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**The Role of Information Systems in Business
Process Redesign**

A case of Turkish Electricity Market

Ceren Çakmak

Dissertation presented as partial requirement for obtaining
the Master's degree in Statistics and Information
Management

NOVA Information Management School
Instituto Superior de Estatística e Gestão de Informação

Universidade Nova de Lisboa

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**THE ROLE OF INFORMATION SYSTEMS IN BUSINESS PROCESS
REDESIGN: A CASE OF TURKISH ELECTRICITY MARKET**

by

Ceren Çakmak

Dissertation presented as partial requirement for obtaining the Master's degree in Information Management, with a specialization in Information Systems and Technologies Management

Advisor: Prof. Jurij Jaklič

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to Tangun,
for the strength that I have been given

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ABSTRACT

This study is specifically concerned with the effect of the Enterprise Resource Planning (ERP) on the Business Process Redesign (BPR). Researcher's experience and the investigation on previous researches imply that BPR and ERP are deeply related to each other and a study to found the mentioned relation further is necessary. In order to elaborate the hypothesis, a case study, in particular Turkish electricity distribution market and the phase of privatization are investigated. Eight companies that have taken part in privatization process and executed BPR serve as cases in this study. During the research, the cases are evaluated through critical success factors on both BPR and ERP. It was seen that combining the ERP Solution features with business processes lead the companies to be successful in ERP and BPR implementation. When the companies' success and efficiency were compared before and after the ERP implementation, a considerable change was observed in organizational structure. It was spotted that the team composition is important in the success of ERP projects. Additionally, when the ERP is in driver or enabler role, the companies can be considered successful. On the contrary, when the ERP has a neutral role of business processes, the project fails. In conclusion, it can be said that the companies, which have implemented the ERP successfully, have accomplished the goals of the BPR.

KEYWORDS

BPR, ERP, Utilities Industry, Information Systems, Industrial Solutions, Electricity Distribution Market, ERP and BPR Relation, Turkish Electricity Market, Privatization, Critical Success Factors in BPR, Critical Success Factors in ERP Systems

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LIST OF ABBREVIATIONS AND ACRONYMS

AMRS	Automatic Meter Reading Systems: the technology of automatically collecting consumption, diagnostic, and status data from water meter or energy metering devices (such as gas, electric) and transferring that data to a central database for billing, troubleshooting, and analysing
BPR	Business Process Redesigning: a business management strategy, originally pioneered in the early 1990s, focusing on the analysis and design of workflows and business processes within an organization
EMRA	Energy Market Regulation Authority: independent regulatory authority of Energy Market in Turkey
ERP	Enterprise Resource Planning: a category of business-management software—typically a suite of integrated applications—that an organization can use to collect, store, manage and interpret data from many business activities
GIS	Geographical Integration Services: a system designed to capture, store, manipulate, analyze, manage, and present all types of spatial or geographical data.
HR	Human Resources: the set of individuals who make up the workforce of an organization, business sector, or economy
IS	Information Systems: any organized system for the collection, organization, storage and communication of information
IT	Information Technology: the application of computers and telecommunications equipment to store, retrieve, transmit and manipulate data.
SCADA	Supervisory Control and Data Acquisition: a system for remote monitoring and control that operates with coded signals over communication channels (using typically one communication channel per remote station)
TOR Agreement	Transfer of Operating Rights Agreement: authorizing the investor of the right to operate the distribution assets

1 INTRODUCTION

Business circumstances and globalization in competitive marketplaces since the early 1990's have placed new challenges to organizations to survive. (Broadbent, Weill, & Clair, 1999). The companies aim more lean and efficient service provision in their organizations. The organizations are drastically changing the way they do business in response to the market pressure. While unprecedented changes due to globalization, political realignment, and the rapid advance of information technology challenge the organizations, Business Process Redesign (BPR) caught the imagination of corporate leaders quickly. (Kettinger, Teng, & Subashish, Business Process Change: A study of Methodologies, Techniques and Tools, 1997). Information Technology (IT) and Information Systems (IS) play a significant role in this transformation process by empowering the innovative redesign of core business process. (Brancheau & Wetherbe, 1996) One of the most important information systems is Enterprise Resource Planning (ERP) systems. They become imperative for companies in order to cope with the competitive business environment. (Štemberger & Kovačič, 2010). However, most of the organizations underestimate the complexity of ERP implementation projects. Štemberger and his colleague stated that the rate of unsuccessful ERP projects is very high. They argue that one of the reasons is incompatibility of business process in the organization and ERP implemented. Therefore, the BPR has an important role on successful ERP implementation. The aim of this thesis is to explore the interdependence between BPR and ERP by assistance of an empirical investigation in utilities sector in Turkey.

1.1 BACKGROUND PROBLEM

As an important part in today's business world, utilities sector is facing some challenges that are driving the need for adoption of digital technology. The Global Power and Utilities leader Van Gils from Ernst& Young, states that the energy industry is adopting intelligent new technology to meet challenges including increasing demand of power and an urgent need to build or improve infrastructure. (Utilities Unbundled, 2014) These challenges are mostly the issue of privatization of utility companies that belong to government formerly. Therefore, companies will have to plan competing in the new smart world. Van Gils says that upgrading the technology will just be the beginning of the story. Better use of IT and active involvement from customers will surely have a deep impact on businesses.

The Turkish electricity market is currently in transition into a fully deregulated market. The liberalisation process started in 2001. (Akgün & Gökmen, 2013) The government has endorsed the dual goals of privatizations and liberalisation. Electricity distribution companies were entitled to perform distribution, generation and retail sale activities under the same legal entity. So, with the on-going liberalization process, the electricity sector is becoming more competitive and vibrant. While the transition phase brings new business processes, it also forces the organizations to work in a more efficient way. In order to cope with the new regulations in electricity market and increasing data load, the distribution companies restructured their IT and IS structures. One of the most significant reformation of the companies was adopting new ERP systems. The implementations of new ERP are big projects in terms of time, resource and cost. According to an independent comparison of three leading ERP; which are Microsoft Dynamics, SAP and Oracle, the average implementation time is 8.5 months, 16 months and 17.5 months relatively. Besides, it is stated that those implementation phases are actually much longer than the expected. So, the actual findings

show that the phase delays up to 12.5, 18.5 and 22.5 months. (Panorama Consulting Solutions, 2014) Therefore, success of such projects is very crucial for the companies. Not only the time and money consumed but also the level of efficiency of performing business processes after the ERP implementation is important for organizations. Wieder and his colleagues argue that the ERP affects organisations to rethink their logic and force employees to think in terms of integrated processes and to change the way they do accounting, production planning etc. (Wieder B., Booth, Matolcsy, & Ossimitz, 2006). However, measuring the level of contribution of ERP Systems on the business processes is complex because there are many internal and external antecedent factors for the organizations such as structure, legal requirements, data load and IT infrastructure.

1.2 PROBLEM DISCUSSION

The relationship between business processes and IT is becoming increasingly complex. (Eardley, Shah, & Rdman, A Model for Improving the role of IT in BPR, 2008). Hence, academic and industry interest on studying the alignment between those areas is growing. During the elaboration process, it has not been possible to rely totally on the referred articles due to several reasons; the main factor was that the referred articles contain information about smaller ranged industries. The other reasons were that the business and market rules are well defined and relatively stable on the other researches. Consequently referring to mentioned articles also required a process of comparison and interpretation.

The business processes in electricity industry are complex, the size of the organizations is big, the daily data load of transactions is quite high and the market rules are volatile. Hence, the scope of ERPS projects implemented in electricity companies is wide. Although there are some studies which analyse the effects of ERP on business processes performance based on financial value, there is no general approach about how to measure the level of reformation on the companies' way of performing tasks regarding ERP influences. Wieder and his colleagues argue the results of such studies, which points only the financial effects of ERP. They state that the result of the studies point out the same direction but not entirely consistent. (Wieder B., Booth, Matolcsy, & Ossimitz, 2006) Those studies only focus on immediate or delayed increases in firm performance after ERP adoptions; however, the identified performance increases are evident only with a few key performance indicators (KPI). They fail to explain the increasing diversity and complexity of ERP. Although Wieder and his colleagues' argument is valid, there is not a comprehensive study on the ERP to see what the direct or indirect effects of them on business process designing really are. Therefore, besides the analysis of the 'results' of an ERP adoption, there is not a detailed study on the role of ERP on the organizations' "rethinking phase" on the process flows.

As argued earlier, ERP implementation projects are big projects in terms of content, therefore, time and cost, and there are just a few studies about the role of the ERP on the business processes. Due to the enormity of the overall process, in order to have a detailed knowledge regarding to that, studying on the effects of ERP on organizations' BPR is significant. Actually, Štemberger and her colleague argue mainly the role of Business Process Modelling on ERP implementation. They evaluate the challenges, advantages and disadvantages of ERP implementation. Their study has a part, which points out the interrelation of business processes and ERP. However, the main purpose of their study is to suggest a framework for a successful implementation. They argue that there are three types of ERP implementation strategies; to adapt the ERP to organisations' business processes (1), to adapt their business processes to the ERP implemented (2) and to combine the acquired (ERP), integrated

and engineered applications (3) (Štemberger & Kovačič, 2010). Other than this, they focus primarily on the challenges of ERP projects and they suggest an alternative (3) to cope with those challenges regarding to their case studies. Broadbent and Butler also argue the role of IT on BPR as an enabler or barrier in organizations' change management. (Broadbent, Weill, & Clair, 1999). They have also analysed the effect of ERP mainly from financial benefits, firms' performance and quality point of view. Besides all the companies' business processes are relatively stable while the transition to the new ERP. This means that the companies on those studies are generally private companies whose concern is to improve their information system structure. However, It is necessary to search how ERP systems influence the processes, reformation of companies in transition phase from public companies to private companies while being constantly affected by the electricity market rules.

Najjar and his colleagues examine the impact of IT in BPR and their interdependency from different dimensions such as market share, customer relationship management, IT impact and efficiency by collecting data from 150 small to medium sized companies. (Najjar, Huq, Aghazadeh, & Hafeznezhami, 2012) Considering the complexity of the ERP implementations and the size of the companies, a closer look into the cases is necessary. In this thesis, for big sized companies, in volatile market rules and complex business processes will be examined in order to see the effects of ERP systems on BPR.

1.3 PURPOSE AND RESEARCH QUESTION

The purpose of this thesis is to explicitly research and consider the role of information systems on organizations' business process redesigning. Electricity distribution companies in Turkey served as case studies and the findings shall be discussed in terms of what can be generalized to any company implementing an ERP. Electricity distribution companies were chosen as cases because the privatization of companies was finalized recently, market rules are being newly defined and therefore business process rules are being reformed. Thereby, the following research question will be addressed by observing Turkish Electricity Distribution Companies: How ERP Systems affect organizations' business processes along with ongoing construction phase of the industry rules and business procedures those are still at an early stage. When the business rules are not clear, can ERP Systems' business templates assist the organizations during designing the way they perform their tasks or ERP systems totally hinder the companies?

1.4 METHOD

The research question requires a general overview of ERP projects and companies' business processes in order to identify several influences on processes' redesigning. The links between BPR and information systems were examined through an exploratory case analysis of eight electricity distribution firms in Turkey. In order to answer the research question, an empirical analysis is required due to the fact that there are many factors such as industry, market condition and rules, organization size, and organization's strategy that impact business processes. Therefore, in this thesis both primary and secondary data were collected. One of the important elements of this study is the usage of several research methods. Besides scientific articles, semi-structured qualitative interviews, meeting minutes of projects, business blueprint documents of ERP projects and project management documents such as project calendars were critically evaluated. It should be stated that the researcher's consultancy background in ERP solutions was also benefited during the study. The results of the research from the interviews was examined in relation to the theory in order to be able to evaluate the important factors of ERP that may affect the companies' way of doing their business

and redesigning them. From beginning of June 2015 to the end of August in 2015, 12 weeks of fieldwork were conducted. In this period, interviews were conducted and companies' project documents were gathered. A more comprehensive explanation of the chosen methodology will be given in chapter 2.

2 THEORETICAL FRAMEWORK

This chapter presents a review of previous studies related to the research question.

2.1 THE BPR CONCEPT

2.1.1 The Background

Business Process Redesigning (BPR) was first introduced by Michael Hammer from Massachusetts Institute of Technology (MIT) in 1990 (Bhasin & Parrey, 2013). BPR became a popular “value creation technique” among many organizations who want to transform the way they work. Bhasin and Parrey (2013) state that BPR proved very effective in breaking the organizations’ present circumstances and guide the organizations to gain advantages in competitive business environment. Although BPR originates in US defence organization, it has been used in several other fields. It is a well-known tool for handling rapid changes on technology and business. BPR is considered as “the radical restructuring” of business processes. Organizations use BPR as a fundamental rethinking method and radical redesign of processes to achieve dramatic improvements in serious measures of performance

Dubey and Bansal (2013) define the distinctive characteristics of the BPR as “radical change, cross functionality, operating across organizational units, breaking outdated paradigms, and involves innovative application of technology”. According to Dubey and his colleague, The Total Quality Management (TQM) techniques, such as – quality management, six sigma, Kaizen, Total Productive Maintenance (TPM) and others focus on improving the existing processes which are outdated and outmoded. Hence, these tools do not add value to the processes. The only means to be able to go out of this limited frame is to adopt the radical approach of BPR. (Dubey & Bansal, 2013)

Mansar and Reijers describe a framework for BPR. They define it as a set of ideas that help in thinking about the business processes within the perspective of redesign. (Mansar & Reijers, 2007) In this framework they emphasize seven factors linked each other:

1. The internal or external customers of the business process
2. The products (or services) generated by the business process
3. The business process with two views:
 - a. The operation view: how is a business process implemented? (Number of the tasks in a job, relative size of tasks, nature of tasks, degree of customisation)
 - b. The behaviour view: when is a business process executed? (Sequencing of the tasks, task consolidation, scheduling of jobs, etc.).
4. The participants in the business process considering:
 - a. The organization structure (elements: roles, users, groups, departments, etc.)
 - b. The organization population (individuals: agents, which can have tasks assigned for execution and relationships between them).
5. The information which the business process uses or creates
6. The technology which the business process uses
7. The external environment other than the customers

In the Figure 2.1, the interaction of the items in BPR framework is given. The size of each component's box is different regarding its importance, which is based on Mansar and Reijer's research. "Customers" and "Products" concepts reflect the ideas "what is being created and for whom". Therefore, they are very important for business processes. Organization structure is given with dash dots because this component should be considered in redesign effort, as business solution should fit the organizational and business culture in an organization. "Information" component represents the area that large scale developments can be made by using BPR, "either using technology or not". Therefore, during the research, those elements were considered closely; since the electricity distribution companies in Turkey are used as cases, the components of the BPR in those companies were defined. This information was gathered during interviews in empirical research. "Changes in Organization" and "Concept of Process Redesigning" in interview questions (See Appendix 8.1) are prepared for analysing the external and internal environment for business processes. The details of the questionnaire are on Section 3.6.

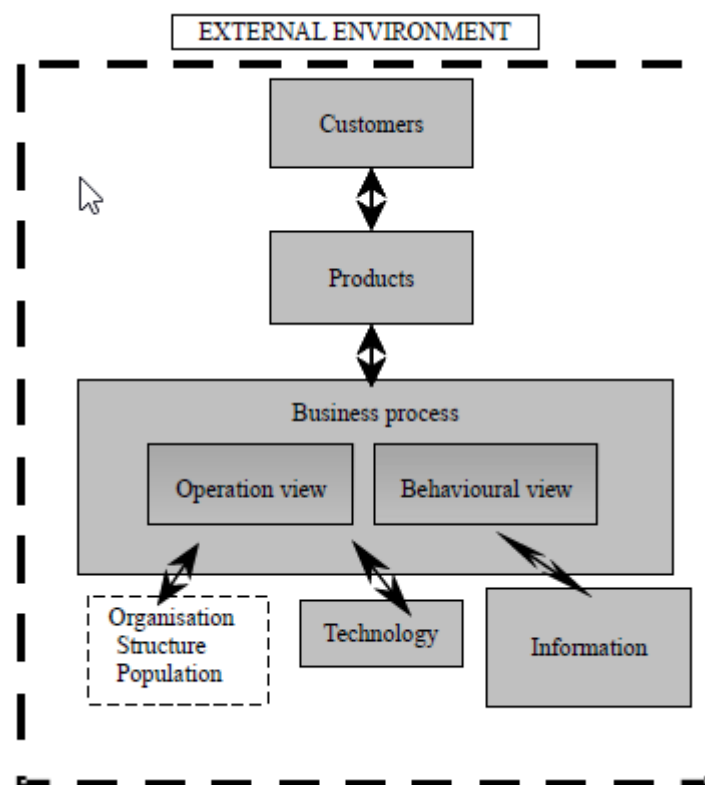


Figure 2.1 – Framework for BPR Implementation (Mansar & Reijers, 2007)

2.1.2 Main Characteristics of BPR Implementation

After defining BPR, it is also essential to identify what BPR means in practice. The route map about the step sequence, which is commonly used in a BPR is explained in Kovach and her colleagues' paper. (Kovach, Vins, & Stefanak, 2010) They argue which stages are passed in a typical business process analysis and process designing period. (See Table 2.1) While understanding the electricity companies' BPR phases, the steps given by Kovach and her colleagues are taken as reference. Each company was questioned if they followed those steps or they had followed a different way.

Business Process Analysis	Business Process Redesign
Think >> How do we do our work now?	Rethink>> How should we do our work?
Define Goals and Objective	Examine task and workflow
Model Context of work	Identify inefficiencies
Identify business rules	Identify inefficiencies with repeatable processes
Describe tasks and workflow	Refine business processes and business rules
Identify common task sets	Remodel context of work
	Restructure tasks and workflow

Table 2.1 – Business Process Designing Steps

Broadbent and Butler (1995) identify the main motivations of companies to implement BPR. The companies on this research were questioned regarding to following statements:

- 1- Organisations realized that they need to maintain profitability and improve customer responsiveness in many current business operations if these concerns stemmed directly from:
 - Industry competition within domestic markets and from overseas
 - A worldwide economic downturn, which forced many firms to seek ways of achieving economies of scope and cost
- 2- The merger and acquisitions "binge" of the 1980s caused:
 - Heavy debt burdens caused by rapid expansion; and/or
 - Unsited or totally different organizational cultures, work practices and Information Systems
- 3- Rapid advancements had produced extensive diversity of new technologies, which were both flexible and affordable.
- 4- The pressing need for renewal or migration of legacy systems and applications:
 - Information systems developed and today's organisational requirements are growing rapidly. It is also increasingly recognised that systems maintenance is now a major cost component of any company investment in IT. It is therefore important for organisations to have efficient information systems in order to justify this investment.
 - The rapid growth of end-user computing has led to increases in user demands for enterprise-wide interoperability. This provides an added incentive for upgrade of the firm's IT infrastructure
- 5- Deregulation, re-regulation or privatisation as it affected government agencies.

Additionally, Broadbent and Butler (1995) define a framework, which provides a sound basis for implementation of BPR. (See Figure 2.2)

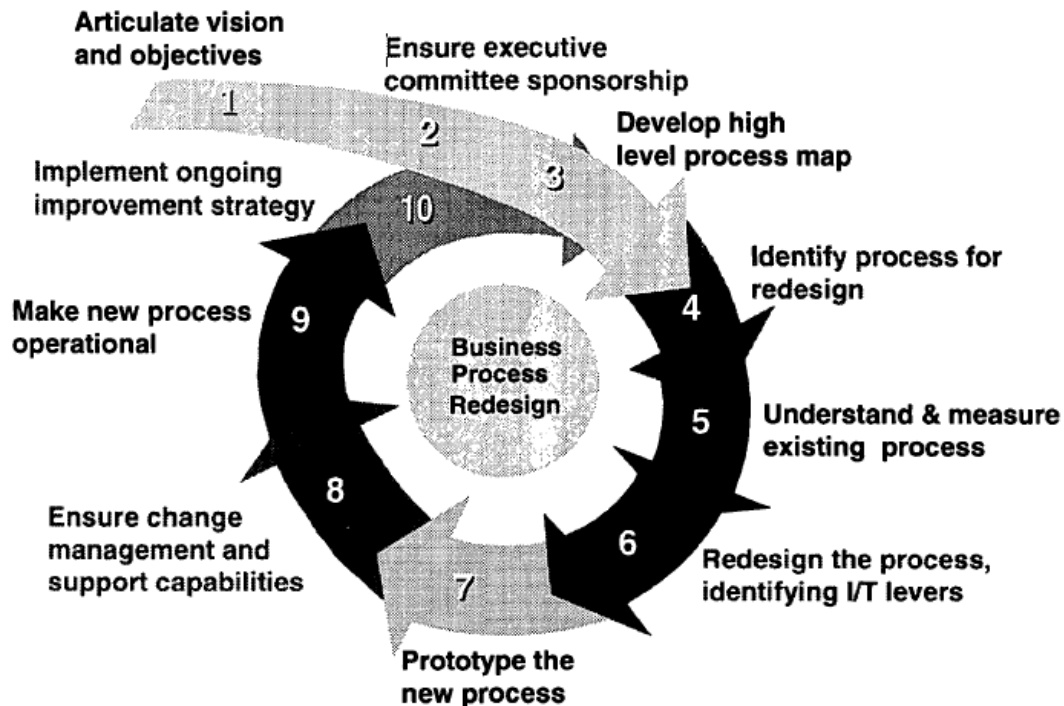


Figure 2.2 – 10 Steps Framework for BPR (Broadbent & Butler, 1995)

In the framework defined by Broadbent and Butler, the first step is for defining the scope of BPR in the organization. Due to the high risks of BPR, it is necessary to have full support and commitment of management. Therefore, the second step is to ensure the sponsorship of executive committee. Then, a high-level process map and defining critical processes are defined. In step 5, the existing business processes are analysed via process modelling tools. After the analysis of existing processes, developing new processes, new process approaches are developed including IT Solutions. The new developed processes are tested in order to see the effectiveness of the design. Later, the people in the organization should be trained for the new processes. Afterward, the new processes are implemented. As the final step, the changes should be monitored and measured for continuing improvements. Regarding this description, BPR stages of the undertaken cases are analysed in order to see the level of BPR implementation of organizations. It was important to analyse that in order to see if there is an organization, which did not implement those steps before implementing the new ERP system. While preparing the questionnaires, these stages were taken into consideration. Additionally, the research materials (such as project calendars, project status documents) were collected to be able to see those stages defined above.

2.1.3 Critical Success Factors in BPR Implementation

A successful BPR implementation is hard to comprehend in general and as a consequence, there are many examples of unsuccessful BPR experiences. (Dubey & Bansal, 2013) A successful BPR implementation requires understanding and setting out of critical success factors: “Collaborative working environment”, “top management support and commitment”, “IT infrastructure”, “training”, “less bureaucratic structure”, “culture”, “adequate financial resources” are some of the critical success factors defined in the literature. Jamali and his colleagues define critical success factors as in Table 2.2 (Jamali, Abbaszadeh, Ebrahimi, & Maleki, 2011)

No	Factor	Definition
1	Collaborative working environment	The collaborative climate decreases resistance to change and simplifies the BPR implementation. The Previous researches indicate that in order to be successful, the BPR should focus on realizing the empowerment of people and the appropriate enabling technology to be applied.
2	Top management commitment and Support	The degree of top management support in BPR implementations is very critical. Top management should have adequate knowledge about the BPR implementation and take important decisions during BPR implementation process. In addition, top management should encourage the employees and have a friendly interaction with the BPR team.
3	IT infrastructure	To achieve the expected results in a BPR implementation, appropriate IT infrastructure is needed. In most projects, the starting point of the BPR is the IT department. IT is a natural partner of BPR and plays a critical and central role in BPR projects
4	Training	Training plays a crucial role in the BPR implementation. Since the BPR changes the organizational processes, employees should have adequate skills to do the new tasks. Through a proper training program, employees will have an in-depth comprehension of their new tasks
5	Less bureaucratic structure	A flexible organizational structure enables BPR to encourage creativity and innovativeness within the organization. Therefore, having a less bureaucratic and more participative structure is essential for a successful BPR implementation.
6	Culture	Culture has been recognized as another critical success factor for the BPR implementation in literature. Coordination, employees' involvement and friendly interactions are the standard feature of an innovative organizational culture. Effective utilization of employees' ideas enables organizations to achieve their expected results

7	Adequate financial resources	Implementing the BPR without the adequate financial resources is not possible. Budget allocation for the BPR is a long-term investment for achieving favourable results. A BPR implementation is a costly process; so, the organization should have adequate financial resources for implementing the changes and facing with unpredictable situations
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Table 2.2 – Critical Success Factors in BPR Implementation

Jamali and his colleagues have observed that four of the factors mentioned above, “top management commitment”, “IT infrastructure”, “training” and “adequate financial resources” undertake the driver role, while the other factors are dependent. Therefore, these four critical success factors play a main role in a BPR implementation. The finding of the mentioned research paper was used as a guide while analysing the cases, which could implement the BPR in their organizations.

2.1.4 Success of a BPR Implementation

According to Guimaraes and Chair (1998) the success of a BPR implementation is defined in two different ways:

The BPR Goals and Objectives Accomplished: The primary objective of the BPR is to make business organizations more competitive by improving the quality. The change process should emphasize the value-added element for every single activity. It should focus on the results and the objectives ensuring the quality. It should be planned for the end-to-end solution and challenge the old ways. Using the right technology, it should propose new ways, empowering people, building consensus on making changes and setting aggressive goals for the new process. The organization should rapidly determine who does what and give workers new tools to enhance efficiency. The process improvements should be based on the capabilities of the information technology. It is a new way to think about information technology, in terms of how it supports new or redesigned business processes, rather than business functions or other organizational entities.

Organization Performance: Though many researchers have tend to use one item to measure company performance, such as company profitability (return on total assets), the company performance can be measured in variable ways. These ways can be quantitative or qualitative; the accomplishment of goals, the growth of the company and the effectiveness across organizational units can be mentioned as one of the BPR performance indicators.

Guimaraes and Chair (1998) state that, given the wide diversity of possible benefits from company innovativeness and the need for content validity, studies which assessing the impact of innovation on company performance should use multidimensional scales.

The interview questions, specifically in the sections “Changes in Organization” and “Changes in Business”, were prepared regarding the criteria given above.

2.2 DEFINITION OF ERP

2.2.1 History of ERP

Information system is one of the essential elements in business today since it provides tools for operational excellence on products, services and survival in global economy. Since this thesis aims to define the role ERP on BPR, it is beneficial to explain the common features of ERP and its part in an organization.

In the competitive business environment, companies and organizations use ERP more and more broadly. ERP market grew 3,8% from \$24.4B in 2012 to \$25.4B in 2013. (Columbus, 2014) Every day, ERP brings innovations in terms of technology and business solutions.

ERP is a software solution that allows an organization to integrate all the main business processes altogether in order to improve efficiency and maintain a competitive position (Addo-Tenkorang & Helo, 2011). ERP is an industry-driven model and system and is universally recognised by business and industries as a practical solution to accomplish an integrated information system. It controls business processes and data within a single system.

ERP originates from accounting and inventory systems in 1960s. Since expenses became the key competitive push in 1960, “MRP I” for manufacturing and production planning systems arose in 1970s. (Mikkola, 2013) In 1980’s MRP II was developed with new functionalities for sales planning, capacity management and scheduling. After 1990, ERP concept arose with a wider scope including back office processes of enterprises such as human resources, finance operations (Seo, 2013). (See Figure 2.3)

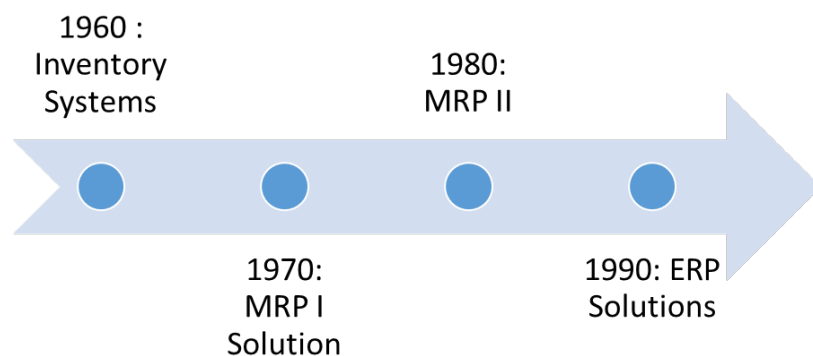


Figure 2.3 – The History of ERP (Mikkola, 2013)

Recently, ERP has incorporated with other business areas such as Supply Chain Management and Customer Relationship Management. In Figure 2.4, some ERP areas of today are given. Regarding industries, new ERP solutions have also arose. Some ERP solutions specific for energy and utilities industry or banking industry can be given as examples.

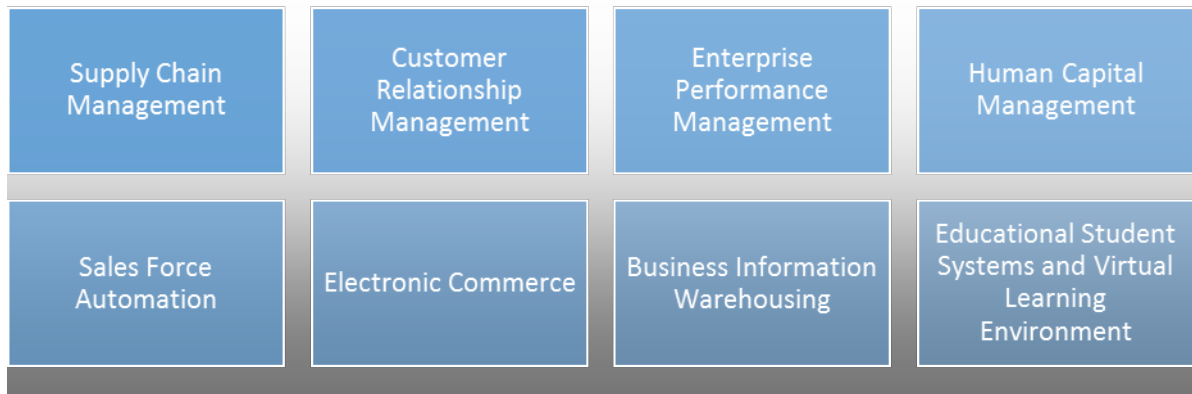


Figure 2.4 – ERP Extention (Seo, 2013)

2.2.2 Main Characteristics of ERP Systems

As a commercial product, ERP software is offered by a range of vendors that specialise in this sector of software marketing. (Klaus, Rosemann, & Gable, 2000) The main ERP vendors in the market are SAP, Oracle, Sage, Infor and Microsoft (Columbus, 2014). ERP is a standard software but is highly configurable and therefore is adjustable according to the needs of users within a wide range of industries. Once an enterprise start to deploy an ERP system, the software is tailored regarding the requirements of the enterprise. It is called "customizing" (Klaus, Rosemann, & Gable, 2000). Klaus and his colleagues state that step-by-step guidelines, further implementation tools, tools for Project managements are some of the necessary support items for an ERP implementation Project. (Klaus, Rosemann, & Gable, 2000) The rich configuration potential of ERP offers companies a pre-configured options for business processes and transactions. Current ERP Solutions can integrate with different software and hardware platforms. An ERP support business in a single system but for different regions of a company.

Klaus and his colleagues also defends that ERP Software should be differentiated from other software like database management software or operating systems because it is an application software which is integrated across the functions. (Klaus, Rosemann, & Gable, 2000) The main feature of ERP is the "business solutions" that supports business processes and administration in an enterprise such as procurement, material management, logistics, maintenace, customer relations, financial accounting and reporting. Within an organization, ERP standardizes business processes and data with "best practices", which are primarily based on benchmarked clients who have already implemented ERP Systems. In addition to those functionalities, ERP has many extentions specific to the industries as indicated above: such as public sector, utilities, healthcare and education. In this thesis, the analyzed business processes are observed in energy industry, correspondingly the ERP solution is utilities specific. This will be explained in details in chapter 4. During the theoretical preparing process of this research, each cases' ERP systems were intended to be analyzed in terms of such features. The modules used in ERP system, the duration and scope of ERP projects, the number of customization and development in the systems, usage of "best practices" were taken into consideration.

2.2.3 Critical Success Factors of an ERP Implementation

Before starting the empirical research, success factors in an ERP implementation projects were researched due to the fact that implementing ERP systems successfully is challenging, costly and complex and often shows high failure rates or even abandonment due to lack of several factors. (Rabaai, 2009) Al-Fawaz and his colleagues define several success factors in an ERP system implementation regarding previous researches about success factors on ERP projects. (Al-Fawaz, Al-Salti, & Eldabi, 2008) Additionally, Mikkola gives some success factors for ERP implementation projects. Some of them are given as the following sub-sections.

Top Management Commitment and Support: Top management commitment and support leads to organizational commitment across an organization. While understanding and revising existing business processes, there might be a top level administration planning board behind the implementation effort that is engaged with business integration, comprehends ERP, agrees with the costs completely, calls for return on investment and advocates the project. (Mikkola, 2013)

Re-engineering business process: While implementing ERP systems in organizations, the organization can choose one the three options: “Adoption of ERP system”, “Adoption of Business Processes” or “Combining business solutions”. Re-engineering business processes in order to fit them to ERP functions creates deep changes in organizational structure. On the other hand, when an organization prefers to maintain its existing processes using an ERP system, the ERP functions can be customized. (Mikkola, 2013) Though, the organization should be careful while choosing one of those options in an ERP implementation project.

Effective Project Management: Effective project management is critical for a successful ERP implementation. (Al-Fawaz, Al-Salti, & Eldabi, 2008) Deficiency of correct understanding of the project needs and the inability to provide leadership and guidance to the project are the main factors when ERP implementation fails. Thus, an effective project management should define clear project objectives, develop a work and resource plan and carefully track the project’s progress.

ERP Team Composition: In an ERP implementation project, the composition team members plays a crucial role because ERP integrates diverse business functions across an organization into one single system, necessitating a complex and integrated software package. (Seo, 2013) For a successful ERP implementation project, the members should be selected regarding to the balance between them, to the business experience in the organization and external experts in different field of ERP. Therefore, while preparing the cases, people from different ERP and business areas were considered

Consultant Selection and Relationship: ERP consultants play an important role in ERP implementation. Consultants are essential knowledge resources for ERP’s hardware, software, and staff. (Mikkola, 2013) They also may have responsibility for project management and audit the project. These people can make crucial decisions. On the other hand, in order to be successful system maintenance after post-implementation,

knowledge transfer from consultants is crucial for the organization. Therefore, for a successful ERP implementation, consultant selection is very important.

Training: End user training has been recognized as a critical factor for ERP implementation. (Al-Fawaz, Al-Salti, & Eldabi, 2008) Due to the complexity of the integrated ERP system, end user training is significant for an intense understanding of how the system works and how to use it. Thus, appropriate end user education and training maximize ERP benefits and increase user satisfaction.

2.2.4 Success of an ERP Implementation

While the critical success factors can lead to success of ERP implementation, they do not guarantee it. Al-Mashari, Al-Mudimigh, and Zairi (2003) state that the delivery of the critical success factors is one major condition to lead benefits from ERP implementation and they suggest that IT projects can be considered successful as according to the following terms:

- 1- Correspondence success, which occurs when there is a match between IT systems and the specific planned objectives.
- 2- Process success, which occurs when IT project is completed within time and budget.
- 3- Interaction success, which occurs when users attitudes towards IT are positive.
- 4- Expectation success, which occurs when IT systems match users expectations.

2.3 OVERVIEW OF BPR AND ERP RELATION

BPR is a difficult, complex and often non-linear activity, which challenges the organization's way of doing work. In order to achieve "what is desired", the organizations should support BPR with an appropriately flexible IT infrastructure to allow the changes to take place. (Eardley, Shah, & Rdman, 2008) Therefore, the role of IT is very important for the success of organizations' BPR strategy.

Organizations' ability to adjust themselves to competitive market rules is an important aspect of today's business world. It is a fact that BPR has considerable contributions on companies to change themselves with innovative solutions. Therefore, the literature related to this subject was examined in order to support the research questions in this study. Abdi and her colleagues define BPR and describe a framework for BPR to show the internal and external factors in it. (Abdi, Zarei, Vaisy, & Parvin, 2011) They describe the external factors as competitors, suppliers, customers, salespersons. The internal environment includes HR, communication, researches and organizational culture. According to Abdi and her colleagues the internal and external environments motives the changes in organizations and influence the success of redesign. Since their approach provides a broad understanding on BPR concept and its interaction with process innovation, it has been considered as a key perspective for the investigation process.

Eardley and his colleagues define a number of IT applications called "disruptive technologies" including ERP Systems. They define possible roles of IT systems. In Table 2.3, it will be given as possible roles of IT as Eardley, Shah and Rdman defined. (2008)

Role of IT	Characteristics of the Role
------------	-----------------------------

Constraint	Legacy systems dominate main business processes. System is inflexible. It is generally very expensive to implement a change or changing the whole system. Lack of potential for investment in IT. Lack of management support and perception for IT. Strategic alignment is low.
Catalyst	New IT has been acquired. Some changes has been done on business processes in with help of IT. Management is aware the potential effects of IT on business. New relationship with IT vendors, consultants or service providers. Strategic alignment is in crucial stage.
Neutral	Lack of IS applications and IT infrastructure in the organization. There is neither IT nor IS strategy defined. The business in an industry with low information density or little competition through IT. Strategies and infrastructures are in alignment.
Driver	The business has technological ability and pursues to achieve it through business opportunities. New business or a technological innovation. Satisfactory investment on IT. IT investment is not a limiting factor. Strategic alignment process is proceeding rapidly.
Enabler	IT is a key performance factor and “a competitive arena” in the industry. Management has a clear business vision and future change plan. Business changes and targets are well defined. Satisfactory investment on IT. IT investment is not a limiting factor. Strategic alignment is in process.
Proactive	Management has a strong business vision and future change plan. The IS and IT infrastructure are well settled. Management is aware the potential of IT. Strategies and infrastructure are in alignment.

Table 2.3 – Characteristics of the Role of IT in BPR (Eardley, Shah, & Rdman, 2008)

The roles of IT as given above are defined as “more negative” through “Constraint” and “positive” through “Proactive”. Figure 2.5 represents the degree to which IT infrastructure is likely to constrain or to lead BPR effort in an organization. (Eardley, Shah, & Rdman, 2008)



Figure 2.5 – A continuum of the possible Roles of IT in BPR

In today's business world, the continuous change is inevitable. Eardley and his colleagues state that the most effective type of re-engineered process is the one, which is able to evolve and adapt those changes. Therefore, “Proactive” is the most desirable role. Regarding this opinion, the cases in this research were questioned through “approach of management to IT” and “motivation for new ERP system” perspective in “Representation” part of the questionnaire. Additionally, during conversation with participants it was aimed to comprehend the concept of IT and ERP for each case.

A summary of characteristics of BPR projects is given as in table 2.4.

<i>Failure</i>	The IT does not have a planned role on BPR, or the project has not been finalized and failed or although it is finalized but the project cannot do the effective changes on business.
<i>Compromise</i>	IT infrastructure cannot be changed within the given time scale. Although such projects can be accepted successful, they are applied to limited business processes or functions.
<i>One Step</i>	This type of BPR projects have wider scope than the “compromise” type of BPR projects. However, the lack of IT support limits the potential of the newly designed processes for achieving the “big” transformations. It still does not have an important part on the organization strategy.
<i>Evolutionary</i>	The infrastructure is flexible in order to adapt continuous changes in business. Its structure is capable of maintaining alignment with the business strategy overtime.
<i>Radical</i>	Achieves major changes in organizations. Scope is very big regarding other types of BPR projects. The IT infrastructure is very flexible and copes with big changes in business processes. IT strategy and business strategies are interdependent.

Table 2.4 – Characteristics of BPR Projects (Eardley, Shah, & Rdman, 2008)

Eardley and his colleagues defend that when IT’s role on business is one of “driver”, “enable” or “proactive” the organization may be able to achieve full value from it when implementing BPR. The cases, which have conducted a BPR project, were evaluated in terms of BPR projects characteristics. In semi-structured interviews for the case study, “Changes in Business” part in the questionnaires (Appendix 1) is for the characteristics of BPR in each of the companies.

Gattinker and Goodhue argue the benefits of ERP and the conditions that increase the returns of ERP to a company. (Gattiker & Goodhue, 2005) They state that ERP can be viewed as a particular class of information processing mechanism in an organization. According to them, when the interdependence between subunits of a firm increases, the level of contribution of ERP to the business process increases because of that the ERP promise integration of business processes. Therefore, companies that implement the ERP have the opportunity to redesign their business practices using templates imbedded in the software (often called “best practices”). This perspective can be considered as one of the supportive arguments in this thesis since it argues that the ERP affects the design of the business process of an enterprise and it is not only a software.

Štemberger and Kovačič argues the role of business process modeling in ERP implementation projects. They define three possibilities about how companies choose and implement the ERP . The figure below (2-6) explains those three possibilities.

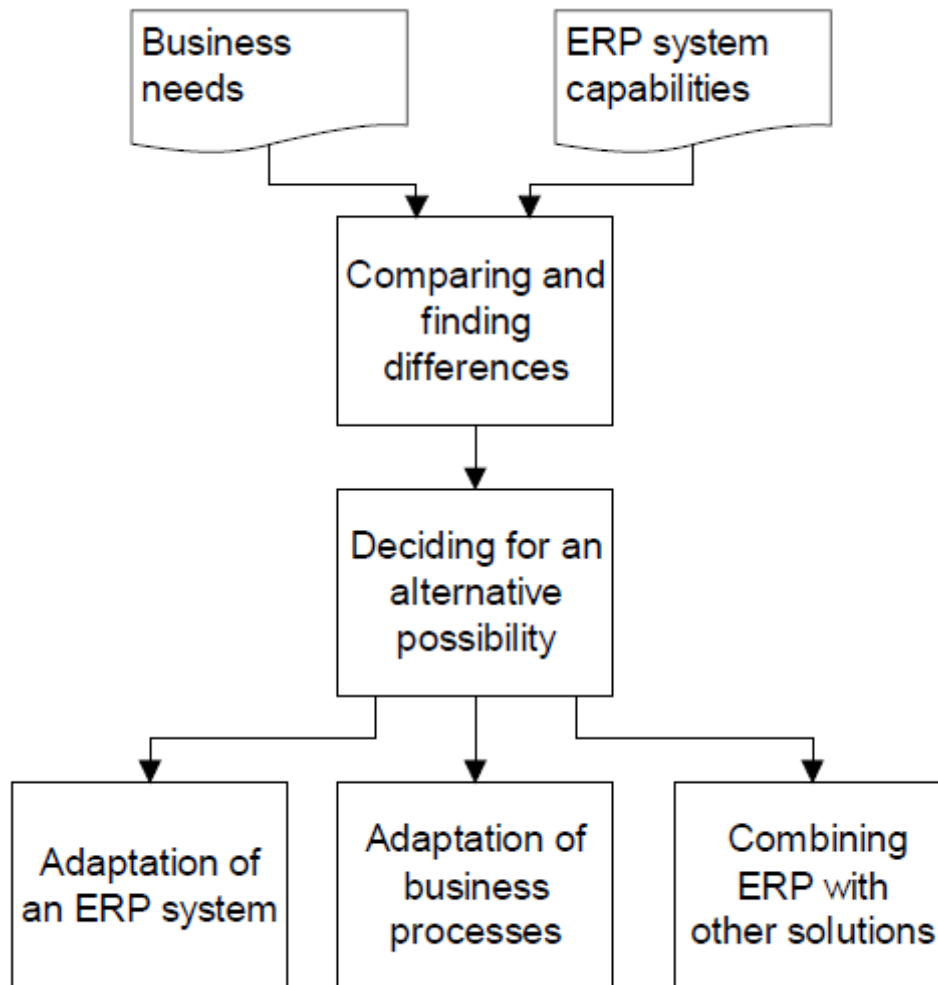


Figure 2.6: The alternatives for selection and implementation of an ERP System (Štemberger & Kovačič, 2010)

The first alternative is appropriate for the organisations that believe their business processes are better than those implemented in an ERP system and do not want to lose their competitive advantage. (Štemberger & Kovačič, 2010) In this option, beside some fine tuning in the ERP system, the company should do additional computer code development for greater changes. It may cause additional high costs. Additionally, it is difficult to maintain and upgrade the systems which include additional development. According to Štemberger and Kovačič, this alternative can lead to the failure of a project. For such organizations, it would probably be better to develop their own solution in the first place. (Štemberger & Kovačič, 2010)

The adaptation of the business processes to an ERP system means that the best practices implemented in these software packages have to be applied in an organisation. Although it is theoretically the best way that allows an organisation to take all possible advantages from an ERP system, such changes are very difficult to implement in practice since they require a process redesign project and by doing so the situation becomes much more complicated. (Štemberger & Kovačič, 2010) Additionally, an organisation might lose the advantage of an unique and perhaps better business practice.

The third option is a combination of the ERP solution and the business processes in the organization. According to Štemberger and Kovačič, it is the best possible alternative in a majority of cases as a blend of acquired (ERP), integrated (best-of-breed) and engineered (adapted or built) applications. Furthermore, this alternative is in accordance with the current trends in the ERP market. While vendors propagated usage of monolithic solutions in the past, nowadays they switched their tendency into combining their software. (Štemberger & Kovačič, 2010)

In the next section, the main characteristics of business processes in the empirical research will be explained briefly.

3 RESEARCH STRATEGY

In order to discover the possible answers to the research questions, it is necessary to determine a research strategy. Therefore, the strategy must include diverse type of tools and methods that are related, in order to achieve the research. Additionally, it is important to use tools and research methods that provide the reliability and validity of the material and data. Moreover, all the materials and the data collected should be critically examined and evaluated.

The dissertation targets to reach the detailed information about the business processes designing within the phase of an ERP implementation in the companies. Therefore, firstly, eight of the electricity distribution companies were determined. Then, business blueprints, some meeting minutes and process documentations such as process drawings were requested from the companies. Meanwhile, semi-structured interview questions were prepared regarding to the important subjects from the literature reviews and the collected documents from companies. The way that the sample semi-structure interviews in the literature were used is explained in chapter 2.

The results from the primary and the secondary data will be analysed and argued in order to identify the most significant marks. Additionally, some conclusions will be drawn based on the results associated with the research questions.

3.1 RESEARCH METHODS

The most common types of data collection are quantitative and qualitative methods in business studies. (Ghauri, Grønhaug, & Kristianslund, 1995) In quantitative method, the researcher conduct empirical studies and analyses the cases with the assistance of statistics and mathematics. Once the data is collected, it is transformed into numbers, which are empirically tested, in order to see if a relationship can be found to reach a conclusion from the results obtained. On the other hand, in the qualitative research technique, the researcher gather the words of participants and investigate them by seeking the common themes, through focusing on the semantic sense of the participants' statements and describing a process using both expressive and persuasive language. (Soiferman, 2010) In this thesis it is important to view the multidimensional structure of business processes in the electricity distribution companies so that the effects of ERP products could be analysed. Gunnarson argues that the advantage of applying a qualitative method in a research is that the method takes the overall picture into consideration in a way that the quantified method cannot. Therefore, regarding to the density of the business processes and multi-faceted structure of the ERP implementation projects, the qualitative method was found more suitable. It will be possible to understand the relation between the business process remodelling in the companies and the ERP by analytically studying each companies' ERP implementation process by using qualitative methods.

3.2 DATA COLLECTION

In this study, both primary and secondary data are used. The primary data is the information that the researcher can get by her own, such as conducting interviews and questionnaires. (Bryman & Bell, 2007) The secondary data refers to the data such as literature, documents, and articles by other institutions and researchers. In this thesis, the primary data were collected by qualitative interviews and open-ended questions that are asked to each respondent. Additionally, academic articles, governmental and legal web sites of electricity distribution companies, some documents from ERP

projects (such as business blueprints, meeting notes) and some independent business processes consultancy company reports were used as secondary data. The secondary data was analysed critically in order to obtain evidence about the business redesign phases in companies and to support the theoretical part of the study. However, since in some cases the information that is needed for this thesis was considered as confidential by the companies, giving certain numbers could not be possible. Then, semi structured interviews were conducted via telephone calls or face-to-face. In telephone calls, notes were taken as in face-to-face interviews tape recording was used.

3.3 SCIENTIFIC APPROACH

There are two main types of scientific method of reasoning; called as deductive and inductive approaches. Soiferman argues that in deductive reasoning arguments are based on laws, rules or other widely accepted principles. On the other hand, in inductive reasoning, arguments are based on experience or observations. (Soiferman, 2010) In deductive reasoning, the researcher follows a cognitive sequence, starting from a theory towards a hypothesis by adding or contradicting the theory while in inductive reasoning the researcher goes to the theory from observations and findings.

In this thesis, inductive approach is used. The research was started with observations and data collection. Then, the themes were identified regarding the data collected in order to reach a conclusion. As more data were collected, the conclusions of the research evolved continuously.

3.4 CASE STUDY

In this thesis, case study research method is used. According to Eisenhardt, the case study is a research strategy that aims to understand the dynamics that present within single settings. (Eisenhardt, 1989) A case study can be conducted through single or multiple cases. Eisenhardt states that multiple-case study projects are desirable when the intent of the research is describing, theory building or theory testing. This method allows researcher to perform cross-case analysis and extension of the theory. Since the aim of this study is to search, analyse and define the dynamics between BPM and ERP, multiple cases are examined.

While doing the case study, Eisenhardt's steps named "Process of Building Theory from Case Study Research", which is as below, are followed:

1. Getting Started
2. Selecting Cases
3. Crafting Instruments and Protocols
4. Entering the field
5. Analysing data
6. Shaping Hypothesis
7. Enfolded Literature
8. Reaching Closure

Regarding to the steps above, after the research question of this study was determined, pre-analyse was conducted for the electricity distribution companies in Turkey. In a case study, concept of the population is important since it allows the researcher to compare the findings from cases and to see common or unique attributes of the cases. In addition, selection of an appropriate population controls extraneous variation and helps to define the limits for generalizing the findings. (Eisenhardt,

1989) So, eight distribution companies were determined according to the ERP that they use, the number of customers that they provide electricity, the region, and different organizational structure. The sample was intended to reflect the specific cases and a broad range of organizations. First, it should be stated that all of the companies are regulated by electricity market rules and all the companies were privatized. All of the companies taken as subject in this thesis implemented new ERP recently, as the privatization process was completed. The number of customers shows the size of the companies, as well as the data load on the company information system. The companies with several ERP software were selected. Besides, the companies were carefully chosen from different regions in Turkey in order to represent samples from different zones.

The companies, which are examined in this study, can be found in Table 3.1

The Name of the Company	Investor	# of Customers	ERP	Region
Başkent Electricity Distribution Inc. (Başkent EDAŞ)	Enerjisa	3.292.151	SAP	Middle Anatolia
Yeşilirmak Electricity Distribution Inc. (YEDAŞ)	Çalık Holding	1.564.004	SAP	Black Sea Region
Bosporus Electricity Distribution Inc. (Boğaziçi EDAŞ)	Kolin-Limak-Cengiz	4.072.336	Oracle	Istanbul European Side
Dicle Electricity Distribution Inc. (Dicle EDAŞ)	İş- Kaya	1.165.924	SAP	South-East Anatolia
Toroslar Electricity Distribution Inc. (Toroslar EDAŞ)	Enerjisa	2.815.351	SAP	South Anatolia
Istanbul Anatolian Side Electricity Distribution Inc. (AYEDAŞ)	Enerjisa	2.309.764	SAP	Istanbul Asian Side
Adıyaman Kahramanmaraş Electricity Distribution Inc. (AKEDAŞ)	Kipaş Holding	538.876	SAP	East Anatolia
Meram Electricity Distribution Inc. (Meram EDAŞ)	Alarko-Cengiz	1.633.271	In-House	Middle Anatolia

Table 3.1– Electricity Distribution Companies

A typical case study combines data collection methods such as archives, interviews, questionnaires and observations. (Eisenhardt, 1989) Beside the secondary data as explained in section 2.3, interviews were conducted with selected participants in the electricity distribution companies.

Regarding the interviews, notes, observations during the interviews, companies' project management documents and ERP ' business blueprint documents were critically analysed to see the distinctive and similar context of the issue. In the following sections, the details about interviews can be found.

3.5 INTERVIEWS AND PARTICIPANTS

In order to be able to have a deep understanding on the role of ERP and on BPR, it is needed to collect as much substantial data as possible. Therefore, in order to collect primary data it was decided to use qualitative interviews. The interview details can be found on section 3.6.1 and 3.6.2.

3.5.1 Interview Questions

While qualitative data is useful in order to comprehend the relationship between ERP systems and BPR, it also requires a detailed and carefully planned research method. Therefore, in this research open-ended interview questions were prepared and the same questions were asked of all interviewees. The interview questions were prepared under some themes as below and the questions can be found in Appendix 1. The BPR concept in companies was questioned about 'before', 'during' and 'after' the ERP implementation. The main themes of the interview questions are given as below.

Before The ERP System Implementation

Representation: This part is prepared according to Mansar and Reijers; they state that in BPR several factors are linked each other. (Mansar & Reijers, 2007) There are internal and external environment for BPR. The internal environment consists of customers of business processes, products of business processes, organization structure & population, information and technology. In this part, it was aimed to understand how "technology" interacts with business processes in the companies. The BPR concept is evaluated along with the ERP systems, which has been one of the most important technologies. Additionally, Mansar and Reijers state, when a job is executed, that number of tasks in a job, size and nature of tasks, are important in BPR. Consequently, the scope, the size and the capacity of the ERP system projects were questioned.

Changes in the Organization: The roles, users, groups, departments and individuals in an organization are important in BPR. (Mansar & Reijers, 2007) Organization structure should be considered in the redesign effort, as business solution should fit the organizational and business culture in an organization. Therefore, some questions were prepared in order to analyse the effects of the ERP on organizational structure, aiming to catch the business process changes due to the organizational changes.

Eardley and his colleagues state that the most effective IT role type on re-designing processes is "Proactive Role". (Eardley, Shah, & Radman, 2008) Regarding this opinion, the cases were questioned from "approach of management to IT" and "motivation for new ERP system" perspective.

BPR Concept and ERP Selection

Changes in Business: The questions in this part aim to understand what kind of business processes were changed and affected by ERP implementation. Eardley and his colleagues defend that when IT role on business is one of "driver", "enable" or "proactive" the organization may be able to achieve full value from IT as the BPR is implemented. (Eardley, Shah, & Radman, 2008) The cases were evaluated in terms of BPR projects' characteristics.

Concept of Process Redesigning: In this section, the goal was to understand deeply how each company had approached the concept of the process redesigning. In Kovach and her colleagues'

paper the steps followed commonly in a BPR are explained. They argue which stages are passed in a typical business process analysis and process designing period. (Kovach, Vins, & Stefanak, 2010) While understanding the electricity companies' BPR phases, the steps given by Kovach and her colleagues were taken as reference. The companies were asked if they had followed those steps or they had followed a different way. Additionally, this section aims to understand if the companies has conducted a project for regulate the business processes before the ERP implementation. Broadbent and Butler's framework is considered while preparing the questions of this section. In their framework, they define 10 steps followed in a BPR project. It was important to analyse that if there are organizations that had not implemented those steps before implementing the new ERP system. While preparing the questions, these stages were considered.

Business Processes after the ERP Implementation

Best Practice Match: Within an organization, the ERP standardizes business processes and the data with "best practices", which are primarily based on benchmarked clients who already have implemented ERP Systems. In order to see the effects of ERP systems on BPR, "best practices" concept will be investigated in detail in the following part. This part is especially prepared for consultants who are actual experts and know the best practices of the ERP solutions.

Closing: Several success factors in an ERP system implementation are defined in literature. Top management support, re-engineering of business processes, project management, ERP team composition and consultants & training are some of those factors (Al-Fawaz, Al-Salti, & Eldabi, 2008). As conclusion, regarding those success factors, the interviewers' opinions about BPR and ERP implementation on the electricity distribution companies were achieved.

Since in-depth responses were expected, there were not "yes or no", "right or wrong" answers along with a description or explanation. Although the interview questions were asked in the given order, there were several times that the same questions were asked in different ways during the interviews.

The interviews were conducted via either face to face or via telephone or video conference calls. All face-to-face interviews have been recorded. During the audio and the video calls, notes were taken as the respondent answers. After the interviews were done, all the recordings from interviews were deciphered completely as the respondent replied. Then, some sentences, which are out of context, were excluded from interview. At the end of this activity, the remaining information has been kept within a close circle of context. In order to decrease the possibilities of using the researcher's own interpretation of the data from the interviews, the material has been shown to the respondents or sent back via e-mail.

3.5.2 Interviewees

The participants' contribution was an important criterion for the thesis because in Turkey each region has different political and geographical characteristics, which may affect the companies' insight in the ERP implementation and the business processes. Therefore, after the electricity distribution companies were selected for this study, the available managers, IT members or key users, consultants in the companies are listed. Different perspectives from each administrative levels and key informants were chosen. For example; an IT manager or IS manager, if available a business processes manager, external consultants and internal IT employees, key users were selected. Additionally, although the list was prepared in advance, some interviewees invited another person,

who was not on the list, in order to receive more and reliable information due to the fact that people can change their position during the implementation. For instance, an IT manager had been in the business process-redesigning phase in Başkent Electricity Distribution Company, then, he changed his position in the company. Within this context, during the interview, the new IT manager stated that some of the answers of the survey could be replied by the previous IT manager. Consequently, another session featuring the previous IT manager was organized. The duration of interviews was one hour on average. However, it should be stated that the interviews with technical consultants have been longer than IT managers and IT specialists in companies since the technical consultants explained technical details in BPR steps and the ERP implementations.

After the data collection step, all the interviews with 39 IT members (including consultants, IT managers and IT employees) were studied. (Table 3.2)

Company Name	#of Interviewers	IT manager	IT/IS Specialist	Consultant
Başkent EDAŞ	9	1	4	4
YEDAŞ	8	2	3	3
Boğaziçi EDAŞ	3	1	2	0
Dicle EDAŞ	3	1	1	1
Toroslar EDAŞ	5	1	1	2
AYEDAŞ	5	1	3	1
AKEDAŞ EDAŞ	3	1	1	1
Meram EDAŞ	3	1	1	1

Table 3.2 – Interviews

4 EMPIRICAL STUDY

This part highlights the results of the empirical data collected from company documents and interviews conducted. In the first section, general overview of Electricity Market and Business Processes is given. Then, the background of the selected companies that has participated in the research is presented. Next, the respondents' experiences regarding to their companies' ERP implementation process and documents collected from companies are presented.

4.1 OVERVIEW OF BPR CONCEPT IN TURKISH ELECTRICITY COMPANIES

The balance between the state and the market has experienced a radical shift by the fall of the Berlin Wall in 1989. (Erdoğan, 2009) Since then, the boundaries of the state have started to shift; and the privatizations in Britain and the transition from state socialism to the market economy in Eastern Europe accelerated it. Within less than a decade, privatization spread around the world. Today, the English model of vertical separation succeeded by privatization and regulation is rapidly becoming the reference model for the reforms in both developed and developing countries. (Erdoğan, 2009)

The growing empirical evidence on the inefficiency of state-owned enterprises and a global trend to liberalization were the main motivations of privatization in many developing countries. (Erdoğan, 2009) Turkish public enterprises in general and Turkish public electricity distribution companies in particular have not been exceptions in this.

In Turkish case, the officially declared reasons for the privatization of electricity distribution regions are as following :(Erdoğan, 2009)

- 1- Efficiency improvement and cost reduction
- 2- Ensuring security of electricity supply and improvement in quality of electricity supplied
- 3- Reduction in distribution loss/theft levels
- 4- Getting private sector made necessary investments in electricity distribution business
- 5- Exploiting the benefits of competition and directing those benefits to consumers

Electricity is a product that is generally regarded as non-storable. In addition, the demand for electricity fluctuates by time of day and year, as the weather varies, and randomly. Supply is also subject to unpredictable outages. However, the equilibrium between supply and demand, called "electrical equilibrium", must be maintained uninterruptedly and throughout the system, which calls for extremely close "minute-by-minute" coordination between generation and transmission & distribution. (Erdoğan, 2009)

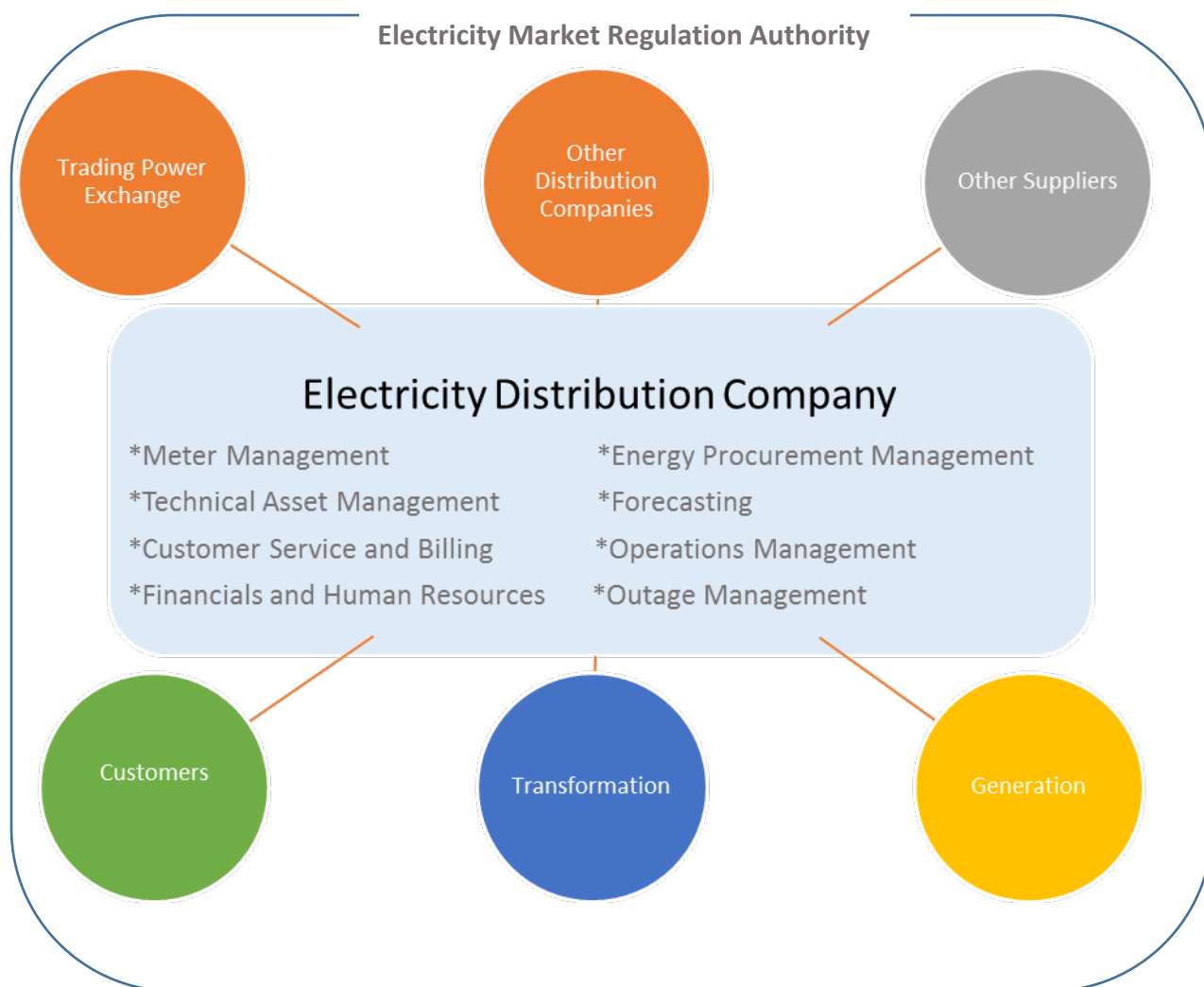


Figure 4.1 – Interaction of an Electricity Company in the market

The privatization process constantly increases the complexity of the market rules . As in Figure 4.1, the electricity distribution companies need to interact with other distribution companies, energy suppliers, customers, market authority, electricity generation and transformation companies.

In Lazard's report it is stated that in the electricity distribution companies, substantial operational efficiency improvements are believed to be achievable through optimizing core business processes such as billing and collections, arranging and redesigning work flows, enabling effective coordination between divisions, improving information systems and infrastructure and optimizing personnel productivity. (Lazard, 2007)

Today, there are 26 million subscribers throughout the country from the smallest villages to the big cities. (TEDAS, 2014) The market is regulated by EMRA, which is an independent regulatory authority. EMRA is administratively and financially autonomous and is responsible for the regulation and supervision of the operation of the electricity market in a competitive environment. The distribution market was completely privatised in 2013. The main purpose of the market liberalization is to achieve lower tariffs by increasing overall system efficiency.

The electricity distribution area is divided into 21 regions based on geographical proximity, managerial structure, energy demand and other technical/financial factors. Eight distribution regions are taken as subject in this thesis.

According to the privatization model, the investor is the sole owner of the shares of the distribution company, which is the unique licensee for the distribution of electricity in the designated region. (Erdoğan, 2009) However, the investor does not own the distribution network assets and other items that are essential for the operation of distribution assets. The ownership of these distribution assets will remain with Turkish Electricity Distribution Utility (TEDAS). The investor, through its shares in the distribution company, however, is granted the right to operate the distribution assets pursuant to a Transfer of Operating Rights Agreement (TOR Agreement) with TEDAS.

4.2 COMPANY DESCRIPTIONS

Başkent Electricity Distribution (Başkent EDAŞ): Başkent EDAŞ participated in the privatization tender for the block sale of 100% of the shares of Başkent EDAŞ in July the 1st, 2008. The transfer of Başkent EDAŞ's shares to Enerjisa was concluded on January 28, 2009. (Enerjisa, 2014) Başkent EDAŞ builds, maintains and operates the electricity distribution grid and provides electricity retail services as well as additional services to more than 3.5 million customers in Ankara, Bartın, Çankırı, Karabük, Kastamonu, Kırıkkale and Zonguldak. (Enerjisa, 2014)

Yeşilirmak Electricity Distribution (YEDAŞ): In 2010, by obtaining the tender Çalık Energy fulfil the obligation of distribution and selling services of electricity for more than 1.5 million subscribers in Samsun, Çorum, Ordu, Amasya, Sinop cities . The energy distributed to customers is around 4.9 billion kWh yearly. (Türkiye Elektrik Dağıtım Bölgeleri 2, 2014)

Boğaziçi Electricity Distribution (Boğaziçi EDAŞ): “Boğaziçi Electricity Company” is the biggest distribution company among the electricity distribution companies in Turkey. It distributes energy to the European side of İstanbul that involves more than 4 million subscribers. The company was privatized in 2013 and it serves the sector by 13 % of the total market share. (Tarihçe, 2015)

Dicle Electricity Distribution (Dicle EDAŞ): The company was privatized in 2013 and delivers energy to Diyarbakır, Şanlıurfa, Batman, Mardin, Siirt, Şırnak cities, to 1.046.000 customers. (Elektrik Üreticileri Derneği, 2015)

Toroslar Electricity Distribution (Toroslar EDAŞ): As a result of the tender held in 15th of March 2013, Enerjisa was qualified to take over the entire stock of Toroslar EDAŞ which is procuring and distributing electricity to the cities of Adana, Gaziantep, Hatay, Kilis, Mersin and Osmaniye. Toroslar EDAŞ has enabled the distribution of electricity to an approximately 2.8 million people in the Toroslar electricity distribution region.

Anadolu Yakası Electricity Distribution (AYEDAŞ): Enerjisa, had entitlement to take over AYEDAŞ (Istanbul Anatolian Side Electricity Distribution Company) through the auction made in 15th of March 2013 and the takeover process completed in the 01st of August 2013. The company provides electricity distribution approximately for 2.3 million people who live in the Anatolian side of İstanbul. (Enerjisa, 2014)

Adıyaman-Kahramanmaraş Electricity Distribution (AKEDAŞ): In 1997, the company was established by investors as a project company. In following years, regarding to the new regulations, the company

was reconstructed. The privatization process was completed in 2012. (Enerji İşleri Genel Müdürlüğü, 2015) The company distributes energy to 550.00 customers in Adıyaman and Kahramanmaraş cities.

Meram Electricity Distribution (Meram EDAŞ): The privatization process was completed in 2009. The company serves 1.7 million customers in Kırşehir, Nevşehir, Niğde, Aksaray, Konya, and Karaman.

In table 4.1, the number of customers in the distribution companies and the total energy consumption of the companies are given (Elektrik Piyasası Raporu 2010, 2014). The numbers on this table are given in order to represent a density of data flow on electricity distribution companies' systems.

The Company	Investor	#of Customers (by 2010)	#of Customers % (by 2010)	Total Electricity Consumption MWH (by 2010)	Total Electricity Consumption % (by 2010)
BAŞKENT EDAŞ	Enerjisa	3.292.151	9,90%	11.885.139	7,60%
YEDAŞ	Çalık Enerji	1.564.004	4,70%	4.677.498	2,99%
BOĞAZİÇİ EDAŞ	Cengiz-Kolin-Limak OGG	4.072.336	12,25%	19.400.963	12,40%
DİCLE EDAŞ	İşkaya-Doğu Ortak Girişim Grubu	1.165.924	3,51%	16.453.666	10,52%
TOROSLAR EDAŞ	Enerjisa	2.815.351	8,47%	16.045.043	10,25%
AYEDAŞ	Enerjisa	2.309.764	6,95%	8.611.700	5,50%
AKEDAŞ	AKEDAŞ	538.876	1,62%	4.084.608	2,61%
MERAM EDAŞ	Alarko-Cengiz	1.633.271	4,91%	6.404.671	4,09%

Table 4.1 – Companies and Number of Customers

4.3 ANALYSIS OF THE COMPANIES

Market liberalization in Turkish Electricity Industry started in order to lead the distribution companies to focus more intensely on customers, flexibility and unbundling of divisions. Therefore, new activities have arose in the distribution companies and these activities have also brought new processes such as smart meter readings, trading, portfolio management and customer retention. It starts from determining the potential customers, following with their exchange of data in the market and maintaining customer data, billing activities and field activities. In addition, increased volume of database is one of the reasons for the implementation of Information Systems. Market models focus on deregulation, privatization, innovation and competition.

The electricity companies analysed in this thesis are given as below. The findings are based on the interviews with the participants.

4.3.1 Başkent EDAŞ

4.3.1.1 Before the ERP Implementation: Changes in the Organization

Başkent EDAŞ was privatized in 2008 as being the first privatized electricity distribution company in Turkey. After privatization process completed in Başkent EDAŞ, the managers decided to see the general overview of existing departments and business processes' flows on these departments. Firstly, they hired new employees for each department such as customer services, field services, meter reading and billing services due to the fact that most of the previous and experienced employees were retired or moved to other public companies after the privatization of the company. The managers agreed that this phase helps the new employees to understand the company's end-to-end processes. The new employees defined the processes and documented the workflows in process charts with the help of the experienced employees who have not retired or moved to other public companies yet. So, the new team became capable to understand the end-to-end processes within the company. At the end of this work, it was recognized that each city had been performing the same task in a different way. For example, the steps followed in a move-out of a customer were different in Ankara and Kastamonu cities. Therefore, the employees decided to standardize the processes and created new work flow charts, which covers both business requirements and the most of the common steps for the processes. Then, the HR department sent those documents to the entire company's business units in order to explain the new standardized process flows. In order to maintain the flows, regarding to the new business needs and regulations in the market, a new department named as "Business Applications" was established. Additionally, IT department was centralized and moved to the Head Quarter's office.

4.3.1.2 The ERP Solution Selection and BPR Concept

The managers were aware that the new market regulations are going to have new requirements in near future and the existing information systems of the company will not be able to meet those requirements. After establishing and empowering the business knowledge, in order to support their analysis phase tasks, a consultancy company, which is expertized for utility companies' business processes and the new regulations of electricity market, was invited to analyse existing business processes as an executer of preparation before any ERP system. They analysed the existent process flow driven by Başkent EDAŞ and named them as "AS-IS Processes". During the exploration, the

consultants reported that the information system of the company is not efficient and it cannot meet the upcoming regulations by the electricity market, which has been just started to liberalize. Consequently, the company decided to implement an ERP product. At the end of several open biddings, SAP ERP product for utilities has been chosen.

Before starting the ERP implementation, some demonstrations of the ERP product for several processes were introduced to Başkent EDAŞ business team. However, the company thought that SAP does not fit the real processes. Then, they decided to draw the “TO-BE” processes, which means that the processes they want to have in the future with the new information system and regulations. IT members, business unit’s managers and Business Applications department attended several meetings in order to discuss the future business processes to the project before it starts.

Since it had been the first information system-designing project after the privatization in Turkey, there was a lack of “know how” about defining new processes and establishing an integrated information systems

The consultants from several countries; where have had completely privatized electricity market earlier such as Brazil, were invited to the projects to use their knowledge about both the business processes redesign and the ERP system. New teams were built up and knowledge transfer was done by consultants. This process has affected the whole organization including all departments and all customers.

Some considerable organizational changes happened in the company. The organization chart was changed simultaneously with the implementation of the new ERP system. Consequently, the owner of the processes could be defined properly. For example, the authorization concept in SAP ERP affected this situation. Centralization of the process management became possible to be done with the new information system. For instance; the system management departments in different cities gathered and the whole processes that they perform were started to be managed in one single point.

In SAP ERP for utilities, a concept named “modules” determines the different areas in terms of business units. For example, while finance module is mainly designed for finance department, plant management module is for field services department of the company. In Başkent EDAŞ the organization of employees was very different from the “module” concept in SAP ERP. A common example was given by the interviewees; Meter readings and billing departments were the same before the ERP implementation. After SAP ERP was used, the responsible employees for each process were separated into related departments. One department was responsible only for meter readings and data collections as the other department called “The Chief Office for Invoicing” became responsible for billing and invoicing. Furthermore, some more divisions added to the company’s business units before the ERP implementation phase is started.

The general regulations in the electricity market should be strictly followed. Therefore, the new design of processes had to be aligned with the regulations; yet, the processes of the company could not be changed “dramatically”. Consultants who contributed to the interviews have used the same sentence:

“The implementation of the new ERP in Başkent EDAŞ was actually adjusting the standard processes of the software to the ‘regulations’ ”.

It was declared that there are more than 400 additional coding developments, implemented to the system. For instance, meter reading and billing process had to be “adjusted” to the regulations of the market by the consultants of the company. One of the interviewees stated that:

“While designing TO-BE, we focused on AS-IS more than anything, however, it was a mistake since we missed some good ‘Best practices’ by the ERP”

The main difference between SAP ERP solution standard and the business processes in Başkent EDAŞ is probably the “onsite billing rule” in Turkey. According to the legislation in Turkey, all the invoices related to the meter readings should be submitted on the field. However, the original design of the ERP solution is for online billing. This was one of the examples, which is stated not only by the consultants in Başkent EDAŞ but also by other consultants who have joined other business processes and an ERP system implementation.

Therefore, as a result, an in-house solution for the onsite billing processes was integrated to the standard process. In addition, in the ERP implementation phase, it was diagnosed that the old master data structure was forcing Başkent EDAŞ to proceed in alternative ways. In the beginning of the implementation project, the master data was maintained. For example; customers’ Turkish citizenship identification number, customers’ contact information, address of customers were collected as much as possible. They have recognized that there were some customers that had not been billed since years. New teams and new levels in teams were conducted in order to collect the data.

In Başkent EDAŞ there are some business processes, which are affected strictly by the regulations in the market, as well as some other processes, which use the standard practices offered by the software. For example, though there were no such a process formerly, Başkent EDAŞ started to send a warning SMS to the customers 3 days before disconnecting the customer’s apartment’s electricity due to his debt.

Through the end of the implementation phase of the ERP, user acceptance tests were conducted. During those tests, some processes were recognized that they had to be changed due to that the users found out some wrong drawings in the process flows.

4.3.1.3 Business Processes after the ERP Implementation

The interviewees were asked about business processes that has to be completely changed or redesigned after the ERP implementation. “Dunning process” was the answer by all of the participants. A new small redesigning project was conducted for it and it was designed from scratch. After the ERP is being used, the company started smart grid, SCADA and AMRS projects in order to strengthen the integration between processes. Therefore, several new processes and new departments appeared. Since the other information systems are not the subject to this study, they are only mentioned in high level in terms of the effects on the business processes.

As a result, in 2011 the new ERP system started to be used in the entire company. Before the ERP started to be used in the company, all employees had gone through a training process. After go-live date, the employees were kept informed about new process changes and how it was implemented in the system.

4.3.2 YEDAŞ

4.3.2.1 Before the ERP Implementation: Changes in the Organization

YEDAŞ was privatized by Çalık Holding in 2009. In YEDAŞ, a business process design before the ERP implementation was not conducted. The only organizational change was in IT department; about 20 new employees were hired to IT department in order to be assigned in different processes: reporting, field services, customer services, call centre, billing and meter reading and finance departments. Until the ERP project is started, the new employees were expected to learn the general processes themselves by contacting with the business units. It should be stated that most of the employees were fresh graduated and had different educational background: While some of them are graduated from technical departments such as “Computer Science”, some of them are graduated from social sciences. The IT strategy was that people from social sciences may act as key users within the ERP projects as the others can be “developers”.

4.3.2.2 The ERP Solution Selection and the BPR Concept

In 2011, the company started the implementation of the new ERP. As a part of the holding, they decided to use SAP ERP Product for the utility sector because as a rule in the organization, all companies under Çalık Holding use the SAP as their ERP system.

A consultancy company conducted a project to YEDAŞ to define the desired processes but they did not perform any analysis on the existing processes before the ERP implementation. Regarding the future legal requirements, they presented a design for the future business process flows. However, this design were not used and not considered in the implementation of the ERP system. The existing processes and desired “To-Be” processes were discussed in the ERP implementation’s business blueprint phase. In the beginning of the ERP project, it seemed that the organization structure is slightly different from the division of tasks and concepts in SAP ERP. For example, as in the other distribution companies, the business unit that is responsible for collecting meter readings from the field and the department that perform billing and invoicing regarding meter reading results of the customers were in the same department. Although it was not mandatory to separate the departments, as the new ERP system is used, the responsible parties for some processes were separated into new departments. Additionally, it should be stated that, in terms of business blueprints, the company has a detailed documentation with process flow charts and description of the business scenarios.

Some new processes were explored and put in an organized way during business blueprinting. For example, “Complaint Management” process actually appeared after the ERP implementation. Before that, it was an unstructured process. It was not considered as a process, yet it was defined as a part of the customer relation process. There were no steps and rules defined for this process. For example, customers could leave petitions as hard copies on the front offices or could call the company’s call centre in case of a problem. The petitions were processed after a while one by one, only by a responsible employee. In the business blueprint phase, it has appeared that the follow up process is possible and keeping the record of the complaint within the new information system can speed up the process. So, collecting the petitions as hardcopies and sending them to the employee responsible was eliminated. Once the employee records the complaint, a mail is sent to the responsible department automatically.

The consultants in the company were asked if they could use “best practices” offered by the ERP solution. One of the answers was

“Actually, we broke the rules. We had to change many processes”.

Other interviewees also agree with this opinion. According to them, the regulation limits the company’s tendency to use the best practices. The interviewees generally commented that the reason that those best practices could not be used is that the market privatization in Europe was done with a preparation phase. In Turkey, this process happened without prearranging the market. The ERP product they use had been evolved regarding the European market rules. Therefore, according to interviewees, the regulation affected the design more than the IS used. One of the IS specialists, who is a business owner stated that

“If SAP ERP solution were not used, the processes could be executed almost in same way.”

The employees in the company were trained about the new processes and the ERP by the key users. The training sessions were not just before the ERP implementation but also after that. Additionally, the key users were often going to the cities to understand if there is any problem or need for training onsite.

4.3.2.3 Business Processes after the ERP Implementation

By the implementation of the new ERP system, the IT department was extended. New people were hired for improving the Information Systems in the company. The people hired for the new information systems acted as key users and they were responsible for the process improvements, data correction and training the employees who work in front offices, back offices and in the fields. Besides, they followed the incident tickets by users and guided the users in case of a problem. Doing this has helped them to see if there is a problem or need to improve in business processes.

Some features of the new ERP system allowed the company to integrate with other information systems such as AMRS, GIS. Those integrations also required new departments. The integration with the other systems has also helped to eliminate and redesign some of the existing processes.

The IT members who have attended the interviews declared that if business process redesign project including “As-Is Processes” had been done before ERP implementation, it could accelerate the processes and eliminate some unnecessary steps.

4.3.3 Boğaziçi EDAŞ

4.3.3.1 Before the ERP Implementation: Changes in Organization

In 2013, Boğaziçi EDAŞ was privatized. Before the ERP solution was selected, they had not conducted a specific activity related the business processes. The only thing that the company did after the privatization is centralization of the IT department. Additionally, they have extended their IT department and business units for this new ERP implementation.

4.3.3.2 The ERP Solution Selection and BPR Concept

Directly after the privatization, they have started the bidding process in order to choose an ERP system for the company. At the end, it was decided to use Oracle ERP product for utilities. All

departments' processes, all customers and the entire workforce in the companies were affected in Boğaziçi EDAŞ.

In the company, the desired process was designed in the business blueprint phase. As-Is analysis was not conducted before the implementation of the new information systems. Both existing processes and desired processes in the future were analysed and documented in this phase. By some of the interviewees, it was declared that "business" knowledge of the consultants were helpful during this phase.

During the implementation phase of the new ERP, it was seen that the data of the company was in bad quality in terms of customers' and technical point of view. Especially the address data of the buildings was not correct. Therefore, some new field service tasks arose. They established a department to collect the address data and correct them in back office. All the interviewees in Boğaziçi EDAŞ stated that they had to change many standardized processes offered by the ERP software according to their processes. They pointed out that, since Turkey follows the general market regulations behind, it's a general case that such software does not fit with the business processes completely. Meter readings, billing and invoicing processes are very different. In order to lessen the differences, there have been many developments on the product. Therefore, it is said by the consultants and business side that they had difficulties in terms of "*new way of performing daily tasks*" during the implementation and after the ERP was used.

Not only difficulties but also some advantages of a new ERP system on business processes could be observed. For example; reporting activities were accelerated and the data in the system became more reliable. This allowed the company to eliminate some of the consolidation reporting from several systems. In addition, new technology has changed the way that they perform their job. For instance, the integration of the Turkish Republic personal identification system with the ERP has helped them to access the customer data easier. It has eliminated the long process of searching for the detailed data about a customer and lessened paper work. Another example was GIS integration for the creation of the buildings in the system. It has also lessened paper work and provided reliable data for them.

Before the go-live date of the project, user acceptance tests were performed for 2 months. During the tests, some processes were changed. One of the consultants declared that:

"The companies generally recognize what has been done in the business blueprints in test phase. Therefore, we had to change many processes during the user acceptance tests. After test phase was completed, the training sessions for the entire company were started. The employees learned the ERP system and how to run the daily processes in the system."

4.3.3.3 Business Processes after the ERP Implementation

In 2015, the new ERP system has started to be used. As it was stated by the interviewees, the company did not change any business processes due to the wrong design in the blueprint but they changed some processes due to new legal requirements. The new system was flexible enough to allow them to change some coding for several processes. However, it should be stated that Boğaziçi EDAŞ was satisfied with the system and the conducted business process design.

4.3.4 Dicle EDAŞ

4.3.4.1 Before the ERP Implementation: Changes in the Organization

In March 2013, Dicle EDAŞ was privatized. Just after the privatization, about 40 IT members were hired regarding the management's decision, aiming to start the new information system implementation. The new employees who mostly have technical background such as coding and doing customization in different ERP systems were hired for the "Business analysts" position. However, it took half a year to choose an ERP system and start the implementation process. Meanwhile, the business analysts firstly decided to build a sub department of IT as "Business Applications" for the analysis of the existing business processes. Beside, several new sub departments were also established under IT, as "Business Intelligence", "Support" and "Helpdesk". However, building some of the new departments was challenging for the business analysts. The knowhow of the IT members had helped to establish the new unit through "module approach" of some common ERP solutions before any of them was chosen and implemented. Also, some people were assigned to different processes such as "Financials Management", "Customer Relation Management", "Device Management", "Human Resources Management", "Material Management", "Work Force Management" and "Billing and Invoicing". Although the management has supported to apply a new ERP system, the interviewees declared that the business process redesign in Dicle EDAŞ had been very difficult to start and to implement due to certain political reasons and the approach of the business owners. They stated that the business owners approached the business processes through a public enterprise mentality. It should be stated that Dicle EDAŞ is in the east part of Turkey, where the government is being said to lack control due to terrorist attacks. The biggest complaint of the business analysts in the company was the business owners' resistance to change..

4.3.4.2 The ERP Solution Selection and the BPR Concept

The employees, who have been working since years before the privatization, have objected to explain the processes to the new business analysts since they were motivated by the fear of losing their job. One of the interviewees answered the question "how they have started the ERP implementation" as following:

"Actually, you should ask first how we could not start the ERP implementation because we had to 'struggle' everyday with the approach of employees who have been working since many years"

Despite all those difficulties, the business analysts analysed the processes from beginning to the end. They analysed the processes by collecting information from experienced employees and they documented it by drawing process charts. Finally, they could determine the problems and the unnecessary process steps in workflows. The most embarking analysis was done in field services. In a short time, they eliminated many unnecessary steps within workflows and increased the number of tasks for month from 15000-20000 range to 60000-70000. Similar efficiency increase stories are also valid for the other departments such as financial transactions and the call centre.

Through the end of the year 2013, the company decided to use SAP ERP solution as anew information systems. Since AS-IS analysis was already done, in the business blueprint phase, the future process design was examined.

Some developments were implemented in the system during the implementation in order to meet business requirements. As indicated above, the region that Dicle EDAS located is different from all other regions. This difference has some indications on the business processes. For example, the theft on electricity was very effective on the business process design because the rate of theft case in this region is very high regarding the other distribution regions. Through the end of the implementation phase of the ERP, a number of user tests for each business processes was conducted for a month. There were not big changes in terms of the business process flows as it is indicated also by the interviewees.

4.3.4.3 Business Processes after the ERP Implementation

In the beginning of 2015, they have completed the implementation of the new ERP system. After the implementation, any correction on the design of processes is reported. The only comment for the post-realization was that since the system includes some coding developments, the maintenance of it needs additional effort during an upgrade or a change in the system.

4.3.5 Toroslar EDAŞ

4.3.5.1 Before the ERP Implementation: Changes in the Organization

Toroslar EDAŞ was privatized by Enerjisa in 2013. Since Enerjisa has already privatized Başkent EDAŞ, the managers of the company decided to make a rollout project for the information systems. They executed the roll out in order to provide alignment in all distribution companies under Enerjisa. In Toroslar EDAŞ HR, IT was changed; as it was centralized.

4.3.5.2 The ERP Solution Selection and The BPR Concept

Whilst Başkent EDAŞ had implemented the new information system in 2011, Toroslar EDAŞ started the new system in 2014. Therefore, this time, the business processes were not the focus due to the fact that the business processes design in Başkent EDAŞ was implemented directly. The business flows in Başkent EDAŞ were tried to be adapted to most of the processes in Toroslar. All processes were standardized within the Enerjisa organization. Besides, the departments were re-established regarding to the Başkent Enerjisa's organizational structure. However, the rollout required a data cleansing process before the implementation. Especially, in the east and south part of Turkey, the data for address, customer names, customer's contacts and meter readings were one of the problems as it was indicated by IT members in Toroslar EDAŞ. Due to time limit, rather than a data cleansing and collection project, the related activities were integrated in the business processes. For example, updating customer address step was added in the new move-in process. Also, new business roles and departments arose due to the data cleansing activities. Such, a meter reader has undertook a new business role to correct address of a premise. New departments for the data correction were recognised. For this, a new project team was established and their only job was to put this thing through. Before the ERP went live, the users in Toroslar EDAŞ were trained by the users in Başkent EDAŞ region, as it was a rollout project.

4.3.5.3 Business Processes after the ERP Implementation

After the rollout of the ERP system in the company, some new departments were established. One of those departments is customer technical services department: The department's main responsibility

is to determine the problems in terms of process flows and to offer solutions. Although the main reason was not the implemented ERP system, it helped to track the business processes with reliable data.

All of the interviewees agreed that after the ERP was started to be used, there was not any business process, which has to be completely changed due to a wrong design in the ERP implementation; the implementation was successful within this context.

4.3.6 AYEDAŞ

4.3.6.1 Before the ERP Implementation: Changes in the Organization

Anadolu Yakası EDAŞ was privatized in 2013. Similarly to Toroslar EDAŞ, all the processes have started to be done in the same way with Başkent EDAŞ and the company started to use SAP ERP solution for utilities. The IT team of Enerjisa, as the investor of Anadolu Yakası EDAŞ, worked in pre and post project activities as in Başkent EDAŞ and Toroslar EDAŞ. Before the rollout project, the company executed an analysis to see how the processes are being performed in all the field services. It appeared that the processes are executed in different ways in each region. The aim was to standardize all the processes and align the processes with Başkent EDAŞ. So that, all the processes was standardized. Before executing certain technical trainings, the employees in Anadolu Yakası EDAŞ were trained for the new process flows.

4.3.6.2 The ERP Solution Selection and the BPR Concept

In Anadolu Yakası EDAŞ, a new department for the reporting was established. There had been a lot of paper work and it was lessened after the new ERP system establishment. A new process, “Hand Held”, arose through the new ERP. Since the system is capable of communicating with another system, the handheld processes and the concept of barcode reading for the archiving purpose were added as new processes. By handhelds, the company became able to read the meter reading results of customers and upload the results into the system online. Moreover, although there was not a specific department for corrections in Başkent EDAŞ and Toroslar EDAŞ, in Anadolu Yakası EDAŞ some people have certain responsibilities for the corrections. Similar to Toroslar EDAŞ, the employees in this region were trained by Başkent EDAŞ users about the new business processes and how to implement those within the system.

4.3.6.3 The Business Processes after the ERP Implementation

By the new ERP system implementation, Başkent EDAŞ, Toroslar EDAŞ and Anadolu Yakası EDAŞ started to use a united system. The interviewees stated that it has been a successful project. The interviewees could not point at a business process, which had to be completely changed due to the wrong design in the ERP implementation, including the post-implementation support phase.

4.3.7 AKEDAŞ

4.3.7.1 Before the ERP Implementation: Changes in the Organization

In 2012, the privatization process was completed in the company. A new information system implementation was decided by the managers due to the upcoming market regulations. The IT

department was centralized and approximately 30 new members were hired as business analysts for the implementation of the new information systems.

The company implemented a predesign phase before the ERP implementation. Some business flows were improved in terms of efficiency before starting the new ERP system process design. Some changes in the organization structure happened. Those changes were mainly in IT department.

4.3.7.2 The ERP Solution Selection and the BPR Concept

Regarding the companies, which have implemented SAP ERP systems earlier, the managers in AKEDAŞ selected the same solution as company's main information system. An interviewee stated that the main motivation for the selection of this ERP solution was "consultants' knowledge in the market".

During the business blueprint phase, the desired system was analysed with both external consultants and the IT members who are then familiar with the business processes since they had been involved in pre-design phase. In this company, the documentation of business process flows and analysis were considerably prepared in a detailed way.

Similar to the other electricity companies in this research, they had to implement several changes and additional coding into the software due to some specific market rules. One of the technical consultants in the interviews stated that there are approximately 350 additional code developments for some specific market rules in Turkey.

Beside some changes in the IT department, some other departments were defined to perform corrections for the increasing number of mistakes, especially in finance and billing departments. In like manner to the other distribution companies, billing and meter reading departments were same in AKEDAŞ. Before the ERP goes live system, employees were trained by business analysts who had attended redesigning of the business processes and the ERP implementation.

4.3.7.3 Business Processes after the ERP Implementation

In July 2015, the company started to use the new ERP. After the implementation, any business process which has to be entirely changed because of an incorrect design in the ERP implementation was reported by the interviewees.

4.3.8 Meram EDAŞ

4.3.8.1 Before the ERP Implementation: Changes in the Organization

In Meram EDAŞ each department have been using different information systems. Finance, Human Resources, field services, customer services and the call centre were all on different platforms. There is not a structured IT department. The employees in the IT worked as business analysts, however, it cannot be said that they are specialized in different fields. The IT department was centralized under the investor Alarko Holding's own IT department. The employees in IT were doing mainly reporting processes. Meram EDAŞ maintained its IT system mainly by the support of external consultants. After the privatization, rather than using an ERP solution, they decided to develop some in-house systems, which are not directly integrated with each other. The integration between the systems was provided through reporting tools. For example, as the finance system and the customer services

being separated and using different systems, the customer services system was responsible to keep the information of new contracts of customers, as the finance system was used for accounts receivable and payables. Although there is no integration between those systems, the business processes were integrated in finance department and customer services. In each new contract, they request security deposit from customers. In order to see the security deposits posted and collected, they had to run reconciliation reports in finance system for each new contract of customers. The integration between the systems was provided mainly by reports and consolidation tools manually. The integration points caused many problems and created additional workload to IT department. Since there were many processes that the data should be exchanged between systems, there was also a department to correct errors in data exchange.

4.3.8.2 The ERP Solution Selection and the BPR Concept

Managers analysed business processes' requirements and they decided that all processes should be contained in the same system due to the fact that all are fed by the same finance resource. Then, they decided to implement an ERP. They have chosen a solution, which is an Ericsson product and developed for the Telecom industry. MERAM EDAŞ's aim was to modify that solution according to the Electricity business processes. In this company, the documentation of business processes' flows and procedures were not prepared. Besides, desired "To-Be" business processes were not written. Rather than this, the existing business processes in the company was taken reference point to start by the developers. One of the interviewees stated that in the project, the developers played a role as business analysts and technical consultants.

After several code developments on the telecom solution, the new solution became ready to go live. Before the go-live date, some user trainings were conducted by the IT department.

4.3.8.3 Business Processes after the ERP Implementation

After a week of go-live, they decided to stop using the solution due to several technical and process based problems. They went back to the previous solution, which requires several integration points. The internal IT members of the company describe the reasons of that unsuccessful project, as being the solution implemented was wrong since it was originally a Telecom solution.

5 RESULTS AND DISCUSSION POINTS

In this chapter, the results from the empirical study are going to be analysed with the support of the theoretical framework.

5.1 MOTIVATION FOR THE ERP IMPLEMENTATION IN THE COMPANIES

Broadbent and her colleague define the motivation for business process redesign as a combination of business imperatives and technology availability. (Broadbent & Butler, 1995). They list five points as the reasons of the Business Process Redesign. Here, Broadbent's arguments about the main motivations to use new information technologies and the electricity companies' drivers will be compared. All these points were analysed, as can be seen below, in order to see if the Electricity Distribution companies, which are the subject of this study, have these reasons to implement a new ERP System.

Broadbent & Butler Definition	Electricity Companies' Motivation for a new IS
Substantial change is necessary for the organizations that need to maintain profitability and improve customer responsiveness. These concerns stemmed from industry competition and a worldwide economic downturn.	The liberalization in Turkish Electricity Market started to lead the distribution companies to customer oriented approach, flexibility, traceability and unbundling of divisions.
The merger and acquisitions of the 1980's had left many organizations with heavy debt and incompatible or very different organizational cultures.	This item is not valid for the Turkish Electricity Industry.
A wide diversity of new technologies, which are both flexible and affordable.	All the companies benefited the ERP software's flexible feature. The processes could be integrated regarding the templates embedded in the software. For example, some of the companies started the integration of ERP systems with GIS.
The need for renewal or migration of legacy systems and applications.	The companies in this study had difficulties about commercial and technical data in the legacy system. Therefore, in business redesign phase (either as a separate one or in business blueprint phase) the companies recognized that the data in the legacy system is in bad quality.
De-regulation, regulation or privatization particularly as it affected government agencies.	Turkish Electricity market is privatized completely. In this thesis, only the privatization phase and its affects were evaluated. The next step for the companies is "deregulation" that will bring new processes.

Table 5.1 – Motivation of Companies in ERP implementation

5.2 THE ERP IMPLEMENTATION STRATEGIES OF THE COMPANIES

Štemberger and Kovačič (2010) define three types of ERP implementation strategies as given in section 2.3. The first strategy is the adaption the ERP to company's business processes. The second strategy is the adaption of the business processes to the ERP implemented. The third strategy is combining the ERP solution features with the business processes. Seven of the Electricity distribution companies in this study have combined the business processes and the ERP systems' features, which points at the third approach. None of the companies directly adjusted their processes to the ERP that they implemented or vice versa. Excluding Meram EDAŞ, all the companies have preferred combining the ERP with the other solutions. This composite approach is also suggested by Štemberger and Kovačič. They state that a custom developed solution is in accordance with the current trends in ERP market.

Adaptation of the ERP Systems	Meram EDAŞ adapted a Telecom Solution for the Utility Industry and implemented their processes on the software.
Adaptation of the Business Processes	None of the cases preferred to adapt their business processes directly to the ERP solution.
Combining the ERP with the other Solutions	Başkent EDAŞ, YEDAŞ, Boğaziçi EDAŞ, AKEDAŞ, AYEDAŞ, Toroslar EDAŞ, Dicle EDAŞ combined the business processes and the ERP solution features during the ERP implementation. Each company has many custom developments within the system; but they also benefited many features of the ERP software in terms of the business processes. The companies used master data structure of the ERP software, changed their organizational structure and established new departments according to the ERP solution requirements.

Table 5.2 – Companies' approach for ERP implementation

Only Meram EDAŞ chosen "Adaption of ERP" to the business processes. The other companies combined ERP solution and business processes during the implementation. It can be stated that one of the reasons of MERAM EDAŞ ERP project's failure is choosing "adaption of ERP to business processes".

5.3 STAGES OF THE BPR AND THE ERP IMPLEMENTATION IN THE COMPANIES

The companies were analyzed if they really have followed the typical stages of the BPR processes regarding Broadbend and Buttler's soundbasis of BPR as below:

Steps	Başkent EDAŞ	YEDAŞ	Boğaziçi EDAŞ	Dicle EDAŞ	Toroslar EDAŞ	AYEDAŞ	AKEDAŞ	Meram EDAŞ
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1: Evaluation of current business and prioritising of objectives.	YES	NO	NO	YES	NO	NO	YES	NO
2: Been Provided Full support by the Management.	YES	YES	YES	YES	YES	YES	YES	YES
3: Developing a high-level definition of existing business processes.	YES	NO	NO	YES	NO	NO	YES	NO
4: Identifying critical or bottleneck Processes.	YES	NO	NO	YES	YES	YES	YES	NO
5: Understanding and measuring the existing processes.	YES	YES	NO	YES	YES	YES	YES	NO
6: Developing new process approaches including IT solutions.	YES	YES	YES	YES	YES	YES	YES	YES
7: Test new processes for robustness.	YES	YES	YES	YES	YES	YES	YES	YES
8: Prepare people for, and involve people in the changes that redesigned processes.	YES	YES	YES	YES	YES	YES	YES	YES
9: Implementing the changes.	YES	YES	YES	YES	YES	YES	YES	N/A
10: Put in place procedures to monitor and measure continuing	YES	YES	YES	YES	YES	YES	YES	N/A

improvements in the redesigned processes.								
Percentage of "Yes" as answer	100%	70%	60%	100%	100%	100%	100%	40%

Table 5.3 –The soundbasis analysis of BPR in the electricity companies

Başkent EDAŞ, Dicle EDAŞ and AKEDAŞ went through all the steps of a BPR. Although Toroslar EDAŞ and Anadolu Yakası EDAŞ did not perform the step 3; which is for identifying high-level definition of business processes, it can be assumed that they went through that step since they are a roll-out projects of Başkent EDAŞ. YEDAŞ has performed seven of these ten steps. Boğaziçi EDAŞ has performed six of these ten steps. Meram EDAŞ has performed only four out of ten steps. As the only company that fails after ERP systems implementation project; it was noted that applying less BPR steps may cause fail of ERP system implementation.

The table 5.4 below shows if an "AS-IS" and "TO-BE" analysis have been conducted in the company. "Pre-Project before ERP" column is used to show the companies that conducted a separate business process redesign before the ERP implementation starts. "AS-IS Analysis" column represent the companies which conduct the current business processes analysis with business owners. "TO-BE Analysis" means that the company designed the future business processes by business owners, without regarding the restrictions of the ERP that will be used. "TO-BE in BBP Phase" column represents if the company has conducted a future processes designing with the help of the standard processes of the ERP during business blueprint (BBP) phase of the project. A company can conduct a design for desired future process by regarding only the business processes with business owners' perspective and at the same time, they can receive support of the business processes offered by the ERP.

	Pre-Project Before ERP	AS-IS Analysis	TO-BE Analysis	TO-BE IN BBP Phase
Başkent EDAŞ	YES	YES	YES	YES
YEDAŞ	NO	NO	YES	YES
Boğaziçi EDAŞ	NO	NO	NO	YES
Dicle EDAŞ	YES	YES	YES	YES
Toroslar EDAŞ	NO	NO	NO	YES
Anadolu Yakası EDAŞ	NO	NO	NO	YES
AKEDAŞ	NO	YES	YES	YES
Meram EDAŞ	NO	NO	NO	YES

Table 5.4 – The "Business Processes Redesign" Phases in Companies

5.4 CHANGES IN THE ORGANIZATIONS AFTER THE ERP IMPLEMENTATION

In order to see the impact of the ERP on business processes, the departments in the companies are analysed in terms of the daily assignments they perform and the number of employees in the departments. Firstly, the changes in the IT department were evaluated. For the new ERP systems more people were hired, intensely in IT departments. The responsibility of the IT department was widened and all the processes were connected to the mentioned department. It is seen that before ERP implementation the companies had only a few or no employee responsible for the Information Systems. After the ERP system implementation, there is a considerable change in number of employees assigned in information systems. The changes in the company information systems departments are given in the table below:

	#of People IS before ERP	#of People IS after ERP	ERP Used
Başkent EDAŞ	Less than 5	More than 40	SAP ERP
YEDAŞ	No IS employee	More than 10	SAP ERP
Boğaziçi EDAŞ	No IS employee	More than 10	Oracle ERP
Dicle EDAŞ	No IS employee	More than 40	SAP ERP
Toroslar EDAŞ	Less than 5	More than 40	SAP ERP
Anadolu Yakası EDAŞ	Less than 5	More than 40	SAP ERP
AKEDAŞ	Less than 5	More than 30	SAP ERP
Meram EDAŞ	No IS employee	More than 10	Ericson – Telecom Solution

Table 5.5 – The Number of Employees in Information Systems department and ERP in the companies

The companies could manage to standardize the business processes in different locations and start to do the daily businesses process in the same way. In the companies, which could implement ERP, the number of the back office processes was increased and the amount of paper work went down.

While the companies were changing the way of doing their business, new business units also appeared in. There are mainly three types of new departments, which are founded after ERP implementation in the electricity distribution companies.

- 1- Units for Business Processes Management:** IT departments had to become stronger in terms of the number of employee and skills. They were divided into two sub- departments; one is for the hardware problems and the other one is for the process-based problems. For the process-based problems in ERP, power users and key users concepts arose. In all the companies, there are separated groups for business power users, key users and information systems department employees. In Başkent EDAŞ “Business Applications Unit” was established for the improvement of the integrated business processes. Since Toroslar EDAŞ and AYEDAŞ are under the same holding and have centralized IT systems, this Business applications department is also valid for them.

Before the ERP implementation, a unit for the business processes improvement has already existed in Dicle EDAŞ. After the implementation, that department worked as a part of the information systems department. In YEDAŞ, AKEDAŞ and Boğaziçi EDAŞ, as the ERP systems implementation is completed, the employees in the information systems department continued to work as business analysts for business development and solving the problems of end users in the systems.

- 2- Reporting Department:** The companies' data load is very high due to the number of customers they serve. With the help of the new reporting tools and having a more integrated system, the companies have either separated the departments for reporting or extended the reporting in terms of number of the employees. Before the ERP implementation, in order to deploy a report, more than one-step was needed. After the ERP implementation, the number of steps that they perform for one report was decreased but the need for skilled employees increased. Hence, sub-departments for the reporting purposes were created.
- 3- New Units for new technologies integration such as GIS, SCADA:** The companies could adopt new processes with the help of the ERP's and the other technologies' integration. With the help of the high integration capability of the ERP systems, the companies deploy new technologies. "Geographical Integration Services (GIS)" and "Supervisory Control and Data Acquisition (SCADA)" can be given as examples for such technologies. The maintenance of data and error handling requires competence in both SCADA and GIS. Therefore, new processes arose and new departments for them were established.

Best practices of ERP products did not fit completely to the distribution companies because the market rules are not mature yet in Turkey. All companies have many custom developments and coding enhancements in their ERP systems because the business practices in standard ERP solutions could not fit to the processes in companies. However, the ERP systems' business logic helped them to reorganize their departments. In the companies, new departments arose as defined above. They could be apply new technologies such as GIS, SCADA since the integration of processes and systems became easier after ERP implementation.

5.5 THE ROLE OF THE ERP IN THE COMPANIES

The role of information technologies may differ within the organizations. Regarding to Eardley, Shah and Rdman's classification, the analysis of the ERP system's role in the companies is as in the table 5.6. In spite of "The Role of IT", "The Role of ERP Systems" is used in the table.

Role of ERP Systems	Characteristics of the Role	The Electricity Companies
Constraint	Legacy systems dominate main business processes. System is inflexible. It is generally very expensive to implement a change or changing the whole system. Lack of potential for investment in IT. Lack of management support and perception for IT. Strategic alignment is low.	All of the companies support IT and ERP investment because the companies need to survive in the new market environment by managing their information effectively. Hence, "Constraint" role of the ERP is not valid for any of the companies.
Catalyst	New IT has been acquired. Some changes has been done on business processes in with help of IT. Management is aware the potential effects of IT on business. New relationship with IT vendors, consultants or service providers.	Although there was not a certain department for the information systems in the companies before the ERP implementation, they already had an IT department. Therefore, it cannot be said that the IT department is newly created. Beside; since they are large scaled

	Strategic alignment is in crucial stage.	companies, they had vendors and service providers (consultants) for the ERP systems implementation.
Neutral	Lack of IS applications and IT infrastructure in the organization. There is neither IT nor IS strategy defined. The business in an industry with low information density or little competition through IT. Strategies and infrastructures are in alignment.	In Meram EDAŞ , the IS department was not defined well compared to the other companies in this research. Rather than the internal information systems team, they have negotiated with an external service provider to implement a new ERP for their business processes. Their strategy was to survive in the market like the other companies. However, they did not use ERP systems as trigger for the new business opportunities.
Driver	The business has technological ability and pursues to achieve it through business opportunities. New business or a technological innovation. Satisfactory investment on IT. IT investment is not a limiting factor. Strategic alignment process is proceeding rapidly.	Dicle EDAŞ, AKEDAŞ, Boğaziçi EDAŞ, YEDAŞ have the technological ability. They invest for new technologies and improving strategies on IT. They have separated department or teams for the ERP implementation and the business processes improvement.
Enabler	IT is a key performance factor and “a competitive arena” in the industry. Management has a clear business vision and future change plan. Business changes and targets are well defined. Satisfactory investment on IT. IT investment is not a limiting factor. Strategic alignment is in process.	Başkent EDAŞ, Toroslar EDAŞ, AYEDAŞ are the companies, which could benefit from the ERP solution that they have used. In the competitive arena, they can be considered as the market leaders since “Enerjisa” was the first holding to deploy a new ERP and succeeded the implementation.
Proactive	Management has a strong business vision and future change plan. The IS and IT infrastructure are well settled. Management is aware the potential of IT. Strategies and infrastructure are in alignment.	Since the companies have recently finalized the ERP implementation projects, it cannot be stated yet that system is well settled. Besides, since the market rules are constantly changed, the business processes run by the ERP systems are changed. Therefore, “Proactive IT” concept in the companies depends on the market rules.

Table 5.6 – Role of the ERP Systems in the Companies

5.6 SUCCESS OF BPR IMPLEMENTATION

The companies are analysed regarding the critical success factors of a BPR implementation as in table 5.7:

No	Factor	Projection of the Factors on the Companies
1	Collaborative working environment	For all the cases, a non-collaborative work environment during BPR is not reported.
2	Top management commitment and Support	For all the companies in the empirical research, the top management supported the ERP project and the business processes redesigning. Except Başkent EDAŞ and Dicle EDAŞ, there was not a separated BPR project in the companies. Since the implementation of the BPR and ERP started together for YEDAŞ, Boğaziçi EDAŞ, Toroslar EDAŞ, AYEDAŞ and Enerjisa, it can be stated that the top management supported the BPR implementation in those companies.
3	IT infrastructure	As it was indicated by Maleki and his colleagues, IT is a natural partner of BPR and plays a critical and central role in BPR projects. Since all the companies that are given as examples are major ones, IT infrastructure is well established and provides support for the Business Processes.
4	Training	Even though all of the companies have arranged trainings before the go-live of the ERP systems, there was not a specific training for business processes because all the trainings were done in order to show how to use the ERP system and how the business processes will be run by employees.
5	Less bureaucratic structure	Maleki and his colleagues defend that a flexible organizational structure enables BPR to encourage creativity and innovativeness within the organization. Despite the fact that the electricity distribution services have been public institutions earlier, the companies managed to have a flexible organizational structure. The investors of the electricity companies hired new employees while advancing the knowledge of experienced employees. The companies tried to gather people from different departments and contribute to the business process designing. The only exception for this case can be Meram EDAŞ since the company did not arrange a team within the organization to contribute the process designing. In their BPR phase, it is not possible to determine if the organizational structure is flexible or not.
6	Culture	After the privatization of the electricity companies, the investors mostly brought their own company culture. In Meram EDAŞ case, the role of the company culture could not be analysed because, for designing the business processes, they worked with external companies. Except the Dicle EDAŞ case, the new employees who joined the company after the privatization and the employees working since many years in the companies have been in collaboration. In Başkent EDAŞ,

		YEDAŞ, Boğaziçi EDAŞ, Toroslar EDAŞ, AKEDAŞ and AYEDAŞ any confliction case which affected the BPR phase was reported.
7	Adequate financial resources	Başkent EDAŞ and Dicle EDAŞ conducted a pre-project before the ERP implementation for the BPR. They have allocated budget to work with external consultancy companies and hired new employees for that purpose. The rest of the companies did not allocate special financial resources for the BPR.

Table 5.7 – The Critical Success Factors in BPR

When the operational performance objectives of the companies were analysed it was seen that the companies had to be loyal to the market rules. Therefore, any significant change was possible due to the market regulations. However, the market rules brought a necessity of being able to adapt the existing processes easily to the changing rules.

The companies' main aim was a flexible and integrated system, which can adapt itself to future market regulations. The companies expected running their daily tasks effectively without being affected easily from market rules. The companies were expected to standardize the processes and manage the processes from central.

It was seen that the companies determined the customers who could not be billed since long time due to some loopholes in the companies' previous information systems. The companies now can provide effectiveness to the processes: such as running new dunning processes with the help of the ERP solutions' features. Besides, new theft and illegal cases were prevented as in Dicle EDAŞ case; faster billing and invoicing, faster and effective field operations, Improvement on field services, faster reporting.

They can also automate the complaint management system as they can determine the responsible people in the processes.

There is no direct indication about companies' financial benefits. However, processes were standardized and managed from a single point.

5.7 SUCCESS OF THE ERP SYSTEMS

Some critical success factors were defined in section 2.2.3. The electricity distribution companies were analysed regarding those factor as below:

Top Management Commitment and Support: The companies in the research provided top management commitment and support for the ERP projects. As it was pointed out in section 5.1, the companies' main motivation was to survive in the market while the market rules are being changed constantly.

Re-engineering business process: For the ERP implementation, the companies had to change their way of doing business on different levels. Regarding the analysis in section 5.3, Başkent EDAŞ, AYEDAŞ, Toroslar EDAŞ, Dicle EDAŞ and AKEDAŞ applied all the steps in a typical BPR. YEDAŞ applied seven of the ten steps and Boğaziçi EDAŞ applied six out of ten. Meram EDAŞ followed only four of the steps in a usual BPR case.

Effective Project Management: This success criterion is evaluated from two point of views. The first view is that if the project is completed successfully; except Meram EDAŞ, all the projects went live. The second view is the clarity and level of details of the documents of the projects. In Başkent EDAŞ, Toroslar EDAŞ, AYEDAŞ, YEDAŞ, AKEDAŞ and Dicle EDAŞ the documentation of the business blue prints and customizing, project calendar are considerably written in a more detailed way and achieved.

ERP Team Composition: In Başkent EDAŞ, Toroslar EDAŞ, AYEDAŞ, AKEDAŞ and Dicle EDAŞ cases, the ERP team composition is better structured comparing to the other companies. The business side and Information Systems employees have different roles on the project. However, in YEDAŞ and Boğaziçi EDAŞ "Information Systems" specialists act as key users. For "information systems specialist" role, external consultants worked on the projects. In Meram EDAŞ, it cannot be stated that there is a determined team composition. External consultants were the backbone of the ERP project. Business decisions were mainly given by the external consultants. In the figures 5.1, 5.2 and 5.3 the team composition is given.

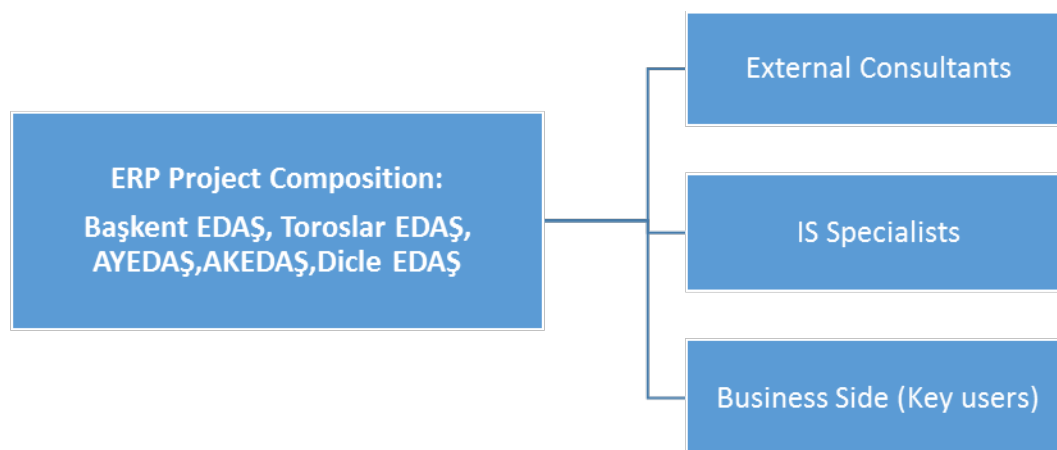


Figure 5.1 – The Team Composition in Başkent EDAŞ, Toroslar EDAŞ, AYEDAŞ, AKEDAŞ and Dicle EDAŞ

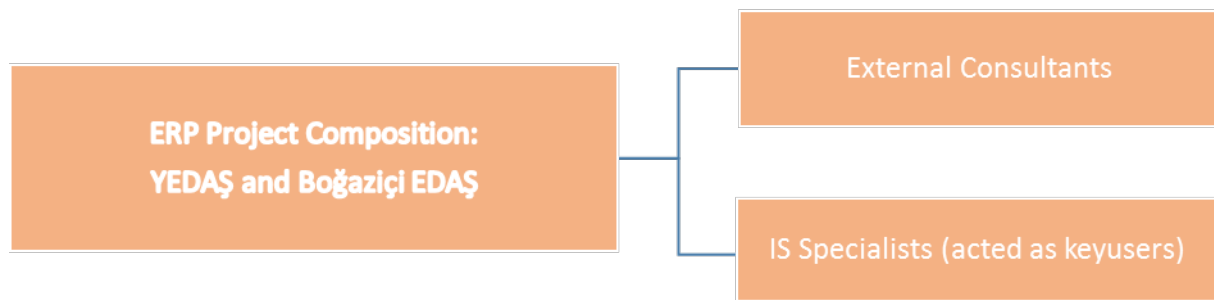


Figure5.2 – The Team Composition in YEDAŞ and Boğaziçi EDAŞ



Figure5.3 – The Team Composition in Meram EDAŞ

Consultant Selection and Relationship: Consultants have important role on the ERP implementation, especially when the market rules are not certain. As the first ERP project on the electricity distribution companies, Başkent EDAŞ project, foreign consultants helped the company to interpret the market rules and convert them to the business processes effectively. The other companies could benefit from the consultants after Başkent EDAŞ project. Besides, all the companies had external consultants and have good relations with them; the cooperation has deeper ties than basic consultancy as they work with certain consultancy companies and cooperate very often.

Training : All the companies conducted user trainings before and after the ERP system goes-live.

The critical success factors mentioned above, they were firstly pointed out in section 2.2.4, are some of the important aspects of a successful ERP project. The success of an ERP system is determined with these factors :

- 1- The ERP system and the specific planned objectives should match.
- 2- The IT project should be completed within time and budget.
- 3- Users' attitudes towards the IT should be positive.
- 4- The IT systems should match users expectations.

Regarding to these factors, only MERAM EDAŞ can be considered as an unsuccessful case for the ERP implementation due to the fact that after the go-live they had to stop the system and went back to the previous system that they have been using.

After the ERP systems started to run, the project teams supported the ERP system by making additional custom developments, corrections and changes about business processes for several months. The electricity distribution companies' duration after go-live date, number of changed processes are given as below that the post go-live activities duration can indicate how much changes have been implemented after the go-live date.

	The Post-Go Live Duration	Business Processes & Changes after the go-live of ERP	The ERP Success
Başkent EDAŞ	3 months	1 Process Changed (Dunning Process)	YES
YEDAŞ	2 months	No Changes	YES
Boğaziçi EDAŞ	2 months	No Changes	YES
Dicle EDAŞ	2 months	No Changes	YES
Toroslar EDAŞ	1 month	No Changes	YES
Anadolu Yakası EDAŞ	1 month	No Changes	YES
AKEDAŞ	1 month	No Changes	YES
Meram EDAŞ	N/A	N/A	NO

Table 5.8 – Post go-live duration and Business Processes Changes in the companies

In table 5.9, a summary of each company's characteristics in BPR can be found. The level of sound basis in the companies for the BPR as analysed above, changes in number of employees in IS departments, the post go-live activities durations in the companies and big process changes are given.

	BPR Sound basis	Approximate # of Employee Changes in IS Department	Post-Go Live Duration	Business Processes Changes after go-live	ERP Success
Başkent EDAŞ	100%	35	3 months	1 Process Changed (Dunning Process)	YES
YEDAŞ	70%	10	2 months	No Changes	YES
Boğaziçi EDAŞ	60%	10	2 months	No Changes	YES
Dicle EDAŞ	100%	40	2 months	No Changes	YES
Toroslar EDAŞ	100%	35	1 month	No Changes	YES
Anadolu Yakası EDAŞ	100%	35	1 month	No Changes	YES
AKEDAŞ	100%	35	1 month	No Changes	YES
Meram EDAŞ	40%	10	N/A	N/A	NO

Table 5.9 – Characteristics of the BPR and the ERP implementations in the companies

In Table 5.3, the companies' BPR soundbasis level (as in Section 5.3) and the duration of support project after the go-live is given. In the beginning of the research it was expected to obtain a result, which represents the BPR preparation before the ERP implementation decreases the go-live support duration.

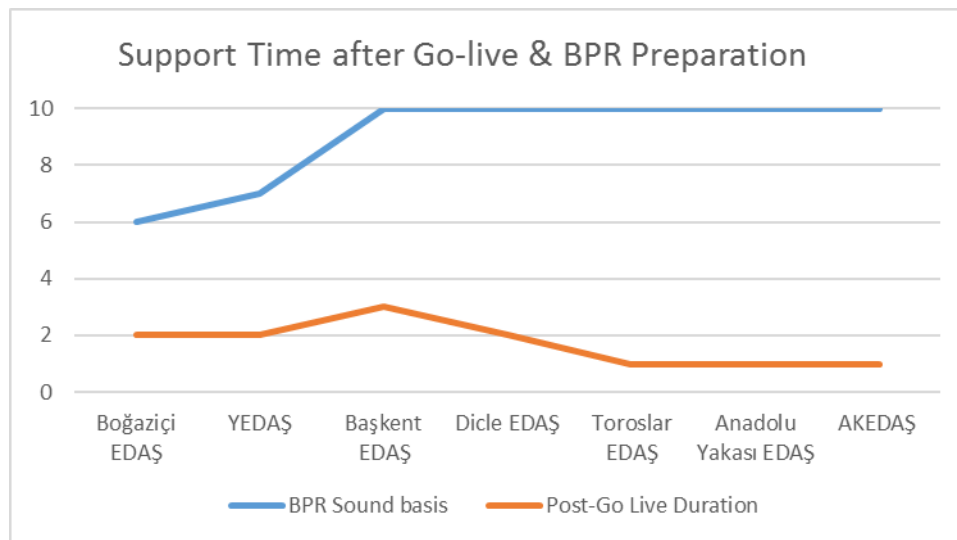


Figure 5.4 – Time spent after Go-live (months) and BPR Preparation

The BPR preparation phase in the ERP projects is important for an effective BPR but only a few of the companies have applied it. In the figure 5.4 it can be seen that there is a tendency to decrease the go-live support time if the BPR preparation percentage is high. In Başkent EDAŞ the post go-live support phase took 3 additional months though it has 100% BPR soundbasis. This can be caused by the fact that it was the first ERP project in the market, know-how of the consultants and IT members were lower comparing the other projects. Although Başkent EDAŞ is the first company in the market, which implemented the ERP, the consultants and employees of Başkent EDAŞ could build a know-how for the other projects. Although AKEDAŞ and Başkent has the same business process designing level, Başkent EDAŞ had a longer post go-live duration. Roll-out Projects of AYEDAŞ and Toroslar EDAŞ show that if the business processes design and system is ready, it takes less time to implement.

6 CONCLUSIONS AND FUTURE WORK

Starting from the second half of the twentieth century, the globalisation and liberalisation both in politics and finance have a huge impact on the world we are living. International relations, multinational companies and cross continental trade have become the key concepts to comprehend the epoch and to evaluate the future possibilities. As the dramatic change is going on within all the possible environments, it is for sure that Turkey as a developing country is under the influence of such impact. Consequently, during the last decade of the Turkish political and financial history, a large scaled privatization policy is being executed. As one of the many privatized industries, the electricity distribution market was also privatized. Due to the relatively high population and the fact that before the privatization the state did not have an innovative approach, the private companies that are a part of privatization process had to face massive projects.

As well as the political and the financial changes in the world, the science has also dramatic progress following the Second World War. As a result, computer technologies, Information Systems, software solutions have an important role as the 21st century begins. Today, it is not possible to imagine any aspect in life, without computer science. ERP, which is taken as the main subject in this thesis, is one of the well-known and important software solutions out today.

It is also must be stated that there is a mutual relation between the progress in sciences and the progress in the politics and the finance world. The globalisation and liberalisation redefined market rules and shaped the industries. They brought different procedures to the companies in terms of business processes. Consequently, more complex the regulations became, a bigger need for the sciences arose. As a developing country, keeping in mind that it follows the developed countries from behind, Turkey has been a scene for the contemporary effects of the mentioned progresses. The shifting from a closed nation state into a liberal state brings also an unplanned change, which means bigger and longer effort to tone itself in the contemporary circumstances.

In this research, eight electricity companies were examined as a part of a new business world. The companies were analysed about how they have implemented the ERP systems on their business processes, including the pre and the post phases and their effects. The ERP systems were considered in terms of their effects on business processes re-engineering and redesigning. Before and after the ERP implementations, the organizational and business process changes were investigated in the empirical research. During the research period, it was seen that the privatization process and the whole market are under the influence of the effects mentioned above. This implies that the companies had to deal with complex projects in an environment where the rules and regulations are not certain. The lack of experience and uncertain regulations have led companies to search for solutions, which may fit the best in these situations. The information about the BPR and the ERP and particularly their effects on each other is the key concept in order to comprehend the phase and interpret it into an academic work.

Regarding the results of the empirical research, it was determined that the BPR and the ERP are two concepts feeding each other; the effect is elevating. As the collected data was evaluated, it was seen that seven of the companies have implemented the ERP systems successfully. The main motivation of the companies to implement the ERP systems was to restructure their business processes so that they can survive in the competitive business environment. Although there are some differences between business processes templates in the ERP solutions and companies' business processes, the

companies could benefit from the ERP solutions' features. The companies, which combine their business processes with the ERP solutions' business process templates, could finalize the implementation of the ERP systems successfully. They could run their processes effectively after the ERP implementation. Beside, despite the undetermined market regulations, the know-how of the ERP implementers could contribute to the companies when redesigning their business processes. Therefore, it can be stated that, when the ERP system implementation is done appropriately, it has positive effects on the organizations and the way of performing the business. One of the inspected companies failed in the ERP implementation.

Here is a brief listing of the key outcomes:

1. In the organizations, there was a will for redesigning the business processes due to changing market rules in Turkey.
2. The companies that combine the ERP Solution features with business processes can be considered as successful cases. The only company, which have failed in the ERP implementation attempts to adopt the ERP solution directly to their business processes.
3. The number of the employees in all the companies have been increased for the ERP implementation and certain new business units have arisen. The companies with the highest rate on new employees and units are also the ones that succeed in BPR. That is to say, the companies that executed a change within the organization as a requirement of the ERP, have started to use the Information Systems that are capable of correspond with the market regulations and the business processes that are probable to change.
4. As the only unsuccessful case in this research, Meram EDAŞ, represents the fact that if the role of the ERP on the Business Processes is neutral, the project fails. Conversely, ERP in driver or enabler role is a factor of success.
5. Likewise, Meram EDAŞ as a case of failure shows that the company that follows the least steps during the BPR soundbasis fails at the ERP implementation.
6. The team composition, which reflects a team understanding that several units and perspectives cooperate, is another success factor in ERP. The only project without success has worked only with external consultants and has no team composition.

After the analysis of the selected cases, the core notion is, the BPR and the ERP are in dense correlation and they must be taken altogether. But that, this correlation requires a detailed and well planned theoretical and conceptual background. The achievement depends on the comprehension of the correlation and the importance of the theoretical/conceptual work.

6.1 LIMITS AND RECOMMENDATIONS FOR FUTURE WORK

Considering the wide scope of the ERP projects and complexity of the business processes in electricity companies, the researcher could identify that many factors affect the relation between the ERP and the business process redesigning.

Depending on the researcher's experience and the information gathered for this work, it can be stated that there are several problematic points when it comes to relation between BRP and ERP. It was seen that, while redesigning the business processes, the companies have a tendency to automate each process step. However, the automation of tasks requires several control steps and

this makes the work more complicated rather than making it easier and effective. Clicking a button and making several checks in a short time does not mean the process is simple. It does not change the business process designing effectively. It can be only one of the advantages of the technology but not about the business processes reshaping. This tendency and the reasons why that the automation does not point at the most effective way can be elaborated in future works as further studies.

7 BIBLIOGRAPHY

- Abdi, N., Zarei, B., Vaisy, J., & Parvin, B. (2011, March). Innovation Models and Business Process Redesign. *International Business and Management*, 3(2), 147-152.
- Addo-Tenkorang, R., & Helo, P. (2011, October). *Enterprise Resource Planning (ERP): a Review Literature Report*. San Francisco. Retrieved from http://www.iaeng.org/publication/WCECS2011/WCECS2011_pp1126-1134.pdf
- Akgün, Ç. E., & Gökmen, N. (2013). Electricity Regulation in Turkey: Overview.
- Al-Fawaz, K., Al-Salti, Z., & Eldabi, T. (2008, 05 25-26). Critical Success Factors in ERP Implementation: A Review. *European and Mediterranean Conference on Information Systems 2008*. Dubai.
- Bhasin, J., & Parrey, A. (2013). Correlating Business Process Management and Organizational Performance : A Case Study of J&K Bank. *The IUP Journal of Organizational Behavior*, 21-33.
- Brancheau, B. J., & Wetherbe, J. (1996). Key Issues in Information Systems Management: 1994-95 SIM Delphi Results. *MIS Quarterly*, 20, 225-242. Retrieved 12 13, 2014, from <http://www.jstor.org/stable/249479> .
- Broadbend, M., & Butler, C. (1995). Implementing Business Process Redesign: Early Lessons from the Australian Experience. *Australian Journal of Information Systems*, 2, 63-76. Retrieved 12 13, 2014
- Broadbent, M., Weill, P., & Clair, D. (1999, June). The implications of Information Technology Infrastructure for Business Process Redesign. *MIS Quarterly*, 159-182. Retrieved 2014, from <http://www.jstor.org/stable/249750> .
- Bryman, A., & Bell, E. (2007). *Business Research Methods*. Oxford: Oxford University Press.
- Dubey, S., & Bansal, S. (2013). Critical Success Factors in Implementing BPR in Government Manufacturing Unit - An Empirical Study. *International Journal of Business and Mangement*, 8, 107-124.
- Eardley, A., Shah, H., & Rdman, A. (2008). A Model for Improving the role of IT in BPR. *Business Process Management Journal*, 629-653.
- Eisenhardt, K. (1989). Building Theories from Case Study Research. *The Academy of Management Review*, 532-550.

- Elektrik Üreticileri Derneği.* (2015, 10 21). Retrieved from Elektrikte 4 Bölgenin İhalesi 4 Şubatta:
<http://www.eud.org.tr/TR/Genel/BelgeGoster.aspx?F6E10F8892433CFF7A2395174CFB32E13E25556277459A0C>
- Enerji İşleri Genel Müdürlüğü.* (2015, 01 12). Retrieved from Akedaş Özelleştirme Süreci:
<http://www.eigm.gov.tr/File/?path=ROOT%2F4%2FDocuments%2FSekt%C3%B6rel+D%C3%B6k%C3%BCman%2FAKEDA%C5%9E+%C3%96ZELLE%C5%9ET%C4%B0RME+S%C3%9CREC%C4%B0.pdf>
- Enerjisa .* (2014, 11 22). Retrieved 11 22, 2014, from Toroslar Electricity Distribution Company:
<http://www.enerjisa.com.tr/en-US/Corporate/OurCompanies/Pages/ToroslarElectricityDistributionCompany-.aspx>
- Enerjisa.* (2014, 11 22). Retrieved 11 22, 2014, from Başkent Elektrik Dağıtım A.Ş:
<http://www.baskentedas.com.tr/en-US/Distribution/Pages/DistributionOperations.aspx>
- Enerjisa.* (2014, 11 22). Retrieved 11 22, 2014, from Istanbul Anatolian Side Distribution Company:
<http://www.enerjisa.com.tr/en-US/Corporate/OurCompanies/Pages/IstanbulAnotolianSideDistributionCompany.aspx>
- Erdoğan, E. (2009). *Some Thoughts on the Turkish Electricity Distribution Industry*. Ankara: Munich Personal RePEc Archive. Retrieved from <http://mpa.ub.uni-muenchen.de/19095/>
- Gattiker, T. F., & Goodhue, D. (2005, September). What happens after ERP implementation: Understanding the impact of Interdependence and Differentiation on Plant-Level Outcomes. *MIS Quarterly*, 29, pp. 559-585. Retrieved 12 13, 2014, from <http://www.jstor.org/stable/25148695>.
- Ghauri, F., Grønhaug, K., & Kristianslund, I. (1995). *Research methods in business studies: A practical study*. Newyork: Prentice Hall.
- Guimaraes, T., & Chair, J. (1998). IMPORTANT FACTORS FOR BPR SUCCESS IN MANUFACTURING FIRMS. *GESTÃO & PRODUÇÃO*, 5(1), 1-14.
- Hammer, M., & Champy, J. (1993). *Reengineering the Corporation: A Manifesto for Business Revolution*.
- Jamali, G., Abbaszadeh, M., Ebrahimi, M., & Maleki, T. (2011). Business Process Reengineering Implementation: Developing a casual Critical Success Factors. *Internation Journal of e-Education, e-Business, e-Management and e-Learning*, 1(5), 354-359.

- Kettinger, W., Teng, J., & Subashish, G. (1997, March). Business Process Change: A study of Methodologies, Techniques and Tools. *MIS Quarterly*, 21, 55-80. Retrieved 12 13, 2014, from <http://www.jstor.org/stable/249742>
- Klaus, H., Rosemann, M., & Gable, G. (2000). What is ERP? *Information Systems Frontiers*, 141-162.
- Kovach, S., Vins, W., & Stefanak, M. (2010). Business Processes Analysis and Redesign Methods: Improving Response to Telephone-Based Reports in Local Health Department. *Public Health Reports*, 903-908.
- Lazard. (2007). Privatization of Turkish Electricity Distribution Industry. Ankara. Retrieved 12 10, 2015, from http://www.oib.gov.tr/tedas/teaser_english.pdf
- Mansar, S., & Reijers, H. (2007). Best Practices in business process redesign: use and impact. *Business Process Management Journal*, 193-213.
- Mikkola, J. (2013, 5 23). Implementation of An ERP System: Case Cimson Koulutuspalvelut Oy. *Not Published*. Oulu, Finland: University of Oulu.
- Najjar, L., Huq, Z., Aghazadeh, S.-M., & Hafeznezhadi, S. (2012). Impact of IT on Process Improvement. *Journal of Emerging Trends in Computing and Information Sciences*, 3(1), 67-80.
- Panorama Consulting Solutions. (2014). *Clash of the Titans 2014*. Denver: Panorama Consulting. Retrieved from <http://panorama-consulting.com/resource-center/clash-of-the-titans-2014-sap-vs-oracle-vs-microsoft-dynamics/>.
- Rabaii, A. (2009). The Impact of Organizational Culture on ERP Systems Implementation: Lessons from Jordan. Pacific Asia Conference on Information Systems (PACIS). Retrieved from <http://aisel.aisnet.org/pacis2009/14/>
- Seo, G. (2013, May). Challenges in Implementing Enterprise Resource Planning (ERP) system in Large Organizations: Similarities and Differences Between Corporate and University Environment. *Unpublished*. Cambridge: Massachusetts Institute of Technology.
- Soiferman, L. (2010, April). *Compare and Contrast Inductive and Deductive Research Approaches*. Manitoba: ERIC. Retrieved 10 10, 2015, from <http://files.eric.ed.gov/fulltext/ED542066.pdf>
- Štemberger, M. I., & Kovačič, A. (2010). The Role of Business Process Modelling in ERP Implementation Projects.
- Tarihçe. (2015, 10 11). Retrieved from Boğaziçi Elektrik Dağıtım: <https://www.bedas.com.tr/sayfa.asp?mdl=sayfalar&id=110&kat=1>

Türkiye Elektrik Dağıtım Bölgeleri 2. (2014, 05 22). Retrieved 11 22, 2014, from Türkiye Elektrik Dağıtım Bölgeleri 2: <http://www.elektrikport.com/teknik-kutuphane/turkiye-elektrik-dagitim-bolgeleri-2/12007#ad-image-0>

Wieder, B., Booth, P., Matolcsy, Z. P., & Ossimitz, M. L. (2006). The Impact of ERP systems on firm and business process performance. *Journal of Enterprise Information Management*, 19(1), 13-29.

Yeşilirmak Electricity Distribution . (2014, 11 22). Retrieved 11 22, 2014, from Vision and Misson Targets: <http://english.yesilirmakedas.com/kurumsal.asp?Id=15>

8 APPENDICES

8.1 INTERVIEW QUESTIONS

Representation

- 1- Which ERP implementation project were you included in this company? What are the time phrases?
- 2- For which processes/departments did you implement the ERP?
- 3- What is the size or capacity of this process (number of units pro-cessed, customers served, etc.)? Per time frame?

Changes in Organization

- 4- What was the motivation for a new ERP implementation project in your company?
- 5- What type of organizational changes have occurred? What type of human resources changes have taken place?

Changes in Business

- 6- Are there any "new" business units, which are appeared/established after ERPS implementation? Can you explain the new business units?
- 7- What proportion of the company's total capacity was impacted by this project?
- 8- What were the operational performance objectives of this ERPS implementation?
- 9- What proportion of the firm's work force was impacted by these projects?
- 10- What proportion of the firm's customers were affected by these project?

Concept of Process Redesigning

- 11- What has been changed in the business processes so far? Could you describe the processes before the ERP project was implemented. In addition, Can you describe the new processes?
- 12- To what extent do the activities embedded in the redesigned processes require customer participation in the process (Can you give answers regarding front office vs. back office activities)?
- 13- Do you think there are new business processes that you start to use with ERP solution? If so, can you give some examples?
- 14- Can this project be classified as a "process redesign project"? If so, why?
- 15- Before IS project implementation; was a pre- project for business process redesign conducted?

16- (If a pre-project conducted) What do you think would happen if pre-project was not conducted? Also, could be effort saved in implementation project same?

(If a pre-project NOT conducted) What do you think would happen if pre-project was conducted? Also, could be effort saved in implementation project same?

Best Practice Match

17- ERPSs offer best practices to the companies; how can you describe the compatibility of your company activities and best practices offered by ERP solution that you used?

Could you benefit ERPSs best practices while adopting your processes?

18- Can you give some examples of processes that were not compatible with best practices provided by the ERP solution you used?

19- What can be the reason of there is a different between ERP solution standard and business processes?

The Closing

20- What have been the biggest barriers and challenges so far? What will they be in the future?

21- What could you use to deal with the barriers, if you start the project now with what you learn from that implementation project?