E-government and Forest Service: The Case of the University Forest of Taxiarchis

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Abstract

The present paper studies e-Government and describes the initial structure of an e-Government information system to be applied in the Greek Forest sector. University Forest and its activities are presented, it is also described the architectural framework of an e-government model, which will be used as a tool guide, and a presentation of the e-government major types as a web design structure guide. The prototype information system that will be designed promotes the activities run by the Forest Service in educational, business, administrative, informational, recreational and ecological levels.

1. Introduction

Governance refers to the exercise of political and administrative authority at all levels to manage a country’s affairs. It comprises the mechanisms, processes and institutions, through which citizens and groups articulate their interests, exercise their legal rights, meet their obligations and mediate their differences [1]. According to UNESCO [2], e-Governance is the public sector’s use of information and communication technologies with the aim of
improving information and service delivery, encouraging citizen participation in the decision-making process and making government more accountable, transparent and effective. During the last decade, a lot of attention has been driven to the strategic and co-ordinated use of Information and Communication Technologies (ICT) in public administration and eventually in political decision making. Developed and Developing countries have adopted national e-government strategies. Governments and international organisations are investing considerable amounts of money to enhance public sector ICT capabilities. The term E-government holds up a meaning of a modern, efficient, transparent, participatory, and customer-oriented government, central to the work and purpose of the public sector its reform and democratic renewal in a knowledge economy. E-government is synonymous with what government itself is about and by being citizen centred along with an external focus includes opportunities like: cost reduction and efficiency gains; improved quality of service delivery; increased capacity of government; and improved transparency and accountability – (internal transformation) [3].

By an overall National Forest Services research, in other European countries, we got to understand and primarily form the context and their focal points of their web design.

There is an absence of a National Forest Service in Greece web presentation and the Forest Service’s web sites are in an early stage. In fact: “Findings from the research about ICT adoption in Greek Forest reveal that the forestry public sector has not reached high rates of adoption mainly concerning infrastructure, hardware, and local intranets and moreover, there is a certain lack in personnel’s skills and education as to computer literature. That was expected as the exploitation of network services and ICTs are introduced in public administration within the last decade, through the E.U. directives and frameworks. The results reveal the necessity of introduction of new technology tools, concerning network connection and services. Yet, there is an optimism among the employees as evidenced by the research findings that is positive and encouraging, as e-Government will successfully enhance service delivery for local authorities” [4].

We find it necessary to create a web portal for the Forest Service of the University Forest of Taxiarchis, and the necessity lies on the fact that Taxiarchis is as much as a research and study area for the internship of university students, as the conducting of forest surveys and also a museum, where specimens of the local flora and fauna are exhibited.

This paper aims to study the E-government issues and describe an initial prototype Information system concerning the forest Service of Taxiarchis and its administrative purposes.

2. Background

2.1 E-government- definitions and perspectives

E-government includes technocratical, technological, sociological and humanitarian types of definitions, over the last 10-15 years of its development. Due to the financial and economic crisis beginning in 2008, governments have been looking at how best to use information and communication technology (ICT) to improve the performance of public sector administrations. The use of ICT in public administrations and its impact on public governance (also known as e-government) has enabled governments to automate a broad range of internal functions and processes within public organisations and across organisational boundaries, making it possible for them to deliver high-quality services to users- whether citizens, businesses or government employees. Governments saw the use of ICT as the ‘silver bullet’ that could finally resolve the lack of coherency in public service delivery, and at the same time free up resources through efficiency and effectiveness gains [5].

Internet is an exceptionally dynamic environment, continually developing and as it has become a major resource in modern business, many enterprises have already created their Web presence [6]. According to Marchioni [7] and Ciment [8] as e-commerce matures and its tools and applications improve, greater attention is being given to its use to improve the business of public institutions and governments (country, state, county, city, etc.). E-Government is the use of information technology in general and e-commerce in particular, to provide citizens and organizations with more convenient access to government information and services and to provide delivery of public services to citizens, business partners, and those working in the public sector. It also is an efficient and effective way of conducting government business transactions with citizens and businesses and within government themselves [9]. E-Government is about using the tools and systems made possible by Information and Communication Technologies
(ICTs) to provide better public services to citizens and businesses. ICTs are already widely used by government bodies, just as in enterprises, but e-Government involves much more than just the tools. Effective e-Government also involves rethinking organisations and processes, and changing behaviour so that public services are delivered more efficiently to the people who need to use them. Implemented well, e-Government enables all citizens, enterprises and organisations to carry out their business with government more easily, more quickly and at lower cost [10].

According to Balla [11] the E-governance definition can be expressed as a wide transformation initiative, facilitated by new technologies for a) developing and providing unified and integrated high quality public services b) facilitate an efficient administration and c) support economic and social objectives of citizens, businesses and society on a local, national and international level. "This definition focuses equally on technological, economic, administrative, organizational and social issues, while legal issues were not directly prejudiced. The term is being looked by another perspective, according to Anthopoulos, L. [12], the E-Government is neither the installation of systems and implementation of software applications nor the mechanisms to promote products and services on the market. It is a whole philosophy that explores a human -citizen centered aspect in organized societies and as a foundation of the Democracy. It evaluates the governments not for the size of their investments, but the improvement of their image to the public. It is trying to provide solutions to issues that undermine the credibility of governments, such as transparency and meritocracy, while exploring ways to attract the interest and participation of citizens in the working mechanisms of modern societies and to support the Democracy.

2.2 E-government Types

According to Bonham [13], the e-government refers to the use of ICTs by government agencies at different levels to re-design and transform relations between governments and businesses (G2B), governments and citizens (G2C), and different government agencies (G2G). Such transformations in turn would serve a variety of different ends – reducing cost, improving efficiency and effectiveness, better delivery of government services to citizens, improving interactions with business and industry, and citizen empowerment through access to information [14].

According to Turban [9] the e-government comprises of four categories:

The government to citizens (G2C) category enables citizens to interact with the government from their homes electronically. G2C applications enable citizens to ask questions of government agencies and receive answers, pay taxes, receive payments and documents and so forth. For example, citizens can renew driver’s licenses, pay traffic tickets, and make appointments for vehicle emission inspections can take driving tests and can be trained and be helped to find employment. An interesting area of application is at the election periods where politicians and voters communicate with e-mail messages and comprehensive information portals. Electronic voting started to take place in many countries with a touch of a computer screen. Another area of G2C activity is in solving constituents’ problems. The government can use CRM type software to assign inquiries and problem cases to the appropriate stuff member. Another common G2C use is the broadcasting of city council meetings, press conferences, and public addresses.

The Government to Business (G2B) category refers to e-commerce where selling products and services occur among government and businesses and vice versa. The two major areas of this category are the e-procurement and the auctioning of government surpluses. E-Procurement makes the bidding process transparent and enables smaller businesses to bid for big government procurement projects. The system also helps government generate bigger savings, as costs from middlemen are shaved off and purchasing agents’ overhead is reduced [15].

The Government to Government G2G category consists of E-commerce activities between units of government, including those within one governmental body. Many of these are aimed at improving the effectiveness or the efficiency of the government. G2G services take place at two levels: at the local or domestic level and at the international level. G2G services are transactions between the central/national and local governments, and between department-level and attached agencies and bureaus. At the same time, G2G services are transactions between governments, and can be used as an instrument of international relations and diplomacy. An example of this category is the “Global Program on Transnational Organized Crime” designed by the UN [16]. Another example is the integration aspect of the Schengen Information System (SIS), developed to meet the requirements of the Schengen Agreement.
The Government to Employees (G2E) and internal efficiency and effectiveness (IEE) category includes activities and services between government units and their employees. Because employees of federal and stage governments often work in a variety of geographic locations, applications may be especially useful in enabling efficient communication. Examples of IEE are the integrated human resources, e-training, e-payroll and more.

The ad hoc actions that there are expected to be achieved in the various e-government categories, as described by Turban [9] are:

G2C: a) Reduce the average time for citizens to find benefits and determine eligibility, b) Reduce the number of clicks to access relevant loan information, and c) Increase the number of citizens who use the Internet to find information on recreational opportunities.

G2B: a) Increase the ability for citizens and businesses to find, view and comment on rules and regulations, b) Reduce burden on business by enabling online tax filing, c) Reduce the time to fill out export forms and locate information and d) Reduce time for businesses to file and comply with regulations.

G2G: a) Decrease response times for jurisdictions and disciplines to respond to emergency incidents b) Reduce the time to verify birth and death entitlement information and c) Increase the number of grant programs available for electronic application.

IEE: a) Increase availability of training programs for government employees b) Reduce the average time to process clearance forms, c) Increase use of e-travel services within each agency d) Reduce the time for citizens to search for federal jobs and e) Reduce time and overhead cost to purchase goods and services throughout the federal government.

3. Study area: The University Forest of Taxiarchis

The University Forest in Taxiarchis is one of the two university forests of the country. The forest was donated in 1934 by the Ministry of Agriculture to the Aristotle University of Thessaloniki for researching and educational purposes. The purpose of the forest was to serve as a model of creating a forest-estate, developing forestry research and ultimately serves the internship of students for the Faculty of Forestry and Natural Environment. It is under the jurisdiction of the University Forests Fund (UFF) of the Aristotle University of Thessaloniki (Law 1881/1951). The University Forest is located in Chalkidiki and spreads on an area of 5800 acres on mountain Cholomontas. Along with the constant interference of the Administration of University Forest, infrastructures were created that improved the living conditions of the population in the forest area and improved and increased the biodiversity of the forest and utilized productive resources.

Since the founding of the department in 1951 the Management of the University Forest of Taxiarchis: 1) Ensures the necessary infrastructures for the internship of university students and the conducting of forest surveys 2) Applies standards of forest and administrative management which focuses mainly on the protection of the forest ecosystem, the improvement and magnification of wood capital/stock, the preparation /drafting of technical forest projects and the implementation of the corresponding projects and 3) Creates infrastructures aiding tourism growth in the mountain range of Chalkidiki and the promotion of alternative cultivation to uphold the forest population in the mountainous areas.

Since 1971 it has formed up the forest cadastre and has secured the forest boundaries, thus providing the local population with ownership titles of their properties. Weather data is being acquired through a meteorological installation of the forest administration, since 1974. The University forest area is rich in minerals. The ground originating from solifluction, shows great diversity and as a result hosts a variety of vegetation. The flora comprises of deciduous tree forests while in places reforestations of conifers (30% of the area). Of special interest are the sapling fir groves, cultivated in private fields for the production of Christmas trees. In total there are more than 1100 recorded species of turfs and woody plants. Among these, 38 species are under protection status, while others are of special biogeographical importance. The area’s fauna has great diversity. In total, 134 species of birds have been recorded. The forest territory is a part of the NATURA network and according to the 92/43/EEC and 79/409/EEC directions of the EU; it has been declared a protected site for the predatory birds. The general area of the University Forest is a representative forest of broadleaf species of the Greek region. The main forestry products are oak, beech and pine firewood, as well as charcoals, while present to a lesser degree is also carpentry. Finally, a total of 30-35 forest workers are employed annually in the various woodcutting activities. Livestock production makes up another
part of the local activities, with numerous units applying biological methods of breeding. Apiculture takes up the last part of the local occupation activities. The University Forest Administration, by applying a different sustainable forestry development in order to maintain and enhance the same forest that serves simultaneously the human factor, has created various infrastructures: 1) A forest road network of A’-B’-C’ category, 2) A firebreak and water intake network, observation posts and a state-of-the-art remote sensing system for additional firebreak protection, 3) Two shelters for wildlife, covering an area of 3,000 hectares, 4) A large number of experimental fields, established in collaboration with the Faculty of Forestry and Natural Environment, 5) Projects to promote tourism in the area, such as constructing trails and greenways, an artificial lake, stands, kiosks, as well as embellishing chapels, etc [17].

A Forest Museum is hosted where visitors can learn about the flora of the region and the fauna and provides information about the history of the Forest Science. Every year, students of the 4th semester of the Faculty of Forestry and Natural Environment attend a one-month practical training in the forest. Moreover, various researches are being held by postgraduate, researching personnel and academic staff throughout the year.

4. Methodology

Aiming to generate an initial prototype model for the e-governance of University Forest, we should adopt in common a number of technologies and system’s infrastructure that would enable us to create a platform to exchange knowledge resources. In the context of the e-Government, university Forest should be able to share and exchange data, independent of formats, devices and underlying architecture. The governance of natural resources has to face the increased multiplicity of connections between different environmental aspects and decisions of local, regional, national, and international relevance, with high coordination and exchange between administrative units, public carriers and private stakeholders [6]. The e-government architecture will define the standards, infrastructure components, applications, technologies, business model and guidelines for electronic commerce among and between organisations that facilitate the interaction of the government and promote group productivity [18]. The widely applied model of Ebrahim & Irani, is an integrated architecture framework for e-government that combines IT infrastructure with business process management in public sector organizations. The framework consists of four layers connected through two-direction arrows which present the hierarchical level of e-government implementation and portray the logical connection of each relevant layer that allow two-way transmission of data and services. (Fig. 1) Basic structure of that model will be fit in our case study.

-Access layer: This level depicts the users and the channel of access of the government services. Citizens, business, employees, other governments, and other community members can be the users. Access channels consist of the data communication devices through which products, services and information are used, accessed and communicated by multiple technologies. Access channels are mobile phones (WAP), web sites, kiosks, digital TV, and call and contact centres. This level is controlled and managed by government users. However, it is essential that public sector organizations provide a common way of finding all government information and services, maintain channel coordination, create a common look and feel across different channels, and comply with the guidelines of technical standards [19].

-E-government layer: This layer should integrate in the form of a one-stop e-government portal all digital data of the various government organisations, the services and the information they provide and receive. The result is improved access to government resources, reduction of service-processing costs, and offering of a higher quality of service. Users can access the information provided by a web browser. The portal allows dispersed sources of information to be linked together, the user can customise what it needs from information sources, the use of and integrated portal reduces overhead and improve information flow by a quick process.

From a portal management perspective, it is necessary to maintain user interface construction abilities to increase user control, such as search capabilities, interactive media, and graphics design; and other key features such as e-mail, calendars, instant messaging, and chat areas. As well as including tools to register, dynamically recognise and classify users; and giving the organization the ability to customise content, information access, and structure to meet the specific needs of employees. Security is another key element of this layer, through deploying government authentication and privacy standards to secure online transactions and protect the portal contents [18].
E-business layer: This layer integrates front-end e-government layer applications that occur within and between organisations, such as online catalogues and transaction interfaces with back-end activities such as existing databases and data warehouses. The e-business layer, using ICT applications, is emerged to manipulate and integrate government data sources across government bodies and make information and services available to the e-government portal in real-time. The implementation of this layer will make a strong foundation to build single e-government portal as stated in e-government layer and also support the relationship and interaction between G-to-G and G-to-E. It provides a seamless, automatic and real-time communication between their systems at both a data and process level [18]. This layer includes several applications and tools that are emerging to help determine, assess, and achieve consistent and integrated processes and information systems in public sector organization.

Infrastructure layer: The bottom level of the framework includes the necessary standards and protocols through network and communication infrastructure approaches (e.g. application server, intranet, extranet, internet). These technologies should be the basis and fist to be placed before the ICT infrastructure of e-government layer can be offered reliably and effectively to the public.

![Framework of e-government architecture](image-url)

Fig. 1. Framework of e-government architecture [18]
5. General design guidelines

For the present study on each layer we will use parts that are important and useful to form the e-Government web portal.

For the infrastructure layer, a Server is going to support the Internet and along with a Lan will be placed in the Forest Service central building. Lan is important for the connection and communication of the employees among the different departments, the Office of Execution of Forest Technical Works, the Forest Administration and Management Department, the Department of Forest Protection and Municipal Prosecutor Office, the Office of Game, Fish and Forest recreation and the Department of Management and Accounting. The Internet could be used for the information and communication of the citizens and the conducting of business with wood industries. However optional software packages aiming to facilitate e-government system design, use, performance monitoring prototyping, simulation and test data generation are often purchased separately or developed by independent software vendors.

For the e-business layer, a database is going to store the information that is about to be presented on the portal, among the different official documents that would be notified on the ‘Diavgeia’ section in order to promote clarity on governmental and administrative processes, using document management systems. Apart from the standard database approach characteristics such as concurrency and controlled redundancy data sharing, representing complex relationships among data, authorized access, back up and recovery flexibility, reduced application development time an availability of up-to-date information [20]. The primary resource is the database and it is administered by the director of the local administration unit who will be responsible for authorizing access to the database and for coordinating and monitoring the database use. He is also accountable to confront security problems and poor system response time. The forest Administration and Management Department and the Department of Management and Accounting could use a customized ERP system for the purposes of accounting, education and payroll. For the e-government layer, the web portal could be organized, presented and customized according to the end-user target group needs. End-users are the forest unit administrative stuff whose job requires access to the database for queries, updates and generation of reports. Their main job function revolves around queering and updating the database using carefully programmed and tested standard types of queries and updates (canned transactions) [20]. These internal transactions can be only accessed and performed among the stuff members. Several sites would be addressed to G2C -for example students, citizens and schools. The G2B category sites would include information for wood industries, merchants and retail sellers. The G2E category sites would contain the processes and seminars of the employees in the service. The G2G category sites would be connected by links to a National forest service site, the Region of Central Macedonia site and the centre of Environmental education site.

For the access layer, the channels that could present the government information to the users are Web, kiosks and Teleconferencing. Teleconferencing could be used when seminars and conferences take place in the convention rooms. Kiosks could be developed and be placed on the area of the forest office for the informing of the visitors.

6. Conclusions

This project describes a possible architecture of an e-Government system to be applied in the Greek Forest Service and it is applied for the university Forest of Taxiarchis, which performs additional functions. The project may consist of an original model for further study in order to design and implement an integrated national portal, which will involve each Greek region. The database approach involves a single repository of data defined once and then accessed by various level end-users, including characteristics such as Insulation between programs and data, support of multiple views of the data for various administration departments and end-users, controls redundancy, supports sharing of data and resources including concurrency control software, restricts unauthorized access, enforces integrity constraints and provides back up and recovery subsystems. However the above system has to be tested in practice and assessed by both forest service personnel and citizens as to be further improved.
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