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Electronic building permission system: The case of Greece

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Abstract

Electronic building permission systems have been used in several European countries from the early 70s (i.e. Italy, France and Netherlands), while in USA are being utilized several components and sub-modules of the system from the early 30s. The European Commission defined the electronic application for Building Permission as one of the 20 primary e-Government services, which each European Member State was obliged to deliver online by 2005, according to the e-Europe strategies (e-Europe2003). However, Greece, as well as several other European countries failed to address this challenge and the goal of an electronic building permission system across Europe was extended, initially until 2010 (i2010 strategy) and eventually until 2020 (Horizon 2020 strategy).

The current study initially defines the primary and secondary functionalities that such a system should have. Furthermore, the study examines the factors that influence the success or failure of such a project and proceed to a case study investigation in Greece by examining the current situation and the level of absorption of the European i2010 strategy regarding the electronic building permission.

The research framework encompasses a literature survey of publications and official reports in order to shape a "clear picture" regarding the different approach of e-service delivery. In addition, in this paper are analyzed the results of structured questionnaires that have been sent and of interviews that have been conducted with public organizations in Greece that are responsible for the implementation, installation and utilization of such a system (i.e. Information Society in Greece, Municipalities).

In conclusion, this research investigates the framework of the building permission e-services and its current situation in Greece that leads to: (a) an effective public management administration by simplification of licensing procedures, (b) a reduction of depraved behavior and (c) environmental benefits by reducing bureaucracy.

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1. Introduction

E-government is a concept with demand and citizen different perspectives [1] and represents, among others, a system with which users can access public services through the Internet [2]. E-government research has made a significant progress in the last decade by researchers in diverse fields. Previous studies have focused on the e-government research domain in general, provided region-specific analyses [3], and examined specific topics such as e-government models [1], e-participation [4], the digital divide [5] and E-government's relationship with aging populations [6]. Such studies have typically focused on governmental programs, policy lessons, or socio-cultural issues related to the E-government research domain and have used conventional systematic literature review (SLR) methods [7]. Such methods may be useful for attaining a general overview of a discipline and its trends, but they are limited in terms of their ability to reveal the hidden structures and properties of the research domain in question, in this case E-government.

The adoption of Internet in public libraries [8] and the widespread utilization of technologies have contributed to the increase of e-government acceptance and adoption [9]. The relationship between Information and Communication Technologies (ICTs), public libraries and e-government has been widely documented in the literature [8]. However, E-government as a respected discipline and an established research field was established in the last decade, and has since developed its own research community and methodology, alongside philosophies and theories [10]; and domains and fields of study [6].

"Application for Building Permission" has been defined as one of the 20 primary e-government services, which each European Member State was obliged to deliver online by 2005 and is the main public service that should be addressed by 2010, according to the e-Europe strategies. The achievement of this e-service delivery has been aligned to critical challenges, among which worth mentioning: service transparency and corruption elimination; respective public service simplification and improvement; execution time minimization; economic growth support etc.

In this paper, there are two main issues that will be investigated: (i) initially, the current status in Europe of the application for building permission e-service delivery will be studied. To this end, there will be performed an extensive literature survey on publications and on official reports. Moreover, this literature survey will return a "clear picture" regarding the different schools of thought that approach this e-service delivery and two main questions will be answered regarding the context of the application for building permission e-service delivery as well as the current status at different countries, specifically in Europe, in delivering building permission e-service. Moreover, it is important to address the reasons that lead European Commission to define this service as one of the primary common 20 public services. (ii) Secondly, the case of Greece will be investigated regarding the current status of electronic building permission as well as the success and failure indicators of such a system. To this end, questionnaires have been sent and interviews have been conducted with public organizations in Greece that are responsible for the implementation, installation and utilization of such a system (i.e. Information Society in Greece, Municipalities).

The development of this paper is structured as follows: section 2 concerns a background and an extensive literature survey and presents the questionnaires and interviews that have been conducted. Next, section 3 presents the main outcomes extracted from the literature surveyas well as the questionnaires' results. Finally, section 5 comments the main conclusions of the current work.

2. Materials and Methods

This section analyses the challenge of building permission e-service and the status of its application to different countries. Subsequently, we explicitly set out our research questions, which were in briefly reported earlier, our literature search strategy and discuss the status quo of building permission e-service.

A building permit is formal permission from the local authority to start a construction project. The plans review process, building permit, and inspection process protect each homeowner's interests, as well as those of the community. It also ensures that the construction is safe, legal, and sound. The building permission could be defined in general as the standard procedure to obtain building or renovation permission for a building.

On the other hand, the concept of E-service (short for electronic service) represents one prominent application of utilizing the use of ICT in different areas. Combining the e-services with the building permits processes could lead to several benefits, both for customers and public authorities. Electronic customer related services of governments have expanded enormously. In many regulatory domains, the use of ICT services has become common property. This applies also to the field of building regulations.

2.1. The building permission e-service: current status

The analysis of the literature that was performed included a deep analysis into scientific conferences, journals, surveys and reports, as presented in Table 1. The main results of the analysis include 4 reports and surveys regarding the digitization of public services, three reports regarding well-recognized European benchmarking processes of online building permission services in several EU countries, over 10 scientific papers to journals and conferences regarding the status of public libraries and their utilization to online building permission process and over 20 scientific papers of the utilization of ICT tools and specifically geographic information systems (GIS) to e-Services, e-government and electronic building permission application. However, as reported earlier, the main literature covers the e-government generic domain, but do not focus on the online building permission application and services.

However, there are not adequate references for the study of online building permission systems and the current status of those systems in different countries. Thus, the current literature analysis included, besides scientific articles in journals and conferences, national and European regulations of building permissions as well European benchmarkingreports and surveys on electronic public services that are summarized in Table 1.

Table 1.Main Journals, Conferences and Surveys on Building Permission e-services.

Journals	Conferences	Reports – Surveys
ISPRS Journal of Photogrammetry and Remote Sensing	International Conference on Digital Government Research	Benchmark Measurement
Annals of GIS	International Conference on Intelligent Environments	i2010 – A European Information Society for growth and employment
Geo-spatial Information Science	International Conference on Utility and Cloud Computing	Web Based Survey on Electronic Public Services
Engineering Applications of Artificial Intelligence (Elsevier)		
Design Studies (Elsevier)		
Journal of Urban Technology		
International Journal of Digital Society (IJDS)		
International Journal of Geographical Information Systems		
Library & Information Science Research		
Government Information Quarterly		
Studies in Computational Intelligence		
Habitat International		

2.2. Case study: Greece

The case study includes an interview that was conducted with a representative of the Information Society in Greece, which is a public entity, supervised by the Ministry of Administrative Reform and Electronic Government, established in 2001. The Information Society S.A. implements ICT projects throughout the Greek territory and was responsible for the project "Electroniki Poleodomia" that aimed to implement an electronic building permission system.

In addition, there were conducted questionnaires and filled by six Municipalities in order to investigate the level of implementation, installation and utilization of the project "ElectronikiPoleodomia" by the Greek public authorities. There were selected three large municipalities (Ioannina, Marousi and Agrinio), two medium-sized (Igoumenitsa, Arta) and one small municipality (Filippiada).

3. Results

The results are being organized according to the two main research questions that are being addressed in this paper: (i) initially, the context of an electronic building permission system and (ii) the case study of Greece analyzing the success and failure indicators.

3.1. Results of survey analysis: Current status in Europe

The EU e-Government Benchmark (EUeGovBe) builds on the Lisbon and i2010 agenda. 20 public services clustered into four areas remain at the core of the measurement: income-generating cluster, registration cluster, returns cluster and permits and license cluster. To understand the progress of the above policy and countries' efforts, the EUeGovBe measures these 20 public services and the national portal, using five main indicators: online sophistication (the extent to which government services allow for interaction and/or transaction between the administration and citizens or businesses), full online availability (the extent to which there is fully automated and proactive delivery of the 20 key public services. A comparison over time illustrates the speed and extent of convergence in performance in Europe), user experience of services (the extent to which the 20 basic e-Government services are easy to use, which covers aspects of usability, transparency, privacy and multi-channel policy as well as the possibility for users to give feedback on the quality of services to administrations), portal sophistication (identifying the most mature, usercentric and personalized portals that provide direct access to a wide range e-Government services), subnational analysis (nomenclature of Territorial Units for Statistics levels, providing an unprecedented granularity of e-Government performance across regional and local administrations).

Table 2 summarizes the main stages of the e-service during the benchmarking process. Each stage represents a different level of maturity of the online building permission system.

Table 2: Stages of Benchmarking Process

Stage	Description
Stage 0	There is no public accessible website for building permission application.
Stage 1: Information	A website is available with published information necessary to start the procedure to obtain a building or renovation permission.
Stage 2: One-way Interaction	The public website offers, besides basic information, the possibility to obtain the paper form to start the building application procedure in a non-electronic way.
Stage 3: Two-way Interaction	There are increased electronic capabilities at the public website such as to start the procedure to obtain a building or renovation permission through an electronic form.
Stage 4: Full electronic case handling	The building permission can be applied, managed and validated completely electronically.

The results of the benchmarking process that was analyzed in previous sections, depicting the 5 stages of building permission e-services intrusion to official governmental processes and everyday transactions of citizens, are presented in Fig. 1.Based on the EUeGovBe, Austria seems to have a respectful e-government system, which means that each citizen or business has the possibility to access the service via a fully transactional electronic channel. Towards the online building permission application [11], an automatic check of completeness of online forms and documents is performed first, and then the application is handed through to the servant responsible for verifying and processing it. The fee is also paid online. If nobody appeals within the next three weeks after the information on the positive decision, the servant performs the final archiving of the record.
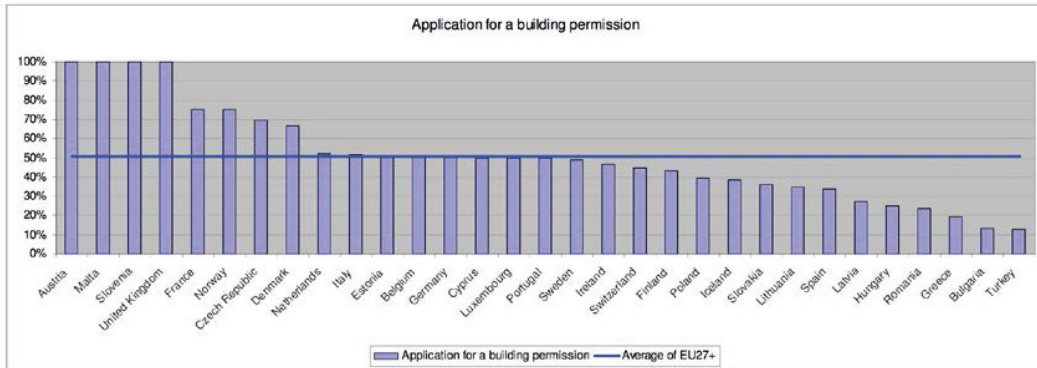

Fig.1. Percentage of utilization of online application for a building permission and relative e-services among different EU countries

Applications for building permission are organized at a local level in Spain (Fig. 2). All cities have reached stage 1 of maturity (description of the service and contact details), and most of them are at stage 2 (downloadable forms). Some have reached full transactional status, such as the city of Lleida. Citizens there can apply for a building permit and the provision of the service is fully electronic, including delivery.
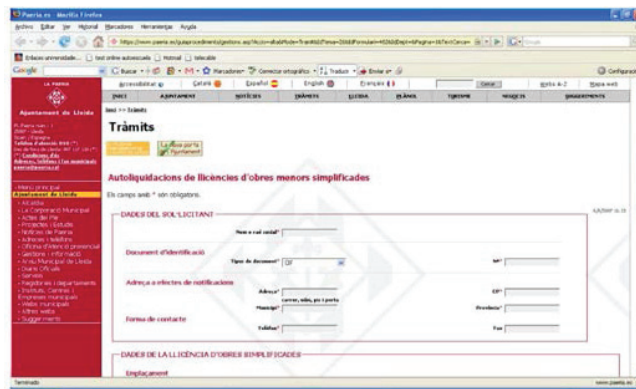

Fig. 2. Online building permissions system in Spain

Moreover, in Netherlands, under the auspices of official policy, various state-funded projects have been started in certain domains (e.g. Building & Housing and Care & Welfare). These projects are expected to spread, through a sort of 'ripple' effect, across the entire public sector. Nowhere in the Netherlands is it possible to actually submit a building permit application electronically, but some municipalities offer a function for checking out the status and progress of an application: information on the processing of building permit applications is available in the back

office and is made publicly accessible via the Internet. To date, this is as far as Dutch municipalities have progressed in the digitization of building permit applications.

The Planning Portal in UK (http://www.planningportal.gov.uk/, Fig. 3) is accessible for general public, professionals and government users. It allows users to apply for a building permission. The implementation of this Portal increased the score for this service in the United Kingdom. Provides information, forms and indicates the e-level of the local authorities: List of the local authorities who are fully online, allowing the user to submit an application electronically, to add attachments and pay online.
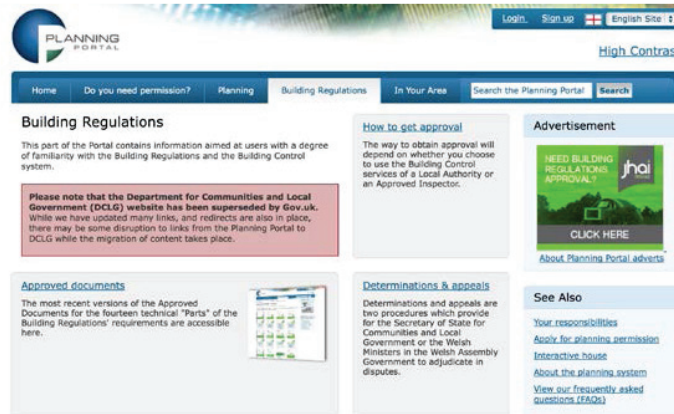

Fig. 3. The Planning Portal in UK with building permission e-services capabilities

In May 2005 a new building regulatory system has come into force in Scotland [13]. In the new system the local authorities are responsible to carry out building control. In the future it could be possible that private parties could also play a role as verifier. Full electronic handling of permits is possible in Scotland.

According to Meijer [12] and based on the data submitted by CGE&Y, it seems that in Ireland there is no such thing as a 'building permit'. Ireland applies a system of planning permission, commencement notices and fire safety certificates. Within the framework of the Government Action Plan for the Information Society in Ireland, goals have been defined for online access to planning application and development control processes, including commencement notices. In some municipalities it is also possible to track the (planning) procedure.

In France, the acquisition of a building permit for new projects actually starts with planning permission from the local authority. The websites of most of the municipalities and regions feature detailed information on the building permit procedures. Forms may also be downloaded from many of these sites, but there are no facilities for submitting applications electronically.

3.2. Results of Case study: Greece

There was conducted an interview with a project manager and representative of the Information Society in Greece and valuable conclusions were extracted. Initially, there was proclaimed a project in 2006, entitled "Electroniki Poleodomia" or e-Poleodomia. In Greece, Building Services (former Urban Planning Authorities) are departments in local authorities throughout the country, which are responsible for urban planning and building activity in their geographical region. All procedures that enable the streamlining and introduction of IT and Communications Technologies in their day-to-day operations have been centralized under the auspices of the Ministry of Interior. To this end, e-Poleodomia aimed to develop and support a centralized system for Urban Planning Authorities throughout Greece allowing them to monitor all procedures and transactions with citizens.

There were several challenges, such as: (i) to standardize procedures and printed forms pertaining to the Authorities, (ii) to develop and install a new IT system that allows internal process flow management, (iii) to enable tracking of building requests or citizen folders by public officials and citizens alike and (iv) to enable the seamless migration from the existing paper system without downtime for the Authorities and without disruptions to the transactions with citizens. The overall benefits of the project that the Greek government tried to address were mainly: (a) faster and better service for citizens and improved operations quality, (b) automation of internal processes and tasks with less processing time, (c) limited required physical presence of citizens at the Authorities' premises and (d) ability to control and have access to extensive insight at a Pan-Hellenic level.

The project was split in three sub-projects and there was followed an open public tender procedure for each one of the three sub-projects to award them to company to undertake their implementation:

- The first sub-project included the electronic protocol, the management and control of the building permits as well as the management of illegal constructions and buildings.
- The second sub-project included a search and indexing system for all the laws and regulations that correspond to building permission as well as to the procedures of the Building Servicesdepartments in local authorities throughout the country. Those include decrees, laws and decisions prefectures (e.g. laws that change the conditions and restrictions of building planning).
- The third sub-project referred to the development of a GIS system. This would include digitized layout maps and urban material. The citizens and engineers would be able to ask questions according to their region (in blocks level) regarding the construction of buildings (e.g. building restrictions, legislation).

However, based on both the answers of the project manager in the Information Society in Greece and the representatives of the Municipalities, responsible for the building permission at a local level authority, the project e-Poleodomia was not successful in general. The first sub-project, after some delays and modifications was eventually completed, but the second and third sub-projects were not fully delivered. There were recognized the following main failure indicators:

- The project was roughly designed from the beginning. There were not followed the right steps according to the Project Management Body of Knowledge (PMBOK), leading to roughly user requirements elicitation, inadequate state of the art analysis and best practices study. Also, as part of the rough design can be considered the lack of interoperability among the various functionalities of the project (e.g. there was no provision for connectivity of the second sub-project with the other two).
- There was inadequate training of users. Also, the resistance to change of the users was high enough to obstruct the correct and efficient function of the system.
- There was a lack of motivation (either promotions or financial motivations) to users as well as a lack of penalties. The employees were not obliged to use the system, while there was a fear that if an employee would use the system then he/she will be shared more work without additional profit.
- Finally, an extremely important failure factor was the interpersonal relationships among engineers and employees of the Municipalities that are responsible for the building permission. Such a system (e.g. the electronic protocol) would notprovide employees the capability to process easily or not at all requirements of the engineers that could, also, be illegal.

4. Conclusions

Through the literature survey and the respective analysis that was performed, our two main research questions have been answered. European countries have set ambitious goals to improve the online availability of their public services the coming years. Without ICT applications these goals cannot be reached. Substantial progress has been realized in the Netherlands. More or less all layers of government (central government, provinces and

municipalities) and the bulk of businesses and private citizens have Internet access. Many public services are available on line and a growing number of services can be managed via the electronic super highway.

Apart from England & Wales, nowhere else in Europe is it possible to actually submit a building permission application electronically on a large scale. Tough, significant progress and interesting work has been going on in other EU countries (e.g. in The Netherlands) to realize a system for the online submission of applications. There seems to be many advantages of an online submission and approval of a building permit. An online system has positive cost and time effects and enables a further streamlining of procedures. The system eliminates sending multiple paper plans, and it is available around the clock. Local authorities can remove a lot of their paper storage and one electronic archive can be established. Progress of applications can be tracked. Building inspectors will be able to take electronic plans and documents out on-site. Drawings can be viewed on screen and redline comments can be made. Work completed outside of the office can be synchronised with the main system once back in the office
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This research investigates the framework of the building permission e-services and its current situation in Greece that leads to: (a) an effective public management administration by simplification of licensing procedures, (b) a reduction of depraved behavior and (c) environmental benefits by reducing bureaucracy. The issue of low take-up of e-Services is currently an important question. Online handling of building permits can potential provide significant benefits both to users and to public authorities mainly reducing the cost and eliminating the time for an application.

The main literature mainly contains scientific publications regarding e-Government services and an extensive analysis of the respective domain, but do not focus on the online building permission application and services. This obstructs the current work, since there are not enough scientific publications and the literature analysis extends to European reports and surveys. For future work, a more extensive analysis of national reports can be conducted to enhance the knowledge in the specific field of current practice.

In addition, important subjects for future research will be the fine-tuning of the assessment method by which progress can be compared and a nearer analysis of the actual contents and practical effects of the online building permit services. This could be attributed to the security issues that arise, which are crucial for online applications. The implementation and utilization of Electronic Signatures services are a step towards the security enhancement but do not eliminate the problem. In addition, as reported earlier, there are still numerous interoperability issues, not only technical, but also administrative and procedural, since there are many public departments and services that need to be connected towards an efficient online building permission application.

Based on the analysis results of the questionnaires, and most specifically on the recognized failure indicators, there are several measures that should be taken into consideration in order to result in a successful electronic building permission system. The most important are the following: (i) national policies that would define the framework of system utilization by the employees of the Building Services departments in local authorities throughout the country, (ii) efficient training of the employees and (iii) motivations (financial or administrative) that should be provided to employees for the correct use of the system.

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