection
3. Internet access and speed
4. Integration with other platforms/ Dependency

- **Government**

This category focuses on the decision that a government must make in order to create, co-create, operate, manage or just use a DGP for government or public service. This public body must select the purpose and aim of the DGPs produced outcome according to its digital strategy, its status of digital maturity, its need for digital advancement and its customers' needs. Join forces with private companies, citizens, and other public bodies in every stage of DGP can be decided. Coordination among all stakeholders is essential for positive network effects so is the continuous feed-back and improvement of all relevant elements and procedures. Finally, public employees must and should be in a state to use the provided DGP, in order to facilitate their work and produce valuable outcomes.

The factors that belong to this category are the following, as seen in Table 1.

1. E-government status /Digital strategy
2. Legislation/ Corruption/ Transparency/Trust
3. Financial issues
4. User focus
5. Platform planning/ Management

## 6. Publicity

## 7. Public servant cooperation

### • User

Users of a DGP can be citizens, private companies, government employees, other governments or public authorities, non-profit organizations etc. First of all, customers must have the ability and the knowledge to use a DGP. Also the services that these users will accept from a DGP must be quick, useful, trustworthy and with a friendly interface. Technical competency is a valuable advantage for a DGP usage. Another valuable factor is e-participation where users effectively interact with other DGP's stakeholders for process and services reengineering.

The factors that belong to this category are the following, as seen in Table 1.

- Ease of use
- Perceived usefulness
- Personal characteristics
- Technical competency
- E-participation

## 5. Presentation.

The following table summarizes the main categories, the factors of its category and the analysis of each factor. The main principles that must operate at all times between the Government and IT are cooperation, collaboration and feed-back for continuous improvement. Also, end-users participation and feed-back offer valuable data for process and service reengineering.

The aim of this framework is to provide a concentrated knowledge about the terms that affect a DGPs function and successful outcome in various environments and with various services. Its purpose is to offer a map to governments that wish to promote their digital strategy by creating, owning, operating or just using a DGP in order to provide valuable services to end-users. This framework does not stand alone but is always in direct compliance to each government's external and internal environment.

The following chapters of this paper conclude its purpose by testing the proposed framework in the Greek environment and more specifically in the DGP called Gov.gr.

TABLE 2: Factors affecting a DGPs successful creation, management and outcome.

CATEGORIES	FACTORS	ANALYSIS
IT	Choice of technology/ Architecture	System architecture, low and high variety components, apps, IT processes and applications and their linkage are crucial elements of a DGP.
	Privacy/ Security/ Data protection	Collection, storage, process and security, data protection (GDPR rules) provide smooth operability, trust and stability.
	Internet Speed Access/	Fast and continuous access to DGP for all users, everywhere and anytime.
	Integration with other platforms /Dependency	GaaP, open data, interoperability and collaboration of network platforms, network effects, sharing of data, apps and services.
GOVERNMENT	E-Government status/Digital strategy	Government's digital status and strategy are basic elements of a DGP that follows the digital aim of a country.
	Legislation/Corruption/ Transparency/Trust	Obligation laws on platforms around user data or identification, GDPR and national security. Government corruption has a negative impact on the platform and on possible partnerships. Clarity of decision-making processes around content and platform rules provides trust and transparency to all users.
	Financial issues	Government investment, financial structure, funding, economic payments, payback is also a key issue for the platform's stability and operation.
	User focus	The main object of a DGP is user satisfaction with the best possible service provision for citizens, public authorities, private companies etc.
	Platform Planning/ Management	The decision of who plans, creates, owns, manages, operates the platform is crucial. Partnership with external players and balancing leadership is an essential issue. Controllability, stability, responsibility and liability also fall into this category.
	Publicity	Via various channels, other platforms, social media etc. users must know the existence and the advantages of GDP.
	Public servant cooperation	The motivation, the digital knowledge and collaboration with public employees is necessary.
USER	Ease of use	User friendly interface, easy navigation through the platform, few clicks, automatic services.
	Perceived usefulness	Provided services must be fast, efficient, trustworthy and applicable
	Personal characteristics	User must be in a position to operate the DGP regardless of age, education, sex, location etc.
	Technical competency	A user with basic technical competences or/ with social media knowledge can reduce anxiety and operate a DGP more easily.
	E-participation	E-participation of users in the creation, operation and assessment of a DGP provides valuable information in operation and improvement.

Source: Authors compilation

## 4. Pilot Application Of The Framework In Greek Gov.gr Platform

In order to initially test our framework, we chose the Greek platform Gov.gr in order to partially validate our results and identify potential limitations to its application. We initially present the digital status of Greece in terms of technological and governmental status and the importance of the Gov.gr platform in elevating the digital public services.

By utilizing a case study research methodology we analyze the case of Gov.gr in relevance to our framework and present our initial findings that allowed us to refine it. Case study as a methodology explores and critiques a phenomenon in context (i.e. bound) using multiple data sources and collection methods [41]. The search was about digital platforms in Greece and Gov.gr. Also Greek digital status was search as a term. The data were gathered mainly from governmental sites and valid newspapers and there were double checked for the validity of the content.

#### 4.1. Digital status of Greece.

In January 2022, Greece had 10,34 million people as habitats (-0,5% reduction over the last year). Internet users increased by 3,5% between January 2021 and January 2022 and internet penetration rate was 82,2% of the Greek population. There were also 14,02 million mobile connections (-6,7% reduction since January 2020) and 8,39 million internet users (1,00% raise since January 2020), 80,7% of total population are internet users and the year-on-year change in average speed of fixed internet connections had a 24,3% increase [35].

Ookla's data at the start of 2022 show that fixed internet connection speeds increased by 9,85 mbps, which is a positive change of 44,8% since last year. At the same time the median mobile internet connection speed increased by 24,93 Mbps, which is a positive change of 90,1% since last year [35].

Greece's position on the Digital Economy and Society Index (DESI) was second to last, in the 27th position out of the 28 EU Member States. But, the final score for Greece has improved from 35,1 in 2019 to 37,3 in 2020. Greece has shown some improvement in digital skills, with over half of the Greek citizens having at least the basic digital skills. Also on Connectivity, the country progressed over 15% compared to 2019 [44].

The same picture is provided by the EGDI and e-participation indexes where the ranking is n. 42 and n. 50 but this ranking shows a positive change from earlier years. Unfortunately, according to OECD' ranking, Greece is first in unnecessary bureaucracy. [6, 10, 73].

#### 4.2. Greece's public digital transformation.

The coronavirus pandemic accelerated the digital transformation of Greece both in private and in the public sector. Procedures needed to be performed by distance, in a safe and efficient environment. Many digital platforms emerged by the public sector

(Gov.gr, e-me, emvolio.gr etc) that offered fast and in-need services such as medical prescriptions, vaccination dates, distance learning and online meetings [37].

In May 2021, Greece presented the Greek-Government 2.0, a national recovery and resilience plan that aimed to change the function of Greek models and institutions. It rests upon 4 pillars: 1. Green transition, 2. Digital Transformation, 3 Employment, skills and social cohesion, 4. Private investment and economic transformation. Many of its components evolve modernization of public administration. [26, 27]. This modernization is analytically described in the Digital Transformation “bible” (DTB) of Greece (2020-2025).

The DTB was designed before the coronavirus pandemic and it had to accelerate its procedures in order to resolve urgent matters. The “bible” maps the basic principles, the strategic axes and the horizontal and vertical interventions that aim to perform the digital transformation of both the private and public sector. Greek authorities will collaborate with private companies, academic communities and citizens for the final implementation. DTBs implementation evolves more than 400 projects in all the sectors such as Economy, Development and Innovation, Foreign Policy, Education, Culture, Sports, Employment and Social Affairs, Health, Environment and Energy, Justice, Public Administration, Transformation of Cities and Communities, Transportation, Maritime Affairs and Insular Policy, Tourism etc. These projects have orchestrated the creation of 97 digital government platforms [15].

It is a difficult and complicated task because of the coronavirus outbreak and the low digital maturity of the Greek public sector.

### 4.3. Digital Government Platforms in Greece.

Several digital government platforms have been created in the last few years that prove the fast implementation of the DTB. Some of them are the following:

1. “Valuemaps”, is a digital platform that was launched in June of 2021 that maps and calculates the objective value of a real estate in Greece. It is cooperation between the Ministry of Finance and the Ministry of Digital Government [2].
2. “i-AGRIC” is a mobile platform that provides services of agricultural interest to producers and citizens. It also offers personalized notifications, information, service and consulting [29].
3. “Greece from Home” is a digital platform that was created by the Ministry of Tourism, (EOT) a Greek tourism organization and the private company Marketing

Greece. It was designed for boosting Greece's touristic image through the corona virus crisis [47].

4. "Elevate Greece", is a digital platform that was created in 2020 and it is a Greek government initiative for promoting startups and their growth by nurturing an effective innovation ecosystem [18].
5. "Greek farms" is a digital platform that connects international traders and consumers of agricultural products with Greek producers [25].
6. E-me is a digital platform of work and cooperation for all students and teachers. It has a safe and secure environment with a friendly interface. It was launched in 2014 but the second edition that was widely used by the school environment during the pandemic was in the 4<sup>th</sup> semester of 2019 [79].

Also, in February 2022, the Ministry of Digital Governance with the support of the National Documentation Centre (EKT) launched the first Digital Governance awards competition. Its purpose is to reward public officials that contribute to the digital transformation of the Greek Public Administration sector by innovations in public services or procedures [26].

#### 4.4. The case of Gov.gr

After analyzing the suitability of the above platforms to test our framework, we concluded that Gov.gr, the official main digital portal of public administration where citizens and businesses can find the digital services they want easily and quickly, is the most suitable one. It was enacted with article 52 of the Law 4635/2019 [15]. It was designed by focusing on the needs of citizens and businesses. It unifies the structure and the philosophy of the services so that the user doesn't have to seek instructions for each individual application or platform [26]. All the services are presented based on "life events" (birth, insurance, business start-up, etc.). For the more familiar users, there is a secondary classification of services based on the organizational structure of the service providers (ministries, independent authorities, organizations, etc.). There is also a search section to quickly find results [23]. The aim is to be constantly enriched with new functions and services which will be fully digitized in the future [80].

All the electronic services and systems that it provides continue to operate under the supervision and responsibility of each provider. Gov.gr operates as the common front desk of these public digital services. It can be accessed by computer, cell phone or a tablet. Another advantage is that it provides completion of services without a physical

presence. This method bypasses time-consuming and bureaucratic procedures and all the documents issued by gov.gr are accepted by all public administration bodies and authorities.

Gov.gr started on Saturday March the 21th of 2020. The original plan was to simplify and gather all public services in one platform called Gov.gr but after the coronavirus outbreak and the first official lock-down started, the initial launch was moved two months earlier [26]. In its initial phase, it gathered more than 500 digital services from 14 ministries, 31 agencies and 3 independent authorities.

During the creation of Gov.gr, the data center had a storage capacity of 1,300 terabytes; it's equal to the capacity of 1,3 million actual office drawer units for storing documents [14].The facility is based in one of the best-guarded non-military buildings in Greece, and hosts about 4,500 processors.

Around 300 highly skilled engineers are responsible for Gov.gr and are on a continuous basis in case of a cyber attack, for an immediate action.

Only for the recording of previously undeclared spaces in private properties, 2,7 million citizens visits to public authorities were averted, by using the tetragonika.govapp.gr application. Another 6,6 million visits to local authority buildings and Citizen Service Centers (KEP) since June 2020 were also prevented since all relevant documents can be acquired through Gov.gr [12].

Digital Governance Minister Kyriakos Pierrakakis expects all public bodies to supply data.Gov.gr with information thus making Gov.gr a complete repository of open, free and strictly anonymous data. The aim is an efficient digital state with less bureaucracy, more transparency and better services for citizens, according to Prime Minister Kyriakos Mitsotakis.

The Gov.gr portal in May 2022 offers 1.396 services in 11 categories. 19 ministries, 72 organizations, 9 independent authorities and 13 prefectures are linked to this unified master platform. One of the first applications that Gov.gr offered was the relevant information and procedures about the corona virus vaccination through emvolio.Gov.gr. It also provided up-to-date information, instructions, teleconsultation and psychological support about the pandemic to all types of entities (families, travelers, healthcare practitioners etc.) On March the 30<sup>th</sup> 2022, Prime Minister mentioned that this platform surpasses the vaccination procedure and will be used generally for the health system gradually reaching the hospitals.

This platform will use the prescription register (AMKA), always in respect to privacy issues and specifications depending on age, health profile etc [55].

Other important ones were the issuance of responsible statements and documents' authorization. Since its launch more than 2 millions responsible statements have been validated and over 800.000 document authorizations have been issued. Greeks from over the world use Gov.gr and more than 94 million digital transactions have been realized [26].

Currently the offered services follow under the following categories:

1. Agriculture and livestock (procedures, subsidies and allowances for agricultural, livestock or fishing activity)
2. Justice (judicial services, issue of documents)
3. Education (Procedures for enrollment and attendance at educational levels and parties)
4. Entrepreneurial activity (services about the launch and growth of any type of business)
5. Work and insurance (tools and services for job search, insurance and retirement)
6. Family (procedures and issue of documents about life events)
7. Property and taxation (instructions and services about property and taxation management)
8. Citizens' everyday life (services concerning declarations, authorizations, fees payments)
9. Culture, sport and tourism (e-libraries, scientific databases etc)
10. Military service (conscription issues, military academies etc)
11. Health and welfare (Public health and food safety procedures, e-prescription and hospital services)

The percentage of citizens satisfied when asked if the page describing each service is useful, exceeds 95%. In this way, Gov.gr approaches its top goal: to be the digital service center that unites all the information, procedures and solutions that citizens and businesses need. [68].

The framework that was created in the previous section shows in the case of Gov.gr that it leads to successful services. In the category of IT, the responsible Ministry of Digital Governance cooperates with other ministries, public authorities, and organizations such as GRNET S.A. for better results. Security and data protection is been considered very



TABLE 3: Comparison of services and visits to Gov.gr.

Services and visits	May 2021	April 2022
Number of digital services	1.159	1.398
Number of users that visited Gov.gr	7.036.422	38.632.031
Pageviews	36.428.221	291.778.915

Source: Hellenic Republic [68].

highly, so it's building security. Internet access and speed is rapidly improving over the last year and there is major integration with a variety of other platforms that are operated by public authorities and Gov.gr orchestrates the collection. The publicity is extremely high through interviews to the press, newspaper articles, government sites etc. Also, crisis management exists and launch of Gov.gr is a living example. Because of the coronavirus; Gov.gr began to operate two months earlier.

When it comes to managerial factors, Gov.gr embraces Greek's DTB strategy. In terms of legislation, the Law 4635/2019 makes Gov.gr legitimate and follows all relevant European and Greek law. Also GDPR issues are of great importance. The stability of Greeks democracy and current dominant party shows low signs of corruption. Same ingredients offer transparency and trust when it comes to Gov.gr.

Also, logging in with specific credentials and private secure signatures that Gov.gr provides, are also a major advantage for trust. In financial terms, the cost of the proposed investments for DTB amounts to 250 million euro and Greece is focused on digital advancement. The Ministry of Digital Governance is the authority that plans Gov.gr and all the new services. Also, many initiatives for public servant cooperation through various educational programs and awards for digital creativity exist.

The third and final category, the end user enjoys an easy, friendly interface, with various search modes. Many documents can be automatically printed, with speed, efficiency and validity. The perceived usefulness is illustrated by the rising number of Greeks that use Gov.gr. Also, the fact that Greeks from all over the world, from cities, villages, of various education and beliefs use Gov.gr, shows its operational convenience. It can be operated with minimum technical competency and at all times it has instructions and Q and A information. Also, at the bottom of its front page it has an active key for user proposals for the platform and questions about the helpfulness of the answers and services that it provides.

## 5. Conclusion

This research focused on DGPs and created a framework of factors that influence their successful creation, operation and outcome. It used literature review as a method for data collection and finally ended with 35 relevant papers for data processing.

A content analysis of these papers was implemented and the result was the creation of a framework of factors with categories and subcategories (factors) as shown in Fig. 1 and Table that summarizes all the factors relevant to a DGP.

The basic categories are: IT, Government and User. Among IT and Government, continuous coordination, support and feed-back is necessary for perpetual improvement. Each category consists of significant factors that were concentrated as follows:

1. IT is a synthesis of factors such as Choice of technology/ Architecture, Privacy/Security/Data protection, Internet access and speed and Integration with other platforms/ Dependency, Publicity and Control Variables.
2. Government is a synthesis of factors such as E-government status /Digital strategy, Legislation/ Corruption, Transparency/ Trust, Financial issues, User focus, Platform management, Public servant cooperation. Finally,
3. User is a synthesis of factors such as Ease of use, Perceived usefulness, Personal characteristics, Technical competency and E-participation

These factors were mentioned in various case studies and papers in different countries and with different environments and digital status. Thus, the perceived framework wishes to provide a unified approach for all governments. The analysis of these factors for each specific occasion provides challenges as well as opportunities. It is in the hand of each government to focus on the satisfaction of each factor atomically and as a whole.

This paper decided to use the framework on the most significant Greek DGP called Gov.gr. With the methodology of a case study, the digital status of Greece was mapped. Greece's digital factors are low but the Digital Transformation Bible and coronavirus expedited the transition to a more digital public sector. Various new government platforms were launched in the past 2 years. Gov gr. is the official main digital platform of public administration where all users can find the digital services from various public authorities, easily, efficiently, by distance and rapidly.

All the data that were gathered related to Gov.gr were then compared to the factors and categories that the framework suggested and proved their importance. Gov.gr

success with over 1.398 digital services, 38.632.031 user visits, 291.778.915 pageviews and over 95% satisfaction, in its 2 years of operation, demonstrates a successful coordination of IT, Government and Users.

The new framework that was used for Gov.gr can be applied to other Greek DGPs in order to prove its validity. Currently, there is ongoing research in this direction. It can also be implemented to other countries that are digitally mature or immature, in order to provide valuable feed-back and to challenge its universal approach.

Limitation of this research is that data were gathered by secondary sources. Primary data from interviews and questionnaires can offer a higher level of validity. An ongoing research also attends to this matter. Also, future research on DGPs in various countries that offer similar services can also offer interesting results.

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