# Analyzing a Frugal Digital Transformation of a Widely Used Simple Public Service in Greece

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**Abstract.** The digital transformation of public services has been traditionally one of the main targets of digital government research and practice; however, it has focused mainly on the digital transformation of complex public services, based on the development of highly sophisticated and costly information systems (IS) for this purpose. Nevertheless, considerable public value can be generated through the digital transformation of widely used simpler public services as well, as it can result in huge savings of both public servants' and citizens' time, as well as improvements in the quality of these services. Furthermore, due to the financial resource constraints that governments of most countries face, it is important that this is implemented at a low cost, adopting a 'frugal innovation' approach. In this direction this paper: a) describes the 'frugal' low-cost digital transformation of a widely used simple public service in Greece, the 'certification of authenticity of signature', which is applied in two special forms, the 'formal declaration' and the 'authorization'; b) evaluates these novel e-services, based on an extension of 'Diffusion of Innovation' theory with an additional trust-related dimension, using both qualitative and quantitative techniques, and finally drawing interesting conclusions of wider interest and applicability.

**Keywords:** Digital Transformation; Digital Innovation; Frugal Innovation; Digital Public Services; Diffusion of Innovation; Greek Government

## 1 Introduction

Though innovation had been initially associated with resource-rich private firms of developed countries, subsequently there has been much interest among both researchers and practitioners in the development of lower cost innovation by private firms in the resource constrained contexts of developing countries, and later developed ones as well, and this gave rise to the development of 'frugal innovation' [1-7]; it is defined as 'a resource scarce solution (i.e., product, service, process, or business model) that is designed and implemented despite financial, technological, material or other resource constraints, whereby the final outcome is significantly cheaper than competitive offerings (if available) and is good enough to meet the basic needs of customers'

[3]. Information systems (IS) can be important drivers or enablers of frugal innovation, especially low-cost ones [5-7]. Considerable research has been conducted in this area of frugal innovation, motivated by the resource scarcity in the developing countries (in which live a large share of world's population), and also in some of the developed ones as well (especially in times of economic crises that repeatedly occur in market-based economies); this research investigates the inputs (resources), the success factors, the impediments and also the outputs (resulting low-cost products and services) of frugal innovation. A comprehensive review of this research on frugal innovation is provided in [2]. However, the research that has been conducted in this area concerns only frugal innovation in the private sector, while frugal innovation in the public sector has not been researched, despite the pressure that government agencies of most countries face to offer 'more with less': to provide more services, through traditional and digital channels, and also digitally transform the existing services, with continuously decreasing budgets [8,9].

The digital transformation of public services has been traditionally one of the main targets of digital government research and practice [10]; however, it has focused so far mainly on the digital transformation of complex public services, such as taxation and social insurance - welfare ones (for instance see the main e-government services defined by the eGovernment Benchmark Reports of the European Commission, such as the most recent one [11]), based on the development of highly sophisticated information systems (IS), which are costly, take time and necessitate lengthy and complex procurement procedures. Nevertheless, considerable public value can be generated through the digital transformation of simpler public services as well, which are widely used by citizens, as it can result on one hand in huge savings of both public servants' and citizens' time, and on the other hand in significant improvements in the quality of the services offered to the citizens' and the jobs of the public servants (improving their work composition by eliminating mundane routine tasks). Furthermore, due to the financial resource constrains that governments of most countries face, as mentioned above, it is important that this digital transformation is implemented at a low cost, adopting a 'frugal innovation' approach.

In this direction this paper makes two contributions:

a) It describes the 'frugal' low-cost digital transformation of a widely used simple public service in Greece, the 'certification of authenticity of signature', which is applied in two special forms, the 'formal declaration' and the 'authorization'; it is based on a simple and low cost IS, which exploits existing authentication services of the well-established and highly mature taxation and banking information infrastructures of Greece.

b) It evaluates these novel e-services, based on an extension of the 'Diffusion of Innovation' theory with an additional trust-related dimension, using both qualitative and quantitative techniques, and finally drawing interesting conclusions concerning the frugal development of digital government and digital transformation of public services in national contexts of lower economic and technological development.

In the following section 2 the background of this study is outlined, while in section 3 the digital transformation of the abovementioned simple public service is presented. The methodology of the evaluation of the new e-services is described in section 4, followed by the results in section 5, and the conclusions in the final section 6.

## 2 Background

### 2.1 Public sector Innovation

Although historically private sector firms have been more active with respect to innovation in their products, services and processes, the increasing problems and needs of modern societies as well as the emerging digital technologies are drivers of substantial innovation in the public sector organizations as well [12-18]. According to Windrum [12] the most usual types of innovation in the public sector concern the services they offer to society: 'service innovation' is defined as the introduction of a new service product or an improvement in the quality of an existing one, while 'service delivery innovation' is defined as the use of new or altered ways of delivering services to citizens, or otherwise interacting with them (including the use of digital channels for this purpose). Another important type of innovation in the public sector they define is the 'administrative and organizational innovation', which changes the organizational structures and routines by which front office staff produce services and/or back office staff support front office services. In the same study [12] have been defined three more types of innovation that are specific to the public sector: 'conceptual innovation', defined as the development of new world views that challenge assumptions that underpin existing service products, processes and organizational forms; 'policy innovations', which concern changes in the shared understanding of a social problem or need, the policy instruments and the roles of the policy actors; and 'systemic innovation' that involves new or improved ways of interacting with other organizations and knowledge bases. Chen et al. [13] developed a typology of innovations in public sector organizations, based on two dimensions: the 'innovation focus' (which can be strategy, capacity and operations) and the 'innovation locus' (which can be internal and external); so this typology includes six types of public sector innovations concerning mission, management, services (internal innovations), as well as policy, partner and mechanisms/platforms for citizen collaboration (external). Hartley et al. [17] propose and analyze three strategies for public sector innovation: a New Public Management oriented one, which emphasizes market competition; a neo-Weberian state oriented one, which emphasizes organizational entrepreneurship; and a collaborative governance oriented one, which emphasizes multi-actor engagement across organizations in the private, public, and non-profit sectors.

The digital technologies can be important drivers or enablers of incremental or even radical innovations in government agencies, concerning their processes, tasks, internal as well as external communication, services, or even business models, and also their relationships with citizens and other government agencies, which can lead to their 'digital transformation' [8-9]. However, extensive research is required concerning the exploitation of this transformative potential of digital technologies in the public sector, and the realization of all these aspects of its digital transformation, in a context of financial resources scarcity, adopting as much as possible cost-efficient 'frugal innovation' approaches. Our study contributes in this direction.

### 2.2 Diffusion of Innovation

Furthermore, extensive research has been conducted for identifying factors that affect positively or negatively the diffusion of innovations, which has developed several diffusion models, with the most established and widely used of them being the 'Diffusion of Innovation' (DOI) theory of Rogers [19]; according to it the main characteristics of an innovation that affect its diffusion are:
- relative advantage (the degree to which an innovation is perceived as better than the idea it supersedes);
- compatibility (the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and needs of potential adopters);
- complexity (the degree to which an innovation is perceived as difficult to understand and use);
- trialability (the degree to which an innovation may be experimented with on a limited basis);
- observability (the degree to which the results of an innovation are visible to others).

Furthermore, previous research has revealed that the adoption of both commercial e-services (such as e-commerce and e-banking ones) and non-commercial e-services (including public sector e-government ones) is influenced significantly by the degree of trust of the potential user to the technology and the provider of the e-service [11, 20-24]. In particular, this research concludes that the technology-mediated nature of the provision of e-services, and the lack of face-to-face interaction between the service consumer and the service provider (and especially of visual and physical clues) generate risk perceptions and uncertainties to the former; these can affect negatively the adoption of e-services, if they are not counter-balanced by consumer trust, meant as consumer's confidence in the ability, integrity and honesty of the provider, as well as the reliable operation of the whole technological and operational infrastructure. Citizens' trust is particularly important for the adoption of e-government services; a comprehensive review of relevant literature is provided by [24]. For all the above reasons our theoretical foundation for the evaluation of the new e-service is an extension of the DOI with the trust dimension.

## 3 Digital Transformation of a Simple Service

In this section is described the digital transformation of a simple (from a citizen/user perspective, based on the number and the complexity of the steps to be performed) and widely used public service: the 'certification of authenticity of signature', which is applied in two special forms: the 'formal declaration' and the 'authorization'. It is estimated that about thirty million performances of it were performed manually each year[1]. Initially is described its traditional paper-based form (in 3.1), and then its digital transformation (i.e. the new corresponding e-services) (in 3.2).

[1] According to "Certificate of Authentication: estimation of annual transactions and cost in Greece", submitted by Koutsona V. & Loukadounou S. in partial fulfillment of the requirements for master's degree in eGov, http://www.dgrc.gr/material_el/studies_el/gnisio-ypografis-metrisi-ke-ypologismos-synolikou-etisiou-kostous-gia-ti-chora/, 2020

### 3.1 Certification of Authenticity of Signature: Paper-based Form

The ‘certification of authenticity of a signature’ is a public service provided in Greece, which is applied for the confirmation of the identity of the citizen signing a document, in order to certify the authenticity of the signature (i.e. that the stated signatory and holder of the document’s statements is authentic, true and genuine, and not a different person from the stated one) [25]. In the paper-based form of this service the citizen visited a Citizens’ Service Centre (CSC) branch or a Police Station, presented his/her identity card and signed on the document before a designated employee. The employee then made an annotation in the document with the details of the deed that was conducted by stamping the document. This process could be applied in any type of document, with no restrictions, and the content of it was not examined by the employee. The document's scope, therefore, was private. The activity diagram of the conventional paper-based service is shown in Fig.1.

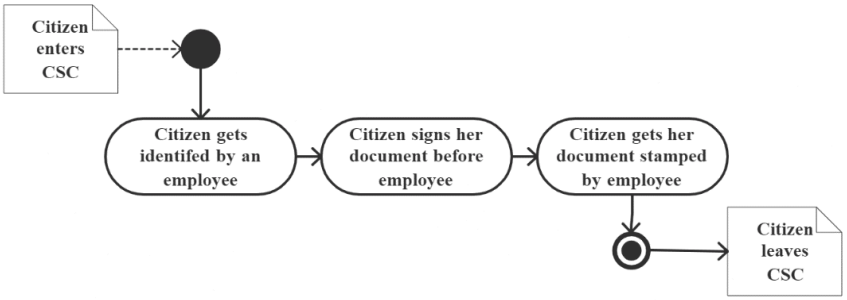


**Fig. 1.** Activity diagram of the conventional paper-based services

The certificate of authenticity of signature was applied in two special forms widely used: the ‘formal declaration’ and the ‘authorization’. The ‘formal declaration’ was a legal document that was addressed to the public administration or an individual in order to provide information about the citizen for a legal requirement when no other evidence was available about it (e.g. having fulfilled an obligation). In such a document, the citizen declared under the law that they were personally accountable for their allegations and that they are susceptible to the legal penal sanctions if the allegations are false. The text of the document had no restrictions on its form and language in which it was drafted. The signatory is initially identified by a designated employee, and then the signature’s authentication was applied/stamped on the document, which rendered it a formal legal document, with no time limit set for its usage. The formal declaration has been widely used in Greece due to the limited interoperability among the IS of different government agencies, which does not allow one government agency to access data stored in the IS of another one.

The ‘authorization’ was a written statement with which a person declared that they wish to be represented by someone else (for a specific activity concerning the public or private sector), and it was widely used in the public as well as the private sector. The personal details of the authorized person were indicated, as well as the description of the work they would perform for the grantor. The document could be used only once, and it expired with the fulfilment of the deed for which it had been author-

ized. It did not require a special form. Revoking it involved a relevant statement to the authorized person. The authentication of the signature was applied to the authorization document, after the identification of it by a designated employee, making the document a formal legal document; however, there were cases for which the representation required the power of attorney from a notary public.

### 3.2 The new e-services

In order to use the new formal declaration and authorization e-services is initially required access to gov.gr via an internet-connected device. Both e-services include a web form with a set of steps that guide the users through each process. Following authentication, the users fill in their personal details, the declaration or authorization text and the name of the receiver. Upon submitting the form, an electronic document is created, with the above provided details embedded. A hash code and a QR code for the document are created as well. Both codes are used as a means of document validity verification: the hash code is suitable for verifying the electronic file, while the QR code is appropriate for its printed version. The electronic document can then be either delivered as a URL via email and SMS to the users or saved locally. Also, the authorization issuance service provides revoking functionality. The activity diagram of the formal declaration and authorization e-services is shown in Fig.2.

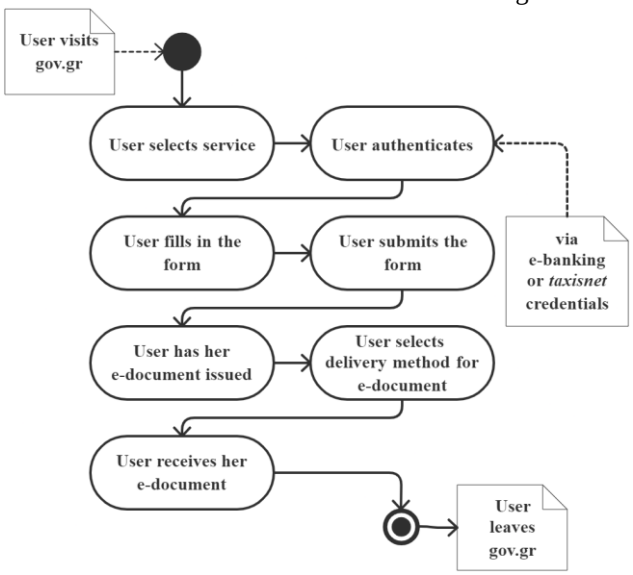


**Fig. 2.** Activity diagram of the new e-services

These declarations and authorizations are stored in a public sector server of the GRNET and can be verified by the receivers. In particular, the validity of a formal declaration or an authorization can be verified by the receiver, regardless of its form (which can be electronic or printed). For electronic documents, one could provide their hash code in a special form in gov.gr. For their printed version, one could scan their QR code via smartphone. The portal provided functionality for QR code scanning as well. Should the verification be successful, the receiver could access the

online version of the document.
Only authenticated users can use these digital public services. In Greece there are limited public/private key authentication infrastructures, as well as limited use of digital certificates/signatures. For these reasons the implementation of user authentication for these e-services drew on the most mature nationwide authentication ICT infrastructures: the taxation (Ministry of Economy) and banking ones. In fact, two-factor authentication is applied within two discrete steps. Initially the users, if they are using these e-services for the first time, log in using their e-banking credentials to the banking ICT infrastructure. Their personal details as well as their mobile phone number are retrieved from it and recorded in gov.gr, since banks' data are regarded as highly accurate and reliable. This provides the user with the future options to log in using either their e-banking or their government taxation e-services (taxisnet) credentials. The second authentication step involves the users receiving a code number on their mobile phones (accessed from their e-banking accounts), which has to be submitted back in gov.gr. The whole process provides a highly reliable way of users' authentication, which did not require any complex and costly developments, but uses the most mature existing nationwide ICT infrastructures for authentication: the banking and taxation ones.
These e-services were internally developed in the public sector, by 'GRNET S.A.', a governmental company that provides various public bodies with network, cloud computing and ICT infrastructure services, by its existing internal personnel, leveraging their knowledge and expertise (concerning both technology and public sector processes and specificities), without employing any external human resources. Also, these e-services are hosted in the cloud infrastructures of the GRNET. This enabled on one hand the rapid development of these e-services, avoiding the lengthy and complex public procurement procedures defined by relevant legislation (usually resulting in high 'transaction costs'), and on the other hand the high-quality and low-cost operation and maintenance of these services in a central government cloud ICT infrastructure. For the above reasons the development and operation cost of the above e-services was quite low, so they can be definitely characterised as 'frugal innovations'.

## 4 Evaluation Methodology

The e-services described in the previous sections were evaluated using a combination of qualitative and quantitative techniques. Initially one of the researchers, who was an active employee in a CSC branch during the time of the study, conducted qualitative discussions with 22 citizens, who preferred accessing the services via the conventional physical channel rather than the digital one. The purpose of those discussions was to gain a better understanding of possible underlying barriers that prevented those citizens from using the new e-services.
Then a survey was conducted, using a questionnaire, based on an extension of the DOI with an additional trust-related dimension (see section 2.2). It consists of three sections. In the first section the initial question asked the participants whether they had used at least one of the e-services (question A1), followed by a question concerning the frequency of making formal declarations or authorizations through the tradi-

tional physical channel (i.e. by visiting a CSC branch) before the new e-services were made available (question A2).

In the second section ten evaluation questions (all to be answered in a Likert scale 1-5) were included. Respondents that would not answer positively in the first question, could not have access to the evaluation section. Initially there were two questions for measuring the general satisfaction of the respondent with the e-services (question B1), as well as his/her intention to use them in the future (question B3). Also, there were seven questions designed carefully for assessing to what extent the respondent believes that these e-services have the first three characteristics defined by the DOI (relative advantage – question B2, complexity – questions B4, B8, B9, compatibility – questions B5, B6, B7), as they obviously have the other two (trialability and observability). Then followed a question (B10) concerning the level of trust the respondents felt towards the public sector, in terms of acknowledging the novel outcome of the e-services as valid (i.e. accepting the formal declaration/authorization issued electronically as valid). In the third section seven demographic-related questions were included, and also a question asking the respondent to write comments/remarks about these e-services in free text (question C8).

The above survey questionnaire was developed as an online Google Form. It was launched on the 14th of June 2020 and lasted for a week. The questionnaire link was distributed via social media and emails. 1274 responses were submitted, with 493 of them reporting that they had used both the manually and the digitally delivered services, so they were allowed to answer the evaluation questions of section 2; so our analysis focused on these responses, while the remaining 781 ones were excluded as non-relevant. Detailed demographics of the above 493 respondents can be found in Tables 1 and 2. We can see in Table 1 that among our citizens' sample there was an almost equal representation of the genders, with most of them having higher education, and belonging to the 31-55 years age group. In Table 2 we can see that most of them were rarely visiting a CSC branch to issue formal declarations or authorizations, before the e-services were made available.

**Table 1.** Demographics of the sample

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Age | **18-30** | | **31-55** | | | **>55** | | |
| | 8.9% | | 68.2% | | | 22.9% | | |
| Gender | **Male** | | **Female** | | | **Other** | | |
| | 51.0% | | 48.5% | | | 0.5% | | |
| Educational Background | **Primary** | **Second.** | **Vocat.** | **Higher** | **5** | | | |
| | 0.0% | 6.3% | 8.9% | 81.1% | 3.7% | | | |
| Occupation | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| | 3.0% | 10.5% | 26.2% | 36.7% | 13.2% | 4.9% | 3.3% | 2.2% |

**Table 2.** Physical channel usage frequency

| **Question** | **1** | **2** | **3** | **4** |
|---|---|---|---|---|
| How often did you visit a CSC branch to issue formal declarations / authorizations before the e-services were made available? | 75.5% | 21.3% | 1.8% | 1.4% |

## 5 Results

The initial qualitative part of our study based on discussions with 22 citizens, which revealed some interesting barriers to the use of these e-services. The most extensively mentioned barriers were poor awareness of the e-services' existence as well as lack of digital skills. A group of citizens raised a concern regarding the use of their internet banking credentials for authenticating in these digital public services, as they believed that revealing their internet banking credentials might pose risks of their misuse by government (e.g. for taxation or other purposes); this reveals an important mistrust in the government concerning the way of use of this banking-related data provided by the citizens, which affects negatively the attitude of citizens towards the use of these e-services. Moreover, another group of them preferred accessing the conventional services, because the text-to-be-declared by them was in such a special form (e.g. tables, images) that could not be accepted as an input to these e-services. This reveals that these e-services can meet the basic relevant needs of citizens, but cannot meet some more complex ones that may appear.

The survey results are shown in Table 3. We can see that 87.2% of respondents were either satisfied or very satisfied with the e-services, and 92.7% of them would continue using them in the future. Therefore, overall satisfaction and intention to use the e-services in the future were particularly high. Furthermore, 93.3% of the participants perceived these e-services as better or much better than the conventional paper-based ones provided through physical channels. So, the relative advantage of this innovation seems to be perceived as exceptionally high. Also, 84.8% of the participants assessed the e-services as easy or very easy to use. In fact, 78.7% of the users were satisfied or very satisfied with the available text input features and 92.1% were satisfied or very satisfied with the available delivery ways of the electronic documents. Therefore, on the continuum of complexity - simplicity the innovation was perceived as highly simple and easy.

**Table 3.** Evaluation survey results

| Question | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Overall satisfaction | | | | | |
| How satisfied are you with the online service for issuing a formal declaration / authorization? | 0.2% | 1.8% | 10.8% | 41.0% | 46.2% |
| Intention in future use | | | | | |
| Would you prefer to issue exclusively online a formal declaration / authorization via gov.gr in the future? | 0.6% | 1.6% | 5.1% | 21.5% | 71.2% |
| Relative advantage | | | | | |
| Compared to the conventional way, how is the online service for issuing a formal declaration / authorization? | 0.0% | 1.2% | 5.5% | 31.6% | 61.7% |
| Complexity | | | | | |
| How easy is the online service process for issuing a formal declaration / authorization? | 0.4% | 1.8% | 13.0% | 42.0% | 42.8% |
| How satisfied are you with the means available to complete the text of a formal declaration / authoriza- | 0.2% | 3.9% | 17.2% | 51.7% | 27.0% |

| | | | | | |
|---|---|---|---|---|---|
| tion in gov.gr? | | | | | |
| How satisfied are you with the means available for delivering the issued formal declaration / authorization to you? (sending by email, sending by SMS, save on the PC) | 0.6% | 0.8% | 6.5% | 45.2% | 46.9% |
| Compatibility | | | | | |
| How compatible is this online service with the way you make transactions with the public sector? | 7.7% | 29.6% | 14.2% | 35.5% | 13.0% |
| How compatible is this online service with the way you make transactions with the private sector? | 2.0% | 13.0% | 22.9% | 44.2% | 17.9% |
| How satisfied are you with using taxisnet and internet banking credentials to authenticate yourself in the service? | 2.8% | 8.1% | 9.9% | 43.1% | 36.1% |
| Trust | | | | | |
| How confident do you feel that the public body - receiver will accept the formal declaration / authorization issued electronically as valid? | 1.8% | 13.2% | 14.8% | 44.8% | 25.4% |

Regarding the compatibility of these e-services with past experiences concerning transactions within the public sector, 48.5% of the participants perceived using the specific e-services as either familiar or very familiar to them, but a considerable percentage of 37.3% of them perceived it as either unfamiliar or very unfamiliar. Regarding past experiences with transactions with the private sector 62.1% of the participants perceived using the specific e-services as either familiar or very familiar, while 15% perceived it as either unfamiliar or very unfamiliar to them. Therefore, these new e-services are to some extent compatible with the ways respondents transact with the private sector. Furthermore, they find the authentication procedure compliant with the ones they use for the taxation system taxisnet and the internet banking, since 79.2% of the respondents were at least satisfied with the use of taxisnet and internet banking credentials for authentication in these e-services.

Finally, with respect to trust, 25.4% of the respondents were completely certain and 44.8% of them were rather certain that the issued electronic documents would be acknowledged as valid by the public body – receiver; 14.8% were feeling neither certain nor uncertain whether the electronic documents were accepted, while 13.2% were rather uncertain and 1.8% were completely uncertain. Therefore 70.2% of the respondents perceive high or very high level of 'technical/operational' trust in these e-services, believing that they will finally work smoothly, and the recipients-receivers of these electronically issued formal declaration/authorizations (mainly rather conservative government agencies) will accept them as valid. However, a substantial number of respondents did not completely trust that the public sector would be flexible enough to welcome the novel outcome of these e-services, even though it was legally valid.

In the free text comments/remarks respondents point out some interesting aspects of these e-services:

– they are less time consuming and more convenient than the use of the conventional ones, since no commute and no waiting time were required, while the digital channel was accessible 24/7 from anywhere with an Internet connection available;

– they are more inclusive, in terms of reduced mobility affected groups, such as older people or people with certain disabilities;
– Greek nationals living abroad can benefit from them;
– however, people with no digital skills are excluded from their use, contributing to an increase of 'digital divide';
– though any identification document can be used as a means of identification of the citizens who accessed the services via the physical channel, this does not hold for the digital channel; it requires having internet banking credentials in one of the four Greek systemic banks, which constitutes a limitation, given the low level of internet banking use in Greece.

## 6 Conclusions

In the previous sections has been described and evaluated the low-cost 'frugal' digital transformation of a widely used simple public service, the 'certification of authenticity of signature', which is applied in two special forms: the 'formal declaration' and the 'authorization'. It has been based on the 'internal' development (by a public sector organization, the GRNET) of a simple and low cost IS, which exploits existing well established and mature taxation and banking ICT infrastructures (widely used and highly trusted by citizens) for users' authentication, addressing in this 'smart' way the limited adoption of digital certificates/signatures in Greece. Furthermore, these e-services are hosted in the central government cloud ICT infrastructure of the same organization, which results in high-quality and low-cost operation and maintenance of them. A first evaluation of these e-services has found that they possess to a good extent the necessary characteristics for wide diffusion according to the DOI: relative advantage, low complexity and compatibility. Also, it revealed a high level of 'technical/operational' trust in these new e-services, but also lower level of trust concerning the use by the government of the banking-related data provided by the users (perceiving risks of possible misuse of them for other purposes). Furthermore, it identified some weaknesses of these e-services with respect to the capabilities they provide for meeting some more sophisticated needs of the users beyond the basic ones (e.g. formal declarations and authorizations involving special forms of content, such as tables, images, etc.; and also risks of increasing 'digital divide').
Our study has significant implications for research and practice in the areas of 'frugal' digital innovation in the public sector, and especially 'frugal digital transformation' of government services and agencies, especially concerning simple but widely used public services. It reveals that the importance of trust for the adoption of such innovations, indicating that the widely used classical DOI theory [19] sometimes has to be extended with trust-related dimensions, and this is quite useful for future relevant research. Furthermore, our study creates some new practically useful knowledge in the above two areas, filling existing gaps, and revealing a generally applicable model by government agencies for low-cost 'frugal' digital innovation and transformations in the public sector: it leverages to the highest possible extent existing public and private sector mature ICT infrastructures, as well as 'internal' public sector knowledge and expertise, human resources and assets (such as equipment and systems, as well as data and digital registries concerning citizens, firms, cars, etc.). This

model can be quite useful for designing and implementing similar public sector innovation and transformations in the future, in conditions of scarcity of government financial resources both in developing and developed countries, by exploiting the extensive functionalities and data of large and mature government IS.

## Appendix – Survey Questionnaire

| | | | | | |
|---|---|---|---|---|---|
| A. Formal Declaration / Authorization | | | | | |
| A1 | Have you made a formal declaration or authorization via gov.gr | | | | |
| | 1. No | | 2. Yes | | |
| A2 | How often did you make formal declarations or authorizations by visiting a Citizens Service Centre branch before the new online services were made available? | | | | |
| | 1. Rarely | 2. 1 - 5 times a month | 3. 6 - 10 times a month | 4. More than 10 times a month | |
| B. Evaluation of the Online Services | | | | | |
| B1 | How satisfied are you with the online service for issuing a formal declaration / authorization? | | | | |
| | 1. Very dissatisfied | 2. Rather dissatisfied | 3. Neutral | 4. Rather satisfied | 5. Very satisfied |
| B2 | Compared to the conventional way, how is the online service for issuing a formal declaration / authorization? | | | | |
| | 1. Much worse | 2. Rather worse | 3. Similar | 3. Rather better | 4. Much better |
| B3 | Would you prefer to issue exclusively online a formal declaration / authorization via gov.gr in the future? | | | | |
| | 1. Definitely no | 2. Probably not | 3. Maybe | 4. Probably yes | 5. Definitely yes |
| B4 | How easy is the online service process for issuing a formal declaration / authorization? | | | | |
| | 1. Very difficult | 2. Rather difficult | 3. Moderate | 4. Rather easy | 5.Very easy |
| B5 | How compatible is this online service with the way you make transactions with the public sector? | | | | |
| | 1. Quite incompatible | 2. Rather incompatible | 3. Neutral | 4. Rather compatible | 5.Quite compatible |
| B6 | How compatible is this online service with the way you make transactions with the private sector? | | | | |
| | 1. Quite incompatible | 2. Rather incompatible | 3. Neutral | 4. Rather compatible | 5.Quite compatible |
| B7 | How satisfied are you with using taxisnet and web banking codes to authenticate yourself in the service? | | | | |
| | 1. Very dissatisfied | 2. Rather dissatisfied | 3. Neutral | 4. Rather satisfied | 5. Very satisfied |
| B8 | How satisfied are you with the means available to complete the text of the formal declaration/authorization on gov.gr? (free text, forms) | | | | |
| | 1. Very dissatisfied | 2. Rather dissatisfied | 3. Neutral | 4. Rather satisfied | 5. Very satisfied |
| B9 | How satisfied are you with the means available of handling the formal declaration /authorization on gov.gr? (sending by email, sending by SMS, save on the PC) | | | | |
| | 1. Very dissatisfied | 2. Rather dissatisfied | 3. Neutral | 4. Rather satisfied | 5. Very satisfied |
| B10 | How confident do you feel that the recipient-receiver will accept the formal declaration/authorization issued electronically as valid? | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | 1. Uncertain | 2. Rather uncertain | 3. Neutral | 4. Rather certain | 5. Certain |
| C. Other Information | | | | | |
| C1 | How often do you shop online? | | | | |
| | 1. Never | 2. Rarely | 3. Occasionally | 4. Often | 5. Very often |
| C2 | How often do you use e-banking? | | | | |
| | 1. Never | 2. Rarely | 3. Occasionally | 4. Often | 5. Very often |
| C3 | How often do you use online transactions with the public sector? | | | | |
| | 1. Never | 2. Rarely | 3. Occasionally | 4. Often | 5. Very often |
| C4 | Age | | | | |
| | 1. 18-30 | 2. 31-55 | 3. >55 | | |
| C5 | Gender | | | | |
| | 1. Male | 2. Female | 3. Other | | |
| C6 | Educational background | | | | |
| | 1. Primary education | 2. Secondary education | 3. Vocational education | 4. Higher education | Other |
| C7 | Occupation | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1. Unemployed | 2. Student | 3. Private sector employee | 4. Public servant | 5.Freelancer | 6. Business owner | 7. Retired | 8. Other |

| | |
|---|---|
| C8 | Comments |
| | Optionally fill in any comments you want to make about your answers or anything related to the digital services of the formal declaration and authorization |

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