DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

MASTER THESIS

Business Process Management

Investigation on creating a bridge between business and IT

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Abstract

Business Process Management (BPM) is a topic with great interest nowadays, due to its significant impact to companies, to change quickly and become competitive. It appears to be the most common talk between business and technology-oriented professionals. On the one hand BPM researchers promise that BPM is the solution for a competitive enterprise. On the other hand SOA researchers claim that SOA is the answer on the demanding IT environment. Both claim that BPM and SOA is the perfect combination for an agile and flexible enterprise because they help on creating the bridge between business and IT people. This study is focused on the way the two approaches are implemented and how this alignment is created.

The study is divided in 6 chapters. In the first chapter, an introduction of the Thesis and its objectives is presented. In the second chapter there is the literature review section. The literature review is conducted with the aim of uncovering BPM concepts and principles, SOA approach and problems that an enterprise may face on when implementing these two approaches. Following from that the methodology chapter gives the reader the knowledge of how the research has been done. The forth chapter presents the research analysis. Interviews have been conducted with experienced managers, consultants and programmers of a big multinational management consulting companies. In the fifth chapter the results of the interviews are analyzed and conclusions are extracted. In the last chapter a conclusion of the study is presented. Finally recommendations for a future research are suggested.

 Keywords: Business Process Management, Service Oriented Architecture, Agility, Business-IT gap, BPM, SOA, Alignment
Declaration

I, Stavroula Fotou, confirm that this work submitted for assessment is my own and is expressed in my own words. Any uses made within it of the works of other authors in any form (e.g., ideas, equations, figures, text, tables, programs) are properly acknowledged at any point of their use. A list of the references employed is included.

Signed:

Date: 8/8/2011
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Without the continued emotional and financial support provided by my parents, Apostolos and Kaiti, I may have not reached the end of my Master studies. My parents’ continues support and confidence in my abilities helped me to overcome the difficulties and complete my studies. Also I would like to thank my brother George and my sister Maria because they are always there for me. No words of thanks can adequately express the depth of my appreciation and love for my family.

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CHAPTER I: INTRODUCTION TO THE STUDY

1 Introduction

“Automated business processes can help deliver huge gains in organizational and cost productivity”

(Noel, 2005).

In management and organization literature review, Porter (1996) asserts that through operational effectiveness the rivals imitate one another and for that reason strategies converge and have a result of limited competition. More specifically, there is limited competition because the enterprises are not trying to develop their firm through different activities (Porter, 1996). This results in limited competitive advantage.

It is worth to mention that organizations the last few decades are trying to discover the best approaches in order to follow their competitors (Porter, 1996), in other words to be competitive. In order to stay ahead of the competition, companies should change the business processes quickly as business conditions are changed. Towards the unstable environment, Business Process Management (BPM) seems to help enterprises to follow these changes by changing their processes continuously (Antunes & Mourão, 2010). Lots of authors such as Wang and Wang (2005) believe that BPM is the organization’s answer towards the “unpredictability” of the business processes. Moreover organizations tend to use BPM in order to model their processes and get the highest value that comes from these processes (Neubauer & Stummer, 2007).
1.1 Objectives of the dissertation

The dissertation’s target is to explore the way that Business Process Management is integrated with Service Oriented Architecture in order to have more agile and flexible enterprises.

More specifically the dissertation will:

- Identify and explore the concepts and principles of BPM
- Identify and explore the concepts and principles of SOA
- Analyze how BPM and SOA cooperate
- Analyze the benefits BPM and SOA application
- Identify the problems that may occur during SOA and BPM application
- Identify and analyze the problem of “IT-business chasma”

Also the objectives of the dissertation are summarized in the following questions:

- Why there is a gap between business and IT people?
- Will BPM and SOA fill this gap? And if yes in which ways?
- Is BPM as effective as statistics show or is just a trend of the current organization environment?
- Why the model and automation of business processes is considered so important?
- How SOA helps in the integration of business processes?
- What are the most common problems in implementing BPM?
- What are the most common problems in implementing SOA?
- What are the risks/difficulties a business analysts and IT engineers could face on BPM-SOA oriented projects?
- What's the best approach in the alignment of SOA and BPM in order to have an agile and flexible enterprise?

Moreover, there would be an extended reference on BPM’s tools and techniques, on SOA application and in which way an organization can use these two approaches in order to increase its profitability. Interviews will take place from people that have already used BPM and SOA in their jobs. These people are managers, consultants and business analysts and would be found from the researcher’s previous working environment.
1.2 Aims of the dissertation

The aims of the dissertation are:

- Provide to reader the knowledge of how BPM works.
- Provide to reader the knowledge of how SOA works.
- Make clear to the reader the problems that organizations have to face when implementing BPM and SOA.
- Make understandable why the problem “business-IT chasma” exists and what should be done in order to solve it.
- Make understandable the reasons BPM is so popular in current organizations environment.
- Give a general idea of how a BPM/SOA oriented project works.

1.3 Overview of the methodology

The dissertation is separated in two parts: the literature review and the qualitative research. Uncovering and discussing basic issues in BPM and SOA are presented in the literature review. The resources for this part were found via journals and articles. All the resources were found through Heriot Watt library and electronic databases such as:

- Heriot Watt library
- Emerald database
- EthOs database
- Google Scholar
- Sage journals on line
- Science Direct database
- Wiley online library
- Other internet sources
The second part of the dissertation is the qualitative part where interviews with BPM and SOA specialists were conducted. The specialists are employees working in a multinational management consulting companies. The interviewers are managers, consultants and programmers, with different levels of experiences in BPM and SOA.

### 1.4 Quality of literature sources

The evaluation of literature review is an important part in research. In order to ensure the high quality and the reliability of the resources, all the resources will come from specific scientific libraries and databases. All the journals and papers should have been published. If there is a need of finding resources from Internet sources then a judgement should be done in order to decide if those resources are appropriate in order to be included in the dissertation. The judgement will be based in logical criteria such as if the material is connected to the objectives of the research project, or if other articles that have been proved reliable have referenced the author.

### 1.5 Description of dissertation structure

The research is comprised of 6 chapters. The first chapter is an introductory chapter, were there are explained the issues a reader expects to be outlined in this study. The second chapter is the literature review. The literature review is presented in order to examine the concepts of BPM and SOA, the technology and the problems that exist in business sector. The third chapter discusses the study’s methodological approach. Every detail has been given in order the reader to understand the methodology and the strategy. The forth chapter presents the study’s findings, as informed by interviewees responses on the qualitative part. In the fifth chapter conclusions of the results are presented. Finally the last chapter concludes the research and some suggestions for further research are given.
1.6 Limitations of the dissertation

The restriction of the time could be considered as a limitation for the dissertation. The interviewees had limited time in answering the interviewee questions. On the other hand the answers required much time. This resulted in collected briefly answers by the interviewees. Emails were sent for clarification but unfortunately not all interviewees were much willing to answer.

Another limitation was the small sample. The topic of the dissertation requires much experience and expertise. So the sample resulted were small due to the lack of experienced people.

Another limitation that could be commented was the restricted answers of the interviewees due to the company’s policies. Data privacy was a limitation on the research study. Interviewees could not provide much information on how BPM / SOA oriented projects really work due to the company’s data protection.

1.7 Professional, legal, and ethical issues

In the dissertation there are interviews by people that have used BPM and SOA technology in their jobs. The aim of the interviews is to give the reader a complete view of the research topic.

The professional and legal issue that may come across through interviews is the issue of data protection. Due to the fact that the people that will be interviewed for the purposes of the dissertation are working in different companies, which nowadays are collaborated with big clients in the telecommunication and financial area, there is a problem on revealing business processes of their companies and their clients. Another issue that may come across is the issue of anonymity. Some people may do not want to appear their name in this dissertation. For the above reasons no names of the interviewees and companies will appear in the dissertation and the execution and the impartment of the results will be done with great attention in order to avoid any issues that may occur regarding data protection.
1.8 Conclusion

As explained in this chapter the study will focus on the way Business Process Management and Service Oriented Architecture can be integrated in order to increase the agility and overcome gap problems in enterprises. The next chapter presents the review of the literature for this research.
CHAPTER II: REVIEW OF THE LITERATURE

2 Business Process Management

“Business Process Management (BPM) has been identified as the number one business priority by a recent Gartner study (Gartner, 2005)”

2.1 Introduction

The chapter reviews the literature for BPM and SOA approaches. Before examining the concept of Business Process Management (BPM), it is essential to make a reference on the BPM definitions exactly as given by important reviewers and BPM researchers. Lot’s of BPM definitions exist but in the following section the most explanatory definitions will be presented.

2.2 BPM Definitions

Ko, Lee and Lee (2009) define business process management as a way of “…supporting business processes using methods, techniques and software to design, enact, control and analyze operational processes involving humans, organizations, applications, documents and other sources of information”. On the other hand, Gartner gives emphasis on the performance of BPM by stating “BPM is a management practice that provides for governance of a process environment toward the goal of improving agility and operational performance. BPM is a structured approach employing methods, policies, metrics, management practices and software tools to manage and continuously optimize an organization’s activities and processes.”

Antuanes and Mourão (2010) although they agree with the previous authors, they drown more attention on IT role. More specifically BPM “integrates a collection of technologies capable to translate business process models into computer-supported activities, relinquishing routine management and control tasks from the organizational agents”.
Verner (2004) completely agree with Antuanes and Mourão by connecting BPM with IT with the following definition “BPM technology provides not only the tools and infrastructure to define, simulate, and analyze business process models, but also the tools to implement business processes in such a way that the execution of the resulting software artifacts can be managed from a business process perspective.” (Verner, 2004). In the same wavelength Behara (2006) agrees “BPM is a methodology, as well a collection of tools that enables enterprises to specify step by step business processes. Business process management (BPM) addresses how organizations can identify, model, develop, deploy, and manage their business processes, including processes that involve IT systems and human interaction”.

Finally another author, Ramachandran (2004) points out a more analyzed definition of BPM by stating that “Business Process Management (BPM) refers to the closed loop, iterative management of business processes over their entire lifecycle. It includes designing, optimizing, documenting, communicating, deploying, evaluating, updating, and retiring processes. Well-managed companies have always had robust, but time consuming, mechanisms for performing all of these functions.”

2.3 BPM Origins

Now that the basic definitions for BPM have been introduced, it is time to make a quick reference on the origins of BPM. At 1993 Michael Hammer and James Champy made a publication with the title “Reengineering the Corporation” (Harper Business, 1993). With this publication many experts started to think that managing an enterprise means managing processes (Ramachandran, 2004). But the spirit began few years before by Frederick Winslow Taylor (1856-1915). This management thinking had an assumption: every time a process changes, the environment should remain stable so that the improved processes will have the time to return the required investment. Of course nowadays nobody should expect from the enterprises, the market and the environment to remain stable because the environment changes quickly and enterprises should be adaptive and react vigorously to those changes. Only with this behavior the enterprises would remain competitive and stakeholders will meet their expectations (Ramachandran, 2004).
However, after many years, the concept of processes has been developed and has integrated with Business Process Management. BPM technology started in 1980’s and has developed significantly, providing enterprises with a series of advantages. BPM is nowadays the ‘leader’ of managing processes. Businesses and governments are paying attention to business processes in order to make a fully description, automation and management of them (Verner, 2004). Consequently, BPM is used with combination of computing technology in order to model and automate business processes (Verner, 2004). Thus, BPM is an approach of “managing change” and specifically managing business processes (Owen & Raj, 2003).

But what was the real situation before BPM years? How the enterprises were acting towards processes? The trend was to produce “data-aware” information systems instead of “process-aware” as happens today with the help of BPM (van der Aalst, 2009). Before BPM, analysts and IT engineers should bring together different processes, methods, isolated systems and manual methodologies in order to work. With BPM no matter how many different systems and processes an enterprise has, all of them are treated as an aggregate “architected system” (Garimella, Lees, & Williams, 2008). Junior learners of BPM should always keep in mind that BPM is not a product (Cho & Lee, 2010). It must not be considered as another IT approach, but as an environment where business processes are created and communicated to the organization (Cho & Lee, 2010).

2.4 The misunderstandings of BPM

According to Ko, Lee and Lee (2009) there is a confusion in literature review about BPM terminology and many times beginners can get mystified between terminologies such as business process reengineering (BPR), workflow management (WFM) and BPM.

In 1980’s Hammer and James Champy wrote a book “Reengineering the Corporation” and introduced BPR principles (Hill, 2007). However, BPM and BPR are two different “approaches”. According to Ko, Lee & Lee (2009) BPR calls for “radical obliteration of existing business processes” whereas BPM is more “more practical, iterative and incremental in fine-tuning business processes”. Furthermore, confusion is made between BPM and WFM. Gartner research group makes clear the point the difference is: “Business process management (BPM) is a process-oriented management discipline. It is not a technology. On
the other hand WFM is a flow management technology that can be found in business process management suites (BPMSs) and other product categories” (Ko, Lee, & Lee, 2009).

According to the authors, another difference between BPM and WFM is that the two “approaches” differ in the final stage, the diagnosis stage. On the other hand some authors correctly argue that the difference is so slight that some vendors have just changed the names of their products from WFM to BPM and they sell the product for BPM support (Ko, Lee, & Lee, 2009). Moreover, Ramachandran (2004) feels that people sometimes should be careful in order to avoid confusing BPM with Enterprise Application Integrations (ERP) and with Six Sigma.

2.5 The 3 Dimensions of BPM

Before going deeper in BPM concepts and techniques it is valuable to examine the three dimensions of BPM. The first dimension is the “business dimension”. It is given when using BPM in every enterprise because value is created for all the stakeholders of a business and productivity is increased. This results in customer’s satisfaction and loyalty for the enterprise (Garimella, Lees, & Williams, 2008). The second dimension is the “process dimension”. This dimension adds value to the enterprise by the creation of well-defined and structured activities. The more structured the processes are the more successfully the enterprise creates value (Garimella, Lees, & Williams, 2008). The third dimension of BPM is the “management dimension”. This dimension uses all the processes and activates them in order to achieve enterprise’s goals.

2.6 Business Processes

Ko (2009) found that people tend to understand better the processes through models. Models and processes can make people understand the problem or identify them, increase knowledge of the organizations processes, understand the areas of potential improvement and define the roles and responsibilities inside the organization. BPM is based on business processes and this is the main reason that makes BPM so effective.
2.6.1 Functions Vs Processes

At this point is worth to understand what “business process” means. In order to make sure that the term process is well defined and understandable it is a wise to make differentiation between functions and processes. Haapaniemi (1998) states: “a function is a group of people performing similar tasks. A process encompasses a range of tasks, and multiple departments participate in the creation of a process’s outcome. For example, product development is a process. It also involves marketing, manufacturing and other functions. Because there are some traditional functional boundaries, processes are often difficult to “see” (Haapaniemi, 1998).

2.6.2 Definition of processes

Now that discrimination has been made between processes and functions is time to take a deeper look in the term processes. Processes nowadays govern people’s life. According to Ko (2009), people use processes in everyday life from planning their holidays till manufacturing. Processes can be developed and improved by experience (everyday processes) or according to scientific investigations (Ko R. , 2009). Usually the term “business process” is used to reference to high-level description of an enterprise. Owen and Raj (2003), define business process as: “The business process comprises all activities carried out in an enterprise, including e.g. staffing, financing, production, marketing, etc.” Business processes (Figure 1) can be seen as processes that have inputs and outputs which usually are the desired outputs for the customer and add value to the enterprise(Ko, Lee, & Lee, 2009).

Another interesting definition of “business process” is this of Lusk (2007) “A business process is uniquely definable; has a defined set of activities that break down into increasingly more granular steps and an agreed to set of sequences; is enabled and/or constrained by culture, skills, policies and rules, laws, measurement/reward systems, workflow design, information systems and facilities; often crosses organizational boundaries; and follows a formal life cycle” (Lusk, 2007). To put it simply a business process is “an organized group of related activities that together create customer value” (Hammer M. , 2001). It is simply the way an organization does its work (Davenport, 2005).
### 2.6.3 Types of Processes

Ko (2009) reports that business processes can be categorized to private and public business processes. Private processes are the processes that take place internal of the organization, for example employee’s payment. On the other hand, public business processes are the processes that are related to the external processes of the organization, for example the shipping management (Ko R. , 2009). Ko (2009) continues analyzing business processes by giving to main perspectives of the area. From a high–level analysis there are two perspectives of business processes: The level perspective and the core competency perspective (Ko R. , 2009).

### 2.6.4 The Importance of business processes

“The future belongs to the process enterprise”

(*Hammer, 2001*)

Hammer and Stanton (1999) through their article at Harvard Business Review append the question to the reader by asking what the common point is between IBM, American Standard, Allmerica Financial, and Duke Power. The common point is that these enterprises have turned into process enterprises and have gained all the benefits an enterprise can gain through processes (Hammer & Stanton, 1999).
The authors continue emphasizing the importance of processes inside an organization by giving the example of e-commerce sites and more specifically the Amazon.com. Well-defined processes are very important in Amazon. If Amazon manages deliver the product to the customer on time and without conflicts, the customer will become a reliable customer to the site (Hammer & Stanton, 1999) and the profits will be increased.

On the other hand, sometimes processes are appearing as the enemy of creativity (Hammer M., 2001). Due to the high automation and routinization the processes require, the creativity and human’s free mind is destroyed. According to the author, this is wrong. Processes are not the enemy of creativity. Processes are the opposite of chaos. Processes create organization and discipline so people are more challenged to work with creativity, rather than having to face a disorganized situation (Hammer M., 2001). In order to strength this opinion Hammer revealed what a senior executive has told him about processes. He told that a process is “the revolution in thought, leading to changes in business” (Hammer M., 2001). In the same spirit Hammer and Stanton (1999), claim that “a process enterprise is the organizational form for a world in constant change”.

### 2.6.5 Design of processes

Lots of papers have been written about the ways processes should be designed. Andersen Consulting (2009) in their handbook “process excellence handbook”, state that in a competitive world the process innovation is very important in an enterprise. The company introduces 7 heuristics for processes also known as the Seven Rs: Rethink, Reconfigure, Reassign, Resequence, Relocate, Reduce, Retool (Haapaniemi, 1998).

When designing the processes the managers and executives should keep in mind that the processes cannot be fixed (Hammer & Stanton, 1999). They must change their shape according to the new technology, the competitors and the circumstances. IBM is given as an example by the authors. IBM has “successfully redesigned” most of the processes, the last years and now the company redesigns them all over again in order to make them competitive towards the Web (Hammer & Stanton, 1999).
Although lots of papers have been written regarding the importance of processes, one question arises: Is good design of processes enough in order to have successful results in the enterprise? The answer according to Hammer is negative. The good design is not enough. Together with good design, the people inside the enterprise should show commitment, responsibility and maturity (Hammer M., 2001).

2.7 BPM in action

Until now a try has been made in order to present basic concepts of BPM such as business processes. But how BPM works in practice? It is time to start analyzing how BPM real works. An example of BPM in action could really help in understanding BPM approach in real business life.

A retailer has a problem with delivery due to wrong address of the customer. The goods are returned back to the retailer. A BPM solution would have provided the company with live monitoring process and before the package is returned to the company, the system could find all opportunities to re-route the package to another destination. With this solution the company can save cost and time (returning, restocking), reduce error cycles and consequently increase customer’s satisfaction. With the mentioned example it is clear that BPM solution can provide the company with clear processes, visibility and control over the enterprise, no matter the number and location of the departments are (Workpoint LLC, 2011).

Another case study of a company that has used BPM and has gained lots of benefits is this of the car company Ford. Ford’s purchasing department had to send copies of the order to many departments with any purchase order. This had not only increased the time of the order completion but there was also a danger of loss. With BPM the business processes were redesigned: the order was inserted in database without the need to send copies to other departments and the copy was checked by the system. Ford said that after BPM application, the company had achieved a significantly improvement in the processes and in some departments there was a reduction of 75% of the number of its employees (Ko R. K., 2009).
2.8 Benefits of BPM

The aforementioned benefits are attested by a research made by Gartner Group. The survey suggests that BPM solution can reduce error cycles and can lead to cost reduction. More specifically can result in a series of benefits (Workpoint LLC, 2011):

- Reduce time
- Reduce numbers of steps of a process
- Reduce error cycles
- Reduce resources

In general BPM enables “efficiency while maintaining effectiveness and complying with regulations” (Larson & Larson, 2011). If the identified processes are aligned with the company’s business strategy, then there are great possibilities to achieve the company’s objectives and increase efficiency. The authors give the three basic benefits of BPM (see figure 2)

<table>
<thead>
<tr>
<th>Three main drivers</th>
<th>Three main benefits achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The need to improve responsiveness</td>
<td>1. Improved relationship with customers</td>
</tr>
<tr>
<td>2. The competitive threat</td>
<td>2. Better cross-functional working</td>
</tr>
<tr>
<td>3. The need to improve quality</td>
<td>3. A change in organisational culture</td>
</tr>
</tbody>
</table>

Figure 2: Three basic benefits of BPM. Source: (Pritchard & Armistead, 1999)

The aforementioned benefits are some of the reasons the enterprises turn to the BPM solution. Apart the benefits of BPM, the enterprises turn to BPM because of the unstable climate on business area. Another research group (Ko, Lee, & Lee, 2009) agree with this statement. More specifically they believe that the globalization and the expansion of organizations have led to the need of quick transfer of information, quick decision making, quick in change adaption and demand for sorter life cycles. The authors consider the above as crucial factors for an organization in order to survive and increase its profitability.
As companies all over the world encounter a volatile environment, with high competition and rapidly growing technology, many turn to the solution of BPM. Adam and Doerr (2009) agree by emphasizing that if an enterprise wants to remain competitive then the 3 main dimensions in business world should be fulfilled: time, cost, quality. BPM through the process-based philosophy and the provided techniques can make the company fulfill these 3 dimensions. Gartner argues by claiming that BPM “wins the ‘Triple Crown’ of saving money, saving time, and adding value.”

The success of BPM application is quantified in terms of financial results (Garimella, Lees, & Williams, 2008). As already mentioned, BPM minimizes the cost, the time and waste (See figure 3).

\[
V_{\text{net}} = V_{\text{new}} - [\text{Cost} + \text{Time} + \text{Waste}]
\]

Where:

- \(V_{\text{net}}\): the net value produced by the project or process
- \(V_{\text{new}}\): the total new value produced
- \(\text{Cost}\): the total cost of the new process and system
- \(\text{Time}\): the operational cycle time or development time
- \(\text{Waste}\): unused or discarded systems or capabilities

**Figure 3: BPM Financial results. Source** (Garimella, Lees, & Williams, 2008)

### 2.9 BPM failure

Although BPM has significant results, there is always the opposite side of the coin. Many reviews report that 60–80% of BPM initiatives have not the most desired results (Trkman, 2010). In fact, misunderstandings of the BPM concepts and principles cause the failure of a BPM project (Trkman, 2010). Fingar (2011) through his article with the title “what does BPM actually means?” states in an ironic way that every technology vendor or management consultant puts BPM as a “lipstick” on their products. By this statement the author wanted to emphasize the popularity of BPM and the fact that some technologists use BPM just to sell their products and without caring about the real techniques of BPM (Adam & Doerr, 2009). This drives enterprises investing money on BPM but not having always the desired results.
Each organization should always ‘fit’ with the environment and the circumstances in order to remain competitive (Trkman, 2010). It is dangerous to take as an assumption that copying a successful BPM project applied to an organization to another is enough. Every organization is unique and has its characteristics. The author continues advising people who are involved in BPM oriented projects by claiming that each organization should study its prospects and characteristics and then decide which BPM application is appropriate for the enterprise. The enterprise also should pay attention in order to align its business processes with its environment whereas the executives and consultants should decide which business processes “are key processes and contribute to the competitive advantage” (Trkman, 2010). Finally, adopting a dynamic method which is customized in concrete circumstances is one of the best practices an enterprise should follow (Trkman, 2010).

Another reason for the BPM failure projects according to Trkman (2010), is the “fit” between business process and IT. The author through his paper shows the critical aspect of IT by stating that “…however, IT should not be considered a panacea but rather as a tool to support improved processes”. However, the relationship with BPM and IT will be analyzed deeply later in this paper.

2.10 BPM Life Circle

Due to the fact that terminologies and features of BPM differentiate and it is difficult for the reader to understand it, it is a good tactic to try and examine the BPM lifecycle in order to gain more understanding (ko, 2009; Ko, Lee & Lee, 2009). In the literature there is no standardized view on the number of phases in the BPM lifecycle. The most popular lifecycle of BPM is this by van der Aaslt (Ko, Lee, & Lee, 2009). This lifecycle is considered by many authors as the most “succinctness” and relevant (Ko, Lee, & Lee, 2009).

The lifecycle of BPM consists of 4 phases: The process design stage, the system configuration stage, the process enactment stage and the diagnosis stage (Lusk, 2007) (See Figure 3)
Through the study, another BPM lifecycle was investigated and will be analytically presented. The lifecycle is the one of Wetzstein et al. (2007). According to the authors the BPM lifecycle consists of 4 phases: modeling, implementation, execution, and analysis.

**Modeling:** This is the first phase in the BPM lifecycle. In this phase a business analyst defines and analyzes the processes and the phases of every process with the help of a modeling analytical tool. BPM provides business analysts with a modeling tool named Business Process Modeling Notation (BPMN). Later in this paper BPMN will be analyzed further. The design in this phase is very high level and in order to be executed, the implementation phase should start (Wetzstein, et al., 2007).

**Implementation:** In this phase IT engineers, into a process model, transform the model that has been created in the previous phase. The process model is executed into a process engine. Service Oriented Architecture (SOA) and web services help in the execution of the processes. The language that describes the processes in the services above is the Business Process Execution Language (BPEL) (Wetzstein, et al., 2007).

**Execution:** In this phase the process engine executes the processes. SOA communicates processes to other systems or clients through web services (Wetzstein, et al., 2007).
Analysis: In this phase monitoring of the running processes takes place. Monitoring helps in order to find error flows and instances and in general control the whole process. It is worth mentioning that some Business Process Management Systems (BPMS) support “business-level monitoring”, where analysts can check the performance of every process. Those results can be collected in a form of dashboards and comprise a form of data storage and statistics for every interested party. As seen data mining is important in BPM (Wetzstein, et al., 2007).

2.11 BPM architecture and tools

BPM technology architecture has proved to be very efficient. Its structure helps in the alignment of IT and business objectives, supports change and maximize productivity (Garimella, Lees, & Williams, 2008). The architecture consists of six layers: the Unified Workspace, the execution environment, the simulation Engine, the process Design Toolbox, the Metadata Repository and the web service adapters and new services development (Garimella, Lees, & Williams, 2008) (See figure 5).

| Unified Workspace: User interfaces, monitoring and dashboards, and task inboxes |
| Execution Environment: Business rules engine, the process engine, and the analytics engine |
| Simulation Engine |
| The Process Design Toolbox: Process modeling, rule definition, KPI definition, process development, and user interface design |
| The Metadata Repository: The “container” for process asset descriptions, relationships, and policies |
| Web Service Adapters and New Services Development Environment: Provides connections to existing functionality and tools for creation of new services |

Figure 5: BPM Architecture. Source (Garimella, Lees, & Williams, 2008)
Another more detailed BPM architecture is the following:

![BPM Architecture Diagram](image)

**Figure 6: A good BPM architecture. Source (Havey, 2005)**

In the figure 6 above a complete BPM architecture is presented. In the center of the system is operating the runtime engine. The runtime engine is executing processes written in BPEL (Havey, 2005).

2.11.1 BPMS

BPMS stands for business process management systems. BPMS is a technology that is used not only for the automation of the business processes but also for the management of the whole business processes inside an enterprise (Ravesteyn & Batenburg, 2010). To put it simply, BPM-systems are” the result of developments in both the business and IT-domain” (Ravesteyn & Batenburg, 2010).
At this point it is valuable to give an example for the better understanding of the BPMS. Likewise, DBMS is used for storing and managing data, BPMS is used for storing, processing and managing business processes (Ravesteyn & Batenburg, 2010). Figure 7 depicts BPMS architecture in a very analytical way (See figure 7).

**Figure 7: BPMS Architecture.** Source (Ramachandran, 2004)
In a BPMS system as can be seen in figure 7, the important parts are the Process Development Environment, the Process Engine, the Business Activity Monitoring (BAM), and the System Administration part (Ramachandran, 2004).

2.11.2 Modelling Standards

Until this point there is no mention about how the processes are modeled from BPM. Is there any tool, any technique? How processes are modeled by analysts and consultants? The answer is BPMN. BPMN stands for Business Process Management Notation and it is “a new standard for modeling business processes and web service processes” (Owen & Raj, 2003). BPMN includes a diagram, which is called Business Process Diagram (BPD); it is user friendly and is appropriate for complex processes (Owen & Raj, 2003). Also the business process management institute (BPMI) has introduced Business Process Modeling Language (BPML) and Business Process Query Language (BPQL) (Owen & Raj, 2003). According to the authors all the above have been developed by BPMI in order to support BPM and use “solid mathematical foundation” which enables BPMN to map easily with BPML and BPQL. BPML are XML based languages used to model processes. Most of the proposed languages use XML and build on top of Web Service Description Language (WSDL) offered by W3C (Owen & Raj, 2003). BPMN is easy to be used by non-technical people and it is good for designing and analyzing complex processes. In order to model a business process flow, the start point, the end point and the middle processes should be defined. Also business decisions are models by using gateways, which is like business decisions in flowcharts(Owen & Raj, 2003). (See figure 8)
Figure 8: BPMN Business Process Diagram for an on-line auction system. Source(Owen & Raj, 2003)

2.12 BPM Maturity Model

BPM is seen as “a holistic organizational management practice, which requires top management understanding and involvement, process-aware information systems, well defined accountability and a culture receptive to business processes” (Rosemann & Bruin, 2009). Authors and researchers lately are investigating various maturity models in order to measure the maturity of BPM. Rosemann and Bruin (2009) propose the Business Process Management Maturity Model that extends previous maturity models like the Capability Maturity Model (CMM). CMM was developed by the Software Engineering Institute at Carnegie Mellon University on 1993 in order to measure the maturity of software processes. The proposed model is “multi-dimensional”. It includes a number of basic components like factors, stages and scope (See figure 9) (Rosemann & Bruin, 2009).
2.13 BPM problems

In a recent survey by Wolf and Harmon, enterprises have reported that they spend more than a third of the time in the BPM projects in order to find out and define the processes inside their company (Muehlen & Recker, 2011). It is surprising the fact that people that follow everyday particular processes are not able to document those processes. In order to gain valuable time, the solution in the process identification phase is to ask the right people. The right people are people that have not only a specific knowledge inside the enterprise but also have a general view and knowledge of the organization (Muehlen & Recker, 2011).

Verner (2004) agrees with Muehlen and Recher, by stating that most of the organizations, especially bigger ones do not know their processes from start to end. So he gives two approaches of how business analysts can define processes. There is the top-down and bottom-up approach. In the first approach analysts should analyze the organizational chart in order to find the high level processes through the responsibilities and then analyze them further till the bottom level of the chart. The second approach is the bottom-up approach. Here the analysts should start interviewing the employees in order to define the day-to-day processes. The author agrees that this approach can be accurate but there is danger of getting
lost in the details. A combination of these two approaches can result to an accurate definition of the processes during the first stage of BPM (Verner, 2004).

Another problem expert’s face in the initiate stages of BPM is at the stage of the redesign of processes (Merrifield, Calhoun, & Stevens, 2008). One of the most important things when redesigning the processes in an enterprise is the identification of the duplicate processes with different names in the company. It is an often phenomenon, the existence of different processes with the same result and with different names. When identifying this, then it is easier for the managers and the technologists to identify which processes should be kept, which should be strengthened and which should be cancelled (Merrifield, Calhoun, & Stevens, 2008).

2.14 BPM and SOA

BPM and SOA are two approaches that have received great attention from the scientific and IT domain (Hiemstra, Ravesteyn, & Versendaal, 2010). Although both concepts can stand independently, they can work together in order to help enterprises survive in the competitive environment (Hiemstra, Ravesteyn, & Versendaal, 2011). Combining these two approaches the enterprises can become more “agile and flexible” (Hiemstra, Ravesteyn, & Versendaal, 2010).

“SOA is poised to make an impact on the way businesses conduct BPM.” The figure below shows a simple business process supported by IT. From the figure it is obvious that SOA “stands to enhance the effectiveness of BPM efforts” (Pulier & Taylor, 2006).
In the study that took place for this paper, BPM usually appears together with SOA. Lots of papers and articles are referenced in BPM and SOA as the connection of building a bridge between IT and business people (Ko, Lee & Lee, 2009; Cho & Lee, 2010). The combination of those two create a linkage between people and systems, “orchestrates the flow of the process” and manages organization’s information (Verner, 2004). More specifically, BPM is a “process-oriented management discipline” while SOA is an IT “architectural paradigm” that helps in the application of BPM (Ko, Lee, & Lee, 2009). According to Gartner (Ko, 2009), BPM “organizes people for greater agility” while SOA “organizes technology for greater agility” (See Figure 11). In other words SOA helps in the synchronization of information systems inside an organization and should not be confused with business processes (Ko, Lee, & Lee, 2009).
Many researchers combine BPM with SOA as the best way of aligning business and IT. Behara (2006) claims, “the combination of SOA and BPM is more powerful than either is alone”. With this statement many authors agree by emphasizing that SOA and BPM in combination are more “powerful than either is in itself” (Hiemstra, Ravesteyn, & Versendaal, 2011). They also insist by indicating that SOA cannot stand without a BPM infrastructure. “BPM works hand-in-hand with SOA” and that SOA “represent services”, and BPM, “consumes services” (Behara, 2006)

As depicted in figure 12, BPM’s work is the modeling, simulation and redesign of the processes of an organization and SOA’s work is to orchestrate the business processes. The communication between the processes and the application takes place only via SOA integration. This way fills the gap between processes and application (Behara, 2009; Adam & Doerr, 2009). More technically speaking, BPM helps in transforming the business processes whereas SOA follows these business processes in order develop business flows (Behara, 2006).
Although BPM and SOA are gaining more interest and many organizations adopt this formula in order to improve their processes and benefit of them, some authors believe that they should be used in combination and not standalone. More specifically, Behara (2006), reports some problems when these two “approaches” are used separately. He says that “BPM without SOA is useful for building applications, but difficult to extend to the enterprise and SOA without BPM is useful for creating reusable and consistent services, but lacks the ability to turn those services into an agile, competitive enterprise” (Behara, 2006). The correct combination of BPM and SOA leads to general processes, modeled by BPM and implemented by SOA infrastructure in production (Noel, 2005).

### 2.14.1 Differences between SOA and BPM

But what is the main difference between SOA and BPM? Some authors appear more skeptical with BPM and SOA. They believe in their effective results but they advise organizations to be careful when using them. More specifically, BPM has a “process-centric view” while SOA has a “service-centric” (Hiemstra, Ravesteyn, & Versendaal, 2011). This usually results in wrong interpretation among the different stakeholders (Hiemstra,
Investigation on creating a bridge between business and IT

Ravesteyn, & Versendaal, 2011). Another difference that should be paid much attention is those of services and processes. Processes can change easily very often but services not. Services are more stable (Hiemstra, Ravesteyn, & Versendaal, 2011). As a result of all the above BPM techniques and methods cannot easily be “integrated” in a service oriented environment (Hiemstra, Ravesteyn, & Versendaal, 2011).

2.15 SOA

Some authors state that although IT is not a “guarantor” for making an enterprise competitive, without IT the enterprise will surely get driven to business failure (Adam & Doerr, 2009). For many researchers and IT representatives SOA is surely the IT technology that drives an enterprise to success (Behara, 2006).

SOA that stands for Service Oriented Architecture is based on the principle of creating “reusable business services” (Behara, 2006). The author emphasizes that SOA is not a product. It helps in filling the gap between business and IT. More specifically, SOA “provides the ideal level of abstraction for defining reusable business functionality, completely encapsulating underlying applications and technology platforms from the BPM system” (Behara, 2006).

An example that could make SOA more understandable is the example of Lego. SOA acts exactly as Lego that can be easily “put together and taken apart”. In other words Service oriented architecture is a new way of “designing or deploying the software that supports a business activity” (Merrifield, Calhoun, & Stevens, 2008).

The goal of SOA is to “expose an organization's computing assets as reusable services that can communicate and integrate more readily” (Noel, 2005). SOA aims to unravel the “spaghetti” that exists in most enterprises (Noel, 2005) (See Figure 13). SOA can be understandable both by business analysts and IT developers and this helps in filling the “gapping chasm” between them (Noel, 2005). In figures 13 and 14 is obvious the effectiveness of SOA. In figure 13, it is obvious that, the way the different systems that may exist in an enterprise cannot communicate properly and this makes every change difficult and increases operational costs. In figure 14, is depicted the system communication after
SOA integration. SOA makes communication faster and reduces operational costs (Noel, 2005).

One of the companies that had applied SOA and had magnificent results is Motorola. The authors state that Motorola found ways to standardize the processes in Motorola’s call centers by using Microsoft’s SOA solution and this helped the company to save millions of dollars. More specifically in an investment of $1.25 in a SOA project, the giant cut the annual cost by more than $3 million (Merrifield, Calhoun, & Stevens, 2008).
2.15.1 SOA problems

Due to the fact that there is no a general standard about SOA this had driven lots of vendors and industries to using different versions of SOA (Merrifield, Calhoun, & Stevens, 2008). A bigger obstacle is the gap between the business leaders and their IT departments. The Ceo’s are too enthusiastic towards the implementation of SOA and rush to implement SOA in order to reduce costs. But the fault is that most businesses avoid the stage of the rethinking and the redesign of processes. This means that they have dismissed SOA’s greatest value: “the opportunity to create much more focused, efficient, and flexible organizational structures” (Merrifield, Calhoun, & Stevens, 2008).

2.15.2 Web Services

Web services are the technology used in order to apply Service Oriented Architecture (SOA). Web services are software components used to communicate over different networks and systems regardless the technology and the programming languages they are using. Extensible Markup Language (XML) is the language that helps in this communication. More specifically, XML is a method that makes the interchangeable data understandable from one system to another. At this point a clarification should be made regarding SOA. SOA is an IT principle used for many years. Web Services is the generally acceptable that is the best way of doing SOA. This means that there are also other ways to apply SOA (Pulier & Taylor, 2006).

Web services use the request/response way in order to communicate. In the figure 15 below computer A requests information from computer B. Computer B responses back the requested information. The interchangeable messages use a specific type of XML, known as Simple Object Access Protocol (SOAP) (Pulier & Taylor, 2006).
2.15.3 SOAP

SOAP is characterized as the “lingua franca” of web services. It is an XML structure where all the web services are built. More specifically, web services are based on SOAP messages, which are written in XML. Every SOAP message is written according to the W3C standards and this gives SOAP messages homogeneity. The figure 16 below shows a SOAP message (Pulier & Taylor, 2006).
2.16 The gap between BPM and SOA

During this study, it was more than obvious that some authors and researchers where more optimistic towards BPM and SOA results and some others more restrained. The restrained proportion of authors believes that BPM and SOA although they are effective there should be given much attention to the gap that can be created amongst IT and Business people.

Usually amongst BPM and SOA implementation, design, simulation, and evaluation are performed by business people and implementation and execution by IT people because business people usually don’t have the IT knowledge (Adam & Doerr, 2009). This results to a separation between IT and business people else called business-IT gap (See Figure 12) (Adam & Doerr, 2009)

The challenge on BPM projects is how to bring SOA and BPM together. In order to keep an alignment between SOA and BPM these are the key areas that the experts should focus: Organization and Governance, methodology and architecture, technology and tools (Rosa, 2010).

Figure 12: the Gap between Business and IT. Source (Adam & Doerr, 2009)
Many researchers are trying to build a bridge between IT and Business people in order to get a more effective BPM-SOA schema. Adam and Doerr (2009) in their paper are proposing a model, as well as Hiemstra, Ravesteyn and Versendaal (2011). The model is called BPM/SOA Alignment Maturity model, which helps organizations to be more flexible and agile towards the current competitive business environment (Hiemstra, Ravesteyn, & Versendaal, 2011).

Some other authors claim that the reason for the Business-IT gap is different (Wetzstein, et al., 2007). They state, “despite the increasing support for BPM, there is still a low degree of automation in the BPM lifecycle” (Wetzstein, et al., 2007). More specifically, the authors believe that there are significant difficulties when it comes to “bridge the gap between the business and IT views on the business processes”. The reason for this gap is indicated between the translation of the “high-level business process models”, which are designed by business analysts and the workflow models which are executed by IT representatives. The gap also known as “Business-IT gap” is caused by the misunderstanding of the business rules by IT people and by the weakness of understanding of the technical terminology by business analysts (Wetzstein, et al., 2007).

The authors strongly believe that Semantic Business Process Management (SBPM) could help in order to build the bridge between business and IT people by using semantic technologies (Wetzstein, et al., 2007). The same way as web Services ensure automation, SBPM can achieve more automation in all the phases of the BPM lifecycle. In their paper show how Semantic technologies can enhance the life cycle of BPM. The authors reassure that SBPM will not affect the typical life cycle of BPM but will add more automation to the phases and to the processes consequently (Wetzstein, et al., 2007). The SBPM lifecycle is the following:
The authors state that using semantic technologies can increase the level of automation. By this way business and IT will be more aligned. For every phase the author’s state: “In the process modeling phase the semantic annotations enable semantic-based discovery of process fragments and auto-completion of process models. In the process implementation phase process composition functionality exploits semantic descriptions to find SWSs or compositions of SWSs for the implementation of the process...during process execution; the use of SWS descriptions in process models enables dynamic binding of services to process tasks. Finally, in the analysis phase semantically annotated event logs enable reasoning and more powerful querying of events in process monitoring and mining” (Wetzstein, et al., 2007).
2.17 Conclusion

BPM and SOA are topics of great interest and researchers believe that the combination of these two will create more agile and flexible enterprises. This study will answer to a couple of questions regarding BPM and SOA integration. Also will examine the problem of Business and IT gap and will give ways of how teams can align these two parts. The problems and the way the implementation of these two approaches will return the desired results are answered and analyzed by specialists at the research analysis part (chapter four).

At this point it can be stated that all the important theoretical aspects, necessary for this research have been elaborated. Chapter three describes the methodology that was used for this study. A review of the research purpose and research questions is presented. Next, the analysis and the target of the questions, the sample of the interviews and the evaluating methods are described.
CHAPTER III: METHODOLOGY

3 Introduction

This chapter presents the selected research methodology. The aim of this study is presented and the key questions are analyzed. Moreover, the strategy and the design of the methodology are explained. Finally the chapter explores the sample and the size of the research analysis part, the limitations and the procedures that were used in order to analyze the data that have been extracted from the research methodology.

At this point it can be admitted that although this part of the research was the most critical and demanding, it was the most challenging. Every attempt has been done in order for this research to extract valuable conclusions about the research topic.

3.1 Research topic

The research topic is about to examine the phenomenon of BPM and SOA. The reason for doing so is the need of nowadays enterprises to remain competitive in a very demanding environment. BPM and SOA are by general consensus two approaches that can defend enterprises with more agility and flexibility. To fulfill the purpose of the study, it was necessary to make a literature review, which would provide even to the most unfamiliar reader the completely understanding of these two approaches. At the same time it was important to explore and analyze the critical problem that exists in today’s business environment, which is the gap between business and IT, also known as “Business-IT gap”.

At the beginning of the research there was a though that this dissertation could be based on the literature review and the analysis of some case studies. The initial intention was to investigate the “Business-IT gap” problem that exists in most enterprises. The problems started when preparing the topic and the literature review for a first presentation. Unfortunately it was realized that there was a lack of resources in the literature about the gap and the existed resources were not able to support a research at the level of a Master thesis.
After much thinking and investigation, there was decided to expand the topic and benefit from the researcher’s business network, and the experience these professional connections have on BPM and SOA oriented projects. It was realized that it would be more interesting to analyze not only the “Business-IT gap”, but also the key determinants of successful enterprises. In this thinking it could be presented the way BPM with the help of SOA can create an alignment between business and IT. Moreover, previous colleagues of the researcher could help in the research study through interviews. As a result the qualitative method was the most challenging and promising method in order to achieve this study’s objectives. Moreover it was decided that quantitative method by the use of questionnaires could not be much helpful because the purpose was to learn from the experts how BPM and SOA are working in practice.

3.2 Research Questions

3.2.1 The problem

This research approaches two problems that exist in nowadays business environment. The first is the very demanding environment that enterprises face. For this reason stakeholders try to find out ways for an enterprise to become more agile and flexible. Also information technology plays a crucial role in business enterprises. And this is the second problem. Due to the interference of IT, a gap has been created amongst business and IT. BPM and SOA seem to be the solution on the above problems.

3.2.2 The questions

The research would give answers to the following basic questions:

1. How do BPM and SOA relate to each other? Is there success for one without the other?
2. What's the best approach in the alignment of SOA and BPM in order to have an agile and flexible enterprise?
3. What are the risks/difficulties a business analysts and IT engineers could face on BPM-SOA oriented projects?
4. How specialists can face the “Business-IT” gap?
3.3 Research method

As already mentioned, qualitative method has been selected for this research. Although the quantitative method is the most popular and easiest to analyze, qualitative method was considered as the most appropriate for the current topic. Interviews were decided to be the most suitable, because the topic can only be supported by experienced people in BPM and SOA, who have worked in the IT sector by implementing these two approaches. As a result interviews would give the opportunity to the interviewees to explain how these two approaches work in practice, and mention the problems that exist and finally to cover all the issues that haven’t been discovered during the literature review.

3.3.1 Interviews

“An interview is a series of questions a researcher addresses personally to respondents. An interview may be structured (where you ask clearly defined questions) or unstructured, where you allow some of your questioning to be led by the responses of the interviewee. Especially when using unstructured interviews, using a tape recorder can be a good idea, if it does not affect the relationship with the person being interviewed.” (Alby, 2010).

The research study is qualitative. The reason for that was that the research method ought to be effective in collecting the data needed to meet the thesis expectations. The interviews consisted of open questions that allowed the interviewees to define and describe the topic through their personal experience on the examinable topic. The interview questionnaires can be found in the Appendix.

In the past years the traditional way of interviews was face-to-face (Opdenakker, 2006) Nowadays interviews through different techniques have gain ground. The reason for this development is the spread of the Internet technology. The new techniques that have been created are the interviews via email or via chat boxes, such as Skype and MSN (Opdenakker, 2006). Although all of the above techniques are used there are advantages and disadvantages.
More specifically, face-to-face interviews are a synchronous type of communication and due to the direct contact with the interviewee; the interviewer can take advantage of the body language, the voice and the reaction (Opdenakker, 2006). On the other hand there are some disadvantages. Synchronous types of communication can be time and cost consuming. For example let’s suppose that the interviewer is 500 kilometer away of the interviewee. This means that he/she should spend time and money in order to accomplish the interview (Opdenakker, 2006).

Another communication technique that is popular is the interview via MSN and in general chat boxes (Opdenakker, 2006). According to the author this is an asynchronous type of communication with advantages and disadvantages. The advantage is that they "can protect the researcher by offering a degree of anonymity, perhaps through the adoption of an (e-mail) pseudonym" (Opdenakker, 2006). In addition asynchronous communication through chat boxes can be a disadvantage, because the interviewer “has no view on the situation in which the interviewee is situated” (Opdenakker, 2006).

Finally another communication technique for interviews is the interview via email. This type of communication has been selected for this study. The first reason is because via this way the “the interviewer can formulate the questions, and the interviewee can answer the questions at his or her own convenience without noise disturbance due to independence of place and time” (Opdenakker, 2006). Moreover, the interviewees were away from the interviewer, so emails were the most convenient way for collecting the data. Finally, the interviewees are working in a big multinational companies in very demanding positions and the time they could spend during the day was limited. Most of the interviewees answered the questions in their personal time. For all the above reasons interviews via email were considered as the most suitable.

Although this method was considered as the most appropriate, a limitation was faced. Email does not give you the opportunity to make clarifications. For that reason extra emails for further explanation were followed by the interviewer.
3.3.2 Interviews content

The interviews questions were designed in such a way that data could be selected regarding how BPM and SOA work in practice and how the gap can be filled in a team consisted by business and IT people. For that reason the selected interviewees had different backgrounds. Some were more business oriented and others more IT specialized. 11 questions were prepared and required about 1 hour to answer. Also there was an opportunity for the interviewees to skip some questions in case they felt that they didn’t have the appropriate knowledge and experience to answer.

At this point it is valuable to make a quick analysis on the content and the purpose of the questions:

**Question 1**: What is your experience on BPM/SOA oriented projects? (Years/level/Section of experience)
This question is a simple question requiring small answer. The purpose of the question is to collect data regarding the level and the amount of the experience. This information will help in analyzing the data based on the different level of experience and knowledge.

**Question 2**: Could you briefly explain a BPM/SOA oriented project you have been involved?
This question is very interesting. The purpose is to give the researcher the icon of real BPM/SOA oriented projects. This will help in the main target of the thesis which is the understanding of BPM and SOA approaches in practice.

**Question 3**: Through your experience, what is your personal definition of the two approaches? (BPM/SOA)
This question is also very interesting and critical. The interviewees should have lots of experience in order to be able to give a complete definition about the two approaches. The purpose of this question is to collect definitions by experts that have worked the two approaches and compare to the definitions from the literature review. Most of the times it is better to listen to people that have worked these solutions than reading papers from some researchers that may never have worked the topic in real time circumstances.
**Question 4:** How BPM and SOA are related to each other? Is there success for one without the other?

This is the first question that focuses on the combination of BPM and SOA and how successful are these two approaches when combined together. The purpose of this question is to find out whether the combination of SOA and BPM is just a trend or a real need.

**Question 5:** What are the main problems you face in implementing BPM and SOA?

This question deals with the problems that enterprises face when implementing a BPM/SOA oriented project. Through the primary data lots of problems have been outlined when using BPM and SOA. This question tends to outline the real problems that experts have faced during implementation.

**Question 6:** What do you think are the required characteristics of a team for a successful BPM-SOA project?

This question’s target is to find out the characteristics and specializations team members should have in order to implement a successful project. This information is very important for the analysis phase because it will help the reader understand differences between business and IT oriented people.

**Question 7:** What are the risks/difficulties for a professional towards a BPM-SOA oriented project?

This question is also very important. The interviewees are asked to outline the risks and difficulties they face or have faced in such a project. The answers will give the reader a deeper understanding of the dangers and obstacles of BPM and SOA.

**Question 8:** What's the best approach in the alignment of SOA and BPM for an agile and flexible enterprise?

This question is one of the most important questions. The responders are asked to give the best approaches in order to align SOA and BPM so as to have a more agile and flexible enterprise.

**Question 9:** The misunderstanding of the business rules by IT people and the weakness of understanding of the technical terminology by business analysts lead to the gap between business and IT people, also known as “Business-IT gap”. Have you ever faced this gap and how have you reacted?
This question is appended to the responder in a special form. The first part of the question is the researcher’s statement that is extracted from the literature review. The question asks the responders to say whether they have faced the “Business-IT gap” or not and how they reacted. This question is critical since it tends to answer to a basic question of this study.

**Question 10:** Some researchers believe that BPM does not help in aligning Business and IT people due to the lack of high automation. Do you agree with this statement or not?

This question tries to outline one of the disadvantages that appear to happen when using BPM and SOA. The statement is extracted by the primary data and the responder is asked to answer whether he/she has faced this problem or not.

**Question 11:** Do you have something else to add about this subject?

This question is general and gives the opportunity to the interviewee to add important information in case he/she hasn’t been asked. Sometimes this type of questions gives valuable information to the research study.

### 3.4 Sample and limitations

This study has conducted interviewees from three different parts. In the first part there were employees from researcher’s previous working environment. They are working for multinational management consulting companies and have experience on BPM and SOA oriented projects. The second part where IT specialists from IT and research groups and the third part where friends that are working in the IT sector. As already mentioned the topic is very specialized and for that reason the final number of the interviewers was 5. Although the number of the people that were conducted for the interview was 20, only 5 had the experience and the time to answer to the questions. It is understandable that except from the experience, the interviewee should spend some time in order to answer to the questions. The interviews are usually time-consuming. For that reason most researchers select the questionnaires, but it is strongly believed that for this study the solution of the interviews was the most suitable.
At this point is worth mentioning that the questions were prepared in a way that could be answered both from business thinkers and IT thinkers, in order to check the different point of view amongst business and IT.

Furthermore, the limitations of the sample were lots. The first was the specialization of the topic. This specialization of the topic was a restriction to the sample. It was difficult to find experts on BPM and SOA approach in order to answer to a couple of questions. The second limitation was the time. The experts that had been conducted are working in top management level and have positions that require lots of their time. In other words they are working lots of hours and there was difficult for them to answer to the interviews. For that reason there was given to them 3 weeks time and send lots of reminders in order to reply.

3.5 Research analysis approach

The primary data have been collected from the literature review. These data had helped in creating the appropriate questions for the interviews. Moreover the secondary data have been collected by the interviews via email. The secondary data are the most important for the study. These data will help in answering the important questions for this study.

The research approach refers to the qualitative and quantitative and to the deductive and inductive (Burney, 2008). For this study the qualitative and deductive methods have been used.
3.5.1 The Deductive versus the Inductive Approach

For the analysis two types of methods exist: the deductive and the inductive (figure 18) (Burney, 2008).

The deductive approach works from the general to the more specific (figure 19), whereas the inductive works from moving from something specific to more general conclusions (figure 20)
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Figure 19: Deductive approach. Source (Burney, 2008)

- Deductive reasoning works from the more general to the more specific.
- Sometimes this is informally called a "top-down" approach.
- Conclusion follows logically from premises (available facts)

Figure 20: Inductive approach. Source: (Burney, 2008)

- Inductive reasoning works the other way, moving from specific observations to broader generalizations and theories.
- Informally, we sometimes call this a "bottom up" approach.
- Conclusion is likely based on premises.
- Involves a degree of uncertainty
In this study the deductive approach is used. This approach was selected because the target of this dissertation was to gather important data from the interviews and analyze it in order to propose ways were an enterprise can became more agile and flexible by using BPM and SOA. Also the problem regarding the gap between business and IT is outlined and solutions are given.

3.6 Summary

As this chapter is presented, the methodology that has been decided as the most suited for this study. The methodology is quantitative in order to gather the secondary data and deductive in order to analyze them. The next chapter will present the results of the interviews.
CHAPTER IV: RESEARCH ANALYSIS

4 Introduction

The results of the research study are extracted from a quantitative survey on BPM and SOA integration related to the problems current enterprises face. More specifically, the results are based on experienced people that are working on IT sector and more specifically on BPM and SOA oriented projects.

As mentioned in the methodology chapter, the sample of this study was limited. The reason for this was the specialization of the topic and the limitation of the time. The experts that were conducted had limited time and the interviews required much of their time. Although lots of people were conducted, only 5 people had the required knowledge and time to answer to the questions.

As earlier noted, the purpose of this study is to investigate the BPM and SOA concepts and how they are working in practice. Another purpose is to examine the reasons of the increasingly spread of the two approaches. Last but not least this study will investigate the complicated problem of business and IT gap in the contemporary enterprises and how BPM and SOA can solve this problem. In order to fulfill those purposes the research study had extracted primary and secondary data.

This chapter presents the findings, followed by an analysis of the interviews results. As already mentioned, although conducted interviewees were about 20, only 5 people had finally responded (figure 21).

In order to make the process more understandable the interviewees have been separated and named with a code. So there are 5 interviewees with the code A, B, C, D and E.
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4.1 Results

4.1.1 Question 1

What is your experience on BPM/SOA oriented projects? (Years/level/Section of experience)

This question is an introductory question in order to understand the experience of the interviewees in BPM and SOA oriented projects. The experienced years are amongst 3 to 5 years and most of the interviewees are working on telecommunication sector. Also most of them have been involved in the design and analysis phase. More specifically, two of them (A and B) are involved in BPM and SOA oriented projects the last 5 years in the design and analysis area. Other 2 (C and D) are working in such projects the last 4 years also in the design and analysis area. More specifically one interviewee states that his role in such project was mixed: “My roles varied from Requirement Analysis, through Design & Build including System and Integration Testing”. The next interviewee (E) seems to be less experienced because the experience is just 3 years in the development area. The last interviewee (F) has also the same experience as E in the analysis and design area. Moreover 4 people are working on telecommunication industry. In the figure below the results of question one are presented concisely.

<table>
<thead>
<tr>
<th>Career Level</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manager</td>
<td>2</td>
</tr>
<tr>
<td>Consultant</td>
<td>1</td>
</tr>
<tr>
<td>Business Analyst</td>
<td>1</td>
</tr>
<tr>
<td>Senior Programmer</td>
<td>1</td>
</tr>
</tbody>
</table>

Figure 21: Career level of the Sample
4.1.2 Question 2

Could you briefly explain a BPM/SOA oriented project you have been involved?

The target of this question was to give the reader the understanding of how a BPM and SOA project work in practice. One of the main targets of the research study is to give the available information of how BPM and SOA work in real circumstances.

More specifically interviewee A had been working in a major telecommunication company. The project was a BPM and SOA Orchestration and Integration project. By the term “Orchestration and Integration” project the interviewee meant that the goal of the project was to implement “a new orchestration platform based on the Oracle SOA Suite”. The Orchestration & Integration solution had helped the telecommunication company to “gain business differentiation and IT simplification”. More specifically, “Business Differentiation” means that the project would give all the required assets an enterprise should have in order to remain competitive. Finally by the phrase “IT simplification” the interviewee stated that this kind of project would simplify the enterprise’s IT systems and processes.
The interviewee was willing to provide further details about the project and reveal more technical aspects of the project. This is very important for the research study because it is the first time the reader can understand completely the key aspects of a project like this. The interviewee stated that the team was using the Oracle SOA Suite which is made by 3 components: Enterprise Service Bus (ESB), Process Orchestration and Business Activity Monitoring.

More specifically ESB helps in integrating “disparate” systems in order to interact as “one unified enterprise using functions that promote reusability by being loosely-coupled, well defined, self-contained, and created independently”. On the other hand Process Orchestration helps in the “automated linking” of the different services in order to integrate the enterprise’s business processes. It is obvious that Process Orchestration is the business part of the projects and refers to the BPM approach because helps in the integration of the business processes. In the process orchestration the basic “ingredient” is BPEL. In the research study BPEL is already mentioned. It is the language that describes the processes in the services above is the Business Process Execution Language (BPEL) (Wetzstein, et al., 2007). Finally the third component of the project was the Business Activity Monitoring, which helps in providing “end-to-end process performance monitoring for real-time insight and control of business”.

In addition to the interviewee A, B seems to have worked in a series of projects depending on BPM and SOA. One of the projects was the implementation of an “order fulfillment Engine”. This engine would execute the business processes in “configurable sequences”. The business processes would come through the integration of a CRM system. Continuously the integration of the CRM system was made by the use of ESB. Also B had taken part in the implementation of “service decomposition” and the integration of provisioning and billing systems probably through ESB. From interviewee B is it clear that BPM and SOA projects can have different aspects every time and all lead to the integration of the different systems inside an enterprise by defining the business processes and execute them through “configurable sequences”.

Interviewee C fortunately gives a more detailed description of the situation. C was involved in a BSS transformation to Service Oriented Architecture. C states that this project should be considered as a program, which had a collection of projects and not a “standalone project
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The aim of the program was to make a transition of “BSS client’s landscape” to a service oriented. In this new transition a couple of tools and techniques took place. From the business part, business process of the order management system was managed by a selected orchestration tool. The selected tool was Oracle’s communication Order and Service Management (OSM). From the IT part, business services were modeled with the use of web services. All business services should follow the SOA principles which according to C should provide “atomic complete functions”, should be based on standards such as SOAP and XML and finally should be “platform agnostic”. Lastly, all web services were supported by an ESB.

Up to this point we can see similarities between the three interviewees such as the ESB and BPEL usage. Moreover, interviewee C attests the findings from the literature review regarding SOAP and XML.

In addition with the interviewees above, interviewee D was more laconic. D has been involved in Oracle’s Service Delivery Platform also known as SDP. SDP provides telecommunication providers “with the ability to manage the critical business functions of order capture and order activation, network administration and operation”. SDP provides a series of APIs used in creating an interface to any OSS (operational Support System)

Interviewee E seems to have a very different application of BPM in projects. Although E seems to have used SOA in projects, BPM is mentioned and used in a wrong way. More specifically, E was involved in SOA projects by developing client applications as web services. On the other hand, E considers BPM as a set of processes that should be followed by a manager and a team in order to assure that all the processes that are set in a project are followed. E states that “A process (quality assurance) manager was allocated for each project and daily/weekly/monthly reports were published to make sure projects were meeting the requirements and following all processes set”. Unfortunately E seems to have not the knowledge of what BPM exactly is but in later questions it seems to have a good knowledge of SOA and business-IT gap.
4.1.3 Question 3

Through your experience, what is your personal definition of the two approaches? (BPM/SOA)

This question is one of the most important ones because the reader has the opportunity to read definitions about BPM and SOA approaches by experienced people who have undoubtedly experience in the field. Interviewee A states that SOA is a way “of building enterprise systems out of reusable building blocks ‘business services’ performing discrete functions”. On the other hand for A BPM is a framework that connects IT with business. More specifically A stated that BPM “provides a shared framework and language to enable IT to communicate effectively with, and create value for, the business”.

Interviewee B believes that SOA is a “governed process” that builds reusing services. On the other hand BPM is about “continuous process improvement”. Specifically, BPM seems to reduce the gap between business and IT because helps in the reduction of errors. Also BPM optimizes the processes so increases the efficiency and finally created ad-hoc processes that help when IT changes occur.

Moreover, interviewee C defines BPM as a structure method used in order to manage and improve enterprise’s activities and processes. Furthermore BPM is a discipline that can improve speed and agility, transparency and efficiency. C believes that BPM offers speed and agility that are required in the contemporary organizations. Also transparency is appropriate because offers a visibility on the processes. Finally efficiency is also required by an enterprise in order to reduce the costs, react faster and improve customer’s satisfaction. C insists in BPM analysis by stating that BPM automation can “add significant value to long, complex business processes that cross interaction channels and span multiple systems”.

Regarding SOA, C states that SOA is an approach for “designing and building flexible IT solutions”. C emphasizes on importance of the combination of BPM and SOA by stating that the effectiveness of SOA enables business process components to be integrated and orchestrated more effectively.

According to interviewee D BPM is a methodology that gives the opportunity to the enterprises to identify business processes. BPM tools help in modeling and developing those business processes. Similarly, SOA helps in integrating different applications. More
specifically, the concept is based on the standard of implementing “reusable business services”. D continues the analysis by emphasizing that SOA is not just a product. It helps in bridging the gap between business and IT through a series of “business-aligned” services.

On the other hand interviewee E just gives a definition for SOA by stating that SOA is a new approach in software architecture and it helps in joining “various independent heterogeneous applications to provide additional/new services”. Regarding BPM he stated that it helps in management in order to have a good insight of the progress. The definition of BPM is completely different of the rest interviewees and with the findings of the literature review. As already mentioned the reason for this is the misunderstanding and the lack of knowledge of interviewee E on the area of BPM.

4.1.4 Question 4

How BPM and SOA are related to each other? Is there success for one without the other?

The intention of this question is to draw the real relation between the two approaches through the eyes of experienced professionals.

Interviewee A had admitted that both BPM and SOA can “work individually and with great success depending on the environment that are placed and the business needs”. However, when they are used together it seems to have greater success. It is proven that the projects have “higher success” rates and both IT and business is more successful. Furthermore, interviewee B states that BPM success is based on proper SOA governance. The combination of BPM and SOA enables “the reusability of services and adaptation of processes”.

On the other hand interviewee C makes a more specific approach to the relation between SOA and BPM. C believes that automated business processes should be designed with great accuracy because they should cover organization’s needs and should not be “limited” by the restrictions IT sometimes occurs. For that reason, SOA provides some business services in order to support the business processes. As C stated “SOA provides the foundation in which BPM lies”. C makes clarifies that SOA has a double role. Except from supporting business processes, is also used for system integration through ESBs.
According to interviewee D, SOA has created “process independence”. When SOA is combined with BPM, services are created which can be used in many ways (reusability) and can lead to process optimization in an enterprise. Finally E due to the fact that has a misunderstanding on BPM cannot relate BPM and SOA.

4.1.5 Question 5
What are the main problems you face in implementing BPM and SOA?

Interviewee A indicates a couple of problems. A states that most users are unwilling to get used with the new processes and ate stack to the previous knowledge. Also A admits that organizations should think carefully about their strategy. “Not all business has or need to have the potentials to adopt a BPM/SOA solution”. Another problem that is frequently met is that most people focus on the tools and not on the process definition. Finally the organization should be open in changing most of the processes and services and not be unwilling to make deep changes. In general A believes that “there should be a clear mix of processes, tools to be used and the cultural environment of the company willing to adopt BPM/SOA solutions. All three aforementioned components need to evolve in parallel”.

For interviewee B the main problem lies in the relationship of IT experts and clients. B admits that most of the times specialists have not enough authority within the company in order to take decisions on processes and services. Due to the fact that every client requires the project to be delivered on time and in budget, acts like an obstacle to the expert who wants to provide a more complete solution.

Interviewee C seems to agree with B. C notices that the main problem of BPM and SOA implementations is the lack of governance. C continues by stating that without governance the enterprise cannot achieve the real values of BPM and SOA.

On the other hand, interviewee D believes that the main problem lies in the transformation of the business processes into a “solid” IT project. Finally the last interviewee believes that the lack of deep knowledge can be proved as a problem.
4.1.6 Question 6
What do you think are the required characteristics of a team for a successful BPM-SOA project?

Interviewee A believes that a team of a BPM-SOA oriented project in order to be successful should consist of individuals with different backgrounds. For example the team should have a business analyst, who will be responsible to understand the existing business processes and create the new ones. Another required role inside the team is the functional specialist. According to A the functional specialist acts as an “advisor to the business analyst who is generating the as-is and to-be business processes”. Also the presence of a technical analyst is required in order to understand the technical architecture and be able to cooperate with the functional team. Finally a team should have a software engineer in order to implement the new services and processes.

Similarly to A, B insists that a team should consist of an integration architect for giving guidelines regarding SOA architecture and a business architect who will control the business processes from the BPM perspective. It is obvious that A and B agree with the roles that a team should consist of but express it with different terms. Regarding interviewee C, a mixed team with understanding of the functional terminology and the business needs, as well as of the technical aspects is necessary to deliver a successful BPM-SOA oriented project. D seems to agree with C by stating that “a mixed team with functional and technical profiles” is necessary. Finally interviewee E believes that functional people need to have understanding of IT (SOA) and vice versa. Finally in order to have a successful project the training of human resources is appropriate.

4.1.7 Question 7

What are the risks/difficulties for a professional towards a BPM-SOA oriented project?

The risks or difficulties a professional could face in a BPM-SOA oriented project are a lot. B states that the commitment of the client teams to the previous processes can be a difficulty. Also a lack of clear governance process within the IT client can became an obstacle. Finally
for B due to the high start-up costs the project may face a risk of low budget. Moreover, D states that sometimes SOA approach is not fully adopted by an organization as much as BPM and this is a risk. Therefore the enterprise can end-up in “implementing something really customized for a specific customer”.

Interviewee A and C are trying to give solutions in order to avoid the risks or difficulties. More specifically A gives the steps for a team to start a BPM-SOA oriented projects without facing many risks. A believes that the initial steps are the most critical. A team should first analyze the ‘As-Is’ processes. Then ‘To-Be’ processes should be designed based on the needs of the enterprise. After ‘To-Be’ processes, measures should be confirmed in order to assure that the defined problems have been solved. Also there should be an assurance of the target goals.

Similarly to A, interviewee C suggests some key factors that can save the team from risks and difficulties. C insists, “BPM and SOA are not only IT related”. Therefore to make a correct implementation there should be the support of business as well. Moreover, C believes that the most important think in implementing projects like the examinable one is the governance. “Applying SOA and BPM is a journey and governance is a must for applying them successfully”. C suggests that Enterprise Architecture Management should be applied. There are frameworks and methodologies such as TOGAF, Cobit and ITIL that can help in governance and having aligned processes and goals across an enterprise.

4.1.8 Question 8
What's the best approach in the alignment of SOA and BPM for an agile and flexible enterprise?

A claims that in order to make an enterprise agile and flexible high leadership and direction are required. Also end-to end processes should be well defined and understandable by every stakeholder. Moreover performance metrics will help in tracing everything from business strategy to system implementation. Such metrics like KPIs can measure business users and leadership satisfaction and can be proved to be a measure for the project success.

Another approach that A suggests is innovation. A believes that process innovation defined by business and IT departments will result in a more agile and flexible organization. If the
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Team follows all SOA principles then agility is ensured. On the other hand, C believes that in amongst BPM and SOA, SOA provides the enterprise with agility and flexibility. More specifically C states, “SOA is the dominant architectural style for agile business applications, and is used when enterprises anticipate application sharing and frequent system changes”. So BPM designs the business processes which are exposed in SOA and finally SOA through the reusable “autonomous business units that are produced” can make an enterprise agile and flexible.

In addition to C, D believes that BPM “leverages and extends SOA’s power by adding a flexible, agile runtime layer to the services exposed by SOA”

4.1.9 Question 9
The misunderstanding of the business rules by IT people and the weakness of understanding of the technical terminology by business analysts lead to the gap between business and IT people, also known as “Business-IT gap”. Have you ever faced this gap and how have you reacted?

All interviewees agree with the statement above and have faced this gap in their professional lives. A states that the gap is a big problem in contemporary projects and especially in telecom areas. Moreover, the gap seems to grow due to the rapid technology development and due to the age gap. By age gap A means that IT people seem to be younger in age that business people and these increases more the gap. A proposes solutions for bridging this gap by “by educating both business and IT persons, providing them with everything needed in order for each party to understand the need and the way the other party works”. Also meetings in an early phase of the project in order to identify this gap are always helpful.

B believes that the “Business-IT” gap is a common problem in projects. B suggests two ways that can be applied in long term and avoid this gap. The first is to prepare consultants with technical background together with business knowledge. Those consultants could have a position of a solution architect and communicate with both IT and business. Finally in the design phase both business and IT people should get involved. Important is from the client side to try to identify people that have not only business background but IT as well. Those people can be used as “mediators” for the client teams.

C seems to agree with B by stating, “this is a common issue faced across all organizations and business domains”. When C faced this problem then the reaction was a creation of a
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The last interviewee considers that business people cause the gap. E believes that many technical people have correct understanding of business. In addition to IT people, business people have not enough knowledge of basic IT. E admits that came up with many cases where “IT people do the job of business analysts at the same time as no other people can do it”. It is obvious for E that the problem is caused by business people and not by IT people. This has a logical explanation. Interviewee E is a senior programmer, so is more IT oriented and the opinion is one-sided.

4.1.10 Question 10
Some researchers believe that BPM does not help in aligning Business and IT people due to the lack of high automation. Do you agree with this statement or not?

Almost all agree with this statement. More specifically A disagrees with that statement. A insists that when BPM is used properly, it can provide a series of tools which can help both business and IT people in working efficiently. On the other hand C states that BPM does not always produce “fully automated processes, aka Business Process Automation (BPA)”. In addition to this C insists that the target of BPM is the “standardization and normalization of processes in order to become effective”. As a result automation is not a target of BPM but just a part of it. D seems to agree with C by stating that the statement is partially true, without giving more details.
4.1.11 Question 11
Do you have something else to add about this subject?

This question is a general question in order to cover interviewees that might have extra information to add. None of the interviewees gave an answer. They all felt that the previous questions had covered them.
CHAPTER V: DISCUSSION

5 Introduction

Already the findings of the primary and secondary data have been presented. This chapter will present the conclusions of the study’s results regarding the examinable topic, the purpose of the research and the research questions.

As already mentioned in the first chapter the objectives of the research study are to identify and explore the concepts of BPM and SOA and to explore the combination of the two approaches. Also analyze the problems, risks and benefits of the two approaches and finally identify and propose solutions for the major problem known as “IT-business” chasma. This chapter will present a series of conclusions that will fulfill the objectives of the research study.

5.1 Discussion of the findings

Due to the need of remaining competitive and alive towards a competitive environment companies seem to have turned their interest to Business Process Management solution. After the detailed research on the subject one could define BPM as a framework or a collection of tools and techniques that help the design, management, optimization and monitor of the business processes. In all organizations, as they expand, business processes are increasing. As a result it seems critical for an enterprise to be able to manage the business processes and improve them in order to be flexible and agile towards the increasingly competitive environment. Moreover the expansion and growing of Information Technology makes the solution of BPM to seem more than required.

It is obvious that BPM is about processes and more specifically business processes. The reason for that is simple: models and by extension processes can make people understand the problem or identify problems, increase knowledge of the organizations processes, understand the areas of potential improvement and define the roles and responsibilities inside the organization. BPM seems to fulfill all the above expectations.
On the other hand in an enterprise with lots of business processes and IT systems it has been conceivable a big problem that afflicts all executives and stakeholders in general. The problem is the gap between business and IT. BPM with the help of SOA seems to be the solution in reducing this gap and building a bridge between business and IT for better collaboration and more efficiency for the enterprise.

Before analyzing this gap, it is valuable to define SOA. Through the research study SOA can be defined as architecture “invented” by IT experts in order to create reusable business services. SOA cannot be seen as a software product. It can be realised as a concept that helps in bridging the gap between business and IT.

The critical question is how BPM and SOA are interlinked. The answer is that BPM focuses in the modeling, simulation and redesign of the organization processes and SOA in the orchestration of the business processes. In this way the two approaches are linked.

To put it more simply a good design of business processes is not always enough. SOA solution provides an architecture that can implement a flexible IT solution that enables business processes to be orchestrated and be reusable. Business processes have previously designed and delivered through BPM framework. This combination helps enterprises to deliver flexible and more effectively services to their customers. Also the benefits are not only for the “end users” (customers) but also for the employees inside the enterprise.

Up to this point definitions about BPM and SOA had been concluded and a general approach to the gap problem has been made. But how really BPM is related with SOA and how the gap between business and IT is filled? As an interviewee has mentioned “SOA provides the foundation in which BPM lies”. SOA concept is to provide the appropriate business services in order to support business processes that are extracted from BPM solution.

A simple description of a BPM / SOA oriented project could be the following. First business processes of an organization are designed or redesigned, are tested and monitored by business people. In general business processes are defined through the BPM’s lifecycle. In chapter 2 BPM’s lifecycle is presented. After the creation of the process orchestration it is time for SOA to create business services. In the market of software systems there are lots of suites implementing SOA, such as the Oracle SOA Suite. One of the components of SOA and the most important is the Enterprise Service Bus (ESB), which enables a series of solely
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systems to interact by using functions that create business services.

In general a lifecycle of a BPM and SOA project looks simple. It could consist of the following phases: The modeling phase, the implementation phase, the execution and the analysis phase. In the first phase the business processes are analyzed and modeled via a modeling analytical tool called Business Process Modeling Notation (BPMN). In the second phase the created processes of the previous phase are transformed into process models. At this point the role of SOA begins. Business Process Execution Language is used in order to translate the business processes into services. Moreover in the execution phase the processes are executed and finally in the analysis phase monitoring of the business processes takes place.

It is worth to mention that although SOA seems to be the base for BPM, the opposite is not valid. SOA except from supporting business processes it can be also used solely. The most common use is the system integration. On the other hand, through the primary and secondary data BPM seems to be used also solely.

Although both concepts can stand independently, they can work together in order to help enterprises survive in the competitive environment. The combination of SOA and BPM is more powerful than either is alone. To analyze this more, BPM without SOA is useful for building applications, but difficult to extend to the enterprise and SOA without BPM is useful for creating reusable and consistent services, but lacks the ability to turn those services into an agile, competitive enterprise. More specifically, SOA provides the ideal level of abstraction for defining business processes from the BPM system. In order to keep an alignment between SOA and BPM these are the key areas that the experts should focus. These areas are the organization and governance area, the methodology and architecture, technology and tools.

Furthermore, the problem of business-IT gap seems to be one of the common issues faced across most enterprises. The reason for this gap is indicated between the translation of the high-level business processes, which are designed by business analysts and the workflow models which IT representatives execute. Business-IT gap is caused by the misunderstanding of the business rules by IT people and by the weakness of understanding of the technical terminology by business analysts. This gap exists because business people do not have the appropriate knowledge of the technology and IT people are not familiar with the business
functions. Even if business people are trained in a way so as to understand IT approaches, the technology is growing rapidly and changes so business people cannot follow this development. The combination of BPM and SOA seem to bridge this gap. As mentioned in the literature review BPM “organizes people for greater agility” while SOA “organizes technology for greater agility”. (Ko, Lee, & Lee, 2009). Enterprises should approach the solution of BPM and SOA as a set of business-aligned IT services.

On the other hand there are other researchers that support the opinion that although BPM and SOA can align business and IT this cannot be taken for a granted. Through the literature review and the interviews it is obvious that some people believe that the high automation of BPM can bring the opposite results and increase this gap.

Although SOA and BPM promise to create a flexible and agile enterprise without problems, there is always the opposite side of the coin. Due to the high automation and routinization the BPM and SOA require, the creativity and human’s free mind could be destroyed. As seen in literature review, some researchers support this opinion. On the other hand there are always opposite opinions that believe that processes create organization and discipline and people are more challenged to work with creativity, rather than having to face a disorganized situation. The interviewees were asked to define the problem that may occur by BPM automation as well. However one interviewee managed to approach it by stating that the primary target is the standardization and normalization of processes. Automation is a part of BPM and not the target. As a result automation cannot be seen as a risk when implementing BPM. In general if experts do not give special attention in the governance and the architecture of the enterprise’s systems then it could be admitted that high automation could be an extra risk.

Although BPM and SOA are gaining much of the market part the implementation of this solution is not always easy. The transformation of the business processes into IT business services is difficult. Lots of the users may not have the complete knowledge of how the processes really work and as a result not be able to design or redesign the business process. Together with the danger of increasing the gap, the difficulty of process transformation seems to be the most important problems in BPM and SOA oriented projects.
However, BPM with the help of SOA definitely can make an enterprise more agile and flexible. In order to have this successful results leadership and governance should be priority. More specifically, a complete and detailed “AS-IS” process analysis should be made in the initial stages. This would help in order to design more effectively the “TO-BE” processes. Furthermore, innovation in process design, only value could add to the enterprise.

Moreover, performance metrics should be used in order to ensure that the company’s strategy is followed and the previous problems are solved. Finally, due to the fact that SOA and BPM may be new knowledge to IT and business users, training is appropriate. Regarding the team that will run a BPM and SOA oriented project, a mixed team of functional and technical profiles is required. The backgrounds should be different in order to have a better alignment amongst business and IT people.

Of course there is always the different side of the coin. Some surveys had shown that enterprises that invest money on BPM, are not having always the desired results. Enterprises should be really careful when deciding to implement a BPM - SOA solution. The strategy and the distinctiveness of every enterprise should carefully be fitted into BPM and SOA solution. Also the possibility for an organization not to need or to not have the required characteristics in order to be supported by BPM and SOA exists. An organization should always study its prospects and characteristics and then decide if a BPM and SOA application is appropriate for the enterprise or not.

Finally it could be summarized that BPM with the help of SOA can be effective. It is not just a trend of the current organization environment. It really can create an agile and flexible business environment ideal for the current competitive world. Also it can align business and IT “world”. On the other if this approach will not be used effectively then the gap can be increased and the enterprise can end up in investing money unduly.

If an enterprise wants to remain competitive then the 3 main dimensions in business world should be fulfilled: time, cost, quality. BPM and SOA seem to fulfill these expectations. Moreover, BPM and SOA provide the company with clear processes, visibility and control over the enterprise. The phrase of a researcher will be used in order to conclude this research study. “The future belongs to the process enterprises” (Hammer, 2001). By this phrase there are obvious the reasons that enterprises have turned to BPM solutions.
CHAPTER VI: CONCLUSION

6 Introduction

This is the final chapter of the research study. A summary of the study is presented. Finally recommendation for future research is provided.

6.1 Research summary

The research study’s objective was to prove how Business Process Management with the help of Service Oriented Architecture could align business and IT and create an agile and flexible enterprise. The research study focused on a couple of objectives, each one of which has been tackled either in the literature review or in the research part. Briefly, the objectives were the following:

- Identify and explore the concepts and principles of BPM
- Identify and explore the concepts and principles of SOA
- Analyze how BPM and SOA cooperate
- Analyze the benefits BPM and SOA application
- Identify the problems that may occur during SOA and BPM application
- Identify and analyze the problem of “IT-business chasma”

During the research study there was an effort to fulfil all the defined objectives and aims of the topic in the most detailed way. More specifically, in the first chapter there was an introductory section. In this section the aims and the objectives of the research study were presented. Also the literature resources were explained. Finally the limitations and ethical issues were provided.

The second chapter was a reference on the literature review. At first an analysis of the importance of business processes has been made. Following that, an extended study has been made in order to analyze the concepts of BPM and SOA. BPMN, BPEL, workflows and
lifecycles were some of the issues that were analyzed. The use of figures aimed to give the reader a more detailed feeling of the topics. Also there was made an extended reference on the difficulties and risks of applying BPM and SOA. Moreover, a focus on the combination of these two approaches was presented. Finally, problems like the business-IT chasma were examined.

In the third chapter the methodology of the dissertation was clearly analyzed. At first there was a focus on the research topic and the problem. Secondly a comparison has been made amongst qualitative and quantitative method. Following that the used methodology was mentioned and the reasons for choosing the solution of interviews were explained. Moreover, the sample and limitations was discussed. Finally the third chapter concludes with the presentation of the research analysis approach.

In the fourth chapter the findings of the interviews were presented. For every question the answers were presented and a first comparison between the answers was made. The answers were analysed separately for every interviewee in order to give a more understandable form, while arguments were done when it was applicable.

In the fifth chapter a discussion took place. The conclusions were presented thoroughly and answers to the initial questions of the research study were given. BPM was realized as the approach that can help contemporary enterprises to survive in a high competitive environment. More specifically there was proven through primary and secondary data that BPM with the help of SOA could help organizations reach great levels of agility and flexibility. Finally the gap between business and IT was realized and analyzed. The problem is caused due to the misalignment of business and IT, and BPM and SOA through tools and methods bridge this gap.
6.2 Further research

Three recommendations for future study can be considered. A study could be made on situations where Business Process Management is not able to bridge the gap between business and IT. This could help readers to understand where Business Process Management does not really help.

Another recommendation for future research is a study to be made on the technical aspects of BPM and SOA. It would be worth to analyze concepts such as BPEL, BPMN and ESB. Finally due to the fact that BPM and SOA oriented projects are increasing as a result the market share is growing rapidly it would be beneficial to make a research based on statistical results and economical data in order to figure out the real efficiency of BPM and SOA. Most times economical data help in understanding whether an approach is really valuable or just a trend.

It is needless to say that there are many other topics on BPM and SOA that could be investigated. The three recommendations above are considered to be the most related to the current research study.
References


Rosa, E. (2010). *BPM and SOA: Taking Care of the Perfect Match to Work in Real Life*.


APPENDIX
Interview Questions

Thanks for taking this interview. Here are the 12 questions. If you're unsure about any of these questions please let me know. You can skip any of these questions if you want to.

1. What is your experience on BPM/SOA oriented projects? (Years/level/Section of experience)

2. Could you briefly explain a BPM/SOA oriented project you have been involved?

3. Through your experience, what is your personal definition of the two approaches? (BPM/SOA)

4. How BPM and SOA are related to each other? Is there success for one without the other?

5. What are the main problems you face in implementing BPM and SOA?

6. What do you think are the required characteristics of a team for a successful BPM-SOA project?

7. What are the risks/difficulties for a professional towards a BPM-SOA oriented project?

8. What's the best approach in the alignment of SOA and BPM for an agile and flexible enterprise?

9. The misunderstanding of the business rules by IT people and the weakness of understanding of the technical terminology by business analysts lead to the gap between business and IT people, also known as “Business-IT gap”. Have you ever faced this gap and how have you reacted?

10. Some researchers believe that BPM does not help in aligning Business and IT people due to the lack of high automation. Do you agree with this statement or not?
11. Do you have something else to add about this subject?

Thank you!