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Leveraging ICT Deployment and Integration in a Public Organization Aged 176 Years
A Greek Case Study

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Abstract: The successful deployment and exploitation of an Information and Communications Technologies (ICT) project in a traditional Public Organization involves the proper design and implementation of the Information System (IS) and a proper combination of Business Process Re-engineering (BPR) and Change Management (CM) techniques, specially adapted to meet the organizations' needs. The current work describes the transformation of such an organization, the Holy Archdiocese of Athens, earlier functioning based on a bureaucratic model, into a modern organization, integrating Information Technology (IT) in core processes and offering electronic public services to citizens. Over and above IT expertise, an individual approach of BPR and CM techniques were used in order to meet the challenges set by the nature of this project, the outdated processes in a church organization and the problems caused by elder, unfamiliar with IT and highly resistant to change personnel.

Keywords: Public services, Business Process Reengineering, Change management, ICT integration, Case study
Categories: H.4.m, K.4.m, K.6.1

1 Introduction

Information and Communication Technology (ICT) is intrinsic to current business practices and continues to be a driver for change. As citizen demand for online services increases, most Public Organizations are oriented towards providing new, direct e-government services, integrating ICT, aiming for simplicity, efficiency and responsiveness [Hulicki 08]. The Holy Archdiocese of Athens has recently taken such an initiative, with two major projects: "*Development of information systems for the provision of ecclesiastic services from the Holy Archidiocese of Athens to the citizens*" and "*Change management and business process re-engineering due to information and telecommunication projects of the Holy Archdiocese of Athens*" that were co-funded by the European Regional Development Fund and the Greek Government.

Both these projects' objective was to upgrade the quality of public services offered to the citizens from the Greek Church through the development of an internet portal. The portal provides services on the issuance of marriage licenses, marriage or

separation certificates plus value added services for the citizens, such as availability check of Churches for perpetrating mysteries. Thus, the communication processes between citizens and Church Authorities and the efficiency of provided services is improved drastically, promoting ICT usage and integration.

Information Technology and Information System failures have been the topic of many articles, conferences, symposiums, studies, and research initiatives over the past 15 years [Murray 01, Standish 94, Whitaker 99, Heeks 08, Heeks 02a & 02b]. The literature of the IT and IS community is rife with articles and commentary about project failures. Still, in 2009 a mere 32% of all projects succeed, i.e. are delivered on time, on budget, with required features and functions. A further 44% are late, over budget, and/or with less than the required features and functions and 24% failed completely (i.e., cancelled prior to completion or delivered and never used) [Standish 09]. Last, numerous projects are deemed as operational failures. Research on IT project failures points to flaws in the way people think as the primary reason for many of the large scale blunders. Other main causes include the lack of execution and focus and an increase in process, tools and red tape.

All these parameters were taken carefully into consideration while designing and implementing this project, which originally had a high failure risk factor, due to the structure of this traditional public organization and the involved personnel.

Purpose of this paper is to describe the original work made, the critical success factors in an ICT project implementation and to propose a new, combined methodology of Business Process Re-engineering (BPR) and Change Management (CM) techniques to address the problems arousing when highly resistant to change personnel is included.

2 Project Description

2.1 Brief Description of the Holy Archdiocese of Athens

The Holy Archdiocese of Athens was established in 1833 as the Holy Metropolis of Athens and since 1925 has been renamed as The Holy Archdiocese of Athens. It is the most significant religious entity in Greece, consisting of a communion of 145 self governing parishes united by a common faith and spirituality, a clergy of 516, and a significant number of supporting personnel.

The mission of the Archdiocese is to proclaim the Gospel of Christ and to cultivate its message among devoted Christians and by all means support humanity. The main services provided by the Archdiocese can be divided into four distinct categories.

Spiritual services: including prayer, liturgy, worship, parish administration, organization, and education

Philanthropy: aiding families and social groups with special needs through a wide network of organizations and local institutions governed by the Archdiocese. Christian Charities, the National Eleemosynary Society, Tabitha, NGO Solidarity and many other organizations are actively engaged in carrying out this mission.

Cultural services: aiming to spread the Christian and byzantine heritage further into the modern society through libraries, art galleries, choirs, dance and music lessons, etc.

Public services: the Holy Archdiocese of Athens oversees the certification of celibacy, marriages, and baptisms to parish residents. It is also solely responsible issuing certificates of separation for spiritual marriages.

The operational model of the Archdiocese for the delivery of public services was characterized by traditional and bureaucratic processes and functions. Moreover the involved personnel were not familiar with the usage of technological tools and had an immanent reluctance to changes. Seen in this context, the successful implementation of an ICT project was a major challenge not only from the technological, but also from the cultural and operational point of view.

2.2 The ICT Project

The first project under the title *"Development of information systems for the provision of ecclesiastic services from the Holy Archidiocese of Athens to the citizens"* was related to the implementation and pilot operation of an Integrated Information System which enhances services to citizens and upgrades the quality of services provided by The Holy Archdiocese of Athens.

The project was focused on supplying the Archdiocese with the necessary equipment and the developing of individual subsystems under the Integrated Information System, ultimately creating an automated communication system that enables citizens to easily interact with Church authorities. This bidirectional communication is supported by the "one-stop-shop" portal offering online services for the issuance of marriage licenses, marriage and separation certificates, in addition to value added services to the public, such as checking liturgy schedules. Implementing measures to promote use of the system and the training of potential users was also within the scope of the project.

The mission outlined above was dependent on the following project goals:

- Digital recording, documentation, and archiving of marriages and separations to enable the automation of processes and the availability of digital information. A joint team, composed of members from the Archdiocese, IT personnel and digitization experts was created in order to complete the project. 36,000 document certificates from the 10 pilot parishes were digitized for this reason. As a result, data can now be easily updated and archived in a consistent manner. At the same time platforms and networks were be built between the Archdiocese and public agencies, whereas a medium-cost digitization system composed of A0 scanner, digital camera and all necessary software has been installed and connected to the database in the premises of the Archdiocese to fulfil their future needs.
- Providing information services to citizens in an effort to facilitate service obtained and to create an interactive electronic channel of support. These online services would incorporate guidelines and standards of accessibility for vulnerable groups.
- The «digital» issuance of licenses and certificates by exploiting opportunities offered by new technologies and the Internet, and ensuring the adequate internal reorganization of The Archdiocese of Athens to facilitate communications with citizens.

- The capacity to connect systems developed by the Archdiocese to existing e-government systems, government agencies, and public services through a transparent and automated process.
- Developing an operations and implementations model for church services, which would be integrated into the Greek e-Government Interoperability Framework and would be subsequently modified to act as a prototype for all parishes in the territory.
- This specific project is a pilot project, which would initially connect 10 parishes. The aim of the whole project is to cover all Holy Metropolis nationwide.

Prior to implementing the system, Mentoring S.A. was selected for the consulting services of recording the needs, the procedures and understanding the organization's business model, while designing the architecture and the specifications of the complete ICT system. Numerous methodologies were combined to support requirement analysis, create a proper feasibility study and interview personnel. All business processes and documents were recorded and modelled and a user-requirements assessment was conducted in order to facilitate the implementation of the IS and the introduction of new, IT-based core processes.

Next, a consortium of experienced ICT companies was selected in order to provide the Holy Archdiocese of Athens with the following equipment and services:

- Application design, including analysis and detailed architectural design of the solution, and the production of metadata standards for electronic church services (in XML Schemas) available for online use across the spectrum of the public sector.
- The supply of computer hardware to the regional reference points within the system (10 parish churches).
- Equipment for the central infrastructure of The Holy Archdiocese of Athens.
- The supply, installation, and configuration of software systems for the strengthening and functioning of regional and central points of infrastructure (servers, e-security tools, etc.).
- The design and development of software applications to support the operations of The Holy Archdiocese of Athens (digital recording, documentation, archiving, digital certificates, etc.).
- The redesign of existing content and development of the "one-stop-shop" portal. The portal can be accessed through www.archdiocese.gr and was deployed in a multi-phase approach in order to ensure the successful implementation: early design, network audit, solution architecture, site and application planning, network design, migration plan, network implementation, one-stop-shop implementation, knowledge transfer, tuning, optimization. The main problems encountered during the deployment and the knowledge transfer phase were the main factors that led to the CM project.
- The consolidation of the Integrated Information System with existing structures of The Holy Archdiocese of Athens.
- The security and maintenance of the system and support for trial operations for a specified period time after completion of the project.

- The training of technical personnel to use and support the software system.
- The training of personnel of The Holy Archdiocese of Athens for the proper use of new technological tools and applications.
- The pilot linking 10 selected parishes to The Holy Archdiocese of Athens.
- The roll-out of promotional activities for the project from implementation to the dissemination of outcomes.

According to the assessment of the organization's requirements, a 4-zone network architecture was implemented, using 10 servers and 15 desktops for the 10 parishes that was planned initially to be connected to the network. This architecture [Fig. 1] was selected in order to host the future needs of this project and enable the Holy Archdiocese of Athens to launch the electronic services nationwide, without any additional hardware and software requirements. Special care was given to security and interoperability issues, as well as the availability of the services and unfailing network access .Interoperability issues were easy to deal with, as a complete data migration methodology was implemented in order to transfer all existing data, services, systems and technologies into the new backbone and database system. The former level of digitization of the Archdiocese was low, therefore no services was necessary to be maintained on the older systems.

The project was successfully completed in 10 months and is now fully operational.

2.3 Business Process Re-engineering and Change Management

In order to cope effectively and efficiently with the new framework established after the implementation of the above described ICT project, The Holy Archdiocese of Athens launched a second project to ensure the utilisation and full exploitation of the ICT infrastructure that was acquired. This successive project titled *"Change management and business process re-engineering due to information and telecommunication projects of the Holy Archdiocese of Athens"* had 10-month duration and was implemented by the consultants of Mentoring S.A., who had also undertaken the design phase of the new IS.

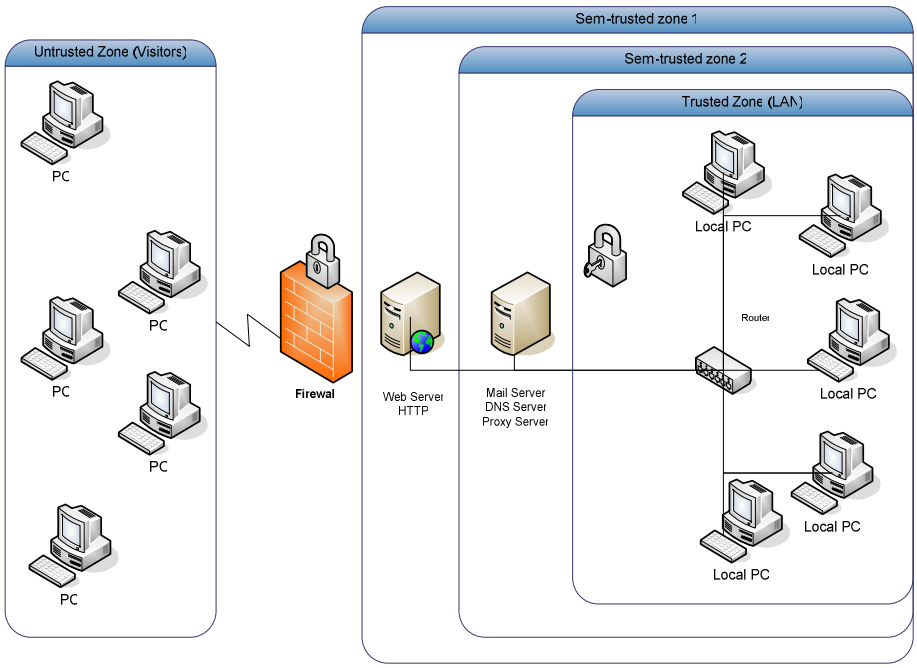

Figure 1: Holy Archdiocese of Athens Network Infrastructure

In order to select the proper BPR a methodology, a review on common BPR practices for the public sector was conducted: e.g. in the health care sector [Coulson-Thomas 98], the legal and judicial field [Mechling 94, Bellamy and Taylor 97], education [Van Belle 97] and social security administration [Halachmi 95], as in different countries ; the USA [Halachmi 95], the UK [Horrocks 97, Pratchett 97], Spain [Coulson-Thomas 98], Denmark [Friis 97]. The used BPR outline is one such model, based on the PRLC (Process Reengineering Life Cycle) approach developed by Guha [Guha et al 93], commonly used in ICT projects, specially adapted to meet the requirements of this project [Fig. 2].

Benefiting from lessons learned from the early adopters and the literature review, we advocated a change in emphasis to a citizen-centric, as opposed to an IT-centric, methodology. The streamlined procedures were organised into three operational areas: (a) Front-office, (b) Back-office and (c) Parish linking processes. A full list of the old and the new procedures and their parallelism is shown in [Fig. 3]. Although the number of procedures seems to be increasing after the BPR, one must note that all procedures are now identified, simplified, integrate ICT and thus, less time-consuming. There is a clear reduction in Document support and on the number of steps required to complete one task. This can be further supported by the example of a re-engineered process [Fig. 4 & 5].

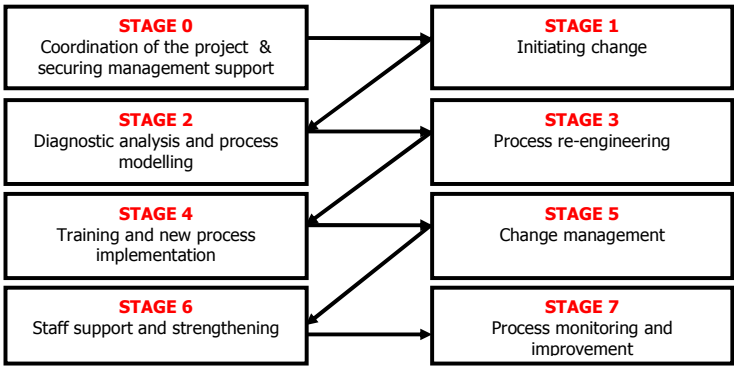

Figure 2: Combined BPR and CM technique used in the project

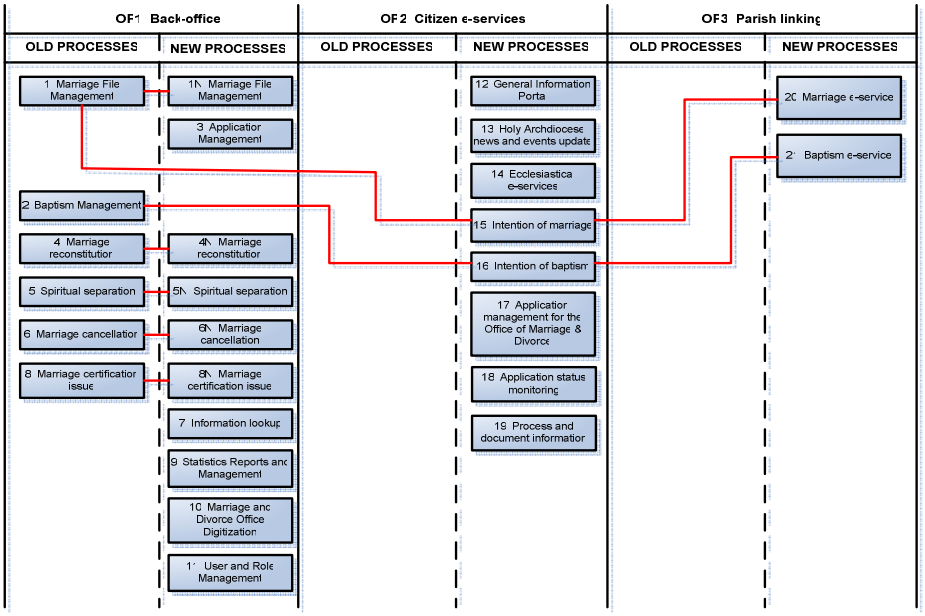

Figure 3: Old versus New Business Process List

Simultaneously, we used change management tools to proactively address resistance to change—a factor linked to the demise of many reengineering initiatives that looked good on the drawing board. The selected change management model was the one proposed by Lewin and Schein, with the three well-known stages: unfreezing, change, refreezing. This model was selected as most effective, since restraining and driving forces could readily be identified, and there was time for a detailed analysis before changes are made. The case here for change management was obvious, as the

personnel involved was elder, highly resistant to change and unfamiliar with IT. Some examples regarding the resistance to change are listed below:

- during the initial interviews we met one of the priests, who had received the desktop workstation for the parish and he had placed a table cloth on top of the box without even removing the computer from the packaging and was using it as desk.

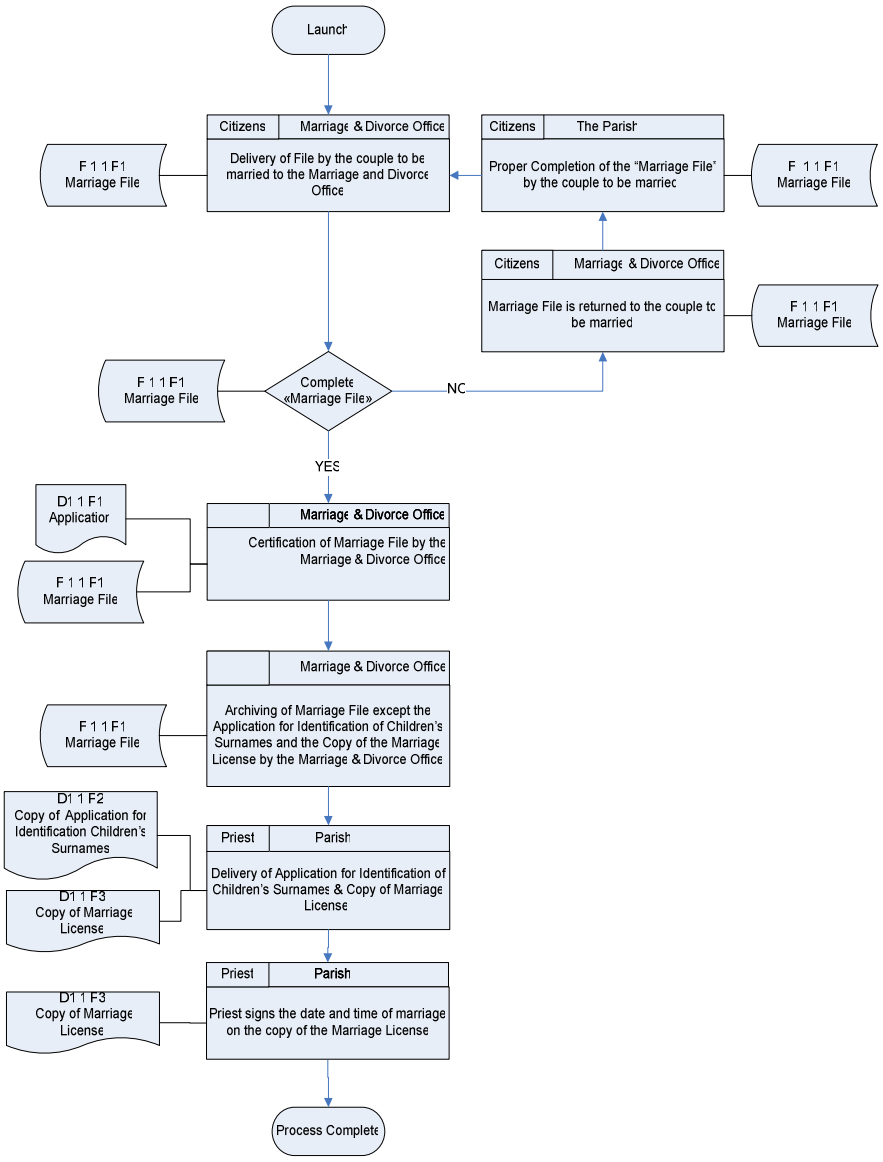

Figure 4: Old Process example (1. Marriage File Management) – F.xx.xx: File, D.xx.xx: Document

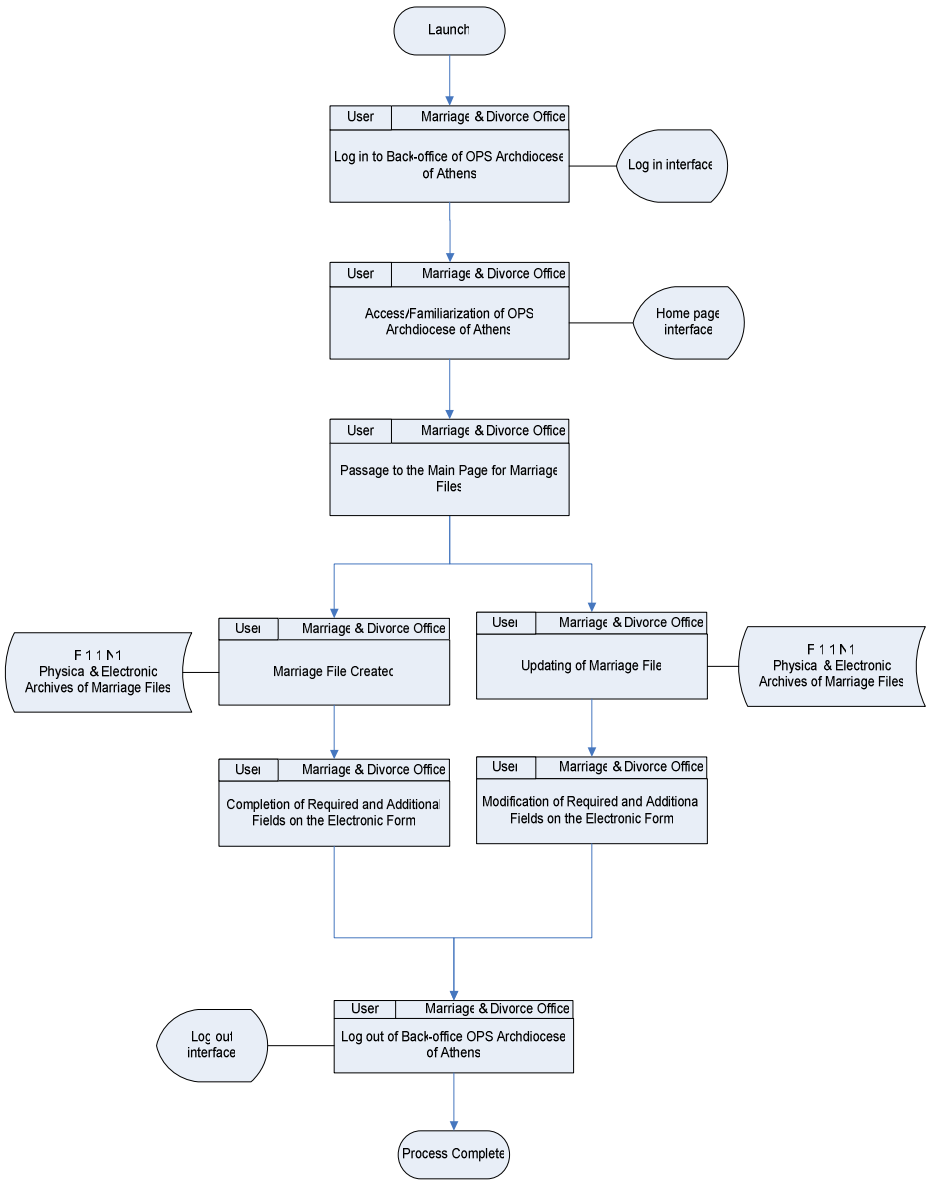

Figure 5: New Process example (1N. Marriage File Management) – F.xx.xx: File

- some priests created bureaucratic obstacles to the implementation of the ICT project, for instance they deliberately delayed signing the broadband internet application to the Internet Service Provider, even though the cost was included in the project.

- the fear of losing touch with the congregation was eminent, as citizens would not have to visit the church in order to manage their religious affairs.
- after the completion of the ICT project, the BPR project was being delayed and sabotaged by a number of priests and decision-makers who wanted the whole project to fail. The final decision was met and signed on a secluded island of the Aegean, during summer vacations, on a private meeting between the Archbishop and the project leader.
- the dissemination part of the ICT project was never materialized in four out of ten pilot parishes, as the publicity material was never handed-out.
- in the beginning of the BPR workshops, the attendance of the priests was very low.

The main performance criteria used to evaluate the change management process throughout the 2-year project duration were:

- Citizen focus — increased focus on 'customer' engagement. The emphasis is on building a citizen-driven culture (focused on better citizen support) and measuring using citizen satisfaction data.
- ICT Competencies — enhanced emphasis on IT skills development, measured through (a) self-assessment of the clerics, (b) daily e-mail and ICT utilization by the clerics (c) daily usage statistics of the online services.
- System performance — measured through money/time economies.

3 Results & Discussion

The two implemented projects had substantial benefit on Archdiocese personnel, improving the level of organization among the sections in which they were employed. Time consuming tasks and procedures are now automated, leading to reduction of bureaucracy according to questionnaires addressed to both the personnel and the early users of the new ICT project. This results in increased staff productivity and efficiency. The main effect of each new process in the operation of the organization is shown in [Table 1].

Additionally, the Archdiocese reduced drastically the cost of processing procedures by redesigning, whereas the Change Management service increased personnel knowledge on ICT, enhancing their capabilities to serve citizens. Contrary to initial expectations, change was received well by the majority of the priests, which can be attributed to the non-antagonistic nature of the work in the specific organization as indicated by the results of the performance criteria.

However, the ICT project has not been yet utilized to its full extent and some resistance still exists. The initial target, which required a 10% of all applications and citizen-issues to be handled through the ICT platform has not been met in the first two years of implementation (8.32% in 2008). This indicates that the monitoring of the project is still necessary and the change management struggle has to go on.

		Effect					
	Process	**Time**	**Volume of Work**	**QoW**	**QoI**	**QoS**	**User-involvement**
1N*	Marriage file management	0	+	+	+	+	+
2N	Baptism management	+	0	0	+	+	-
3N	Application management	+	+	+	+	+	+
4N	Marriage reconstitution	0	0	+	+	0	+
6N	Marriage cancellation	+	+	+	+	0	+
7N	Information lookup	+	+	+	+	+	-
8N	Marriage certification issue	+	+	+	+	+	+
9N	Statistics Reports and Management	+	-	+	+	+	-
10N	Marriage and Divorce Office Digitization	+	-	+	+	+	-
11N	User and Role Management	0	-	0	+	0	-
12N	Genergal Information Portal	+	+	0	+	+	+
13N	Holy Archdiocese news and events update	+	+	+	+	+	+
14N	Ecclesiastical e-services	+	+	0	+	+	+
15N	Intention of marriage	+	0	+	+	+	-
16N	Intention of baptism	+	0	+	+	+	-
17N	Application management for the Office of Marriage & Divorce	+	+	0	+	+	+
18N	Application status monitoring	+	+	+	+	+	+
19N	Process and document information	+	+	+	+	+	+
20N	Marriage e-service	0	0	0	+	+	-
21N	Baptism e-service	0	0	0	+	+	-

0: no effect, +: positive effect, -: negative effect
QoW: Quality of Work, QoI: Quality of Information, QoS: Quality of Service

Table 1: Effect of new business processes on various parameters of work (personnel and management assessment based on questionnaires)

Moreover, the nature of the pilot project facilitates the integration of new processes on existing processes on a small sample of parishes and not the Archdiocese in its entirety. This methodology was used to reduce implementation costs of system-user complications that often occur during large scale change/implementation projects.

In order to quantify results and monitor the project, a comprehensive set of indices was installed (BPR Stage 7). Some of the main results in the beginning of the project (basis results – 2007) and their sophistication through the first operating years are shown in [Table 2]. Whereas the citizen satisfaction level is satisfactory, the ICT maturity of the clerics is still low and their lack of confidence is evident, as the need for further training is still high.

A further investigation on citizen and internal actors' satisfaction levels was carried out, in order to evaluate money/time economies and to quantify user satisfaction for each new service [Table 3].

First level indices (results)	**2007 %**	**2008 %**
Citizens who utilize the new e-services	0.00	8.32
Citizen satisfaction (parish level)	0.00	74.20
Second level indices (technological)	**%**	**%**
Online sophistication	20.23	40.53
ICT maturity of clerics	13.30	34.20
Infrastructure for the introduction of new ICT projects	0.00	10.92
Third level indices (secondary technological)	**%**	**%**
Installed PCs on parishes	90.48	100.00
Clerics who use e-mail as part of their every-day tasks	20.00	42.50
Clerics who utilize ICT as part of their every-day tasks	35.00	63.45
Parishes connected to the Internet	81.82	100.00
Training satisfaction	64.71	69.86
Need for further training	75.00	65.00

Table 2: Project monitoring results for the 10 pilot parishes.

Internal actors	**Administrators**	**Users**
System functionality	72.60	45.46
Every-day task time reduction	12.35	3.46
Users who mention positive effect on every-day tasks	100.00	85.00
Users who mention negative effect on every-day tasks	0.00	15.00
Help-desk assistance	98.50	75.65

External user groups	**Parish level**	**Athens level**	**Nationwide level**	**Public services**
Overall system functionality	74.20	30.42	00.00	12.30
Money economy	12.00	6.45	n/a	n/a
Time economy	96.48	23.45	n/a	n/a
e-Information provision	79.89	10.92	45.45	20.12
Digital services users	8.32	0.92	00.00	1.48
Digital services satisfaction	89.45	65.43	00.00	50.00

Table 3: Percentile internal and external actor user satisfaction on the 10 pilot parishes (2008).

The main users of the system still seem to be partly annoyed by the introduction of ICT on their every-day tasks, whereas citizens seem very satisfied by the overall services provided through the new channels. Money economies to external user groups are indirect, as the provision of e-services has the same cost as the traditional

provision of services. Time economies are not yet obvious by the internal actors, as more information become readily available and the digital archive is still expanding. Still, external users who have utilized the new digital services are highly satisfied (89.45%) and quantify their time gain with the value of 96.48%, which can be attributed to the initial extremely time-consuming provision of services through the traditional, bureaucratic model of the church. Both parameters reflect the proper design of the ICT system and the BPR effect on the organisation as a whole. As far as the nationwide and public services satisfaction is concerned, one must note that the integration of the system is not yet implemented nationwide and public servants who utilize the back-office of the system are mainly users from the Ministry of Education and Religious Affairs.

4 Conclusion

The present work describes a Greek case study of leveraging ICT deployment and integration in one of the oldest Public Organizations in Greece (The Holy Archdiocese of Athens) and providing citizens with new e-services. Through this work, a preliminary framework for successfully implementing an ICT project, re-engineering processes and managing change is presented.

Understanding the non-linear and emergent nature of change in traditional organizations has driven the consulting services to new combined BPR and CM techniques (such as the one presented here), understanding the dynamics of change at the people/technology interface and the symbiotic relationship between information systems and strategy which should be considered as a prerequisite for all ICT projects. This can be further supported by this case study, which involved elder and highly resistant to change personnel (mainly priests), with no/little technological background.

Moreover, another equally important good practice learned by the implementation of the project was the pilot application of this methodology on a smaller scale (i.e., 10 pilot parishes). Such an e-government project would have deemed almost impossible had it been required to be completed at once, nationwide.

The main advantages of the proposed methodology to the organization can be summarized as follows: successfully coping with resistance to change, cost reductions, productivity increase, citizen-centric processes, document management, faster procedures, IT skill-building, improved citizen satisfaction, organizational learning. However, such a project requires a sophisticated monitoring system and the coupled BPR/CM project cannot be expected to solve all issues related to resistance to change and utilization of the ICT project at once. During the initial years of implementation, staff support, ICT encouraging and further training are deemed as absolutely necessary.

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