

MASTER OF PHILOSOPHY
PROCESS IMPROVEMENT IN THE GREEK PUBLIC AGENCIES

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Abstract

The purpose of this research is to explore process improvement in the Greek public agencies. This research is of particular interest because the Greek public sector context has some unique characteristics compared to the public sector of other countries. Firstly, the use of BPR, as a process improvement method to achieve cost reduction and efficiency increase, is politically enforced. This means that it may not be an appropriate process improvement method for the Greek public sector. Secondly, the changes that are taking place in the Greek public sector due to the Troika support mechanism may have an impact on process improvement in the Greek public agencies. These characteristics pave the way for exploring process improvement in the Greek public agencies.

The abovementioned characteristics influenced the current research as follows. Given that the research started in January 2009, Document 1 was a research proposal about developing a BPR method for the needs of the Greek public agencies. This idea originated from the fact that Greek Public Administration had announced in 2007 Request for Proposals during the 4th CSF for reengineering its processes and services using BPR method. Greece signed on 6th May 2010 the agreement with Troika in order to fund its liabilities for the period 2010 – 2014. Hence, the research scope changed from developing a BPR method for the needs of Greek public agencies to examining how and why process improvement is achieved in the Greek public sector context. In this respect, Document 2 reviewed process improvement methods, the difficulties of implementing process improvement in the public sector, and the Greek public sector context regarding process improvement. Document 3 explored how and why process improvement is achieved in the Greek public sector by studying two process-cases in a process improvement project within one Greek public organization. One of its findings was that the case organization did not use any substantial measurement system. Thus, Document 4 was a research about the development of a process performance measurement system for the needs of the Greek public agencies.

More specifically, Document 3 used case research as a research strategy because the phenomenon can be studied in its natural setting and the research question (“how and why” type question) can be answered with a relatively good understanding of the nature and complexity of the complete phenomenon. In this respect, data were gathered (i.e. empirical investigation) about process improvement in the Greek public sector (i.e. a particular contemporary phenomenon) by studying the improvements of three process-cases in a process improvement project within one Greek public organization (i.e. real-life context) through a research approach that involves passive observation, field notes, semi-structured

interviews with key persons from the public organization, focus groups with the project team-members and secondary data (i.e. multiple sources of data).

Document 3 indicated that radical changes may not be the outcomes of process improvement projects in the Greek public sector even though it is a political decision to use BPR method, which sets radical changes as the primary objective of such projects for the following reasons; (a) there was a lack of political management commitment and low project sponsorship on behalf of the two General Secretaries of the studied organization, (b) the middle managers, who were members of the committee responsible for evaluating the project's deliverable, manipulated the focus of the process improvement project only to changes that were not against their personal interests, (c) the middle managers undermined the concept of radical changes and enhanced the logic of "if it ain't broke - don't fix it", and (d) there was a difficulty in defining value because there was a debate whether process improvement projects in the Greek public sector should add value for the clients of public organizations or the Greek public administration itself.

Moreover, Document 3 indicated that Lean seems to be a more appropriate process improvement method to achieve incremental results in the Greek public sector context. However, given that the Greek public sector needs short-term radical changes, which cannot be the outcome of process improvement projects due to legal restrictions, Greek Public Administration should consider a more radical alternative than Lean that could help Greek public sector to achieve the needed radical changes. Document 3 also indicated that this radical approach should be a combination of change in the legislation covering employment in the Greek public sector and the use of outsourcing as a method to reduce cost and increase efficiency in public organisations. Moreover, it indicated that the radical change of the purpose of process improvement from adding value for the clients of public organisations (as it is for the time being) to adding value for Greek public administration (in terms of the targets set by the Troika support mechanism) can trigger the implementation of radical changes to the Greek public sector and also add indirect value for citizens and enterprises.

The managerial implications of Document 3 concern the Greek public administration, the Greek Information Society (GIS), the management consultants and the researchers and practitioners of process improvement in the public sector. Greek public administration is proposed to consider changing the Greek legislation covering public sector employment in order to allow for layoffs to take place and to allow GIS employees to become members of the committee(s) responsible for evaluating process improvement project's deliverables.

GIS is proposed to consider allowing management consultants to use other methods than BPR (e.g. Lean) for implementing process improvement, encouraging them to propose privatisation practices such as outsourcing for achieving radical changes in public organizations.

Management consultants are informed about barriers to implement process improvement in the Greek public sector, how its context addresses these barriers, and how process improvement methods such as Lean and privatization practices such as outsourcing may be used for process improvement in the Greek public sector.

The research limitations of Document 3 are the following. The inherent limitation of one process improvement project questions the external validity of the research findings. However, given that this project meets the Greek Information Society guidelines about process improvement projects, it can be considered as a “representative” case of the process improvement projects that will take place in the Greek public sector in the future. Moreover, the selected process-cases followed the five project phases of the Greek Information Society guidelines.

Furthermore, it is acknowledged that respondents might not consciously be aware of or be able to describe or appreciate social processes shaping process improvement in the Greek public sector. Thus, multiple research methods and triangulation were used in order to identify at the best possible degree the causal mechanisms that are inferred from the events that respondents experience.

Finally, it is recognized that the research outcomes may not apply to the public sector of other countries. However, it is noted that if other barriers are experienced when implementing process improvement in other public sectors or if the barriers of this research influence process improvement in other public sectors differently, this might merely mean that process improvement theory works differently in different contexts.

Document 4 explored the use of a Process Performance Measurement System (PPMS) in the Greek public sector due to the lack of performance measurement systems in the Greek public sector as indicated in Document 3. Document 4 aimed to answer the following research questions:

- 1) What is an appropriate quantitative indicator for measuring the performance improvement of the business processes in a Greek public agency?***
- 2) What are the variants that have an impact on the quantitative performance indicator in a Greek public agency?***

Document 4 used action research as a research methodology. It used a hypothetico-deductive approach to develop an initial conceptual framework and to identify a cause and effect relationship between the quantitative indicators (dependent variable) and the variants (independent variables). In this respect, data were gathered by interviewing key persons from a Greek public agency and by using passive observation in a process improvement project in this agency in order to calculate the changes of the variables from the as-is and the to-be situation of the improved processes. Descriptive statistics were used in order to describe the variables of the data set. Regression analysis, residuals analysis, logistic regression analysis and chi squared tests were used in order to indentify the dependence of the dependent variables on the explanatory variables. In order to perform the statistical analysis, SPSS v.17.0 was used as a statistical software tool.

Document 4 indicated that change in cost for executing the process is an appropriate quantitative indicator to measure its performance improvement in a Greek public agency. It also indicated that changes in how frequent a process is executed, in the risk level (high, medium, low) of a process, in the number of public servants that are involved and in the amount of time that public servants spend for executing a process have an impact on it. Given these indications, this research can be useful for developing a PPMS for the needs of the Greek public sector.

Document 4 has managerial implications that concern the managers of the Greek public organisations. They can set value-targets to the performance improvement indicator of the processes (change in cost) and can identify the variants that they should change and how much they should aim to change them in order to achieve the value-targets. By doing so, they have at their disposal a tool (PPMS) in order to achieve cost reduction on the processes for which they are responsible and as a consequence to contribute to the reduction of the operating cost of public organisations. Thus, they will be enabled to help Greek public administration to achieve the targets set by the troika support mechanism.

Finally, the research limitations of Document 4 are the following. The first one is the inherent limitation of a single case. Given the single case, the external generalisability of the findings is limited. Secondly, the examined public organisation operates in the Greek public sector context. Nevertheless, lessons learned from this case are still useful to all public organisations because it confronts to the general guidelines of Greek Information Society about process improvement projects. Thirdly, a number of middle managers decided to participate on their own to the interviews without the assistance of key persons. However, he claims that the use of fieldwork as an additional data collection method minimises the impact of the abovementioned issue on the generalisability of the research findings.

Keywords: process improvement, process performance measurement system, public sector, Greece.

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DOCTOR OF BUSINESS ADMINISTRATION

**Business Process Re-engineering:
A proposed methodology for the Greek Public Agencies**

**Document One:
Definition and mapping of research questions (s)**

Cohort 10

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1 ORGANISATION AND MANAGERIAL CONTEXT

The general area of the current research is business process reengineering (BPR) in the Greek public sector. A more thorough discussion about its definition and its concept is in chapter 3. Yet, there is need to define the organisation and managerial context of BPR as opposed to other approaches which involve business process as their primary unit of analysis such as continuous improvement, business process management, six sigma and kaizen.

1.1 BPR AND CONTINUOUS IMPROVEMENT

Continuous improvement has some similarities with business process reengineering (Davenport, 1993a) such as the same primary unit of analysis (that is business process), rigorous business process performance measurement, the same need for organisational and behavioural change and substantial time investment and a corporate environment focused on implementing operational change rather than quick fixes in financial results or organisational structure.

On the other hand, these two approaches have greater differences than similarities (Davenport, 1993a). Firstly, BPR initiatives aim to achieve mainly radical improvement in the cost, time or quality of a business process. Continuous improvement initiatives aim to achieve incremental improvement, e.g. 10% in any given year. Secondly, BPR initiatives follow at most times a top-down approach as far as the design of the to-be situation is concerned, while continuous improvement initiatives are highly participative. Thirdly, BPR initiatives focus on the identification of the IT or organisational factors that may create significant changes in the as-is business processes of an organisation. Continuous improvement initiatives focus on minimizing the unexplained variation in a business process using statistical process control techniques.

Although there is the potential for conflict between these two approaches, one does not necessarily replace the other. On the contrary, organisations should not only reconcile them, but also to integrate them into a single coherent program of operational change.

1.2 BPR AND BUSINESS PROCESS MANAGEMENT

Business process management does not work effectively and efficiently when overlaid on a hierarchical command and control management structure. Hence, the shift to business process management requires a business process reengineering initiative (Gulledge and Sommer, 2002). The relation between BPR and BPM is that BPR creates the necessary infrastructure and mentality in an organisation so that BPM can take place after the end of the BPR initiative.

1.3 BPR AND SIX SIGMA

Six sigma was developed by experts within Motorola in the USA in 1985. It uses quality-engineering methods in the context of a well-defined problem-solving structure in order to identify problems related to execution of processes, solve these problems and improve mainly the operational performance of an organisation such as its productivity, customer satisfaction, etc (Van Der Wiele et al., 2006).

There are some similarities and differences between BPR and six sigma. With respect to their similarities, they both follow a top-down approach emphasizing on radical changes (Van Der Wiele et al., 2006), they require full-time dedication of change agents to projects or at least 50% of their time, they use a staged methodology, they associate with tools and they are customer-focused (Ricondo and Viles, 2005).

With respect to their differences (Ricondo and Viles, 2005), BPR began as an approach that sees IT as an enabler for overcoming functional barriers, while six sigma was born in a quality environment aiming at achieving financial results. Six sigma is based on reducing the variability of measured processes, whereas BPR tries to identify IT opportunities for improving processes. As far as desired results are concerned, six sigma has more business oriented results (financial orientation), while the results of BPR are significant change.

1.4 BPR AND KAIZEN

The term “kaizen” is taken from the Japanese words “kai,” meaning change, and “zen,” meaning good (iSixSigma, 2003). Kaizen is implemented in organisations through the use of kaizen events as a structured improvement mechanism (Doolen et al., 2008).

There are some similarities and differences between BPR and kaizen (Doolen et al., 2008). Both of them use cross-functional project teams to achieve radical changes. On the other hand, their differences can be summarized as follows; a) BPR requires high investment (often organization-wide) in IT for business processes, while kaizen events require little or no budget for capital investment, b) BPR requires high implementation time, but kaizen events are short-term interventions (typically three to five days) and c) Kaizen events focus on improving existing processes, rather than implementing solutions that require investment in new technology like BPR.

1.5 BPR AND GREEK PUBLIC SECTOR

After having described briefly the relation of BPR with continuous improvement, business process management, six sigma and kaizen, the next step is to outline the current situation of the Greek public sector regarding BPR.

The Greek Public Administration followed an e-Government model which does not quite defer from what the other EU developed countries have adopted. Greece was always lacking in the ICT sector compared to the European average presenting important divergences in various fields. Thus, the only solution was the adoption of best practices from other EU countries which presented a great progress in this particular sector. However, these practices were applied without them first being adapted to the “Greek business reality” due to the need of presenting rapid results. In fact, the adoption of the best practices was mostly limited to the simple application of ICT to existing bureaucratic processes of each public organisation. No structural reorganization / simplification of the way government and citizens/enterprises transact in a horizontal level (integrated multi-sectoral processes) took place. The result was the planning and realization of a total of ICT infrastructures which continue to automate complex, time-consuming and ineffective existing processes.

The lack of BPR initiatives in the Greek Public Administration in the frame of the 3rd Community Framework Support (see Appendix 1) is a problem. It became noticeable from the begging of the programmatic period due to the fact that the ICT infrastructure developed during the 2nd Community Framework Support did not take the BPR factor into consideration as well. The result is that the ICT infrastructures (provision of e-services to citizens and enterprises) that have been developed and are still being developed are functioning by supporting bureaucratic processes on the level of a single public organisation and not on the level of Public Administration as a total.

The problem of the bureaucratic processes of the aforementioned infrastructures was solved partly with reorganization / simplification studies which were included to the projects funded by the 3rd Community Framework Support. These studies have been realized in a very short amount of time (because of the general delay in absorbing European funds) and without central co-ordination. Hence, a question is raised whether they have contributed to the actual problem solving.

The “independence” of Ministries of Central Public Administration, which were responsible for the realization of the e-Government projects in their sector of responsibility, also contributes to the maximization of the abovementioned problem. The Operational Plans for the “Information Society” which were delivered in the year 2000 were elaborated under great pressure. Thus, they introduced great coverage among them, since they did not give emphasis to the inter-sectoral synergies. These synergies are significant to the reengineering of processes through interoperability. Moreover, the Operational Plans left many questions in relation to how the multiple e-Government infrastructures could function effectively and with economies of scale for the Greek tax payer.

On the aforementioned frame it has been clear that processes, on which the function of public services has been based, should progressively (leaving out their bureaucratic and formal orientation) be reengineered. **The strategic orientation of this reengineering effort should be towards the service of citizens and enterprises and the efficiency and quality of the offered services, taking into consideration financial and other burdens which these processes produce to every stakeholder, based on international acceptable practices.**

ICTs occupy a central role in the reengineering context and are used in order to support planned **radical change** of operational activities aiming at **the dramatic improvement of performance**. While in the past the use of information technology was restricted to the automation of existing processes, it is widely recognized now that such a use often leads to high investments and increased operational cost, but not to the expected improvements in performance. Today, the central idea is that ICTs are a lever for reengineering processes. Consequently, ICTs should not be simply applied on existing processes and organizational structures. **The introduction of e-Government in Greek Public Administration should be combined with BPR projects.**

Therefore, the main target of the Greek Public Administration during this period is the mapping and analysis of business processes and the exploration of the possibility to reengineer and to sophisticate these processes. The desired outcomes of this reengineering initiative will be to decrease their duration and operational cost, cancel non added-value processes and eliminate unnecessary regulation which creates delays, ambiguities and increase of cost in the operation of public administration. It is obvious that the Greek Public Administration seeks to achieve dramatic changes in its business processes in order to provide high quality services with low cost to citizens and enterprises.

Although BPR is essentially a 1990's methodology, it is the only management approach/tool which captures the concept of dramatic changes to business processes (see previous discussion in this chapter and further discussion in chapter 3). Greek Public Administration has already decided that this management approach fits better its needs for dramatic changes in its processes. Hence, it will announce Request For Proposals (RFPs) during the fourth programmatic period (4th Community Framework Support - CFS) for reengineering its business processes and services. BPR methodology will be considered (political decision) as a prerequisite for all potential participants to these RFPs and not other approaches such as continuous process improvement, business process management, six sigma and kaizen. Moreover, Greek government has not taken any political decision about whether the aforementioned approaches will be the "successor" of the BPR.

Today taking into consideration the important issues of absorbing the funds of the 3rd Community Framework Support and the lack of substantial cooperation between the agencies with respect to e-Government topic, it has become henceforth understood that the Greek Public Administration was not ready on an institutional, organizational and procedural way to support an effective e-Government. However, the steps that have been made should be considered quite important. The biggest part of software infrastructure is based on workflow management systems which easily can be adapted to operational, institutional and functional changes of Public Administration's environment. Additionally, a large part of information is provided already via Internet and many 3rd (but also 4th) sophistication level transactions (see Appendix 2) are provided already electronically, decreasing perceptibly the cost involving tails at public agencies' wickets.

This situation, even with its any advantages and disadvantages as a result of the effort strived by the Public Administration in a short period of time, constitutes the starting base for the 4th CFS. During the 4th programmatic period, **the strategy for modernizing Greek**

Public Administration is henceforth totally faced under the scope of a targeted Operational Program titled “Improvement of Public Administration’s Management Capability” (total budget € 505 million for the period 2007 – 2013; initial timetable) which emphasizes to the re-engineering of public agencies.

Consequently, BPR projects in the Greek Public Sector will be established for the recording, modeling, analysis and optimization both of all processes of the Public Agencies, and of their organizational structure. The main target is the creation of a system which will manage the basic organizational structure of every agency, centrally organized, with consequence and simplicity, in depth of time.

1.6 BPR BENEFITS

The successful completion of BPR projects is expected to have important direct and indirect benefits since:

- it constitutes the internationally advisable practice for business “self-awareness” and consequently for the flexibility of responding to change, a fact which henceforth constitutes an imperative need to every agency
- it creates the prerequisites for common business language between the executives of the agency
- it unifies the infrastructure for the existence of a central reliable image of the agency, which establishes clear roles, structure, but also priority and justification for the decisions made by the administration
- it establishes clear and published processes, facilitating their optimization, and the management of existing but also imminent regulations and certifications (obligatory or by choice)
- it creates the background for selecting and measuring suitable performance indicators (KPI’s) in all the spectrum of the agency and in absolute compatibility with its strategy and the consequent actions per department, cost center, process, etc.

In order for these benefits to be ensured and maximized, it is essential to take appropriate care in order for:

- the BPR projects to be supported by the top management of every agency and to ensure its commitment for their implementation

- the management but also the monitoring of each BPR project not to become an activity of a single department of the agency, but each department to take part equally representative in the project steering committee and to refer to one project manager who will be appointed by the agency and who will communicate all issues concerning the project with the project manager of the BPR consultant
- the system which will be completed to be delivered with the direct assignment and activation of its maintenance procedure and of the individuals in charge for the execution of any required relevant action
- the reengineering of business processes (on a technical level) which will be designed to take into consideration and to include with the best way all the ICT systems and technologies which each agency has and uses, as well as the ICT projects which are under implementation, especially for institutions that by nature are supported from multiple and specialized ICT systems which have to be developed in the best possible way.

Apart from the apparent necessity for reengineering the Greek public sector as already described via a public administration's perspective, there is market evidence that highlights the business benefits for the management consultancy (MC) companies and the relevant professionals (both at European and Greek level) stemming from such an initiative.

1.7 MARKET EVIDENCE ABOUT BPR PROJECTS IN THE EUROPEAN AND GREEK PUBLIC SECTOR

Based on FEACO (2009), total sales of the European MC industry amounted to € 61.6 billion in 2005. Organisation/Operations management and Change Management (both of them are sub areas of BPR field) account for 23% and 13.3% of the aforementioned amount respectively. An analysis of per client industry shows that Public Administration accounts for 17.5% of the total turnover. Hence, as far as BPR projects to public sector are concerned, the business opportunities for management consultancy companies and relevant professionals are high at a pan-European level.

As far as the relevant situation in Greece is concerned, total sales of the Greek MC Industry amounted to € 181 million in 2005. Organisation/Operations management and Change Management account for 19.9% and 1.9% of the aforementioned amount respectively. Public Administration is by far the largest client of Greek MC Industry as it accounts for 43.1% of

the total turnover¹. Given the fact that the Greek Information Society has announced officially that it will grant € 505 million to Greek public agencies for BPR projects (initial time schedule 2007 – 2013, revised time schedule 2010 – 2016), this is an appropriate time for management consultancy companies and professionals to focus on developing BPR methodologies specialized for the needs of the public sector.

¹ The second largest client of Greek MC industry is Industry (23%) and the third one is Financial services (6.8%).

2 TOPIC, PROBLEM AND ISSUE DESCRIPTION AND JUSTIFICATION

2.1 BPR METHODOLOGIES

Many structured-based methodologies have been proposed for BPR implementation. Table 1 summarises the major stages of 19 representative BPR methodologies.

Table 1: Existing BPR methodologies

1 Davenport and Short (1990)
<ol style="list-style-type: none">1. Developing business vision and process objectives2. Identification of process in need of redesign3. Understanding and measuring existing processes4. Identifying IT capabilities5. Prototyping new process design
2 Burke and Peppard (1993)
<ol style="list-style-type: none">1. Have a vision2. Identify and understand the current business processes3. Redesign the processes4. Implement redesigned processes
3 Furey (1993)
<ol style="list-style-type: none">1. Identify the process' customer driven objectives2. Map and measure the existing process3. Analyse and modify the existing process4. Benchmark for innovative, proven alternatives5. Reengineer the process6. Roll out the new process
4 Guha, Kettinger & Teng (1993)
<ol style="list-style-type: none">1. Envisioning new processes: Securing commitment from senior management, identifying reengineering opportunities, identifying enabling technologies, and aligning with corporate strategy2. Initiating change: organising re-engineering team and setting performance targets3. Diagnosing the processes to be reengineered: documenting existing processes, and uncovering pathologies4. Redesign: Exploring alternative designs, designing new processes, designing human resources, prototyping and selecting an IT platform

<ul style="list-style-type: none"> 5. Reconstruction: BPR implementation in terms of installing IT components and reorganising other business components 6. Monitoring the newly constructed processes: identifying performance measures and linking to incremental improvements
5 Harrison and Pratt (1993b)
<ul style="list-style-type: none"> 1. Setting directions for BPR efforts 2. Baselining and benchmarking: analysing existing processes and evaluating processes against customer needs 3. Creating vision for future processes 4. Problem-solving: identifying breakthrough improvements, and building broader insight into various change aspects 5. Comprehensive planning for process improvement 6. Implementation 7. Embedding continuous improvement to reflect ongoing performance measurement effort
6 Talwar (1993)
<ul style="list-style-type: none"> 1. Building the vision of the re-engineered organization 2. Planning how the vision will be realised 3. Analysing the current structure and processes 4. Redesigning the “business architecture” 5. Implementing the redesigned organization and processes 6. Measuring the benefits and sharing the learning
7 Barrett (1994)
<ul style="list-style-type: none"> 1. Incubation: team members selection, best practices determination, and IT application identification 2. Targeted brainstorming: identifying improvement opportunities, and future processes redesign alternatives 3. Eureka: taking choice for implementation, motivating team, and ensuring commitment 4. Learning laboratory: starting experiments to test small-scale prototype for proposed processes
8 Klein (1994)
<ul style="list-style-type: none"> 1. Preparation: BPR project participants first organised and activated 2. Identification: development of customer-oriented models for business processes 3. Vision: selecting processes for re-engineering, and setting redesign options 4. Solution: defining technical and social requirements for new processes, and

<p>developing detailed implementation plans</p> <p>5. Transformation: implementing re-engineering</p>
9 Petrozzo and Stepper (1994)
<p>1. Discover: identification of problems, setting of targets, determining processes for redesign, and forming BPR team</p> <p>2. Hunt and gather: process analysis, documentation, benchmarking, and IT levers identification</p> <p>3. Innovate and build: rethinking new processes</p> <p>4. Reorganise, retrain, and retool: implementing new processes structure, training on new techniques</p>
10 Wastell, White & Kawalek (1994)
<p>1. Process definition</p> <p>2. Baseline process capture and representation</p> <p>3. Process evaluation</p> <p>4. Target process design</p>
11 Archer and Bowker (1995)
<p>1. Prepare study</p> <p>2. Analysis of current business processes</p> <p>3. Redesign the processes</p> <p>4. Implement redesigned processes</p> <p>5. Continuously improve</p>
12 Jackson (1995)
<p>1. Organisation to decide what business it is in</p> <p>2. Determine the goals</p> <p>3. Develop a vision</p> <p>4. Identify the core processes for the organisation</p> <p>5. Analyse and understand the processes</p> <p>6. Find out what the customer wants</p> <p>7. Redesign the processes to achieve what the customer wants</p> <p>8. Implement the new processes</p>
13 Grover and Malhotra (1997)
<p>1. Preparation: development of top management commitment and link between business strategy and reengineering project's goals</p> <p>2. Process think: building and understanding a customer-based process model of the business</p> <p>3. Creation: identification of existing processes and development of new processes based on desired performance outcomes</p> <p>4. Technical design: Documentation of new processes</p>

5. Social design: Selling the solution to the social aspects of the new processes
6. Implementation: Implementation of the technical and social plans
14 Kettinger, Teng & Guha (1997)
1. Envision: Establish management commitment & vision, discover reengineering opportunities, identify IT levers and select processes
2. Initiate: Inform stakeholders, organise reengineering teams, conduct project planning, determine external process customer requirements and set performance goals
3. Diagnose: Document existing processes and analyse existing processes
4. Redesign: Define and analyse new process concepts, prototype and detailed design of a new process, design human resources structure and analyse and design IS
5. Reconstruct: reorganise, implement IS, train users and process cut-over
6. Evaluate: evaluate process performance and link to continuous improvement programs
15 Motwani et al. (1998)
1. Understanding of BPR objectives and commitment of top management
2. Initiating: create a vision, select processes for BPR, define clear and measurable objectives, form reengineering project team
3. Programming: evaluate & document current processes, uncover bottlenecks, establish baselines & benchmarking
4. Transforming: conduct pilot study, estimate scope of organisational change and estimate resource requirement needs
5. Implementing: employee education, leadership, structured alignment, redeployment of IT, modified reward system
6. Evaluating: evaluate success, make modifications, monitor progress
16 Subramanian, Whitman & Cheraghi (1999)
1. Prepare for BPR: Build cross-functional team, identify customer driven objective and develop strategic purpose
2. Map & Analyze As-Is Process: Create activity models, create process models, simulate & perform ABC and Identify disconnects & value adding processes
3. Design To-Be Processes: Benchmark processes, design to-be processes, validate to-be processes and perform trade-off analysis
4. Implement Reengineered Processes: Evolve implementation plan, prototype & simulate transition plans, initiate training programs and implement transition plan
5. Improve Continuously: Initiate on-going measurement, review

performance against target and improve process continuously
17 Valiris and Glykas (1999)
<ol style="list-style-type: none"> 1. Establishing the vision and objectives, the scope and mode of BPR 2. Business modeling 3. Business analysis 4. Redesign 5. Continuous improvement
18 Vakola and Rezgui (2000)
<ol style="list-style-type: none"> 1. Develop business vision and process objectives 2. Understanding existing process for redesign 3. Indentify change levers 4. Implement the new process 5. Make new process operational 6. Evaluate the new process 7. Ongoing continuous improvement
19 McAdam and Corrigan (2001)
<ol style="list-style-type: none"> 1. Identify the critical processes for improvement: define ownership, identify key success factors and measures and identify critical processes for improvement 2. Analyse the current process: define ownership, the viewpoint and the process boundaries, map and validate the as-is process and identify opportunities for improvement 3. Improve process: define ownership, establish benchmarks, design and map the new process, define roles and responsibilities, perform a validation check and develop an implementation plan 4. Pilot study: define ownership, define success measures and time frame, issue documentation to cover the study, test the pilot study, document results, review and upgrade with the team 5. Implement the improved process: define ownership and implement the improved process

2.2 CRITIQUE OF EXISTING BPR METHODOLOGIES

The number of methodologies outlined in Table 1 verifies the need for developing a BPR methodology that can guarantee success. On the other hand, it is extremely difficult, if not impossible, to develop such a methodology applicable to every business sector. The majority of the methodologies in Table 1 are general guidelines attempting to cover the needs of all or as many as possible organizations (Vakola and Rezgui, 2000).

Many authors and practitioners have argued that there are many differences among public and private organizations. Hence, BPR methodologies applied to private companies should not be used to the public sector. Moreover, they also argue that public organizations of the same country may have different needs and unique features. Therefore, it is difficult to develop a generic BPR methodology appropriate for the majority of the public agencies of a country.

2.3 GREEK INFORMATION SOCIETY GUIDELINES ABOUT BPR PROJECTS

With respect to this research, Greek public organizations can be considered to have the same needs and features regarding BPR projects because they should confront to the same guidelines of the Greek Information Society about BPR projects (Managing Authority of Operational Program "Information Society", 2006). These guidelines could be summarized as follows:

- **Process Re-engineering and Organizational development**

The main targets are the reengineering of processes in order for the productive capacity of public agencies to be improved via ICT projects, the design of an improved organizational structure, the development of a performance measurement framework, the reform of rules and regulations, the utilization of ICT infrastructure and the focused intervention on organizational pathologies. Indicative actions can be considered as follows:

1. Analysis of as-is processes, use of best practices and identification of BPR goals
2. Mapping and evaluation of as-is processes (core or added-value processes)
3. Modeling of new processes
4. Identification of the operational “gaps” of the existing operational model compared to the new one, the new services, the measurable goals of services and the IT infrastructure
5. Identification of the short- and long-term interventions and the range of organizational changes with respect to the evaluation of the feasibility of the new model
6. Development of action plans – coordination with the implementation of ICT funded projects of each agency
7. Pilot implementation of BPR
8. Organization of workshops at the right scale for communicating BPR goals to the employees and training and educating the employees of the organizational units that perform the new processes

9. Evaluation of the interventions to the organization
10. Recommendations for changing the legal – normative – institutional framework of each organization

- **Change management – take up**

The main target is the management, the implementation and the continuous support of the operational/organizational changes that

- Come from BPR or
- Have been put forward as operational demands of ICT projects under implementation or
- Accrue under the context of other type of interventions of the public agencies for more efficient and effective operation of their organizational units

The main components of a successful change management are the development of a persuasive business case, the simplicity and clarity of the vision and the strategy, a strong leadership and top management commitment, a focused communication strategy, an increased change capability, the close relation between planning and implementation, the continuous participation of all stakeholders and the correlation of the evaluation procedure with the organizational culture. Indicative activities can be considered the following:

- At the initial stage, the conduction of basic diagnostic evaluation of the organisation's readiness, its organizational structure, its top management's strategic capability, its existing competences and growth plans, the project teams' effectiveness and its communication strategy.
- At the stage of realization, risk management, organization's reengineering, development of the adaptation program, support of the project team's effectiveness, development of competences, appointment and encouragement of successes, periodical monitoring of the achievement of goals/profits/improvements, development of the active strategically encouragement and participation of the stakeholders and the development of the communication plan and the internal marketing plan.
- At the stage of evaluation/completion, the development of the to-be situation and the evaluation of the performance of the change factors i.e. project managers, individuals in charge of organizational units etc. and the ascertainment of the achievement-divergence from benefits realization.

2.4 SUMMARY

Based on the discussion above about how important a BPR methodology is, the similarities and drawbacks of existing BPR methodologies and the guidelines of the Greek Information Society for BPR projects, it is clear that a BPR methodology specialized for the needs of Greek public agencies should be developed. Before describing the research plan and methods for developing this methodology, the next section will set the academic basis of this research by outlining the main literature about BPR. Document 2 will elaborate more on this academic basis.

3 ACADEMIC FIELD – OVERVIEW OF LITERATURE

Several authors have provided their own interpretation of the changes being applied to organizations (O'Neill and Sohal, 1999). A variety of names has been used to describe this activity (Al-Mashari and Zairi, 2000); business process redesign (Davenport and Short, 1990), business process improvement (Harrington, 1991), organizational re-engineering (Lowenthal, 1994), core process redesign (Heygate, 1993; Rigby, 1993; Kaplan and Murdock, 1991), process innovation (Davenport, 1993b), breakpoint business process redesign (Johansson et al., 1993), business process transformation (Burke and Peppard, 1993), business restructuring (Talwar, 1993), business scope redefinition (Venkatraman, 1994), organisational change ecology (Earl, Sampler & Short, 1995), structured analysis and improvement (Zairi, 1997) and business process change (Harmon, 2003).

3.1 DEFINITIONS OF BPR

Table 2 summarizes the different BPR definitions provided by several researchers and practitioners.

Table 2: Definitions of BPR

The researcher finds himself mostly identifying with what Hammer and Champy (1993) define as BPR. This is because he finds their definition differs from the ordinary way of looking and changing organisations - different from the so called 'norm'. He also sees the term 'radical' as being very vague and open to criticism. Therefore, he would like to see more of that breakthrough taking place based on a realistic time boundary. He would add to the above definition that radicality should also be seen in the amount of time which is pre specified for the initiative to take place and not only based on how much change is achieved. Hence, the definition of the BPR that will be used in this research is the following one:

BPR is the fundamental rethinking and radical redesign of an organisation's processes taking into account their relationships with five interacting forces: the organisational strategy and structure, human element, culture, time and IT, for achieving dramatic improvements in critical contemporary measures of performance, such as cost, quality, service and speed. Radicality, though, should not be translated only in terms of amount of change carried out

but also in conjunction with the terms of a pre-specified amount of time for the initiative's completion.

From the definitions presented at Table 2, it is apparent that BPR; a) is based on IT- enable change and introduces a different form of organisational change (e.g. Hall, Rosenthal & Wade, 1994), b) comes partly from the organisational behaviour area (e.g. Loh, 1997), c) takes into account Project Management principles and d) is related at some point to organisational change (Teng, Grover & Fiedler, 1994b; Hammer and Champy, 1993).

3.2 THE “SOFT” AND “HARD” FACTORS OF BPR

The soft and hard factors that affect BPR initiatives can be categorised into the following dimensions (Al-Mashari and Zairi, 1999) which are related to the abovementioned analysis of the BPR definition.

3.2.1 CHANGE MANAGEMENT

3.2.2 MANAGEMENT COMPETENCY AND SUPPORT

3.2.3 ORGANISATIONAL STRUCTURE

3.2.4 PROJECT PLANNING AND MANAGEMENT

3.2.5 IT INFRASTRUCTURE

3.3 CRITIQUE OF BPR

The nature of BPR's initial theoretical underpinning is well documented in literature (Martinsons and Revenaugh, 1997; Mumford and Hendricks, 1996). The magnitude of its euphoria with the initial success stories led to considerable empirical research with the cooperation of the early implementers. The initial focus was on basic issues central to BPR, such as methodology, critical success factors, risk factors and intervention strategies for successful implementation (Grint and Willcocks, 1995; Benjamin and Levinson, 1993; Hall, Rosenthal & Wade, 1993). The widely differing findings and viewpoints, notwithstanding

growing consensus, led to the conclusion that BPR was by no means a stable entity; the subject area was yet to mature.

Subsequently, attention turned to other issues that continued to pose challenges in practice, such as strategic planning, IT, processes management and redesign and the people dimension. Since then, the theoretical framework underpinning BPR has developed considerably. Yet, the long-term benefits that were sought, in particular the creativity and dynamism of employees (Martinsons and Revenaugh, 1997), a collaborative, information sharing culture that complements the capabilities of IT (Wohl, 1995), and an openness to “constant change and productive chaos” (Fiedler, Grover & Teng, 1995) either never materialised or were limited.

Even original proponents of BPR, in particular Hammer (1990), and his co-authors Champy (Hammer and Champy, 1993) and Stanton (Hammer and Stanton, 1995), have criticized BPR that it has failed to deliver its promised results. Doherty and Mistry (1995) confirm that 70% of BPR projects fail. BPR has attracted criticism in relation to three main areas; nature of BPR, office politics and human factor.

3.3.1 NATURE OF BPR

There are many contradictions associated with the term of BPR. These contradictions such as incremental vs radical, process-led vs IT led, etc led to the unreliability of the term which created confusion not only around the use of BPR as a management tool but also around the significance of the concept itself.

Key authors argue that the nature of BPR is radical and novel. Yet, the high failure rate of BPR projects has driven many practitioners and academics (Grint and Willcocks, 1995; Strassman, 1994; Whiting, 1994) to call in question its nature. They argue that BPR is based on previous management concepts such as total quality management. Other practitioners and academics argue that BPR is new, its novelty lies in the consolidation and integration of individual elements such as IT, processes and transformation (Grint, 1994; Davenport, 1993b), its nature is radical (Fiedler, Grover & Teng, 1995) and its innovation is based on the denial of the incremental changes' logic that has prevailed for 30 years (Grint, 1994). On the other hand, there are some academics and practitioners who suggest a more incremental approach to BPR. Their approach is mainly based on the high rate of failure of BPR projects due to radical implementation.

3.3.2 OFFICE POLITICS

A second criticism is that BPR does not take into account the office politics (Grint and Willcocks, 1995) even though management is a political activity in the terms of managing the politics among competing stakeholders in the same organization. With respect to IT, there is a growing debate about its political influence in BPR. Some academics and practitioners argue (Grint and Willcocks, 1995) that IT can also be utilised and interpreted as a symbol of cultural change, investment and progress. On the other hand, BPR champions argue that IT is technological, impartial, rational, and apolitical. However, the main underlying argument is that an organization is unlikely to emerge “depolticized” throughout a BPR initiative (Grint and Willcocks, 1995).

3.3.3 HUMAN FACTOR

BPR is also criticized because of its approaches to organisations and people. Some writers argue that the human factor (creativity, empowerment and fulfillment) is missing from the organizational change that BPR proposes (Orman, 1998; Willmott, 1995). Moreover, the advocates of BPR often consider organizations as machines (Grint and Willcocks, 1995).

Another important criticism with respect to the human factor is that BPR's approach to change is dictatorial. Top management dictates changes to employees. Harnessing employee creativity and contribution remains very much an abstraction yet to be realized. The symbolic issues associated with the new partnership proposed between management and employees in BPR, cannot be solved by mechanistic means, they require sensitivity, understanding, negotiation and nurturing, not dictation (Sayer, 1998).

3.3.4 SUMMARY OF BPR CRITIQUE

Given this state of the current debate and criticisms of BPR, many researchers seem to be unclear regarding the development of the concept (Davenport and Stoddard, 1994). The current thinking shows that reengineering is little by little integrated as a change method and is already discussed from a strategic planning point of view. Finally, there is some evidence in the literature that BPR advocates have learnt from past failures and started taking into consideration people related issues such as organisational culture which has proved to be a major inhibitor to re-engineering progress among US and European companies (Oram and Wellins, 1995).

3.4 CONFUSION BETWEEN BPR AND OTHER MANAGEMENT CONCEPTS, TECHNIQUES AND TOOLS

Some academics and practitioners have noticed a confusion between BPR and other management concepts such as Total Quality Management, automation, organizational approaches and software re-engineering (Al-Mashari and Zairi, 2000).

3.4.1 BPR VS TQM

There are both similarities and differences between BPR and TQM (Table 3).

Table 3: Differences and Similarities between TQM and BPR

Differences	TQM	BPR
1. Nature (Green and Wayhan, 1996; Zairi and Sinclair, 1995; Wells, O'Connell & Hochman, 1993; Gulden and Reck, 1992)	Incremental, Evolutionary, Continuous	Radical, Revolutionary, One-time approach
2. Type of processes (Wells, O'Connell & Hochman, 1993; Gulden and Reck, 1992)	Narrow processes within departments	Cross multiple functions
3. Role of IT (Wells, O'Connell & Hochman, 1993; Gulden and Reck, 1992)	Minor	Major
4. Benefits (Kelada, 1994; Wells, O'Connell & Hochman, 1993)	Quality	Quick reduction in cost and cycle-time
Similarities	1. Process orientation (Green and Wayhan, 1996; Zairi and Sinclair, 1995; Wells, O'Connell & Hochman, 1993) 2. Need for organizational and cultural change (Zairi and Sinclair, 1995; Davenport, 1993a; Wells, O'Connell & Hochman, 1993; Gulden and Reck, 1992) 3. Use of benchmarking (Zairi and Sinclair, 1995) 4. Focus on customer needs (Green and Wayhan, 1996; Wells, O'Connell & Hochman, 1993) 5. High importance of process measurement (Zairi and Sinclair, 1995; Davenport, 1993a; Gulden and	

	Reck, 1992)
	6. Improve business performance for competitive gains (Zairi and Sinclair, 1995; Davenport, 1993a; Gulden and Reck, 1992)

3.4.2 BPR VS AUTOMATION

3.4.3 BPR VS ORGANIZATIONAL APPROACHES

3.4.4 BPR VS SOFTWARE RE-ENGINEERING

3.5 LITERATURE AND PUBLIC SECTOR

There are many BPR initiatives in the public sector worldwide recorded in the literature since the 1990s, as well in different policy issues, e.g. *the health care sector* (McAdam and Corrigan, 2001), *the legal and judicial field* (Bellamy and Taylor, 1997), *education* (Van Belle, 1997) and *social security administration* (Harrington, McLoughlin & Riddell, 1998; Halachmi, 1996), *public housing authority* (Thong, Yap & Seah, 2000), e-government (Hesson, Al-Ameed & Samaka, 2007; Indihar Stemberger and Jaklic, 2007; Martin and Montagna, 2006; Scholl, 2004; Bun and Robins, 2003; Scholl, 2003) as in different countries, e.g. *Australia* (Bun and Robins, 2003), *UK* (McAdam and Corrigan, 2001; Harrington, McLoughlin & Riddell, 1998; Willcocks, Currie & Jackson, 1997), *United Arab Emirates* (Hesson, Al-Ameed & Samaka, 2007), *Slovenia* (Indihar Stemberger and Jaklic, 2007), *Singapore* (Thong, Yap & Seah, 2000) and *the Netherlands* (Thaens, Bekkers & van Duivenboden, 1997) and in different levels of government, e.g. BPR in UAE local government (Hesson, Al-Ameed & Samaka, 2007), in Western Australia government (Bun and Robins, 2003), Ministry (Indihar Stemberger and Jaklic, 2007; Thong, Yap & Seah, 2000) and USA state level (Scholl, 2004).

3.6 BPR: PRIVATE SECTOR VS PUBLIC SECTOR

3.7 PROBLEMS IN IMPLEMENTING BPR IN THE PUBLIC SECTOR

Due to special characteristics of public processes, the experiences of the private sector with BPR cannot be directly transferred to government. Table 4 presents the most common difficulties that usually appear in BPR projects in government (Martin and Montagna, 2006).

Table 4: BPR difficulties in the state-owned sector

3.8 SUMMARY

Addressing the question whether or not BPR can be implemented in the public sector, researchers and practitioners of the subject (e.g. Indihar Stemberger and Jaklic, 2007; Martin and Montagna, 2006; Bun and Robins, 2003; MacIntosh, 2003; Scholl, 2003; Thong, Yap & Seah, 2000; McAdam and Donaghy, 1999; Harrington, McLoughlin & Riddell, 1998; Halachmi and Bovaird, 1997) suggest that BPR may be implemented successfully as long as the particularities of the public sector are taken into consideration during a BPR initiative. As a result, the main objective of the current research is related to the clarification of BPR with respect to its implementation in the public sector and the development of a relevant methodology. The following chapter will present and discuss these objectives analysing the main research themes of the current study.

4 RESEARCH QUESTIONS AND OBJECTIVES

4.1 RESEARCH AIMS & OBJECTIVES

The aim of this research is to discuss and clarify the concept of business process reengineering through the development of an appropriate BPR methodology for the needs of the public sector, to identify the organizational and human issues involved and to identify the factors that affect the performance improvement of the reengineered business processes in a public agency.

This aim translates into the following objectives:

- Develop an appropriate BPR methodology that will support business process reengineering initiatives in the Greek public sector.
- Clarify the concept of business process re-engineering through the development of a BPR methodology and its implementation in Greek public agencies.
- Identify those organisational and human issues which have an impact on the successful implementation of a business process re-engineering initiative in a Greek public agency.
- Identify those factors which have an impact on the performance improvement of the reengineered business processes of a Greek public agency.

Having outlined the main research objectives, the next step is to identify the research questions that address the abovementioned objectives.

4.2 RESEARCH QUESTIONS

Having outlined the major difficulties in implementing BPR in the public sector and the main differences regarding BPR initiatives between public and private organizations it is now time to explore the role and the usefulness of BPR in the public sector.

The role of business process re-engineering is crucial in order to enhance organisational effectiveness of the public sector. Although there are many existing BPR methodologies in the literature (a brief description and a critique of existing methodologies is presented in chapter 2), the failure rate of BPR projects is very high (70%) (Hammer and Champy, 1993).

The current research aims at developing an appropriate BPR methodology that will support business process reengineering initiative in the Greek public sector.

This research aims at identifying reasons for justifying the use of a BPR methodology at the public sector in order to enhance organisational effectiveness. For example, a methodological step such as the identification of core processes may enable the participants to represent the core processes of their public agency, identify their weaknesses, communicate their results and take actions. Another example is that a level of organisation (e.g. planning and monitoring of the change process) may help participants to clarify their roles and tasks which leads to better communication and co-ordination. These improved characteristics may enhance organisational effectiveness.

As explained in the literature review (chapter 3), there are many different perspectives on business process re-engineering which include a number of significant contradictions (e.g. radical versus incremental, IT-driven versus Process-driven, etc). The current research aims to clarify the concept of business process re-engineering through the development of a BPR methodology and its implementation in Greek public agencies. For example, the participating public agencies will reveal if they use incremental or radical approach to business process re-engineering. Another clarification of the business process re-engineering concept refers to the drivers of BPR. As explained in the literature review (chapter 3), there are many approaches to what is driving BPR. Some authors (e.g. Davenport, 1993b; Davenport and Short, 1990) argue that IT has the dominant role, hence BPR is IT driven. Other authors suggest that BPR is business process driven (e.g. Green and Wayhan, 1996; Zairi and Sinclair, 1995; Wastell, White & Kawalek, 1994) and they minimise the importance of IT. The development of this methodology aims at proving that a holistic view of the BPR factors is necessary. The focus on business processes and IT may be essential, but organisational and human factors have a major role on the re-engineering initiative. Finally, another clarification of the BPR concept is related to the use of BPR as a management tool common for every business sector or not. Some authors (e.g. Subramanian, Whitman & Cheraghi, 1999; Valiris and Glykas, 1999) argue that there is no need to customise BPR for different business sectors because its concept is based on techniques and tools which are appropriate for every business sector. On the other hand, other authors (e.g. McAdam and Corrigan, 2001; Vakola and Rezgui, 2000) argue that BPR needs customization according to the needs of each business sector. The above issues can be translated into the following two research questions:

1a) How will the study help to define an appropriate business process reengineering methodology in order to facilitate its implementation in the public sector?

1b) How will the study help to clarify the concept of business process reengineering and facilitate its implementation in the public sector?

With respect to research question 1a, the steps of all methodologies mentioned at chapter 2 can be categorized in four main stages; alignment of corporate strategy with BPR initiative objectives, analysis and evaluation of as-is situation, design of to-be situation and moving from as-is to to-be situation. Thus, the researcher attempts to break research question 1a into the following research sub-questions;

1a.1) What are the main steps for aligning the public organization's strategy with the BPR initiative objectives?

1a.2) What are the main steps for analyzing and evaluating the as-is situation of a Greek public organization?

1a.3) What are the main steps for designing the to-be situation of a Greek public organization?

1a.4) What are the main steps for moving from the as-is to the to-be situation in a Greek public organization?

It has been argued in chapter 3 that it is inappropriate to simply transfer and transplant to the public sector new management techniques and philosophies used and assessed in the private sector. The reason is that public sector is characterised by some unique features which justify its incompatibility with the private sector.

The literature and 'lessons learnt', arising from best practice, indicate several organisational characteristics such as organisational culture, business strategy, communication etc, as critical success factors for a business process re-engineering initiative. However, the suggested 'universal' successful ways of implementing organisational change do not respond to the special needs of the public sector because of its characteristics. Given BPR's focus on processes, many authors have highlighted the fact that business process re-engineering failed to recognise the importance of organisational and human issues in the change process (Willmott, 1995). Therefore, the second research theme of the current research is to identify

those organisational and human issues which have an impact on the successful implementation of a BPR initiative in a Greek public agency.

As far as the organisational issues are concerned, a potential list of these issues available to the public agencies can be the following; building BPR vision, effective communication, empowerment, human involvement, training and education, top management support and commitment and effective management of risks. All these issues are prerequisites for a successful BPR initiative as outlined in literature (chapter 3).

Organisational culture is one of the most important aspects of any BPR initiative. Creating an effective culture for organisational change and stimulating receptivity of the organisation to change may set the basis for the successful implementation of any BPR initiative. A successful BPR initiative requires the support and involvement of both management and employees. Yet, there is a number of barriers, such as organisational structures and cultures that support management and individual roles rather than teams and processes, strict hierarchical structures, vertical communication, conflicts, accepting the status quo, mistrust and non acceptance of the IT role.

The current research aims at confirming which of the aforementioned factors can facilitate or constrain the business process re-engineering initiative to Greek public agencies. More specifically, the above observations and conclusions are translated into the following research question which the current research will try to address:

2) What are the major organisational and human issues that affect the successful implementation of a business process re-engineering initiative in a Greek public agency?

It has been argued in chapter 3 that BPR aims to achieve dramatic improvements in critical performance measures such as cost, quality, service and speed. Taken into account the business environment of the Greek public sector as outlined in chapter 1, the researcher argues that it is very important to identify; a) a quantitative indicator to measure the performance improvement of the reengineered business processes in Greek public agencies and b) the factors that will have an impact (either positive or negative) on that indicator. The business practice indicates that; a) the quantitative performance indicator may be duration or improvement in duration or cost or reduction in the cost of a reengineered business

process and b) the factors could be the use of IT, the changes in frequency, the number of persons employed and the execution steps of the reengineered business process, etc. The above indications can be translated to the following research questions;

3a) What is an appropriate quantitative indicator for measuring the performance improvement of the reengineered business processes in a Greek public agency?

3b) What are the factors that have an impact on the quantitative performance indicator in a Greek public agency?

Having identified the research questions, the next step is to argue how the researcher will divide them between documents 3, 4 and 5 and to provide the logic link among documents 2, 3, 4 and 5.

4.3 LOGIC LINK OF DOCUMENTS 2, 3, 4 AND 5

Document 2

Document 2 will include an extensive literature review. This review will set the basis for developing the conceptual framework of the research. It will provide evidence about the past and the present research trends regarding the aims, objectives and questions of the current research. More specifically, the literature review will include the following chapters (high-level headings):

- a) Nature of Business Process Reengineering – this section will provide evidence in order to fulfill the second research objective and answer research question 1a.
- b) Business Process Reengineering: Methodologies and Critique – this section will provide evidence about the first research objective and the research question 1b.
- c) The Role of Organizational and Human Issues in BPR – this section will provide evidence about the third research objective and the research question 2.
- d) Reengineering Business Processes – this section will provide evidence about the fourth research objective and the research question 3.
- e) Conceptual Framework – this section will include the hypotheses/propositions that will be tested at documents 3, 4 and 5.

Document 3

Document 3 aims to test the propositions of the conceptual framework about the impact of the human and organizational issues on a BPR initiative at a Greek public agency and the BPR methodology that will support this initiative. The researcher will use an interpretivist research methodology and case study as a research method (for more details see chapter 5). The researcher will develop one case study based on data from a BPR project at a Greek public agency. The researcher at this point argues that the case study of Document 3 will act as a pilot case study. He intends to check if there are any changes that he should make to the conceptual framework developed in Document 2 about the BPR methodology and the organizational and human issues. Moreover, the outcomes of Document 3, in case that no major changes in the conceptual framework of Document 2 will take place, will set the research basis of Document 5. Document 2 will answer research questions 1b and 2.

Document 4

Document 4 aims to test the hypotheses of the conceptual framework about the factors that have an impact on the performance improvement of the reengineered business processes at a Greek public agency. The researcher will use a positivist research methodology and action research as a research method (for more details see chapter 5). The researcher will develop a linear regression model which will include one dependent variable (measure of the performance improvement of the reengineered processes) and some independent variables (factors). As a consultant, the researcher will be introducing changes in the existing business processes of the Greek public agency. He will gather data before and after the changes in the existing business processes. The data will come from the same BPR project as in Document 3. Document 3 will answer research questions 3a and 3b.

Document 5

Document 5 aims to test the same propositions as Document 3. Hence, the researcher will use interpretivist research methodology and case study as a research method as in Document 3. The researcher estimates at this point that the number of case studies developed in Document 5 will be 3 (including the case study of Document 3). Thus, Document 5 will determine what the main steps are for aligning the public organization's strategy with the BPR initiative objectives, for analyzing and evaluating the as-is situation, for designing the to-be situation and for moving from the as-is to the to-be situation in a Greek public organization and what the organizational and human issues are that affect the successful implementation of BPR initiative in a Greek public agency.

5 RESEARCH PLAN AND METHODS

There are many discussions in literature about whether qualitative or/and quantitative methodology is the best. The initial answer from most researchers to that question was quantitative methodology. Yet, the number of qualitative methodology advocates increased throughout the years and some of them have argued that qualitative methods should replace the dominant quantitative research methods. Over recent years, the trend is that researchers should use a combination of quantitative and qualitative methods because it gives them the opportunity to compensate for each method weaknesses.

The researcher will use both qualitative and quantitative research. The research methodology for conducting qualitative research will be interpretivist research methodology and the research methodology for conducting quantitative research will be positivist research methodology. The interpretivist research methodology will involve case studies and the positivist research methodology will involve action research. The nature of action research is a matter of debate. Researchers from an educational background consider action research to be interpretivist. Researchers from managerial background (e.g. Revans, 1983) consider it positivist. The researcher will use action research in a positivist manner which is appropriate to both his research objectives and his role as a management consultant. The researcher will use the research method of case studies for the purposes of document 3 and 5 (research questions 1a and 2), while he will use action research for the purposes of document 4 (research question 3).

5.1 QUALITATIVE RESEARCH

This method is used to test relationships between processes and outcomes, to present the context of the research and to test hypotheses and the theoretical conceptions (Gummesson, 2000). The case studies can provide a better understanding of the studying organisations and can help the researcher to gain insights and develop propositions (McNeill and Chapman, 2005).

5.1.1 DATA COLLECTION

According to Yin (2008), there are four sources of case study evidence: documents, interviews, archival records and direct observations. In this study, the researcher will collect data via all the above sources. Firstly, he will review documents such as reports, deliverables of previous projects in the studying organisation and administrative materials in order to understand the case environment. Secondly, interviews with top management and middle

managers will be conducted. This type of source represents the main source of information regarding the strategy, the vision and the organisational culture (top management), the as-is and the desired to-be situation (middle managers). Thirdly, he will examine archival records such as anonymised data regarding employees' info (e.g. average salaries, years of experience, etc), organisational records and history of the organisation in order to obtain information related to the organisation and its employees. Finally, he will visit the case studies organisations (direct observation). Direct observation will facilitate the researcher to indentify behavioural and environmental conditions that will be useful for developing the case studies.

Although interviews with top and middle managers will be the main source of information in order for the researcher to develop the case studies, he recognises that they are subject to the problems of bias, inaccurate articulation and poor recall due to the subjective perceptions of the interviewees. Therefore, he will use triangulation via other sources so as to corroborate interview data with information from those sources (e.g. management reports, internal memos and organisation charts, administrative materials, policies and procedures documents, existing business process documentations, etc). Moreover, to eliminate any bias of a single respondent, he will try to validate respondents' perceptions and responses through multiple sources and also interviewing multiple members at different levels of the organisation for cross validation. Thus, he will interview the following profiles:

- Top management to discuss vision, strategy and organisational culture.
- Middle managers to discuss the description of as-is situation, an insight of the desired to-be situation and any obstacles and facilitations for the BPR project as a whole.

5.1.2 CONDUCTING THE INTERVIEWS

The interviewees will have a high degree of involvement with the BPR project. Each interview will be conducted using a list of open-ended questions. The interview questions will be commonly designed regardless of the interviewee's department, but based on the level of responsibility (managerial versus operational), and inputs from document reviews. With respect to top management, the questions will reflect issues about the organisation's strategy, its vision and the need for reengineering. With respect to middle managers, two main groups of questions will be developed. The first group of questions will include factual information about the as-is situation. The second group of questions will ask the respondents for their insights or opinions on various aspects of the to-be situation. Interview notes will be transcribed within one day. The interview notes will be reviewed for consistency with other

documents of the studying organisation. Inconsistencies will be clarified with the relevant officers (top or middle management).

The researcher will use member validation so as to gain fuller understanding of the initiative, rather than to get at any absolute truth, by including multiple viewpoints. Member validation involves taking the analysis of responses back to the members to enable them to check (e.g. interview notes, minutes of the project meetings, project deliverables, etc).

5.1.3 CASE STUDIES

With respect to Document 3, the researcher will use a pilot case study to determine whether the theoretical issues identified in Document 2 (BPR methodology and organisational and human issues conceptual frameworks) are prevalent in practice and to investigate whether some of the research techniques developed for the research are suitable or whether they require changing. In other words, the pilot case study will assist in refining the research techniques, modifying the questions in a way that the most and relevant information could be obtained for the research and in assisting in forming better constructs (propositions for the BPR methodology and for the organisational and human issues) of the research.

5.2 QUANTITATIVE RESEARCH

Therefore, quantitative methods are appropriate for testing hypotheses, synthesising variables to determine association and generalisability. For the current research purposes (Document 4), the researcher will use action research method.

The researcher will collect quantitative data about the as-is business processes of the organisation of Document 3. He will collect the same data after the reengineering of the as-is business processes. Hence, the sample of the business processes that will be included in the research will be all the as-is business processes that will be reengineered. This minimises the risk of selecting an inappropriate sample.

The next step will be to develop the independent variables that may have an impact on the performance improvement of the reengineered business processes. The data, gathered at the previous step, will determine the type and the values of the independent variables. Middle managers will be informed about the values of the independent variables for each business process of the sample. This increases the reliability and validity of the values of the

independent variables as the researcher will enhance his observations by receiving feedback from the appropriate “process owners”.

Moreover, the researcher based on site participation will determine what the appropriate measure for quantifying performance improvement of the reengineered business processes in the specific Greek public organisation is. This measure will be selected based on the researcher’s observations, the organisation’s strategy and the BPR initiative objectives. This reduces the risk of selecting an inappropriate dependent variable (research question 3a). Then, the researcher will use appropriate statistical analysis (use of SPSS). The independent variables that will have statistically significant impact on the dependent variable will be the answer of research question 3b.

5.3 LIMITATIONS OF RESEARCH

Given the complexity and the breadth of the scope of the subject area under study, several limitations of this study can be identified, as follows:

- With respect to the organisational and human issues that affect the successful implementation of a BPR initiative in a Greek public agency, there are other important constructs that this study may not consider. The researcher will choose only one proposition for each of the identified issues based on the prevalent literature of BPR. However, there are bound to be many more propositions that could be derived for each of those issues.
- The cases studies' organisations are based in Greece in order to investigate the effect of organisational and human issues on a BPR initiative in the Greek public sector. Obviously, for improved generalisability, more cases of organisations in other EU countries may lead to a richer study and facilitate the cross comparison of the country's organisational and human issues' effect on the implementation of BPR.
- This study will not cater for factors that are not indispensably necessary conditions for BPR success. Obviously, there are many factors that would have a "moderating effect" on the outcome of the BPR wherein the availability, and its level, of such factor could have an effect on the availability of a necessary condition and subsequently on the level of the BPR outcome. As an example, consider the case of an organisation that had successfully undergone a BPR initiative that did not involve the use of a specialized business process management tool. Clearly, the use of such a tool in this initiative could have had a "moderating effect" on the outcome of the BPR, i.e. either further increase or decrease the level of success of the project.

6 RESEARCH ETHICAL ISSUES AND ORGANISATIONAL ISSUES

The researcher will be involved in the BPR projects in the public sector of his company because he is the consulting services manager of the company. Thus, he is responsible for the successful completion of these projects. He will be an active team member of these projects (project manager at most cases). The other members of these teams will be employees of his company from various backgrounds such as information technology, business consultants, business architects, etc.

Researcher's main responsibility in these projects will be to conduct research in business process reengineering and facilitate its implementation within some Greek public agencies (three – estimation) in order to meet the projects' aims and objectives. He will focus on the identification of the change levers trying to identify the main human and organisational issues involved in those business process reengineering initiatives. Moreover, he will focus on the identification of the factors that have an impact on the performance improvement of the reengineered processes in these agencies.

For the current research purposes, the project teams will conduct in-depth interviews with employees (top and middle management mainly) from the Greek public agencies that will participate to this research using questionnaires (open-ended questions). The researcher will try to participate to the majority of these interviews. As far as the interviews that he will not attend to are concerned, the researcher will use the data that other team members will provide to him. The researcher is fully aware of the dangers of his subjectivity and the other team members' subjectivity. Thus, he will make any efforts to circumvent both of them.

The researcher has a dual role at his research, consultant and researcher. As a consultant, he will work with the employees of the case study organisations appointed by its top management. Top management has the obligation to appoint the right persons for working with him based on the contractual agreement between the case study organisation and the researcher's company. These employees will not have the right not to work with him (in the context of his consultant role). The interviews that will be conducted with these employees are a method for the project team to retrieve the necessary data for completing the BPR projects successfully. These interviews will not be additional interviews for conducting his research.

The researcher thinks that retrieving data in “real” project conditions will be more useful for his research. Thus, he will ask participants to the interviews after the end of the interviews if they are willing to participate to his research. Participants will be informed that they have the right not to work with him as part of his research. He will provide them with a participation sheet information to inform them about his research and a consent form to sign in case they will be willing to participate to his research (as evidence of their genuinely voluntary participation to his research). The interviews will not be audio or video or photographic recorded. Hence, no explicit consent will be sought for those types of recording. The researcher will make written notes during the interviews and then he will develop minutes per interview. He will send the minutes of each interview to each person that will have accepted to participate to his research. So all participants will be informed about what data will be collected.

Finally, with respect to the use of data from his company’s projects, the researcher will inform his company that he will use them only for academic purposes.

7 OUTCOMES

7.1 PERSONAL

The benefits of the researcher will be the following;

- gain a thorough understanding of a subject that will be of high importance for the Greek public administration (the largest client of Greek management consultancy companies as mentioned in chapter 1) during the next years (2009 – 2016)
- develop a BPR methodology specialised for the needs of Greek public agencies (pioneer work in Greece)
- increase his experience in implementing BPR initiatives in Greek public agencies using a specific methodology
- establish himself as a distinct professional at the area of BPR in the public sector over the next years
- improve his research skills in both positivist and interpretivist approaches
- use the research experience gained in the work situation
- obtain a worthy post graduate qualifications for the efforts applied
- enrich his intellectual and academic abilities

7.2 ORGANISATIONAL AND MANAGERIAL

The contribution to practice of the current research is divided into the following three sections; a) business process reengineering, b) business process reengineering and organisational and human issues and c) business process reengineering and quantitative factors of the reengineered processes.

7.2.1 BUSINESS PROCESS REENGINEERING

Throughout the literature review, the concept of business process re-engineering is somewhat ambiguous. There are several contradictions (e.g. radical versus incremental). The literature review also revealed that a high percentage of BPR projects fail. Moreover, it reveals that there are many differences in implementing a BPR initiative in the public sector than in the private sector. Furthermore, there are certain problems in implementing a BPR initiative in the public sector. Therefore, one of the research themes of the current study is to develop an appropriate BPR methodology in the public sector and then clarify the concept of BPR. After analysing the unique characteristics of the public sector, the criticisms of existing methodologies and the relevant BPR literature, the researcher will develop a BPR methodology specialised for the needs of the Greek public agencies. The development of this

methodology and its use in a practical context will give the researcher an opportunity to clarify some aspects of the business process reengineering concept. Some potential clarifications may be; radical vs incremental approach, BPR drivers (IT vs organisational and human issues), universal vs specific management solution, etc. Therefore, practitioners (e.g. Greek management consultancy companies) and key Greek public agencies (such as the General Secretariat of Public Administration and e-Government and the Greek Information Society) will gain a better understanding of the BPR implementation in the public sector.

7.2.2 BUSINESS PROCESS REENGINEERING AND ORGANISATIONAL AND HUMAN ISSUES

As mentioned in literature, business process re-engineering focuses primarily on processes and as a result organisational and human issues are often neglected. The human and organisational aspects are areas that are viewed to improve the success rates of projects within the BPR area. This research aims to be more beneficial and original as it will provide practical examples of the human and organisational aspects of BPR. The application of the BPR methodology specialised for the needs of Greek public agencies will show which organisational and human issues need to be addressed in a BPR initiative in a Greek public agency. An indicative list of organisational and human issues is the following; top management commitment, effective communication, empowerment, human involvement, training and education and effective planning. Thus, Greek public organisations and practitioners (e.g. Greek management consultancy companies) will gain a better understanding of the organisational and human issues that may determine the outcome of a BPR initiative at Greek public sector. Greek public organisations will be able to prepare themselves better for experiencing a BPR initiative. Practitioners will be able to contribute more adequately to this direction.

7.2.3 BUSINESS PROCESS REENGINEERING AND QUANTITATIVE FACTORS OF THE REENGINEERED PROCESSES

The concept of performance improvement has emerged into Greek public administration the last decade. Business process re-engineering is considered to be the most suitable management tool for the Greek public administration to improve its services (better performance) towards citizens and enterprises. This research will indicate an appropriate quantitative indicator that Greek public agencies may use to measure the performance improvement of their reengineered business processes and a list of factors that may have an impact on this indicator. Hence, Greek public organisations will gain a broader understanding of the factors that have an impact on the performance of their reengineered business processes.

7.3 DISSEMINATION ACTIVITIES

The researcher aims to use two different dissemination channels; presentations to key Greek public organisations and publications of articles in a number of scientific journals. As far as the presentations are concerned, they will take place at the premises of the General Secretariat of Public Administration and e-Government (www.gspa.gr) which is responsible for the Operational Program titled “Improvement of Public Administration’s Management Capability” (mentioned at chapter 1) and of the Greek Information Society (www.infosoc.gr) which has an horizontal role for monitoring the distribution of funds (4th Community Framework Support) to Greek public agencies. As far as the publications of articles are concerned, the researcher aims to publish one or two articles to the following journals (indicative list); Business Process Management Journal, Business Process Re-engineering & Management Journal, Business Change & Re-engineering Journal. Both of these dissemination activities will take place after the end of the DBA program.

7.4 FUTURE RESEARCH

Several directions are available for expanding the scope and addressing the limitations of this study, as follows:

- There is a need to conduct a research on organisations in other EU countries to study the role of organisational and human issues in BPR and to test the BPR methodology of this study. This would lead to comparative studies across different economic regions (Scandinavia, Mediterranean countries, etc), where the results of this research can be used and compared to other studies. This will enrich and provide a better understanding of the human and organisational differences and how it would affect the implementation of BPR. Moreover, this would contribute to the development of a BPR methodology in public organisations that will address the EU guidelines about BPR projects. It is through such a process that more enriched and improved theories and methodologies evolve.
- Although the study will make an effort to raise and test important propositions related to the organisational and human issues in BPR, it is obvious that not all crucial issues in this area will be covered. While the recommended framework will serve its purpose in the study, there is always a place for enhancement. Therefore, a further study could focus on testing more propositions in order to enhance the recommendations of this study.

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APPENDICES

APPENDIX 1: COMMUNITY FRAMEWORK SUPPORT

The European Union comprises 27 Member States. The economic and social disparities among these countries and their 271 regions are great. Hence, European Commission (EC) has designed a European regional policy in order to reduce the gap between the development levels of the various regions. This policy helps to finance concrete projects for regions, towns and their inhabitants. The desired outcome of this policy is that all regions can achieve greater growth and competitiveness through these projects and, at the same time, to exchange ideas and best practices (European Commission, 2009).

Each Member state is responsible for developing its regional development programme and for presenting it to the EC in order to benefit from Structural Funds co-financing within the framework of the priority regional objectives. Then, EC in accordance with each Member state sets the priorities for action and the level of financial assistance to be provided by the European Union (European Commission, 2008). The outcome of the discussions between EC and each Member State is the development of each Member State's Community Support Framework. This framework describes the strategy of each Member State for the next period, the actions that each Member State is abide to fulfill, the type of projects that will be co-financed by the EC and the timeframe for achieving the desired outcomes.

APPENDIX 2: E-SERVICES & SOPHISTICATION LEVELS

Capgemini² (<http://www.capgemini.com>) conducted a survey on behalf of the European Commission (DG Information Society & Media – http://ec.europa.eu/dgs/information_society/index_en.htm) in order to assess the progress of eEurope (provision of electronic public services to citizens and enterprises). In order to measure the availability of public services online, Capgemini developed a four-stage framework (Cap Gemini Ernst & Young, 2003). European countries use this framework as a “common language” in order to define the online availability of the public services that they provide to their citizens and enterprises:

- *Stage 1 - Information:* The information necessary to start the procedure to obtain this public service is available on-line.
- *Stage 2 - One-way Interaction:* The publicly accessible website offers the possibility to obtain in a non-electronic way (by downloading forms) the paper form to start the procedure to obtain this service. An electronic form to order a non-electronic form is also considered as stage 2.
- *Stage 3 - Two-way Interaction:* The publicly accessible website offers the possibility of an electronic intake with an official electronic form to start the procedure to obtain this service. This implies that there must be a form of authentication of the person (physical or juridical) requesting the services in order to reach stage 3.
- *Stage 4 - Full electronic case handling:* The publicly accessible website offers the possibility to completely treat the public service via the website, including decision and delivery. No other formal procedure is necessary for the applicant via "paperwork".

The abovementioned framework is called ‘sophistication’ framework, thus its stages are called sophistication level.

² In 2000, Cap Gemini acquired Ernst & Young Consulting. It simultaneously integrated Gemini Consulting to form Cap Gemini Ernst & Young. When the abovementioned survey was conducted, the name of the company was Cap Gemini Ernst & Young. After a series of acquisitions and mergers, the Group reverted to Capgemini in April 2004 (its current name).

DOCTOR OF BUSINESS ADMINISTRATION

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A proposed methodology for the Greek Public Agencies**

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Critical Literature Review and Conceptual Development**

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1 INTRODUCTION

This research will focus on the description of a process improvement methodology and its implementation in the public sector in Greece. The contribution to practice of the current research is divided into the following two sections; a) development of a process improvement methodology, b) process improvement methodology and quantitative factors of the reengineered processes.

Through the literature review, the main management approaches were examined. More particularly, Total Quality Management, Six Sigma, Theory of Constraints, Kaizen, Lean Thinking, Business Process Reengineering, Business Process Management and Continuous Process Improvement were thoroughly investigated. One of the main outcomes of the literature review was that all these approaches focus on the same purpose and follow the same main process steps; a) theory discovered through an academic article, b) discussion upon the theory, summary and repetition, c) popularization of the concept, d) the new approach is carried to the client base by consultants, d) the fad is embraced by managers, e) enthusiasm passes over and gives its place to critique, and f) a new approach is created to bother consultants.

The main gaps that the literature review revealed were two. The first one was about the difficulty in implementing a process improvement methodology in the public sector, and the second one that in Greece, there has been a significant effort towards radical changes within the public sector but only two process improvement projects until now. In the framework of the 4th Community Framework Support, more of such projects are about to be performed. Therefore, practitioners (e.g. Greek management consultancy companies) and key Greek public agencies (such as the General Secretariat of Public Administration and e-Government and the Greek Information Society) will gain a better understanding of the implementation of a process improvement methodology in the public sector.

The concept of performance improvement has emerged into Greek public administration the last decade. This research will indicate an appropriate quantitative indicator that Greek public agencies may use to measure the performance improvement of their reengineered business processes and a list of factors that may have an impact on this indicator. Hence, Greek public organizations will gain a broader understanding of the factors that have an impact on the performance of their reengineered business processes.

Based on the above, the following sections are organized as follows. In the next section, a brief description of the main management approaches will be carried out, along with a comparison among them. As it is shown in that section, all these different approaches share some basic common steps as well as the same critical targets.

In the third section, the relationship between process improvement and the public sector is discussed. More specifically, a general literature review regarding process improvement and its implementation in the public sector is performed, and the basic problems in implementing process improvement in the public sector are discussed. Moreover, some basic characteristics of the process improvement with reference to the Greek public sector are presented, along with relevant guidelines about process improvement projects and market evidence about such projects in the European and Greek public sector.

The next section refers to the measurement of the performance improvement of the reengineered business processes. In that framework, approaches on performance evaluation are presented and measurement approaches are compared. Additionally, a Process Performance Measurement System is presented and the need for such a system in the Greek public sector is discussed.

The conceptual framework is described in the fifth section. More specifically, the process improvement methodology is discussed, along with performance improvement issues regarding reengineered processes.

Finally, in the sixth section, a literature review on methodological and epistemological issues is carried out, along with the description of the main research methodology that will be used.

2 LITERATURE REVIEW ON MANAGEMENT APPROACHES

2.1 INTRODUCTION

In this section, a literature review about some of the most important management approaches will take place. More specifically, a brief description will be carried out regarding Total Quality Management, Six Sigma, Theory of Constraints, Kaizen, Lean Thinking, Business Process Reengineering, Business Process Management and Continuous Process Improvement. These approaches will be examined in chronological order based on the publication date of the relevant seminal work (academic article or/and book).

2.2 DEFINITIONS OF MANAGEMENT APPROACHES

2.2.1 TOTAL QUALITY MANAGEMENT (TQM)

TQM originated and was developed within Japanese industry after the Second World War. Japan was a defeated nation with few natural resources and an inability to feed a population of 90 million, by itself. The future lay in successfully exporting consumer products across the world market, yet it had a reputation for shoddy goods and management systems that were described as "feudal" and "despotic".

Juran published "The Quality Control Handbook" in 1951, which became the standard reference book on quality world-wide (Juran, 1951). He developed his TQM philosophy around his "quality trilogy"; (1) Quality planning: the process for preparing to meet the quality goals, (2) Quality control: the process for meeting quality goals through operations and (3) Quality improvement: the process for break through levels of performance.

TQM was also investigated by a statistician named Edwards Deming. He is considered the father of the modern quality movement. He strongly influenced Japanese industry post WWII with Statistical Process Control (SPC) and Total Quality Management (TQM), similar to Joseph Juran. In 1986, Edwards Deming published "Out of the Crisis" (Deming, 1986) identifying 14 points for management which if applied would enable Japanese manufacturing efficiencies to be realized.

Both Juran (1951) and Deming (1986) correctly stressed the need to involve people throughout the organisation in quality improvement, but in particular that most quality issues are down to management dealing with systems. The emphasis is on getting the system

correct rather than blaming failure on operator error. Juran (1951) particularly emphasized the use of quality teams and training them in measurement and problem solving.

TQM focuses on designing products to satisfy the customer through the quality of design. It enhances quality measurement and benchmarking as well as the correlation of quality standards with reward system. It focuses on employee training and empowerment and it sets time quality standards for performing tasks. Moreover, it helps employees work on the problems that matters to customer and it is based on enforcing the work based on specific quality standards about responsiveness (Dale, 2003).

The coming out of TQM may be considered as a very important development regarding the practice of management. It was introduced in the United States in the early 80's, mainly due to significant competitive challenges from Japanese entities (Kelemen, 2000). The identification of such a management practice as a competitive advantage is well - known all over the world, mainly in Western countries, and nowadays very few companies can afford to ignore TQM. The quality model was originally introduced and developed in the private sector and holds as basic principles the users' satisfaction and the promotion of organizational efficiency in order to increase profits (Bendell et al, 1994). It has also been implemented to the service sector with significant success (Khamalah and Lingaraj, 2003).

According to the latter definition, TQM is not merely a technical system. In fact, TQM is associated with the organization itself, which is also a social system. Pike and Barnes (1996) argue that organizations are not only technical systems, but also human systems. Additionally, Oakland (1993) states that TQM is an effort to improve the whole organization's competitiveness, effectiveness and structure.

From the above definitions, two important aspects that comprise TQM can be identified: management tools and techniques as well as management concepts and principles. The techniques refer to what has been referred to as the "hard" aspects (e.g. statistical process control, ISO 9000 series, etc.) of TQM, while the principles refer to the "soft" side (e.g. total employee involvement, continuous improvement, continuous training, etc.).

2.2.2 SIX - SIGMA

Six Sigma is a business management strategy, which was first developed by Motorola, in 1980's in the United States of America, where a goal of improving all products (goods as well

as services) by an order of magnitude (e.g. a factor of ten) within five years was established. This provided an important focus on the improvement rate and, in particular, that simply 'better' may not be sufficient, but that the critical consideration is that of becoming sufficiently better expeditiously.

Six Sigma clearly focused resources at Motorola, including human effort, on reducing variation in all processes, that is to say manufacturing processes, administrative processes and all other processes. To set a clear measure on the improvement work, the program called Six Sigma was launched between 1981 and 1987. The reason for the name was that 'sigma' is a statistical measure related to the capability of the process, that is, its ability to produce non-defective products/units/parts. In statistical jargon sigma is a measure of process variation referred to as the standard deviation and 'six sigma' generally implies occurrence of defects at a rate of 3.4 defects per million opportunities (DPMO) for defects to arise. Nowadays, the specific strategy has extensive application in several parts of industry, even though that the use of this approach is not without disagreements. Its basic ideas though were first proposed by Ishikawa (1976).

Many six sigma studies refer to five stages DMAIC, but nowadays a six step has been appeared (Antony, Kumar & Labib, 2008):

- Step 1: Define. It includes the selection of the best projects, the development of project plans and identification of the appropriate processes.
- Step 2: Measure. It includes the measurement of process variables via data quality tests, repeatability and reproducibility studies, and addressing processes constancy.
- Step 3: Analyze. It includes the usage of graphical schemes to study the process behavior.
- Step 4: Improve. This step includes the improvement of the existing process via experimentation and simulation method.
- Step 5: Control. This step is about the development of the control plan for process enhancement.
- Step 6: Reporting. Finally, the sixth step is about reporting the benefits of the reengineered process.

2.2.3 THEORY OF CONSTRAINTS (TOC)

TOC is an overall management philosophy introduced by Dr. Eliyahu M. Goldratt in his 1984 book titled 'The Goal' (Cox and Goldratt, 1984), and then further mentioned within several novels such as 'Critical Chain' (Goldratt, 1997), and Necessary But Not Sufficient (Goldratt, Schragenheim & Ptak, 2000).

The core idea of TOC is that every organization has at least one constraint that prevents management from achieving the goal of the organization to a larger degree. Constraints can be physical resources or policies. TOC develops a set of procedures and methodologies to identify and optimize such constraints (Cox and Goldratt, 1984).

Let us assume that the goal of an entity has been defined (e.g. "Increase profitability"). Then, the main steps regarding the TOC are (Watson, 2007):

1. The first step is to identify the constraint, the process in other words that prevents the entity from reaching its target.
2. The second step is about deciding how to take advantage of the constraint, by ensuring that the constraint's time is not wasted.
3. After that, all other processes should be aligned according to the above decision.
4. The elevation of the constraint is the next step of the TOC, by permanently increasing the capacity of the constraint.
5. Finally, if the constraint has moved, return to Step 1.

These steps mainly target on ensuring that continuous improvement efforts are based on the entity's constraints.

2.2.4 KAIZEN

Kaizen is a very simple concept, formed from two Japanese characters: "kai", meaning "change"; and "zen", meaning "good".

According to Masaaki Imai, who introduced kaizen to the international audience with his seminal book, Kaizen: The Key to Japan's Competitive Success, kaizen is an umbrella concept for a large number of Japanese business practices (Imai, 1986). One way the principle of kaizen is implemented in organizations is through the use of kaizen events as a structured improvement mechanism. A kaizen event is a focused and structured continuous improvement project, using a dedicated cross-functional team to address a targeted work

area, to achieve specific goals in an accelerated timeframe (usually one week or shorter). Generally, the targeted work area centers on some form of waste elimination (e.g. reduction of work-in-process inventory, floor space, lead-time), similar to lean thinking (see section 2.2.5).

Muda or waste elimination is the very basic idea of kaizen, because kaizen activities are implemented through the identification and elimination of muda (Imai, 1997; Imai, 1986). Hence, kaizen's origin can be traced back to the early 1950's, like lean thinking (see section 2.2.5).

The dual aims of the kaizen event as an organizational change mechanism are to substantially increase the technical performance of the targeted work area (often by implementing lean manufacturing practices) and to develop the underlying human resource support needed to sustain the changed system and develop future solutions (Melnik et al., 1998; Sheridan, 1997).

2.2.5 LEAN THINKING

John Krafcik first employed the word "Lean" to describe the new production techniques introduced by Taiichi Ohno at Toyota (Japan) after World War II (early 1950's). He was studying developments in the automobile industry as part of the MIT International Motor Vehicle Programme lead by Daniel Roos, James Womack and Daniel Jones. The work was published in their book 'The Machine that Changed the World' (Womack, Jones & Roos, 1990). They referred to the group of techniques pioneered by Toyota which they extended into their ideas of Lean Thinking (Womack and Jones, 1996).

Womack and Jones (1996) identify five key principles of the lean organisation: a) the elimination of waste (or muda), b) the identification of the value stream, c) the achievement of flow through the process, d) pacing by a pull (or kanban) signal, and e) the continuous pursuit of perfection.

2.2.6 BUSINESS PROCESS RE-ENGINEERING (BPR)

BPR is an approach targeting in improving management as well as computer science through elevation of the effectiveness of the business processes within and across entities. The main point regarding BPR is for entities to look at their business processes from a "clean slate" perspective and settle on how they can build these processes to develop the way they perform

business. BPR is considered to be a management tool of the 90's. It was introduced in the United States during that period.

The main proponents of BPR were M. Hammer and J. A. Champy (Hammer and Champy, 1993). In 1990, Michael Hammer, who was a former professor of computer science at the Massachusetts Institute of Technology (MIT), published an article in the Harvard Business Review, in which he claimed that the major challenge for managers is to obliterate non-value adding work, rather than using technology for automating it (Hammer, 1990). This statement implicitly accused managers of having focused on the wrong issues, namely that technology in general, and more specifically information technology, has been used primarily for automating existing processes rather than using it as an enabler for making non-value adding work obsolete.

In general, in many publications and books, some of them are the Reengineering the Corporation (Hammer & Champy 1993), Reengineering Management (Champy, 1996), they state that too much time is wasted passing - on duties from one department to another. They also state that it is more effective to use a team responsible for all the tasks in the process. Moreover, they expand the statement to add in suppliers, distributors, as well as other business partners (Albizu and Olazaran, 2006). The following figure presents a typical BPR cycle.

Figure 1: BPR Cycle

(source: Albizu and Olazaran, 2006)

2.2.7 BUSINESS PROCESS MANAGEMENT (BPM)

BPM is another approach regarding process management, mainly introduced during the 90's.

Furthermore, BPM enhances employee training in order to use the BPM software, and it processes automation. Finally, it focuses on core processes and follows a continuous approach to optimization through problem solving and reaping out extra benefits (Lee and Dale, 1998).

In general, one could state that BPM is a customer - focused approach to the systematic management, measurement and improvement of all business processes that is made via cross - functional teamwork (Sentanin, Santos & Jabbour, 2008).

2.2.8 CONTINUOUS PROCESS IMPROVEMENT (CPI)

CPI is a management process whereby delivery processes are constantly measured and improved in the light of their efficiency, effectiveness and flexibility. CPI is a meta - process for several other management systems such as [BPM](#), TQM or [Project Management](#). Some successful implementations use the approach known as [Kaizen](#) that was discussed in section 2.2.4.

CPI defines customers' expectations and improves efficiency and effectiveness of a process, as well as the processes through continuous controlled experimentation. It enhances employee training and controls the process for ongoing improvement. It focuses on the people, machines, and systems that add value and employs partnering with suppliers, customers, and other stakeholders (Deputy Secretary of Defence, 2006).

The more strategic elements include decisions about how to increase the value of the delivery process output to the customer and as well as the grade of flexibility that is valuable in the process to meet changing needs (Imai, 1997). In other words, CPI may be seen as a collection of techniques in order to analyse how work is presently being done and how processes may be enhanced in order for the tasks to be completed in a more effective way on an ongoing basis.

2.2.9 SUMMARY

To sum up, the following table summarises the place and the date of origin for each management approach. Based on Staw and Epstein (2000), the discovery of theory for management approaches takes place through an academic article or book publication. Thus, for the purposes of this review, the researcher decides to present the abovementioned approaches based on the publication date of the relevant seminal work and not the date of origin (conceptual origin). The place of origin is defined as the place where each management approach was first established as mentioned to each relevant seminal work.

Table 1: Place and date of origin of each management approach

Management approach	Place of origin	Date of seminal work	Date of origin
TQM	Japan	1951	
Six Sigma	USA	1981	1976
TOC	USA	1984	1970's
Kaizen	Japan	1986	Early 1950's
Lean Thinking	Japan	1990	Early 1950's
BPR	USA	1990's	
BPM	USA	1990's	
CPI	USA/Japan	1990's	

2.3 MANAGEMENT APPROACHES: DIFFERENT APPROACHES, COMMON CHARACTERISTICS, SAME TARGETS

2.3.1 COMMON CHARACTERISTICS AND TARGETS

Having clarified the basic characteristics of these approaches, one may conclude that they are different approaches in order to achieve mainly the same thing: process improvement.

In general, all approaches may be seen as ways to achieve a specific set of targets. This set may include improved customer satisfaction, product and service quality, as well as cost reduction. Moreover, harnessing skill is also a goal, along with reducing times and improving value-added. Finally, all these approaches tend to enhance faster responsiveness.

The following table summarizes the level that each management approach achieves the abovementioned targets. In order to depict this achievement level, a three star rating system is applied. Therefore, the number of stars indicates the level of suitability of each approach in order to achieve each one of the abovementioned goals, according to the following encoding:

*: low suitability

**: medium suitability

***: high suitability

Table 2: Viewpoints of each management approach per target

	Improved customer satisfaction	Cost reduction	Improved product & service quality	Harnessing skill	Reduced times	Improving value-added	Faster responsiveness
TQM	***	**	***	***	**	*	**
Six Sigma	*	**	*	**	**	**	***
TOC	**	***	**	*	**	**	**
Kaizen	*	***	**	**	**	**	**
Lean	**	**	**	***	*	**	***
BPR	**	**	***	**	**	***	**
BPM	**	**	***	***	**	*	**
CPI	**	**	***	**	*	***	**

2.3.2 COMMON PROCESS STEPS

Based on the above, we could state that there are five basic steps, which may be used in general from all approaches to fulfill the abovementioned conditions;

- (1) Value definition. Value – adding features definition.
- (2) “Value stream” identification. That is, to identify the chronological flow of actions that add value – people are visual by nature, and they place value on seeing a process flow visually.
- (3) Enabling the continuous flow of activities. Any of them that do not add value should be either removed or minimized.
- (4) Allowing the product to be pulled through the process by the customer.
- (5) Perfection pursuing during the process by revisiting the steps again in a continuous loop.

These steps are for example used by lean thinking (Womack, 2006; Snee, 2004), but are also applicable by all approaches. The following table summarizes the correlation of each management approach's steps with the abovementioned steps.

Table 3: Each management approach steps vis-à-vis the five common steps

	Value Definition	“Value Stream” Identification	Enable continuous flow of activities	Allow customer to “pull” the product or service through the process	Continuously pursue perfection of the process
TQM	X	X			X
Six Sigma		X		X	X
TOC	X	X	X	X	X
Kaizen	X			X	X
Lean	X	X	X	X	X
BPR	X		X	X	X
BPM	X		X	X	X
CPI	X	X		X	X

2.3.3 COMPARISON SUMMARY

To sum up, one could state that, after the examination of the abovementioned management approaches, all of them seem to share common targets (section 2.3.1) and try to achieve them following pretty much the same basic steps (section 2.3.2). All approaches may be seen as ways to achieve a specific set of targets, such as improved customer satisfaction, product and service quality, cost reduction, harnessing skill, reducing times and improving value-added. All these targets are to be accomplished through some common steps / procedures, which include value definition, value stream identification, enabling the continuous flow of activities, allowing the product to be pulled through the process by the customer and perfection pursuing during the process by revisiting the steps again in a continuous loop.

Therefore, the researcher argues that all the aforementioned approaches are process improvement approaches that seem to follow the same pattern (process steps and targets) from different viewpoints. However, as it is explained in section 3.5, it is a political decision to use the term BPR for any process improvement initiative in the Greek public sector.

3 PROCESS IMPROVEMENT AND PUBLIC SECTOR

3.1 PROCESS IMPROVEMENT LITERATURE AND PUBLIC SECTOR

There are many process improvement initiatives in the public sector worldwide recorded in the literature since the 1990s, as well in different policy issues, e.g. *the health care sector* (McAdam and Corrigan, 2001), *the legal and judicial field* (Bellamy and Taylor, 1997), *education* (Van Belle, 1997) and *social security administration* (Harrington, McLoughlin & Riddell, 1998), *public housing authority* (Thong, Yap & Seah, 2000), e-government (Hesson, Al-Ameed & Samaka, 2007) as in different countries, e.g. *Australia* (Bun and Robins, 2003), *UK* (McAdam and Corrigan, 2001), United Arab Emirates (Hesson, Al-Ameed & Samaka, 2007), *Slovenia* (Indihar Stemberger and Jaklic, 2007), *Singapore* (Thong, Yap & Seah, 2000) and *the Netherlands* (Thaens, Bekkers & van Duivenboden, 1997) and in different levels of government, e.g. process improvement in UAE local government (Hesson, Al-Ameed & Samaka, 2007), in Western Australia government (Bun and Robins, 2003), Ministry (Indihar Stemberger and Jaklic, 2007) and USA state level (Scholl, 2004).

3.2 PROCESS IMPROVEMENT: PRIVATE SECTOR VS. PUBLIC SECTOR

Stated in terms of the public sector's characteristics relative to those of the private sector, these differences include (James, 2005):

1. Environmental Factors:

Less market exposure may lead to less inducement for productivity and efficiency, lower effectiveness, and less availability regarding market data. Moreover, the above may lead to additional constraints as well as higher political influences.

2. Organisation–Environment Transactions:

Increased obligatory activities because of the unique sanctions and coercive powers of government; wider scope of concern and significance of actions in the public interest; higher level of scrutiny of public officials; and greater expectation that public officials act fairly, responsively, accountably, and honestly.

3. Internal Structure and Processes:

More complex criteria (e.g., multiple, conflicting, and intangible); managers with less decision-making autonomy, less authority over subordinates, greater reluctance to delegate, and a more political role for top managers; more frequent turnover of top managers due to elections and political appointments; difficulties in devising incentives for individual performance; and lower work satisfaction and organizational commitment.

The researcher expects the differences between private and public organisations to have an impact on process improvement. The unique characteristics of public organisations will have significant effect on process improvement in public organizations, particularly in the following areas (see section 3.8): (1) deciding to adopt process improvement; (2) setting objectives of process improvement; and (3) implementing process improvement.

It is true that public organisations are based on appropriations rather than on market exposure. Therefore, one could state that there is reduced motivation to minimise cost and increase efficiency. This leads to unwillingness regarding the adoption of the needed changes that are highly connected to process improvement. Moreover, public organisations have a monopoly regarding several mandatory services, which results in decreasing their motivation to reengineer existing processes. Apart from that, public officials are usually characterised as less pioneering and exercising more carefulness and inflexibility in their actions, creating an obstacle to achieving the type of thinking needed for process improvement. As public organisations are keen on many and diverse formal controls by authorised institutions and there is an increased necessity for political influences, it is expected to have more difficulties in obtaining approval for reengineering projects and redesigned processes (James, 2005).

In addition, due to the breadth of impact in public organisations, there are difficulties in evaluating impact and benefits of process improvement. In summary, adoption of process improvement is likely to be slower in the public sector.

After outlining the differences between public and private sector that may influence the process improvement implementation in the public sector, the next step is to outline problems in implementing process improvement in the public sector (section 3.3) and issues that may influence process improvement methodologies implementing in the public sector (section 3.4).

3.3 PROBLEMS IN IMPLEMENTING PROCESS IMPROVEMENT IN THE PUBLIC SECTOR

Due to special characteristics of public processes, the experiences of the private sector with process improvement cannot be directly transferred to government. The most common difficulties that usually appear in process improvement projects in government are summarized as follows (Martin and Montagna, 2006).

The willingness to apply the radical changes derived from process improvement results to the fact that it is likely that public servants do not accept the changes posed by process improvement (lack of contribution from affected people) (Joia, 2004). Moreover, deep changes generate more resistance, but also imply larger benefits. Hence, the more deep the changes are, the more resistance on behalf of public servants (Scholl, 2004).

In addition to the above, public organisations in order to provide services to their “clients” may cooperate with other public organisations. Each organisation has its own features and objectives. Communication problems arise to break boundaries and generate workflows through several agencies, regulations, and legal limitations to which the public sector is subjected (Allen, 2002).

It is also important that such organisations are not used to organisational changes (IT-enabled change, change in organisational structure and processes, etc.). Hence, top and middle managers are not used to be able to handle this type of changes (Indihar Stemberger and Jaklic, 2007).

Another issue, that is more relevant to leadership, has to do with the fact that top management commitment and leadership have a positive impact to the successful implementation of a process improvement initiative. In the public sector, top management may change as a result of elections. New top management may reject the scope and objectives of the process improvement initiative. Process improvement implies changes extended in time and risks that must be led by the same person (Scholl, 2004).

Furthermore, many process improvement projects fail because their objectives are not aligned with the corporate objectives. With respect to corporate objectives, it is very difficult to assess benefits such as customer satisfaction, growth, result improvements, etc, in a public organisation. With respect to process improvement objectives, there are usually more

stakeholders in a public organisation than in a private one, thus it is hard to arrive to consistent objectives that match all their needs (Wu, 2002).

Moreover, institutional restrictions in the public sector are stricter than those in the private sector. Existing business processes are realized under restrictions imposed by current legislation. The reengineering of these processes should take into account these restrictions. The institutional dimension has a very important role as an inhibitor of innovations. As a result, institutional restrictions limit the outcome of the project (Thong, Yap & Seah, 2000).

Another important difficulty is relevant to the fact that according to experience, process improvement generally takes more time than what has been estimated, involves more people and resources than the available ones and always comes up with unexpected problems. This situation is more intense in the public sector than in the private sector. Moreover, it is likely that public organisations will have great difficulty in involving more people and resources than the budgeted one in a project due to their bureaucratic procedures (Willcocks, Currie & Jackson, 1997).

Finally, a common characteristic regarding public organisations is that they usually buy IT solutions without implementing the necessary changes such as organisational changes, reengineering existing processes that are affected by the new IT solutions, etc. The risk of not exploring solutions which implies organisational changes is high (Wimmer, 2001).

3.4 ISSUES THAT INFLUENCE PROCESS IMPROVEMENT METHODOLOGIES FOR THE PUBLIC SECTOR

Most of the process improvement projects have been undertaken in profit-oriented organisations. Hence, most methodologies for process improvement projects have been developed for private organisations. The concept of redesigning processes goes against the ordinary culture in many public organisations. On the other hand, taxpayers are usually comparing public sector to the private one, claiming for better service.

It is an interesting question, whether public organisations have some characteristics that make process improvement projects significantly different in them. Although the differences between business and government are not clear, many differences that are important to be thought about in process improvement projects are being discussed in literature. Governmental organisations have a distinctive culture and face many challenges because of

their social obligations and higher legislative and public accountability (Kumar, Maheshwari & Kumar, 2002).

Cats-Baril and Thompson (1995) mentioned the following characteristics of the government; more limitations inserted by red tape, higher level of interrelation among organisational boundaries, higher level of extra - organisational linkages, greater interdependence across organisational boundaries, the turnover of top level administrators, the need to convince employees to change the existing organisational processes is greater, the difficulty to implement change is increased, and management tends to have less authority than its private sector counterparts.

The above complies with the research performed by Thompson (2000) on the National Performance Review (N.P.R.) success. That research indicated that part of the demands of the N.P.R., are not easy to implement. Moreover, according to the same article, the Social Security Administration agency cannot deal with radical changes due to its size and dynamic.

Finally, there are four major characteristics that should be considered in process improvement planning (Kettinger, Teng & Guha, 1997). The first is about project radicalness, the second refers to process structuredness, the third one is customer focus, and the last one is the potential for IT enablement.

After the examination of some of the basic characteristics regarding process improvement implementation in the public sector in general, the next step is to focus on the case of Greece.

3.5 PROCESS IMPROVEMENT AND GREEK PUBLIC SECTOR

After having described briefly in section 2.2, TQM, Six Sigma, TOC, Kaizen, Lean Thinking, BPR, BPM and CPI and having compared them in section 2.3, the next step is to outline the current situation of the Greek public sector regarding process improvement.

The Greek Public Administration followed an e-Government model which does not quite defer from what the other EU developed countries have adopted. Greece was always lacking in the ICT sector compared to the European average presenting important divergences in various fields. Thus, the only solution was the adoption of best practices from other EU

countries which presented a great progress in this particular sector. However, these practices were applied without them first being adapted to the “Greek business reality” due to the need of presenting rapid results. In fact, the adoption of the best practices was mostly limited to the simple application of ICT to existing bureaucratic processes of each public organisation. No structural reorganization / simplification of the way government and citizens/enterprises transact in a horizontal level (integrated multi-sectoral processes) took place. The result was the planning and realisation of a total of ICT infrastructures which continue to automate complex, time-consuming and ineffective existing processes.

The lack of process improvement initiatives in the Greek Public Administration (see section 3.8) in the frame of the 3rd Community Framework Support (see Appendix 2) is a problem. It became noticeable from the begging of the programmatic period due to the fact that the ICT infrastructure developed during the 2nd Community Framework Support did not take the process improvement factor into consideration as well. The result is that the ICT infrastructures (provision of e-services to citizens and enterprises) that have been developed and are still being developed are functioning by supporting bureaucratic processes on the level of a single public organization and not on the level of Public Administration as a total.

The problem of the bureaucratic processes of the aforementioned infrastructures was solved partly with reorganisation / simplification studies which were included to the projects funded by the 3rd Community Framework Support. These studies have been realised in a very short amount of time (because of the general delay in absorbing European funds) and without central co-ordination. Hence, a question is raised whether they have contributed to the actual problem solving.

The “independence” of Ministries of Central Public Administration, which were responsible for the realisation of the e-Government projects in their sector of responsibility, also contributes to the maximisation of the abovementioned problem. The Operational Plans for the “Information Society” which were delivered in the year 2000 were elaborated under great pressure. Thus, they introduced great coverage among them, since they did not give emphasis to the inter-sectoral synergies. These synergies are significant to the reengineering of processes through interoperability. Moreover, the Operational Plans left many questions in relation to how the multiple e-Government infrastructures could function effectively and with economies of scale for the Greek taxpayer.

On the aforementioned frame it has been clear that processes, on which the function of public services has been based, should progressively (leaving out their bureaucratic and formal orientation) be reengineered. The strategic orientation of this process improvement effort should be towards the service of citizens and enterprises and the efficiency and quality of the offered services, taking into consideration financial and other burdens which these processes produce to every stakeholder, based on international acceptable practices.

ICTs occupy a central role in the reengineering context and are used in order to support planned radical change of operational activities aiming at the dramatic improvement of performance. While in the past the use of information technology was restricted to the automation of existing processes, it is widely recognised now that such a use often leads to high investments and increased operational cost, but not to the expected improvements in performance. Today, the central idea is that ICTs are a lever for reengineering processes. Consequently, ICTs should not be simply applied on existing processes and organisational structures. The introduction of e-Government in Greek Public Administration should be combined with process improvement projects.

Therefore, the main target of the Greek Public Administration during this period is the mapping and analysis of business processes and the exploration of the possibility to reengineer and to sophisticate these processes. The desired outcomes of this process improvement initiative will be to decrease their duration and operational cost, cancel non added-value processes and eliminate unnecessary regulation which creates delays, ambiguities and increase of cost in the operation of public administration. It is obvious that the Greek Public Administration seeks to achieve dramatic changes in its business processes in order to provide high quality services with low cost to citizens and enterprises.

Although BPR is essentially a 1990's methodology, it is the only management approach/tool which captures the concept of dramatic changes to business processes (see chapter 2). Greek Public Administration has already decided (it is a political decision to use the term BPR for process improvement projects in the Greek public sector) that this management approach fits better its needs for dramatic changes in its processes. Hence, it will announce Request For Proposals (RFPs) during the fourth programmatic period (4th Community Framework Support - CFS) for reengineering its business processes and services. **BPR methodology will be considered (political decision) as a prerequisite for all potential participants to these RFPs and not other approaches such as CPI, BPM, TQM, six sigma, lean thinking, TOC and kaizen.** Greek Public Administration considers that all management approaches (apart from BPR) capture the concept of continuous

improvement. Hence, the next step for the Greek Public Administration will be to decide (political decision) which of the abovementioned approaches will be used for continuous improvement projects as the next step of the BPR projects (radical changes).

Today taking into consideration the important issues of absorbing the funds of the 3rd Community Framework Support and the lack of substantial cooperation between the agencies with respect to e-Government topic, it has become henceforth understood that the Greek Public Administration was not ready on an institutional, organisational and procedural way to support an effective e-Government. However, the steps that have been made should be considered quite important. One important step is that the biggest part of software infrastructure is based on workflow management systems, which easily can be adapted to operational, institutional and functional changes of Public Administration's environment. Another important step is that a large part of information about public services is already provided via Internet (e.g. what type of applications citizens should fill in or what type of documentation is necessary for the provision of public services, etc.). Moreover, there are many 3rd (but also 4th) sophistication level transactions (see Appendix 3) that are already provided electronically.

This situation, even with its any advantages and disadvantages as a result of the effort strived by the Public Administration in a short period of time, constitutes the starting base for the 4th CFS. During the 4th programmatic period, the strategy for modernising Greek Public Administration is henceforth totally faced under the scope of a targeted Operational Program titled "Improvement of Public Administration's Management Capability" (total budget € 505 million for the period 2007 – 2013; initial timetable) which emphasises to the re-engineering of public agencies.

Consequently, BPR projects in the Greek Public Sector will be established for the recording, modeling, analysis and optimisation both of all processes of the Public Agencies, and of their organisational structure. The main target is the creation of a system which will manage the basic organisational structure of every agency, centrally organised, with consequence and simplicity, in depth of time.

3.6 GREEK INFORMATION GUIDELINES ABOUT PROCESS IMPROVEMENT PROJECTS

With respect to this research, Greek public organisations can be considered to have the same needs and features regarding BPR projects because they should confront to the same guidelines of the Greek Information Society about BPR projects (Managing Authority of Operational Program "Information Society", 2006). These guidelines could be summarized as follows.

Regarding the Process Re-engineering and Organisational development, the main targets are the reengineering of processes in order for the productive capacity of public agencies to be improved via ICT projects, the design of an improved organisational structure, the development of a performance measurement framework, the reform of rules and regulations, the utilisation of ICT infrastructure and the focused intervention on organisational pathologies. Indicative actions may include, for example, analysis of as - is processes, use of best practices and identification of process improvement goals, as well as mapping and evaluation of as-is processes (core or added-value processes). Moreover, the modeling of new processes and the identification of the operational “gaps” of the existing operational model compared to the new one, the new services, the measurable goals of services and the IT infrastructure may also take place.

Identification of the short- and long-term interventions and the range of organisational changes with respect to the evaluation of the feasibility of the new model may also be included in the proposed actions, along with the development of action plans – coordination with the implementation of ICT funded projects of each public agency. The process improvement should be first implemented in a pilot way, and workshops should be organized at the right scale for communicating process improvement goals to the employees and training and educating the employees of the organisational units that perform the new processes. Finally, evaluation of the interventions to the organization should be carried out, and recommendations for changing the legal – normative – institutional framework of each organization should be made.

As far as the change management is concerned, the main target is the management, the implementation and the continuous support of the operational / organisational changes that; a) come from process improvement or, b) have been put forward as operational demands of ICT projects under implementation or, c) accrue under the context of other type of interventions of the public agencies for more efficient and effective operation of their organisational units.

The main components of a successful change management are the development of a persuasive business case, the simplicity and clarity of the vision and the strategy, a strong leadership and top management commitment, a focused communication strategy, an increased change capability, the close relation between planning and implementation, the continuous participation of all stakeholders and the correlation of the evaluation procedure with the organisational culture.

Indicative activities may include the following. At the initial stage, the conduction of basic diagnostic evaluation of the organisation's readiness, its organisational structure, its top management's strategic capability, its existing competences and growth plans, the project teams' effectiveness and its communication strategy.

At the stage of realization, risk management, organisation's reengineering, development of the adaptation program, support of the project team's effectiveness, development of competences, appointment and encouragement of successes, periodical monitoring of the achievement of goals/profits/improvements, development of the active strategically encouragement and participation of the stakeholders and the development of the communication plan and the internal marketing plan.

Finally, at the stage of evaluation/completion, the development of the to-be situation and the evaluation of the performance of the change factors i.e. project managers, individuals in charge of organizational units etc, and the ascertainment of the achievement-divergence from benefits realization.

3.7 MARKET EVIDENCE ABOUT PROCESS IMPROVEMENT PROJECTS IN THE EUROPEAN AND GREEK PUBLIC SECTOR

Based on FEACO (2009), total sales of the European Management Consultancy (MC) industry amounted to € 61.6 billion in 2005. Organisation/Operations management and Change Management (both of them are sub areas of process improvement field) account for 23% and 13.3% of the aforementioned amount respectively. An analysis of per client industry shows that Public Administration accounts for 17.5% of the total turnover. Hence, as far as process improvement projects to public sector are concerned, the business opportunities for management consultancy companies and relevant professionals are high at a pan-European level.

As far as the relevant situation in Greece is concerned, total sales of the Greek MC industry amounted to € 181 million in 2005. Organisation/Operations management and Change Management account for 19.9% and 1.9% of the aforementioned amount respectively. Public Administration is by far the largest client of Greek MC industry as it accounts for 43.1% of the total turnover¹. Given the fact that the Greek Information Society has announced officially that it will grant € 505 million to Greek public agencies for process improvement projects (initial time schedule 2007 – 2013, revised time schedule 2010 – 2016), this is an appropriate time for management consultancy companies and professionals to focus on developing process improvement methodologies specialised for the needs of the public sector.

3.8 ISSUES AND CRITIQUE OF IMPLEMENTING PROCESS IMPROVEMENT IN THE PUBLIC SECTOR

It is obvious, that the differences between private and public organisations to have an impact on process improvement. The unique characteristics of public organisations will have significant effect on process improvement in public organisations, particularly in the following areas: (1) deciding to adopt process improvement; (2) setting objectives of process improvement; and (3) implementing process improvement. The reflexive critique will be used (see Appendix 1).

3.8.1 DECIDING TO ADOPT PROCESS IMPROVEMENT

3.8.2 SETTING OBJECTIVES OF PROCESS IMPROVEMENT

3.8.3 IMPLEMENTING PROCESS IMPROVEMENT

3.9 SUMMARY

Addressing the question whether or not process improvement can be implemented in the public sector, researchers and practitioners of the subject (e.g. Indihar Stemberger and Jaklic, 2007; Martin and Montagna, 2006) suggest that process improvement may be implemented successfully as long as the particularities of the public sector are taken into

¹ The second largest client of Greek MC industry is Industry (23%) and the third one is Financial services (6.8%).

consideration during a process improvement initiative. As a result, the main objective of the current research is related to the clarification of process improvement with respect to its implementation in the public sector and the development of a relevant methodology.

With respect to the Greek public sector, only two BPR projects have been completed in two Greek public organisations (source: researcher's record keeping of RFP's about BPR projects): a) the Ministry of Foreign Affairs (homepage - www.mfa.gr) and b) the General Secretariat of Communication – General Secretariat of Information (homepage - www.minpress.gr). The first one was completed in the end of 2009 and the second one was completed in January 2009. These projects were funded by the 3rd CFS. Greek public administration will announce new RFP's for BPR projects in the 4th CFS as it is already mentioned. Thus, there is quite limited empirical evidence about process improvement projects in the Greek public sector. As a result, the main objective of the current research is related to the clarification of process improvement with respect to its implementation in the Greek public sector and the development of a relevant methodology. Therefore, the researcher presents an initial conceptual framework about a process improvement methodology for the Greek public sector in section 5.1.

4 MEASURING THE PERFORMANCE IMPROVEMENT OF THE REENGINEERED BUSINESS PROCESSES

4.1 APPROACHES ON PERFORMANCE EVALUATION

Measuring performance regarding the redesigned processes towards improvement has been an issue for many years for researchers. The first roots of such measurement approaches can be found at the end of the 19th century (Kueng and Krahn, 1999). Since then, managers have been focusing on financial parameters, while on the same time they had a strong incentive to manipulate the figures they report.

Within the decades of '80s and '90s there has been a significant change. Several discussions have been made with relevance to the field of performance evaluation, and specifically regarding terms such as self-assessments, quality awards, benchmarking, activity-based costing, capability maturity model, balanced scorecard, workflow - based monitoring, etc. These approaches are summarised as follows, in chronological order.

4.2 COMPARISON OF MEASUREMENT APPROACHES

Process - oriented organisations require a process management able to evaluate the current level of process performance. Hence, a measurement system is needed *which focuses on processes*. Having in mind that business processes may cross departments or even divisions, this aspect is central. Moreover, effective process management requires a *broad spectrum of performance - relevant data*. Hence, financial and nonfinancial data are needed, as well as quantitative and qualitative data. None of the abovementioned measurement approaches combines these two criteria (see Table 4). The following approach, named Process Performance Measurement System (see section 4.3), meets these criteria, in order to be used for measuring the process improvement performance. The following table summarises the main points of these approaches.

Table 4: Comparison of measurement approaches

(source: Kueng and Krahn, 1999)

4.3 PPMS

PPMS is a measurement system that enables the development of competitiveness within business processes. It enables us to visualise and to enhance processes performance incessantly. Therefore, PPMS helps not only a philosophy about total quality management philosophy but also an approach that is process-based. One of the key points of PPMS is that it tends to depict a complete view of the business processes performance.

Figure 2: Main characteristics of PPMS

(source: Kueng and Krahn, 1999)

What is the approach needed in order to compose PPMS? The approach consists of nine steps (Kueng and Krahn, 1999).

4.4 THE NEED FOR A PMMS IN THE GREEK PUBLIC SECTOR

Several types of public organisations of different sizes may be found within the Greek civil service. These organisations may provide all types of services such as health, education, social services, economic, developmental and cultural services and other.

Greek civil service size, defined as a percentage of the total employment force (Handler et al., 2005), is around 22% from 2000 till 2008 with minor deviations from this average number and is close to the EU27 average civil service size, which is around 25% (for more details see Appendix 4). The civil services employ a large number of people with reference to the total population, equal to 1,022,121 civil servants in 2008 (ILO, 2008). That may be characterised as a problem, along with the bureaucracy, that also prevails in that huge public system. Inflexibility, inefficiency and need for radical and urgent changes are some more basic characteristics regarding the Greek public administration and the civil service state in general (Sotirakou and Zeppou, 2006).

Therefore, the researcher will try to shed further light upon the use of a PMMS in the Greek public sector. He will examine the factors that may influence that implementation, and then provide a framework (see section 5.2) to be used by public organisations as a self – assessment tool that will assist them to develop their capacity for critical reflection, evaluation and improvement.

5 CONCEPTUAL FRAMEWORK

5.1 PROCESS IMPROVEMENT METHODOLOGY

According to the main findings regarding the literature review, all management approaches towards process improvement share common targets and aims (section 2.3.1), which they try to accomplish through almost the same steps and procedures (section 2.3.2). In particular, all these approaches tend to follow the same steps, starting from Value definition, “Value stream” identification, enabling the continuous flow of activities, allowing the product to be pulled through the process by the customer, and finally perfection pursuing during the process by revisiting the steps again in a continuous loop.

Regarding their common targets, all approaches aim to add value, regardless the fact that for each one of them value may be defined in a different way. Moreover, they tend to develop conceptual models for defining what is a business process, from the perspective of adding value to goods / services.

On the other hand, in section 3, the researcher outlined the major difficulties in implementing process improvement in the public sector and the main differences regarding process improvement initiatives between public and private organizations. Regarding the first, the most important difficulties may include communication problems, public servants that do not accept the changes posed by process improvement, top and middle managers that are not used to be able to handle the needed changes etc.

The main differences between public and private sector may refer to environmental factors, organization – environment transactions and internal structures and processes.

Moreover, regarding the Greek public sector in particular, it was mentioned (section 3.9) that only two relevant process improvement projects have been carried out, but there will be a growing trend for process improvement projects to be funded under the framework of the 4th CFS (section 3.5).

Hence, this research aims at developing an appropriate process improvement methodology that will support process improvement initiatives in the Greek public sector. Based on the above, the main research question that the researcher aims to answer is the following:

“How and why a process improvement methodology can be successfully implemented in the Greek public sector?”

In order to properly deal with the above question, it is important to develop a conceptual framework about a process improvement methodology that takes into consideration the five common steps of all management approaches that were mentioned in section 2.3.2. This conceptual framework consists of five steps which are the alignment of the public agency's strategy with the process improvement initiative objectives, the analysis and evaluation of the as-is situation, the design of the to-be situation, the analysis of moving from the as-is to the to-be situation, and the continuous improvement. These steps are correlated with the common steps of the managements approaches presented in section 2.3.2 as follows.

Regarding the value definition, alignment of the public agency's strategic objectives with the process improvement initiative's objectives will be needed in order to define what is valuable for the public agency in order to improve it. Moreover, regarding value stream identification, it actually includes the analysis and evaluation of the organization's situation and the definition of the value chain as well as the relevant problems. The third step, enabling the continuous flow of activities, actually aims to establish a continuous process flow and therefore the design of the to-be situation takes place at this steps The fourth step refers to the transition to the to-be situation in order to fulfill better the customer's needs. Finally, the last step is about seeking constant optimization that requires the establishment of a continuous process improvement step. Hence, the desired contribution of this research will be to examine thoroughly the implementation of these steps to Greek public agencies and to describe their implementation.

The preliminary conceptual framework of process improvement methodology in the Greek public sector may be summarised as follows, having 4 basic steps that may include several tasks. These steps can be considered as stages in a process. This relationship is illustrated by a “boxes and arrows” diagram. However, in this case, the relationships are not based on cause and effect, but on logic and proper order (Fisher, 2007, p. 128). The main idea regarding that conceptual framework is to deal with the issues presented in section 3, regarding the decision to adopt process improvement, the settings of its objectives and its implementations in the public sector. The whole conceptual framework may be summarised in the following diagram. This conceptual framework will be the basis for the research in Documents 3 and 5 about developing a process improvement methodology specialised for the needs of Greek public sector.

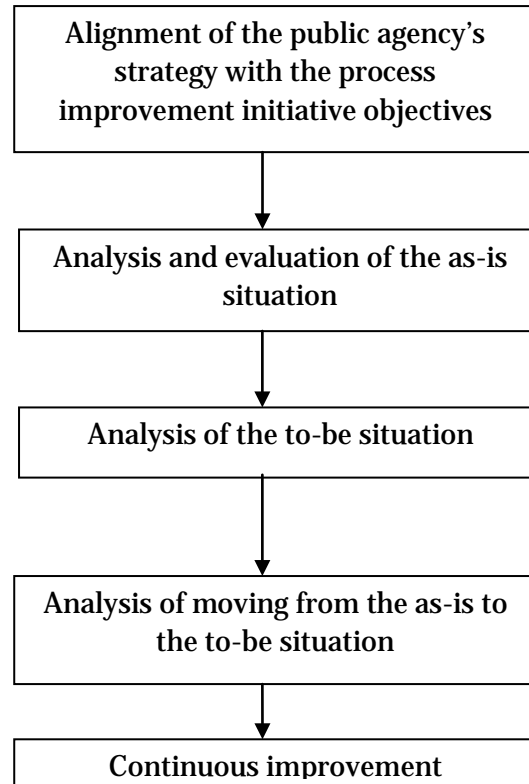


Figure 3: Process Improvement Methodology Conceptual Framework

5.2 PERFORMANCE IMPROVEMENT OF REENGINEERED PROCESSES

It has been already argued that process improvement aims to achieve improvements in critical performance measures such as cost, quality, service and speed. Taken into account the business environment of the Greek public sector as outlined in section 3.5 and section 4.4, the researcher argues that it is very important to identify;

- a) A quantitative indicator to measure the performance improvement of the reengineered business processes in Greek public agencies and
- b) The factors that will have an impact (either positive or negative) on that indicator.

The business practice indicates that;

- a) The quantitative performance indicator may be duration or improvement in duration or cost or reduction in the cost of a reengineered business process and
- b) The factors could be the use of IT, the changes in frequency, the number of persons employed and the execution steps of the reengineered business process, etc.

The above indications can be translated to the following research questions;

2a) What is an appropriate quantitative indicator for measuring the performance improvement of the reengineered business processes in a Greek public agency?

2b) What are the factors that have an impact on the quantitative performance indicator in a Greek public agency?

As already stated in section 4.3, the main steps that will be used in order to measure the performance will be the following. First, the identification of the business process goals will be carried out. Then, the indicators for each process goal will be defined, and the goals and indicators will be broadened. After that, the acceptance of these indicators will be ensured, and the data sources as well as the target values will be defined. The technical feasibility and the economic efficiency of measuring the selected indicators will then be judged, and the PPMS will be implemented and used. Finally, the business processes will be improved and the indicators will be continuously modified.

The researcher tries to find a cause and effect relationship between an appropriate quantitative indicator for measuring the performance improvement of the reengineered business processes (dependent variable – research question 2a) and the factors that have an impact on that indicator (independent variables – research question 2b).

At this point, based on his experience about process improvement projects in the Greek public sector, he thinks that there are two appropriate quantitative indicators for measuring the performance improvement of the reengineered business processes (dependent variable):

- a. Change in cost for executing the reengineered business process
- b. Change in the duration of the reengineered business process

Based on his experience, a preliminary list of factors that affect the abovementioned indicators are the following;

- i. Frequency factor: Changes in how frequent the reengineered business process is executed
- ii. Risk factor: Changes in the risk level (low, medium, high) of the reengineered business process

- iii. Human resources factor: Changes in the number of public servants that are involved in the execution of the reengineered business process
- iv. Time factor: Changes in the amount of time that public servants spend for executing the reengineered business process
- v. IT factor: Changes in the IT systems that are used during the execution of the reengineered business process
- vi. Technical factor: Changes in the technical infrastructure that supports the execution of the reengineered business process
- vii. Place factor: Changes in the place that the reengineered business process is executed.

Conceptual frameworks based on cause and effect relationships are often the basis of hypothetico-deductive research because they are the source of the hypotheses that such research seeks to test. The arrows in the following figure can be converted into a series of hypotheses (for instance, the higher the number of public servants spend for executing the reengineered business process, the more likely that the duration of the reengineered business process will be reduced) that can be tested (Fisher, 2007, p. 128). The following conceptual framework will be the basis for the research in Document 4.

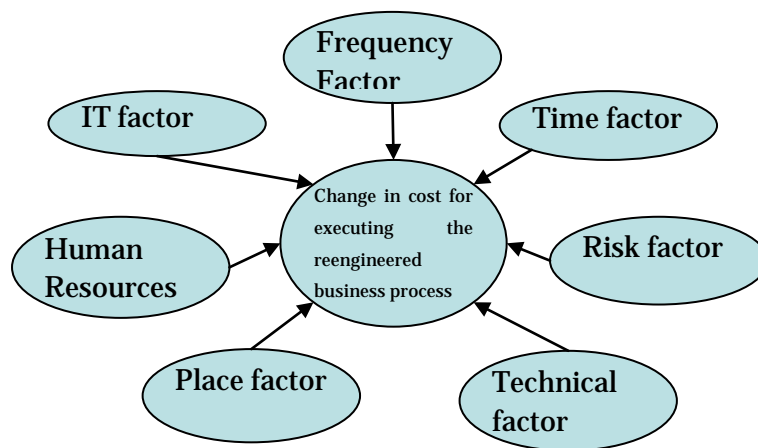


Figure 4: Performance Improvement Conceptual Framework

After the presentation of the initial conceptual frameworks that will guide this research, the next step is to discuss the methodological and epistemological issues of this research.

6 LITERATURE REVIEW ON METHODOLOGICAL AND EPISTEMOLOGICAL ISSUES

6.1 EPISTEMOLOGY OF RESEARCH: PROCESS AND VARIANCE THEORY

With this section, the researcher discusses the epistemology of research in general. More specifically, he points out details regarding a process theory and a variance theory, along with their main differences as well as under what conditions they are appropriate.

Taken into account the aforementioned characteristics of the variance and process theory, the researcher bases the process improvement methodology conceptual framework (section 5.1) on a process theory and the performance improvement conceptual framework (section 5.2) on a variance theory. The main research methodologies are summarised in the next section, then the researcher describes the research methodology that he will use to conduct his research (section 6.3 and 6.4).

6.2 LITERATURE REVIEW ON RESEARCH METHODOLOGIES

In the following, the presentation of several research methodologies will be carried out, based on the question whether the reality is subjective or objective, and on the question if it can be defined in an objective or a subjective way.

6.2.1 POSITIVISM

6.2.2 REALISM

6.2.3 PRAGMATISM

6.2.4 POST MODERNISM

6.2.5 SOCIAL CONSTRUCTION

6.2.6 CRITICAL THEORY

6.2.7 HERMENEUTICS

6.2.8 INTERPRETIVISM

6.2.9 ACTION RESEARCH

Figure 5: Action research by Kemmis & McTaggart (1982)

Figure 6: Action research by MacIsaac (1995)

The following table summarizes the nature of the ontology and the epistemology of each research methodology.

Table 5: Research Methodology – Ontology and Epistemology

Research methodology	Ontology	Epistemology
Positivism	Objective	Objective
Realism	Objective	Subjective
Pragmatism	Objective or Subjective	Subjective
Postmodernism	Subjective	Subjective
Social constructivism	Subjective	Subjective
Critical Theory	Subjective	Subjective
Hermeneutics	Subjective	Subjective
Interpretivism	Subjective	Subjective
Action research	Subjective	Subjective or Objective

6.3 ACTION RESEARCH: THE MOST APPROPRIATE METHODOLOGY FOR CONDUCTION A RESEARCH ABOUT PROCESS IMPROVEMENT

In addition to the above, the research regarding the implementation of process improvement in the public sector may be not only qualitative but also quantitative. Therefore, while trying

to take a decision regarding which research methodology would be more suitable for this research, that specific requirement should be taken into consideration. As shown in the following table, only a few methods combine these approaches.

Table 6: Research Methodology – Type of research

	Qualitative	Quantitative
Positivism	NO	YES
Interpretivism	YES	NO
Pragmatism	YES	YES
Post modernism	YES	NO
Social Construction	YES	NO
Critical theory	YES	NO
Hermeneutics	YES	NO
Realism	YES	NO
Action Research	YES	YES

Having a look on the fact that the researcher in this case is a practitioner, as well as on the other issues already mentioned, one may derive that the only two research methodologies that are able to be used for examining the process improvement implementation in public sector by the researcher is pragmatism and action research. Positivism is suitable for quantitative research only, while interpretivism, post modernism, social construction and critical theory are to be used with qualitative pieces of data.

As a result of all the above, the researcher using action research is not only able to combine qualitative and quantitative methods to produce grounded theory, but also to meet the requirement that the researcher is a participant to the process improvement initiative.

6.4 ACTION RESEARCH APPLIED FOR PROCESS IMPROVEMENT IN PUBLIC ORGANIZATIONS RESEARCH

As already mentioned, in order to examine the implementation of process improvement in public organisations, action research will be used. It will include qualitative research for Documents 3 & 5 (section 5.1) and quantitative research for Document 4 (section 5.2).

In Document 3, case research will be carried out, which will actually be the first step of the action research cycle presented in section 6.2.9. On the other hand, Document 5 will be based on action research, with multiple case studies examined. In other words, the examination of the case presented in Document 3 will help towards the development of the theoretical framework (general idea) in order to perform the action research in Document 5.

6.4.1 THE IMPLEMENTATION OF ACTION RESEARCH IN PROCESS IMPROVEMENT

In order to describe the research about the implementation of process improvement in public organisations, it is essential to understand what might be subtle differences between public and private sector process improvement projects. During the research process, a range of primary and secondary data will be collected. The primary data will come via attendance at management meetings within the organisations concerned and semi-structured interviews with managers from a cross-section of these organisations. The way in which the process improvement projects are executed means that these interviews are exclusively with the management team but may also involve a broad cross-section of the organisations. In addition, since an action research approach will be used, opportunities will arise to become directly involved in a number of workshops and in some cases to lead aspects of the process improvement projects under study. Field notes will be taken after project meetings and during numerous informal conversations about the projects. Secondary data sources may include unrestricted access to organization reports, minutes of meetings, financial figures, etc.

The limitations of this approach are obvious. Personal involvement in the projects imposes a number of practical constraints, not least on the number of studies which can be undertaken. On this basis, the validity of such work might be questioned. On the other hand, this approach is expected to provide the chance to develop a clear insight of the process as well as the outcomes of the process improvement projects and help the kind of public / private sector comparisons that are required in order to reach important conclusions regarding the implementation of process improvement in the first one.

Figure 7: Action Research for process improvement

(source: Fitzgerald and Murphy, 1996)

In that framework, the action research will be applied and used in order to investigate the implementation of process improvement in the public sector.

6.4.2 CASE RESEARCH

Case research is the research methodology based on the examination of use cases. According to Eisenhardt (1989), case study is a research strategy that focuses on understanding the dynamics present within single settings. According to Leonard – Barton (1990), a case study is a history of a past or current phenomenon, drawn from multiple sources of evidence. Moreover, as mentioned by Voss, Tsikriktsis and Frohlich (2002), case research's unit of analysis is the case study. In order to conduct a case research, one may use different cases from one organisation in order to examine different issues, or to examine the same issue in a variety of contexts in the same organisation.

The main strong points of case research, according to Meredith (1998), include the fact that the phenomenon can be studied in its natural setting, that questions regarding why, to what extend and how, are answered with a relatively full understanding of the nature and complexity of the complete phenomenon, and that early, exploratory investigations are carried out where the variables are still unknown and the phenomenon not at all understood. According to Voss, Tsikriktsis and Frohlich (2002), case studies can be used for different types of research purposes such as exploration, theory building, theory testing and theory extension / refinement. In addition, Eisenhardt (1989) mentions that case studies may combine several data collection methods like interviews, observations and questionnaires, and they may be used to accomplish various targets, similar to the ones mentioned by Voss, Tsikriktsis and Frohlich (2002).

Case studies are considered to be the most appropriate research strategy when three conditions are met. First, when the phenomenon to be examined cannot be separated from its context. Second, when the focus is on contemporary events, and third when the experience of the actors is important. Therefore, the case study is the most common qualitative research method used in information systems (Myers, 1997), and is particularly appropriate in order to study the information systems in organizations, when the focus is on organizational rather than technical issues. Such a case is the research to be conducted. More specifically, in cases like the implementation of a process improvement initiative in a public organization, researchers are usually not able to provide guidance on how to manage the introduction of new systems. This may result in finding themselves investigating how practitioners implemented and managed change, and developing theories from it. In that framework, case research may be applied in order to capture and formalize the knowledge of practitioners, develop theories from practice, and move on to the testing stage (Benbasat, Goldstein & Mead, 1987).

6.4.3 IMPLEMENTATION FOR THE TWO CONCEPTUAL FRAMEWORKS

Within this research, two conceptual frameworks will be taken into consideration for the implementation of action research in process improvement initiatives. These frameworks have been already discussed in section 5, and include the process improvement methodology that will involve qualitative research (Document 3 and 5), and performance improvement, that will include quantitative research (Document 4).

Therefore, the implementation of action research in this research will be carried out based on the approach described in section 6.4.1, after of course being adapted to the characteristics of the two conceptual frameworks of the current research. The procedure described in Figure 7, will be applied for both frameworks, in order to assist the researcher to reach useful conclusions regarding the implementation of process improvement in the public sector. The following figures depict the implementation of action research for each conceptual framework. The feedback arrows signify that after having validated the claims made about the next step of each conceptual framework, the researcher will go back to the previous step of each conceptual framework in order to find out if anything of the previous step, which can influence the next step, has been overlooked.

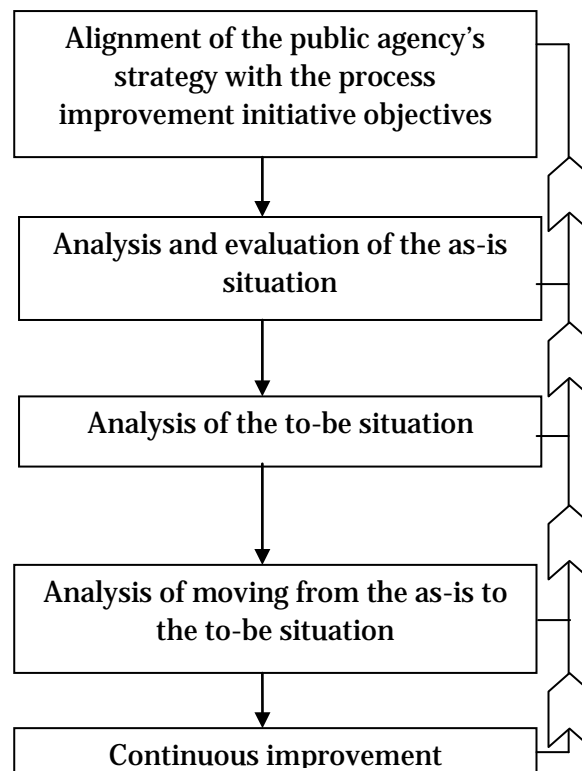


Figure 8: Action Research – Process Improvement Methodology Conceptual Framework

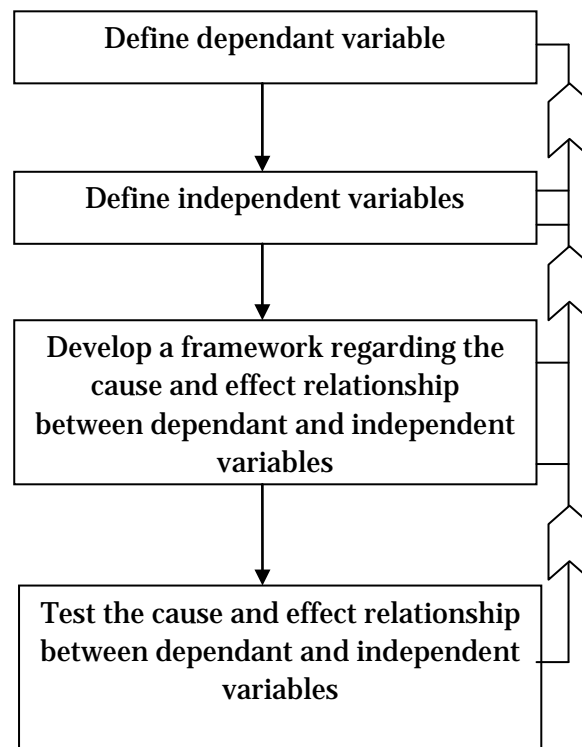


Figure 9: Action Research – Performance Improvement Conceptual Framework

6.5 SUMMARY

To sum up, the researcher points out that it is of great importance to choose the correct type of research in order to be able to investigate correctly the subject of implementing process improvement in public organisations and reach correct and accurate conclusions. There are several research methodologies available, each one of them with advantages and disadvantages, making them suitable for different kinds of investigations.

The main criterion in order to choose the appropriate research methodology in this study was the fact that the researcher is a practitioner. Therefore, based also on the rest of its characteristics, action research was chosen. After explaining the main reasons regarding the choice of action research for this research, a brief description of the steps to be followed for using that research methodology was given.

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APPENDICES

APPENDIX 1: DEFINING AND CHOOSING TYPES OF CRITIQUE

APPENDIX 2: COMMUNITY FRAMEWORK SUPPORT

The European Union comprises 27 Member States. The economic and social disparities among these countries and their 271 regions are great. Hence, European Commission (EC) has designed a European regional policy in order to reduce the gap between the development levels of the various regions. This policy helps to finance concrete projects for regions, towns and their inhabitants. The desired outcome of this policy is that all regions can achieve greater growth and competitiveness through these projects and, at the same time, to exchange ideas and best practices (European Commission, 2009).

Each Member state is responsible for developing its regional development programme and for presenting it to the EC in order to benefit from Structural Funds co-financing within the framework of the priority regional objectives. Then, EC in accordance with each Member state sets the priorities for action and the level of financial assistance to be provided by the European Union (European Commission, 2008). The outcome of the discussions between EC and each Member State is the development of each Member State's Community Support Framework. This framework describes the strategy of each Member State for the next period, the actions that each Member State is abide to fulfill, the type of projects that will be co-financed by the EC and the timeframe for achieving the desired outcomes.

APPENDIX 3: E-SERVICES & SOPHISTICATION LEVELS

Capgemini² (<http://www.capgemini.com>) conducted a survey on behalf of the European Commission (DG Information Society & Media – http://ec.europa.eu/dgs/information_society/index_en.htm) in order to assess the progress of eEurope (provision of electronic public services to citizens and enterprises). In order to measure the availability of public services online, Capgemini developed a four-stage framework (Cap Gemini Ernst & Young, 2003). European countries use this framework as a “common language” in order to define the online availability of the public services that they provide to their citizens and enterprises:

- *Stage 1 - Information:* The information necessary to start the procedure to obtain this public service is available on-line.
- *Stage 2 - One-way Interaction:* The publicly accessible website offers the possibility to obtain in a non-electronic way (by downloading forms) the paper form to start the procedure to obtain this service. An electronic form to order a non-electronic form is also considered as stage 2.
- *Stage 3 - Two-way Interaction:* The publicly accessible website offers the possibility of an electronic intake with an official electronic form to start the procedure to obtain this service. This implies that there must be a form of authentication of the person (physical or juridical) requesting the services in order to reach stage 3.
- *Stage 4 - Full electronic case handling:* The publicly accessible website offers the possibility to completely treat the public service via the website, including decision and delivery. No other formal procedure is necessary for the applicant via "paperwork".

The abovementioned framework is called ‘sophistication’ framework, thus its stages are called sophistication levels.

² In 2000, Cap Gemini acquired Ernst & Young Consulting. It simultaneously integrated Gemini Consulting to form Cap Gemini Ernst & Young. When the abovementioned survey was conducted, the name of the company was Cap Gemini Ernst & Young. After a series of acquisitions and mergers, the Group reverted to Capgemini in April 2004 (its current name).

APPENDIX 4: CIVIL SERVICE SIZE AT EU27

The civil service size is defined as a percentage of the total employment force (Handler et al. 2008). Based on ILO (2008), the public sector employment force is the sum of the general government sector's employment (government units, social security funds and other no profit institutions) and the publicly owned enterprises' employment. Total employment force is the sum of the public and the private sector employment (ILO, 2008). The following table provides evidence about the civil service size for EU27³ between 2000 and 2008.

Table 7: Civil Service Size EU27

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	Country Average
Cyprus	17,92%	18,01 %	18,22%	18,29%	17,72%	17,99%	17,98%	20,50%	17,57%	18,25%
Czech Republic	22,18%	21,41%	21,10%	20,89%	20,71%	20,20%	19,90%	-	-	20,91%
Denmark	34,28%	33,85%	34,07%	33,85%	34,29%	34,25%	33,82%	33,23%	32,30%	33,77%
Estonia	28,84%	28,75%	26,66%	26,30%	25,52%	24,53%	25,17%	24,16%	23,69%	25,96%
Finland	27,34%	27,25%	27,20%	27,60%	27,80%	27,28%	26,83%	26,36%	26,31%	27,11%
France	29,52%	29,48%	29,70%	30,15%	29,97%	29,22%	29,03%	-	-	29,58%
Germany	16,69%	15,73%	15,62%	15,71%	15,23%	14,48%	14,63%	14,33%	-	15,30%
Greece	<u>21,08%</u>	<u>20,99%</u>	<u>21,26%</u>	<u>21,46%</u>	<u>23,02%</u>	<u>22,03%</u>	<u>22,57%</u>	<u>22,52%</u>	<u>22,30%</u>	<u>21,91%</u>
Hungary	30,78%	30,81%	31,23%	31,50%	31,40%	31,48%	22,79%	21,86%	29,25%	29,01%
Ireland	18,04%	18,78%	19,08%	18,92%	18,78%	18,11%	17,62%	17,52%	17,70%	18,28%
Italy	15,55%	15,41%	15,26%	15,07%	14,94%	14,89%	14,67%	14,46%	14,45%	14,97%
Latvia	40,71%	39,47%	39,18%	37,89%	35,84%	34,63%	33,34%	31,23%	30,65%	35,88%
Lithuania	44,81%	43,20%	40,74%	39,62%	38,81%	36,31%	34,89%	33,35%	-	38,90%
Luxembourg	11,14%	10,96%	11,17%	11,48%	11,53%	11,53%	11,41%	11,01%	10,75%	11,22%
Malta	34,59%	33,28%	34,28%	33,44%	33,14%	32,26%	30,78%	-	-	33,11%
Netherlands	25,10%	26,07%	26,60%	27,47%	27,56%	27,44%	27,18%	26,97%	-	26,80%
Poland	27,88%	26,86%	30,50%	29,90%	29,05%	28,40%	27,50%	26,29%	-	28,30%
Romania	26,40%	24,25%	24,78%	23,66%	23,18%	21,03%	20,67%	18,72%	18,39%	22,34%
Slovakia	33,24%	31,47%	29,43%	27,29%	26,20%	24,56%	24,12%	24,03%	22,77%	27,01%
Slovenia	30,54%	30,51%	30,33%	31,27%	31,20%	30,84%	29,39%	28,21%	27,91%	30,02%
Spain	15,75%	15,52%	15,58%	15,66%	15,58%	15,10%	14,60%	14,18%	14,60%	15,17%
Sweden	33,71%	33,81%	33,94%	34,38%	34,41%	34,38%	34,42%	33,87%	-	
United Kingdom	19,22%	19,44%	19,69%	20,02%	20,28%	20,38%	20,20%	-	-	19,89%
EU average	26,32%	25,88%	25,90%	25,73%	25,46%	24,84%	24,07%	23,31%	22,05%	24,84%

(source: ILO, 2008)

The above table shows that eastern European countries (such as Estonia, Hungary, Lithuania, Poland and Slovakia) and Scandinavian countries (e.g. Denmark, Finland and Sweden) have high civil service size, while southern countries (e.g. Spain, Italy and Cyprus) have low civil service size. Greek civil service size is between the southern countries' civil service size and the eastern European countries' civil service size.

³ There are missing data for either the public or the private sector employment in Austria, Belgium, Bulgaria and Portugal.

DOCTOR OF BUSINESS ADMINISTRATION

Process Improvement in the Greek Public Agencies

Document Three:

Research methodology & Non-Survey Based Research

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Cohort 10

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1 INTRODUCTION

This research aims at exploring process improvement in the Greek public sector. Hence, the main research question that the researcher aims to answer is the following:

“How and why is process improvement achieved in the Greek public sector?”

There are three reasons that make this research question interesting: a) there are many contradictions and difficulties in the literature about process improvement in the public sector that need more research to clarify them, b) there is a gap in the literature about process improvement in the Greek public sector, and c) the current changes that are taking places to the Greek public sector due to the EU and IMF support mechanism.

In order to answer this research question, the researcher uses the case research as a research method. This method seems to be appropriate for this research because the phenomenon can be studied in its natural setting and the research question (“how and why” type question) can be answered with a relatively good understanding of the nature and complexity of the complete phenomenon.

The research methods employed in order to apply the case research are the participant observation, field notes, a focus group, in-depth interviews and secondary data (deliverables of a process improvement project and minutes of project meetings). The first four of them are about gathering primary data. The fact that the researcher exploits these five methods at the same time, gives him the ability to reach outcomes that are far more acceptable and trustworthy. He triangulates the gathered data in order to achieve the forming of outcomes and results that are as objective and less biased as possible.

This case study has examined the process improvement experience of a Greek public organisation. A cross-case analysis takes place in this case study. The researcher selects three process-cases for this purpose. He selects them because they follow all the steps of the conceptual framework of the process improvement initiative, they provide evidence about whether ICT influences the achievement of process improvement given the e-government trend in Greece and, they are examples of polar type.

The case analysis supports the general proposition that the special characteristics of public organisations and the Greek public sector context necessitate some unique responses in achieving process improvement. The researcher argues that Lean seems to be a more appropriate process improvement method to achieve incremental results in the Greek public sector context. However, given that the Greek public sector needs short-term radical changes, which cannot be the outcome of process improvement projects due to law restrictions, Greek Public Administration should consider a more radical alternative than Lean that could help Greek public sector to achieve the needed radical changes. He argues that this radical approach should be a combination of change in the law about employment in the Greek public sector and the use of outsourcing as a method to reduce cost and increase efficiency in public organisations. Moreover, he argues that the radical change of the purpose of process improvement from adding value for the clients of public organisations (as it is for the time being) to adding value for Greek public administration (in terms of the targets set by the EU and IMF support mechanism) can trigger the implementation of radical changes to the Greek public sector and also add indirect value for citizens and enterprises.

Finally, he discusses the limitations of this research, and future research extension. Firstly, he notes the inherent limitation of a single case. Given the single case study, the external generalisability of the findings is limited. Future research can address this limitation by examining additional public organisations. Secondly, the examined public organisation operates in the Greek public sector context. Nevertheless, lessons learned from this case are still useful to all public organisations because it confronts to the general guidelines of Greek Information Society about BPR projects.

Future research could examine the process improvement experiences of public organisations in other countries to determine whether radical changes in the public sector are the outcome of process improvement projects or of governmental policies. Moreover, it could also examine if radical changes are the outcome of using process improvement methods (such as Lean, BPR, kaizen, etc) or methods of privatisation (e.g. outsourcing, public-private partnerships, etc). Furthermore, it could examine if process improvement should add value for the clients of public organisations or the public administration itself especially under poor public financial conditions. This would contribute to the developing theory of process improvement in public organisations.

Based on the above, Document 3 is organised as follows. The next section discusses the research question and the literature gaps that make it interesting. The third section discusses the research epistemological and methodological issues and the selection of action research

as a research methodology. The fourth section presents the main characteristics of case research and ethnographic research, discusses why case research is more appropriate for the research conducted in Document 3 and how it can fit into the action research in Document 5, and presents the conceptual framework about the process improvement project. The fifth section discusses the research methods, while the sixth section outlines the validity and reliability issues of the research. The seventh section discusses the use of Eisenhardt's (1989) framework for building theories from case study research and two alternative ways to perform the research. The eighth section analyses the case regarding a process improvement project that took place in a Greek public organisation. Finally, the last section presents the main conclusions of the research, its limitations and future extension.

2 PRESENTATION OF THE RESEARCH QUESTION

According to the main findings of the literature review (Document 2), all management approaches towards process improvement share common targets and aims, which they try to accomplish through almost the same steps.

With respect to their common targets, they aim to add value, regardless the fact that for each one of them value may be defined in a different way. Their targets are to improve customer satisfaction, product and service quality, as well as cost reduction (e.g. downsizing). Moreover, harnessing skill is also a goal, along with reducing lead times and improving value-added processes. Finally, they tend to enhance faster responsiveness.

With respect to the steps, they tend to follow the same steps, starting from Value definition, “Value stream” identification, enabling the continuous flow of activities, allowing the product to be pulled through the process by the customer, and finally perfection pursuing during the process by revisiting the steps again in a continuous loop.

Therefore, the researcher argues that all approaches seem to follow the same pattern (process steps and targets) from different viewpoints. However, there is a difference on how they try to implement changes to an organisation, continuous improvement or step change. Based on their origin and initial concepts, BPR is about radical changes and other approaches are about continuous improvement as discussed in Document 2.

On the other hand, the researcher outlined in Document 2 the major difficulties in implementing process improvement in the public sector and the main differences regarding process improvement initiatives between public and private organisations. Regarding the first, the most important difficulties may include communication problems, public servants that do not accept the changes posed by process improvement, top and middle managers that are not used to be able to handle the needed changes etc. The main differences between public and private sector may refer to environmental factors, organisation – environment transactions and internal structures and processes.

Moreover, regarding the Greek public sector in particular, the researcher mentioned in Document 2 that only two relevant process improvement projects have been carried out, but

there will be a growing trend for process improvement projects to be funded under the framework of the 4th CFS.

Hence, this research aims at exploring process improvement in the Greek public sector based on a case study research. The main research question that the researcher aims to answer is the following:

“How and why is process improvement achieved in the Greek public sector?”

There are two reasons that make this research question interesting: a) there are many contradictions and difficulties in the literature about process improvement in the public sector that need more research to clarify them (section 2.1), b) there is a gap in the literature about process improvement in the Greek public sector (section 2.2) and c) the current changes that are taking places in the Greek public sector due to the EU and IMF support mechanism (section 2.2). Moreover, as mentioned in Document 2 and further discussed in Document 3 (section 2.2), Greek public organisations do not have the option not to adopt a process improvement initiative due to the EU and IMF guidelines about the Greek fiscal economy. Hence, the main research focus should be on how and why process improvement is achieved in Greek public organisations.

According to Kumar and Bauer (2010), Barraza, Smith and Dahlgaard-Park (2009), Sentanin, Santos and Jabbour (2008), not much has been said on the literature for process improvement in the public sector; most of the literature concerns the private sector. This is due to the different mindset of the people working in the public sector and of its bureaucratic structure that may create problems during the implementation (Barraza, Smith & Dahlgaard-Park, 2009; Gullledge and Sommer, 2002). Hence, there is a need to research how and why the Greek public sector can achieve process improvement (Sotirakou and Zeppou, 2006; Dalamagas, 2000).

2.1 PROCESS IMPROVEMENT AND PUBLIC SECTOR

Public sector organisations over the past few years have experienced a rise in focus of the use of process improvement methods (Radnor and Boaden, 2008). These methods include approaches such as Lean, Six Sigma, Business Process Reengineering, Theory of Constraints, Business Process Management, Kaizen and Total Quality Management as well as blended approaches such as Lean Six Sigma and Lean Kaizen (Radnor, 2010).

Addressing the question whether or not process improvement can be achieved in the public sector, researchers and practitioners of the subject (e.g. Indihar Stemberger and Jaklic, 2007; Martin and Montagna, 2006) suggest that process improvement may be implemented successfully as long as the particularities of the public sector are taken into consideration during a process improvement initiative.

The first important aspect to point out is the fact that there are many differences between public and private organisations. According to Loizidis and Patsouratis (2008, p. 16), the differences between public and private organisations in Greece are in terms of (a) **Ownership**, public organisations are owned by the Greek state or on some cases from both the Greek state, which holds the management and more than 50,1% of the shares, and private organisations or individual shareholders, (b) **Scope of the organisation**, public organisations are aiming at the social wellbeing of the society and they are working as a tool to reduce unemployment and re-distribute the income, while private organisations aim to profit maximization, (c) **The way they are managed**, public organisation's top management is appointed by governmental officials, while on the private sector it is made by experienced executives and managers.

From this, we understand that there are fundamental differences between private and public organisations in Greece. The different ways of management imply also different interpretation of business practices. A practice that is successful to the private sector may not be so successful to the public sector. According to Sotirakou and Zeppou (2006) and Pagoulatos (2001), elements such as bureaucracy, many layers of control and the culture of the public servants on most of the cases have worked against any change or innovation in the Greek public sector. Hence, process improvement methods applied to private companies may not always be suitable for public organisations as discussed in Document 2. Moreover, it has been argued that public organisations even within the same country may have different characteristics and needs, making the development of a generic process improvement methodology rather impossible. One of the main differences in achieving process improvement between public and private service sector may include the difficulty to define in the first one "value" and "quality", their strategic objectives, their cost systems and the stakeholder's power (Kumar and Bauer, 2010; Suarez-Barraza, Smith & Dahlggaard-Park, 2009).

These differences between the public and private sector, that result in the implementation of process improvement to the first one to be rather challenging, may also be categorised as follows (James, 2005). Firstly, there are the environmental factors, which include the fact

that within the public sector it is possible to deal with less inducement for productivity and efficiency, lower effectiveness, and less availability regarding market data. Secondly, the differences include the organisation – environment transactions, which mainly refer to increased obligatory activities, wider scope of concern and significance of actions in the public interest, higher level of scrutiny of public officials, and greater expectation that public officials act fairly, responsively, accountably, and honestly. Finally, there are differences about internal structure and processes, regarding mainly the more complex criteria within the public sector.

These differences are possible to result in several difficulties when trying to achieve process improvement in the public sector. According to Joia (2004), it is likely that public servants do not accept the changes posed by process improvement, or strongly resist to them (Scholl, 2004; Pagoulatos, 2001). Allen (2002) points out communication problems that may arise to break boundaries and generate workflows through several agencies, regulations, and legal limitations to which the public sector is subjected, while public organisations are not used to organisational changes and therefore top and middle managers are not used to be able to handle this type of changes (Indihar Stemberger and Jaklic, 2007).

Another issue regarding process improvement and its implementation in the public sector is that top management may change as a result of elections and the new management may reject the scope and objectives of the process improvement initiative (Scholl, 2004). Additionally, many process improvement projects fail because their objectives are not aligned with the corporate objectives. Regarding corporate objectives, it is difficult to assess benefits such as customer satisfaction, growth, result improvements, etc. in a public organisation. Furthermore, regarding process improvement objectives, there are usually more stakeholders in a public organisation than in a private one, making it hard to arrive to consistent objectives that match all their needs (Kumar and Bauer, 2010; Wu, 2002). Thong, Yap and Seah (2000) point out that the fact that institutional restrictions in the public sector, which are stricter than those in the private sector, may also limit the outcome of a process improvement project.

Finally, according to Kumar and Bauer (2010), it is likely that public organisations will have great difficulty in involving more people and resources than the budgeted one in a project due to their bureaucratic procedures; while Wimmer (2001) states that in public organisations, the risk of not exploring solutions that implies organisational changes is high.

All the above characteristics underline the several possible difficulties that one could face trying to achieve process improvement in a public organisation. The existence of the unique characteristics of public organisations has significant effect on process improvement in them. More specifically, there are three basic areas regarding the implementation that may be affected by these characteristics as discussed in Document 2 (section 3.8): the decision upon adopting process improvement, setting its objectives and implementing it in the organisation.

Regarding the first characteristic, it has to be pointed out that in public organisations there is usually significant unwillingness to apply the changes that are needed within a process improvement project. In general, in such organisations there are difficulties in measuring the result and the benefits of a process improvement initiative because they do not rely on market exposure and the decision upon using it is usually difficult. As far as the second characteristic is concerned, there are several factors in public organisations that usually result in difficulties in setting objectives, designing alternative processes, and selecting the redesigned processes. These factors could be greater diversity and intensity of external influences, such as interest group demands and lobbying and interventions by congressional representatives on decisions. Finally, regarding the implementation, these organisations are characterised by less autonomy for the managers, more needed time to specify and approve redesigned processes and more unwillingness to delegate, more levels of review, and more significant use of formal regulations.

Summing up the main characteristics regarding the difficulties and contradictions of achieving process improvement in the public sector, the following can be observed. Firstly, although it is achievable to change processes radically in the public sector, willingness for such changes is low in most of these organisations. The structures are usually inflexible, resources are limited, top management commitment is in most cases hard to accomplish, many processes are mainly intra - functional etc. All these points enhance the opinion that radical changes may cause significant risks.

Furthermore, customer focus is more important in the public sector nowadays, compared to the past. Customer friendliness and process simplification is the imperative of public administration. Sometimes, this is the key motive for reengineering processes in the public sector. On the other hand, the target is usually to keep the existing customers rather than attracting new ones.

Finally, regarding the potential for IT enablement, one could state that process improvement can be said to revolve round Process Management, advancement in IT and development in organisational structure. The architecture of process improvement refers to the process, data and technology infrastructure components that make up the IT environment. IT is significantly essential to the public sector due to the general e-government trend.

The drivers for introducing the process improvement methods in the public sector (BPR, Lean, six sigma, TOC, TQM, etc) are stated as the need to reduce costs and increase quality (Document 2, section 3.1). Where these methods have been implemented in public services focused around processes and departments, the evidence indicates significant impact related to quality, cost, time and even, satisfaction of both staff and customers.

2.2 PROCESS IMPROVEMENT AND GREEK PUBLIC SECTOR

The Greek public organisations are well known for having a number of problems, such as bureaucracy (Loizidis and Patsouratis, 2008, p. 20), lack of commitment, ineffective procedures, corruption, lack of transparency and accountability and a heavy resistance on every change that would affect labour relations or challenge the power relations of unionists and of some groups of workers in the public sector (Pagoulatos, 2001). There are also several issues such as the lack of ICT knowledge and of adopting new information systems (Buhalis and Deimezi, 2003).

From the above we understand that we have to deal with a public sector that did not want to change. However, the recent economic crisis forced the Greek public sector, but also the Greek society in general, to have a “shocking treatment” in order to recover from a crisis that was caused not only from the pressure of the financial institutions, but also from the abovementioned issues that created a huge deficit which could not be tackled. According to Martin and Roth (2010), there was a tolerance of the Greek public and of the government towards corruption and greedy policies that created a public sector that was spending and wasting public and EU’s money without any regrets. The end-result was a number of changes, including reduction in benefits for the public servants and job cuts on organisations of the public sector that should not exist. At this point, it is important to mention that based on the article 102 of the Greek constitution established in 1911 (Greece. Greek Constitution, 1911), public servants cannot be fired as long as their job positions are not made redundant. The aim of this Article was to protect public employees against the will of each government to make them redundant in order to hire their own people. This was the situation in the

Greek public sector from 1798 (date of the first Greek Constitution) until 1911 (Greek Parliament, 2010). It is crucial for the Greek government, in order to secure thousands of jobs in the public sector, to tackle with all those anomalies. This will be done with changes, but also with the adaptation of modern management techniques.

Therefore, the main target of the Greek Public Administration during this period where it has to face the economic crisis, it is the mapping and analysis of business processes and the exploration of the possibility to redesign and to sophisticate these processes. It is obvious that the Greek Public Administration seeks to achieve dramatic changes in its business processes in order to provide high quality services with low cost to citizens and enterprises. Moreover, the need of accountability of the public servants and of public organisations brings the need of new process improvement. Hence, the ongoing changes in the Greek public sector is the ideal case to bring process improvement as a medium to overcome the crisis but also to produce a new public administration model which will help the Greek state to improve its reputation. The foreign markets claim that the lack of efficiency is the key driver of the current crisis. If the Greek public sector adopts a process improvement model, it will convince the markets about its efficiency and transparency and that will not waste funds provided from IMF (International Monetary Fund) and EU.

An example of step changes and ongoing improvements is the use of e-government in the Greek public sector as a medium to overcome the “anomalies”. There is a debate between step change and ongoing improvement. According to Hartley (2005), public sector cannot be so flexible on changes like the private sector does. Gouscos, Mentzas and Georgiadis (2001) discussed the implementation of e-government in the tax system. Though the “taxis” system was launched 10 years ago, it has managed to provide solid evidence, that e-government can be implemented with success. They emphasized the fact that ongoing changes were necessary at the early stages of the taxis system. Buhalis and Deimezi (2003) emphasize the fact that there are some factors in Greece that may create obstacles, such as technophobia and inadequate training on IT. However, recent changes have shown that there is shift from ongoing to step changes. Ongoing changes have the advantage that they can help the public administration not to provoke any challenges and conflicts with the existing culture and routines, but those changes may have delays (Bessant and Francis, 1999).

The Greek government has recently launched two new processes, which is an indication of its commitment to step changes on e-government but also to ongoing improvements. The first project was the opevgov.gr initiative. This web site was launched the day a week after the elections in 2009. Opengov.gr was a new process where everyone who wanted to apply for a

top managerial position (general secretariat, general manager) in the public sector must submit his/her CV. Moreover, citizens could write down their comments on the new tax bill, which were available from opengov.gr. The web site was an ongoing improvement process in order to meet the citizens' demand for transparency and service quality. Recently, the opengov.gr launched a new procedure; all public employees should register in this web site to measure how many people were working in the public sector in order to change the process of monthly payments and to ensure that none would get a double or even a triple salary through applying on different sources. The latter was a change where a huge process such as the payment of public employees, which was chaotic, and often pretty corrupted, would take place from one source in order to know how much money each employee is paid. This was a step process improvement. The public servants had to fill in an electronic form from the 20th until the 30th July 2010 in order to receive their salary. If they did not fill in this application, they would not receive their monthly salary. For the Greek government, step process improvement is unavoidable in order to implement all the necessary changes in order to cope with the recent economic crisis.

Greek Public Administration has already decided that BPR fits better its needs for dramatic changes in its processes (political decision). It launched in 2000 an operational program for the Information Society, which covered the period 2000-2006 and EU supported it as part of the third CSF (Community Framework Support). One of the priorities set in this program was the development of online applications, as well as the use of ICTs to streamline and reengineer processes and communication within and amongst government departments, covering all public administration (Markellos et al., 2007). Therefore, the purpose of this program was to achieve radical changes in the provision of public services towards citizens and enterprises, from offline to online provision. Given that BPR, as defined by Hammer and Champy (1993), is about achieving radical changes in the processes of organisations, it seems that the selection of the term BPR in 2000 by Greek Public Administration was appropriate, at least in theory. The researcher will discuss this issue in section 8.5 in order to see whether the selection of BPR term is appropriate from a practical perspective.

Unfortunately, no structural reorganisation / simplification of the way government and citizens/enterprises transact in a horizontal level (integrated multi-sectoral processes) took place during the 3rd CFS. The result was the planning and realisation of a total of ICT infrastructures, which continue to automate complex, time-consuming and ineffective existing processes. Hence, Greek Public Administration will announce Request For Proposals (RFPs) during the 4th CFS for reengineering its processes and services.

During this period, the strategy for modernising Greek Public Administration is henceforth totally faced under the scope of a targeted Operational Program titled “Improvement of Public Administration’s Management Capability” (total budget € 505 million for the period 2007 – 2013; initial timetable, revised time schedule 2010 – 2016) which emphasises to the re-engineering of public agencies. BPR methodology will be considered for reasons discussed as a prerequisite for all potential participants to these RFPs and not other approaches such as continuous process improvement, business process management, TQM, six sigma, lean management, theory of constraints and kaizen. Greek Public Administration considers that all management approaches (apart from BPR) capture the concept of continuous improvement. Hence, the next step for the Greek Public Administration will be to decide (political decision) which of the abovementioned approaches will be used for continuous improvement projects as the next step of the BPR projects (radical changes).

Up to now, only two process improvement projects have been completed in two Greek public organisations (source: researcher’s record keeping of RFP’s about BPR projects): a) the Ministry of Foreign Affairs (homepage - www.mfa.gr) and b) the General Secretariat of Communication – General Secretariat of Information (homepage - www.minpress.gr). The first one was completed in December 2009 and the second one was completed in January 2010. These projects were funded by the 3rd CFS. Greek public administration will announce new RFP’s for BPR projects in the 4th CFS as already mentioned.

Recent changes in Greek economy, including the economic recession and the challenges that the Greek economy has to face, can become a driver of changes that will push forward process improvements.

Greece signed on 6th May 2010 (Greece. Support Mechanism Act no 3845/2010) the agreement with EU and IMF in order to fund its liabilities for the period between 2010 and 2014. Based on this agreement, Greece must reduce its deficit from 13.6% of GDP in year 2009 to less than 3% of GDP in 2014 (target 2.6%). This target will be achieved by increasing public revenues (e.g. tax rates increase, new taxes, tax avoidance reduction, etc) and by decreasing public cost (e.g. public investment reduction, pension decrease, labour cost reduction, etc).

One of the main drivers for reducing public cost is to reduce labour cost. There are three ways to reduce labour cost. One of them is to make civil servants redundant, the other to reduce their salaries and the third is to do both.

As far as the reduction of labour cost by decreasing the number of public employees is concerned, based on s. 40 of the Act (Greece. Employment in the public sector Act 3528/2007), public employees in governmental agencies and publicly owned companies as long as they complete successfully a two-year period in their job positions, they become permanent employees. Based on s. 39 of the same Act, they are permanent as long as their job positions exist.

Additionally, when a public organisation announces job vacancies, it describes the desired skills, e.g. educational level (bachelor, master, etc), type of degree (IT, marketing, etc), years of work experience, etc in a generic way, which makes it difficult to abolish job positions. For example, if a public organisation announces job vacancies about the IT department, it will request for candidates that hold a bachelor degree in IT, a master degree in IT is desired but not obligatory and have at least 5 years of experience in relevant job positions. In this case, it will be difficult for the public organisation to reduce the number of employees in the IT department by reducing the IT job positions because all job positions respond to the same skills, hence it should abolish the IT department in total. Therefore, it is difficult for the Greek government to reduce labour cost by firing public employees.

Moreover, given the high unemployment rate, 11.6% in June 2010, (Hellenic Statistical Authority, 2010), the Greek government will probably try to avoid increasing the unemployment rate. However, based on the revised version of the Support Mechanism Act (Greece. Revised Support Mechanism Act no 3845/2010) which was signed on 6th of August 2010, Greek government committed that it will hire 1 new civil servant per 5 civil servants that are retired. Due to the reduction in the salaries of public servants (see next paragraph), 25.000 public servants have applied for retirement up to September 2010 (Asfalisinet, 2010). This figure was 9.000 last year at the same period. Based on estimations by the General Accounting Department of the Ministry of Finance, this figure will probably reach 35.000 in 2010 and might reach 40.000. Given the ratio for hiring new public employees and the abovementioned trend for retirement, it is obvious that there will be a significant decrease in the number of public employees until the end of 2010. However, this decrease will not be the outcome of any specific reform in the Greek public sector, but an effect of the measures that the Greek government has already taken in order to reduce the deficit as a percentage of GDP.

As far as the reduction of labour cost by reducing the salaries of public servants is concerned, Greek government has already taken a course of actions based on the agreement with IMF and EU. Before outlining these actions, it is crucial to present some key data about the

salaries of public servants. Based on s. 7 of Act (Greece. Public employees' salaries Act no. 3205/2003), public employees receive a basic monthly salary which is €590 for high school graduates, €690,10 for lyceum graduates, €772,90 for technical universities graduates and €808,30 for universities graduates. Based on the same law, they also receive a number of monthly benefits (main categories) depending on their job position (e.g. IT, nurse, doctor, teacher, etc), their hierarchy level (e.g. managers, general managers, etc), their responsibilities (depending on which Ministry they are working for), their marital status (e.g. married, married with one child, etc), their performance (e.g. €86 for high school graduates, €96 for technical universities graduates and €120 for universities graduates). Based on s. 9 of the same Act, they also receive 50% of their monthly salary (basic salary plus the abovementioned benefits) as benefit for Eastern holidays (10 days before Eastern), 50% of their monthly salary as benefit for summer holidays (on the first working day of July) and 100% of their monthly salary as benefit for Christmas holidays (on the first working day after 16th of December).

Based on the s. 3 of Act (Greece. Support Mechanism Act no 3845/2010), Greek government has set a limit of €250 for the benefit for Eastern holidays and summer holidays and €500 for the benefit of Christmas holidays for civil servants whose monthly salary is less than €3000. Civil servants, whose monthly salary is more than €3000, do not receive these benefits anymore. With respect to the other benefits, a total monthly decrease of 12% starting from 1st of January 2010 and an additional decrease of 8% starting from 1st of June 2010 has taken effect based on the same law. Furthermore, the Greek government changed the tax rate of the benefits from 15% (regardless of the income level) to the regular tax income rates (Greece. Taxation Policy Act no. 3842/2010, section 5). These rates vary from 18% to 45% based on the income level. Given the abovementioned actions, it is obvious that the labour cost (measured as the amount of public servants salaries) has been decreased significantly.

Moreover, based on the revised version of Act 3845/2010, Greek government will revise the salary system of public servants and conclude to a new one starting from 1st January 2011. The aim is to reduce the number of benefits and as a result to save up to €450 million per year.

Though there are various definitions on process improvements in the public sector (Sotirakou and Zeppou, 2006; Thong, Yap & Seah, 2000), the abovementioned context indicates that it is necessary to provide a definition for the Greek public sector. At this point, there is no apparent definition of process improvement in the Greek public sector context

because the financial crisis influences the process improvement concept for the Greek public sector. The research can have significant contribution because there is quite limited empirical evidence about process improvement in the Greek public sector, especially under the abovementioned circumstances. In that framework, the main objective of the current research is to explore how and why process improvement is achieved in the Greek public sector context as described previously.

At this point, the researcher summarises that there are five constructs that characterise the Greek public sector context; (a) Greek legislation about public sector employment, (b) use of BPR term, (c) e-government trend, (d) process improvement projects in the 4th CFS , (e) EU and IMF support mechanism. These constructs may determine the answer to the research question.

2.3 SUMMARY

Having in mind not only the lack of researches regarding the process improvement within the Greek public sector (section 2.2), but also the important challenges considering the implementation of a process improvement initiative in the public sector in general as previously described (section 2.1), the researcher will try to examine the following research question in Document 3:

“How and why is process improvement achieved in the Greek public sector?”

In the following sections, the researcher presents the research methodology and methods for examining this research question.

3 RESEARCH EPISTEMOLOGY AND METHODOLOGY

There are many research methodologies in order to perform qualitative research. In this section, the researcher presents these approaches (section 3.2), their differences, while he explains why he selects action research as the research methodology for Document 5 (section 3.3). Before this, he discusses the epistemological issues of this research (section 3.1). In Section 4, he explains why he selects case research for the purposes of Document 3 and how case research fits into the action research for Document 5.

3.1 EPISTEMOLOGY OF RESEARCH: PROCESS THEORY

In management research, process theory gives a clarification regarding 'how'/'why'/'to what extent' something happens. Finally, it has to be pointed out that all natural procedures have compound phases in which the result state of the procedures is not clarified by their input state. Taken into account the aforementioned characteristics of the process theory, the researcher bases the current research on a process theory.

After discussing the epistemological issues of the current research, the researcher summarises the main research methodologies that are appropriate for conducting quantitative research.

3.2 RESEARCH METHODOLOGY

In order to perform process theory, several research methodologies may be used. Taken into account that Document 3 is a piece of qualitative research, the researcher briefly outlines the research methodologies that claim that reality is subjective.

After discussing the main research methodologies for conducting qualitative research, the researcher explains why he uses action research to conduct his research in Document 5 and paves the way for the discussion about how case research in Document 3 fits into action research in Document 5 (see section 4.4).

3.3 WHY ACTION RESEARCH

Regarding the research in Document 5 (section 4.4 discusses under what grounds the researcher combines the case research of Document 3 with action research of Document 5), action research will be used.

In the current research (Document 5 and Document 3 since research in Document 3 will be the first cycle of the action research as explained in section 4.4), the initial idea is that the Greek public sector context and the agreement between Greece and EU and IMF support mechanism (section 2.2) as well as the differences between public and private organisations about process improvement (section 2.1) may influence how and why (main research question – section 2) process improvement can be achieved in the Greek public sector. The researcher follows the idea throughout the research carried out in Document 3 and examines if it complies with what should have happened based on literature review. Then, he will use the research outcomes of Document 3 to conduct the second cycle of action research in Document 5.

Many researchers have used action research as a research methodology to perform research about process improvement. LaGanga (2011) studied a lean process improvement project in a public health care organisation. She tried to analyse a lean process improvement project that was conducted to increase capacity to admit new patients into a healthcare service operation system. She selected action research because she was not only observing action, but also was making action happen and reflecting on it to develop knowledge.

Eriksson (2010) studied a lean construction pilot project in a manufacturer of heavy vehicles. The purpose of his study was to increase the understanding of how various aspects of lean thinking can be implemented in a construction project and how they affect supply chain actors and their performance. He selected action research because he was engaged as a partnering facilitator, responsible for planning and conducting a series of three subsequent surveys and follow-up workshops in the beginning, middle and end of the construction stage.

Nair, Malhotra and Ahire (2010) studied ten Six Sigma process improvement projects in manufacturing and service firms in order to examine the interrelationship among project context, elements, and success. They selected action research because they were engaged with the decision-making, implementation, and change processes in these projects. They were involved with both intellectual work and group work with frequent visits to the

companies, presentations at meetings, written memos, and presentation of final written reports.

Likewise, in this research (Document 3 – first cycle of action research in Document 5, see section 4.4) the researcher has the opportunity to participate as an observant to the project that took place at a Greek public organisation. This helps him to enter the field in order to examine how and why his initial idea may influence process improvement in the Greek public sector.

After discussing the epistemological issues of the current research and the selection of action research as a research methodology in Document 5, the next section discusses why the researcher uses case research to conduct the research in Document 3 and how this approach fits into the action research that he will perform in Document 5.

4 CASE OR ETHNOGRAPHIC RESEARCH

In this section, the researcher discusses the basic characteristics of case research (section 4.1) and ethnographic research (section 4.2) in order to explain why case research is more appropriate for the purposes of the current research (section 4.3) and how case research in Document 3 fits into action research in Document 5 (section 4.4). Finally, he presents the conceptual framework of the current research (section 4.5).

4.1 CASE RESEARCH

Case research is the method that uses cases studies as its basis (Voss, Tsikriktsis & Frohlich, 2002). As pointed out by Eisenhardt (1989), case study is a research strategy that focuses on understanding the dynamics present within single settings. According to Leonard – Barton (1990), a case study is a history of a past or current phenomenon, drawn from multiple sources of evidence. Bryman (2004, p. 49) writes that a case study can use qualitative or quantitative approaches. Though there is a belief that the qualitative approach is the most common, Bryman (2004, p. 50) insists that case study can be used to perform quantitative research. The information included in such cases may derive either from observation and systematic interviewing or from public and private archives.

In order to conduct a case research, one may use different cases from one organisation in order to examine different issues, or to examine the same issue in a variety of contexts in the same organisation (Voss, Tsikriktsis & Frohlich, 2002). The main strong points of case research are that the phenomenon can be studied in its natural setting, that questions regarding why, to what extend and how, are answered with a relatively full understanding of the nature and complexity of the complete phenomenon, and that early, exploratory investigations are carried out where the variables are still unknown and the phenomenon not at all understood (Meredith, 1998).

According to Voss, Tsikriktsis and Frohlich (2002), case studies can be used for different types of research purposes such as exploration, theory building, theory testing and theory extension/refinement. Additionally, Eisenhardt (1989) mentions that case studies may combine several data collection methods like interviews, observations and questionnaires, and they may be used to accomplish various targets, similar to the ones mentioned by Voss, Tsikriktsis and Frohlich (2002).

In any kind of qualitative research, such as case research, data collection and construction pose some specific concerns (Bryman and Bell, 2007, p 423-424). Data construction may for instance be time consuming and additionally can lead to the gathering of large amounts of data. Moreover, subjectivity in the process of data collection and construction is also regarded as one of the disadvantages of case research. Prejudice is able to arise from two sources: the first is the influence of the researcher over the behaviour of the participants and the second is the impact of the researcher's own beliefs.

4.2 ETHNOGRAPHIC RESEARCH

4.3 WHY CASE RESEARCH?

When trying to compare the case research to ethnographic research in order to determine which one of them is more appropriate for the current research, the researcher could point out the following.

Case studies are considered the most appropriate research strategy when three conditions are met. First, when the examined phenomenon cannot be separated from its context. Second, when the focus is on contemporary events, and third when the experience of the actors is important. Therefore, the case study is the most common qualitative research method used in information systems (Myers, 1997), and is particularly appropriate in order to study the information systems in organisations, when the focus is on organisational rather than technical issues. Such a case is the current research. More specifically, in cases like a process improvement initiative in a public organisation, researchers cannot usually provide guidance on how to manage the introduction of new systems. This may result in finding themselves investigating how practitioners implemented and managed change, and developing theories from it.

Summing up, case research seems to be more applicable for the current research. Using case research, the phenomenon can be studied in its natural setting. Therefore, the research question ("how and why" type question) can be answered with a relatively good understanding of the nature and complexity of the complete phenomenon. Moreover, early exploratory investigations are carried out where the variables are still unknown, the phenomenon not at all understood and finally theoretical generalisation is possible.

In the current research, all the abovementioned conditions are met. Firstly, the main research question is a “how and why” type question (section 2). Secondly, the influence of the agreement between Greece and EU and IMF support mechanism (section 2.2) on process improvement paves the way for early explanatory investigation since it is a new theme not only for Greece but also for Europe.

Based on the above arguments, the researcher prefers to exploit mainly the advantages of case research in order to examine how and why process improvement is achieved in Greek public organisations. This requires an in-depth investigation of the situation before and after the change. Hence, there is a need for qualitative approach that will allow him to examine deeper his topic.

After explaining why case research is more appropriate for the purposes of the current research, the next step is to discuss how case research in Document 3 fits into the action research in Document 5.

4.4 ACTION RESEARCH AND CASE RESEARCH

A case research will be carried out as mentioned before.

The main strengths of case research may include the following (Eisenhardt, 1989); a) it increases the likelihood of creating new theory, b) theory is likely to be testable through constructs that can easily be measured and hypothesis that can be proven wrong and c) theory is likely to be empirically valid. On the other hand, the main weaknesses are; a) empirical evidence can lead to extremely complex theory and b) theory may be narrow and strange.

In order to combine action research with case research, one should consider the following. Action research requires the researcher to be an observation participant, as part of a process improvement initiative within an entity. On the other hand, case research requires the researcher to keep field notes regarding what is being performed during the implementation of the process improvement project. Eisenhardt (1989) presents a similar attempt, combining case research with action research. The researcher describes in section 7 how he used Eisenhardt’s model to conduct the current research.

To undertake an action research approach, the following cycle may be used:

Figure 1: Action research by Kemmis & McTaggart (1982)

MacIsaac (1995) also proposed a similar procedure. It is depicted in the following figure:

Figure 2: Action research by MacIsaac (1995)

The researcher aims to explore how and why process improvement can be achieved in the Greek public sector for the purposes of the current research. His initial idea is that the Greek public sector context and the agreement between Greece and EU and IMF support mechanism (section 2.2) as well as the differences between public and private organisations about process improvement (section 2.1) may influence how and why (main research question – section 2) process improvement can be achieved in the Greek public sector. He follows this idea throughout the research carried out in Document 3 and examines if it complies with what should have happened based on literature review. In order to follow this idea, he uses case research in Document 3 as explained in section 4.3. Then, he will use the research outcomes of Document 3 to re-assess how and why process improvement can be achieved in the Greek public sector in order to conduct the second cycle of action research in Document 5. In order to perform the second cycle, he will use case research as well by studying a process improvement project in another Greek public organisation.

Several researchers have used case research in order to investigate process improvement within organisations. For instance, Dangle et al. (2005) perform a case study to examine the process improvement in small organisations. A similar study has also been conducted by Momoh and Ruhe (2006), focusing on industrial companies. Moghdeb, Green and Indulska (2009) also use case studies in order to investigate higher levels of process improvement.

Moreover, a case study approach is also used frequently for conducting qualitative research about process improvement methods (Lean, BPR, TQM, etc), especially in the public sector. For example, Sentanin, Santos and Jabbour (2008) analysed how a Brazilian public research centre implemented business process management highlighting the challenges of change that have to be dealt with in the stage developed by this organisation. Sia and Neo (2008) aimed to clarify the confusion on the work impacts of BPR, specifically, the level of empowerment and work monitoring, by studying the Internal Revenue Service of Singapore which had undergone a BPR project. Kaluarachchi (2010) identified the effect of organisational culture on the total quality management practices by studying a Sri Lankan

public sector hospital. Radnor (2010) examined the transfer of a Lean approach developed by a global manufacturing and logistics company into a large UK Government department. Suarez-Barraza and Ramis-Puyol (2010) presented a successful example of how Lean-Kaizen is implemented in the human resource service process of a Mexican public service organisation.

The case research as a methodology means that the researcher studies what someone else did. In this research, he studies the project undertaken by the company where he works, a project concerning the process improvement in a public organisation. In this case, he has chosen participant observation but also to keep field notes as discussed in section 5. More precisely, in the current research, he observes the project and keeps notes for the progress of the project. Then, based on the notes that he keeps, he creates a list with the topics that he finds interesting to discuss during the interviews with executives of the public organisation but also with the focus group. Therefore, the researcher follows a hybrid case research. He discusses the abovementioned research methods in section 5.

After discussing how case research (Document 3) fits into action research (Document 5), the next step is to discuss the conceptual framework in order to answer the research question.

4.5 CONCEPTUAL FRAMEWORK

In order to answer the research question, it is important to describe a conceptual framework about a process improvement initiative that takes into consideration the five common steps of all management approaches as discussed in Document 2 (section 2.3.2). This conceptual framework consists of five phases which are the alignment of the public agency's strategy with the process improvement initiative objectives, the analysis and evaluation of the as-is situation, the design of the to-be situation, the analysis of moving from the as-is to the to-be situation, and the continuous improvement. These phases are correlated with the common steps of the management approaches presented in Document 2 (section 2.3.2) as follows.

Regarding the value definition, alignment of the public agency's strategic objectives with the process improvement initiative's objectives will be needed in order to define what is valuable for the customer in order to improve it. Moreover, regarding value stream identification, it actually includes the analysis and evaluation of the organisation's situation and the definition of the value chain as well as the relevant problems. The third phase, enabling the continuous flow of activities, actually aims to establish a continuous process flow and

therefore the design of the to-be situation takes place at this phase. The fourth phase refers to the transition to the to-be situation in order to fulfil better the customer's needs. Finally, the last phase is about seeking constant optimization that requires the establishment of a continuous process improvement step. Hence, the desired contribution of this research will be to examine and discuss process improvement to Greek public agencies through these steps.

The conceptual framework of process improvement in the Greek public sector may be summarised as follows, having five basic phases that may include several tasks. These phases can be considered as stages in a process. This relationship is illustrated by a “boxes and arrows” diagram. However, in this case, the relationships are not based on cause and effect, but on logic and proper order (Fisher, 2007, p. 128). The main idea regarding that conceptual framework, is to deal with the issues presented in section 2 (Document 3) and in Document 2 (sections 2 and 3), regarding the decision to adopt process improvement, the settings of its objectives and its implementations in the public sector. This conceptual framework may be summarised in the following diagram. It will be the basis for the research in Documents 3 and 5 about examining process improvement in the Greek public sector.

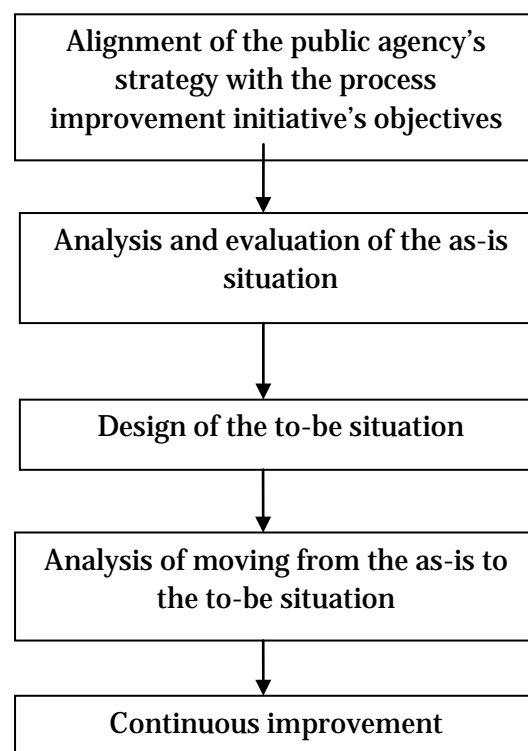


Figure 3: Process Improvement Conceptual Framework

The company that performed the process improvement project in the case study organisation used it (see section 8). It is BPR-oriented because, as already mentioned in section 2.2, the term BPR is used for process improvement initiatives in the Greek public sector.

The researcher uses specific research methods to examine process improvement based on the abovementioned conceptual framework. These methods are presented in the next section. Briefly, he collects data for the first two phases using participant observation, field notes, focus group and in-depth interviews. He uses these methods with secondary data to perform the necessary analysis of the to-be situation and of moving from the as – is to the “to – be” situation. Finally, he combines participant observation, field notes, focus group, in-depth interview and secondary data to collect data about the last phase.

5 RESEARCH METHODS

After having presented the research methodology and the conceptual framework of this research, the next step is to outline the main research methods used within Document 3.

The first research method used to construct primary data is participant observation. As already stated, the researcher is a part of the process improvement initiative when it takes place within the public organisation. Therefore, he can observe the way the process improvement initiative is carried out through all the necessary phases. After all, he is a practitioner, and therefore the observation of the process improvement project is definitely one of the methods to be exploited. Gathering data by observing the process improvement project is significantly useful, as it enables him to have a close relationship with the actual topic of the research and therefore to come to useful outcomes.

The second research method used to construct primary data is keeping “field notes”. Keeping field notes, a strongly related method to the previous one, is commonly used by a practitioner carrying out case research. Therefore, it may be assumed that the combination of these two methods is necessary as well as adequate in order to perform the research and construct the needed primary data.

With respect to participant observation and field notes, a key issue is whether the researcher will have an active or passive role. It is suggested to have a passive role and to observe. Otherwise, he may become biased. A key advantage is that the observer is an eyewitness of the process. He will not have to receive the information from other parties but he will have an eye contact with the research object. However, this means that he focuses on his subject, but he may ignore some other elements or parallel events (Bryman, 2004, p. 302-308). In order to overcome this potential disadvantage, he decides to perform a focus group with project team members of the company that participated to the project and to conduct in-depth interviews with managers of the studying organisation that had a key role to the project.

The third research method, also used to construct primary data, is focus group. Through focus group, the researcher may find new knowledge that cannot be found from the other methods, while he can discuss several issues and listen to different views about the examined topic (Bryman, 2004, p. 348). The focus group occurred among the project team members of the company that participated to the project at the public organisation. It consisted of 8

persons. After the end of the project, the researcher discussed with them about what happened during the project, the possible problems that faced and how they overcame them. The focus group lasted four hours. The researcher had informed the participants prior to the focus group that it may last several hours. They agreed that it would take place as a half-day session. Hence, he received the consent from the managing director of the company about the half-day session. The participants and the managing director selected the day for the focus group to take place. The researcher kept notes during the focus group. He sent the transcripts to all members of the focus group by email for validation. After clarifying all the issues that they raised, he sent the final transcript to them.

For the focus group, Bryman (2004, p. 350-355) notes that it helps the researcher to find valuable information and allow the participants to unveil important data. However, it is not a focused discussion and often it can produce general conclusions. In this case, the researcher uses participant observation and field notes prior to the focus group in order to make a list of the topics to be discussed during the focus group to overcome the abovementioned disadvantage.

The fourth research method used to construct primary data was in-depth interviews. Three managers of the public organisation were interviewed after the end of the project about their views for the project. They were selected because of their key role at the project. One of them was the president of the Managerial Committee, the second one of the Steering Committee and the third one of the Monitoring Committee. Each interview, using a list of open-ended questions (Appendix 1), lasted for two to three hours. The questions were designed based on the issues that the researcher identified as a participant observant. Interview notes were transcribed within the same day. They were then reviewed for consistency with secondary data. Inconsistencies were clarified with the interviewees. Interview transcripts were sent to them by email for validation.

The questionnaire consists of open questions. The usefulness of this kind of questionnaires is that the respondent can develop his/her views upon the examined issue. This is also the reason that the researcher has chosen qualitative research, to have an in-depth analysis of the examined issue. This can happen only with qualitative research and its tools, such as focus groups and in-depth interviews (Bryman, 2004). During the interview, the researcher had also the time to discuss several other issues.

Regarding in-depth interviews, Bryman (2004, p. 320-324) notes that they can produce some unique results since the one-to-one communication allows the parties to build trust and to reveal valuable information. However, in-depth interview is lengthy and the researcher is limited only to a small sample of interviewees. Therefore, he uses focus group and participant observation and field notes as additional sources of primary data.

Apart from the primary data, the researcher uses secondary data. One source of secondary data is the minutes of meetings that are performed during the process improvement project within the practitioner's company and the studying organisation. He, as a practitioner, is not only able to observe the process of the process improvement implementation, but also to attend meetings that are carried out either within his company or the studying organisation. In these meetings, he can keep notes regarding the process improvement initiative that took place at the public organisation, the problems that his company had to deal with during the different phases, as well as the several concerns brought out by either the top or middle management of the studying organisation. These concerns originate by the way that the process improvement is being achieved.

Another source of secondary data is the deliverables of the process improvement initiative that took place in the public organisation. The researcher can gather secondary data from this source in order to triangulate the primary data gathered by the focus group and the interviews. Moreover, he can have access to quantitative data using this source.

With respect to the use of secondary data, Bryman (2004, p. 202-204) notes that the data might be outdated or not in accordance with the research target. In this case, they are not outdated since the interviews and the focus group took place three months after the end of the project. Furthermore, they are in accordance with the research target. Firstly, the minutes of meetings were used as a pool of potential topics to be discussed during the interviews and the focus group. Secondly, the deliverables of the project were used to validate the primary data from the interviews and the focus group.

Therefore, the research about the implementation of the process improvement is actually based on five different research methods. The first four of them, participant observation, keeping field notes, focus group and interviews are related with the gathering of primary data regarding the research topic. On the other hand, the fifth method is used in order to gather secondary data. The fact that these five methods will be exploited at the same time, gives the researcher the ability to reach outcomes that will be far more acceptable and

trustworthy. The data, gathered from these methods, will be triangulated in order to achieve the forming of outcomes and results that will be as objective and less biased as possible (Yin, 2003, p. 46).

The abovementioned research methods are commonly used by several researchers performing case studies in the field of process improvement. For instance, Momoh and Ruhe (2006) exploit both participant observation as well as collection of secondary data, in order to perform their case research. Voss, Tsikriktsis and Frohlich (2002) also exploit participant observation as well as having some kind of “field notes” in their research about operations management. Thong, Yap and Sean (2000) use site visits and multiple interviews with the parties involved in the reengineering project and secondary data such as reports, memos, etc. This multimethod data collection allowed them for triangulating their findings in order to increase the reliability and validity of the results. Likewise, Hines, Martins and Beale (2008) combine participant observation, semi-structured interviews and secondary data in order to test the boundaries of lean thinking in two public legal organisations. Radnor (2010) uses site visits, semi-structured interviews, focus group and secondary data in order to study Lean into a large UK Government department. Grove et al. (2010) triangulate data gathered by semi-structured interviews, document analysis and participant observation in order to present the challenges during a lean implementation within a large primary care trust in NHS UK. Aoki (2008) used semi-structured and unstructured interviews, field notes and secondary data in order to minimise the interviewer’s bias and to increase the reliability of results. Sharma and Hoque (2002) also use secondary data such as internal publications and documents in order to increase the validity and reliability of the primary data collected by interviews for studying TQM implementation in a public organisation. In general, the combination of participant observation, keeping field notes, interviews and secondary data is assumed more than enough in order to perform a thorough case study research.

Having clarified the main research methods to be used in Document 3, the main validity and interpretation issues that may arise are presented in the next section, while the main issues about research ethics are presented in Appendix 2.

6 VALIDITY, RELIABILITY AND INTERPRETATION ISSUES OF THE CASE BASED METHOD

This section discusses the validity, reliability and interpretation issues of the current research.

With respect to the validity of the current research, the researcher discusses four types of validity (Fisher, 2007, p. 295-298). The first one is construct validity. In qualitative research, it refers to whether or not the constructs refer to what they claim they do (Fisher, 2007, p. 296). Bryman (2004, p. 51) argues that in order to check the construct validity of a research, the researcher has to make sure that the questions are close with the aims and objectives of the research and that if someone made the same survey, he would have found the same results. In this respect, the researcher first enters the field (see section 7 step 3) using ethnographic research methods (participant observation and keeping field notes) in order to determine interesting themes to discuss with the interviewees and the focus group at a later stage (see section 7 step 4). Therefore, the questionnaire used to the interviews and the list of topics to discuss with the focus group are close with the social setting and circumstances of the studying public organisation, the Greek public sector context, the EU and IMF support mechanism and the differences about process improvement in public and private organisations. For example, the researcher used questions (see Appendix 1), such as how the organisation was before and after the process improvement project, how the process improvement project was linked with the current economic crisis and changes, etc. These constructs are relevant to the aims of the current research and the nature of the main research question which is a “how and why” type of question. Many researchers in the field of process improvement have used a similar approach to ensure high level of construct validity (Kaluvarachchi, 2010; Radnor, 2010; Suarez-Barraza and Ramis-Puyol, 2010; Suarez-Barraza, Smith, & Dahlgaard-Park, 2009; Sentanin, Santos, & Jabbour, 2008).

The second type of validity is internal validity. In qualitative research, it refers to whether or not there is a good match between researcher’s observations and the theoretical ideas he develops (Bryman and Bell, 2007, p. 410; Fisher, 2007, p. 296). In the current research as mentioned above, the researcher enters the field first (see section 7 step 3) using ethnographic research methods such as participant observation and keeping field notes in order to determine interesting themes to discuss with the interviewees and the focus group at a later stage (section 7 step 4). This means that he can claim internal validity for the current research because the prolonged participation in the social life of a group over a long

period of time allows the researcher to ensure a high level of congruence between and concepts and observations (Bryman and Bell, 2007, p. 410).

Moreover, internal validity issues in case researches arise also when a practitioner who is part of the project performs the research (Amaratunga and Baldry, 2001). In such cases, the research may lead to biased results (danger of the researcher's own subjectivity). Furthermore, another issue that may question the validity of the results is the fact that some managers of the studying organisation may be against the implementation of the process improvement project in their organisation. As already mentioned, such projects usually cause reactions especially in the Greek public sector (section 2). Therefore, it is possible that the data gathered by these managers is also biased. Hence, they can lead to unreliable results (danger of their own subjectivity). Finally, given that the researcher conducted a focus group with the consultants that participated actively to the project, there is also the danger of their own subjectivity. In order to minimise the effect of these internal validity issues, the researcher used two techniques: triangulation and respondent validation (Bryman and Bell, 2007, p. 411; Fisher, 2007, p. 296-297).

With respect to triangulation, the researcher, as already mentioned in section 5, uses five research methods (participant observation, keeping field notes, focus group, interviews and secondary data). The fact that these five methods will be exploited at the same time, gives the researcher the ability to reach outcomes that will be far more acceptable and trustworthy (Yin, 2003, p. 46). This type of triangulation is a common technique in qualitative research about process improvement in order to achieve internal validity (Grove et al., 2010; Suarez-Barraza, Smith, & Dahlgaard-Park, 2009).

With respect to respondent validation, it can be defined as a process whereby a researcher provides the people on whom he or she has conducted research with an account of his or her findings (Bryman and Bell, 2007, p. 411; Fisher, 2007, p. 297). There are two main forms of respondent validation (Bryman and Bell, 2007, p. 411–412). The first one is for the researcher to provide each research participant with an account of what he or she has said to the researcher in an interview or a focus group or of what the researcher observed by watching that person in the course of an observational study. The second one is for the researcher to feed back to a group of people or an organisation his or her impressions and findings in relation to that group or organisation.

The researcher followed the first form of respondent validation. More specifically, he sent back to each interviewee transcripts of what he or she has sent to the researcher and to each member of the focus group an overall transcript of what they discussed with him at the focus group for validation (see section 5). This technique is commonly used to researches about process improvement (Modell, 2009; Aoki, 2008).

The researcher did not use the second form of respondent validation for two reasons. The first one is that he notices by studying several researches in the field of process improvement (e.g. Radnor, 2010; Suarez-Barraza and Ramis-Puyol, 2010; Suarez-Barraza, Smith, & Dahlgaard-Park, 2009) that the researcher sent to the research participants (their role could be an interviewee or member of a focus group or key informant) a draft version of the case study or site report in case the researcher has made a lot of interviews or focus groups. In the current research, the researcher has made 3 interviews and one focus group. The second one is that if the researcher had sent a case study to the interviewees which would have included evidence from the focus group, this might have endangered the relationship between the private company and the public organisation (for more details see section 7 where the researcher describes a different research approach to conduct the current research).

The third type of validity is external validity. It questions whether the generalisations that a researcher has proved in a particular context apply equally well to other populations or contexts (Bryman and Bell, 2007, p. 410; Fisher, 2007, p. 297). The current research is about a process improvement project that took place in a Greek public organisation. Given that this project meets the guidelines of the Greek information Society (see Document 2) about process improvement projects in the Greek public sector, it can be considered as a “representative” project for the Greek public sector. Thus, the researcher may claim that the outcomes of the current research can be generalised for the Greek public sector. Moreover, the fact that theoretical generalisation will be performed for the current research rather than population generalisation minimises the possibility for the research to lead to invalid results. However, the researcher recognises that the outcomes of the current research may not apply to the public sector of other countries and to private companies in either Greece or other countries. Future research could examine the generalisations of the current research to the public and private sector of other countries and make comparisons either with public organisations and/or private companies in other countries.

The fourth type of validity is ecologic validity. It questions if findings obtained from contrived circumstances have validity in the messy complexity of real life (Fisher, 2007, p. 298). Ecological validity concerns qualitative research less than quantitative because

qualitative research is carried out in a real-life, or naturalistic, setting (Fisher, 2007, p. 298). In the current research, the researcher studied the phenomenon in its natural setting, which was a process improvement project in a Greek public organisation. As with credibility, he provides enough information about the context of the current research (see section 2) so that the reader can conclude about the ecological validity of his findings.

With respect to the reliability issues of the current research, the researcher discusses two types of reliability (Bryman and Bell, 2007, p. 410). The first one is internal reliability. It questions whether or not, when there is more than observer, members of the research team agree about what they see and hear (Bryman and Bell, 2007, p. 410). In the current research, there was only one observer, thus there is no internal reliability issues for the current research.

The second one is external reliability. It is defined as the degree to which a study can be replicated (Bryman and Bell, 2007, p. 410). This is difficult to achieve in qualitative research, as it is impossible to 'freeze' a social setting and the circumstances of an initial study to make it replicable. Bryman and Bell (2007, p. 410) suggest that a qualitative researcher replicating ethnographic research needs to adopt a similar social role to that adopted by the original researcher. Otherwise, what a researcher conducting a replication sees and hears will not be comparable to the original research.

Theoretically, another researcher could follow the same research methods to study a process improvement project in another Greek public organisation that meets the guidelines of the Greek Information Society having the same social role (participant observation). In this respect, the social setting and the circumstances of this other project might differ from those of the current research. However, given that the other project would follow the same guidelines and take place in the Greek public sector context (e-government trend, EU and IMF support mechanism, legislation about public sector employment, etc), and that the other researcher would have the same role and use the same research methods, this would minimise the differences of the social settings and the circumstances between the current research and the replicated research. On the other hand, if the other researcher tried to perform the same study (how and why process improvement can be achieved) at a different context (e.g. public organisation in another country or private company in Greece or in another country), the current research would be difficult to be replicated since the social setting and the circumstances of the different context might have differed highly from those of the current research.

Another issue was the interpretation of the research findings. The researcher has worked in a number of projects that included primary research and interpretation of data. His experience along with the research model that relied on triangulation helped him to interpret the findings with as less bias as possible.

After having discussed the research methodology, the research methods and the validity, reliability and interpretation issues of this research, the next step is to discuss the rigorousness of the research.

7 PROCESS OF BUILDING THEORY OF CASE STUDY RESEARCH

Eisenhardt (1989) has developed a framework for building theories from case study research. The researcher uses this framework because it is appropriate especially in new topic areas. As discussed in section 2, process improvement in the Greek public sector is a new topic in Greece and has some “anomalies” compared to the process improvement concept as applied in Western countries. Thus, he argues that this framework is appropriate in order to build theory about process improvement in the Greek public sector context based on case study research (section 8). He presents the steps that took place in his research based on Eisenhardt’s framework (1989).

Step 1: Getting Started

The first step is to formulate the research problem. In this respect, he defines the research question “How and why is process improvement achieved in the Greek public sector?”. He argues in the literature review that this question is interesting for three reasons. Firstly, not much has been said in the literature about process improvement in the public sector. Secondly, there is a gap in the literature about process improvement in the Greek public sector. Thirdly, the newly reforms in the Greek public sector due to the agreement with EU and IMF cause interesting changes about how Greek government can reduce public cost. These changes are not the outcome of process improvement initiatives. Hence, they set some limitations about what process improvement can achieve in a Greek public organisation.

He wants to theorise how and why process improvement is achieved in the Greek public sector given the emerging changes due to the supporting mechanism from EU and IMF and the existing legislation concerning the Greek public sector. Ideally, he should follow a clean theoretical state. However, he has some preordained theoretical perspectives. One perspective is that the agreement between Greece and EU and IMF boost changes due to political decisions and not process improvement initiatives. This perspective refers to the “why” part of the research question. The other one is that the status quo of the Greek public sector (e.g. legislation about public sector employment, etc) set limitations about the possible outcomes of a process improvement initiative. This perspective refers to the “how” part of the research question.

Step 2: Selecting Cases

He uses one case study of a process improvement initiative in a Greek public organisation. This initiative meets the guidelines of Greek Information Society about process improvement projects (see Document 2). Hence, it can be considered as a “representative” process improvement project for the Greek public sector. Moreover, the fact that theoretical generalisation will be performed for the purposes of this research rather than population generalisation, minimises the possibility for the research to lead to invalid results.

With respect to cross-case analysis within the case study organisation, he selects three “process-cases”. There are three reasons why he selects them. Firstly, he bases the description of the processes on the conceptual framework presented in section 4.5. Thus, he selects process-cases that follow all the steps of this framework. He decides to use this criterion because it is important to study the implementation of the proposed-to-be situation of the processes, even at a pilot implementation level, in order to study the outcomes of the improvement. Secondly, as discussed in section 2.2, there is a general trend in the Greek public sector from government to e-government. He selects two ICT-based processes and one non ICT-based. He aims to examine if the ICT parameter influences the “why” and/or “how” part of the research question. Thirdly, he selects these process-cases in order to provide examples of polar types (e.g. no existing measurement system, additional human resources despite the financial crisis in the Greek public sector, etc). Appendix 3 presents the selection of the cases based on these criteria.

Step 3: Entering the Field

He does not follow Eisenhardt’s model (1989) at this point. Based on this model, the third step is Crafting Instruments and Protocols. The reason that leads him to the decision to choose not to follow the model is that he prefers to enter the field without having knowledge of the project, its course and results. This allows him to create a shortlist of topics that he examines with the executives of the public organisation and focus group (active participants in the project) on the fourth step in order to have a critical reflection of what happened within the project. In this way, he creates a list of the subjects to discuss with the focus group and the executives of the organisation (in-depth interviews). At the same time, he keeps field notes that enrich these discussions.

He uses participant observation for entering the field. He is a part of the process improvement initiative when it takes place within the public organisation. Therefore, he can observe the way the process improvement initiative is carried out through all the phases.

Furthermore, he keeps field notes during each phase of the project. By that way, he writes down whatever impressions in order to discuss them with the interviewees and/or the focus group. The discussion about these research methods takes place in section 5.

The purpose of using participant observation with field notes is twofold. Firstly, he can overlap data analysis with data collection in order to make any necessary adjustments during the data collection process. Secondly, he can adjust the questionnaire used during the interviews (e.g. add new questions) and add new themes during the focus group.

The abovementioned flexibility in the data collection process allows him to probe emergent themes. For example, the studying process improvement initiative started in February 2009 and completed in January 2010. During this period, there was a big change in the Greek public sector status which resulted by the support mechanism of EU and IMF. Although the relevant law was voted for in May 2010 (see section 2.2), its articles about civil servants' salaries and hiring rate have taken into effect from January 2010.

Step 4: Crafting Instruments & Protocols

Based on Eisendhart's model (1989), this is the third step, but for reasons explained in Step 3, he uses Crafting Instruments & Protocols as a fourth step. He uses multiple data collection methods in order to triangulate the results of his research. He collects both primary and secondary data.

As far as primary data are concerned, he uses the following methods in order to collect primary data. Firstly, he conducts interviews with the president of the Managerial Committee, the president of the Steering Committee and the president of the Monitoring Committee. He selects to interview them due to their key role to the process improvement project. Secondly, he conducts a focus group with the team members of the company that undertook the process improvement initiative in that organisation. This method gives him the opportunity to allow team members to reflect on the project. As far as secondary data are concerned, he uses the project deliverables in order to crosscheck what has been discussed during the interviews and the focus group. Moreover, he can have access to quantitative data by this method. The discussion about the abovementioned research methods takes place in section 5.

Step 5: Analysing Data

He selects three process-cases as already mentioned. He uses within-case analysis in order to describe each case. He uses a common structure to present each case based on the conceptual framework discussed in section 4.5. The description of each process-case takes place in sections 8.2, 8.3 and 8.4 respectively. Thus, he makes a list of the main themes to discuss for each step of this framework. The themes stem from the literature review and the research problem. The following table summarises the relation between steps and themes.

Table 1: Process Improvement Steps - Themes

Process Improvement Steps	Themes
Alignment of the public agency's strategy with the process improvement initiative's objectives	Why is the process-case selected for improvement How is it selected for improvement
Analysis & evaluation of the as-is situation	What are the steps of the case-process What are its main problems Is there any type of measurement system
Design of the to-be situation	Which steps are changed Why are they changed How do these changes contribute to the improvement of the process
Analysis of moving from the as-is to the to-be situation	What is the proposal for moving from the as-is to the to-be process How is this proposal concluded
Continuous improvement	How does the pilot implementation of the process-case take place Are there any divergence between the designed and the actual implementation of the process-case What are the corrective actions that need to take place in order to minimize the effect of any divergence

The next step is to perform the cross-case analysis. Cross-case analysis takes place in section 8.5. Based on the themes presented in Table 1, he discusses the differences and similarities of the cases. Furthermore, he links the outcome of this discussion with the implications of the Greek public sector status (e-government trend, EU and IMF support mechanism, legislation about civil servants employment, etc) on process improvement.

Step 6: Shaping Hypotheses

According to Eisendhart's model (1989), in this step he will have to design his hypotheses. The current research is qualitative, hence he will not have to prepare hypotheses but propositions. He has made a different interpretation of this step from what Eisendhart's model (1989) is about in order to fit better with the logic of the current research. More precisely, he initially tries to define the constructs related with the process improvement in the Greek public sector. The constructs do not include any quantified elements. Hence, in the current research he tries to understand the relation among constructs related with the process improvement and to draw the related propositions (Bryman, 2004). He uses the findings of within-case and cross-case analysis in order to sharpen the constructs. Moreover, he finds evidence that "formulate" these constructs in the three process-cases.

The next step is to examine the relationship of these constructs with process improvement. At this point, he tries to verify the emergent relationships between constructs and process improvement by using case evidence from the three process-cases. He examines these relationships per process-case.

Step 7: Enfolding Literature

He examines whether his research results are similar to the literature or not. This discussion takes place in section 8.5. This comparison gives him the opportunity to find the underlying reasons why his research results are similar to the literature or not. The research outcomes provide deeper insights into process improvement in the public sector and the conflicting/similar literature. Thus, he sets the limits of generalisability in the Greek public sector context and explains the underlying reasons why his research results are similar or not to the literature based on the characteristics of this context. Another literature topic that he aims to unfold is the definition of process improvement in the Greek public sector.

Step 8: Reaching Closure

He has to cope with two issues in this step. The first one is about when to stop adding cases. As already mentioned in step 2, the first criterion is that all process-cases go through all the steps of the conceptual framework mentioned in section 4.5. This criterion reduces the number of potential cases to select and creates a subset of process-cases. The second reason is to examine if the ICT parameter influences the answer to the research question. He notices that all process-cases of the abovementioned subset that are ICT-based have the same main characteristics (e.g. high effectiveness, core processes, etc) with the two selected ICT-based process-cases. Likewise, non ICT-based processes of the subset share the same main

characteristics with the selected non ICT-based process-case. The other criterion is to provide examples of polar types; a) no use of measurement system and b) need for more human resources. He notices that these two polar examples are the only polar examples that exist in the subset of the process-cases. Therefore, he argues that any additional process-case would not make any marginal contribution to the research.

Moreover, he examines if three process-cases are enough to reach closure. Given this number, the external generalisability of the findings is limited. The fact that theoretical rather than population generalisation will be performed in this research minimises the possibility for the research to lead to invalid results. Moreover, the case study can be considered as a “representative” case of the process improvement projects that will take place in the Greek public sector in the future for reasons mentioned in section 6. This issue will be validated or not in Document 5, as more process improvement projects and process-cases will be examined there. Finally, it should be noted that it is the quality of the theoretical inferences, which are made out of qualitative data, which is crucial to the assessment of generalisation.

The second one is about when to stop iterating between theory and data. He tries to find the underlying reasons why his research results are similar or not to existing literature. Therefore, he develops a list of all the themes that needs to look deeper in order to explain these reasons. For each theme, he tries to correlate the research results with these reasons. Once the correlation is completed, then he stops iterating between theory and data.

The abovementioned research approach has the following limitations. Firstly, the researcher conducted the interviews and the focus group after the end of the project. This means that both the interviewees and the members of the focus group might have not provided him with accurate information about what happened during the first steps of the project. He attempted to address this limitation by retrieving information from secondary data, such as project deliverables and meetings. Moreover, the conduction of the interviews and the focus group after the end of the project means that he could not ask the interviewees and the members of the focus group about any fluctuations or changes of their opinions about the project while he observed them (participant observation). The researcher attempted to address this limitation by asking them about these changes during the interviews and the focus group, but he recognises that it is more insightful to collect data when a phenomenon takes place.

Secondly, the researcher did not receive any feedback from the interviewees about the opinion of the consultants for the project and vice versa. This could have helped him to increase the internal validity of the current research and to receive more insightful research findings. He could have sent them an initial description of the case study using evidence from both the interviews and the focus group. Then, the research participants could have commented not only to what they have said but also to what the other research participants have said. He did not follow this respondent validity because it could endanger the relationship between the private company and the public organisation. In this respect, he attempted to address this limitation by using a different respondent validity as described in section 6 (sent transcripts to research participants for validation).

Finally, the researcher discusses two alternatives for carrying out the current research in order to get more rich and insightful research results. The first one would be to use a more iterative research approach between the steps of the Eisenhardt's model (1989). As discussed earlier, the researcher enters the field first (step 3) and then he conducts the interviews and the focus group (step 4). One alternative would be to enter the field for the first process improvement step (see table 1), then conduct the interviews and the focus group for this step, analyse the data (step 5) and define the constructs related with the process improvement in the Greek public sector (step 6) based on the first step. Then, based on this analysis, he could enter the field again for the second process improvement step and follow this pattern for all the steps (Table 1). This approach would probably allow the researcher for probing more in-depth to the experiences of the interviewees about the project and allow the consultants to reflect more about the project.

Modell (2009) used a similar approach to examine how organisational experimenting with TQM and the balanced scorecard affects the bundling of design characteristics associated with these innovations in a Swedish central government agency. He conducted a first round of interviews aiming at probing into the experiences of the interviewees about TQM and balanced scorecard. The preliminary analysis of these interviews and documents provided by the government agency (e.g. internal planning documents, memos, etc) revealed some interesting connections between the organisation's experimenting with different management techniques and its ongoing development of strategic planning and performance management practices. Therefore, he conducted a second round of interviews in order to examine these connections in greater detail.

This approach has two main advantages compared to the one that the researcher followed. Firstly, the interviewees and the members of the focus group could have provided him with

more accurate and rich data about the project if the interviews and the focus group had taken place after the end of each step, because their experiences about the project would have been very recent in their minds. Secondly, this approach could contribute to more insightful results since the researcher would have been able to observe any fluctuations or changes of the opinion of the interviewees or the members of the focus group during the project (from the one process improvement step to the next step) which could trigger more in-depth discussions with them.

However, the researcher did not follow this approach for two reasons. The first reason is the time availability of the interviewees and the focus group. This approach would mean that he should interview 5 times each interviewee and performs 5 times the focus group, each time after the end of each process improvement step. The researcher argues that this would not be very feasible since the interviewees were top-level managers in the public organisation and their availability was very limited. Moreover, he argues that the members of the focus group were very busy with the project as well.

The second reason relates to the concept of case research. In case research, the researcher studies what others are doing. In this respect, he recognises the possibility that any reflective discussion with the focus group after the end of each process improvement step might influence the course of their work. It is possible that if the focus group had a discussion with the researcher asking them their opinion about what went wrong during each step, what could have been done better, etc, this might have influenced their stance towards the project, e.g. try to use another method, etc. Likewise, given that the three interviewees were the presidents of the three committees of the project, such discussions after the end of each process improvement step might have influenced their cooperation with the private company. For example, questions like what went wrong during the first step, what could have been done better, etc may be interpreted by the interviewees that the private company does not perform a good work. In this respect, the researcher might have influenced up to a point what would have happened during the project.

The second alternative to conduct the research would be to use a different form of iteration than the abovementioned. After gathering the material from the focus group, the researcher could conduct a second round of interviews based on this material. Then, he could conduct a second round of focus group based on the material gathered by the second round of interviews. By that way, he could perform a “dialogue” between the interviewees and the members of the focus group that could generate more in-depth and interesting themes than the ones generated by the research approach that he used.

Nair, Malhorta and Ahire (2010) used a similar approach in order to develop a theory of managing context in six sigma projects. The data collection process was an iterative collaborative effort between the research team and the client team.

He did not use this research approach for two reasons. The first issue that this approach raises is if he should have informed the interviewees and the members of the focus group for this research approach. In case he would have informed them, then the interviewees might have not participated to the interviews at all or might not feel free to discuss their experience about the process improvement project and therefore be too politically correct. Moreover, the members of the focus group might have avoided discussing issues that could be offending for their client. Hence, in case the researcher would have informed them about this approach, he would not have gathered in-depth data. In case, he would not have informed them about this approach, but actually would have followed it, this would raise ethical considerations about the research. The second reason that the researcher did not follow this approach is that it might have endangered the relationships between the private company and the public organisation. By that way, the researcher might have harmed mainly the private company because it might have lost its client.

After having discussed the use of Eisenhardt's framework (1989) in order to build theory about process improvement in the Greek public sector context, the next step is to present the case analysis.

8 CASE ANALYSIS

8.1 INTRODUCTION

As already mentioned, two process improvement projects have been completed in the Greek public sector: a) the Ministry of Foreign Affairs (homepage - www.mfa.gr) and b) the General Secretariat of Communication – General Secretariat of Information (GSC-GSI, homepage - www.minpress.gr). The first one started in June 2009 and ended in December 2009 and the second one started in February 2009 and ended in January 2010. These projects were funded by the 3rd CFS. The second one will be presented in the context of this research. The reason for choosing this organisation is that the researcher had the opportunity to participate as a participant observation in the project that occurred in this organisation since he works for the firm that undertook this project.

The researcher selected three process-cases based on three criteria (see section 7, step 2). Firstly, they all followed the steps of the conceptual framework presented in section 4.5. Secondly, he used two ICT-based and one non-ICT based process in order to examine the effect of e-government trend in the Greek public sector as discussed section 2.2. Thirdly, he selected the process-cases to provide evidence from examples of polar type, such as the lack of performance measurement systems in the Greek public sector. Appendix 3 presents the selection of the cases based on these criteria.

The mission of GSC-GSI is to provide the public with objective information, inform state services and public sector agencies of major international events, contribute to the enhancement of relations with Greeks living abroad, participate to state policy - shaping and pursue international developments in the wider field of information and communication media, by undertaking legislative and normative initiatives.

GSC-GSI provides online accreditation services for media representatives wishing to cover special events, for which its services set up fully equipped Press Centers to facilitate the work of the media. It provides online all the necessary applications forms for a permit to photograph or videotape in museums, monuments and archaeological sites. Moreover, it provides online subscription service for receiving the Daily Briefing by the Government's Spokesman.

Finally, it provides a wide set of services to media professionals. It classifies cinema films as well as cinema trailers, according to audience age groups, and the granting of the relevant licenses. It grants certificates for musical pieces, based on specific information (title, composer, singer, lyricist, musical notes) as a proof of copyright. It grants licenses to film scenes (apart from sites such as military bases, archaeological sites, ports, etc where special license is required) such as for cinema and television, as well as trailers, based on the filming script which is submitted to the competent independent Committee. It grants license for foundation, installation and function of the private radio and TV stations. It is in charge of the accreditation of the foreign press correspondents as well as assisting them substantially in the exercise of their journalistic profession. It provides access to its film and photographic archives.

The basic aim of the project was to ensure that GSC-GSI would improve its processes based on ICT functions. This would help the organisation to improve the quality of its services, provide Greek and foreign citizens with accurate information, reduce bureaucracy and lead times on its processes, and finally promote e-governance in every level of Greek public administration.

In order to understand how and why process improvement is achieved in a Greek public organisation, the researcher needs to examine the different phases of the process improvement initiative. Therefore, the case analysis is organised chronologically around the five phases of the conceptual framework discussed in section 4.5. This conceptual framework was used by the company that performed the process improvement project in the case study organisation. This is commonly used in the historical tradition of case studies (Mason, McKenney & Copeland, 1997; McKenney, Mason & Copeland, 1997; Dyer and Wilkins, 1991). The main steps that took place per phase are outlined as follows.

Alignment of the public agency's strategy with the process improvement initiative's objectives

The purpose of this step was to align the process-case objectives with GSC-GSI's strategy in order to define the strategic orientation of its improvement. Team members mentioned that they used the organisation's vision and interviews with the two General Secretaries and top managers.

Analysis & evaluation of the as-is situation

The next step was to identify and analyse the process in order to identify its main problems. As discussed with the focus group and verified by examining Deliverable 1: “Analysis of current situation of GSC-GSI”, the following tasks took place.

Firstly, GSC-GSI middle managers informed the contractor about the process owners. Secondly, the project manager on behalf of the contractor arranged an interview with them. Thirdly, prior to the interview, team members of the contractor identified a list of features about the process that should be retrieved from the interview. These features were (Deliverable 1): a) goal, b) steps, c) input(s), d) process category, e) frequency, f) cost, g) duration, h) risk level and i) output(s). Fourthly, they developed a semi-structured questionnaire. The next step was to conduct the interview using the questionnaire. They transcribed the information and they sent the transcripts to the interviewees for validation. After having received the transcripts, they analysed the relevant information about each process.

The President of the Managerial Committee said that “Business Process Management Notation was used for modelling the as-is processes because a critical mass of the GSC-GSI employees was already acquainted with this notation”. The diagram of each process was designed using a business process management tool.

Design of the to-be situation

The next step was to design the to-be situation of the process. Since there were no data available in order to compare the values of the proposed indicators of the previous step, the only input to design the to-be situation of the process were the problems that the process owners mentioned during the interviews with the team members.

Analysis of moving from the as-is to the to-be situation

The aim of this step was to make a plan about the necessary tasks that would need to take place in order for the organisation to execute the to-be situation of the process. Therefore, the outcome of this step was to identify the necessary tasks that should take place in order to move from the as-is to the to-be situation of the process and to assign the relevant responsibilities.

Continuous improvement

GSC-GSI in cooperation with team members decided how the pilot implementation of each process would take place within the timeframe of the project. Then, the outcome of each pilot implementation was compared with the designed outcome of the to-be situation. Finally, the researcher discussed with the interviewees how GSC-GSI implemented the proposed changes after the end of the project.

He uses three process-cases to answer the research question for reasons as already mentioned. These process-cases are presented below (sections 8.2, 8.3 & 8.4) and a cross-case analysis takes place at section 8.5.

8.2 PROCESS-CASE A

The title of the first process-case is “Provision of accreditation services to foreign journalists or foreign broadcasting channels”. Its purpose is to provide online accreditation services for media representatives wishing to cover special events, for which its services set up fully equipped Press Centers to facilitate the work of the media. It provides online all the necessary applications forms for a permit to photograph or videotape in museums, monuments and archaeological sites. The value of this process is that media representatives can apply for their permits online instead of mailing official letters to GSC-GSI, which would mean that they would receive their permits later. Moreover, given the negative publicity on foreign media about Greece due to its financial situation, it is important for GSC-GSI to facilitate media representatives to come to Greece in order to cover events that can promote Greece abroad and to counteract the negative publicity. The researcher discusses further the issue of value in section 8.5.

The outcomes of the improvement of this process were the following. A process performance measurement system was created, which did not exist prior to the project, while the executives of the organisation became familiar with the concept of performance measurement. Another benefit was the reduction of the time needed to perform the process since there was not a need for approval from third parties, while the issue of permit for media representatives – which was in the Greek language - occurred in the English language.

Alignment of the public agency’s strategy with the process improvement initiative’s objectives

The President of the Monitoring Committee stated the organisation’s vision, as it was expressed by the two General Secretaries when they first undertook their duties in 2004, “The provision of services in the fields of information and communication, promotion of the country worldwide and the monitoring of media, reliably and effectively, contributing decisively to the upgrade of media in Greece as well as to the development and maintenance of a positive image for Greece by other countries”.

In this respect, this process-case provides services in the field of communication since foreign media and/or journalists can arrange to cover events in Greece by this service. Secondly, it contributes to the promotion of Greece worldwide since the topics of these events concern photograph or videotape in museums, monuments and archaeological sites. Thirdly, it contributes to the development and maintenance of a positive image for Greece by other countries because of the information that is communicated through these events to the

citizens of other countries. Usually, this information concerns about Greece's ancient history, its touristic attractions and cultural events. Thus, this information enhances positive publicity for Greece.

As far as the interviews during the process improvement initiative are concerned, a focus group member mentioned, "The manager of the International Public Relations Department of GSC-GSI stressed that many journalists make complaints about delays in the execution of this process". Moreover, she mentioned that there were no performance measures, e.g. number of complaints. The lack of measurement indicators was verified by Deliverable 1. Given the importance of this process for the organisation as analysed by its vision and due to the complaints of journalists, the contractor and top managers of GSC-GSI agreed to select this process for improvement. The researcher discusses further why the process-cases were selected for improvement in section 8.5.

Analysis & evaluation of the as-is situation

In this case, the process owners were the International Public Relations Manager of the organisation and a key person responsible for setting up Press Centers. The interview lasted two hours. During this phase, focus group members said, "there were no quantitative data kept regarding the complaints made by the journalists even though the staff of the International Public Relations Department received a lot of complaints".

The following table summarises the data gathered about this process. These data were gathered by team members during the interview with the process owners. The following template was proposed by the contractor and agreed upon with the Presidents of the three committees of the project.

Table 2: Process-case A info

General Info	
Code	Da3
Division	Public Relations
Department	International Public Relations
Other stakeholders	(Depending on the request from journalists) Ministry of Culture, Ministry of Internal Affairs, Ministry of External Affairs, Ministry of National Defence, Ministry of Maritime Affairs, Municipalities, National Tourism Organisation
Title	Provision of accreditation services to foreign journalists or foreign broadcasting channels
Clients	Foreign journalists and media
Outputs	Grant licence to photograph or videotape in museums, monuments and archaeological sites
Templates	Application for permission to photograph and/or videotape in museums, monuments and archaeological sites
Process Parameters	
Importance	High
Frequency	Ad-hoc
Category	Administrative
Risk level	Average
Duration	10 days
Human Resources	One employee (university's degree)
Estimated cost	€737 per se
Use of IT	Livelink

The following diagram depicts the steps of this process.

Da3.Provision of accreditation services to foreign journalists or foreign broadcasting channels

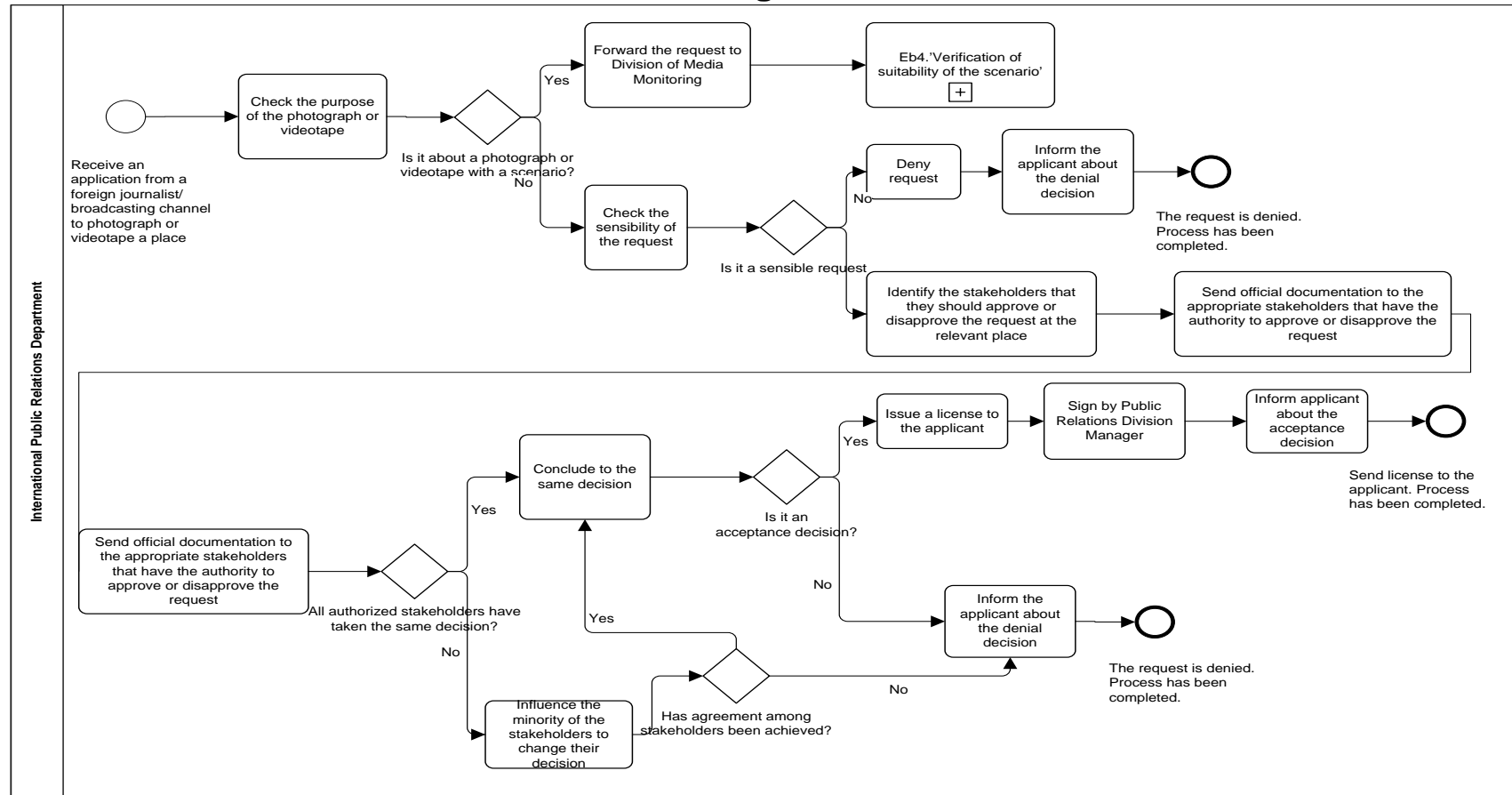


Figure 4: Process-case A as-is diagram

After having mapped and analysed the process, the next step was to evaluate it. A focus group member said, “we found out during the interview with the process owners that they did not use any measurement system, not even a simple indicator, to measure the performance of this process”. The president of the Monitoring Committee when asked by the researcher why they did not use any type of measurement for such a core process, he said, “We are not used to the concept of measurement. I am here 20 years and no one has ever asked me to measure anything. I am not used to give such reports and I am sure that this is pretty much the case for every manager here”.

The lack of measurement indicators forced the team members of the contractor to develop some performance indicators about this process. They are outlined as follows (Deliverable 1); a) Number of licenses issued to foreign journalists or broadcasting channels, b) Number of applications that were denied, c) % of applications denied by other stakeholders, and d) Impact measurement about the opinion that foreign journalists and broadcasting channels have about the level of service provided by the International Public Relations Department (use of online questionnaire).

The abovementioned indicators were discussed at a later stage with the process owners and then presented to the Monitoring and the Managerial Committee of the project for approval. After their approval, team members move onto measuring them using data provided by the International Public Relations Department. Hence, they set the basis for future measurements. One focus group member said that “The main problem with setting the measurement basis from scratch is that there not any comparable data, so you can not tell if they are doing a good job or not by just looking at the indicators”. Therefore, team members, the Managerial and the Monitoring Committee decided to use this basis to compare with the to-be situation of the process.

Another issue that was discussed during the interview of the team members with the process owners was about the problems of the process. They are outlined as follows (Deliverable 1). Firstly, other stakeholders deny the request of journalists without any apparent reason (see above diagram control point: is it an acceptance decision?). Secondly, the Ministry of Culture (stakeholder for permitting videotaping and photo shooting in archaeological places) usually delays to issue its license. The result is that foreign journalists receive their licenses after coming to Greece. This delay lowers the quality of service that GSC-GSI provides even though it is not its fault. Thirdly, the Ministry of Culture issues its license only in Greek. Thus, this documentation is not useful to foreign journalists and broadcasting channels that they need to be informed about the fees that they should pay for the photo shooting or the

videotaping. Furthermore, it includes a description of the administrative responsibilities of the journalists e.g. send copy of their work to tax office. One focus group member said, “International Public Relations Manager told us that the Press and Communication Offices Abroad undertake the translation of this document”. Fourthly, another focus group member said, “we were asked by the process owners to re-identify the recipients of the license as it was their impression that most of them did not have to receive it”.

Design of the to-be situation

Team members made some recommendations about how the organisation could cope with these problems. They presented them to the Monitoring Committee at first and then at the Steering Committee because this process is of vital importance for the organisation. The president of the Steering Committee said, “there were few processes that we wanted to hear good ideas about how to improve them. This was definitely one of them”.

These recommendations as discussed during the focus group and studied in Deliverable 3: Design of the to-be model of GSC-GSI, are the following. Firstly, the issue of the license was proposed to be made both in Greek and in English or in Greek adding a document describing in English the administrative responsibilities of the foreign journalists after arriving in Greece. Secondly, GSC-GSI should reconsider the involvement of other stakeholders in this process. It was proposed to the two General Secretaries to suggest a law to the Minister of Press, which would provide GSC-GSI the authority to decide whether foreign journalists and broadcasting channels would receive the relevant license. Thirdly, since GSC-GSI would have the authority to deny or accept the relevant request by foreign journalists and broadcasting channels, it was suggested that the license would be sent only to the Ministry that is responsible for the place of the videotaping or the photo shooting.

The members of the focus group said that they proposed to the committees a more radical approach how to improve this process. The initial proposal was to develop a portal where the journalists could submit their applications and receive their permits (‘one-stop shop’). This portal would be integrated with the IT systems of all the relevant stakeholders (GSC-GSI, Ministry of Culture, etc). One member of the focus group said, “We thought that they would be interested for this proposal given the e-government trend in Greece”. Another member added, “the Steering Committee told us that it is too radical proposal...it may cause a lot of reactions”. The researcher discusses further why incremental changes took place in section 8.5.

After discussing these recommendations with the two committees, team members designed the to-be situation of the process using the same business process management tool and notation. The diagram below depicts its to-be situation. The main difference with the previous diagram is that the process takes place only within the International Public Relations Department and there is no communication with other stakeholders. The other difference as already mentioned is in the language of the license.

Nb2.Provision of accreditation services to foreign journalists or foreign broadcasting channels

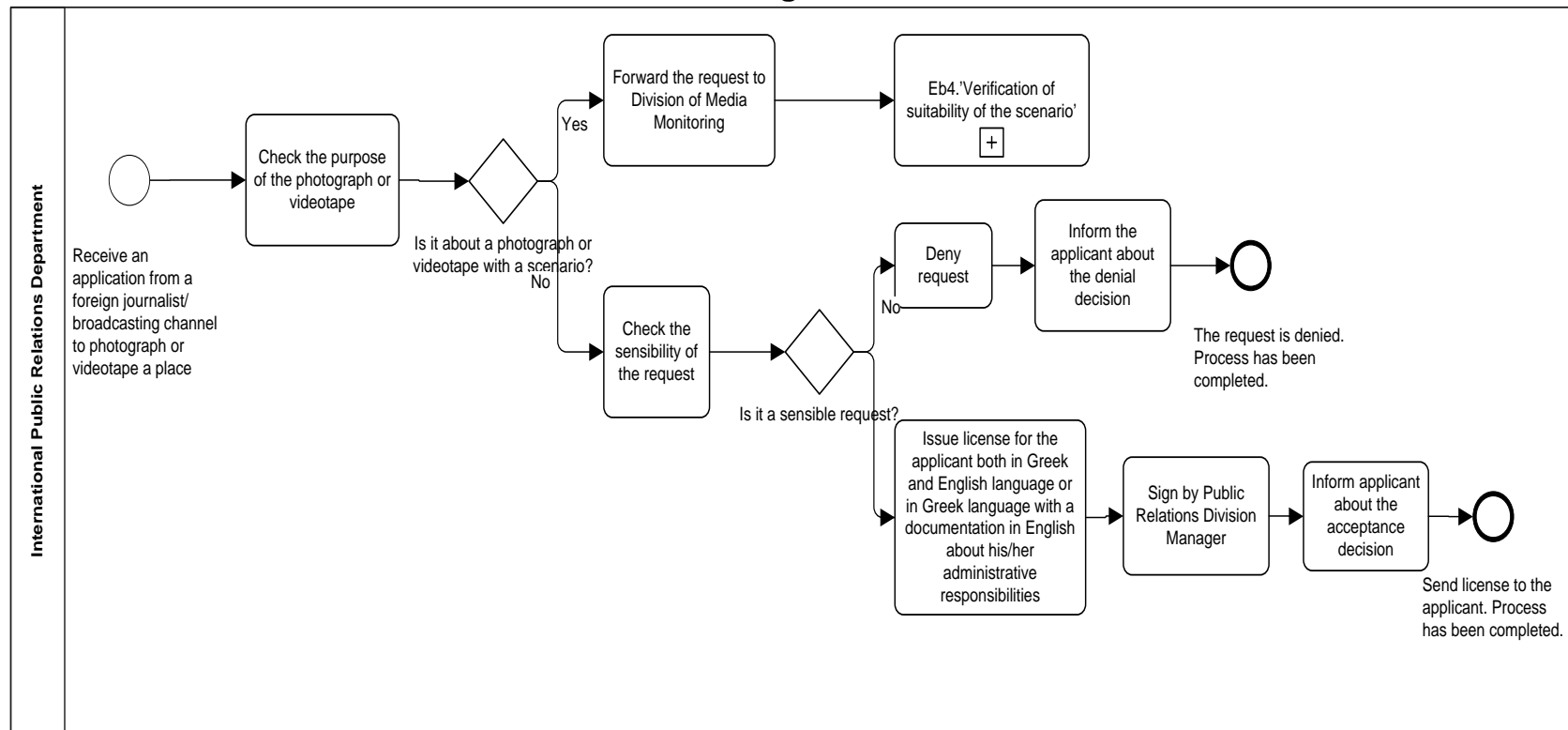


Figure 5: Process-case A to-be diagram

The next task was to define the type of improvement that is desired for this process. For reasons explained in step “Alignment of the public agency’s strategy with the process improvement initiative’s objectives”, process improvement was defined as the reduction in the duration of the process due to the changes in its steps *ceteris paribus*. Team members used the simulation module of Casewise Corporate Modeler in order to estimate the duration of the to-be situation. The simulation outcome was that the to-be process would last around 4 working days instead of 10 as mentioned by the process owners to team members during the second phase.

Analysis of moving from the as-is to the to-be situation

Given the abovementioned changes, the following tasks were suggested. Firstly, team members informed the Steering Committee that top management should decide who is going to translate the license in English. One focus group member said, “the Steering Committee suggested that the Press and Communication Offices Abroad should undertake this task”. Yet, after several meetings with the team members, the Steering Committee was persuaded to assign this task to the International Public Relations Department. Team members underlined the fact there is no reason to send the license for translation to Press and Communication Offices Abroad because this action would delay the execution of the process.

Secondly, team members suggested to the Steering Committee that the General Secretaries should be informed about the type of change in the steps of the process. This change needs a political influence in order to be performed.

Continuous improvement

Due to the importance of this process as already mentioned, team members and the Monitoring Committee agreed to select it for pilot implementation. In order for the pilot implementation to take place, the first task was to decide for which event to implement it. Unfortunately, due to the time schedule of the project, the only event that was about to take place in September 2009 was the International Exhibition in Thessaloniki. Because this event is of high importance for Greece, the General Secretary of Communication was afraid of implementing in full scale the to-be situation of the process. Thus, he arranged with the Minister of Press and the Minister of External Affairs (stakeholder for this event) that GSC-GSI would implement the to-be situation of the process, without the interference of the Ministry of External Affairs, only for the foreign journalists that would attend the press conference of the Greek Prime Minister.

After having identified the pilot event, the next step was to decide what to measure and why. One focus group member said, “the Steering Committee due to prior complaints of the journalists about delays in this process wanted to measure the impact on the opinion of journalists about the service quality”. Thus, the fourth indicator from “Analysis & evaluation of the as-is situation” was selected. Team members set up an online questionnaire. They proposed an initial questionnaire to the Managerial Committee and after a meeting between them, its form was finalised. Journalists, after receiving an answer about their application (end of process), were kindly requested to fill in the online questionnaire. They were asked to fill in the same questionnaire for the event in 2009 and in 2008. Some key results that prove the impact of the to-be process to foreign journalists follow. Actions taken such as the online questionnaire and the measurement of journalists’ satisfaction that the team members did, encouraged continuous improvement and there were quite successful since it motivated the organisation to improve its processes based on their stakeholders’ expectations.

Firstly, at most cases, almost 95% of the cases, journalists received an answer within 4 working days and only 5% in 5 days. The delays occurred due to the different time zones (e.g. journalists from USA). Secondly, out of the 50 foreign journalists that attended the press conference, 35 of them attended this event in 2008 as well. 30 out of the 35 journalists participated to the research, which shows that they were satisfied by the to-be process in order to spend some time to fill in the questionnaire. Indeed, the total satisfaction index as calculated by the online engine was 92% compared to 65% for the same event in year 2008.

Finally, the president of the Steering Committee said after the end of the project “We have already started translating the license in English for all the events. Yet, we have not managed to achieve full-scale implementation of the to-be process to any event. However, what we are doing at the moment is to make pilot implementations of the to-be process in certain events and gather measurable data at last to prove to other stakeholders the necessity for accepting the change in the process”. Thus, the outcome of this step is that GSC-GSI has actually started measuring.

Summing up, this is an ICT-based process. There was not a performance measurement system and the employees were unfamiliar with such systems. During the project many changes occurred. Firstly, a performance measurement system was established and the executives of the organisation began to become familiar with the concept of performance measurement. Secondly, the time taken for the completion of the process was reduced

without changing its steps. This happened because GSC-GSI would not have to wait for approval from third parties. Finally, a permit for media representatives was issued in the English language instead of Greek.

The basic conclusion is that the introduction of the performance measurement system and its usage during the pilot testing but also after the completion of the project is a counter cultural situation comparing to the situation before the project.

Finally, the researcher points out that process improvement for this case concerned the introduction of a performance measurement system that helped the organisation to measure the process-case and find ways to improve its duration without changing the steps of the process.

8.3 PROCESS-CASE B

The title of the second process-case is “Monitoring published advertisement material in newspapers”. Its purpose is to monitor if the advertisement material in newspapers is published based on the specifications set by the relevant legislation, so that GSC-GSI can provide them the right to publish announcements of public organisations and balance sheets of private organisations. The value of this process is for the government to ensure that newspapers apply the law regarding the advertisement material and hence to be able to monitor the newspapers’ income from advertisement. The value for the newspapers is that they receive public grants for the published advertisement material in case they apply the relevant legislation. As it is discussed later (see step “Analysis & evaluation of the as-is situation”), GSC-GSI is far behind from the number of the advertisement material in newspapers that it should have monitored. Hence, newspapers cannot receive their eligible grants. Thus, it is very important to improve this process so that GSC-GSI can move onto paying the eligible grants to the newspapers. The researcher discusses further the issue of value in section 8.5.

The process improvement allowed the use of a measurement system that helped the executives to understand to reduce lead times for this process, while it was found that the problem related to the performance of this process lied on the allocation of human resources. The organisation was using personnel who were not capable and did not have the appropriate experience in order to accomplish successfully the process. Furthermore, there was lack of personnel in order to improve the duration of this process, thus the project proposed to add more personnel on this process.

Alignment of the public agency’s strategy with the process improvement initiative’s objectives

Process-case B provides services in the field of information since people can be informed about public announcements and the balance sheets of private organisations. Secondly, it contributes to the monitoring of media, in this case newspapers.

With respect to why this process was selected for improvement, a focus group member mentioned, “the main problem of this process, as underlined by the manager of the Media Professionals Department, is that the existing human resources are not enough to complete the process on time due to the high volume of the newspapers. Thus, there are many

newspapers that publish advertisements without having been given the right by GSC-GSI". Moreover, this process is based on a platform called e-Pasithea as mentioned later and thus, it fits into the general e-government trend in the Greek public sector context. Furthermore, the end-customer of this process is newspapers, which are one of the most important customers of GSC-GSI. Given that newspapers are not sure that they apply the relevant legislation because GSC-GSI is not able to monitor them, the contractor and top managers of GSC-GSI agreed to select this process for improvement. The researcher discusses further why the process-cases were selected for improvement in section 8.5.

Analysis & evaluation of the as-is situation

In this case, the process owner was the Media Professionals Manager. The interview with her lasted 90 minutes. The same template with process-case A was used to summarise the data gathered about process-case B. The below mentioned data were gathered by team members during the interview with her. The following diagram depicts the steps of this process.

Table 3: Process-case B info

General Info	
Code	Eg10
Division	Media Monitoring
Department	Media Professionals Department
Other stakeholders	-
Title	Monitoring of published advertisement material in newspapers
Clients	Private and public media organisations
Outputs	List of newspapers that apply the criteria about advertisement material set by the relevant legislation
Templates	List template
Process Parameters	
Importance	High
Frequency	Continuous
Category	Administrative
Risk level	Average
Duration	4 days for 180 daily newspapers
Human Resources	3 permanent and 5 non-permanent employees
Estimated cost	N/A
Use of IT	e-PASITHEA

Eg10. Monitoring published advertisement material in newspapers

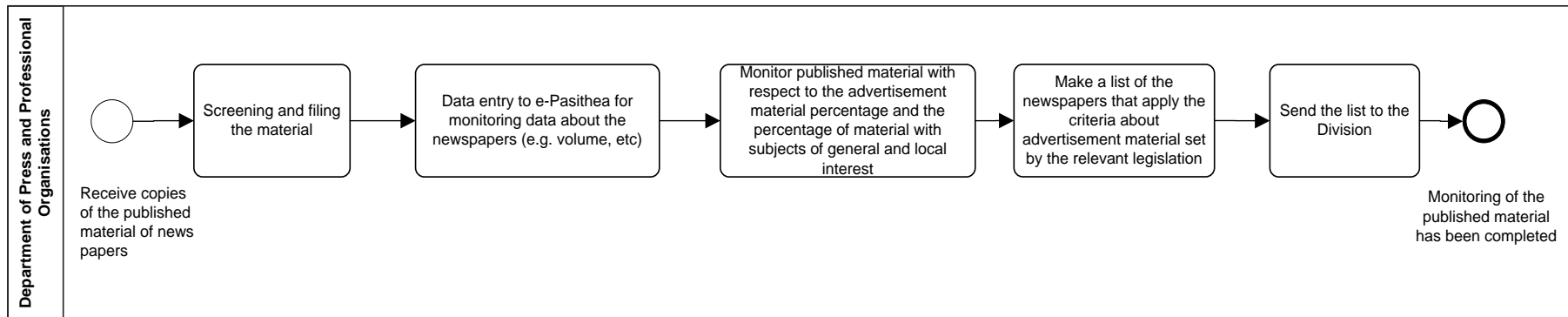


Figure 6: Process-case B as-is diagram

After having mapped and analysed the process, the next step was to evaluate it. Like in process-case A, team members found out after interviewing the Media Professionals Manager that she did not use any type of measurement system. However, in this case, there were some quantitative data, which depicted the main problem of this process. Firstly, GSC-GSI should monitor 180 daily newspapers in Greece (both national and local) based on its records. Secondly, one focus group member said that the Media Professionals Manager told team members “the monitoring of the published advertisement material in newspapers for December 2008 started on 10th January 2009 and finished on 20th May 2009”. Thirdly, she mentioned that 3 permanent employees and 5 non-permanent employees participated to the monitoring for that specific period.

The abovementioned data highlight the extent of the performance problem of this process. The existing human resources are not enough to complete this process on time. Moreover, one focus group member said, “The Media Professionals Manager estimated based on the existing personnel capacity that the monitoring of the published advertisement material in newspaper for year 2009 would be completed in 2011”.

Based on the abovementioned data and the main problem of this process, contractor’s team members developed the following indicator (Deliverable 1): % of newspapers for which the monitoring process is completed (per month). This indicator was approved by the Monitoring Committee “because it captures the essence of the problem”, as its President mentioned. Like in process-case A, team members set the basis for future measurements.

Apart from the abovementioned problem of this process, the Media Professionals Manager mentioned another problem during the interview with team members (Deliverable 1). Given that 5 out of the 8 persons employed for this process are non-permanent employees, there is no guarantee about the quality standards of this process. These 5 employees are either students or long-term unemployed persons that participate to the program “STAGE”. This program is about obtaining employment experience. This means that these 5 persons may not do their job properly because they are not experienced and they work under time pressure.

Design of the to-be situation

Team members made some recommendations about how the organisation could cope with these problems. They presented them to both committees. These recommendations as discussed during the focus group and studied in Deliverable 3: Design of the to-be model of GSC-GSI, are the following.

Firstly, team members proposed to the committees that GSC-GSI should employ another 7 permanent persons who are familiar with the relevant legislation about published advertisement material in newspapers. These employees could originate from the media field. Secondly, they proposed that the 5 non-permanent employees should be replaced by 5 permanent employees. That means 15 permanent employees would participate to this process in the future. One focus group member mentioned, “we calculated how many newspapers are monitored on average by a permanent employee and by a non-permanent employee by being present during the execution of the process. We found out that one permanent employee can monitor 30 newspapers per day and one non-permanent employee 10 per day”. The Manager of the Managerial Committee admitted, “we did not have any idea that there was such a huge gap in the performance between permanent and non-permanent employees”. Another focus group member said that “The Media Professionals Manager was under the impression that this process was an administrative process that anyone without any specific skills could do it. Thus, she did not mind that most of the permanent personnel of her department were replaced by non-permanent employees in 2007”.

The members of the focus group said that they followed a totally different approach initially. In this respect, one member of the focus group said, “We never thought to make any proposal about increasing human resources....I mean given the financial situation in the Greek public sector, who would propose something like that?”. Another focus group member said, “we thought to take advantage of the IT skills of the students.....we proposed to the Steering Committee to write a few commands using Visual Basic in MS Excel 2007, something very simple for students to handle.....”. Based on the focus group description, this system could import data from e-Pasithea and categorise the newspapers based on specific criteria, such as size in terms of issues sold per week, size in terms of income by advertisements, geographical area, etc. The focus group member added, “Students could just run some queries in order to find out which newspapers to inspect...then they could inform the other persons from STAGE to make a report for the division manager”. Another member of the focus group said, “We thought that this was a good proposal because the division could

start to make some inspections at a good pace, students could actually do something useful and interesting for them and the other persons from STAGE could also do something instead of getting coffees and sandwiches for the permanent employees and the manager,.....but that was too radical for the Steering Committee again". The researcher discusses further why incremental changes took place and why the Steering and the Managing Committee could impose its positions about how to improve the processes in section 8.5.

After discussing these recommendations with the two committees, team members used the simulation module of Casewise Corporate Modeler in order to estimate the duration of the process. The simulation outcome was that 15 permanent employees could monitor 360 newspapers per day, which means that they can monitor the newspapers of two consequent days. Hence, GSC-GSI can catch up the gap between the actual publication date of the newspaper and its monitoring day in 2011.

The next task was to define the type of improvement that is desired for this process. For reasons explained in step "Alignment of the public agency's strategy with the process improvement initiative's objectives", improvement was defined as the reduction in the duration of the process due to the changes in the number of human resources employed in this process *ceteris paribus*.

Analysis of moving from the as-is to the to-be situation

Given the abovementioned changes, the following tasks were suggested. Firstly, team members informed the Steering Committee that top management should discuss which permanent employees would move to the Media Professionals Department in order to replace the non-permanent employees. Secondly, they informed the Committee that GSC-GSI should publish job vacancies about the Media Professionals Department. They made a high-level list of the skills that the candidates should have (Deliverable 4: Moving from the as-is to the to-be situation); a) university degree in Media, b) at least 5 years work experience in the media field and c) good knowledge of the relevant legislation. Moreover, they stressed the need that top management should underline to the General Secretary of Information the need for new human resources based on the design of the to-be situation and the existing problems of the process. A focus group member said, "we recommended to the Steering and the Managerial Committee that they should use hard evidence, such as the simulation outcomes, in order to persuade the General Secretary of Information about the need for new human resources because of the general financial conditions in the Greek public sector".

Continuous improvement

Due to the fact that practically there is no monitoring for many newspapers whether they apply the relevant legislation about published advertisement material, team members and the Monitoring Committee agreed to select it for pilot implementation. The pilot implementation period for this process lasted three months based on the project time schedule.

Unfortunately, GSC-GSI could not hire new personnel within the abovementioned timeframe due to the administrative hiring processes in the Greek public sector that last on average around six months (see Appendix 4). Thus, the Steering Committee decided that only the replacement of the 5 non-permanent employees by permanent employees would take place within the project. Therefore, the Monitoring Media Division Manager and the Departmental Managers of his Division selected 5 permanent employees that would move from their departments to the Media Professionals Department. They also decided to move the 5 non-permanent employees to another department in the same Division that needed more human resources for a three-month period.

After a short training of the 5 permanent employees that lasted 3 days, they undertook their new duties. Since the pilot implementation period had a timeframe of three months, the Monitoring Committee and team members agreed to measure the performance indicator that was suggested in step “Analysis & evaluation of the as-is situation” twice, once per month. They also agreed that the employees of the Media Professionals Department would measure this indicator with the aid of the team members. A focus group member mentioned what a member of the Steering Committee said about this issue “Our employees should be in position to measure their performance by their own. After all, you are not going to be here in the future to help us to measure our performance. We should do it on our own”. From a critical point of view the 3 days training program was useful because the personnel learned how to set performance indicators and of course to use them. The whole session was successful and it helped the employees to develop critical analysis skills about measuring.

The following table summarises the outcome of the pilot implementation vis-à-vis the values of the same indicator during the analysis & evaluation of the as-is situation step (Deliverable 4).

Table 4: Process-case B pilot implementation outcomes

Employee ID	Baseline Measurement	Pilot Implementation Measurement	
	April 2009	November 2009 – December 2009	December 2009 – January 2010
Existing Permanent Employees			
A	97%	97%	99%
B	96%	99%	97%
C	97%	98%	96%
Existing Non- Permanent Employees		New Permanent Employees	
A	30%	88%	92%
B	36%	85%	89%
C	42%	95%	91%
D	32%	89%	93%
E	38%	92%	94%

The column “Baseline Measurement” presents the value of the indicator (% of newspapers for which the monitoring process is completed per month) measured in step “Analysis & evaluation of the as-is situation”. The next column presents the value of the same indicator measured in two different periods during the step “Continuous improvement”. Based on the table, existing permanent employees performed pretty much the same between the two steps. On the other hand, new permanent employees that replaced the existing non-permanent employees performed better than the latter.

It is obvious from the above table that the replacement of non-permanent employees by permanent employees contributed significantly to the improvement of the process. Based on this evidence, the Steering Committee discussed the issue of hiring new permanent employees with the General Secretary of Information.

Finally, the president of the Steering Committee said after the end of the project “We managed to convince the General Secretary of Information about the need for hiring new personnel. However, due to the general financial conditions in the Greek public sector, the hiring of 4 employees was approved”. As he told us, the job vacancies were announced at www.diorismos.gr in March 2010 as all job vacancies for the Greek public sector. The new personnel started its duties in October 2010. Hence, there is no significant measurement about their contribution yet. This issue will be examined in Document 5.

To sum up, it was an ICT-based process. Though there was not a system for measuring the performance of the process, the executives were well aware of the fact that the performance was lagging behind. Finally, such a system was established that helped the organisation to measure its performance and to know where it stands.

Nevertheless, there was an issue regarding the allocation of human resources for this process. It relied on non-permanent personnel who were not experienced and were not efficient. Furthermore, there was a need for additional permanent staff.

Hence, as a result, we can say that the introduction of a performance measurement system was important for improving the efficiency of the process. However, there is an issue regarding the efficiency of the process, which was achieved through staff increase. Although the relative literature on BPR and process improvement dictates the opposite, at this case it was necessary to increase the number of permanent employees in order to increase the performance of this process.

8.4 PROCESS-CASE C

The title of the third process-case is “Publication of Grèce hebdo and other publications”. Grèce hebdo and other publications are weekly publications in French, German and Spanish that summarise political, financial and cultural news in Greece that are of interest for French, German and Spanish speaking countries. The value of this process is to provide newsletters about Greek news in foreign languages that can be read by people living abroad. The target audience of these newsletters is mainly foreign tourist operators and foreign media. Given that tourism is one of the main pillars of the Greek economy and the negative publicity in foreign media about Greece due to its financial situation, it is important for GSC-GSI to publish weekly newsletters in many languages in order to promote tourism (cultural news) and to deal with negative publicity (political and financial news) that may have a negative impact on financial markets about the effort that the Greek government is currently making to improve that the financial situation in Greece. Hence, this process adds value for people living abroad since they can read news about Greece on time and online and for government in terms of enhancing the promotion of tourism in Greece. The researcher discusses further the issue of value in section 8.5.

It should be noticed that there was a political will to increase the publications and to issue publications besides French. There were two needs. Firstly, there was a need to find ways to develop a structured way to collect data and information that can be used as raw material to issue the publications. Secondly, there was a need for the different publications teams of the three publications to find a structured way to communicate. In this case, there was not an issue of measuring the accomplishment time of this process since the publications would have to be ready every given Friday. Nevertheless, there was a need for additional staff in order to accomplish the publication of the additional issues. Finally, this was a non-ICT based process before the project but it became one after the project because it was easier for staff to keep an electronic record of all publications as well as to exchange data and information.

Alignment of the public agency’s strategy with the process improvement initiative’s objectives

With respect to why this process was selected for improvement, a focus group member mentioned, “The main problem of this process, as underlined by the Planning and Implementation Department manager, is that there are many publishing teams in the department. Hence, we need to find a common way to make publications and to become

more efficient”. Moreover, the end-customers of this process (as mentioned later) are users of minpress.gr (GSC-GSI website) and subscribers to newsletters. This means that this process offers services in the field of communication. Furthermore, it contributes to the promotion of the country worldwide since these publications are written in French, German and Spanish and they inform foreign citizens about political, financial and cultural news in Greece.

Given the importance of this process for the organisation as analysed by its vision and the need for efficiency, the contractor and top managers of GSC-GSI agreed to select this process for improvement. The researcher discusses further why the process-cases were selected for improvement in section 8.5.

Analysis & evaluation of the as-is situation

In this case, the process owners were the Planning and Implementation Department Manager and a key person who was responsible for publishing Grèce hebdo. The interview with them lasted two and half-hours. The same template with the previous process-cases was used to summarise the data gathered about process-case C. The below mentioned data were gathered by team members during the interview with the process owners. The following diagram depicts the steps of process-case C.

Table 5: Process-case C info

General Info	
Code	Ga5
Division	External Affairs
Department	Planning and Implementation
Other stakeholders	-
Title	Publication of Grèce hebdo
Clients	Users of minpress.gr and newsletter's subscribers (tourist operators, foreign media)
Outputs	Newsletter
Templates	-
Process Parameters	
Importance	High
Frequency	Weekly
Category	Productive
Risk level	Average
Duration	4 days
Human Resources	4 employees
Estimated cost	€2880 per month
Use of IT	-

Ga5. Publication of Grèce Hebdo

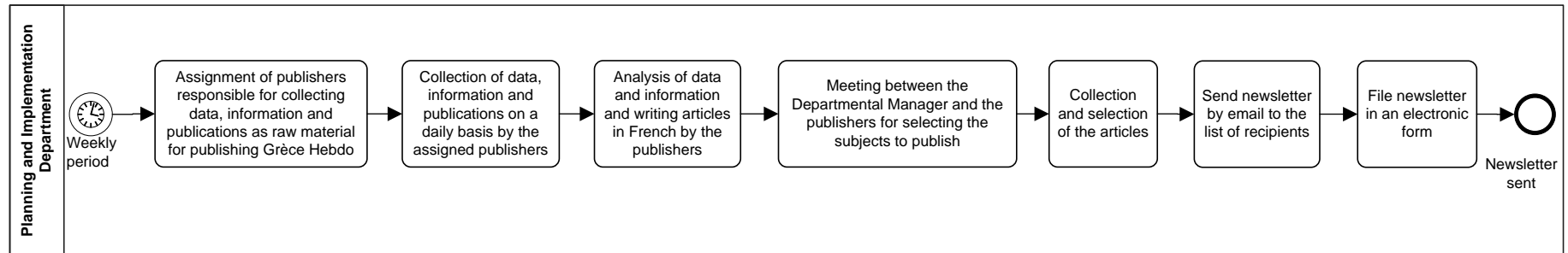


Figure 7: Process-case C as-is diagram

After having mapped and analysed the process, the next step was to evaluate it. In this process, unlike the other two, there was a specific deadline for completing the process, which was every given Friday. However, one focus group member said, “Both the interviewees mentioned that they prefer to complete the publication as soon as possible in order to have spare time to add any last minute news”. They had estimated that they need around 4 working days to publish Grèce hebdo (Deliverable 1). The abovementioned data, as discussed with focus group, show that there was a preliminary type of measurement in this department. Team members built on this type of measurement instead of developing a new measurement system. In this respect, the President of the Monitoring Committee said, “We did not want to completely change measurement practices in the cases that we actually measured our performance. We were afraid of the people’s reaction. Therefore, we asked from the contractor not to change these practices”. Hence, the measurement indicator that was used in this case was the time that the employees need to prepare one newsletter per week. Team members measured this indicator in order to confirm what the key persons mentioned during the interview. Therefore, they set the basis of measurement for the as-is situation at 4 working days per publication (Deliverable 1).

Apart from the issue of efficiency, the interviewees mentioned additional issues to be considered for improving this process (Deliverable 1). Firstly, they raised the issue of developing a structured communication between the different publishing teams that exist in the department so that these teams can exchange information in order to avoid looking for the same information/data from the beginning. Secondly, no IT system was used to store the data/information. Thus, it was time consuming to look for these data in paper files. Thirdly, the cooperation between the different publishing teams should be improved in order to improve process efficiency. Fourthly, there was no structured way to gather data and information, e.g. specific sources, way to validate information etc.

Design of the to-be situation

The to-be situation of the process should include two additional publications, one in German named ‘Griechenland Aktuell’ and one in Spanish named ‘Boletín de Noticias’. Team members made some recommendations about how the organisation could cope with these problems. They presented them to both committees. These recommendations, as discussed during the focus group and studied in Deliverable 3: Design of the to-be model of GSC-GSI, are the following.

Firstly, team members suggested that employees should follow the same steps as in Grèce hebdo. Since all newsletters should be published every Friday, this recommendation would help employees from different publishing teams to know to which step the other publishing teams are. This would facilitate the communication and the cooperation among them at any step. Furthermore, in order to facilitate the cooperation, a meeting between all publishers and the departmental manager was proposed (see diagram below). This meeting would be about the subjects to be published in the newsletters. Secondly, it was proposed that publishers should collect information and data by the same way (see diagram below). Hence, all publishers were requested to make a broad list of potential sources that would be updated. Thirdly, it was proposed the use of Livelink in order to manage newsletters and raw material electronically. Livelink is an IT document management system that the organisation used in other departments. Hence, it was proposed to the Steering Committee to ask from the IT company that installed it to GSC-GSI to create user licenses for the Planning and Implementation Department as well.

The members of the focus group said that the initial proposal was to integrate a project management tool with Livelink. Based on this proposal, each team could see online the same tasks and be informed about the progress of other teams and any delays by the system (e.g. use of flags). This system could enhance their cooperation and integrate their work. One member of the focus group said, “A member of the Managerial Committee said that if we adopt this proposal, then we will not know who is actually making the work, the system or the employees?”. The researcher discusses further why incremental changes took place in section 8.5.

After discussing these recommendations with the two committees, team members designed the to-be situation of the process using the same business process management tool and notation. The diagram below depicts the to-be situation of the process. There are no major differences compared to the as-is situation diagram. The main difference is that all publishing teams follow the same steps.

Moreover, team members used the simulation module of Casewise Corporate Modeler in order to estimate the need for human resources given that the measurement basis for each publication is 4 working days and that there were two additional publications in the to-be situation as already mentioned. The outcome of the simulation was that 6 people should be employed (2 per each publication). In the as-is situation, there were 4 employees for one

publication. The use of IT and the use of common sources for gathering data and information have been estimated that they would make the process more efficient. Instead of 12 employees for three publications (as projected by the as-is situation), it was estimated that 6 employees could make all publications. Hence, the department would need only two additional employees.

Ld2.Publication of Grèce Hebdo and other publications

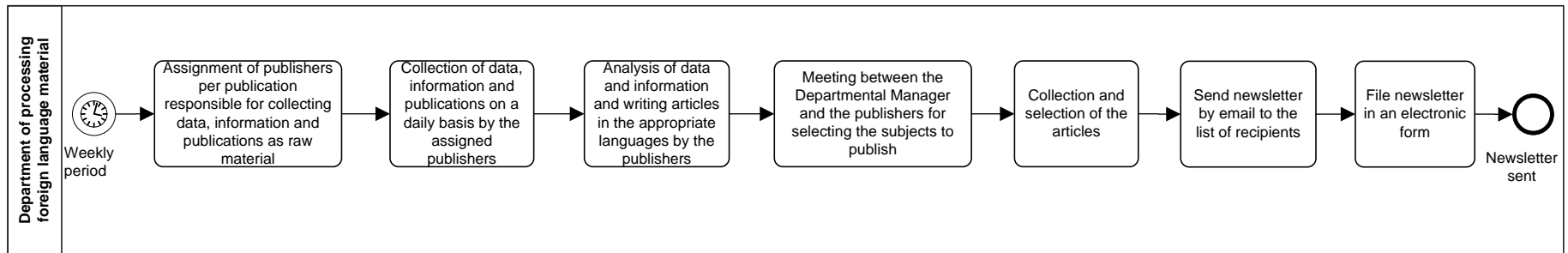


Figure 8: Process-case C to-be diagram

The next task was to define the type of improvement that is desired for this process. For reasons explained in step “Alignment of the public agency’s strategy with the process improvement initiative’s objectives” and based on the issues discussed in the as-is and the to-be situation, improvement was defined as an increase in the efficiency of the process given that each newsletter should be published every Friday following the same steps.

Analysis of moving from the as-is to the to-be situation

Given the abovementioned changes, the following tasks were suggested (Deliverable 4). Firstly, team members informed the Steering Committee that top management should ask from the company that installed Livelink to create user licenses for the Planning and Implementation Department.

Secondly, they informed the Steering Committee that top management should decide if the 2 additional job positions were covered by employees from other departments or from new job vacancy announcements. For the purposes of the second scenario, they made a high-level list of the skills that the candidates should have (Deliverable 4); a) university degree in Media, b) excellent written skills in German and in Spanish and c) at least 5 years work experience in the media or marketing or public relations field.

Continuous improvement

Due to the political will, as expressed by the General Secretary of Information, about adding two newsletters, one in German and one in Spanish, team members and the Monitoring Committee agreed to select it for pilot implementation. The pilot implementation period for this process lasted three months based on the project time schedule.

Unfortunately, GSC-GSI could not hire new personnel within the abovementioned timeframe for the same reason mentioned in process-case B. Moreover, top management was indecisive with respect to which employees to move to the Planning and Implementation Department from other departments of the same Division. Thus, the Steering Committee decided that the existing 4 employees would try to publish both Grèce hebdo and Griechenland Aktuell within the project. The Steering Committee selected the publication of Griechenland Aktuell instead of Boletín de Noticias because two employees knew German. One focus group member said, “The Steering Committee told us that we do not need to implement full scale this process within the timeframe of the pilot implementation phase. If four employees can publish 2

newsletters per week, then 6 employees can publish 3 newsletters per week”. To sum up, the decision that 4 persons would publish two editions instead of a full-scale pilot implementation (6 employees - 3 editions) was successful and fully utilised the potentials of the organisation’s human resources. We should not forget that there was an issue with the allocation of the labour, hence this solution was the best possible under the current circumstances.

GSC-GSI top management arranged with the company that installed Livelink to create 4 licenses for the Planning and Implementation Department. This activity increased the cost of the process by €1.000 per year per license. Furthermore, GSC-GSI top management arranged with that company to train its employees. The training was completed at the end of the first month of the pilot implementation step. The outcome of this step was that Grèce hebdo and Griechenland Aktuell were published 9 times in two-month period (Deliverable 4).

Finally, the president of the Steering Committee said after the end of the project “Our request for hiring 2 new employees was rejected due to the general financial conditions in the Greek public sector. At this moment, only Grèce hebdo and Griechenland Aktuell are published. With respect to Boletín de Noticias, we have made a job vacancy announcement at GSC-GSI intranet. We have received 10 applications and we are now discussing with their managers in order to conclude to which 2 employees to select”.

To sum up, it was a non-ICT based process before the project that was made ICT-based after the project in order to collect data and facilitate the communication between the various publishing teams. There was a primary performance measurement system before the project, upon which the contractor built the new system.

The key issue was the human resources. Due to an increase in the number of the publications, there was an estimation that the organisation would have to increase the number of employees working for those publications.

Therefore, there are three main conclusions. The first is that the measurement system was not built from scratch, but it was built upon the existing system because it was one of the few cases where the organisation had some type of a measurement system. The second

conclusion is that technology contributed to the improvement of the process since it provided all of the necessary information and analysis needed to improve the process. In general, this fits into the general e-government trend in Greece. The third conclusion was that the personnel would again increase the efficiency of the process if the organisation increased the number of people working on this process, although this is against the relative literature on BPR and process improvement claims.

Finally, based on this process-case, we can say that process improvement is a concept where human resources and the appropriate use of IT play a key role. Organisations would not have to hesitate to increase the number of employees employed even though it is against the literature. Process improvement is about efficiency and this can be achieved at any way, even if it is against the industry's norms.

8.5 CROSS-CASE ANALYSIS

After having presented the three process-cases, the researcher aims to perform the cross-case analysis. He discusses the differences and similarities of the process-cases and links the outcome of this discussion with the implications of the Greek public sector status (e-government trend, EU and IMF support mechanism, legislation about civil servants employment, etc) on process improvement. The following table summarises the main points of the process-cases research outcomes.

Table 6: Process-cases research outcomes

	Process A	Process B	Process C
Process improvement definition	Reduction in the duration of the process	Reduction in the duration of the process	Increase in the efficiency of the process
Use of ICT	Yes, before project start	Yes, before project start	Yes, after project start
Measurement system	No measurement before project start	No measurement before project start, but have a indication of the performance drawback	Preliminary measurement before project start
Efficiency	No change in human resources	Increase in human resources	Increase in human resources

Based on the above table, he notes that for the first two processes, process improvement is defined as a reduction in the duration of the process, though in the third process, it is defined as efficiency increase. This is because the first two cases were ICT-based before the project, while the third one became ICT-based after the project.

The public organisation did not use any substantial measurement system in the process-cases. This raises the question “**How can process improvement be defined in the Greek public sector?**” Measurement systems are useful since they help an organisation to spot where it is and to set up its targets (Sotirakou and Zeppou, 2006; Al-Mashari and Zairi, 2000). Based on the above table, process improvement can be defined in the Greek public sector context as the time reduction in the completion of a process, which can be achieved with the use of ICT and/or additional human resources.

As discussed in the literature review, process improvement aims to increase efficiency, reduce cost and lead times (Albizu and Olazaran, 2006; Davenport, 1993). The research results show that the organisation needs to employ more human resources in two process-cases. This contradicts the existing literature in the Western countries that process improvement, and especially BPR, means that organisations would have to reduce the number of their employees (Albizu and Olazaran, 2006; Hammer, 1990).

On the other hand, the research results show that process improvement means reduction in the duration of the process. This is similar to existing literature about process improvement which dictates that BPR and other process improvement methods aim to reduce lead times (Nolan and McFarlan, 2005). Moreover, they show that the use of ICT can contribute to the increase in the efficiency of the process. This is also similar to existing literature. According to Nolan and McFarlan (2005), IT can help an organisation to increase its efficiency and to improve its processes.

As discussed in section 2.2, Greek civil servants cannot be fired, thus downsizing is out of question. Another point is that the reduction of their salaries is not a result of process improvement projects, but of governmental policies. These points pave the way to challenge Hammer and Champy's (1993, p.32) definition about BPR, within the Greek public sector context, which dictates that BPR is "the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical contemporary measures of performance, such as cost, quality, service and speed".

Hence, the research findings raise another question **"Why BPR in the Greek public is different from BPR as defined by Hammer and Champy?"** Based on Halachmi and Bovaird (1997) a key factor influencing the results of a BPR initiative is the 'BPR capacity'. They defined BPR capacity as the ability of an organisation to undertake and survive such a radical initiative. They suggest that there are three elements of this BPR capacity. Their presence is necessary for implementing BPR. The first element is that organisations need a proper understanding of the requirements and implications of the BPR process. A second element is the ability to operationalise and implement the results of a BPR analysis. The third element is a need for a shared willingness to face the cultural challenge that BPR poses to the organisation.

With respect to the first element, Hammer and Champy (1993) are highly specific about the requisite extent of change. They insist that change through reengineering must be fundamental, radical and dramatic, an all-or-nothing proposition that cannot be carried out in small steps. Hence, they exclude steady incremental improvement (Hammer and Champy, 1993, p. 49). For example, those involved in the BPR attempt must realise before its beginning that its outcomes effort will not come from a succession of marginal changes; they are intended to be radical, not incremental. They will therefore be painful to some stakeholders.

In the case of the current research, the two General Secretaries did not make any particular effort to get involved with the project. As one member of the focus group mentioned “they were too busy with their duties about the agreement between Greece and the IMF and EU support mechanism...at least that is what their personal secretaries were telling us each time we were trying to meet them”. Hence, the two General Secretaries could not understand how a BPR project can contribute to the implementation of radical changes in their organisation. This is a tragic irony. On the one hand, they were supposed to work for the Greek government in order to achieve the radical changes that the EU and IMF support mechanism requires for the Greek public sector. On the other hand, they did not spend much time on a project, which in its nature is about radical changes aiming to achieve cost reduction and increase efficiency, which are the two main targets set by the EU and IMF support mechanism for the Greek public sector, as discussed in section 2.2.

Another issue that contributed to an improper understanding of the requirements of the project was the composition of the two committees for the project on behalf of the public organisation. The managerial committee consisted of the two General Secretaries and the division managers of the organisation. The steering committee consisted of the departmental managers of the organisation. Hence, both the committees consisted of employees that had a motive to deal with the project as a threat for their influential power in the organisation. Both division and department managers believed prior to the beginning of the project that this project could be a threat for their roles, their responsibilities, the number of the human resources of their departments, etc. In this respect, one member of the focus group said that one departmental manager said “I am here 15 years, I have seen this organisation to flourish and there is no apparent reason for changes, why change sth that actually works?” At this point, the researcher mentions that there was a third committee called Monitoring Committee, as mentioned in section 5. This committee, consisted of five low hierarchical level employees, was responsible for facilitating the day-to-day communication between the

public organisation and the private company (e.g. arrangement of interviews and meetings, distribution of internal reports, memos, etc). Hence, this committee could not influence the evaluation of the project's deliverables.

Based on the Greek legislation about public procurement (Greece. Public Procurement Act no. 118/2007), any contractual agreement between a Greek public organisation and a private company specifies the evaluation procedure of the project's deliverables. In most cases, one or two committees consisted of public employees evaluate the deliverables. The possible outcomes of this evaluation are: a) accept the deliverable, b) request for modifications and c) not accept the deliverable. In the second outcome, the committee informs officially the company about the modifications. The company has a specific time period (set in the contractual agreement) to make the modifications and then resubmit the deliverable. This procedure can take place only twice, then the committee decides whether it accepts the deliverable or not. In the third outcome as well as in case the committee decides not to accept the deliverable after the end of the second outcome, the income of the company by the project is reduced based on the monetary value of the "not accepted" deliverable as defined in the contractual agreement.

Hence, it is obvious that the committee which is responsible for the evaluation of the project deliverables can direct the focus of the project based on its comments/requested modifications. In the current project, both committees ought to evaluate the project deliverables based on the contractual agreement between the public organisation and the private company. The steering committee evaluated each deliverable first and it sent its evaluation report to the managerial committee. The managerial committee could accept this report, add more modifications or make its own report. The focus group mentioned that in most cases they sent them a common evaluation report, apart from few times that there were some minor differences (e.g. structure of the deliverable, clarity of speech, etc). Moreover, one member of the focus group said, "Departmental managers cooperate with division managers almost every day during their daily activities, I am sure they have discussed how they will act during the evaluation of our deliverables sooner than the beginning of the project". Therefore, since the members of these committees believed that there was no need for radical changes, they could make sure that the outcome of the project would not be radical changes.

With respect to the second element, the implementation of a BPR project is closely related to the 'health' of the organisation before it undergoes the drastic treatment of reengineering. To use an analogy, a very sick person is less likely to survive a heart transplant. Thus, organisations at the peak of their performance are more likely to be able to move to a higher performance curve through a reengineering effort. Poorly performing organisations start with intrinsic weaknesses and are therefore less likely to come up with the right ideas, the right people to carry them out or sufficient resources for underwriting the necessary reengineering effort. However, contrary to private companies, public organisations which are performing well but which wish to improve their performance still further may not be permitted or encouraged to undertake a BPR initiative because of politicians' belief that "if it ain't broke - don't fix it" (Halachmi and Bovaird, 1997).

However, as mentioned before, not only the managers but also the two General Secretaries believed that this organisation operates at the best possible way in the Greek public sector context. One member of the focus group said, "This is another reason why they did not involve with this project". Therefore, she continued saying "given that the General Secretaries, the top and the middle managers think that they operate just fine, how can you achieve radical changes? They do not really tell you what they are not good at, they tell you what they are good at". Given these circumstances, it was logic based on the focus group that the project outcomes were incremental, not radical. Thus, the belief "if it ain't broke - don't fix it" dominated the course and the outcomes of the project.

With respect to the third element, BPR requires the organisation to do away with everything it had in the past, including its previous culture, because the old culture is related to (indeed may partly be the reason for) the unsuccessful way the organisation previously was operating. Replacing the existing culture should be one of the stated goals of BPR, a necessary condition for regarding the overall set of changes as a success - not merely an unintended side effect. In other words, the BPR plan is a real, not simply a subjectively perceived, threat to an important element of the organisation's identity. In this case, the members of the organisation must share a consensus that it is acceptable to absorb the opportunity cost. That is to say, they must take the risk knowingly and willingly that if the BPR effort fails, after expending a large amount of tangible and nontangible resources, there may be adverse consequences for them at the individual and subunit level (Halachmi and Bovaird, 1997).

In the context of the current research, as already mentioned, the top and the middle managers tried to prevent radical changes to the organisation. However, they recognised that the project should have, at least, some incremental outcomes because it was funded 80% by the 3rd CFS and 20% by Greek funds. They were afraid that they might be accused that they wasted EU and Greek money especially under the current financial conditions in Greece. Therefore, as one member of the focus group noticed, “although they were telling us what the organisation was good at, they seemed to be willing to reveal problems about low level day-to-day tasks of the employees”, the project outcomes focused on incremental changes in low level day-to-day processes. Research findings prove this tension as well as the deliverables of the project. This means that there was no change to the old culture of the organisation. Hence, it was not possible for radical changes to take place.

In conclusion, the answer to the sub-question “why BPR in the Greek public is different from BPR as defined by Hammer and Champy?” is fourth-fold. Firstly, the two General Secretaries did not understand how this project could contribute to the implementation of radical changes in the organisation in order to achieve cost reduction and increased efficiency as required by the EU and IMF support mechanism. This resulted in the lack of political management commitment and in low project sponsorship on behalf of the two General Secretaries that is of high importance for such projects (Hesson, Al-Ameed & Samaka, 2007).

Secondly, the two committees of the project responsible for the evaluation of project's deliverables consisted of employees that treated the project as a threat to their interests. This is often observed during a BPR project and that is why BPR teams should be as neutral as possible (Hesson, Al-Ameed & Samaka, 2007). Moreover, in the current case, the Greek legislation about public procurement enhanced their influence on the outcomes of the project. This is an example of the effect of stakeholder's power on implementing process improvement in the public sector as mentioned in section 2.1 (Kumar and Bauer, 2010). Furthermore, this is an example of the effect of institutional restrictions on implementing process improvement in the public sector as mentioned in section 2.1 (Thong, Yap & Seah, 2000).

Thirdly, both top and middle managers thought that the organisation operates well. This undermined the concept of radical changes and enhanced the logic "if it ain't broke - don't fix it" (Martin and Montagna, 2006). This is an example of the effect of resistance to change on implementing process improvement in the public sector as mentioned in section 2.1 (Joia,

2004; Scholl, 2004). This logic also paved the way of not exploring solutions. Hence, this is an example of the risk of not exploring solutions when implementing process improvement in the public sector as mentioned in section 2.1 (Winner, 2001).

Fourthly, top and middle managers deliberately limited the depth of changes to incremental, not radical. Hence, there was not attitude on behalf of them for radical changes (Martin and Montagna, 2006). This is an example that top and middle managers in the public sector are not used to handle such changes, thus they try to avoid them as mentioned in section 2.1 (Indihar Stemberger and Jaklic, 2007)

Given the third and the fourth reason why BPR in the Greek public sector is different from BPR as defined by Hammer and Champy (1993), this raises another question **“Why not radical changes and only incremental changes take place at a process improvement project in the Greek public sector?”** As already mentioned the General Secretaries, top and middle managers of the organisation believed that it operates well, yet top and middle managers in fear of being accused that they wasted EU and Greek funds, they were in favour of incremental changes to take place during the project. This behaviour is presented by managers and decision makers faced with what is described by Argyris (1977) as a "double bind".

In the current project, the participants to the committees followed the first norm “hide errors” as already mentioned. On the other hand, when faced with the prospect of failure in radical process redesign based on the Greek Information Society guidelines, the committees shifted its focus to incremental improvements. This was done for self-preservation. Process improvement goals were initially used as an excuse, but soon they began to be seen as the "real goals" of the re-engineering attempt. This found support from top and middle management staff, which reinforced the belief that those were the goals to go for. Given this attitude on behalf of top and middle managers, the lack of active participation by the two General Secretaries and the composition of the managerial and the steering committee, the norm “hide errors” dominated having as a result the implementation of the logic “let’s do incremental improvements to the satisfactory operational level of the organisation”.

This behaviour raises the question **“How can Greek Information Society prevent the norm “hide errors” from process improvement projects in the Greek public sector?”** As mentioned in section 2.2, Greek Information Society is a public authority

responsible for the distribution of EU funds among public organisations for process improvement projects. Moreover, it has set some guidelines about process improvement projects (see Document 2). In the current case, the two committees managed to direct the focus of the project where they wanted instead of where they should have as already mentioned. They were empowered to do so based on the contractual agreement between GSI-GSC and the private company as explained before. Since Greek Information Society is responsible for the distribution of EU funds among public organisations, the researcher proposes that the committee(s) responsible for the evaluation of the project's deliverables should not only consist of public employees on behalf of the public organisation, but also of employees on behalf of the Greek Information Society. This proposal originates from literature saying that BPR teams should be as neutral as possible (Hesson, Al-Ameed & Samaka, 2007). These employees should aim to ensure that the process improvement projects that will take place to public organisations during the 4th CFS will contribute significantly to the effort that Greek public administration is currently doing to reduce its public debt. Their role could be dual.

Firstly, they could act as a horizontal consultant of the government. They could inform Ministers, General Secretaries, top and middle managers about the essence of the Greek Information Society guidelines during the implementation of process improvement projects. In this way, they could increase the understanding of the requirements and implications of the BPR process (what the reengineering process is all about, as well as what it is not) by the political and the top management of Greek public organisations. Moreover, they could underline how these requirements and implications are related to the goals of cost reduction and increase efficiency as set by the agreement between Greece and the EU and IMF support mechanism. By that way, they could trigger discussions inside the public organisations that would help their political and top management to see beyond the logic of "if it ain't broke - don't fix it". Moreover, they could motivate the political management of Greek public organisations to have a more active participation to such projects. The political management support and commitment is a very important factor that contributes to ensure significant improvements as an outcome of process improvement projects in the public sector (Suarez-Barraza and Ramis-Pujol, 2010; Suarez-Barraza, Smith & Dahlgaard-Park, 2009; Sentanin, Santos & Jabbour, 2008).

Secondly, the employees of the Greek Information Society as members of that committee could deal with the norm "hide errors" phenomenon in two ways. The first way is by communicating to the other members of the committee the importance of having project

outcomes that can contribute to the reduction of public debt. In this respect, their role would be to reduce internal resistance within public organisations. This way originates from literature (section 2.1) about high resistance to changes on behalf of public employees when implementing process improvement (Joia, 2004; Scholl, 2004). The second way is to monitor that the other members do not propose modifications to project deliverables to ensure their personal interests in the organisation. This way originates from literature (section 2.1) about the effect of stakeholder's power on process improvement projects in the public sector (Kumar and Bauer, 2010). The employees of the Greek Information Society could do that since they will have access to the deliverables sent by the private company to the committee and they will be present to the discussion of the committee. By that way, they could try to minimise or even better eliminate the logic "let's do incremental improvements to the satisfactory operational level of the organisation". Thong, Jap and Seah (2000) describe a similar approach in a public organisation where the reengineering team consisted of "neutral officers". In that case, "neutral officers" were able to provide an unbiased view in reengineering the processes of the public organisation.

At this point, the researcher underlines that the answer to the question **"How can Greek Information Society prevent the norm "hide errors" from process improvement projects in the Greek public sector?"** addresses one of the constructs of Greek public sector context, which is process improvement projects in the 4th CFS, because it proposes how Greek Information Society can increase the possibility that the process improvement projects during the 4th CFS will contribute significantly to the effort that Greek public administration is currently doing to reduce its public debt.

Given that the norm "hide errors" dominated the project as explained earlier, this raises the following questions: **a) who and why selected GSI-GSC as a pilot BPR project?** and **b) why were these relatively insignificant process-cases were selected?** With respect to the first question, Greek Information Society selected GSI-GSC as one of the two pilot sites for carrying out BPR projects within the 3rd CFS because it is one of the smallest and the most modern Greek public organisations and it has employees of high caliber compared to other Greek public organisations. This is the official justification on the technical report about the approval of funding this particular project signed by the President of Greek Information Society. Focus group members mentioned that one of the two General Secretaries showed it to them. In this respect, Greek Information Society thought that this is the most likely public organisation in Greece that could show some significant improvements after a BPR project. Thus, the driver behind the project in the GSI-GSC was the belief of

Greek Information Society that it would be a successful BPR project that could be used as a best practice BPR project in the Greek public sector. Given that during the 4th CFS, there is an Operational Program titled “Improvement of Public Administration’s Management Capability” (total budget € 505 million for the period 2007 – 2013; initial timetable, revised time schedule 2010 – 2016) for the funding of BPR projects in the Greek public sector (see section 2.2), Greek Information Society thought that the present project could be used as a best practice BPR project for future projects.

Regarding the second question, there is a combination of several issues that led to the selection of these process-cases (as already mentioned). Firstly, the two General Secretaries, the top and middle management of the organisation believed that it operates well, thus no need for radical changes. Secondly, the two General Secretaries did not participate actively to the project. This meant that the other members of the managerial committee and the member of the steering committee were in charge of the project. Thirdly, these members viewed this project as a threat to their interests. Fourthly, they followed the norm “hide errors” during the monitoring of the work by the private company. Fifthly, they followed the logic “let’s do incremental improvements to the satisfactory operational level of the organisation” because they were afraid that they might be accused of wasting EU and Greek funds. Therefore, taking the three process-cases described in the current research as an example, these incremental changes were minor changes to the processes of the organisation that could facilitate its employees and “clients” (e.g. professional media, journalists, etc) up to a point. This is an example of the difficulties in selecting the processes to redesign when implementing a process improvement project in the public sector as mentioned in section 2.1 and discussed in Document 2 (section 3.8). These difficulties originate from interest groups demands and lobbying.

Based on the abovementioned discussion, BPR in the Greek public sector differs highly compared to the BPR as defined by Hammer and Champy (1993). This raises another question **“Why is BPR term used for process improvement projects in the Greek public sector?”** As mentioned in section 2.2, Greek Public Administration launched in 2000 an operational program for the Information Society, which covered the period 2000-2006 and EU supported it as part of the 3rd CSF. One of the priorities set in this program was the development of online applications, as well as the use of ICTs to streamline and reengineer processes and communication within and amongst government departments, covering all public administration (Markellos et al., 2007). Therefore, the purpose of this program was to achieve radical changes in the provision of public services towards citizens

and enterprises, from offline to online provision. Given that BPR, as defined by Hammer and Champy (1993), is about achieving radical changes in the processes of organisations, it seems that the selection of the term BPR in 2000 by Greek Information Society was appropriate, at least in theory. At this point, the researcher notices that the e-government trend (one of the constructs of the Greek public sector context – section 2.2) explains in theory why Greek Information Society adopted the term BPR for process improvement projects in 2000.

However, the research results show that there were incremental changes in the three process-cases and there was not a reduction in human resources as an outcome of these changes in order to improve efficiency. Given that this case study can be considered as a ‘representative’ process improvement project in the Greek public sector for reasons discussed in section 6, the researcher notes that in practice the use of BPR term about process improvement in the Greek public sector context does not seem to be suitable. Therefore, Greek Information Society should reconsider the use of BPR term and try to find a more appropriate term. Hence, this raises the next question **“Which can be an appropriate process improvement method in the Greek public sector?”**

As already mentioned, the research results show that incremental changes took place. Moreover, the changes made in the process-cases had as a result to reduce time in service delivery to the customer (focus on value for the customer – reduce waste of time). Therefore, we can say that the concept of process improvement for the Greek public sector fits better with Lean than BPR.

This means that Greek Information Society should consider using the term Lean instead of BPR for process improvement projects. Lean produces team-oriented organisations that are focused on serving the customer. In case of a Greek public organisation, this could mean to move the best employees into a process improvement team that will act as internal consultant (Radnor, 2010). This alternative would address the need to maintain employment (Greek legislation about public sector employment – section 2.2) but also establish the capability to apply the incremental improvements in the organisation.

More specifically, this team could undertake the following tasks in order to achieve lean transformation to an organisation (Piercy and Rich, 2009).

At this point, the researcher underlines that the answer to the question **“Which can be an appropriate process improvement method in the Greek public sector?”** challenges the use of BPR term for process improvement project in the Greek public sector which is one of the constructs of the Greek public sector context as discussed in section 2.2.

On the other hand, the Greek public sector needs short-term radical changes (section 2.2). Therefore, the researcher examines a more radical alternative than the previous one as well that could help Greek public sector to achieve the needed radical changes. This raises the question **“Which can be an appropriate radical alternative for process improvement in the Greek public sector?”** Radical process-focused change in a public sector organisation like GSI-GSC can only be achieved with deep changes in its bureaucratic practices. This, in turn, normally cannot be achieved without either changes in the law or privatisation (Kock and McQueen, 1996).

With respect to changes in the law, this alternative would be to change the article of the Greek constitution about public sector employment. Its outcome would be to change labour relations in the public sector so that civil servants can be fired. This may lead to a social unrest. Furthermore, it would probably raise question about undermining the reason why it was established in 1911 that civil servants could not be fired (section 2.2). However, this is an option that Greek government should consider it despite the political cost because it can contribute to the short-term radical changes that Greek public sector needs. Hence, Greek government should examine to set a framework that would provide the option to make public employees redundant but at the same time would set the criteria for layoffs in order to protect them from governmental abuse of power. In that case, downsizing could be the outcome of process improvement projects in the Greek public sector in order to improve efficiency.

Moreover, this is an alternative that other EU countries are using as part of their public spending cuts in order to deal with the general financial crisis. For example, Poland and Bulgaria will reduce public sector employment by 10%, Romania has announced 250,000 job cuts and the United Kingdom 490,000 job cuts representing almost 10% of the British public sector work force (ETUC, 2010). The European Trade Union Confederation (2010) expects that a further 1 million employees will lose their jobs in the public sector over the coming years.

However, a remaining question about the job cuts in Europe is **“Are they the outcome of process improvement projects in the public sector or of governmental policies?”** In case that they will be the outcome of process improvement projects, this gives an additional boost to Greek Public Administration to reconsider the relevant article of the Greek Constitution about public sector employment and to change the relevant legislation so that civil servants can be made redundant. This issue will be re-examined in Document 5 when published data about how job cuts in European public organisations took place will be probably available and compare them with evidence from additional process improvement projects in the Greek public sector.

With respect to the radical alternative of privatisation, it can be implemented only after the change in the law about employment in the public sector takes place. As already mentioned (section 2.1), privatisation may be used for improving the efficiency and effectiveness of processes of public organisations. Given the different types of privatisation (see section 2.1), the one that seems to be more appropriate for the Greek public sector is outsourcing. Greek public administration could use outsourcing as a method to reduce cost (Joha and Janssen, 2010) and to increase efficiency (Pessoa, 2009), which are the two main targets set by the EU and IMF support mechanism for the Greek public sector. In service organisations, such as GSI-GSC and most organisations in the public sector, most of the costs are labour costs. Given that the change in the law about employment in the public sector would have taken place, then public organisations could make public employees that deal with these services or internal processes redundant. Hence, cost reduction would equal savings from the public employees' salaries minus the outsourcing fee of the private companies. In this case, outsourcing would take place only if there were considerable savings compared to outsourcing fee in order for the government to be able to justify up to a point such decisions and to reduce social unrest.

At this point, the researcher underlines that the answer to the question **“Which can be an appropriate radical alternative for process improvement in the Greek public sector?”** challenges the Greek legislation about public sector employment and proposes a approach about how to achieve radical changes in order to address the two main targets set by the EU and IMF support mechanism for the Greek public sector. Hence, in this question, he addresses two constructs of the Greek public sector context, legislation about public sector employment and EU and IMF support mechanism (section 2.2).

Finally, the researcher discusses the issue of “value” in process improvement in the Greek public sector context. Greek public sector interplays with two different types of stakeholders; citizens, enterprises and Greek public organisations (in terms of clients), Greek public administration (in terms of the targets set by the EU and IMF support mechanism). Hence, this raises the question **“Who do process improvement in the Greek public sector should add value for?”**

Research findings, show that in process-case A (section 8.2), process improvement adds value for media representatives (clients of GSI-GSC) since they can apply for their permits to videotape/photo shoot Greek sites online having as a result to receive their permits faster, in process-case B (section 8.3), process improvement adds value for government since it can monitor the newspapers’ income from advertisement in order to cross-check their income declaration, and in process-case C (section 8.4), process improvement adds value for people living abroad (clients of GSI-GSC) since they can read news about Greece on time and online and for government in terms of enhancing the promotion of tourism in Greece. Therefore, based on research findings process improvement in the Greek public sector should add value for the clients of public organisations.

Greek Information Society guidelines about process improvement projects in the Greek public sector (Managing Authority of Operational Program “Information Society, 2006) say that the aim of these projects is to reengineer public administration in order to provide better services to citizens and enterprises. Hence, based on these guidelines process improvement projects in the Greek public sector should add value for the clients of public organisations. This approach is reasonable given that these guidelines stemmed from the priority set in the operational program Information Society 2000-2006. As discussed earlier about the use of BPR term in the Greek public sector, the purpose of this program was to achieve radical changes in the provision of public services towards citizens and enterprises, from offline to online provision. In this respect, Hu et al. (2009) conducted an explanatory study about the definition of e-government for the time period 1990-2007. Based on their study, the field of e-government deals with the major initiatives of management and delivery of information and public services on behalf of citizens and enterprises. Given the e-government trend in Greece (Markellos et al., 2007) and the Greek Information Society guidelines, process improvement projects in the Greek public sector should add value for the clients of public organisations.

Based on the incremental approach as discussed earlier, Lean seems to be a more appropriate process improvement method for the Greek public sector for reasons explained above. The first step of Lean in the public sector (Radnor, 2010) is to specify the value desired by the customer. Hence, in case Lean is adopted, process improvement in the Greek public sector should add value for the clients of public organisations.

On the other hand, the agreement between Greece and EU and IMF support mechanism (Greece. Support Mechanism Act no 3845/2010) sets cost reduction and efficiency increase as the two primary targets for the Greek public sector. These targets pave the way for setting Greek public administration at the center of process improvement outcomes. This means that based on this agreement, process improvement projects should add value for the Greek public administration.

Moreover, based on the proposed radical approach, process improvement projects should add value for the Greek public administration. Firstly, the change in legislation about public sector employment can contribute to the reduction of public debt by making public employees redundant taken into account that in most cases of public organisations, labour costs are the main cost. Secondly, outsourcing as already mentioned is a process improvement method that can be used to reduce cost (Joha and Janssen, 2010) and to increase efficiency (Pessoa, 2009), which are the two main targets set by the EU and IMF support mechanism for the Greek public sector.

Given that Greece needs to cope with the agreement with the EU and IMF support mechanism and the need for radical changes as discussed in section 2.2., this means that process improvement should add value for Greek public administration. In this case, value would be defined as cost reduction and/or efficiency increase. The radical methods to achieve this value would be the change in the law about public sector employment and the use of outsourcing. The researcher argues that the radical change of the purpose of process improvement from adding value for the clients of public organisations (as it is for the time being) to adding value for Greek public administration (in terms of the targets set by the EU and IMF support mechanism) can trigger the implementation of radical changes to the Greek public sector.

However, since the outcomes of process improvement projects would be cost reduction and efficiency increase in the Greek public sector, these projects would also add indirectly value

for citizens and enterprises. Based on the agreement with the EU and IMF support mechanism (Greece. Support Mechanism Act no 3845/2010), Greek government has already increased VAT by 4%, oil tax by 4%, income tax rate by 5%, eligible pension age by 5 years, etc. in order to reduce public debt. Therefore, if process improvement projects contribute to cost reduction and increase efficiency, this will pave the way for the Greek government to adopt less harsh measures for citizens and enterprises.

At this point, the researcher underlines that the answer to the question **“Who do process improvement in the Greek public sector should add value for?”** challenges the general belief and trend that customer focus is more important in the public sector nowadays compared to previous years (section 2.1), as well as in the Greek public sector (section 2.2). Moreover, this answer addresses the EU and IMF support mechanism and the process improvement projects for the 4th CFS, which are two of the constructs of the Greek public sector context, since it sets for who the changes due to EU and IMF support mechanism and the process improvement projects should add value.

Based on the abovementioned discussion, the researcher summarises the answer to the main research question “how and why is process improvement achieved in the Greek public sector?”. About the “how” part of the question, he argues that Lean seems to be an appropriate process improvement method to achieve incremental changes to the Greek public sector. However, given that the Greek public sector needs radical changes, he proposes outsourcing (privatisation method) of services or internal processes to private companies after changing the law about public sector employment. Moreover, he proposes that the Greek Information Society employees should actively participate to the monitoring of the implementation of process improvement projects and have as a role to reduce resistance to change on behalf of public organisations. Regarding the “why” part of the question, he argues that the Greek public sector needs to address the two targets of cost reduction and the efficiency increase set by the EU and IMF support mechanism by exploiting the EU funds (4th CFS) for process improvement projects in the Greek public sector. Hence, he proposes that process improvement should add value directly for the Greek public administration itself and not for citizens and enterprises.

9 CONCLUSIONS AND THEMES FOR FURTHER RESEARCH

This research aims at exploring process improvement in the Greek public sector. The main research question was **“How and why is process improvement achieved in the Greek public sector?”** The researcher tried to answer this question by examining the process improvement experience of a Greek public organisation. He unfolded a list of issues (sub-questions) that stem from the main research question and the research findings. He summarises the main conclusions of the current research based on these issues as follows.

Firstly, research results show that process improvement can be defined in the Greek public sector context as the time reduction in the completion of a process, which can be achieved with the use of ICT and/or additional human resources.

Secondly, this contradiction paves the way to challenge Hammer and Champy's (1993) definition about BPR within the Greek public sector context. In this respect, BPR in the Greek public sector is different from BPR as defined by Hammer and Champy (1993) for the following reasons: (a) there was a lack of political management commitment and low project sponsorship on behalf of the two General Secretaries; (b) the two committees of the project responsible for the evaluation of project's deliverables consisted of employees that treated the project as a threat to their interests; (c) the logic "if it ain't broke - don't fix it" prevailed; (d) there was not any attitude on behalf of top and middle managers for radical changes.

Thirdly, the difference between BPR in the Greek public sector context and BPR as defined by Hammer and Champy (1993) raised the issue of why incremental and not radical changes in the Greek public sector. The participants to the two committees responsible for the evaluation of project's deliverables followed the norm “hide errors” instead of “reveal errors” because they believed that the operation was operating well. When faced with the prospect of failure in radical process redesign based on the Greek Information Society guidelines, they shifted the focus of the project to incremental improvements. Given this attitude on behalf of top and middle managers, the lack of active participation by the two General Secretaries and the composition of the managerial and the steering committee, the norm “hide errors” dominated having as a result the implementation of the logic “let's do incremental improvements to the satisfactory operational level of the organisation”.

Fourthly, this behaviour on behalf of the participants to these committees raised the issue how Greek Information Society can prevent the norm “hide errors” from process improvement projects in the Greek public sector. The researcher proposes that the committee(s) responsible for the evaluation of the project’s deliverables should not only consist of public employees on behalf of the public organisation, but also of employees on behalf of the Greek Information Society. These employees could have a dual role. Firstly, they could act as a horizontal consultant of the government about how process improvement projects can contribute to cost reduction and efficiency increase in order to motivate political and top management to have a more active participation to such projects. Secondly, they could monitor the other members of the committee(s) in order to prevent “hide errors” phenomenon.

Fifthly, given that the norm “hide errors” dominated at the case study, this raises the issue about the selection of the specific organisation and the specific process-cases for process improvement. Greek Information Society selected GSI-GSC as one of the two pilot sites for carrying out BPR projects within the 3rd CFS because it thought that this is the most likely public organisation in Greece that could show some significant improvements after a BPR project and it could be used as a best practice BPR project in the Greek public sector for future process improvement projects that will take place in the 4th CFS. Regarding the specific process-cases, there was a combination of several issues that led to the selection of these process-cases. The main issues were the lack of political management commitment to the project on behalf of the two General Secretaries and the norm “hide errors” on behalf of top and middle managers.

Sixthly, given that BPR in the Greek public sector differs from BPR as defined by Hammer and Champy (1993), this raises the issue about the use of the term BPR in the Greek public sector. Greek Public Administration launched in 2000 an operational program in order to achieve radical changes in the provision of public services towards citizens and enterprises, from offline to online provision. Given that BPR, as defined by Hammer and Champy (1993), is about achieving radical changes in the processes of organisations, it seems that the selection of the term BPR in 2000 by Greek Information Society was appropriate, at least in theory.

Seventhly, research results show that the use of BPR term about process improvement in the Greek public sector context does not seem to be suitable since only incremental changes can

be the outcome of process improvement projects in the Greek public sector. Therefore, Greek Public Administration should reconsider the use of BPR term and try to find a more appropriate term.

Research results show that Greek Public Administration should consider using the term Lean instead of BPR for process improvement projects because the incremental changes made in the three process-cases resulted in reducing time in service delivery to the customer (focus on customer value – reduce waste of time). Given that lean produces team-oriented organisations which are focused on serving the customer, Greek public organisations may consider moving the best employees into a process improvement team that will act as internal consultant (Radnor, 2010). This team could help the organisation to define customer value, map the operational system, analyse any constraints that prevent value from flowing to the customer, conclude to the necessary improvements, design a smooth flowing process and monitor the implementation of the changes by the departments (Piercy and Rich, 2009). This alternative would address the need to maintain employment (Greek legislation about employment in the public sector) but also establish the capability to apply the incremental improvements in the organisation.

Eighthly, given that the Greek public sector needs short-term radical changes, which cannot be the outcome of process improvement projects as already mentioned, Greek Public Administration should consider a more radical alternative than the previous one as well that could help Greek public sector to achieve the needed radical changes. This raises the issue which might be that radical approach. Radical process-focused change in a public sector organisation cannot be achieved without either changes in the law or privatisation (Kock and McQueen, 1996).

With respect to changes in the law, this alternative would be to change the article of the Greek constitution about public sector employment. This means that civil servants could be made redundant. Other EU countries are using this alternative as part of their public spending cuts in order to deal with the general financial crisis (ETUC, 2010). In order not to undermine the reason why public employees cannot be fired as established by the Greek constitution in 1911 (section 2.2), Greek government should examine to set a framework which will provide the option to make public employees redundant but at the same time will set the criteria for layoffs in order to protect them from governmental abuse of power.

With respect to the radical alternative of privatisation, it can be implemented only after the change in the law about employment in the public sector takes places. Greek public administration could use outsourcing as a method to reduce cost (Joha and Janssen, 2010) and to increase efficiency (Pessoa, 2009), which are the two main targets set by the EU and IMF support mechanism for the Greek public sector. The researcher proposes a generic conceptual model of outsourcing for the Greek public sector.

Finally, the researcher discusses the issue of “value” in process improvement in the Greek public sector context. The issue is if process improvement should add value for clients of the public organisations or Greek public administration (in terms of the targets set by the EU and IMF support mechanism). Given that Greece needs to cope with the agreement with the EU and IMF support mechanism and the need for radical changes as discussed in section 2.2., this means that process improvement should add value for Greek public administration. In this case, value would be defined as cost reduction and/or efficiency increase. The radical methods to achieve this value would be the change in the law about public sector employment and the use of outsourcing. The researcher argues that the radical change of the purpose of process improvement from adding value for the clients of public organisations (as it is for the time being) to adding value for Greek public administration (in terms of the targets set by the EU and IMF support mechanism) can trigger the implementation of radical changes to the Greek public sector. However, this radical change would also add indirectly value for citizens and enterprises. If process improvement projects contribute to cost reduction and increase efficiency, this will pave the way for the Greek government to adopt less harsh measures for citizens and enterprises.

In conclusion, the researcher summarises the answer to the main research question “how and why is process improvement achieved in the Greek public sector?”. About the “how” part of the question, he argues that Lean seems to be an appropriate process improvement method to achieve incremental changes to the Greek public sector. However, given that the Greek public sector needs radical changes, he proposes outsourcing (privatisation method) of services or internal processes to private companies after changing the law about public sector employment. Moreover, he proposes that the Greek Information Society employees should actively participate to the monitoring of the implementation of process improvement projects and have as a role to reduce resistance to change on behalf of public organisations. Regarding the “why” part of the question, he argues that the Greek public sector needs to address the two targets of cost reduction and the efficiency increase set by the EU and IMF support mechanism by exploiting the EU funds (4th CFS) for process improvement projects

in the Greek public sector. Hence, he proposes that process improvement should add value directly for the Greek public administration itself and not for citizens and enterprises.

With respect to the research methodology employed in this study, the researcher selected case research because the phenomenon (process improvement) can be studied in its natural setting (a Greek public organisation). However, he used a hybrid case research approach. Firstly, he used participant observation based on field notes in order to make a list of topics to research and then, he conducted interviews with executives of the organisation and a focus group in order to extract data for the case study based on these topics. Due to the use of case research, the research question (“how and why” type question) can be answered with a relatively full understanding of the nature and complexity of the complete phenomenon. Moreover, early exploratory investigations are carried out using case research where the variables are still unknown, and the phenomenon not at all understood and finally theoretical generalisation is possible. Theoretical generalisations about lessons learned for process improvement in the Greek public sector were carried out as mentioned previously.

Finally, he discusses the limitations of this research, and future research extension. Firstly, the inherent limitation of a single case should be noted. Given the single case study, the external generalisability of the findings is limited. Future research can address this limitation by examining additional public organisations. This will take place in Document 5. Secondly, the studying public organisation operates in the Greek public sector context. This context is exemplified by a government policy to modernise Greek Public Administration (section 2.2). As a result of this policy, the government started an operational program titled “Improvement of Public Administration’s Management Capability” (total budget € 505 million for the period 2007 – 2013; initial timetable, revised time schedule 2010 – 2016) aiming at the re-engineering of public organisations and at making government more effective and responsive to the needs of citizens and enterprises. To support this policy, Greek public organisations will be granted funds for process improvement projects from this program. Nevertheless, lessons learned from this case are still useful to all public organisations because it confronts to the general guidelines of Greek Information Society about BPR projects (Document 2). Hence, this case study can be considered as a ‘representative’ case of the process improvement projects that will take place in the Greek public sector in the future. This issue will be validated or not in Document 5, as more process improvement projects will be examined there.

Future research could examine the process improvement experiences of public organisations in other countries to determine whether radical changes in the public sector are the outcome of process improvement projects or of governmental policies. Moreover, it could also examine if radical changes are the outcome of using process improvement methods (such as Lean, BPR, kaizen, etc) or methods of privatisation (e.g. outsourcing, public-private partnerships, etc). Furthermore, it could examine if process improvement should add value for the clients of public organisations or the public administration itself especially under poor public financial conditions. This would contribute to the developing theory of process improvement in public organisations.

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APPENDIX 1: THE QUESTIONNAIRE

PARTICIPANT INFORMATION SHEET

Principal researcher

Mr. Grigorios Kontolaimos

Tel. 00302109404774

email: gkontolaimos@bridge-it.gr

Invitation

You are being invited to take part in a research study. Participation in the project is voluntary. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

Thank you for reading this.

What is the purpose of the study?

The purpose of this study is to develop an appropriate process improvement methodology that will support process improvement initiatives in the Greek public sector.

Why I have been chosen?

You have been chosen because you were the president of the XXX Committee of the project that took place at the public organisation and you can provide us with information about the project from the public organisation's view.

Do I have to take part?

It is up to you to decide whether or not to take part. If you decide to take part in this research, you will be given a copy of this information sheet to keep. You will also be asked to sign one consent form, which will be kept by the researcher. If you decide to take part, you are still free to withdraw at any time and without giving a reason.

What will be my involvement if I take part?

A research interview will take place. The interview will not be audio or video or photographic recorded. The researcher will take written notes during the interview.

Will my taking part in this study be kept confidential?

Yes. At no point will your identity be revealed to anyone. Your name will not be recorded on any of the research notes that are made and kept as part of the research. All notes will be kept in secure storage. There will be nothing in any materials they may have access to that could identify in the study.

What will happen to the results of the research study?

The research will be written up as an academic dissertation. It will be stored in the archives at Nottingham Trent Business School and will be available for inspection on request by students and academics.

Who is organising and funding the research?

The research is being undertaken as part of academic study at Nottingham Trent University leading to the award of Doctor in Business Administration.

Who has reviewed this study?

This study has been reviewed by the Research Ethics Committee of Nottingham Trent University.

CONSENT FORM

Principal researcher:

Mr. Grigorios Kontolaimos

Tel. 00302109404774

email: gkontolaimos@bridge-it.gr

1. I confirm that I have read and understand the information sheet dated [date] for the above study and have had the opportunity to ask questions. ☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason. ☐
3. I agree to take part in the above study. ☐

Name of the participant Date Signature

Name of the researcher Date Signature

QUESTIONS

1. Please describe how SGC-SGI was before the change
2. Do you consider that SGC-SGI could survive the economic crisis without the process improvement project?
3. What impressed you from the whole project?
4. What was the view of the employees for the project? Do you believe that they had a positive stance for the changes? How their work routing was affected?
5. Please describe the situation of the organisation after the change. Indicate the major differences between the “before” and “after” situation.

APPENDIX 2: RESEARCH ETHICS

APPENDIX 3: SELECTION OF THE CASES

The following table presents the selection of the cases based on the three criteria mentioned in Section 7 (step 2). “Conceptual framework” is a yes or no criterion whether the process follows all the steps of the conceptual framework presented in section 4.5. “ICT-based” is a yes or no criterion whether the process is based on ICT before the improvement. Polar example criterion briefly presents the type of polar example for each process in case there was one. The selected cases are in bold.

Table 7: Selection of the cases

No.	Process	Conceptual framework	ICT-based	Polar example
Political and Financial Issues Department				
1	Analysis and documentation of political issues	NO	NO	No measurement system
2	Analysis and documentation of national issues	NO	NO	No measurement system
Cultural Issues Department				
3	Analysis and documentation of cultural issues	NO	NO	No measurement system
Media Professionals Department				
4	Identification of daily and weekly prefectural and local newspapers that are allowed to publish companies' balance sheet	NO	YES	Preliminary measurement system
5	Identification of daily and weekly prefectural and local newspapers that are allowed to publish governmental announcements	NO	YES	Preliminary measurement system
6	Monitoring published advertisement material in newspapers	YES	YES	Preliminary measurement system Additional needed human resources

7	Record keeping of advertising companies' registration number	NO	YES	Preliminary measurement system
Press and Communication Offices Abroad				
8	Collection and processing of data and information about international issues relevant to international affairs	YES	NO	-
9	Production of informative material about international visitors	YES	NO	-
11	Development of press bulletin review	YES	NO	-
International Communication Planning and Analysis Department				
12	Publication of informative notes about international and European issues of Greek interest	NO	NO	No measurement system
Planning and Implementation Department				
13	Publication of Grèce hebdo and other publications	YES	NO	Additional needed human resources
International Public Relations Department				
14	Provision of accreditation services to foreign journalists or foreign broadcasting channels	YES	YES	No measurement system
IT Department				
15	Maintenance of IT infrastructure	NO	YES	No measurement system
Inventory Department				
16	Financial management of inventory material	NO	YES	Preliminary measurement system Additional needed human resources
17	Management of useless or surplus material	NO	YES	Preliminary measurement system Additional needed human resources
Procurement and Expenses of Press and Communication Offices Abroad Department				

18	Management of financial demands of Press and Communication Offices Abroad	NO	YES	No measurement system
Procurement and Expenses Department				
19	Project implementation funded by the National Public Investments Program	NO	YES	No measurement system
20	Settlement of rent expenses	NO	YES	No measurement system
21	Settlement of funding expenses	NO	YES	No measurement system
22	Settlement of mail expenses	NO	YES	No measurement system
23	Settlement of telecommunication expenses	NO	YES	No measurement system
24	Realisation of request for proposals	NO	YES	No measurement system

APPENDIX 4: HIRING PROCEDURE IN THE GREEK PUBLIC SECTOR

Supreme Council for Civil Personnel Selection (ASEP), which was established by Law 2190/1994 (Greece. Development of an Independent Authority for Public Servants Selection and Regulation of Public Administration Issues Act no 2190/1994), is an independent authority responsible for verifying the faithful implementation of the provisions on civil service staff hiring. There are specific independence safeguards in the establishing law to facilitate ASEP in carrying out its mandate. Its members enjoy personal independence and they are characterised as senior state functionaries. ASEP is subject only to parliament control and not to control by other public authorities. It has nation-wide powers to regulate and control the lawfulness of acts that fall within its scope of authority.

During its operation for over fifteen years, it has managed to prove its ability to carry out its institutional mandate and ensure impartiality and transparency in the crucial and sensitive area of civil personnel selection. Thus, ASEP has been established as an effective mechanism for control of civil service hiring, in the interest of safeguarding the principle of meritocracy and consolidating the rule of law.

Its main responsibilities are to select the permanent employees of the public sector; to control the lawfulness of staff hiring procedures followed by public agencies; and to identify cases of illegal hiring, through ASEP's Councillors-Inspectors who act as investigating officers. ASEP organises written exams and/or evaluates candidates by assigning grade points according to specific criteria provided for by law (Greece. Development of an Independent Authority for Public Servants Selection and Regulation of Public Administration Issues Act no 2190/1994) in order to select civil staff; for certain vacancies, it conducts supplementary practical or special tests or interviews.

Vacancies are always filled following a nation-wide announcement, in which the required qualifications and the relevant procedures are mentioned, as specified by the law establishing ASEP (Greece. Development of an Independent Authority for Public Servants Selection and Regulation of Public Administration Issues Act no 2190/1994). ASEP meets the key requirement of transparency by publicising, for every candidate, all the stages of the staff selection procedure. As a rule, public agencies and local authorities conduct hiring procedures themselves according to the said law, but always subject to ASEP's control, which hears any objections raised by candidates.

A robust IT system supports all the functions of ASEP, notably those relating to hiring procedures. This IT system meets the requirements of the large number of agencies, vacancies, announcements and candidates that ASEP has to manage.

Every year ASEP issues on average 30 announcements of 6,000 vacancies and receives 350,000 applications. It controls the procedures of exams conducted by agencies to fill 3,000 permanent posts and 30,000 seasonal posts. It hears 5,000 objections and 350 oppositions and petitions for remedial action by candidates and replaces 1,000 appointees. ASEP's bodies issue 2,000 decisions (Supreme Council For Civil Personnel Selection, 2009). Hence, the hiring process may take up to 6 months or even more. Unfortunately, the thorough hiring process as described earlier can create problems since public organisations cannot have an immediate replacement of a vacant job position. This is a problem especially for cases that a job position becomes vacant for abrupt reasons, e.g. death, early retirement, transfer of an employee to another department. Thus, Greek Public Administration should re-consider the civil personnel selection process at least for the cases that there are vacant job positions for unforeseen reasons.

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Document Four:

Survey Based Research & Statistical Research

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1 INTRODUCTION

This research aims at exploring the use of a Process Performance Measurement System (PPMS) in the Greek public sector. A PPMS will help the public sector's managers to develop quantitative indicators, which will provide a solid evidence of the performance improvement of their organisations. Hence, the main research questions that the researcher aims to answer are the following:

1) What is an appropriate quantitative indicator for measuring the performance improvement of the business processes in a Greek public agency?

2) What are the variants that have an impact on the quantitative performance indicator in a Greek public agency?

These research questions are interesting because the IMF and EU support mechanism has asked from Greece to provide evidence about its fiscal performance based on quantitative standards. This paves the way to research which is an appropriate quantitative indicator for measuring the performance improvement of the processes in a Greek public organisation and which variants may have an impact on it. By this way, the public organisation will know which variants that change during a process improvement project improved its performance as implied by the quantitative indicator.

In order to answer these research questions, the researcher uses action research as a research methodology. He uses a hypothetico-deductive approach to develop his initial conceptual framework and identify a cause and effect relationship between the quantitative indicator and the variants. Thus, he deduces from literature review and his experience as a consultant two quantitative indicators (change in the cost for executing the process, change in its duration) and eight variants (Frequency, Risk, Human resources, Time, IT, Technical, Location).

In order to collect the necessary data, he interviews the process owners of a Greek public organisation using a questionnaire and uses passive observation in order to calculate the changes of the variables from the as-is and the to-be situation of the improved processes. Finally, he triangulates the data gathered from the interviews and the fieldwork to crosscheck the answers.

He analyses the data using descriptive statistics, regression analysis, residuals analysis, logistic regression analysis and chi squared tests in order to identify the dependence of the dependent variables on other explanatory variables. In this respect, he uses SPSS v.17.0 as a statistical software tool.

The research findings show that change in cost for executing the process is an appropriate quantitative indicator to measure its performance improvement in a Greek public organisation. They also show that frequency, risk, human resources and time variant have an impact on it. Given the abovementioned findings, this research can be useful for developing a PPMS for the needs of the Greek public sector. Furthermore, its managerial implication is that the use of a PPMS can enable public managers to help Greek public administration to achieve the targets (decrease public cost – increase efficiency) set by the EU and IMF support mechanism.

Finally, he discusses the limitations of this research, and future research extension. Firstly, he notes the inherent limitation of a single case. Given the single case study, the external generalisability of the findings is limited. Future research can address this limitation by examining additional public organisations. Secondly, the examined public organisation operates in the Greek public sector context. Nevertheless, lessons learned from this case are still useful to all public organisations because it confronts to the general guidelines of Greek Information Society about BPR projects. Thirdly, a number of middle managers decided to participate on their own to the interviews without the assistance of key persons. However, he claims that the use of fieldwork as an additional data collection method minimises the impact of the abovementioned issue on the generalisability of the research findings.

Future research could examine the results of this research to other Greek public organisations. Moreover, it could examine its generalisations to the public and private sector of other countries and make comparisons either with public organisations and/or private companies in other countries.

Based on the above, Document 4 is organised as follows. The next section discusses the research questions and the literature gaps that make them interesting. The third section discusses the research epistemological and methodological issues and the selection of action research as a research methodology. The fourth section presents the initial conceptual framework of the research and the hypotheses that will be tested. The fifth section discusses the research methods. The sixth section presents the research sample construction and size.

The seventh section discusses the design and implementation of the research instruments. The eighth section outlines the validity and reliability issues of the research. The ninth section analyses the research material using statistical methods and explains the cause and effect relationship between the dependent variables and the independent variables. Finally, the last section presents the main conclusions of the research, its limitations and future extension.

2 PRESENTATION OF THE RESEARCH QUESTION

This section discusses the research questions. A research question is the first methodological step where the researcher sets and defines what he is looking for from his research. It contributes also to the construction of the theoretical assumptions. At the end of the research, the researcher has to answer the research question (Bryman, 2004, p.31). Before presenting the research questions, he reviews the literature about performance measurement system in general and in the Greek public sector and then he explains why the research questions are interesting.

2.1 PERFORMANCE MEASUREMENT SYSTEMS

Measuring performance improvement of processes has been an issue for many years for researchers. These measurement approaches started to grow at the end of the 19th century (Kueng and Krahn, 1999). Since then, managers have been focusing on financial parameters, having at the same time a strong incentive to manipulate the figures they report.

Within the decades of '80s and '90s there has been a significant change. The field of performance evaluation, such as self-assessments, quality awards, benchmarking, activity-based costing, balanced scorecard, workflow-based monitoring, etc. has been the topic of many discussions. These approaches are summarised as follows, in chronological order.

Table 1: Control Charts

(source: Adapted from MacCarthy and Wasursi, 2002)

Figure 1: Main characteristics of PPMS

(source: Kueng and Krahn, 1999)

The following table summarises the main points of the abovementioned approaches.

Table 2: Comparison of measurement approaches

(source: Kueng and Krahn, 1999)

Process-oriented organisations require a process management able to evaluate the current level of process performance. Hence, a measurement system is needed *which focuses on processes*. Having in mind that processes may cross departments or even divisions, this aspect is central. Moreover, effective process management requires a *broad spectrum of performance-relevant data*. Hence, financial and nonfinancial data are needed, as well as quantitative and qualitative data. Only PPMS combines these two criteria (Table 2).

Hence, the researcher deems that PPMS is the appropriate measurement system for the purposes of this research, since it allows him to monitor the performance of the processes within the framework of process improvement that is the core theme of this study.

After reviewing the main performance measurement systems, the next step is to discuss the need for a performance measurement system in the Greek public sector.

2.2 THE NEED FOR A PPMS IN THE GREEK PUBLIC SECTOR

There are several types of public organisations of different sizes within the Greek civil service. They may provide all types of services such as health, education, social services, economic, developmental and cultural services and other.

Greek civil service size, defined as a percentage of the total employment force (Handler et al., 2005), is around 22% from 2000 till 2008 with minor deviations from this average number and is close to the EU27 average civil service size, which is around 25% (Appendix 12.1). The civil services employ a large number of people with reference to the total population, equal to 1,022,121 civil servants in 2008 (ILO, 2008). That may be characterised as a problem, along with the bureaucracy, that also prevails in that huge public system. Inflexibility, inefficiency and need for radical and urgent changes are some more basic characteristics regarding the Greek public administration (Sotirakou and Zeppou, 2006).

The Greek public sector had to face a number of challenges such as inefficiency, poor performance and on many cases, there was a complete lack of performance measurement indicators (Loizidis and Patsouratis, 2008). The outcome was the fact that Greek economy since May 2010 operates under the auspices of IMF and EU since it had to borrow € 110 billion in order to cover its huge deficits (Martin and Roth, 2010). IMF and EU have asked from Greece to reduce its public spending, reduce labour costs and improve processes

(Document 3 - section 2.2). This means that there is a need to implement a PPMS in the Greek public sector in order to improve its efficiency and comply with IMF and EU support mechanism regulations.

Therefore, the researcher will try to explore the use of a PPMS in the Greek public sector. He will examine the variants that may influence that implementation, and then provide a framework (section 4.1) to be used by public organisations as a self–assessment tool that will assist them to develop their capacity for critical reflection, evaluation and improvement.

After describing the focus of this research, the next step is to discuss the research questions.

2.3 RESEARCH QUESTIONS

This section discusses the research questions:

1) What is an appropriate quantitative indicator for measuring the performance improvement of the business processes in a Greek public agency?

2) What are the variants that have an impact on the quantitative performance indicator in a Greek public agency?

They link with the current situation and needs of the Greek public sector. As already mentioned, there is a need to implement a PPMS in the Greek public sector. It will help the public sector's managers to develop quantitative indicators, which will provide a solid evidence of the performance improvement of their organisations. At this point, he notes the fact that IMF and EU support mechanism has asked from Greece to provide evidence about its fiscal performance based on quantitative standards. Therefore, the use of quantitative indicators is not a choice but a necessity for the Greek public sector. This paves the way about the first research question. The performance improvement of a Greek public organisation will be the outcome of a process improvement project aiming to improve the performance of the organisation by improving its processes.

Besides the need to set a quantitative performance indicator, there is a need to set the variants that may have an impact on it. This means that there must be an investigation on

what variants of the process improvement changes that will take place in a Greek public organisation in order to improve its performance will have an impact on the performance indicator. By this way, the public organisation will know which variants that changes during a process improvement project improved its performance as implied by the performance indicator. Other researchers (e.g. Wong, Chan & Chiang, 2011; DeSarbo, Wang & Blanchard, 2010) have also used the term “variant” as a variable that has an impact on a response variable.

3 RESEARCH METHODOLOGY

There are three research methodologies in order to perform quantitative research; positivism, realism and action research. In this section, the researcher presents these approaches, their differences, while he explains why he selects action research as the research methodology for the purposes of this research. Before this, he discusses its epistemological issues.

3.1 EPISTEMOLOGY OF RESEARCH: VARIANCE THEORY

Taken into account the aforementioned characteristics of the variance and process theory, he bases the performance improvement conceptual framework (section 4.1) on a variance theory. Variance can construct a theory based on the variance of the variables (dependent and independent) that the researcher examines in his research. He relies on this epistemology because he examines the variance of the examined variables in order to construct a new theory for a particular point of time (before and after process improvement).

The next section summarises the main research methodologies that are appropriate for conducting quantitative research.

3.2 POSITIVISM, REALISM AND ACTION RESEARCH

Positivism is a methodological approach, which advocates the use of natural sciences methods for the study of social reality (Bryman, 2004, p.542). The term relies on the fact that reality is stable and must be observed from an objective point of view.

Another research methodology is **realism**. It shares two features with positivism (Bryman, 2004, p.543). First, it is a belief that “natural and social sciences can and should apply the same kinds of approach to the collection of data and to explanation” and, second “a commitment to the view that there is an external reality to which scientists direct their attention (in other words there is a reality which is separate from our descriptions of it)” (Bryman, 2004, p.12). On the other hand, “realists, unlike positivists, are perfectly content to admit into their explanations theoretical terms that are not directly amenable to observations” (Bryman, 2004, p.12).

Action research is a broad methodology and it refers to a situation where the researcher and the client collaborate in order to analyse a problem and to develop a solution (Bryman, 2004, p.277). Action research examines the impact of an intervention, in this case it is the process improvement in the Greek public sector. Action research projects tend to begin by diagnosing the particular problem or need of a client. A researcher tries to utilise whatever knowledge is available to understand the client's problem. However, this knowledge may not apply or may require substantial adaptation to fit the ill-structured or context specific nature of the client's problem (Van de Ven, p.281-282). It is a popular approach because it allows the researcher to collect both qualitative and quantitative data but also to intervene in the problem and find solutions.

After presenting the main research methodologies to conduct quantitative research, the next step is to select a research methodology for the purposes of this research.

3.3 WHY ACTION RESEARCH

In order to choose the most appropriate research methodology, the researcher examines which research methodology fits better with the focus and the context of his research. In this research, the issue of using a PPMS in the Greek public sector needs a broad examination since it may allow this sector to improve its performance, reduce costs and increase efficiency under the pressure of IMF and EU. A broad examination of a research topic can happen with action research compared to the other two research methodologies, since it will allow him to intervene to the problem and seek for an appropriate framework of a PPMS in the Greek public sector.

Moreover, Schein (1999, p.7) has indicated that action research is the most suitable approach for projects requiring the solving of a key issue or problem, so that the researcher can fully understand its nature. De Mast (2003) notes that when there is a need to have a research involving process improvement and measurement, action research is the most appropriate methodology. He used action research on his research since it allowed him to become part of the problem, to get involved and find a suitable solution. Other researchers like Sotirakou and Zeppou (2006 and 2005), and Neely et al. (2000) have relied on action research.

Neely et al. (2000) became part of the examined problem, investigated it and provided a solution. The literature gap was that there was little work on the process of actually designing measurement systems. They developed a structured methodology for designing

performance measurement systems. Initially, they tested it in three participatory action research projects involving major UK automotive and aerospace companies. Then, they revised it and tested through six further non-participatory action research projects in UK manufacturing business units.

Sotirakou and Zeppou (2006 and 2005) have conducted researches about how to modernise the Greek public sector. The examined “problem” was the need to increase the efficiency of performance in the Greek public sector and to propose an appropriate solution. In order to identify the cause of the problem they used qualitative (focus group) and quantitative (structured questionnaire administered to member of the focus group) methods.

Neely et al. (2000) used a more interpretivist approach to action research. On the other hand, Li and Tang (2009) employed a positivist approach to it. Their study concerns the design of a performance measurement system in a large Chinese state-owned enterprise, focusing on how change happens. They adopted action research for two reasons. Firstly, the potential insights gained through action research are not achievable using other research methodologies. In their study, the participation in the design process provided them with a unique opportunity to experience and closely observe how change happened. Secondly, action research can be used to focus upon identifying whether effective change has occurred in organisations. In their study, the existence of mutual interest between researchers and the case company provided a good starting point for interaction, cooperation and intervention.

Likewise, in this research the researcher participates to the project that took place at a Greek public organisation. This helps him to observe the performance of its as-is and improved processes in order to identify an appropriate quantitative indicator for measuring their performance improvement (research question 1) and the variants that have an impact on it (research question 2). He collaborates with the management of the organisation in order to investigate the research topic, collect data and come up with solutions on how they can improve the performance of its processes. The progressive problem solving when the individual researcher involves with the persons who are affected by the problem and together they are working as a team is one of the key elements of action research. Finally, he follows a positivist approach to action research (section 5) like Li and Tag (2009).

After explaining why action research in this research, the next step is to discuss its conceptual framework and hypotheses.

4 CONCEPTUAL FRAMEWORK AND HYPOTHESIS IDENTIFICATION

4.1 THE CONCEPTUAL FRAMEWORK

Process improvement aims at a number of improvements, on issues like cost, quality, etc. Though that it has been widely used in the private sector with success, there have not been so many cases in the public sector. Especially for Greece, the only cases where process improvement was used had only a negative outcome. This resulted not by the concept of process improvement itself but by the nature of the Greek public sector and the resistance of the workforce (Sotirakou & Zeppou, 2006).

According to authors like Moghdeb, Green and Indulska (2009) and Martin and Montagna, (2006) there are a number of quantitative indicators such as the cost cuts that the process will achieve, the reduction in lead times on the services and increase in efficiency. The factors that may have an impact on them are the changes in the IT systems and hardware, risk management, continuous management support, supportive culture, technical capabilities and staff capabilities.

The researcher, from his own experience as a consultant, believes that there are two key quantitative indicators to measure process performance improvement; change in the cost for executing the process and, change in its duration. Those indicators are quite important taking into consideration that the Greek public sector is under pressure to reduce costs and to increase its efficiency (section 2.2).

Based on his experience and the abovementioned literature, he has indicated a number of variants that may affect the abovementioned indicators.

Table 3: Variants - Definition

No.	Variants	Definition
1	Frequency	Changes in how frequent the business process is executed
2	Risk	Changes in the risk level (low, medium, high) of the business process
3	Human Resources	Changes in the number of public servants that are involved in the execution of the business process
4	Time	Changes in the amount of time that public servants spend for executing the business process
5	IT	Changes in the IT systems that are used during the execution of the business process
6	Technical	Changes in the technical infrastructure that supports the execution of the business process
7	Location	Changes in the location that the business process takes place

As mentioned in section 2.1, PPMS should focus on processes, include the measurement of indicators that are relevant to process performance and determine a 'cause and effect' relation between these indicators. Thus, he tries to find a cause and effect relationship between an appropriate quantitative indicator for measuring the performance improvement of the processes in Greek public organisations (dependent variable-research question 1) and the variants that have an impact on it (independent variables-research question 2).

Conceptual frameworks based on cause and effect relationships are often the basis of hypothetico-deductive research because they are the source of the hypotheses that such research seeks to test (Bryman, 2004, p.440). The arrows in the following figure can be converted into a series of hypotheses (section 4.2) that can be tested (Fisher, 2007, p.128). The following conceptual framework will be the basis for this research. He will examine the same conceptual framework for change in the duration of the process as a dependent variable.

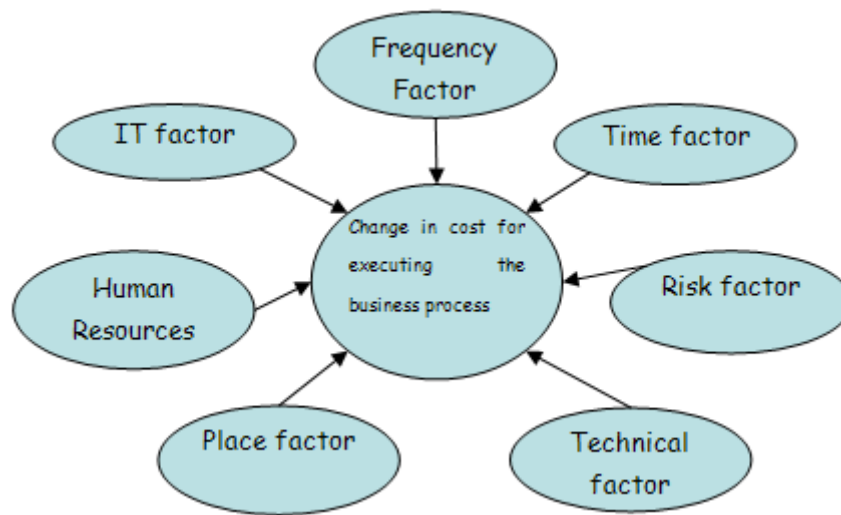


Figure 2: Performance Improvement Conceptual Framework

After presenting the conceptual framework of this research, the next step is to discuss the research hypotheses.

4.2 RESEARCH HYPOTHESIS

The research hypotheses originate from literature review and his experience as a consultant (section 4.1).

H0.1 Change in cost for executing the process does not depend on the change in the frequency of the process

H1.1 Change in cost for executing the process depends on the change in the frequency of the process

The level of improvement achieved in process improvement projects depends heavily on the level of the organisational capabilities. They are limited, and, thus, organisations need to use their resources in a cost-effective way (Moghdeb, Green and Indulska, 2009). A change in the frequency of a process may mean that employees cannot execute it using the same resources. Given the general e-government trend in Greece and the high demand for both public services and e-services (Introna, Haynes & Petrakaki, 2010), one alternative for the public organisations would be to increase the frequency of their processes in order to come up to the new expectations of citizens and enterprises. If they follow this alternative, they might need to employ more resources (either human or not) to execute their processes having as a potential result an increase in their execution cost.

H0.2 Change in cost for executing the process does not depend on the change in the risk level of the process

H1.2 Change in cost for executing the process depends on the change in the risk level of the process

Moghdeb, Green and Indulska (2009) say that risk management contributes to achieve better process improvement results and, hence higher levels of process performance. A change in the risk level of a process may mean that employees should perform more carefully their duties in order to avoid any mistakes. This could mean that they should spend more time performing their duties. Therefore, the execution cost of a process could increase because employees spend more time in doing their tasks.

H0.3 Change in cost for executing the process does not depend on the change in the number of public servants that are involved in the execution of the process

H1.3 Change in cost for executing the process depends on the change in the number of public servants that are involved in the execution of the process

There are two main reasons that could cause a change in the number of public servants employed. The first one is the general e-government trend in Greece (Introna, Haynes & Petrakaki, 2010). One of its outcomes is a reduction in the demand for offline services, which may mean a need for lesser public servants. This need may reduce the execution cost of offline services. The second one is the agreement between Greece and the EU and IMF support mechanism about public spending reduction (Document 3). One way to reduce it is to reduce labour cost by either reducing public servants' salaries or making them redundant. Greek government has selected the first option (Document 3). However, it has asked from all public organisations to record their needs in human resources so that it can move them from one organisation to another based on their needs (Greece. Ministry of Internal Affairs, 2010). This could cause a change in the number of public servants that are involved in the execution of the processes in the public organisations. The change in the number of public servants employed in the processes may cause a reduction in their execution cost.

H0.4 Change in cost for executing the process does not depend on the change for time that public servants spend for executing the process

H1.4 Change in cost for executing the process depends on the change for time that public servants spend for executing the process

Due to the financial situation in Greece as well as the EU and IMF support mechanism (Document 3), there is a huge discussion about the efficiency of the Greek public sector. This

sector is under pressure to provide better services and to become more cost efficient. One way to provide better services is for public servants to spend the necessary amount of time to offer services of high quality. An increase in time spent by public servants may increase the execution cost of processes.

H0.5 Change in cost for executing the process does not depend on the change of the IT systems that support the execution of the process

H1.5 Change in cost for executing the process depends on the change of the IT systems that support the execution of the process

Due to the general e-government trend in Greece (Introna, Haynes & Petrakaki, 2010), public organisations have started to provide e-services and they keep investing money in IT. The use of IT in the execution of a process may affect its cost, e.g., reduce time spent by employees, reduce its duration having as a result a reduction in the use of other resources (apart from human resources) necessary for its execution (Martin and Montagna, 2006).

H0.6 Change in cost for executing the process does not depend on the change in the technical infrastructure that supports the execution of the process

H1.6 Change in cost for executing the process depends on the change in the technical infrastructure that supports the execution of the process

Due to the provision of e-services, Greek public organisations have needed to invest not only to IT software but also to hardware (Introna, Haynes & Petrakaki, 2010). The constant need for e-services requires constant investment in hardware (e.g. new hardware, upgrade existing hardware, etc) as well. The change in hardware is one of the parameters that can help public organisations to minimise the requirements for frequent updates in software and hence changes to the processes related to the provision of e-services (Schwester, 2009). However, since changes in hardware seem to be necessary for providing e-services, they can cause changes in the cost of the processes that are relevant to these services.

H0.7 Change in cost for executing the process does not depend on the change of the location that the process is executed

H1.7 Change in cost for executing the process depends on the change of the location that the process is executed

The majority of processes in Greek public organisations are interdepartmental due to their bureaucratic nature (Sotirakou and Zeppou, 2006). This means that departments exchange many documents among them in order to execute one process. One way to facilitate the

execution of interdepartmental processes is to manage to place the relevant employees from each department to the same office room in order to enhance their cooperation aiming at increasing process efficiency. Hence, the change of the location that the process takes place may change its cost.

The researcher will test the same hypotheses for change in the duration of the process as dependent variable. After discussing the conceptual framework and the research hypotheses, the next step is to describe the research methods used to gather data in order to test the hypotheses.

5 RESEARCH METHODS

The researcher uses a hypothetico-deductive approach to conduct this research. In this type of hypotheses test, he tries not to confirm a hypothesis but to falsify it. That is its key difference with the other types of hypothesis test, since it does not try to confirm them but to reject them. This allows him to be in the role of a “detective” where he excludes the false hypothesis in order to confirm which the valid ones are. A key advantage is that allows the development of new theories. But, the fact that it relies on deductive logic to create falsified errors means that it may lead also to erroneous conclusions (Saunders, Lewis & Thonill, 2003, p.40).

There are many quantitative researches in the field of performance measurement, which follow a hypothetico-deductive approach. Most of them follow the same pattern. The researchers describe the research topic, review the literature, deduce hypotheses from the literature, formulate the variables, collect data using questionnaire and finally falsify the hypotheses (Grafton, Lillis and Widener, 2010; Salleh, Josuh and Isa, 2010; Cousins, Lawson and Squire, 2008; Dossie and Patelli 2008; Hyvönen, 2007). He used the hypothetico-deductive approach for the purposes of this research as follows (Fisher, 2010; Fisher, 2007, p.44-46);

Step 1: Fix the focus of the research.

He reviews the literature about performance measurement approaches and the need for a performance measurement system in the Greek public sector (section 2). The outcome of this step is to conclude to the research questions (section 2.3).

Step 2: Develop some models or conceptual frameworks.

He used both deduction and induction approach to develop the conceptual framework. Regarding deduction, he inferred from logic and speculation from first principles, which may be the dependent and the independent variables of this research. Regarding induction, he used his experience as a consultant on process improvement of the public sector. The outcome of this step is the conceptual framework and an initial list of the dependent and independent variables (section 4.1).

Step 3: Develop testable hypothesis using a number of variables.

Based on the conceptual framework, he develops seven research hypotheses (section 4.2) that try to identify a cause and effect relationship between dependent and independent variables.

Step 4: Work out how to measure the variables.

After developing the hypotheses, the next step is to work out how to measure the variables that he identifies in the hypotheses. Given the focus of the research, he uses indicators that compare the situation of the processes of the public organisation before and after the end of the process improvement project. Therefore, he uses proxy measures (section 9).

Step 5: Do the research, collect data on the variables.

He studied a process improvement project that took place at a Greek public organisation (section 9). He examined the relationship between the performance measure (dependent variable) of the processes and the variants (independent variables) that changed after the project (section 4). In order to collect the necessary data, he made interviews using a questionnaire (section 7) and he used passive observation (fieldwork).

Regarding the interviews, he interviewed the process owners of the processes that were improved during the project. They were fourteen middle managers and 30 key persons (section 6). The interviews lasted around 90 minutes. Interview notes were transcribed within the same day. Interview transcripts were sent to them by email for validation.

In this respect, he measured the variables according to the changes that occurred on the processes during the project. Therefore, he measured the performance improvement from the as-is to the to-be situation of the processes.

It is important to state that he used a questionnaire in order to increase the effectiveness of the research since it improves the chances of getting the right data, to increase its consistency since it provides comparable data from different sources (middle managers and key persons) and to increase its efficiency since it is the same questionnaire for different sources. Furthermore, there is not any insufficiency issue because both middle managers and key persons take part to the interviews (section 6). Hence, he has the ability to crosscheck the collected data. Moreover, he makes face-to-face interviews in order to deal with the

difference in the interpretation of the questions by the respondents and to reduce their bias by explaining to them the questions and the purpose of the research aiming at resolving any conflicting issue between the research and their interests (Saunders, Lewis & Thornill, 2003, p.212).

Regarding passive observation (fieldwork), he collected data during the project in order to calculate the changes of the variables from as-is and to-be situation of the improved processes. He collected data for two types of variables, dummy and continuous variables (section 9.2), for each of the thirty-eight processes (section 6). Regarding dummy variables, he observed whether there is any change or not in each variable per process between the as-is and the to-be situation. He used value of 0 to indicate that there was not any change and 1 to indicate that there was. Regarding continuous variables, he collected data by observing the execution of the processes during the as-is and the to-be situation. For each of the thirty-eight processes, he collected more than 30 replicates per variable during the as-is and the to-be situation. Then, he calculated the mean of each variable for the as-is and the to-be situation. He used the difference between the mean of the variable for the to-be and as-is situation (to-be mean minus as-is mean) in order to perform the statistical analysis (sections 9.2 and 9.3). The reason for selecting the difference of the means of each process is that the value (either 0 or 1) of each dummy variable per process is one measurement, hence he should use one measurement for each continuous variable per process in order to be able to perform the statistical analysis (section 9.3). Appendix 12.4 presents an analytical example of using passive observation for collecting data about the continuous variables.

The key advantage is that he has the choice to become part of the problem in order to explore in-depth the problem and its solution and to understand fully the environment of his research object. However, his judgment might be subjective (Saunders, Lewis & Thornill, 2003, p.286). In this research, the use of a structured questionnaire as the main research instrument minimises his subjectivity. Finally, he triangulates the data taken from the interviews and fieldwork to crosscheck the answers.

Step 6: To analyse the data and have a hypothesis testing.

He analyses the data using statistical methods in order to test if the 7 hypotheses are null or valid and he tries to explain the cause and effect relationship between the dependent and independent variables. He uses descriptive statistics (section 9.2), regression analysis, residuals analysis, logistic regression analysis and chi squared tests (section 9.3). In this respect, he uses SPSS v.17.0 as a statistical software tool.

Other researchers use mainly a close or open-ended questionnaire as a research instrument to conduct a quantitative study about a topic in the field of performance measurement. Their surveys take place by mail, email, telephone, webpage or interview (Gomes, Yasin and Lisboa, 2011; Salleh, Josuh and Isa, 2010; Kumar et al., 2008; Gosselin, 2005; Pollanen, 2005; Tapinos, Dyson and Meadows, 2005). Hence, collecting data through personal interviews using a questionnaire (step 5) is a valid practice.

On the other hand, there are only few quantitative surveys in the field of performance measurement using a questionnaire, which use a method to crosscheck the data collected by questionnaires. For example, Chiesa et al. (2009) mailed a close-ended questionnaire to research and/or development managers of Italian R&D intensive firms in order to find empirical evidence about the existence of any difference between the performance measurement approaches used in basic & applied research and new product development. They also performed a follow-up multiple case study investigation to understand the reason underlying the dissimilarities, which emerged from the survey. This means that the use of fieldwork (step 5) in this research as a method to crosscheck the validity of the data gathered by the questionnaires is a valid practice as well even though it is not common.

An alternative way to perform the research is the following one. He could have selected positivism as a research methodology. In this case, he would have developed a structured questionnaire using Likert scale 1-5 or 1-7 (ranging from 'strongly agree' to strongly disagree'). There would have been questions about the dependent variable, e.g. 'Do you agree that change in cost is an appropriate performance indicator for measuring performance improvement?' and the independent variables, e.g. 'Do you agree that change in risk level of a process can have an impact on the performance indicator?'. He would have sought the departmental managers' opinion (around 10 managers) on the draft version of the questionnaire in order to pretest it. The population of the research would have been all the employees that participated to and/or were influenced by the process improvement project that took place at the public organisation (around 300 employees). He would have emailed them the structured questionnaire. Then, he would have sent them an email as a reminder and after some time, he would have phoned them in order to increase the response rate. After collecting the questionnaires, he would have checked the responses for non-response bias by comparing the late and the early responders. In general, early responders are presumed to have a greater interest in the research topic. Moreover, he would have used Cronbach's alpha to assess the reliability of the survey. Furthermore, he would have evaluated the normality of the data via skewness and kurtosis. Finally, he would have done a descriptive statistics analysis, e.g. frequency of each scale per answer (bar charts for

example), and would have performed a multiple regression analysis (R-squared, F-test, t-test, etc). This research approach is similar to the approach that other researchers in the field of process improvement follow (Gomes, Yasin & Lisboa, 2011; Salleh, Josuh & Isa, 2010; Kumar et al., 2008; Gosselin, 2005; Tapinos, Dyson & Meadows, 2005; Pollanen, 2005).

The advantages of the abovementioned approach compared to the one used are the following. Firstly, it is easier to code the answers because of the use of scale ratings in the questionnaire. Secondly, it is easier to perform the statistical analysis since all variables are of the same type. Thirdly, this approach could potentially lead to a bigger sample. Given that the population of the alternative approach is 300 employees, a response rate of more than 13% would mean a bigger number of respondents. Finally, it is less time consuming for both the researcher and the respondents since no face-to-face interviews take place.

However, he did not follow this approach for four reasons. Firstly, the respondents were familiar with him due to his role as a consultant to the process improvement project that took place at the public organisation. Hence, they were comfortable to participate to the face-to-face interviews. He could not have been sure whether or how many respondents would have participated to his research using the alternative approach. Secondly, he could not have explained the questions of the questionnaire to all the potential respondents of the alternative approach as he did during the face-to-face interviews. Hence, he could not have reduced the respondents' understanding bias of the questions. Thirdly, he would not have had the option to obtain additional information during the alternative approach as he did during the face-to-face interviews. Finally, he could not have exploited fieldwork data during the alternative approach since it would have been very difficult to relate the answers with these data.

After discussing the research methods employed, the next step is to present the sample construction and size of the research.

6 SAMPLE CONSTRUCTION AND SIZE

In any research, the researcher has to concentrate the focus of the research on the ‘research units’ that will be the subject of the research (Saunders, Lewis & Thornill, 2003, p.312). In this research, the ‘research units’ are the persons involved with the process improvement project that took place in a Greek public organisation called General Secretariat Communication – General Secretariat Information. The reason for choosing this organisation is that he participated as a passive observant to the project that occurred in this organisation since he works in the firm that undertook its implementation.

This project meets the guidelines about process improvement projects set by the Greek Information Society (Document 3), thus it can be considered as a “representative” process improvement project in the Greek public sector. It can be used as the blueprint for future process improvement projects in the Greek public sector in order to comply with the changes on its environment and the regulations of the IMF and EU supporting mechanism.

The population of a research is defined as every possible case or group members, which is directly linked with the research (Saunders, Lewis & Thornill, 2003, p.150). In this research, its population is all the middle managers of the departments where there were improvements in their processes. This means fourteen middle managers. Overall, thirty-eight processes were improved. All middle managers participated to this research. Hence, the response rate was 100%.

He informed middle managers that they may ask from key persons to participate to the research. Ten out of the fourteen middle managers did so, while only four middle managers replied on their own at the questionnaire. The former said that key persons know in-depth how processes are executed, hence they can provide more accurate information, while the latter said that they are fully aware how processes are executed. Overall, thirty key persons participated to the research. This means that he collected data for eight out of the thirty-eight processes only by middle managers. He dealt with this limitation by crosschecking the validity of the data provided by them with the info gathered by passive fieldwork observation (section 5-step 5).

After explaining the sample construction and size of the research, the next step is to discuss the research instrument used for its conduction.

7 DESIGN AND IMPLEMENTATION OF RESEARCH INSTRUMENTS

The research instrument is a structured questionnaire consisting of open-ended questions (Appendix 12.2). They are helpful to acquire in-depth data, but they are making difficult the process of data encoding and analysis (Bryman, 2004, p.145). However, in this survey, the researcher quantifies the provided answers.

The response format is free response. Its advantages are that it allows for unanticipated responses and respondents are 'open up' in their own words. Its disadvantages are that the questionnaire may be too complex to answer and thus put respondents off, and it is difficult to collate and analyse response (Bryman and Bell, 2007, p.259). Regarding the first disadvantage, he did not give the questionnaire to the interviewees before the interview, but he used it as a research instrument during it (Kumar et al., 2008). Regarding the second disadvantage, he used fieldwork (section 5-step 5).

The questionnaire consists of two parts (Appendix 12.2). The first one concerns the as-is situation and the second one the to-be situation. Before the questions, there is a consent form and an information sheet about the research scope (Chiesa, 2009; Pollanen, 2005). This provides an ethical background on the research (Saunders, Lewis & Thornill, 2003, p.352). In order to construct the questionnaire, he tried to use clear and simple language, avoid using leading and presumptive questions, be aware of hypothetical questions and bear in mind the research questions (Bryman and Bell, 2007, p.266-271).

Before the interviews, he conducted a pilot test in two departments of the public organisation to ensure that the questionnaire is valid, the interviewees understand the questions and the responses are relevant to the research questions (Bryman and Bell, 2007, p.273-274).

Furthermore, he gathered information using passive observation (section 5-step 5) which reduces the chances of intrusion. He observed the changes in the values of the performance indicator variable (research question 1) and the variants that may have an impact on it (research question 2) from the as-is to the to-be situation of the improved processes. Finally, he conducted a triangulation using data taken from the interviews and the fieldwork to crosscheck the answers (Dossi and Patelli, 2010; Chiesa et al., 2009).

After outlining the research methods, the sample construction and size and the design and implementation of the research instruments, the next step is to discuss the reliability, validity and research ethics issues of this research.

8 VALIDITY, RELIABILITY AND RESEARCH ETHICS

This section discusses the validity, reliability and research ethics issues of this research. Regarding its validity, the researcher discusses four types of validity (Fisher, 2007, p.295-298).

The first one is construct validity. It questions whether the variables/constructs measure what they purport to measure (Fisher, 2007, p.295). In this respect, he developed the dependent and the independent variables using both his experience as a practitioner (Pollanen, 2005) as well as other similar researches (Grafton, Lills & Widener, 2010; Pollanen, 2005).

The second one is internal validity. It concerns whether the evidence presented justifies the claims of the cause and effect relationship (Fisher, 2007, p.296). Given that cost reduction is the broad topic in the Greek public sector, he claims that the effect (dependent variable) in this research should be a quantitative performance indicator about cost change in the execution of the processes. Regarding the causes (independent variables), he listed the variants that changed between the as-is and the to-be situation of the processes. Then, using his experience as a practitioner and other similar researches, he concluded whether they might have a cause and effect relationship with the dependent variable.

The third one is external/population validity. It questions whether the generalisations that a researcher has proved in a particular context apply equally well to other populations or contexts (Fisher, 2007, p.297). This research is about a process improvement project that took place in a Greek public organisation. Given that it can be considered as a “representative” project for the Greek public sector (section 6), he may claim that the research outcomes can be generalised for this sector. However, he recognises that they may not apply to the public sector of other countries and to private companies in either Greece or other countries. Future research could examine the generalisations of this research to the abovementioned contexts and make comparisons either with public organisations and/or private companies in other countries. Moreover, external validity refers to the sample representation in the case of large sample research (Fisher, 2007, p.297). In this research, he gathered data for the thirty-eight processes that were improved during the project. However, he collected data for eight processes only by middle managers and not by both middle managers and key persons (section 6). He claims that the use of fieldwork as an additional

data collection method minimises the impact of the abovementioned issue on the generalisability of the research findings.

The fourth one is ecological validity. It questions if findings obtained from contrived circumstances have validity in the messy complexity of real life (Fisher, 2007, p.298). He uses a type of activity sampling (Fisher, 2007, p.164) in order to obtain quantitative data from a natural setting. He limits his sample only to the processes that were improved during the process improvement project and he collects data for the as-is and the to-be situation. As with credibility, he provides enough information about the research context (section 2) so that the reader can conclude about the ecological validity of his findings (Fisher, 2007, p.298).

Regarding reliability, it refers to the consistency of a measure of a concept. There are three prominent factors involved when considering whether a measure is reliable (Bryman and Bell, 2007, p.163). The first one is stability. It concerns whether a measure is stable over time so that the researcher can be confident that the results relating to that measure for a sample of respondents do not fluctuate. In this research, he crosschecked the answers of the respondents using fieldwork (section 5-step 5) in order to overcome any potential variation over time in their answers. The second one is internal reliability. It concerns whether the indicators that make up the scale or index are consistent. He did not use any type of scale, thus there is not any internal reliability issue for this research. The third one is inter-observer consistency. It concerns the involvement of subjective judgment in activities such as the recording of observations or the translation of data into categories and where more than one "observer" is involved in such activities. In this research, there is only one researcher who triangulated the data collected by fieldwork and interviews (section 5-step 5) in order to minimise the danger of his own subjectivity.

9 ANALYSIS OF MATERIAL

9.1 INTRODUCTION

The researcher aims to find a cause and effect relationship between an appropriate quantitative indicator for measuring the performance improvement of the processes in Greek public organisations (dependent variable-research question 1) and the variants that have an impact on it (independent variables-research question 2). In this respect, he studies a process improvement project that took place in the General Secretariat of Communication – General Secretariat of Information (GSC-GSI, homepage - www.minpress.gr) between February 2009 and January 2010 (section 6).

Its basic aim was to ensure that GSC-GSI would improve its processes based on ICT functions. This would help the organisation to improve service quality, provide Greek and foreign citizens with accurate information, reduce bureaucracy and lead times on its processes, and finally promote e-governance in every level of Greek public administration.

In order to collect the necessary data, he made interviews using a questionnaire (section 7) and he used passive observation (section 5). Regarding the interviews, he interviewed the process owners (section 6) of the processes that were improved during the project (Appendix 12.3). Regarding passive observation (fieldwork), he collected data during the project in order to calculate the changes of the variables from the as-is and the to-be situation of the improved processes (Appendix 12.4). Finally, he triangulates the data gathered from the interviews and the fieldwork to crosscheck the answers.

After collecting the data, he analyses them using statistical methods in order to test if the 7 hypotheses (section 4.2) are null or valid and he tries to explain the cause and effect relationship between the dependent variables and the independent variables. He uses descriptive statistics analysis (section 9.2), regression analysis and some categorical analysis tests (section 9.3). Finally, he discusses the results of his research (section 9.4).

9.2 DESCRIPTIVE STATISTICS

This section presents the dataset. It consists of 9 variables measured.

Table 4: Data set variables

Variable Name	Alias	Type	Treated as
CH_COST	Change in cost for executing the business process	Continuous	Dependent
CH_DURATION	Change in the duration of the business process	Dummy	Dependent
FREQ	Frequency variant: Changes in how frequent the business process is executed	Dummy	Explanatory
RISK	Risk variant: Changes in the risk level (low, medium, high) of the business process	Dummy	Explanatory
HR	Human resources variant: Changes in the number of public servants that are involved in the execution of the business process	Continuous	Explanatory
TIME	Time variant: Changes in the amount of time that public servants spend for executing the business process	Continuous	Explanatory
IT	IT variant: Changes in the IT systems that are used during the execution of the business process	Dummy	Explanatory
TECHNICAL	Technical variant: Changes in the technical infrastructure that supports the execution of the business process	Dummy	Explanatory
LOCATION	Location variant: Changes in the location that the business process takes place.	Dummy	Explanatory

Continuous Variables

1. Change in cost for executing the business process (€)

Variable name in the dataset: CH_COST.

The following table summarises its descriptive statistics.

Table 5: Descriptive statistics Change in cost

	N	Range	Min	Max	Mean	Std. Deviation	Variance
Change in cost (€)	38	690339.0	-186112.0	504227.0	37354.3	106593.0	11362059224.9

Its mean is at around € 37.000, with the highest decrease observed at around € 186.000 and the highest increase at around € 504.000. Looking back to the data, he notices that the

highest decrease is observed in the process titled 'Management of financial demands of Press and Communication Offices Abroad' (Procurement and Expenses of Press and Communication Offices Abroad Department), while the highest increase is observed in the process titled 'Development of press bulletin review' (Press and Communication Offices Abroad). The below scatter plot highlights the abovementioned extreme observations.

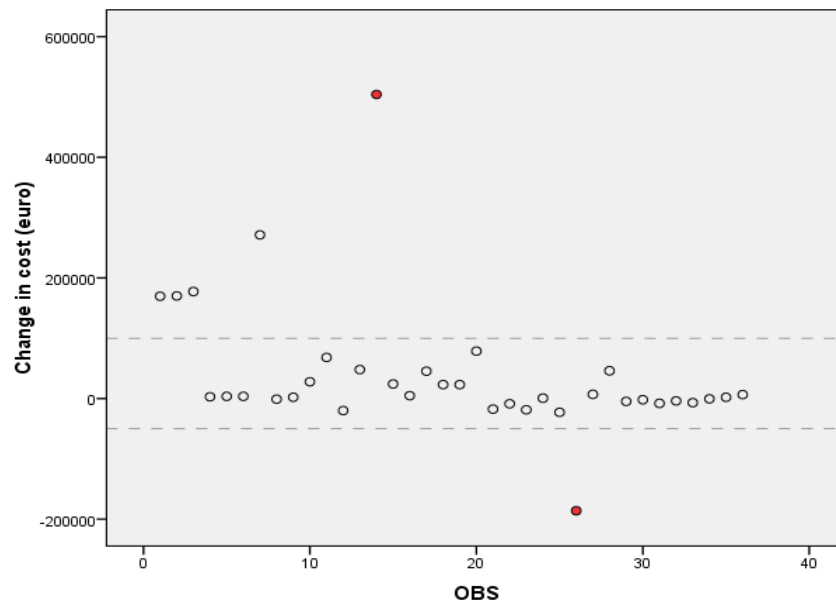


Diagram 1: Scatter plot Change in cost

The researcher uses the horizontal dashed lines in the above diagram to show that the vast majority of the observations of this variable are between -50.000 and 100.000 €. Hence, he expects that the independent variables that can explain the 2 extreme values will probably qualify for statistical significance.

2. Human resources variant: Changes in the number of public servants that are involved in the execution of the business process (number of servants)

Variable name in the dataset: HR.

The following table summarises its descriptive statistics.

Table 6: Descriptive statistics Human Resources variant

	N	Range	Min	Max	Mean	Std. Deviation	Variance
HR (numbers)	38	15.00	-8.00	7.00	-.2368	2.08837	4.361

The highest decrease in the number of public servants is 8 public servants, while the highest increase is 7 public servants. These values correspond respectively to the process titled 'Management of financial demands of Press and Communication Offices Abroad' (Procurement and Expenses of Press and Communication Offices Abroad Department) and the process titled 'Monitoring published advertisement material in newspapers' (Media Professionals Department). The abovementioned observations, highlighted in the below scatter plot, are actually quite far from the rest observations. If he removed them, this variable would have much less variability around zero (no change):

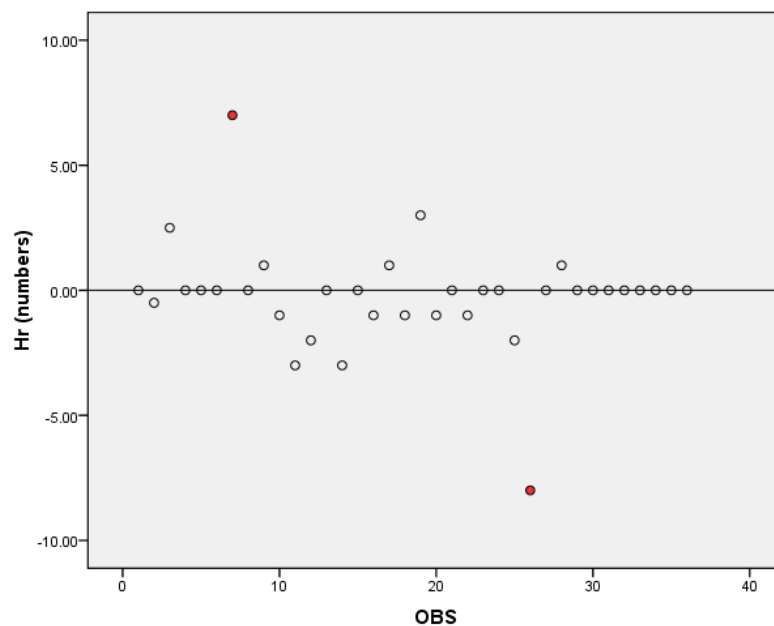


Diagram 2: Scatter plot Human Resources variant

As a first sign for statistical significance, he notices that the highest decrease of this variable corresponds to the highest decrease in cost (dependent).

3. Time variant: Changes in the amount of time that public servants spend for executing the business process (days).

Variable name in the dataset: TIME.

The following table summarises its descriptive statistics.

Table 7: Descriptive statistics Time variant

	N	Range	Min	Max	Mean	Std. Deviation	Variance
Time (days)	38	2963	-110	2853	296.89	555.455	308530.367

Its mean is plus 297 days, with the highest decrease being 110 days and the highest increase being 2853 days. These highest changes correspond respectively to the process titled 'Management of financial demands of Press and Communication Offices Abroad' (Procurement and Expenses of Press and Communication Offices Abroad Department) and the process titled 'Development of press bulletin review' (Press and Communication Offices Abroad). These observations correspond to the respective minimum and maximum values of change in cost, which means that this variable is very likely to explain the pattern of the continuous dependent variable in a significant degree. The extreme value is the one that refers to the maximum increase, highlighted in the below scatter plot.

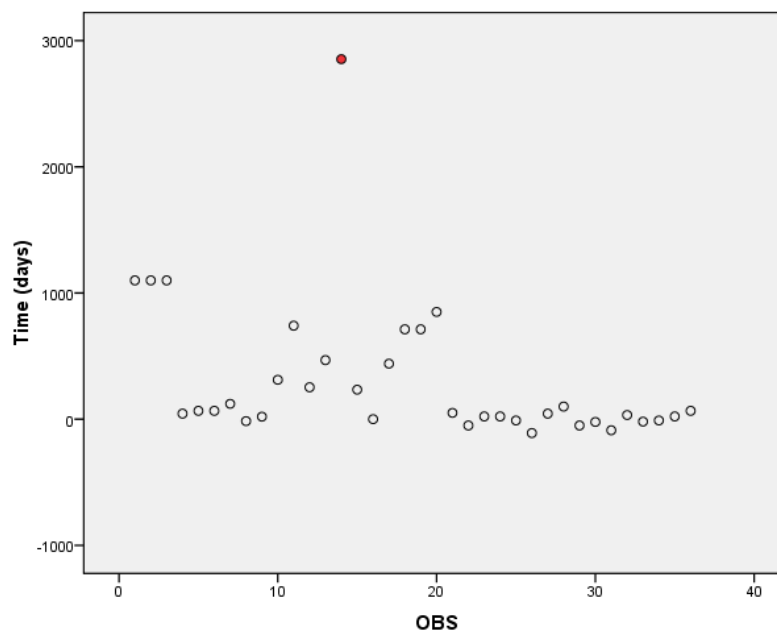


Diagram 3: Scatter plot Time variant

At this point, it is interesting to make a correlation analysis between the 3 continuous variables. In section 9.3, he discusses the need of implementing regression analysis in order to see in which degree the dependent continuous variable (cost) is explained by other variables, characterised as explanatory. Closely related but conceptually very much different from regression analysis is correlation analysis (Aczel and Sounderpandian, 2002, Chapter

10), where the primary objective is to measure the strength or degree of linear association between two variables. Thus, he makes this analysis in order to evaluate -apart from their individual descriptive characteristics- their linear association that will give him an idea of how they could behave in a statistical model. The results will be indicative, as his main purpose is to apply a multiple model that will include as many explanatory variables as possible.

The most common correlation index is Pearson's correlation r , which can be positive or negative and lies between the limits of -1 (absolute negative correlation) and 1 (absolute positive correlation). The closer r is to zero, the weaker the variables' linear correlation is (Bryman and Bell, 2007, p.362; Buglear, 2005, p.228-233). The following table presents the Pearson's correlation matrix for the 3 continuous variables as well as the p-values (in the blankets) for the relevant correlation coefficients.

Table 8: Pearson's correlation matrix

	Change in cost (€)	Hr (numbers)	Time (days)
Change in cost (€)	1	0.302 (0.065)	0.844 (0.000)
Hr (numbers)	0.302 (0.065)	1	0.089 (0.597)
Time (days)	0.844 (0.000)	0.089 (0.597)	1

From the above matrix, he concludes that there is a very strong linear relationship between Time and Change in cost, as the relevant coefficient is 0.844 ($p\text{-value} < 0.05$). Moreover, the correlation coefficient between Hr and Change in cost is 0.302, significant in 10% level of significance, but not in 5%. The positive sign of the two correlation coefficients statistically confirms what his intuition says: the more time the public servants spend for executing the improved process and the biggest the number of the involved public servants in their execution, the more the cost will increase. He notices that the fact that the correlation between the two explanatory continuous variables is insignificant, is good for the validity of the regression model (section 9.3).

The R-squared index that he uses in the regression model (section 9.3) is a more meaningful measure than the correlation coefficient r because R-squared can be applied in a linear model with more than one variables and can depict the proportion of variation in the

dependent variable explained by the explanatory variables (Aczel and Sounderpandian, 2002, p.511).

Dummy Variables

He uses dummy variables in order to model all the qualitative information. They are artificial variables that take on values of 1 or 0, 0 indicating the absence of an attribute and 1 indicating its presence (Aczel and Sounderpandian, 2002, p.539). In this case, 0 means that there is no change in the specific variable and 1 that there is a change. The following table summarises the descriptive statistics (frequency and percentages) of the 6 dummy variables.

Table 9: Descriptive statistics Dummy variables

	Change in duration	Frequency Variant	Risk Variant	IT Variant	Location Variant	Technical Variant
No change (0)	23 (60.5%)	33 (86.8%)	31 (81.6%)	26 (68.4%)	36 (94.7%)	38 (100%)
Change (1)	15 (39.5%)	5 (13.2%)	7 (18.4%)	12 (31.6%)	2 (5.3%)	0 (0%)

Change in duration is the dummy variable that will be treated as dependent. He notices at the dataset that all changes in duration are positive besides one case. Thus, when referring to Change in Duration, he refers to positive change, which means more days for the execution of the process. He will insert the other dummy variables in the regression model for the statistical explanation of the continuous response variable Change in cost and will use them as well in some categorical analysis for the dependence of Change in duration (section 9.3). As shown above, there is not any change in the technical infrastructure that supports the execution of the process (technical variant). Hence, he will not use this variable in any kind of statistical analysis.

9.3 STATISTICAL ANALYSIS

He believes that there are two key quantitative indicators to measure process performance improvement; change in the cost for executing the process and, change in its duration (section 4.1). Therefore, he treats the two relevant variables as dependent and he tries to explain them with the aid of the other variables that will be treated as explanatory. The analysis takes place in two phases. In Phase I, he uses Regression Analysis and in Phase II, he conducts some Categorical Analysis tests.

Phase I: Regression Analysis

Regression Analysis is the most popular technique for explaining the dependence of a quantitative variable on other (qualitative or quantitative) variables (Appendix 12.5.1). In this case, the first variable to be analysed is the continuous variable Change in Cost. It is treated as response variable to other explanatory variables that can be either quantitative (continuous) or qualitative (dummy). The following table shows the variables that he uses in this analysis.

Table 10: Regression analysis variables

Variable Name	Alias	Type	Treated as
CH_COST	Change in cost for executing the business process	Continuous	Dependent
FREQ	Frequency variant: Changes in how frequent the business process is executed	Dummy	Explanatory
RISK	Risk variant: Changes in the risk level (low, medium, high) of the business process	Dummy	Explanatory
HR	Human resources variant: Changes in the number of public servants that are involved in the execution of the business process	Continuous	Explanatory
TIME	Time variant: Changes in the amount of time that public servants spend for executing the business process	Continuous	Explanatory
IT	IT variant: Changes in the IT systems that are used during the execution of the business process	Dummy	Explanatory
LOCATION	Location variant: Changes in the location that the business process takes place	Dummy	Explanatory

Model's selection

For the purposes of this research, he applies a multiple linear regression model with seven variables, one dependent, which is CH_COST and six explanatory, which are FREQ, RISK, HR, TIME, IT and LOCATION. The regression function is the following one:

$CH_COST_i = \beta_0 + \beta_1 \cdot FREQ_i + \beta_2 \cdot RISK_i + \beta_3 \cdot HR_i + \beta_4 \cdot TIME_i + \beta_5 \cdot IT_i + \beta_6 \cdot PLACE_i + u_i$
,where u is the stochastic disturbance term (Appendix 12.5.1) and $i=1,...,38$ and denotes the i th observation of the dataset.

He uses OLS (Ordinary Least Squares) as an estimation method to obtain the outputs of the regression model, because many statisticians consider it the most appropriate method (Moisiadis and Bora-Senta, 1997). OLS method gives the following estimated equation:

$$\text{Mean}(CH_COST_i) = -3239.80 - 75016.83 \cdot FREQ_i + 44114.14 \cdot RISK_i + 14840.81 \cdot HR_i + 168.19 \cdot TIME_i - 15021.63 \cdot IT_i + 12567.84 \cdot PLACE_i \quad (1)$$

The following table presents all the information for the estimations of the estimated model (1) and their significance.

Table 11: Multiple Linear Regression Model

Model (1): R-squared = 89.0% Dependent: CH_COST				
Variable	Regression Coefficient	Std.Error	t - statistic	P-value
Constant	-3239.80	9527.56	-.34	.736
FREQ	-75016.83	26466.70	-2.83	.008
RISK	44114.14	21428.12	2.06	.048
HR	14840.81	3400.42	4.36	.000
TIME	168.19	12.01	14.01	.000
IT	-15021.63	15003.92	-1.00	.324
LOCATION	12567.84	30174.88	.42	.680

From the above table, he notices that the statistically significant variables (5% level of significance) are FREQ, RISK, HR and TIME (p-value<0.05), while IT and LOCATION are not (p-value>0.05) when it comes to the explanation of the Change in Cost. The R-squared indicator, which is the basic measure of the model's goodness of fit (Aczel and Sounderpandian, 2002, p.511), is very high at 89.0%, which means that the explanatory variables explain the 89.0% of the dependent variable's variation.

However, he tries to get a more compact model, by using the Stepwise Backward Elimination algorithm (Aczel and Sounderpandian, 2002, p.584-585), which involves starting with all the candidate independent variables and testing them one by one for statistical significance,

deleting any that is not significant. The below table summarises the abovementioned algorithm:

Table 12: Stepwise Backward Elimination Algorithm

Starting point: Explanatory variables in the model: FREQ, RISK, HR, TIME, IT, LOCATION		
Step	Variables Removed	Variables in the model
1	LOCATION	FREQ, RISK, HR, TIME, IT
2	IT	FREQ, RISK, HR, TIME
End of algorithm: Explanatory variables in the model: FREQ, RISK, HR, TIME		

The optimum model according to Backward Elimination is the one, which includes FREQ, RISK, HR and TIME as explanatory variables. Hence, the estimated equation is the following one:

$$\text{Mean}(CH_COST_i) = -8024.31 - 78153.61 \cdot FREQ_i + 45766.01 \cdot RISK_i + 15078.69 \cdot HR_i + 171.11 \cdot TIME_i \quad (2)$$

The following table presents all the information for the estimations of the estimated model (2) and their statistical significance.

Table 13: Multiple Linear Regression Model (Stepwise backward elimination)

Model (2): R-squared = 88.7% Dependent: CH_COST				
Variable	Regression Coefficient	Std.Error	t - statistic	P-value
Constant	-8024.31	7659.78	-1.05	0.302
FREQ	-78153.61	25875.01	-3.02	0.005
RISK	45766.01	20985.22	2.18	0.036
HR	15078.69	3333.46	4.52	0.000
TIME	171.11	11.33	15.10	0.000

From the above table, he notices that there are four explanatory variables ($p\text{-value} < 0.05$), while IT and LOCATION have been removed by the method he applied. Although he reduced the number of variables in model (2), R-squared is still very high, 88,7% from 89.0% in model (1). Thus, he chooses to draw his conclusions from model (2) which is much more compact, as it has four explanatory variables that manage to explain the 88.7% of the dependent variable's variation.

In order for the above results to be valid, the conditions concerning the model's significance and some assumptions for the residuals have to be satisfied.

Model's significance

The following table is the ANOVA (Analysis Of Variance) table for model (2), which summarises the portions computed by the OLS method.

Table 14: ANOVA

Model	Sum of Squares	df	Mean Square	F	P-value
Regression	3.728E+11	4	9.319E+10	64.55	0.000
Residual	4.764E+10	33	1.444E+09		
Total	4.204E+11	37			

The last column presents the p-value for the significance of the model. It concerns the hypothesis that the explanatory variables of the model do not contribute at all in the explanation of the dependent variable. This hypothesis is, as expected from the previous results, rejected at 5% level of significance ($p\text{-value} < 0.05$), hence model (2) is a significant model.

Residuals Analysis

The two fundamental assumptions that have to be satisfied for the residuals are normality and independency (Keppel and Sheldon, 1989).

Normality

Hypothesis tested: H_0 : *The residuals follow the Normal distribution.*

The regression model assumes that the residuals are normally distributed (Appendix 12.5.2). In order to test hypothesis H_0 , he uses the Kolmogorov-Smirnov test, which will give him a p-value, according to which he will reject or accept this hypothesis (Corder and Foreman, 2009, chapter 2). The following table presents the Kolmogorov-Smirnov test's result.

Table 15: Kolmogorov-Smirnov test

One-Sample Kolmogorov-Smirnov Test: Residuals of Model (2)	
P-value	0.548

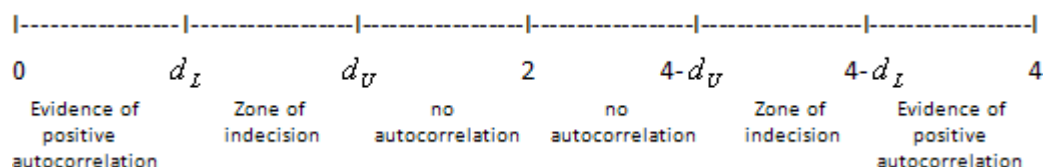
The hypothesis H_0 is not rejected at 5% level of significance ($p\text{-value}=0.548>0.05$), therefore the normality assumption is satisfied for the residuals.

Independency (Autocorrelation)

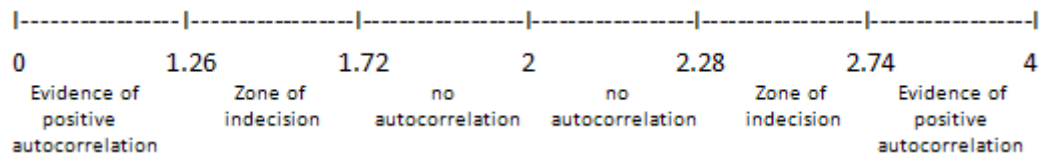
Hypothesis tested: H_0 : *The residuals are independent to each other, that is they are not autocorrelated.*

The regression model assumes that autocorrelation does not exist in the residuals.

The most celebrated test for detecting autocorrelation is the Durbin-Watson d statistic (Aczel and Sounderpandian, 2002, p.577). Based on the number of observations and the number of explanatory variables in the model, he creates the following axis (Aczel and Sounderpandian, 2002, p.579):



In this research, $d_L=1.26$ and $d_U=1.72$. These values are found in the Durbin-Watson statistical tables for $n=38$ (observations) and $k=4$ (explanatory variables). He computes $4-d_U=2.28$, $4-d_L=2.74$ and he creates the following axis:



The following table presents the results for the Durbin-Watson test.

Table 16: Durbin-Watson test

Durbin-Watson Test: Residuals of Model (2)	
d statistic	1.50

Looking at the axis, he sees that d statistic 1.50 lies on zone of indecision. Therefore, he has to perform an alternative test.

In this respect, he uses runs test (Appendix 12.5.3), which will give him a p -value, according to which he will reject or accept this hypothesis (Corder and Foreman, 2009, chapter 9). The following table presents the Runs test's result.

Table 17: Runs test

Runs Test: Residuals of Model (2)	
P -value	0.622

The hypothesis H_0 is not rejected at 5% level of significance (p -value=0.622>0.05), therefore the residuals are independent.

Phase II: Categorical Analysis

Logistic Regression

In Phase I, he had a continuous dependent variable (change in cost), thus the multiple regression model was the most obvious method to analyse this variable in order to explain its statistical behaviour. But, for the analysis of the second quantitative indicator (change in duration), linear regression analysis is not the appropriate method, as in this case there is a dummy variable as response, which requires a different approach.

The following table shows the variables that he will use in this analysis.

Table 18: Logistic Regression Data set

Variable Name	Alias	Type	Treated as
CH_DURATION	Change in the duration of the business process	Dummy	Dependent
FREQ	Frequency variant: Changes in how frequent the business process is executed	Dummy	Explanatory
RISK	Risk variant: Changes in the risk level (low, medium, high) of the business process	Dummy	Explanatory
HR	Human resources variant: Changes in the number of public servants that are involved in the execution of the business process	Continuous	Explanatory
TIME	Time variant: Changes in the amount of time that public servants spend for executing the improved process	Continuous	Explanatory
IT	IT variant: Changes in the IT systems that are used during the execution of the improved process	Dummy	Explanatory
LOCATION	Location variant: Changes in the location that the business process takes place	Dummy	Explanatory

In this case, he applies a logit model with seven variables, one dependent, which will be the dummy variable CH_DURATION and six explanatory, which will be FREQ, RISK, HR, TIME, IT and LOCATION. The logistic regression function is the following:

$$L_i = \ln\left(\frac{P_i}{1-P_i}\right) = \beta_0 + \beta_1 \cdot FREQ_i + \beta_2 \cdot RISK_i + \beta_3 \cdot HR_i + \beta_4 \cdot TIME_i + \beta_5 \cdot IT_i + \beta_6 \cdot PLACE_i + u_i$$

where u is the stochastic disturbance term and $i=1,...,38$ and denotes the i th observation of the dataset. L_i is the logit for the variable CH_DURATION and $\frac{P_i}{1-P_i}$ is the odds ratio in favor of no change, that is the ratio of the probability of no change in the duration of the process to change in the duration of the process. The index i denotes the i th observation of his dataset.

In order to obtain the outputs of the logit model, he uses WLS (Weighted Least Squares) instead of OLS because of the not stable variance of the disturbance term (Aczel and Sounderpandian, 2002, p.529; Theil, 1970). WLS gives the following estimated equation.

$$L_i = \ln\left(\frac{P_i}{1-P_i}\right) = -40.46 - 17.76 \cdot FREQ_i - 23.02 \cdot RISK_i - 0.63 \cdot HR_i + 0.001 \cdot TIME_i - 0.85 \cdot IT_i - 0.99 \cdot PLACE_i \quad (3)$$

The following table presents all the information for the estimations of the estimated logit model (3) and their significance.

Table 19: Logistic Regression Model

Model (3): Dependent: CH_DURATION				
Variable	Coefficient	Std.Error	t - statistic	P-value
Constant	-40.46	4016.39	.00	.992
HR	-.63	.62	1.01	.315
TIME	.001	.00	1.03	.309
FREQ	-17.76	.00	.00	1.000
RISK	-23.02	4016.39	.00	.995
IT	-.85	1.17	.52	.469
LOCATION	-.99	1.66	.35	.553

From the above table, he notices that for 5% level of significance there is no statistically significant variable for the explanation of the Change in Duration. Even if he considers 10%

level of significance instead of 5%, there is no variable in the logit model that could explain the behaviour of Change in Duration.

The above results turn his attention to other solutions in order to test the dependency of Change in Duration on each explanatory variable separately, as he proved that these variables could not act jointly in forming a statistical model. However, the method (Chi Squared tests) that he applies below assumes that the variables are strictly qualitative.

Therefore, he can conclude that the 2 continuous variables HR and TIME are insignificant for the explanation of CH_DURATION. This means that there is no statistically significant effect in the duration of a process when there is a change in the number of public servants that are involved in its execution or in the amount of time that public servants spend for its execution.

Chi Squared Tests

For each of the explanatory dummy variables, he performs Chi Squared tests in order to test their independency with the dependent variable. These tests are used to examine the independence of 2 qualitative variables with 2 or more levels. The outcome of this test is a p-value in order to test the null hypothesis (Buglear, 2005, p.569; Agresti, 2002, p.78-80):

H0: The 2 variables are independent.

Here, he has in every test 2 variables with 2 levels each.

The following table shows the contingency tables between CH_DURATION and each qualitative variable and the Chi Squared tests' results.

Table 20: Contingency tables and Chi Squared tests' results

	FREQ			
CH_DURATION	No change	Change	Total	P-value
No change	23	0	23	0.003
Change	10	5	15	
Total	33	5	38	
	RISK			
CH_DURATION	No change	Change	Total	P-value
No change	23	0	23	0.000
Change	8	7	15	
Total	31	7	38	
	IT			
CH_DURATION	No change	Change	Total	P-value
No change	16	7	23	0.851
Change	10	5	15	
Total	26	12	38	
	LOCATION			
CH_DURATION	No change	Change	Total	P-value
No change	22	1	23	0.754
Change	14	1	15	
Total	36	2	38	

The independency hypothesis H_0 is rejected at 5% level of significance ($p\text{-value} < 0.05$). Therefore, Change in the duration of the process depends on the changes in how frequent it is executed ($p\text{-value} = 0.003 < 0.05$) and in the risk level of the process ($p\text{-value} = 0.000 < 0.05$), but does not depend on the changes in the IT systems that are used during its execution ($p\text{-value} = 0.851 > 0.05$) and in the location that the process takes place ($p\text{-value} = 0.754 > 0.05$).

9.4 RESULTS DISCUSSION

The dataset consisted of 3 quantitative variables which were the following,

Variable Name	Alias
CH_COST	Change in cost for executing the business process
HR	Human resources variant: Changes in the number of public servants that are involved in the execution of the business process
TIME	Time variant: Changes in the amount of time that public servants spend for executing the business process

as well as 6 qualitative variables, which were transformed into dummy variables with values 0 and 1 for expressing no change and change respectively.

Variable Name	Alias
CH_DURATION	Change in the duration of the business process
FREQ	Frequency variant: Changes in how frequent the business process is executed
RISK	Risk variant: Changes in the risk level of the business process
IT	IT variant: Changes in the IT systems that are used during the execution of the business process
TECHNICAL	Technical variant: Changes in the technical infrastructure that supports the execution of the business process
LOCATION	Location variant: Changes in the location that the business process takes place

Change in Cost and Change in Duration were the 2 indicators for measuring the performance improvement of the processes in a Greek public agency. He tried to found out which one of them is more appropriate indicator (research question 1) and which variants, quantitative (HR, TIME) or qualitative (FREQ, RISK, IT, TECHNICAL, LOCATION), can have an impact on them (research question 2). Therefore, he treated the key indicators' respective variables as dependent variables in his analyses.

For analysing the quantitative variable Change in Cost, he performed a Regression Analysis. He ended in an optimal model, which explained the 89% of the total variance and satisfied all the necessary assumptions in order to be valid. This model showed that the variants that significantly affect this indicator are Frequency, Risk, Human Resources and Time. This means that in the case of Change in Cost as dependent variable, hypotheses H0.1, H0.2, H0.3 and H0.4 (section 4.2) were falsified (hypothetico-deductive approach).

Moreover, attempting to examine the nature of significant variables' impact on Change in Cost, he used the coefficients of the regression model. The coefficients' analysis showed with 95% confidence that the average cost for executing the process is; a) decreased by € 78.154 when there is a change in the frequency of the process, b) increased by € 45.766 when there is a change in the risk level of the process, c) increased by € 15.079 for every additional public servant involved in the execution of the process, and d) increased by € 171 for every additional day the public servants spend for executing the process.

For analysing the qualitative variable Change in Duration, he performed a Logistic Regression Analysis. It did not give any statistical significant results, which means that the explanatory variables cannot act jointly in forming a statistical model for explaining Change in Duration. This finding is relevant to the restricted suitability of this key indicator. Hence, he concludes that Change in Cost is a more appropriate indicator than Change in Duration for measuring the performance improvement of the processes in a Greek public agency (answer to research question 1).

However, he tried to find other solutions in order to examine the dependency of Change in Duration on each variant. Regarding the quantitative variants (HR, TIME), they were not statistically significant in the Logistic Regressions' model as already mentioned. This means that there is no significant effect in the duration of a process in cases there is a change in the number of public servants that are involved in its execution or in the amount of time that public servants spend for its execution. Regarding the qualitative variants (FREQ, RISK, IT, LOCATION), he used Chi squared tests to examine the dependency of Change in Duration on each qualitative variant separately. The result was that Change in Duration depends on the changes in how frequent the process is executed and in the risk level of the process, while it does not depend on IT and Location variant.

Given that the answer to first research question is Change in Cost, the answer to the second research question is change in the frequency of the process, the risk level of the process, the number of public servants that are involved in the execution of the process, and the amount of time that public servants spend for executing the process. This shows how the research findings inform the initial conceptual framework (section 4.1).

At this point, he discusses the research outcomes vis-à-vis the theoretical background of the hypotheses tests (section 4.2). Regarding the relation between change in cost and change in frequency (frequency variant), authors like Grafton, Lills and Widener (2010), Kohlbacher

(2010) and Pappis (2008) argue that the cost of a process reduces when its frequency reduces. The research findings confirm this statement. As mentioned in section 4.2, given the general e-government trend in Greece and the high demand for both public services and e-services (Introna, Haynes & Petrakaki, 2010), public organisations might increase the frequency of their processes in order to come up to the new expectations of citizens and enterprises by employing more resources (either human or not) to execute them. This means that their execution cost might increase.

Regarding the relation between change in cost and change in time that an employee spends on executing a process (time variant) as well as the relation between change in cost and change in the number of employees employed in a process (human resources variant), Grafton, Lills and Widener (2010), Kohlbacher (2010) and Pappis (2008) notice that the more a process lasts the more time the employees have to spend to execute it or/and the more employees the organisation has to employ on it. Hence, process improvement through the decrease of the time needed to implement the processes will lead into cost and time savings. The research findings confirm this statement. They are in accordance with the e-government trend and the EU and IMF support mechanism that characterise the Greek public sector context (section 4.2).

Finally, regarding the relation between change in cost and change in the risk level (risk variant), the research results confirm that the execution cost of a process could increase because employees spend more time in doing their tasks in order to avoid any mistakes (Moghdeb, Green & Indulska, 2009).

Moreover, he discusses how this research can be useful for developing a PPMS for the needs of the Greek public sector. As mentioned in section 2.1, a PPMS should focus on processes, include the measurement of indicators that are relevant to the performance of the processes and determine a 'cause and effect' relation between these indicators. In this respect, this research argues which is an appropriate quantitative performance indicator (change in cost) for measuring the performance improvement of the processes in Greek public organisations and which variants (frequency, risk, time and human resources) have a negative or positive impact on it (cause-effect relationship). Furthermore, as research results show, these variants are measurable, either quantitative or qualitative, indicators.

Additionally, he discusses how the research findings fit into the Greek public sector context. As discussed in Document 2 (section 3.5), Greek public sector is not familiar with the

concept of measurement. Furthermore, the research findings in Document 3 (section 8.2, 8.3 & 8.4) showed that the public organisation (same case with Document 4) did not use any substantial measurement system for any of its processes. This case is representative for the Greek public sector for reasons explained in Document 3 (section 6). As mentioned in Document 3, Greece signed on 6th May 2010 (Greece. Support Mechanism Act no 3845/2010) the agreement with EU and IMF in order to fund its liabilities for the period between 2010 and 2014. Reducing public cost and increasing efficiency are two of the main targets set by the EU and IMF for the Greek public sector (Document 3 - section 2.2). Hence, this means that Greek public sector needs to implement a PPMS in order to achieve the abovementioned targets.

The research findings can contribute to this direction by proposing change in cost as an indicator for measuring the performance improvement of the processes in Greek public organisations. This indicator is relevant to the target of the IMF and EU support mechanism about reducing public cost because the execution cost of a process is part of the operating cost of an organisation. Hence, by reducing the execution cost of a process, the organisation can reduce its total operating cost and therefore, Greek public administration can reduce its public cost. Moreover, the research results show which variants have a negative or positive impact on the cost of a process. Thus, Greek public organisations can establish a PPMS aiming at reducing the cost of their processes by influencing these variants.

Finally, he discusses the managerial implications of this research that concern the managers of the Greek public organisations. They can set value-targets to the performance improvement indicator of the processes and can identify how much they should aim to change the variants that have an impact on it in order to achieve the value-targets. By doing so, they have at their disposal a tool (PPMS) in order to achieve cost reduction on the processes for which they are responsible and as a consequence to contribute to the reduction of the operating cost of public organisations. Thus, they will be enabled to help Greek public administration to achieve the targets set by the EU and IMF support mechanism.

10 CONCLUSIONS AND THEMES FOR FURTHER RESEARCH

This research aims at exploring the use of a Process Performance Measurement System (PPMS) in the Greek public sector. The PPMS will help the public sector's managers to develop quantitative indicators, which will provide a solid evidence of the performance improvement of their organisations. Hence, the main research questions that the researcher aims to answer are the following:

1) What is an appropriate quantitative indicator for measuring the performance improvement of the business processes in a Greek public agency?

2) What are the variants that have an impact on the quantitative performance indicator in a Greek public agency?

The initial conceptual framework (section 4.1) was that there are two key quantitative indicators to measure performance improvement of a process. The first one is the change in the cost for executing the process and, the second one is the change in its duration. Based on this framework, there are seven variants that may affect the abovementioned indicators; a) Frequency, b) Risk, c) Human resources, d) Time, e) IT, f) Technical, and g) Location.

The research findings show that change in cost for executing the process is a more appropriate quantitative indicator to measure performance improvement of a process in a Greek public organisation than change in its duration (research question 1). They also show that frequency, risk, human resources and time variant have an impact on change in cost (research question 2).

More specifically, cost for executing the process is decreased when there is a change in how frequent it takes place and increased when there is a change in its risk level, there is an increase in the number of public servants involved in its execution, and there is an increase in the amount of time that the public servants spend for executing it.

Moreover, this research can be useful for developing a PPMS for the needs of the Greek public sector. As mentioned in section 2.1, PPMS should focus on processes, include the measurement of indicators that are relevant to the performance of the processes and

determine a 'cause and effect' relation between these indicators. In this respect, this research argues which is an appropriate quantitative performance indicator (change in cost) for measuring the performance improvement of the processes in Greek public organisations and which variants (frequency, risk, time and human resources) have an impact on that indicator (cause-effect relationship).

Furthermore, this research fits into the Greek public sector context. Given that the targets set by the EU and IMF support mechanism are public cost reduction and efficiency increase, this research can contribute to this direction by proposing change in cost as an indicator for measuring the performance improvement of the processes in Greek public organisations. By reducing the execution cost of a process, the organisation can reduce its total operating cost and therefore, Greek public administration can reduce its public cost. Moreover, the research findings show which variants have a negative or positive impact on the cost of a process. Thus, Greek public organisations can establish a PPMS aiming at reducing the cost of their processes by influencing these variants.

Finally, this research has managerial implications that concern the managers of the Greek public organisations. They can set value-targets to the performance improvement indicator of the processes (change in cost) and can identify the variants that they should change and how much they should aim to change them in order to achieve the value-targets. By doing so, they have at their disposal a tool (PPMS) in order to achieve cost reduction on the processes for which they are responsible and as a consequence to contribute to the reduction of the operating cost of public organisations. Thus, they will be enabled to help Greek public administration to achieve the targets set by the EU and IMF support mechanism.

With respect to the research methodology employed in this research, he uses action research as a research methodology for two reasons. Firstly, the potential insights gained through action research are not achievable using other research methodologies (realism, positivism). Secondly, action research can be used to focus upon identifying whether effective change has occurred in organisations.

In order to conduct the research, he uses a hypothetico-deductive approach. This means that if the test does not challenge the hypothesis, he considers the hypothesis as valid. In order to collect the necessary data, he made face-to-face interviews using a questionnaire and he used passive observation. Regarding the interviews, he interviewed the process owners of the processes that were improved during the process improvement project that took place at the

public organisation. Regarding passive observation (fieldwork), he collected data during the project in order to calculate the changes of the variables from the as-is and the to-be situation of the improved processes. Finally, he conducts a triangulation since he uses data taken from the interviews and the fieldwork to crosscheck the answers.

The use of questionnaire contributes to the increase in the effectiveness of the research since it improves the chances of getting the right data. It also contributes to the increase in the consistency of the research since it provides comparable data from different sources such as middle managers and key persons. Moreover, it increases the efficiency of the research since it is the same questionnaire for different sources (middle managers and key persons). Furthermore, it minimises the subjectivity of the researcher because he becomes part of the problem and his judgment might be subjective (use of passive observation).

The use of face-to-face interviews contributes to deal with the difference in the interpretation of the questions by the respondents because he can explain to them the questions. Moreover, it contributes to reduce the interviewees' bias because he can explain to them the purpose of the research aiming at resolving any conflicting issue between the research and the process owners' interests.

He analyses the data using statistical methods in order to test if the hypotheses are null or valid and he tries to explain the cause and effect relationship between the dependent variables (continuous and dummy) and the independent variables. In this respect, he performs descriptive statistics in order to describe the variables of the data set. Moreover, he uses regression analysis (multiple linear regression model and stepwise backward elimination algorithm) and residuals analysis (normality and autocorrelation tests) in order to identify the dependence of the continuous dependent variable on other explanatory variables. Finally, he uses logistic regression and Chi Squared tests in order to identify the dependence of the dummy dependent variable on other explanatory variables. In order to perform the abovementioned statistical analysis, he uses SPSS v.17.0 as a statistical software tool.

Finally, he discusses the limitations of this research, and future research extension. Firstly, he notes the inherent limitation of a single case. Given the single case study, the external generalisability of the findings is limited. Future research can address this limitation by examining additional public organisations. Secondly, the examined public organisation operates in the Greek public sector context. Nevertheless, lessons learned from this case are

still useful to all public organisations because it confronts to the general guidelines of Greek Information Society about BPR projects. Thirdly, a number of middle managers decided to participate on their own to the interviews without the assistance of key persons. However, he claims that the use of fieldwork as an additional data collection method minimises the impact of the abovementioned issue on the generalisability of the research findings.

Future research could examine the results of this research to other Greek public organisations. Moreover, it could examine its generalisations to the public and private sector of other countries and make comparisons either with public organisations and/or private companies in other countries.

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12 APPENDICES

12.1 CIVIL SERVICE SIZE AT EU 27

The civil service size is defined as a percentage of the total employment force (Handler et al., 2008). Based on ILO (2008), the public sector employment force is the sum of the general government sector's employment (government units, social security funds and other no profit institutions) and the publicly owned enterprises' employment. Total employment force is the sum of the public and the private sector employment (ILO, 2008). The following table provides evidence about the civil service size for EU27¹ between 2000 and 2008.

Table 21: Civil Service Size EU27

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	Country Average
Cyprus	17,92%	18,01 %	18,22%	18,29%	17,72%	17,99%	17,98%	20,50%	17,57%	18,25%
Czech Republic	22,18%	21,41%	21,10%	20,89%	20,71%	20,20%	19,90%	-	-	20,91%
Denmark	34,28%	33,85%	34,07%	33,85%	34,29%	34,25%	33,82%	33,23%	32,30%	33,77%
Estonia	28,84%	28,75%	26,66%	26,30%	25,52%	24,53%	25,17%	24,16%	23,69%	25,96%
Finland	27,34%	27,25%	27,20%	27,60%	27,80%	27,28%	26,83%	26,36%	26,31%	27,11%
France	29,52%	29,48%	29,70%	30,15%	29,97%	29,22%	29,03%	-	-	29,58%
Germany	16,69%	15,73%	15,62%	15,71%	15,23%	14,48%	14,63%	14,33%	-	15,30%
Greece	<u>21,08%</u>	<u>20,99%</u>	<u>21,26%</u>	<u>21,46%</u>	<u>23,02%</u>	<u>22,03%</u>	<u>22,57%</u>	<u>22,52%</u>	<u>22,30%</u>	<u>21,91%</u>
Hungary	30,78%	30,81%	31,23%	31,50%	31,40%	31,48%	22,79%	21,86%	29,25%	29,01%
Ireland	18,04%	18,78%	19,08%	18,92%	18,78%	18,11%	17,62%	17,52%	17,70%	18,28%
Italy	15,55%	15,41%	15,26%	15,07%	14,94%	14,89%	14,67%	14,46%	14,45%	14,97%
Latvia	40,71%	39,47%	39,18%	37,89%	35,84%	34,63%	33,34%	31,23%	30,65%	35,88%
Lithuania	44,81%	43,20%	40,74%	39,62%	38,81%	36,31%	34,89%	33,35%	-	38,90%
Luxembourg	11,14%	10,96%	11,17%	11,48%	11,53%	11,53%	11,41%	11,01%	10,75%	11,22%
Malta	34,59%	33,28%	34,28%	33,44%	33,14%	32,26%	30,78%	-	-	33,11%
Netherlands	25,10%	26,07%	26,60%	27,47%	27,56%	27,44%	27,18%	26,97%	-	26,80%
Poland	27,88%	26,86%	30,50%	29,90%	29,05%	28,40%	27,50%	26,29%	-	28,30%
Romania	26,40%	24,25%	24,78%	23,66%	23,18%	21,03%	20,67%	18,72%	18,39%	22,34%
Slovakia	33,24%	31,47%	29,43%	27,29%	26,20%	24,56%	24,12%	24,03%	22,77%	27,01%
Slovenia	30,54%	30,51%	30,33%	31,27%	31,20%	30,84%	29,39%	28,21%	27,91%	30,02%
Spain	15,75%	15,52%	15,58%	15,66%	15,58%	15,10%	14,60%	14,18%	14,60%	15,17%
Sweden	33,71%	33,81%	33,94%	34,38%	34,41%	34,38%	34,42%	33,87%	-	
United Kingdom	19,22%	19,44%	19,69%	20,02%	20,28%	20,38%	20,20%	-	-	19,89%
EU average	26,32%	25,88%	25,90%	25,73%	25,46%	24,84%	24,07%	23,31%	22,05%	24,84%

(source: ILO, 2008)

¹ There are missing data for either the public or the private sector employment in Austria, Belgium, Bulgaria and Portugal.

The above table shows that eastern European countries (such as Estonia, Hungary, Lithuania, Poland and Slovakia) and Scandinavian countries (e.g. Denmark, Finland and Sweden) have high civil service size, while southern countries (e.g. Spain, Italy and Cyprus) have low civil service size. Greek civil service size is between the southern countries' civil service size and the eastern European countries' civil service size.

12.2 QUESTIONNAIRE

PARTICIPANT INFORMATION SHEET

Principal researcher

Mr. Grigorios Kontolaimos

Tel. 00302109404774

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Invitation

You are being invited to take part in a research study. Participation in the project is entirely voluntary. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

Thank you for reading this.

What is the purpose of the study?

The purpose of this study is to identify those factors which have an impact on the performance improvement of the reengineered business processes of a Greek public agency.

Why I have been chosen?

You have been chosen because you are a middle manager within the case study public organisation who can provide us with information about the performance measurement system that is currently using and the indicators that should use based on your opinion. All middle managers of this public organisation will be asked to participate to this study.

Do I have to take part?

It is up to you to decide whether or not to take part. If you decide to take part in this research, you will be given a copy of this information sheet to keep. You will also be asked to sign one consent form, which will be kept by the researcher. If you decide to take part, you are still free to withdraw at any time and without giving a reason.

What will be my involvement if I take part?

The research interview will actually be the interview that will have been conducted for the purposes of the BPR project in your organisation. No further interview is required. The interview will not be audio or video or photographic recorded. The researcher will take written notes during the interview.

Will my taking part in this study be kept confidential?

Yes. At no point will your identity be revealed to anyone. Your name will not be recorded on any of the research notes that are made and kept as part of the research. All notes will be kept in secure storage. There will be nothing in any materials they may have access to that could identify in the study.

What will happen to the results of the research study?

The research will be written up as an academic dissertation. It will be stored in the archives at Nottingham Trent Business School and will be available for inspection on request by students and academics.

Who is organising and funding the research?

The research is being undertaken as part of academic study at Nottingham Trent University leading to the award of Doctorate in Business Administration.

Who has reviewed this study?

This study has been reviewed by the Research Ethics Committee of Nottingham Trent University.

CONSENT FORM

Principal researcher:

Mr. Grigorios Kontolaimos

Tel. 00302109404774

email: gkontolaimos@bridge-it.gr

1. I confirm that I have read and understand the information sheet dated [date] for the above study and have had the opportunity to ask questions. ☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason. ☐
3. I agree to take part in the above study. ☐

Name of the participant Date Signature

Name of the researcher Date Signature

QUESTIONNAIRE

AS-IS SITUATION

1. Business process name
2. Name of the department of the public organisation responsible for the business process
3. Which are the IT systems that are used during the execution of the business process?
4. How often does the business process take place?
5. How many human resources are involved in the execution of the business process?
6. How many mandays (on average) are necessary for the execution of the business process?
7. How much time (on average) is required for the completion of the business process?
8. What is the risk level of the execution of the business process?
9. Is there any type of measurement system (qualitative and/or quantitative) for measuring the efficiency and/or effectiveness of processes and/or services?

TO-BE SITUATION

1. Which do you think that it would be the key performance indicators for evaluating the performance of this business process? (e.g. duration of the business process, throughput, lead time, qualitative indicators, etc)
2. Were there any previous attempts for improving this process? What were the success/failure factors in this attempt?
3. Do you think that the existing infrastructure and human resources involved in this process are adequate for its successful completion?

12.3 PROCESSES

The following table presents the processes that were improved during the process improvement project that took place at GSC-GSI. The researcher collected data by interviews and passive observation for these processes.

Table 22: Processes

No.	Department	Process title
1	Political and Financial Issues Department	Analysis and documentation of political issues
2	Political and Financial Issues Department	Analysis and documentation of national issues
3	Cultural Issues Department	Analysis and documentation of cultural issues
4	Media Professionals Department	Identification of daily and weekly prefectural and local newspapers that are allowed to publish companies' balance sheet
5	Media Professionals Department	Identification of daily and weekly prefectural and local newspapers that are allowed to publish governmental announcements
6	Media Professionals Department	Identification of daily and weekly prefectural and local newspapers that are allowed to publish companies' balance sheet and governmental announcements
7	Media Professionals Department	Monitoring published advertisement material in newspapers
8	Media Professionals Department	Record keeping of advertising companies' registration number
9	Media Professionals Department	Development of documentation defence against media professionals' negative claims about GSC-GSI
10	Press and Communication Offices Abroad	Collection and processing of data and information about international issues relevant to international affairs
11	Press and Communication Offices Abroad	Development of reports
12	Press and Communication Offices Abroad	Production of informative material about international visitors
13	Press and Communication Offices Abroad	Advance payment for office facilities
14	Press and Communication Offices Abroad	Development of press bulletin review
15	Press and Communication Offices Abroad	Development of informative notes
16	International Communication Planning and Analysis Department	Publication of informative notes about international and European issues of Greek interest
17	International Communication Planning and Analysis Department	Development of Press and Communication Offices Abroad budget
18	Planning and Implementation Department	Publication of Greek news agenda
19	Planning and Implementation Department	Publication of weekly international material

20	International Public Relations Department	Provision of accreditation services to foreign journalists or foreign broadcasting channels
21	IT Department	Management of outsourcing IT systems maintenance
22	IT Department	Maintenance of IT infrastructure
23	Inventory Department	Supply chain management
24	Inventory Department	Financial management of inventory material
25	Inventory Department	Management of useless or surplus material
26	Procurement and Expenses of Press and Communication Offices Abroad Department	Management of financial demands of Press and Communication Offices Abroad
27	Procurement and Expenses Department	Project implementation funded by the National Public Investments Program
28	Procurement and Expenses Department	Documentation of purchase orders
29	Procurement and Expenses Department	Settlement of contractual agreement expenses
30	Procurement and Expenses Department	Settlement of rent expenses
31	Procurement and Expenses Department	Settlement of funding expenses
32	Procurement and Expenses Department	Settlement of mail expenses
33	Procurement and Expenses Department	Settlement of mobile telecommunication, electric and water expenses
34	Procurement and Expenses Department	Settlement of telecommunication expenses
35	Procurement and Expenses Department	Realisation of open request for proposals
36	Procurement and Expenses Department	Realisation of close request for proposals
37	Human Resources Department	Development of taxation documentation for HR salaries

12.4 EXAMPLE OF USING PASSIVE OBSERVATION

The following table presents the data collected using passive observation for the continuous variable 'time variant' for process 'Record keeping of advertising companies' registration number'. This process belongs to the department 'Media Professionals Department' as mentioned in Appendix 12.3.

Table 23: Passive observation example

Replicates	AS-IS Time Variant (days)	TO-BE Time variant (days)
1	20,0	5,8
2	21,5	5,6
3	21,2	5,4
4	19,8	5,6
5	19,7	5,7
6	22,1	5,6
7	21,2	5,8
8	21,7	5,7
9	21,6	5,5
10	21,5	5,6
11	20,2	5,8
12	19,9	5,5
13	20,7	5,6
14	21,7	5,5
15	20,8	5,7
16	20,6	5,5
17	21,4	5,7
18	20,3	5,8
19	21,5	5,4
20	20,4	5,7
21	19,6	5,5
22	20,2	5,6
23	20,1	5,7
24	20,4	5,5
25	19,8	5,8
26	20,1	5,7
27	20,4	5,5
28	20,6	5,2
29	21,1	5,4
30	20,8	5,6
31	20,2	5,7
32	19,7	5,5
33	20,1	5,6
34	20,2	5,8
35	20,3	5,7
<i>Mean</i>	<i>20,61</i>	<i>5,61</i>
<i>Min</i>	<i>19,60</i>	<i>5,20</i>
<i>Max</i>	<i>22,10</i>	<i>5,80</i>
<i>S.D.</i>	<i>0,69</i>	<i>0,14</i>
Time variant	-15	

Column AS-IS Time variant presents the data collected for the continuous variable during the as-is situation of the process. Column TO-BE Time variant presents the data collected for the continuous variable during the to-be situation. The researcher observed (passive observation, see section 5 step 5) the number of days that an employee needs to complete this process in both situations. The above table presents the mean, min, max and standard deviation (s.d.) of the continuous variable for both situations. For reasons explained in section 5 (step 5), he calculated the difference between the to-be and the as-is mean (to-be mean minus as-is mean) in order to use it in the statistical analysis performed in sections 9.2 and 9.3. In this case, the row 'time variant' depicts the measurement that he used in the statistical analysis for this continuous variable regarding this specific process. By the same way, he gathered data and used the difference between the to-be mean and the as-is mean for the three continuous variables (see section 9.2) for every process (see appendix 12.3).

12.5 STATISTICAL BACKGROUND

12.5.1 REGRESSION ANALYSIS

12.5.2 NORMAL DISTRIBUTION

12.5.3 RUNS TEST

12.5.4 LOGISTIC REGRESSION – LOGIT MODEL