

E-government: applications in the labor and social security regulatory area

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Abstract

Purpose – The purpose of this study is to primarily address the need for expanding e-government in Greece in the labour market. The authors attempt to analyse e-government initiatives in labour and social security legislation areas and identify whether private sector companies are willing to utilize them. The re-organization of government functions and procedures is discussed as a means of achieving the desired objectives of all interested parties.

Design/methodology/approach – The study is based on a survey of companies in the area of Heraklion, Crete. A questionnaire instrument was used to collect the data. The authors attempted to identify whether companies would prefer to use either the Integrated Information System (IIS) that the Ministry of Labour has initiated or Payroll Information System (PIS) that is proposed by the authors and provided via a cloud computing platform by the public sector. In addition, the authors use the Delphi technique and a panel of experts consisting of Inspectors of the Ministry of Labour in an attempt to identify which of the aforementioned systems would help make controls more efficient and effective.

Findings – The companies acknowledge the need for e-government and about 50 per cent of them would feel positive about using the proposed application (PIS). Small companies are more willing to accept PIS and large companies feel more positive about using the IIS. Furthermore, the panel of experts agree that the adoption of PIS would help the most in the fight against undeclared work.

Research limitations/implications – The questionnaires were completed by 75 companies in the area of Heraklion, Crete, Greece. The sample, although representative of the structure of Greek industrial sector, is nevertheless small and expresses only the local culture. This limitation provides at the same time opportunities for further research. Although the need for e-government is recognized, there are concerns about the possible failure of new applications' implementation.

Practical implications – Labour and social security legislation areas are important for modern countries. The paper provides a model of e-government on these areas that if implemented could reduce administrative costs and facilitate public control.

Social implications – The proposed model could enhance employees' protection and effectively reduce undeclared work.

Originality/value – This study is a first attempt to analyse e-government initiatives in labour and social security legislation areas in Greece. The main idea is not simply to make procedures electronic but to re-organize and re-define these procedures. Thus, the model that is proposed by the authors as a possible way of e-governance appears to help the most in reducing companies' administration costs,



increasing the protection received by the employees and assisting public services in conducting more effective and simpler controls.

Keywords Cloud computing, E-government, Government auditing, Payroll system, Regulatory compliance, Undeclared work

Paper type Research paper

1. Introduction

Currently, in Greece, the need for simplifying procedures and reducing the administrative burdens becomes a national priority for the Greek government as well as for the Greek economy (White Paper on Governance, 2012).

The Greek Minister of Administrative Reform and Electronic Government, via a press release issued on 30th January 2012, stated:

It is generally recognized that there is need for a radical change in the country's public administration, a reformist creative explosion in the state, which cannot but be associated with Electronic Government.

Also, several researchers recognize e-government as a catalyst or a tool for achieving this administrative reform (Helbig *et al.*, 2009; Kraemer and King, 2003). As the President of World Bank Wolfensohn (2001) said: "we want to see how it is that the use of e-government can be a net plus and not just some adornment". Furthermore, the Ministers responsible for e-government policy of the European Union (2009) declared that the "efficiency and effectiveness is enabled by a constant effort to use e-government to reduce the administrative burden, improve organizational processes and promote a sustainable low-carbon economy".

However, e-government is not limited to simply installing an electronic application to be used in and by the public sector. There should be a general assessment of the work environment where e-government is used, both in the public and private sectors. There should be realistic actions which would be accepted by all employees, public and private and by freelancers, as "the culture, the values and generally the usual practices of a nation are associated with e-government" (Khalil Omar, 2011). Several researchers report that one of the main factors of e-government implementation failures is the human factor, as people – particularly public servants – usually resist to these changes (Nograsedk, 2011; Sacheva, 2009) mainly thinking about the required re-training and the possible change of their competences and responsibilities (Rabaiah *et al.*, 2006). Furthermore, it seems that major roles in e-government failure play the federal management of information technology (IT) (Beachboard and McClure, 1996), the external technical and policy environment and the coordination and the supportive ability of information centres (Chen and Chen, 2009). According to Schwere and Deane (2003), other critical factors are the legal and regulatory instruments required for e-government and the information and communication technology infrastructure development.

Hence, as e-government is predominantly seen as a technological achievement rather than a re-organizational and transformation tool (Nograsedk, 2011), the present study attempts to approach e-government use through the determination of how it can lead to the re-organization of governmental functions and procedures so as to achieve the desired objectives of all interested parties.

However, special attention should be paid, because, despite the fact that e-government promises to provide better services and to this end pertinent “investments” are made, there is disagreement among researchers whether the original objective is achieved (Scott and Delone, 2009; Heeks and Bailur, 2007; Heldig *et al.*, 2009). Service quality is an elusive concept, very difficult to be defined. This can be equally claimed for e-government services (Chee-Wee *et al.*, 2010).

A study by Heeks (2003) regarding 40 projects in developing countries has shown that the rate of successful implementation of e-government projects reaches only 15 per cent. About 35 per cent of projects fail completely, because they are either not implemented at all, or they are abandoned during the implementation phase. Finally, the remaining 50 per cent partially fails, in the sense that the implementation is completed but the desired results are not obtained. Furthermore, it is claimed that e-governance should be developed as an independent area of research, without, of course, ignoring the theories and its intersection with the information systems discipline (Dwivedi *et al.*, 2011).

Up until now, in Greece, there is limited e-governance involvement in the social security provision network and labour market procedures. This has led to an uncontrollable rise of administrative costs and to bureaucratic procedures, thus increasing the operating cost of both the businesses and the state. Also, it has led employers to put pressure on the employees demanding more and more effectiveness and cost-effectiveness when at the same time employees receive limited protection from the civil control system.

The Ministry of Labour, in an attempt to address the problem, has initiated the “Integrated Information System Labour Inspectorate” (IIS). The implementation of this system is what we call in this paper “Hypothesis A”. According to this system, numerous procedures are carried out electronically; procedures which up until today required the physical presence of the citizens in public services offices for filing in the pertinent documents. In the No. 5/2011 Government Gazette issue regarding the invitation to tender for the selection of a contractor for the project IIS, the main actions that the employers and their authorized representatives will have the possibility to perform online are presented (Ministry of Labour and Social Insurance, 2011). These are depicted in the Questionnaire (b), Table I.

However, according to the authors’ opinion, the main objective is not simply to make procedures electronic, but to re-organize and re-define these procedures. Thus, the authors propose as a possible way of e-governance the provision by the public sector of a Payroll Information System (PIS) via cloud computing. We call this “Hypothesis B”. This proposal is described in more detail in the following section, as it could revolutionize the existing procedures. Summarizing, the next section presents the aforementioned proposal and its pertinent literature. The remaining paper is organized

Reserve about	Mean	Skewness	Kurtosis	SD	Result
Data security	2.91	0.06	1.80	1.39	Reserve
Data loss	2.6	0.35	2.00	1.38	Reserve
Losing connection	2.35	0.70	2.61	1.28	Slightly reserve
Network speed	2.32	0.73	2.70	1.22	Slightly reserve
Software problems	2.91	0.02	1.56	1.53	Reserve

Table I.
Company
reservations

as follows: the research methodology is presented and then the analysis of the empirical data follows. Finally, the conclusions are reached and limitations are discussed.

2. Prior research

2.1 Cloud computing solutions

The Greek Ministry of Labour has initiated the IIS, which, at the time the paper was written, appeared to be in the final phase of implementation. The system accommodates numerous procedures that are to be carried out electronically. According to the authors, there could be another option. Instead of businesses sending electronic reports to the public authorities, the public authorities could become the holder and administrator of the businesses database, thus having all the information required, as well as, and more importantly, the final control.

The technology that deals with this idea is cloud computing. The evolution of cloud computing over the past few years is considered as one of the major advances in the history of computing (Marston *et al.*, 2011), and is one of the emerging technologies that may have an impact on building a new information modelling and management model (Underwood and Isikdag, 2011). Cloud computing refers to the storage and processing of data, using computers and data centres provided through the Internet, probably in an unknown place. According to Armbrust *et al.* (2009), cloud computing is an old idea whose time has finally come. The main general promise that cloud computing gives is that more can be done with less (The Economist 2008a). As tasks can be distributed in a large number of computers, it enables users to get access to storage space, computing power and information services according to their demands (Peiyu and Dong, 2011). The adoption of cloud computing by a company results in a considerable amount of organizational change. As this change will probably affect employees' work in significant ways (Khajeh-Hosseini *et al.*, 2012), there should be an *ex ante* evaluation of the solution and effective change management, but the benefits in terms of cost savings may be considerable. However, according to The Economist (2008b), cloud computing has not been adopted on a large scale by large companies, at least at the time of the report. In any case, nowadays, only a limited number of companies in Greece adopted cloud computing solutions and then only for projects that do not critically affect their business. Also, Greece is dominated by small and medium-sized enterprises (SMEs), as the large companies are only 1.5 per cent of the total number of companies (SEV, 2011).

Cloud computing is very widespread through applications like Facebook and Twitter. Thus, without investing in software and hardware, without having storage space or computing power, users through these applications can store information, photographs, data, etc. The system requirements are minimal, and all users need is a network device and an Internet connection. Of course, hi-speed communication networks are essential for cloud computing (Dwivedi and Mustafee, 2010). Even a mobile network device could be used. Mobile applications bring challenges because of the limited battery capacity, constraints of wireless networks and device's limitations (Choi *et al.*, 2011). On the other hand, mobile cloud computing combines the advantages of mobile and cloud computing (Dinh *et al.*, 2011) and is very promising. Therefore, as the proposed PIS could also be used in a mobile cloud computing environment, it has a significant advantage against IIS.

One of the most important disadvantages of cloud computing is the safety and reliability of data (Li-Qin and Yang, 2011). As it has been argued, the “tendency to implement cloud infrastructure and worry about the consequences later will lead to unpredictable and undesirable consequences to a nation’s information” (Papuette *et al.*, 2010). An appropriate level of oversight and governance needs to be implemented. Many other researchers refer to this safety problem as well (Subashini and Kavitha, 2011; Che *et al.*, 2011; Lang and Schreiner, 2011). On the other hand, cloud computing has significant benefits, and other not so obvious, such as energy savings (Greenpeace, 2010).

Cloud computing benefits include the following:

- Cost reduction.
- Reduced initial capital expenditure.
- No need for high-powered and high-priced computers.
- Best-of-breed technology.
- Highly scalable applications.
- Real-time backups.
- Remote service.
- Data accessibility.
- Increase in mobility of employees.

In an era of economic constraints, cloud computing offers the opportunity for governments to reduce costs while making data more easily accessible to citizens and significantly improve the services provided. According to the Vice-President of the European Commission responsible for the Digital Agenda:

It is similar story with cloud computing services, which the USA and UK governments are embracing – bringing savings up to 20 per cent of costs. Other governments would be crazy to ignore such opportunities (Kroes, 2010).

2.2 Cloud computing applications in the field of undeclared work

Regarding the problem of undeclared work in Greece, public administration, to have the required information from companies and the final control, has developed a number of administrative procedures, which place a heavy burden for most companies. However, if the public sector could provide PIS via cloud computing, as the sole administrator and owner of the data centre, it would have the ultimate information about labour issues. So, the “on-site inspection” would completely be separated from the control performed by distance, leaving “on-site inspections” to mainly deal with the control of undeclared work. Most issues could be addressed by a “distance control agency” and lead to a reduction of administrative costs. The effectiveness of control would also benefit employees, increase the financing of social security organizations, decrease the social damping, etc. On the other hand, it could also be the greatest fear of companies that do not comply with labour law. To this direction, by using a questionnaire, we attempt to identify whether companies would feel positive about using the proposed PIS. To identify the benefits derived by the proposed PIS, firstly, we present the control

procedure as it is today, and then we present it as it would be after the hypothetical implementation of PIS. Finally, we discuss the differences between the two systems.

Up to dated, usually the control group visiting companies consists of two labour inspectors. Firstly requested by the inspectors auditing a company are the “special book of newly recruited personnel”, the “employees table” and the “work plan” (hereinafter referred to as “elements”). Then, the employees are interviewed and the accuracy of the above elements is checked. Otherwise, the employees are firstly interviewed and then the elements are requested. In the first case, the auditee company could delay to deliver the elements to the inspectors, giving the opportunity to the unregistered employees to move away. In the second case, the unregistered employees have less time to move away, but the auditee company has time to register employees in the “special book of newly recruited personnel”. As the number of labour inspectors is very small, auditing has limited effectiveness. Then, the labour inspectors are checking the payroll, the “pay slips”, the “payment receipts”, the “individual employment contracts” and the “book of leave” (hereinafter referred to as “secondary elements”). So, the auditing in a small company lasts 1 to 2 hours.

Under the proposed PIS, the “on-site inspection” would completely be separated from the auditing by distance, which would deal with the inspection of the secondary elements. The “on-site inspection” would already have the elements presented on a mobile computing device (or printed). So, the employees will be immediately interviewed and the accuracy of the elements would be checked. The “on-site inspection” in a small company would last only a few minutes. The “on-site inspection” would be very effective, and the labour inspectors would daily perform more controls. In the present paper, we propose exactly this, that is, the development of a PIS provided by the public sector that could revolutionize the existing procedures. It could also make regulatory compliance easier and less costly.

3. Research methodology

3.1 Research design

Cloud computing has emerged as a dynamic and promising technological platform which can provide many benefits not only for business but also for local and central governments. The benefits of e-government and especially of cloud computing applications in the field of undeclared work have been discussed in the previous paragraphs. However, although it is true that the need for e-government is recognized by most researchers, there are concerns about possible failure of proposed application’s hypothetical implementation. The main concern arises from the possible businesses prejudice to integrate new applications because most companies for years have adapted their organizational structure to the old procedures. Therefore, in this study, we attempt to identify whether the companies would feel positive about using such applications by using a questionnaire survey filled in by companies in the area of Heraklion, Crete. The companies were asked to express their strongest reservations and to estimate the cost of the existing procedures in the labour market and social security provision network. The main goal of the survey is to reduce the likelihood that the hypothetical implementation of the proposal will partially fail because of the unwillingness and/or the lack of trust of the companies in the proposed application.

In addition, we felt that consulting a panel of experts on the subject of undeclared work would provide valuable insights and strengthen the results of the research. We

used the Delphi technique in an attempt to identify which of the aforementioned Hypotheses A and B would help make controls more efficient and effective. The panel of experts consulted is formed by Inspectors of the Ministry of Labour, who have many years of experience. In the survey, first presented are the procedures that the Ministry of Labour aims to make electronic through the IIS, and then the remaining procedures, according to the proposed PIS, would become electronic. The inspectors are called to estimate the degree to which every electronic procedure will limit bureaucracy and the degree to which every procedure will help make controls more efficient and effective. Also, the inspectors are called to estimate which of the aforementioned hypotheses will help address the problem of undeclared work. The research design is summarized in Figure 1.

3.2 Questionnaire (a)

In this study, using a questionnaire filled in by companies in the area of Heraklion, Crete, we attempt to identify whether these companies would feel positive about using the proposed method of e-government. As mentioned in the previous section, a change on businesses information systems, and especially the adoption of systems in cloud computing environment, could result in a considerable amount of changes on a company's organizational structure (Khajeh-Hosseini *et al.*, 2012). For this reason, companies could be reluctant to such changes. Therefore, through a questionnaire, businesses are called to give responses to a Likert-type scale about the reservations they may have about the "data security", as businesses do not want their data to be accessed by unauthorized users (Subashini and Kavitha, 2011; Che *et al.*, 2011), reservations about the fear of "data loss", as companies want to be sure that all sensitive enterprise data are regularly backed up, so to facilitate quick recovery in cases of disaster (Subashini and Kavitha, 2011; Che *et al.*, 2011), reservations about "losing connection" in the cloud (Moschakis and Karatza, 2011), reservations concerning the "network speed" (Hofmann, 2010; Dwivedi and Navoni, 2010) and possible "software problems" and, finally, they are called to express any other reservation they might have. Furthermore, companies are called to estimate the administrative burdens, and in particular, they are called to estimate how much the basic procedures for hiring an additional employee costs.

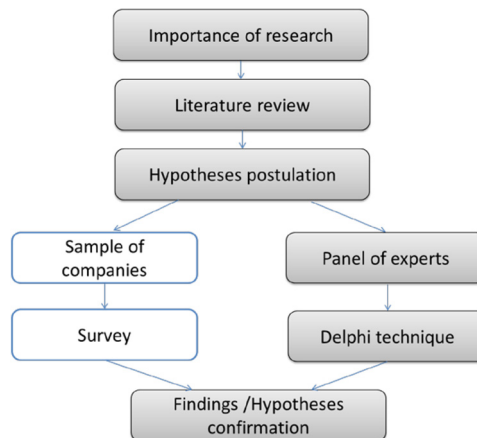


Figure 1.
Research design

In addition, the questionnaire includes questions concerning the two basic hypotheses of this study. Hypothesis A is planned by the Ministry of Labour IIS, and Hypothesis B is the proposed by the authors PIS provided by the public sector via cloud computing. Businesses are called to choose one of these two models. Of course, they can also express either their denial or their own opinion.

In the questionnaire, companies are presented by sector/activity into five categories: industrial, commercial, service, hotel and catering–restaurant. Also, they are categorized into seasonal and non-seasonal business. These categories were created based on statistics of the Labour Inspectorate Body. Furthermore, companies are presenting by their size according to the European Union Commission recommendation concerning the definition of very small enterprises and SMEs.

The Questionnaire (a) was given according to the homogeneous subgroups created by the sector/activity criterion to achieve a random stratified sampling. The companies received a request for participation and a link to the website for the survey. The request was given to the companies which hired personnel between 15 and 30 March 2012. This period was selected to also have samples from the seasonal companies. A total of 250 companies received request (about 50 of every sector), but only 77 companies responded to the survey. The strongest participation was by the very small and small companies. Also, two questionnaires were eliminated because they had controversial responses.

In conclusion, the main research question that Questionnaire (a) attempts to answer is: “would companies feel positive about using the proposed method of e-government (PIS)?”

3.3 Questionnaire (b)

Furthermore, the Delphi technique is used in an attempt to identify which of the aforementioned hypotheses would help make controls more efficient and effective. The Delphi survey method is often used to gain consensus among experts asked to predict the impact of future events. The panel of experts in the present survey consists of Inspectors of the Ministry of Labour. The labour Inspectorates are aware of the required procedures in labour and social security legislation issues, more than anyone else. The Delphi technique, as usual, consists of three survey rounds, in which the panel members express a probability of occurrence of the provided event and their rationale behind their prediction. During the second and the third round, participants are given back their probability, the average probability of the panel and the rationales (anonymously) of the panel predictions of the previous round. At the end of the last round, the panel probably will have reached consensus in the majority of the issues or will have shown that they are no likely to do so (Baldwin and Trinkle, 2011). Twelve labour inspectorates of the area of Crete accepted to participate in the three-round research. After being presented, firstly, the procedures the Ministry of Labour aims to make electronic through the planed IIS (Hypothesis A) and, secondly, the additional procedures that according to the PIS (Hypothesis B) would be electronic, the labour inspectors are called to estimate the degree in which every electronic procedure reduces bureaucracy as well as the degree in which every procedure would help make controls more efficient and effective. So, in Questionnaire (b) Table II presents the 17 procedures, which, according to IIS, would be electronic or submitted online, and Table I presents the inspection procedures provided by the proposed PIS.

Finally, in the third table of the questionnaire, the inspectors are called to estimate which of the aforementioned Hypotheses (A or B):

Table II.
Types of companies
and IIS and PIS
proposals

	Sample (%)	A IIS (%)	B PIS (%)
Total	100	48	52
Seasonal	23	47	53
Non-seasonal	77	48	52
Industrial	13	50	50
Commercial	21	50	50
Service	43	40	60
Hotel	13	50	50
Restaurant	9	71	29
Micro	57	33	67
Small	27	65	35
Medium	13	70	30
Large	3	100	0

- Would limit the scope of “on-site inspection”.
- Would impact the effectiveness of the control.
- Would increase the speed of “on-site inspection”.
- Would help more to address the problem of undeclared work.
- Finally, if “on-site inspection” would require support from less-qualified public servants.

It should be noticed that the problem of undeclared work is highlighted by the European authorities. As the Commission of the European Communities (2007) addresses, there is no simple solution to combating undeclared work. However, one of the most important policies the Commission implies is the administrative reform and simplification, with a view to reducing the cost of compliance with regulations.

4. Analysis

4.1 Questionnaire (a)

The empirical results presented in this study were obtained via a questionnaire instrument. The majority of responses were given by accountants, who showed an interest probably because they face the problem of bureaucracy in labour and social security issues more than anyone else in a company. Figure 2 presents the basic procedures for hiring an additional employee by a company in Greece.

During 2012, 75 questionnaires were completed. The study revealed that the majority of businesses (78 per cent) – which filled in Questionnaire (a) – estimate the cost for the recruitment procedure of an additional employee to be at least €20 and the half of businesses estimate this cost to be at least €30. This cost includes the labour cost (of the representative who performs the procedure), the transition cost, the parking costs, etc.

By implementing e-government applications, the procedures will be simplified. Under Hypothesis A, two separate and independent electronic reports should be sent. While under Hypothesis B, the registration of the employees in the payroll system will suffice. But, in any case, businesses register their employees in a payroll system before the execution of a payroll run. It is noted that the above “employee’s table procedure” is repeated at any change made in the work plan or the salary of an employee. So, the

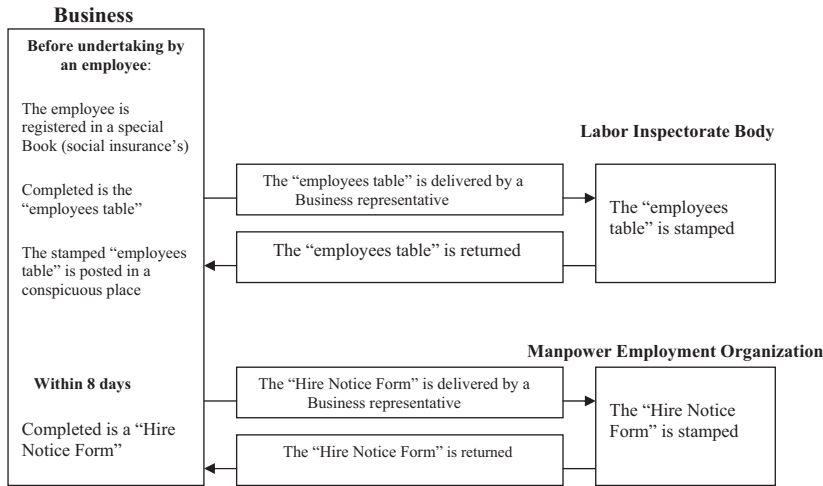


Figure 2. The basic procedures for hiring an additional employee in Greece

estimated cost for the procedures related to labour and social security legislation compliance burden the accounting department by approximately 5 per cent. The study revealed that 55 per cent of businesses fear that they are often at risk to be imposed on them administrative sanctions, as they consider the promptly regulatory compliance a very difficult issue to achieve. About 40 per cent of businesses fear that they are rarely exposed to this risk and only the remaining 5 per cent believe there is no risk at all. It is noted that the penalty for each violation is up to €50,000. The study also revealed that hotels and restaurants feel they are at a greater risk than other industries.

Table II shows the results of the survey. Companies recognized the need for e-government in labour and social security issues. It also summarizes the responses of the companies regarding the two basic hypotheses of this study; that is, Hypothesis A, which refers to the IIS planned by the Ministry of Labour, and Hypothesis B, which refers to the PIS proposed by the authors provided by the public sector via a cloud computing platform.

It was also found that the smaller the company is, the more willing it is to adopt PIS applications. The latter finding makes sense if one takes into consideration the fact that larger companies are noted to hardly ever change their organization and software programmes as opposed to smaller ones. According to other researchers, cloud computing is likely to be an attractive option for many SMEs (Sultan, 2011). As far as the classification of businesses in seasonal and non-seasonal companies is regarded, it was not observed any significant relationship.

Furthermore, all the companies that already use information systems in cloud computing environment are in favour of the second hypothesis – the implementation of PIS. On the other hand, a strong correlation was observed between companies that stated that they do not know about cloud computing and listed converging towards the first hypothesis. Apparently, the lack of information makes companies not to trust PIS. It is not excluded that, as the concept of cloud computing becomes familiar to managers in the long run, more and more companies will converge towards accepting PIS. Table I presents the strongest reservations the companies have. The mean is estimated from the

answers in a Likert-type scale from 1 to 5 (1: very slightly reserve, 2: slightly reserve, 3: reserve, 4: strong reserve and 5: very strong reserve).

It is noted that even those who converge towards the development and use of the IIS system believe that PIS applications should still be developed because, even if they are used in the future, or they are adopted only by a certain number of companies, this fact alone would reduce much of the work in public services.

Furthermore, according to the Hellenic Federation of Enterprises (SEV, 2011), 60.5 per cent of Greek companies are micro-sized, 30.7 per cent are small-sized, 7.3 per cent are middle-sized and 1.5 per cent are large-sized. As Greece is dominated by micro-enterprises and SMEs (98.5 per cent), and as SMEs feel positive about using PIS, the provision of a payroll system by the public sector via cloud computing is very possible to be widely accepted, especially in the long run. Also, if the PIS had the ability to interface with the Enterprise Resource Planning (ERP) software it could well be the first choice for every company.

4.2 Questionnaire (b)

In addition, we use the Delphi technique in an attempt to identify which of the aforementioned hypothesis would help make controls more efficient and effective. Twelve labour inspectors of the area of Crete accepted to participate in the research for the three rounds. After being presented, firstly, the procedures the Ministry of Labour aims to make electronic through the planed IIS (A) and, secondly, the additional procedures that, according to the aforementioned proposal (B), would be electronic, the labour inspectors completed three tables.

Table II of Questionnaire (b) contains the procedures according to IIS that will be electronic. At the end of the third round, the inspectors did not reach consensus, but, on average, they estimate that every individual procedure would contribute significantly towards both addressing the problem of bureaucracy and improving the effectiveness of controls.

Table I of Questionnaire (b) contains the procedures that additionally, according to the proposed PIS, will be electronic. Specifically, the PIS could provide much information about payroll, liabilities to personnel and public institutions, the individual employment contracts and the “normal leave of absence”. At the end of the third round, the inspectors almost reached consensus, and agreed that these electronic facilities will contribute the most towards both addressing the problem of bureaucracy and improving the effectiveness of controls.

Table III of Questionnaire (b) contains a comparison among the two hypotheses. We present the results in a Likert-type scale from 1 to 5 (1: very slight impact, 2:

System's benefits	A IIS	B PIS
Would increase the speed of “on-site inspection”	Average to strong impact	Very strong impact
Would limit the scope of “on-site inspection”	Average to strong impact	Very strong impact
“On-site inspection” would require support from less-qualified public servants	Average to strong impact	Very strong impact
Would impact on the effectiveness of the control	Average to strong impact	Very strong impact
Would help more to address the problem of undeclared work	Average to strong impact	Very strong impact

Table III.
Comparison between
ISS and PIS

slight impact, 3: average impact 4: strong impact 5: very strong impact). It is noted that the inspectors almost reached consensus in the first round. The second and the third round functioned more as a confirmation of the first round's results.

As we can see, the inspectors revealed that every attempt to use e-government applications in the labour market area could significantly improve the effectiveness of state controls. They also noted that the adoption of a PIS with cloud computing characteristics would result in fundamental changes in inspection metrology, as the "on-site inspection" would completely be separated from the distance control, leaving "on-site inspections" to mainly deal with the control of undeclared work. Finally, the inspectors commented that much of the information derived from PIS could be used in the resolution of labour disputes.

5. Discussion

Governments, worldwide, try to find ways to control labour and social security issues to be informed and take some crucial decisions. Moreover, they want to help businesses in their administrative field so that businesses are able to reduce their cost, become more competitive and enhance their investments.

The current global economic crisis also has a strong impact on the Greek market and undermines the financing of social security organizations. Therefore, it is an absolute necessity to address the problem of undeclared work. According to the European authorities, the problem of undeclared work is one of the biggest challenges faced by the European Union nowadays. Relating e-government with labour and social security issues is not just an opportunity for businesses to reduce their cost. It is the ultimate tool in the hands of civil control mechanisms, as they will be able to monitor, identify and, finally, address the phenomenon of undeclared work. However, this phenomenon is very complex, and there is no simple solution to it, as many other factors also play a significant role. For instance, there is the people's confidence in the fiscal and social protection system, the lack of strict controls as the benefits recipients is regarded, the financial attractiveness of undeclared work, and so on (COM, 2007). Also, there is a link between illegal immigration and undeclared work. Nevertheless, e-government could address this problem significantly and enhance both employees' and employers' level of awareness.

The Greek Ministry of Labour, in an attempt to address the problem of undeclared work and simplify procedures, has initiated the IIS. According to this system, numerous procedures are carried out electronically. It should be noted that up until today, numerous procedures require the physical presence of citizens in public service offices for filing in the pertinent documents. However, according to the authors' opinion, the main objective is not simply to make procedures electronic but to also re-organize and re-define these procedures. So, the authors propose as a possible way of e-governance the provision by the public sector of a PIS via a cloud computing platform. This system promises to remove most procedures, as it will turn the state to become the holder and administrator of the businesses database, thus having all the information required for audits and the final control. The study revealed that the majority of businesses that filled Questionnaire (a) estimate the cost for the recruitment procedure of an additional employee to be at least €20. Moreover, the estimated cost for the procedures related to labour and social security legislation compliance burden the accounting department by approximately 5 per cent.

Regarding and taking into account the results presented in the tables above, it is obvious that both systems have much to offer in many different directions. Findings showed that there is a prediction that PIS system is more effective than IIS in terms of implementation, although the differences between the effectiveness of these two systems are not significantly noticeable. This is despite the fact that using PISs in a cloud computing environment is not widely known and the majority of the panel, who are experts in inspections and labour issues, have never used similar systems so as to understand the advantages of these practices. If the panel had used similar systems, probably the predicted effectiveness of these two systems would be different.

During the past years, the Greek Government has spent much money and many hours in studying the effectiveness of the IIS system in terms of their design, their implementation and their development for all businesses. As a consequence, it is considered difficult to support a new system such as the PIS system that would change all the previous philosophy. On the other hand, PIS in cloud computing is a new promising idea that seems to be the future of IT systems.

It should be noted that, finally, IIS has been established by the government and nowadays, at the time of publishing this paper, it is officially recognized and accepted by businesses in Greece that perform numerous transactions via the system. IIS includes a set of applications that is constantly renewed. Likewise, further attention has been given to the benefits of the IIS to the public services. Since IIS was implemented, the waiting time in public services' queues has been reduced. Moreover, the labour inspectors, having an additional tool in their hands (ISS's reports and tools to extract information), perform their inspections more effectively. On the other hand, companies express their complaints that the compliance cost has not been reduced accordingly to IIS's promises. While research is needed on the effectiveness of IIS in businesses, PIS is recommended as a new pilot programme. In our view, PIS is a new promising idea that involves payroll systems in cloud computing, facilitates state control, reduces companies' administrative costs and it seems to be the future of IT systems in the government.

6. Conclusions

In this study, the need for e-government involvement in labour market procedures and in the social security provision network was identified. This study is a first attempt to analyse benefits and problems arising from the proposed use of a government system (ISS) and identify the attitudes of business towards a cloud-based system (PIS) proposed by the authors.

All businesses want the development of an e-government system. Approximately half of the responses listed converge towards the first hypothesis – the implementation of IIS – while the other half of the responses listed converge towards the second hypothesis – the implementation of PIS. It is noted that even those who converge towards the development and use of an IIS system believe that PIS applications should still be developed because, even if they are used in the future, or they are adopted only by a certain number of companies, this fact alone would reduce much of the work in public services. However, the companies have some reservations about using PIS, mainly regarding data security, as well as Internet connection and software issues. It was also found that the smaller the company is,

the more willing is to adopt PIS applications. The latter finding makes sense if one takes under consideration the fact that larger companies are noted to hardly ever change their organization and software programmes as opposed to smaller ones. However, as Greece is dominated by micro-enterprises and SMEs (98.5 per cent), the provision of a payroll system by the public sector via cloud computing is very possible to be widely accepted, especially in the long run. E-governance will also help to draw out detailed and reliable information and create statistical reports, thus facilitating government policy on labour issues.

Questionnaire (b) – filled in by labour inspectors using the Delphi technique – revealed that every attempt to use e-government applications in the labour market area could significantly improve the effectiveness of state controls. However, the inspectors noted that the adoption of a PIS with cloud computing characteristics would result in fundamental changes in inspection metrology, as the “on-site inspection” would completely be separated from the distance control, leaving “on-site inspections” to mainly deal with the control of undeclared work.

6.1 Implications of this research on theory and practice

This study is the first attempt to analyse e-government initiatives in labour and social security legislation areas in Greece. The main idea is not simply to make procedures electronic as the IIS probably aims to, but also to re-organize and re-define these procedures. Thus, the PIS that is proposed by the authors as a possible way of e-governance appears to help the most in reducing companies’ administration costs, increasing the protection received by the workers and assisting public services in conducting more effective and simpler controls. This study could also be the starting point and inspiration for formulating at first and then testing a theoretical framework concerning the provision of cloud solutions by governments.

6.2 Limitations of this research

The study has some limitations regarding the sample size and local focus. Questionnaire (a) was filled in by 75 companies in the area of Heraklion, Crete. The sample was quite small and expressed the local culture. This limitation alone provides opportunities for further research. Furthermore, similar proposals relating to tax and accounting issues could be researched provided that numerous businesses in the future will use information systems provided by the public sector via a cloud computing platform.

6.3 Future research recommendations

While research is needed on the effectiveness of IIS in businesses, PIS is recommended as a new pilot programme. In our view, PIS is a new promising idea which involves cloud-based payroll systems administrated by the government, facilitates state control, reduces companies’ administrative costs and it seems to be the future of IT systems in the government field. However, field research is needed to quantify results and proceed to generalizations in an attempt to building theory, which is much needed in this relative new but very important field.

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