ENTERPRISE RESOURCE PLANNING (ERP)

IMPLEMENTATIONS IN TURKEY

by

Işıl ÖZBİLEN

July 2006

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I certify that this thesis satisfies all the requirements as a thesis for the degree of Master of Science.

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This is to certify that I have read this thesis and that in my opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Science.

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July 2006

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IMPLEMENTATIONS IN TURKEY**

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M. S. Thesis - Industrial Engineering
July 2006

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ABSTRACT

In today's business for many companies, implementing an ERP system gives the impression that it is the answer to their needs because it holds the promise of decreasing costs, improving processes and increasing sales. Although ERP system has been referred to as the core of organizations, in practice, implementing an ERP system could bring many difficulties to the company because of its higher failure rate and costs. This thesis is about ERP implementations in Turkey and especially aims to search the causes of many problems/drawbacks during & after ERP implementations and some critical success factors (CSFs) to overcome those drawbacks. With the idea of getting qualified information, I made interviews with five ERP software providers in Turkish Market about their ERP systems implementation experiences. This research also presents a case study to demonstrate a real ERP system application in an organization.

Key Words: Enterprise Resource Planning (ERP), ERP failures, ERP implementation, Turkey, Small and medium-sized enterprises (SMEs), ERP vendors.

TÜRKİYE'DE Kİ KURUMSAL KAYNAK PLANLAMA UYGULAMALARI

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Yüksek Lisans Tezi – Endüstri Mühendisliği
Temmuz 2006

Tez Yöneticisi: Yrd.Doç.Dr. Ömer Fahrettin DEMİREL

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ÖZ

Günümüz ticaretinde, birçok firma için ERP sistemi geliştirmek maliyetleri düşürme, işlemleri geliştirme ve satışları arttırma imkanlarını sağlamasıyla firmaların ihtiyaçlarına cevap olma etkisini vermektedir. Her ne kadar ERP sistemleri kurumların temeli olarak belirtilse de, uygulamada, ERP sistemlerini geliştirmek yüksek başarısızlık oranları ve maliyetleri sebebiyle firmalara beraberinde pek çok zorluk getirebilmektedir. Bu tez Türkiye deki ERP uygulamaları üzerine olup, özellikle ERP kurulumları sırasında ve sonrasında yaşanan birçok problem ve sıkıntıların nedenlerini ve bunların aşılmasını sağlayacak önemli başarı faktörlerini incelemeyi amaçlamaktadır. Araştırmamda kalifiye bilgiye sahip olma düşüncesiyle, ERP sistemleri uygulamalarındaki deneyimleri hakkında Türkiye pazarındaki beş tane ERP yazılım sağlayıcısıyla görüşmeler yaptım. Bu araştırma bir firmadaki gerçek bir ERP uygulamasını da örnek çalışma olarak sunmaktadır.

Anahtar Kelimeler: Kurumsal Kaynak Planlaması (ERP), ERP başarısızlıkları, ERP uygulamaları, Türkiye, Küçük ve orta ölçekli işletmeler, ERP sağlayıcıları.

DEDICATION

To my husband and to my parents

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SYMBOL/ABBREVIATION

AMR	Advanced manufacturing research
APS	Advanced planning solutions
BI	Business intelligence
BPR	Business process reengineering
BSI	British standards institution
CRM	Customer relationship management
CSFs	Critical success factors
DBMS	Centralized common database management system
ERP	Enterprise resource planning
ERP II	Next generation enterprise resource planning
IC	Inventory control
IEC	International electrotechnical commission
ISO	Istanbul industrial board
IT	Information technology
KOSGEB	Small and Medium Industry Development Organization
MBS	Microsoft's business solutions
Mid	Middle
MRP	Material requirements planning
MRP II	Manufacturing resources planning
PC	Personnel computer
PPSs	Production planning systems
R&D	Research and development
SAP	Systems, applications and products in data processing
SCM	Supply chain management
SMEs	Small and medium-sized enterprises
TCO	Total cost of ownership

TSE	Turkish standards institution

CHAPTER 1

INTRODUCTION

1.1 ERP SYSTEMS BACKGROUND

Enterprise resource planning is a term coined in the early 1990s that serves as the information backbone for the entire business. Thousands of companies worldwide have rushed to implement ERP systems in order to take advantage of information technology to effectively plan, coordinate, and control such corporate internal resources as finance, manufacturing, sales and distribution, human resources, etc. (He, 2003; Lo, Tsai and Li, 2005; Nah, Lau and Kuang, 2001; Sebastianelli and Rishel, 2003).

ERP's vitality for the success of a company can be measured by the fact that more than 90% of Fortune 100 companies rely on ERP systems (DeWitte and Jung, 2001). According to a recent survey at USA, 75% of U.S. manufacturing firms were adopting packaged ERP systems (Mabert, Soni and Venkataramanan, 2001). Initially, larger firms were the first to move to ERP systems in mid 90s. Smaller companies have followed later, realizing the benefits the others are reaping with its implementation (Sebastianelli and Rishel, 2003).

Generally, ERP systems are complex, and their implementation is expensive, challenging and time consuming, and there are additional costs (training, integration and testing, data conversion, etc.) beyond installing the software. However the profits it yields, if successfully implemented, are far more substantial. The benefits include cost reductions, improved workflow design, higher transparency, increased revenue generation, reengineered processes (Sebastianelli and Rishel, 2003; Taylor, 1999).

The ERP implementation is the process where business process and ERP system match each other. Usually companies have to change their current business processes and match them to the corresponding processes in the ERP system. To implement ERP

systems, companies often seek the help of an ERP vendor (Xue, Liang, Boluton and Synder, 2005) or of the third-party consulting companies.

Thus the difficulties (such as cost overruns, implementation complexity, the wrong ERP selection) and high failure rate in implementing ERP systems have been widely cited in the literature (Davenport, 1998). The failure percentages of ERP systems were determined by Standish Group[1] are; (1) about 35% of large software projects fail, and (2) 55% of ERP implementations end up late or over budget.

The high failure rate of ERP implementation with high risk that calls for a better understanding of its "critical success factors" those are so important for a successful implementation. Top management support, change management program and culture, implementation strategy, project management, business process reengineering, etc. are the most commonly discussed CSFs of ERP implementation (He, 2003; Nah, Lau and Kuang, 2001; Reimers, 2002). "BPR involves a fundamental rethinking and redesign of business processes to achieve improvement in critical measures of performance, such as cost, quality, customer service, and speed to market" (Hammer, 1990).

1.2 RESEARCH OBJECTIVE

The object of the thesis is to use the conclusions of the ERP vendors in Turkish market and use the results of the Senkron implementation in Atılım[2] to determine ERP systems applications methodology in Turkey. The causes of many problems/drawbacks during & after ERP implementations and some CSFs to overcome those drawbacks are also researched.

[1] (http://www.standishgroup.com)
[2] Atılım Cable is one of manufacturing companies in Turkey serving domestic and international markets in the production and sale of cable.

CHAPTER 2

ENTERPRISE RESOURCE PLANNING SYSTEMS

2.1 THE STRUCTURE OF ERP SYSTEMS

There are several definitions that might be quoted from published literature to further explain the ERP systems. Nah, Lau and Kuang (2001) define ERP system as "a packaged business software system that enables a company to manage the efficient and effective use of resources (materials, human resources, finance, etc.) by providing a total, integrated solution for organization's information – processing needs". ERP supports "a process-oriented view of the business as well as business processes standardized across the enterprise".

The architecture of an ERP system facilitates transparent integration and standardization of modules, providing support for complete data flow between all functions within the enterprise in a consistently visible manner (Macris, 2004; Rashid, Hossain and Patrick, 2002). The concept of ERP system can be illustrated, following Davenport (1998), with the diagram in Figure 2.1.

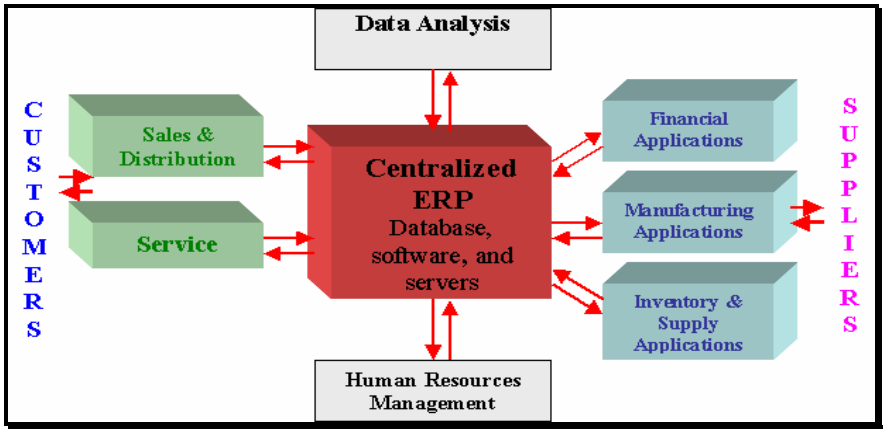


Figure 2.1: ERP systems concept

2.1.1 ERP System Characteristics

Some of the ERP system characteristics are listed as follows (Davenport, 1998; Rashid, Hossain and Patrick, 2002):

- Have a direct and paradoxical impact on a firm's organization and culture
- Modular design that comprising many distinct business modules such as accounting, production, sales & distribution, financial, manufacturing, purchasing, etc.
- Uses or it is integrated with a relational database system - defined as centralized common database management system (DBMS)
- The modules in an ERP system are integrated and "provide seamless data flow among the modules, increasing operational transparency through standard interfaces"
- In general, ERP systems are complex systems involving high cost, high risk
- They are flexible and have several "best practices" tailored on various industries such as textile, automotive, manufacturing, etc.
- They require "time-consuming tailoring and configuration setups for integrating with the company's business functions"
- Allow access to data in "real time" with online and batch processing capabilities
- They are Internet-enabled or soon they will be in the near future

More about ERP systems, it is possible to say (Macris, 2004; Yingjie, 2005):

- Support for the flexible use of language (critical for multinational companies), currency and accounting standards
- Support for specific industries such as oil & gas, health care, chemicals, industries, banking, etc.
- "Ability to customize without programming"

2.1.2 The Inherent Appearance of ERP Software Market

Numbers in AMR's report, confirm the effects of ERP vendor amalgamation. In 1999, the top five ERP vendors are SAP, Oracle, People Soft, J.D. Edward, Baan. Together they controlled approximately 59 % of the "multibillion dollar global market".

In AMR Research (2005) expects the five dominating ERP vendors - SAP, Oracle (which acquired J.D.Edwards, People Soft), Sage Group, a Microsoft's Business Solutions group, and SSA Global (which bought Baan) – to account for 72% of the revenues (Rashid, Hossain and Patrick, 2002; Woodie, 2005). ERP vendors include the following:

1. SAP (Systems, Applications and Products in Data Processing) AG:

SAP, a German firm, is the world's third largest software provider & is the global market leader in ERPs with 12 million users, 100,600 installations, and more than 1,500 partners. Its first ERP product, R/1, was launched in 1973, R/2 in 1979 "using a mainframe-based centralized database that was then redesigned as client/server software R/3 in 1992". SAP also spends a large percentage of its revenues in research and development sector. In early 2003, SAP launched my.SAP ERP that is the provider of SAP's internet-enabled ERP solutions (Les Pang, 2001; Rashid, Hossain and Patrick, 2002; Rossi, 2003).

2. Oracle:

Oracle is the world's second-largest software company that has over 33,000 employees and is located in 145 countries. Oracle Applications includes more than 100 various modules in six major categories: (1) finance, (2) CRM, (3) human resources, (4) manufacturing, (5) supply chain, (6) projects and front office. Oracle is both a partner and a competitor to other firms in ERP market such as SAP, PeopleSoft because of the usage of Oracle relational database management system in their ERP systems (Les Pang, 2001; Rashid, Hossain and Patrick, 2002; Rossi, 2003). Its five powerful products: (1) Oracle 10g Database, (2) Oracle 10g Application Server, (3) Oracle e-Business Suite 11i, (4) Oracle 10g Collaboration Suite, (5) Oracle 10g Developer Suite.

3. PeopleSoft:

PeopleSoft is "the third largest ERP vendor after SAP and Oracle". Having a culture of collaboration with customers makes PeopleSoft more flexible than others (its competitors). PeopleSoft's ERP solutions include modules for distribution, finance, manufacturing, materials management, human resources management, and supply chain planning. PeopleSoft's "strength still remains its human resource management systems"

(Les Pang, 2001; Rashid, Hossain and Patrick, 2002; Rossi, 2003). Oracle acquired PeopleSoft on December 28, 2004.

4. J.D.Edward (cofounded by **J**ack Thompson, **D**an Gregory and C. **E**dward Mc Vaney)**:**

J.D.Edward has a product called "OneWorld" with origins in the AS/400 market. "OneWorld Xe" ("Xe" is used for "extended enterprise") is J.D.Edward's internet-extended version of OneWorld. It designs all its solutions to be open, scalable, and flexible (Les Pang, 2001; Rossi, 2003). In August 2003, J.D.Edward was acquired by PeopleSoft. Sage Group, which is based in England, is a world-leading supplier of accounting and business management software to small and medium-sized-sized enterprises in Europe. Sage "has a quietly assembled a solid suite of ERP software using a strategy combining organic sales and acquisitions" (Woodie, 2005).

5. MBS (Microsoft's Business Solutions group):

MBS grew revenues to $891 million, which gave it a 4 percent share in ERP market. Microsoft Business Solutions product – Navision is also useful for growing medium-sized companies with unique business processes and specialized needs to integrate their financial, manufacturing, distribution, customer relationship management, and e-commerce data (Woodie, 2005).

6. Baan:

Baan (which was bought by SSA Global) is one of the dominant players in ERP market. Its solutions include Business Intelligence, enterprise, SCM, CRM, OpenWorldX, Dynamic Enterprise Modelling, and Product Life Cycle Management. Baan's one of the ERP product "Orgware tool" consists of a framework of open, flexible, and easy-to-configure (Les Pang, 2001; Rossi, 2003). For SSA Global, SSA ERP_{LN} – "flexibility in order-driven manufacturing" - & SSA ERP_{LX} – "control in high-volume/repetitive manufacturing" - delivers comprehensive support for manufacturing operations, extending the traditional ERP footprint of finance, sales, purchasing, and warehouse management.

Figure 2.2 shows ERP vendors ranked by 2004 ERP revenue[3] (Reilly, 2005).

[3] AMR Research 2004.[online].Available: www.amrresearch.com

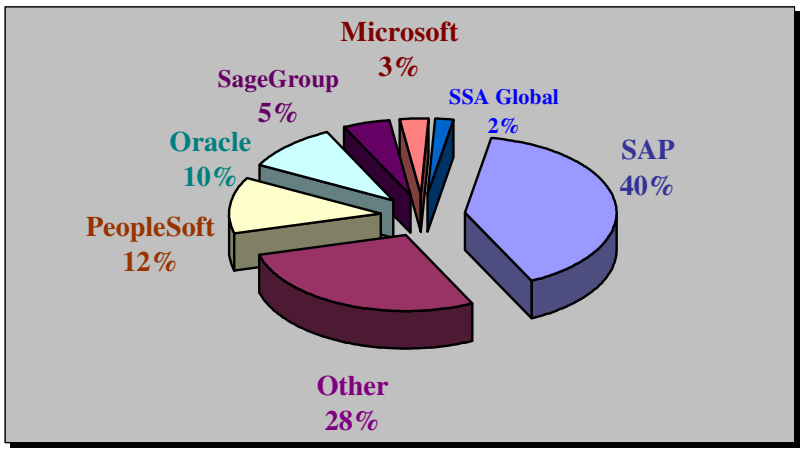


Figure 2.2: ERP vendors ranked by their ERP revenue

2.1.3 The Core ERP Modules

ERP systems consist of several modules that are combined together to access & share the same database. Although various ERP vendors "provide ERP systems with some degree of specialty, the core modules are almost the same for all of them". The most common modules in the successful ERP system are the following (Rashid, Hossain and Patrick, 2002; Rossi, 2003):

- Accounting & Finance
- Manufacturing management
- Sales & distribution management
- Human resources management
- Supply chain management
- Customer relationship management

In ERP systems modules can work as "stand-alone units" or another way various modules can "be combined together to form an integrated system". UNIX, Windows 2000, IBM AIX, LINUX, HP-UX, Windows XP are several operating platforms that the systems are mostly designed to operate under them (Rashid, Hossain and Patrick, 2002).

2.2 ERP EVOLUTION

The evolution of ERP systems closely followed the faster growing segments in the field of computer systems. 1960s in order to satisfy customer demand and stay

competitive companies designed, developed and implemented centralized computing systems, mostly automating their inventory control systems using inventory control packages. IC packages were legacy systems based on programming languages such as "COBOL, ALGOL and FORTRAN" (Rashid, Hossain and Patrick, 2002).

In the 1970s it was realized by many companies, large volumes of inventory was a luxury and unaffordable. This led to the introduction of material requirements planning systems. "MRP is a computational procedure used to convert the master production schedule for end products into a detailed schedule for raw materials and components used in the end products. The detailed schedule indicates the quantities of each item, when it must be ordered, and when it must be delivered to achieve the master schedule". For the MRP system to function properly, it must receive inputs from various files: (1) master production schedule, (2) bill of materials file, (3) inventory record file, and (4) capacity requirements planning. With the passage of time, capacity requirements planning was included into the basic MRP system (Heizer and Render, 2001).

Once the master schedule is set, the MRP system explodes the bills of materials (usually overnight or on weekends), and develops the requirements for materials. The material requirements feed the capacity-planning module that tests the schedule developed by MRP against current capacity. This feed back loop creates two alternatives: (1) adjust the master schedule, or (2) increase capacity. Netting of "on-hand inventory balances and work-in-process" is including as a regenerative process.

"Following this route new software systems called manufacturing resources planning were introduced in the 1980s with an emphasis on optimizing manufacturing processes by synchronizing the materials with production requirements". MRP II included areas such as shop floor and distribution management, quality control, project management, finance, sales analysis, human resource and engineering (Rashid, Hossain and Patrick, 2002).

MRP II is (essentially) MRP but with more added. It can also include purchasing functions, sales order, costing, accounts receivable and payable and general ledger, etc. MRP II is an extremely powerful technique concerned with the manufacturing aspects of the expanded model rather than a total integrated package, usually known as business requirements planning (Aghazadeh, 2003).

In the late 1980s and the beginning of the 1990s the contribution of technology improvement permitted more and more areas to be included into MRP II, such as manufacturing, distribution, accounting, finance, human resource management, project management, inventory management, service and maintenance, and transportation, providing accessibility, visibility and consistency across the enterprise (Rashid, Hossain and Patrick, 2002; Yingjie, 2005). "There is a tendency within the operations management field to consider ERP as a natural extension of MRP II" (Yingjie, 2005).

During the 1990s ERP vendors added more modules and functions ("add-ons") to the main modules giving birth to the "extended ERPs" that include advanced planning and scheduling, CRM and supply chain management (Rashid, Hossain and Patrick, 2002).

The next generation of ERP systems (ERP II) represents a business and application strategy for users that "builds on current ERP deployments and converts the information within the enterprise into a tool for collaboration within communities of interest, through integration that goes beyond the limited boundaries of the enterprise" (Macris, 2004).

ERP systems have grown in popularity surprisingly. Enterprise applications market grew from US $319 million in 1993 to $23.6 billion in 2004.

Figure 2.3 summarizes the historical events related with ERP (Andreu, Sieber and Valor, 2003; Gartner Group, 2001; Rashid, Hossain and Patrick, 2002; Rossi, 2003; Thao, 2002).

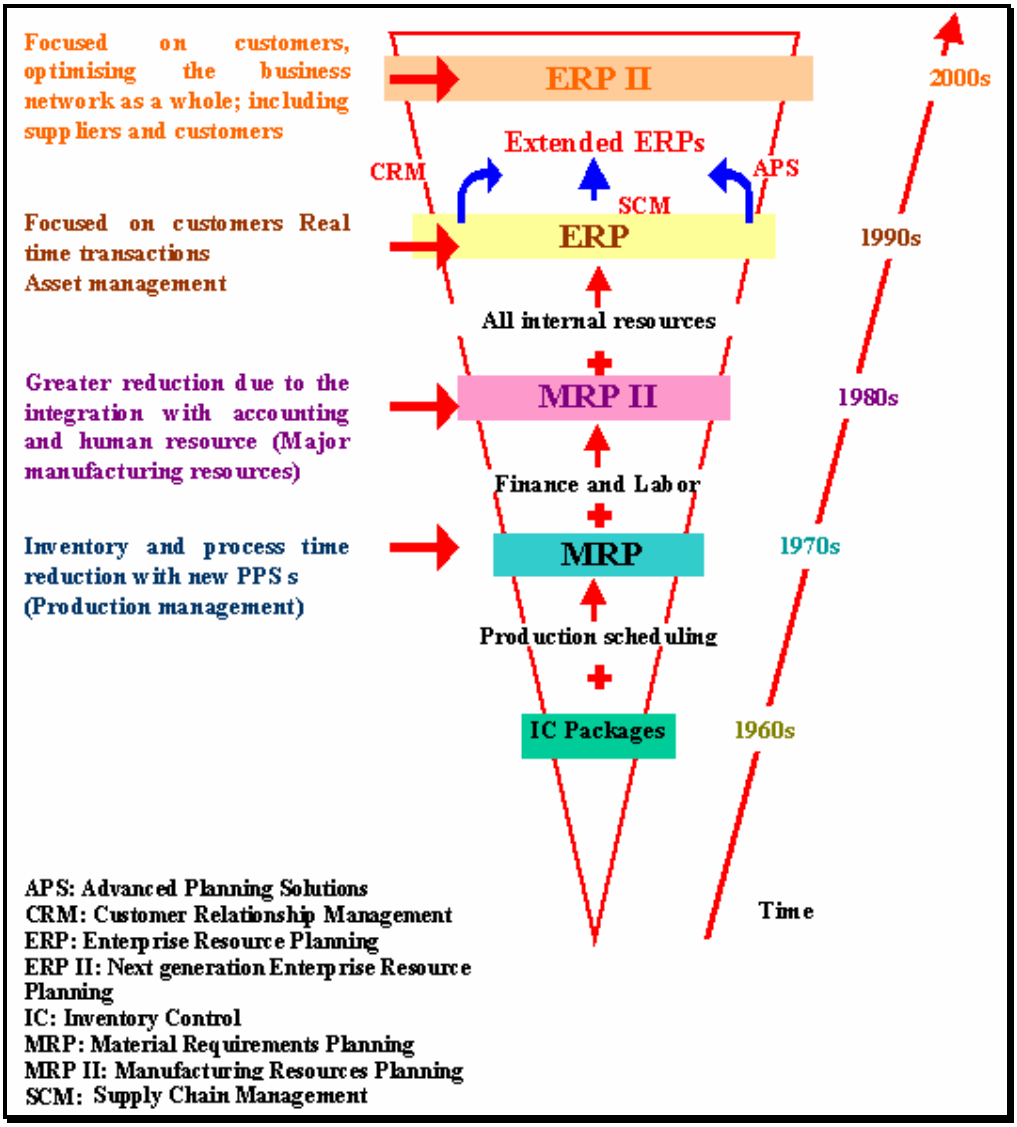


Figure 2.3: ERP evolutions

2.3 ADVANTAGES & DISADVANTAGES OF ERP SYSTEMS

According to a report by Advanced Manufacturing Research, the enterprise applications market is expected to grow from $23.6 billion in 2004 to $64.8 billion in 2009. The reason behind this phenomenal growth is the high expectation of achieving all-round cost savings and service improvements. Companies choose ERP systems and deploy them for many “tangible and intangible benefits” and “strategic reasons” (Luo, and Strong, 2004; Rashid, Hossain and Patrick, 2002). Tangible benefits include: Inventory reduction, Personnel reduction, Productivity improvement, Order management improvement, Financial close cycle reduction, IT cost reduction,

Procurement cost reduction, Cash management improvement. Intangible benefits include: Information/visibility, New/improved processes, Customer responsiveness, Integration, Standardization, Flexibility, Globalization, Supply/demand chain management (Kovar, 2002).

The advantages (benefits) of ERP systems are shown in Table 2.1 (Davenport, 1998; Macris, 2004; Rashid, Hossain and Patrick, 2002; Trehan, 2005).

Table 2.1: Advantages of ERP systems

Advantages of ERP Systems
What Benefit: Easier access to reliable information **How:** Creates commonality of databases (DBMS), provides an opportunity to ensure accurate and consistent data for use, improves reports.
What Benefit: Elimination of redundant data and operations **How:** Modules access same data from centralized database system. This avoids multiple data input and update operations.
What Benefit: Delivery and reduction of cycle times **How:** Minimizes retrieving and reporting delays. Improve on time delivery.
What Benefit: Cost reduction & improved effectiveness **How:** Time savings, improved control by enterprise-wide analysis of organizational decisions. Improved the overall business processes and practices.
What Benefit: Easy to adapt **How:** Changes in business processes easy to adapt and redesigned.
What Benefit: Improved scalability **How:** Structured and modular design with "add-ons" to respond quickly to meet the new business demands.
What Benefit: Improved maintenance **How:** "Vendor-supported long-term contract as part of the system procurement".
What Benefit: Globalization **How:** Extended modules such as Supply Chain Management, online procurement, and Customer Relationship Management.
What Benefit: E-Commerce, e-business **How:** "Internet commerce, collaborative culture".
What Benefit: Competitive Advantage **How:** May provide a strategic advantage over competitors.

Also companies need to over-come certain problems and disadvantages of ERP systems, which are listed in Table 2.2 (Davenport, 1998; Rashid, Hossain and Patrick, 2002; Trehan, 2005).

Table 2.2: Disadvantages of ERP systems

Disadvantages of ERP Systems
• **The implementation itself is very "time – consuming"**
• **Expensive to purchase, even more costly to customize**
• **Implementation may require major changes in the organization and its processes (Conflicts with Business Strategy, Employees Resistance to Change)**
• **Vendor Dependence (Conflicting with Vendors)**
• **Too many features and so complex**
• **Lack of integration between the various components of the ERP system**
• **Integration problems**
• **Over budget and late projects**

High cost of implementation of an ERP system is a critical issue. In USA the estimated range of cost is between $400,000 and $300 million (O'Leary, 2000). The total cost of ownership is a staggering $53,320 per user. For companies that have implemented ERP packages there are also significant hidden costs such as training, integration and testing, data conversation, waiting for ROI, etc. (Andreu, Sieber and Valor, 2003; Les Pang, 2001).

2.4 ERP IMPLEMENTATION

ERP implementation is "a complicated large-scale project has far-reaching strategic and organizational implications", and may turn into a nightmare easily for implementing organizations (Davenport, 1998, Xue, Liang, Boluton and Synder, 2005). The main elements of an ERP implementation are: (1) "the core transaction system", (2) "packaged decision support applications provided by the ERP vendor", (3) in-house or outsource application, (4) "a collection of tools for managing various aspects of the system" (Les Pang, 2001; Yingjie, 2005). Using, the accelerated implementation techniques used by an ERP vendor (SAP) consultants, as a guideline, implementation steps are listed below (Hartwig, 1999; Prince, 1998):

- Project preparation – Review and refine the implementation strategy of the firm, organize the project team, prepare project plan, define the system landscape strategy, identify technical demands, select the hardware & database vendors and gain consensus among stakeholders.

- Business blueprint – Develop system environment, create the technical design and, based on this design, configure the ERP software.
- Realization – Based on the requirements, tests the software, install the production system and start planning the data migration strategy from the legacy systems, and create reports.
- Final preparation – Check the system settings and quality test the system throughput for key business processes and establish a help desk (productive system administration).
- Go live and support – Start the production system, ensure its availability (provide production support), monitor key business processes, optimize system use, manage the help desk and define the long-term plan, follow up training.

There are some ways to execute ERP systems. One extreme is the "big bang" implementation that "involves having all modules at all locations implemented at the same time" (Les Pang, 2001). There is no need for temporary interfaces. In this approach, advantages are defined as low risks, no going back, lower costs, cross-module functionality, etc. (Yingjie, 2005). The other extreme "phased" implementation is "when modules are implemented one or a group at a time, often a single location at a time". Benefits of this approach include: peak resource requirements, an ability to focus on a particular module, availability of existing legacy systems, reduced risk, and project manager can demonstrate working system. The wave approach, parallel implementations, and instant cutovers (flip-the-switch) are the other implementation approaches (Les Pang, 2001; Yingjie, 2005).

Single Package and Best-of-Breed…

ERP system can be implemented using all modules from one vendor, or by selecting individual modules from different vendors.

Single package implementation involves "the installation of the full suite of a vendor's ERP software" (Les Pang, 2001). To take the advantage of "standardization", applications from one vendor and "high interoperability among modules" are some of the advantages under this approach (Les Pang, 2001; Rossi, 2003).

Best-of-Breed implementation involves selecting modules from different ERP vendors that meet specific needs in each area and integrate. Disadvantages of this approach include: (1) “higher cost”, and (2) “incompatibility among modules”. Advantage using Best-of-Breed solution is “to use best application for each supply chain function” (Les Pang, 2001; Rossi, 2003).

2.5 ERP IMPLEMENTATIONS IN TURKEY

According to “M.F.Yegül and B.Toklu”’s study, “Implementations of enterprise resource planning (ERP) systems in Turkey”, it is possible to say enterprises in Turkey are not far behind in adopting ERP systems. After larger firms were the first to move to ERP systems, small & medium-sized - sized enterprises (SMEs) have followed them. Also local ERP software providers have tended to owned market share in ERP environment. The modules implemented in various organizations in Turkey such as finance, sales & distribution, manufacturing, project management, human resource, customer relationship management, supply chain management, etc.. The study results showed that the most widely implemented module is financial accounting. The companies that had installed a packaged ERP software system reported successful ERP system implementation experiences were significantly more likely to have been successful with taking right decisions, to take the advantage of inventory and cost reduction. “Employees resistance to change” was the one of the major problems the companies faced during and after ERP implementation (Yegül and Toklu, 2005).

2.5.1 ERP Market Conditions in Turkey

In 2001, estimated Turkish ERP market size was about 40 million dollar. SAP was the leader of the market with its 8 million dollar incoming (table 2.3). Many company waived their investments due to the crack-up in 2001 and that had caused the reduction of the ERP market.

After two years, the growing in the Turkish ERP market began again. Following that growing rate, the prices decreased with the crack-up in 2001, began to increase and the investments started to continue.

Table 2.3: ERP sector in Turkey

Firm	2001 sales (US$ milyon)
SAP	8
IBM Türk	5,7
Logo	4,6
Oracle	1,8
Likom	1,6
Meteksan	1,5
Byte&Muhsinoğlu	1,5
IAS	1,5
Bilişim Sanayi	1,3
Koç System	1,1
Link	1,1
Others	11,9
Total	41,6

Resources: Bilişim 500, Netsis

2.6 ERP FAILURES

ERP systems are complex and their installation requires large investments in money, expertise and time so the difficulties (such as cost overruns, implementation complexity, the wrong ERP selection) and high failure rate in implementing ERP systems have been widely cited in the literature (Davenport, 1998; Trehan, 2005).

According to a Standish Group[1] 2004 research on ERP implementations, most ERP implementations today result in cost and schedule overruns – 53%.

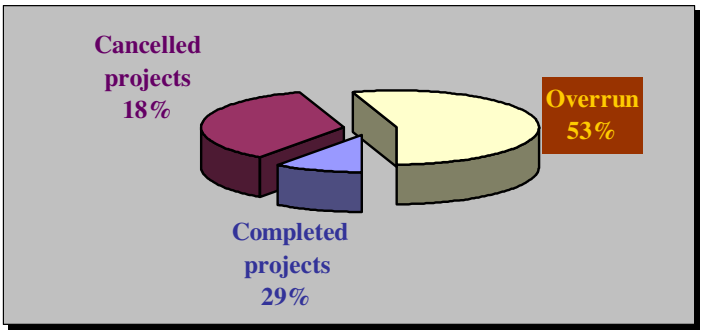


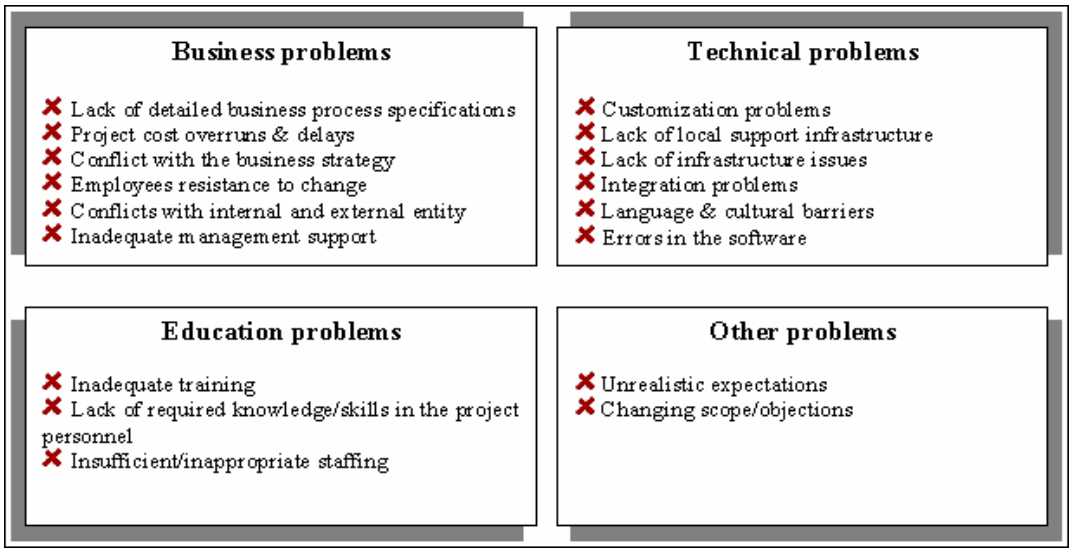
Figure 2.4: ERP projects failures and successes

When the causes of many problems during & after ERP implementation are further examined, it can be said, "the technical challenges are not the primarily responsible for failure of ERP systems but the biggest problems are business problems"

[1] (http://www.standishgroup.com)

(Trehan, 2005). The following are other causes cited for failed ERP projects are shown in Table 2.4 (Macris, 2004; Themistocleous, Irani, O'Keefe and Poul, 2001; Trehan, 2005).

Table 2.4: The drawbacks during & after ERP implementation



2.6.1 ERP Horror Stories

The horror stories we heard in the private sector about ERP can usually serve as important experiences, keeping other firms from falling into the similar traps. Here are the ERP failures at Volkswagen, Hershey Foods, FoxMeyer Drugs, Whirlpool and W.W.Grainer in details (Les Pang, 2001; O'Brien, 2001).

- Volkswagen – In spring of 2000, after turning on SAP AG's R/3 software in its central parts warehouse, Volkswagen AG had trouble. The shipping of parts to dealers was taking more time than expected (significant delays in parts shipments), and caused product inventories to build up to costly levels.

- Hershey Foods – Hershey Foods Corp.'s after installing the R/3 & other applications faced a various problems during its most profitable season in the US – Halloween season. Shipments were not getting in time to the warehouses, Hershey could not find a way being faster and that caused a 19% in earnings. FoxMeyer Drugs – Before it declared bankruptcy in 1996, FoxMeyer Drug Corporation was the fourth largest wholesale drug distributor in the United

States. The project failure was the result of poor change management and disorganized project management.

- Whirlpool – Whirlpool suffered delays in shipping product after it started with an SAP system implementation. ERP implementation crippled shipping system, leaving appliances sitting in warehouses and stored with six- to eight-week delays for shipping orders.

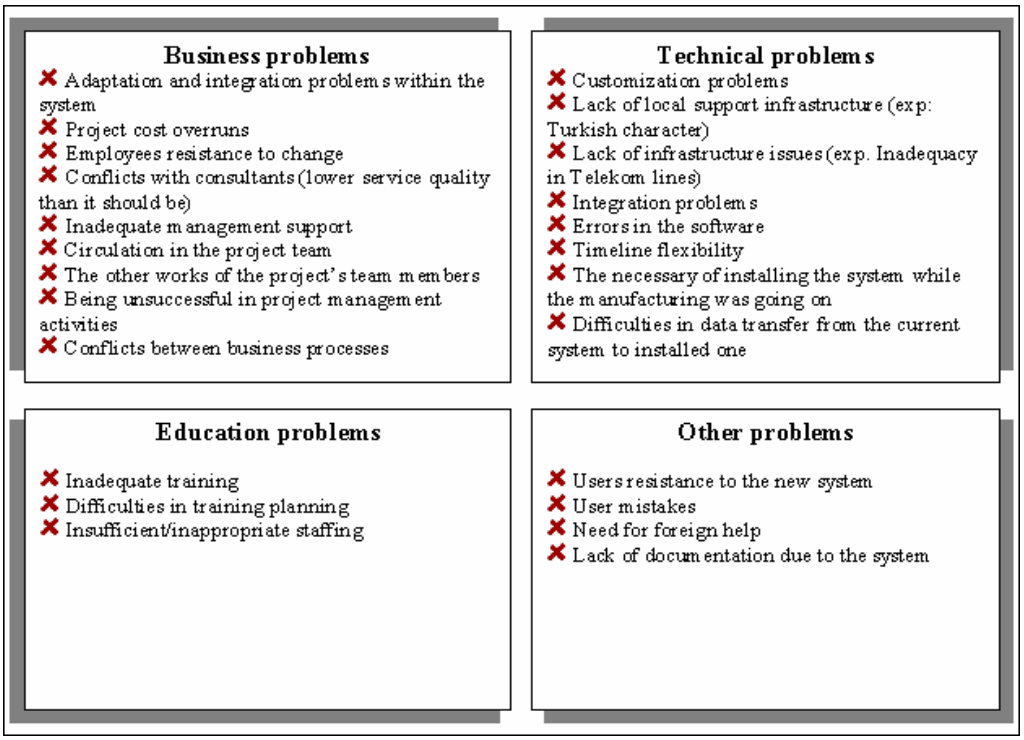
- W.W.Grainger - W.W.Grainger, a company that sells manufacturing supplies and spare parts installed SAP AG's R/3 software into the system in spring 1999. For W.W.Grainger the problem was that the ERP software was counting more than were actually on hand in the warehouses. It has cost Grainger over $35 million by the end of one year.

2.7 ERP FAILURES IN TURKEY

In fact, the studies / paperwork in the literature are not enough to give a general view about "ERP implementations in Turkey". Yegül and Toklu (2005)'s study, is one of those. In their research the data gathered from only 13 firms, so this study is very far to reflect ERP reality in Turkey as a whole. But it can be able to give some information about the approach of Turkish enterprises to ERP system applications, expectations of them, their benefits from ERP, and problems & disadvantages of ERP.

According to survey results in "M.F.Yegül and B.Toklu" 's study, the drawbacks that the organizations faced during ERP system installation and after ERP installation completed and the new system had begun to run are showed in Table 2.5 (Yegül and Toklu, 2005). It is possible to say from the table 4, for the companies in Turkish market; exactly same challenges are mentioned with the worldwide enterprises.

Table 2.5: The drawbacks during & after ERP implementation (in Turkey)



2.8 FUTURE OF ERP

Today's business, ERP is still evolving - "adapting to developments in technology" and the demands of the growing market. Here are four important trends that are shaping ERP's such continuing evolution: "improvements in integration and flexibility", "extensions to e-business applications", "a broader reach to new users", and "the adoption of Internet technologies" - such as Internet & WAP (Mello, 2002).

Because of the growing competition, vendors need systems that support e-business transactions. ERP software providers now include the five new e-business applications in their systems to accommodate this e-business trend (Janstal, 2000):

(1) E-commerce: "E-commerce is the use of computer networks, primarily the Internet, to buy & sell products, services, and information" (Heizer and Render, 2001). E-commerce sites & back-office systems (financial, manufacturing, inventory & supply, etc.) integration enables firms to present "a unified image" to their trading clients and partners. Without this "continuity", clients cannot be sure that the firm is managing its information well so it will not be possible to

make customers to have the "sense of security and trust" while conducting business on a Web site (Janstal, 2000).

(2) Supply chain management (SCM): SCM "is a concept that has flourished in manufacturing, originating from Just-In-Time (JIT) production and logistics" (Vrijhoef and Koskela, 1999). SCM is also a process-oriented, integrated approach to "designing, developing, optimizing and managing the internal and external components of the supply system" (Spekman, 1998). Those components include sup-suppliers, suppliers, trade & retail customers, and end-users (Metz, 1998).

(3) Advanced planning and scheduling (APS): APS software system that uses intelligent analytical tools to perform finite scheduling and produce realistic plans. APS system can be helpful tool in "dynamic environments", because of its several benefits. One of those is that it has "the advantage of being really fast in recalculating the plans whenever necessary" and another it "facilitates the combination of information of multiple sites and that it calculates an optimal plan for a complete supply chain" (Eck, 2003).

(4) Customer relationship management (CRM): CRM "is strategically managing all interactions between an organization and its customers in an effort to help the organization achieve its overall mission". CRM provide those interactions by making the firms to gather knowledge about their customers, their needs, and values (Rashid, Hossain and Patrick, 2002).

(5) Business intelligence (BI): BI is a decision support tool "refers to a broad category of analytical applications that help companies exploit the data in their systems". Today, ERP software providers include such BI applications in their offerings to be efficient "analyzing the volumes of transactional data gathered by the ERP system" (Janstal, 2000).

Those are the next generation of ERP tools that “better support” internal & external collaboration, real-time or near real-time data access, have more industry-specific requirements and gain competitive advantage for companies (Janstal, 2000).

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

In this research, I decided to use interview method to collect information about "ERP Applications in Turkey". Due to that aim, I had tried to make interviews with some of the ERP software providers in Turkish Market. I believed that, these vendors' ERP experience and conclusions due to their analysis in their ERP projects, would give my study a professional vision with better understanding of "ERP implementations in Turkey".

3.2 INTERVIEW

Following this idea, for the interview I prepared 29 questions and grouped them in 6 main categories. I determined these categories according to necessary information that I need to get for my study. Here are the categories in titles and the explanations of their necessity.

- "General knowledge about the software providers (ERP oriented)": In order to define the vendor and get information about them in details,
- "Provider's conclusions for current Turkish ERP market today (competitors oriented)": In order to understand the current ERP conditions in Turkey,
- "Provider's view about ERP": In order to understand "why ERP is necessary in Turkish business market" with its reasons,
- "Software provider's ERP applications": In order to get detailed information about vendor's ERP Installation methodology, project plans, etc.,
- "General knowledge about their customers": In order to understand customers' needs and problems, their knowledge about ERP, etc.,

- "If the software provider gives service both large firms and SMEs": In order to find out are there any differences between large firms and SMEs in installing ERP software packages to their customers.

3.2.1 Interview Questions

- **General knowledge about the software providers (ERP oriented)**

Question 1. As a software provider, how long have you given ERP service to the firms in Turkey?

Question 2. Could you tell shortly about ERP service that you give to your customers?

Question 3. What are your products that your ERP service includes?

Question 4. Which type of sectors do you provide solutions in ERP area? (automotive, chemical, textile, etc.)

Question 5. Could you provide special solutions to various kinds of specific industries?

Question 6. Are there any special project applications for the organizations?

Question 7. What is your market share in the market?

Question 8. Which of them does your software provide solution for, large firms, medium-sized enterprises, and small enterprises?

Question 9. What are the possible reasons that organizations have chosen you and your service?

- **Provider's conclusions for current Turkish ERP market today (competitors oriented)**

Question 1. What do you think about the current situation in Turkey in ERP software area?

Question 2. By thinking your other rivals in the ERP market, how do you estimate your position between them?

Question 3. How do you get knowledge about your rivals and their activities in the market?

Question 4. What do you do to take the competitive advantage in the market?

Provider's view about ERP

Question 1. How could you list the possible reasons of the organizations' ERP software needs?

Question 2. Why are the ERP system installations necessary?

Question 3. Could you estimate ERP systems future in Turkey by your sight?

- **Software provider's ERP applications**

Question 1. Could you give shortly information about your ERP software package, its processes and advantages?

Question 2. During your ERP software installation, what are the elements that you are especially careful with?

Question 3. By thinking your ERP software installation all stages, how could you estimate your success rate generally?

Question 4. Is there any project plan that is applied during your ERP software installation?

Question 5. Could you make estimations generally about the costs that the organizations have to pay for ERP systems?

- **General knowledge about their customers**

Question 1. Before starting an ERP project in any customer firm what kind of structural specialties should be provided?

Question 2. Are the customers in Turkey sure about ERP system and its advantages?

Question 3. Mostly which modules of your software do the customers prefer?

Question 4. Could you tell about your customers' profiles? (from which sectors they are?)

Question 5. How many percentages of your customers are able to use your existing ERP software package will its all modules?

Question 6. What kind of problems do the organizations come with, to take service by you?

- **If the software provider gives service both large firms and SMEs**

Question 1. According to the capacity of the firms, how do the ERP installation steps show difference?

Question 2. Could you give suggestions for SMEs about what they should be careful with before making ERP investment.

3.3 HOW DID I CONTACT THE VENDORS?

With the idea of getting qualified information from the software providers, I tried to make contacts especially with the dominant and the professional ones in the Turkish ERP software market. According to that purpose, for seeing the conditions by the global

software providers' sight I made interview with "Oracle" and "Microsoft Business Solutions". In addition, for seeing the conditions by the local software providers' sight and for understanding their situation in Turkish market, I made interview with "Senkron", "LOGO Business Solutions", and "UyumSoft Information Systems".

My first contact is "Binsal" which is the solution partner of "LOGO Business Solutions" and has partnership with Microsoft's solution partner "UYD" (Application Software Consultancy). So Nevzat Saldanlı, one of the Binsal's owners, was able to give me information for both two software providers and their ERP applications – Logo Unity and Microsoft Axapta.

I made the next interview with Funda Karaşoğlu who is the Business Application Sale Director in "Oracle". She told me about Oracle's e-Business Suite applications and Oracle's initiatives for entering SMEs' ERP market in these days.

I continued making interview with another local vendor "UyumSoft Information Systems". Sale and Marketing Director, Binnur Berber helped me to understand, "how local firms have begun to improve in ERP system applications and increase their proficiency in that area.

My last contact "Senkron Information Technologies" is one of the 15-20 firms that enter KOSGEB's provider list and Erdal Özkan, general manager, told me that it is an important preference reason for SMEs. I made all interviews face-to-face form and by recording conversations I took the advantage of getting more and detailed information.

3.4 GENERAL INFORMATION ABOUT SOFTWARE PROVIDERS

3.4.1 LOGO Business Solutions (www.logo.com.tr)

Logo Group is the Turkey's largest independent software group with, %60-market share and is also the first public IT Company listed on İstanbul Stock Exchange with, 2,000 business partners and with an installed base 135,000 packages.

Started with improving accounting applications for small enterprises in 1984s, Logo has grown into a "corporate international provider" of business applications in the

global market. Logo has several “best practices, ERP and Supply Chain Solutions” tailored on various specific industries and also gives support for them such like textile, automotive industry, construction, etc.. As “special project applications” for the organizations Logo Business Solutions gives “implementation consultancy” service and studies on turn-key development projects. Their success in applying project is about 100 percent. “Istikbal”, “Telekom”, “BIS Gömlekleri” are the samples of Logo’s important successful projects.

Being a local software provider and having many high qualified & professional solution partners comprise Logo’s the most important corporate asset and the competitive advantage. However, in the other sight, Logo’s development tools are not in dynamic structure enough for its solution partners. Partners could make changes on Logo’s tools only in defined area, after that point they are not be able to make any customizations.

“Unity” is a comprehensive ERP solution of Logo, which is designed for especially big organizations like manufacturers, wholesalers, retailers, service industry and governments. For the small enterprises, “Tiger” is another possible ERP solution of Logo. Unity handles all aspects of firms’ business along the “Supply, Production, Sales, and Delivery” axis. By that powerful way, it runs firms’ business processes “in a modular structure”.

Logo offers technical support services “24 hours a day and 7 days a week” for technical guidance service. If solutions cannot be provided over the phone “0n-site support” is offered.

3.4.2 UyumSoft Information Systems (www.uyumsoft.com.tr)

During 1996s, Uyumsoft has taken its place in the market as an ERP software centered provider. Their mission is to be the leading software vendor and to provide productivity and profitability solutions for enterprises in manufacturing sector by using ERP systems. Uyumsoft makes special investment on Business to business (BtoB) activities and on research and development (R&D) due to its mission.

Uyumsoft's 65 personnel are mostly administrators and industrial engineers. Uyumsoft wants to take the advantage of providing high number of personnel to each project team. They give professional implementation consultancy service to their customers and they are assertive in this area. Uyumsoft's customers are mostly small and medium-sized enterprises. Gold Bilgisayar, Tuna Mobilya are some of them.

Uyumsoft's modules are grouped in 7 categories; (1) Manufacturing Management, (2) Human Resources and Payroll, (3) Financial Management, (4) Maintenance Management, (5) Foreign Trade, (6) Budget Forming and Control, (7) Material and Sale Management.

In their applications, Uyumsoft provides 6-12 months guarantee term after the sale to the customers. By providing service, Uyumsoft's priority aim is to solve problems with not going to customers, to be able to solve them by using technological ways efficiently. So following the maintenance agreement, Uyumsoft continues to give services to their customers such as, telephone support, on-line support, etc.

3.4.3 Oracle (www.oracle.com)

Oracle is the world's second-largest software company that has over 33,000 employees and is located in 145 countries (DeWitte and Jung, 2001; Kovar, 2002). According to its growing strategies in the ERP market Oracle acquired PeopleSoft, J.D.Edward and Siebel. Nowadays, with the new existing products Oracle becomes the leader software provider in CRM and SCM application areas. Moreover, Oracle is the number one in Internet applications.

Oracle Applications (Oracles ERP system), includes more than 100 various modules in six major categories: (1) finance, (2) CRM, (3) human resources, (4) manufacturing, (5) supply chain, (6) projects and front office (DeWitte and Jung, 2001). Oracle is both a partner and a competitor to other firms in ERP market such as SAP, PeopleSoft because of the usage of Oracle relational database management system in their ERP systems (DeWitte and Jung, 2001; Les Pang, 2001).

Its five powerful products: (1) Oracle 10g Database, (2) Oracle 10g Application Server, (3) Oracle e-Business Suite 11i, (4) Oracle 10g Collaboration Suite, (5), Oracle 10g Developer Suite.

Oracle's whole modules work as the part of "Oracle E-Business Suite". Oracle E-Business Suite is a fully integrated, complete suite of business applications for the enterprises. It is a kind of "Specially packaged edition", for mid market companies. By its "industry-specific functionality", it is possible to meet industries' unique requirements.

"Oracle Metalink" is Oracle Support Services premier web support services available (24 hours a day, 7 days a week) free to Oracle customers with current support contracts.

3.4.4 Microsoft Business Solutions (www.microsoft.com)

Microsoft Business Solutions, a part of Microsoft, "offers a wide range of integrated, end-to-end business applications and services designed to help small, medium-sized and corporate enterprises become more connected with clients, employees, partners and suppliers". The aim of Microsoft Business Solutions' applications is to optimize strategic business processes across financial management, manufacturing and retail management, human resources management, CRM, project management, SCM, e-commerce, etc. Those applications are "designed to provide insight to help customers achieve business success". Their successful applied projects are "Adel Kalemcilik", "Trabzonspor", "Çelik Motor", "Total Oil".

Microsoft Business Solutions – Axapta, a customizable, scalable and global Enterprise Resource Planning (ERP) solution that is designed to help large and medium-sized companies improve "sales, finance, human resources, and other various business operations". Key specialty of the Axapta solution is, providing customers with a fast and powerful way to gain a competitive advantage. Especially in pharmaceuticals industry "Axapta" can beat other providers because they "have structured the ability to attach many bills of materials to the same part number". The average size of an "Axapta deployment is 120 users, with a low of 35 and a high of 800".

Microsoft Business Solutions – Navision, is the other business management solution of Microsoft that is designed mostly meet the certain needs of the small and

medium-sized enterprises. It includes a wide range of integrated business functions such as finance, supply chain management, e-business, etc.

3.4.5 Senkron Information Technologies (www.senkron.net)

Senkron is a software vendor that has given ERP service to the organizations since 1996. In ERP area, Senkron provides to its customers services such as process documentation, process revision, training and support services. Sale Management, Material Management, Manufacturing, Maintenance Management, Customer Relationship are the major modules that belong to Senkron's ERP software package.

Senkron mostly gives ERP services to "textile" and "cable" sectors. With their software's measurable structure and its suitability to ERP standards, Senkron provides solutions both large firms and small and medium-sized enterprises.

In the market, Senkron provides industrial special solutions with "Senkron ERP" to their possible customers. By making detailed analysis to get information about each sector, Senkron is able to decrease total owned costs, and provide customers competitive advantage. Senkron is one of the 15-20 firms that enter KOSGEB's provider list. It is an important preference reason for SMEs also.

CHAPTER 4

ERP SYSTEMS APPLICATIONS METHODOLOGY

4.1 APPLICATION OF ERP TO AN ORGANIZATION

According to the interviews with five vendors, enterprise resource planning software or ERP systems are computer-based systems that are designed to

- make it possible for an organization to follow all its business processes,
- standardize the processes,
- provide organizations to take the advantage of system control ability,
- and make it easy to collect the data and provides their analysis.

ERP is an integrated approach that has a huge impact on both the information technology and business world. Today ERP affects most major organizations in all around the world and even sometimes small and medium-sized enterprises.

The reasons of ERP systems development and their huge growth rate today could be summarized such as below:

- Globalization and international competition
- New possibilities that information technology provides
- Widespread and more active usage of international distribution chains
- The need of best management and control of organizations with high number of foundations
- The changes due to the competition in product and manufacturing politics
- Various kind of manufacturing systems

4.1.1 Selecting an ERP System

The first step of the top-level realization of the benefits provided by ERP solutions to business corporations is to choose correct solution. At the ERP projects put into practice until recently, the most important characteristics of the organizations hold the success is to choose the most suitable solution to their own structure, technology and corporational targets. Make an error on selection of solution gives not only high-level time and money loss but also many disturbances in life after the system installation. In such a project, living difficulties/drawbacks at each phase causes decreasing operational productivity and increasing cost even if prepare situation where operation totally comes stop point. Because of that reason during an ERP system selection, a systematic way could be followed and the most suitable solution could be determined in requirement framework.

Whether ERP or another enterprise solution selection could be decided in a definite methodology and systematic way. A comprehensive methodology contains a period, which starts from determination of corporate goals to different parameters of solution (Microsoft, 2006).

Phase 1: Determination of processes in the organization

Today, many enterprises get in difficulty to see totally their jobs. Especially in medium-sized enterprises, the intensity of routine work and effort to keep in pace with continuous changes cause increases in operational activities and narrowing of strategic view points. At that point, before evaluation of enterprise solution, especially small business corporations should describe their processes clearly. After that point, answer to question, “Why an organization needs a solution” could be given clearly.

Organizations need new solutions because of the following reasons:

- Insufficiency of business functions,
- work force and process number increases after development and growing ,
- insufficiency of performance on current system.

At this stage, fundamental questions taken in the account for the organizations are:

- What are our expectations from new product or new system?

  Such as,
  - We could do the things what we could not do for today!
  - We could do our business cheaper, quicker or with less number of workers!
  - Changes in our business processes should become easy to adapt and redesign!
- Is it necessary to make data migration from current system?
- How will the new solution influence existing environment?

Phase 2: Evaluation of targets

Each organization works for definite aim and targets, and develop strategies to reach them. Really, the project's whole picture hides in these aims. For this reason, organizations summarize their requirements in the future if they put in front where they stand today and what they want to do in the future. After that, in organizations targets frame, when the needed solution goes live, budget situation and decision about that solution will be developed inside organization or outsource, can be made easily.

Phase 3: Evaluation of ERP Firms (Vendors)

Guaranty and success of a solution is the "Vendors". ERP projects come into scene up to date fail because of continuity and support insufficiency of vendors. Keep in mind that, ERP will become integrated part of organization and because of this ERP must be considered strategically. For this reason, vendor that offers ERP solution has also long term and continuous increase in support.

In the light of this information, vendors' strategies, long-term targets, sectors focused on and accumulation of knowledge about this sectors and distance are factors considered in solution selection.

By taking Oracle researches as reference, here are the possible ways that customers come to "the vendor" for solution.

- With their partners recommendations.
- With their consulting firms suggestions.
- With getting information about successes of vendor's ERP systems implementations in other firms.
- With special organizations, important events that are made by the vendor to introduce their products & services.
- With customers' trust to their vendors – being a vendor's database user & technology customer and want to go on with the same vendor.

Phase 4: Evaluation of determined solutions

After requirements come into scene and targets are clear, evaluation of alternative solutions' phase starts. In this phase, organizations try to determine the best solution from the alternatives on the market. More definite criteria and questions are necessary during process.

As define solution alternatives, first it is necessary to look whether the solution is suitable for organization's capacity and growth in the future. Transaction volume and number of workers are parameters in evaluation process. In addition, all necessary functions must exist in the ERP solution. On the other side, ERP solutions should be work together with other applications.

Which ERP Package does an organization select? – In general, four factors that have been used during the selection of which "ERP package". Those factors are: (1) functional capabilities, (2) technical attributes, (3) partnership and (5) cost and also the ERP package, an organization will select should be based on those factors. Detailed specialties include the following in Table 4.6 (Kovar , 2002):

Table 4.6: Factors that have been used during the selection of an ERP package

Functional capabilities	**Technical attributes**
▪ The ERP system's functional fit with the organization's business processes – functionality ▪ Degree of integration among components of the ERP system – integration ▪ Flexibility & Scalability ▪ Quick implementation – shorter installation time ▪ User friendliness–providing easier-to-use systems ▪ Ability of supporting multisided planning and control	▪ Client-server capabilities ▪ Database independence ▪ Security ▪ Reliability ▪ Versions of software ▪ Capacity & Standards
Partnership	**Cost**
▪ Availability of regular upgrades - upgradeability ▪ Amount of customization required ▪ Local support infrastructure – support ▪ Future prospects	▪ Implementation ▪ License ▪ Maintenance ▪ Training ▪ Customization ▪ Hardware requirements ▪ Updates

Determining the best solution from the alternatives on the market is very critical for an organization. So in that part "12 steps process" should be applied. Here are the steps listed below (Baksak, and Cetişli, 2004; Kimberling, 2006):

1. Create vision: At the beginning of the "ERP project preparations", the project's targets and goals should be determined in parallel with the company's strategies.

2. Create characteristic/function list: The characteristics and functions of the ERP solution should be determined to match the company's needs. It is necessary to look whether the solution is suitable for organization's capacity and growth in the future.

3. Define general ERP packages and form a vendor list: Based on the company's business requirements and budgetary needs, to recommend arriving at a group of no more than 8-10 "long-list" vendors that the company will assess.

4. Make the “short-list”: Once the "long-list" has been identified, determine the key requirements that a package must have in order to make the short-list. Reduce the number to 4-5.

5. Improve suggestion & examine the offers again: Conduct a more detailed assessment and analysis of the short-listed vendors.

6. Select two or three finalists: According to their solutions’ technical capabilities selecting two or three finalists from the short-listed vendors.

7. Accept the finalists’ presentations: Accepting demo scripts that each vendor is demonstrating their product as it relates to the company’s business processes.

8. Select the best one: Due to “how well each of the ERP packages meets the company’s business requirements”, selecting the vendor software that is right for the organization.

9. Confirm the investment: Making an initial contact with the selected vendor and confirming the investment.

10.Haggle over the contact: Especially making meeting about the cost of ERP implementation and installation conditions with the vendor.

11.Perform pilot implementation: Before implementing ERP solution to the organization completely to see how the new system is going on making a pilot application. This helps minimize risks associated with large implementations.

12.Approve the selection: After the pilot application, if every thing goes right approve the ERP solution and implementing the new system to the organization.

Phase 5: Evaluation of integrator

Even if the vendor is strong and successful, the integrator/solution partner/ consultancy firms, which apply ERP in organization, must have necessary structure for this job. Because this integrator is the only part that works in organization like its department and stand up in business by coordination.

What exactly are the “Partners/Integrators”? - Enterprise resource planning (ERP) firms do not implement all the software they sell or do not give consultancy services. They typically work with a wide range of partners in order to implement the software instead of them. For example, Oracle has two types of partners:

1. Group: The partners that provide services to customers with Oracle E-Business Suite modules – following Oracles ERP system’s implementation methodology.

2. Group: The partners that provide extensions to some of the Oracle’s modules such as “Payroll”, which are not in Oracles ERP systems applications structure but are needed in customers’ systems.

The partners are an important case because they indicate a rapid growth in the number of consultants. As noted in the interview with Nevzat Saldanlı, having many high qualified & professional solution partners comprise LOGO’s the most important corporate asset and the competitive advantage.

During integrator evaluation, here are the important parameters to thinking about:

- References of integrator,
- The history of cooperation with ERP software provider,
- Knowledge level,
- Sectoral experience,
- Being one of the firms that enter KOSGEB’s provider list (special parameter for SMEs)
- Project management and implementation experiences of the integrator.

Phase 6: Evaluation of Support and Services

Always keep in mind that ERP solution is a long-term investment. Because of this, importance of support and services that are needed in time are very important. What kind of support programs that is owned by software provider, in which ways these support and services are given and methodology used is important topics.

Phase 7: To take notice of the hidden costs

While selecting and practicing an ERP software solution, it is also important to take notice of the hidden costs over software and hardware cost. Those are also necessary spent for the new system installation, teaching and durability. Designing and planning those hidden costs will be possible only with a good methodology.

What are the hidden costs of ERP (Andreu, Sieber and Valor, 2003; Chan, 2006):

1. Training: Training is the most underestimated budget item. Training expenses are associated with new interface as well as new set of processes of inexperienced employees. So, the companies have to spend on design and development of new courses, training their own key users and IT personnel.

2. Integration and testing: A typical manufacturing company may have add-on applications like supply chain, bar coding, logistics and e-commerce. All require integration links to ERP. “As with training, testing ERP integration has to be done from a process-oriented perspective”.

3. Customization: Because of being so tightly linked together the customizations can affect every module of the ERP system. The company will have to use extra staffers to do the customization work, and to maintain it.

4. Data conversion: It costs money to move associated information-such as customer and supplier records, product design data-from old systems to new ERP system.

5. Data analysis: For analysis purposes it is necessary that the data from the ERP system must be combined with data from external systems.

6. Consultants ad infinitum: Improper disengagement planning may allow the consulting fees to run wild. To avoid this, organizations “should identify objectives for which their consulting partners must aim when training internal staff”.

7. Replacing your best and brightest: It is accepted opportunity that ERP success depends on staffing the project with the best and brightest from the business. The ERP software is too complex and “the business changes too dramatic to trust the project to just anyone”.

8. Implementation teams can never stop: Companies could not afford to send their project team members back into the business because there's so much thing to do after the ERP software is installed. "Just writing reports to pull information out of the new ERP system will keep the project team busy for a year at least".

9. Waiting for Return on investment (ROI): The organization management expects to gain value from the ERP application as soon as it is installed. This does not apply to ERP. Most of the systems don't reveal their value until after companies have had them running for some time.

10. Post-ERP depression: When users can not do their jobs in the familiar way and haven't yet adapted the new system, they panic, and the business goes into spasms. That is why; ERP systems often cause chaos in the companies that installed them. It is very important to help the users who are supposed to protect and develop the new system to understand the conceptual framework of the new system. User training will become an important issue in this context.

Phase 8: Planning the Future

In long-term solutions, it is important that not only today's requirements but also tomorrow's requirements must be considered in layout of organizational strategies. For this reason it is necessary to keep attention on subjects:

- How ERP solution support organization needs
- How long ERP solution support organization needs
- How ERP adopt itself when number of users and transactions are increased
- How new modules of ERP integrate to the system
- How updates of ERP put into application (go live)

In addition, more important than above subjects, the vision and mission of ERP software provider about own ERP solution must be thought carefully.

4.1.2 Preparing the Organization to an ERP Implementation

After deciding to implement ERP and also install an ERP software package to the organization, it is very important to prepare the organization for the implementation. The following steps should be considered for a successful ERP implementation.

Step 1: Top Management Support and Believe

ERP forms a structure that includes an organization's business processes and affects its business strategies. So starting with the top management everybody in the organization should believe necessity of ERP system with its possible advantages and difficulties. Inadequate management support or management irrelevance causes many ERP projects fail. It is every important that after top management approval of the ERP project, they should announce in every department of the organization and gives support.

Step 2: ERP Propaganda

Usually people do not like to change. Before starting an ERP implementation they should be convinced for the needs of the change. With the top management support, in the organization it is necessary to make a positive communication about the subjects that include:

- Why ERP solutions are needed,
- What ERP systems' advantages are,
- How ERP systems are applied.

Step 3: Project Management Approach

The process of integrating an ERP system into the organization's current system is very important. Starting with believe and understanding the project is very critical. To increase the success rate in this period it is necessary,

- accepting ERP implementation as an project
- providing the high skilled personnel to take part in that project,
- following time and cost acts during the project,
- and also periodically report them to the top management.

Other key points in an ERP project are; Project manager's value, identity, view to the project and the time he/she reserves for the project. Project team members' dedication is also carrying importance for the ERP project's success.

Step 4: The coordination between the vendor, customer and user

Due to Nevzat Saldanlı's interview, while applying an ERP software package in an organization's system, it is very important to think in the "3 Brains" structure for being successful. Other way ERP solution would be nothing more than a very expensive accounting system. During the ERP projects and periods after their installation, the coordination between those three important players (vendor, customer and user) and culture agreements & trust between them would bring the success to the project. In Figure 4.5 this concept is shown.

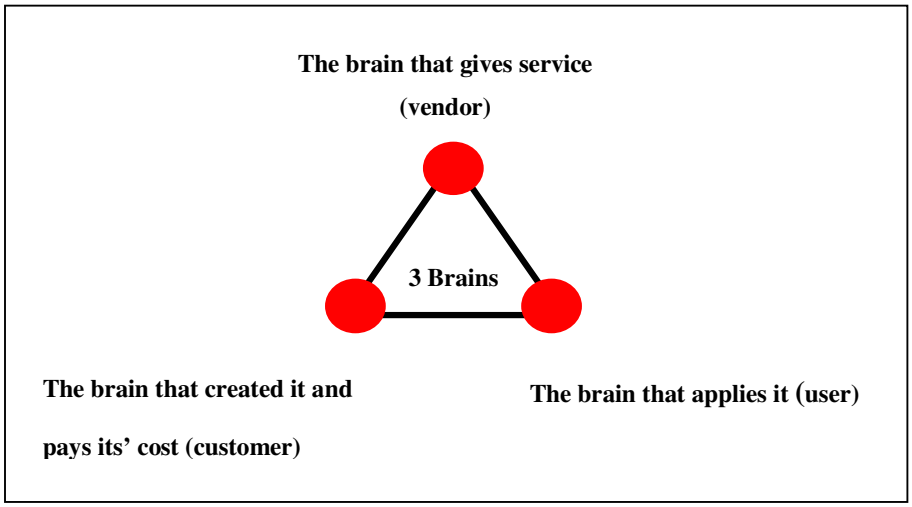


Figure 4.5: Three Brains Structure

Step 5: User Acceptance

In every organization because of the changes, showing resistance to the new system is very common. To minimize that resistance it is very important to make the users who are supposed to protect and develop the new system to accept and trust in it. Also users should be helped to understand the conceptual framework of the new system. User training will become an important issue in this context.

Step 6: Provide qualified data to the new system

In the project team working with the highly skilled and contented people would provide every time the coming data's reality to the project. Because low quality data will directly affect the quality of the output and that will cause loss of trust in the new system.

Step 7: Update the Solution Continuously

Because of the changes in business structure, technological innovations and existing needs ERP solutions always should be updated. By this way, it will make it possible to maximize the projects' value and will bring important savings in ROI area.

4.1.3 ERP Implementation Methodology

Generally, ERP systems implementations are expensive, challenging and time consuming. However, the important cause of facing such kind of problems during ERP projects is, not installing and realizing systematically the period that includes from planning the solution to it goes live. Similar as all other enterprise solutions "ERP solutions" are applications that spread in whole organizations' system and influence all business processes and operating systems. Because of that reason ERP projects will go live faster, safely and more successful if they are based on business realties and strategic base.

An organization has started an ERP application cycle with making critical analysis (identifying the needs, the challenges, etc.) that is necessary to ensure that the organization makes the correct decision regarding ERP. The next step after "deciding to go ERP" is preparing the organization to the new system that has been selected. In this research, this step's phases are mentioned more in detail with "part 4.1.2". Following part in ERP application cycle is the "implementation process".

According to interviews, implementation steps are listed below, using, as a guideline, the accelerated implementation techniques used by 5 ERP vendors (Logo, Senkron, Microsoft, Oracle and Uyumsoft) consultants. Activities comprising the consultancy process are grouped under three headings:

1. Pre-Implementation process
2. Implementation process
3. Post-Implementation process

4.1.3.1 Pre-Implementation Process

This phase consists of "sales-related activities" before the initiation of the implementation project:

1. Initial contact

In that part, according to Nevzat Saldanlı's conclusions it is possible to say that in Turkey many customers (especially SMEs) are generally unconscious about ERP systems applications. At the beginning of the initial contact between vendor and customer, vendor has many difficulties with telling customer their systems' needs and the possible ERP solutions to these needs. Because customers generally think ERP systems, as a set of activities provide development of accounting applications for small and medium-sized businesses.

2. Introduction and preliminary analysis meeting

Especially before starting the project, the vendor tries to get detailed knowledge about their customers. Their aims are;

- to maintain a happy and productive workforce,
- to identify relationships between the employees and the top management,
- to understand the system needs,
- to determine what the customer want from ERP,
- to find out what types of documentation the organization use,
- to answer that what the general procedure is for approval system in the organization.

3. Proposal preparation

4. Contract preparation

5. Project planning meeting

Before ERP system installation, there is need for arranging in both three areas.

- Hardware needs

According to the configuration, user number in the customer's firm and according to the project's needs, system requirements will change. With the minimum standards here are vendors' system requirements showed in Table 4.7:

Table 4.7: System Requirements

Area	Requirements (at least one of the following within each area)
Clients	Microsoft Windows NT Microsoft Windows 2000 Microsoft Windows XP
Server platforms	Microsoft Windows 2000 Server Microsoft Windows 2000 Advanced Server Microsoft Windows NT Server 4.0
Operating systems	Windows NT UNIX
Databases	Microsoft SQL Server, Oracle ,DB, Btrieve
Microsoft Office (only if needed)	Microsoft Office 2000 Microsoft Office XP

- Getting ERP license
- Checking the current project team members

In Pre-Implementation phase, it is also necessary that, after the customer analysis vendor should prepare an introduction presentation to show the customer its current situation and estimations about it. This presentation could be in the power point form or in the demo form. Because customer would be pleasant with the idea, "my vendor really understands my needs and me".

4.1.3.2 Implementation Process

The Implementation Process contains the following sub-processes:

A. Analysis and Design
B. Installation
C. Going live

A. Analysis & Design

i. Basic product training

After that training the vendor tries to see.

- What will the users get from possible products?
- How will the products work?
- How will the extra needs provided?

ii. Basic methodology training

iii. A&D kick-off meeting

The initial kick-off meeting beginning with the group establishing opportuneness, determining who would be responsible for what duties/activities, setting expectations, and they also determined which of the modules would be implemented first.

iv. A&D steps

v. A&D reporting

vi. A&D conclusion meeting

B. Installation

During this sub-process, the system is configured according to the Analysis and Design Report. The steps are:

i. Installation kick-off meeting
ii. Installation steps
iii. Testing

At the end of the testing step, changes are made according to the customer's new requirements about the product.

Funda Karakaşoğlu said, "For an implementation's success, testing the system is very important". Because the drawbacks in the testing step will cause project time overruns.

iv. Preparation of the System Guide

v. Installation conclusion meeting

C. Going Live

This phase of the project includes the activities for switching to the new system for daily use. It contains two steps:

i. Parallel run

This phase involves complete simulation of the new system to validate its performance and also the effectives of interfaces.

ii. Live processing

4.1.3.3 Post-Implementation Process

The Post-Implementation Process includes support services required after setting up and going live with the new system by using the vendor's method. Mostly vendors offer technical support services available (24 hours a day, 7 days a week) free to their customers with current support contracts. If solutions cannot be provided over, the phone 0n-site support is offered. A vendor's support service should be:

- Available 24x7 (24 hours a day, 7 days a week)
- Faster and More Efficient (It leverages the Internet for quick and immediate access to technical support)
- Proactive
- A Global Knowledge database
- No Additional Cost

In their applications, vendors generally provide 6-12 months guarantee term after the sale to the customers. Following that period, a maintenance contract covering the related services is signed and renewed on an annual basis. The agreement will include the following services:

- Monthly system audit
- System Audit Report documenting the audit results and listing new requirements
- Incremental Analysis and Design, Installation and Going Live

4.2 HOW LONG WILL AN ERP PROJECT TAKE?

Organizations that install ERP systems do not have easy time of those. Mostly ERP vendors tell customers about a three or seven month average time for the new system implementation. If the company was a small/medium-sized enterprise, implementation was limited to a defined area of the company, or the company used only a few pieces of the ERP system that 3-7 month period will be true. But if a company want to install an ERP software package with its nearly all pieces, real transformational ERP efforts generally run between two and three years, on average. For small and medium-sized firms that period will be shorter. In here, the most important thing is not focus on time but rather to understand why the company needs ERP and how the company will use ERP to improve its business.

4.3 MAINTENANCE OF AN ERP SYSTEM

ERP projects do not finish with its installation. It is a continuing application that must address new or changing requirements associated with the following (Les Pang, 2001; O'Leary, 2000):

- Changes to system: Making changes in the system parameters as the organization changes. As the company evolves there will be a need for changes in the chart of accounts, etc.

- Training & Documentation: When the ERP system goes live, a review of changes in training and documentation begins, and resources/data can be allocated to where they are needed.

- Various inputs & output management: Managing different ERP input and output requirements (exp., responding to changes in reporting needs).

- Update and maintenance of the system: After ERP system installation in some situations, upgrades to the new system versions must be made so that additional features can be implemented.

- Budget: To support the complete project there must be a budget. Because without budget, there can be no progress and no staff.

- User support: Answering user questions and satisfying their needs.

4.4 WHY DO ERP PROJECTS FAIL SO OFTEN TODAY?

ERP is a set of best practices for performing various duties in an organization, including manufacturing, accounting/finance and the warehouse. However, the profits they yield, ERP systems are complex and their installation requires large investments in money. If an organization not careful with the detail of the ERP project that would cause big loss.

The common drawbacks that the organizations generally faced during an ERP system installation, after it completed and the system have begun to run, are users resistance to the new system and also user mistakes. If an organization is resistance to change, then their ERP project is more likely to fail (Henderson, 2004).

As it known, ERP projects are mostly long-term projects. Therefore, handicaps will be formed with the lack of individual communication and trust between customers and vendors. In this condition, it is necessary to form a group that its members could understand each other clearly and have qualified communication between them.

Here are the 10 possible reasons of unsuccessful ERP system implementations in Turkey according to interviews with the vendors (Logo, Senkron, Microsoft, Oracle and Uyumsoft):

1. Inadequate management support
2. Not determining strategic goals clearly
3. Employees resistance to change

4. Being unsuccessful in project management activities
5. Insufficient/inappropriate staffing
6. Inadequate end-user training
7. The lack of individual communication and trust between customer and vendor
8. Lack of documentation due to the system
9. Customization problems
10. Technical problems such as errors in software/hardware, difficulties in data transfer from the existing system to the installed one, lack of infrastructure issues (exp: Inadequacy in Telecom lines).

4.5 CRITICAL SUCCESS FACTORS

The most important critical success factor in ERP implementation is the top management approval and support for the project. In the ERP project, management resistance is more important than employees. Everybody, including the top management should trust in the new system and should believe the benefits that come from it.

The essential point is the new information system should meet the requirements of the customer. While designing the new information system it must be considered, the organic structure of the organization, its strategic goals and the industry it operates in.

In the project team working with the highly skilled and contented people would provide every time the coming data's reality to the project. Because low quality data will directly affect the quality of the output and that will cause loss of trust in the new system. Other key points in an ERP project are; Project manager's value, identity, view to the project and the time he/she reserves for the project. Project team members' dedication is also carrying importance for the ERP project's success.

Mostly for SMEs, it is too often that user's resistance to the new project. They will compare their existing system with the installed one and think about the old one. User training is an important issue in this context. Users should be helped to understand the conceptual frame of the new system, and helped to know what to expect from the new system besides operational use. To overcome the drawbacks "Investment Consultants" help the organizations (especially the ones that are growing very fast) by giving suggestions about "what they should do for being a well-organized firm".

Table 4.8: Success factors of an ERP project

Technological Factors	▪ Efficient ERP implementation strategy/plan ▪ Choose right ERP software package ▪ Avoid customization ▪ ERP software's integration with other programs
Organizational Factors	▪ Top management support ▪ Efficient project management ▪ User involvement and participation ▪ Project team members dedication ▪ Strong and effective communication inputs and outputs ▪ Trust between vendor and customer ▪ Adequate ERP implementation consultancy ▪ Adequate training and documentation ▪ Formalized project plan/schedule ▪ Implementation time and cost

4.6 ERP FOR SERVICE INDUSTRY COMPANIES

As far as ERP is concerned, companies in service industry were not "in the initial target zone of many ERP vendors, which instead developed products for manufacturing companies". However, ERP packages are increasingly being installed in the service sector.

According to the increasing needs for better direction and management of service companies, operations management (OM) researchers have started to implement "integrated information systems developed in manufacturing sectors". The main possible reasons for ERP implementations in service sector, cited in the literature, are (Botta-Genoulaz and Pierre-Alain, 2006):

• reduce managerial workload;

• replace doubtful finance and materials management systems;

• improve visibility across the entire system;

• The Euro migration: Importance of the currency migration to Euro in European Union. “Information system had to manage two currencies with specific legal rules of conversion and rounding”;

• Investment security – “an important consideration, in particular, among public sector services limited by financial constraints”;

• real-time data processing.

4.6.1 ERP Vendor Solutions for the Service Sector

Many ERP vendors have begun to build ERP functionality that meets the requirements of the service industry. For example, SAP, PeopleSoft, Oracle or Microsoft provide solutions for financial services - banks, insurance companies -, utilities, healthcare, higher education, public sector, wholesale distribution, telecommunications, etc (Botta-Genoulaz and Pierre-Alain, 2006).

When asked the service companies what ERP functions they have operational or they are implementing, “91% mentioned finance and revenue management”. It is also not surprising, since these are applicable across all industries. One functional area that service companies use more than their “manufacturing counterparts” is human resources 73% versus 67%, respectively. At present, many ERP vendors are expanding their offers for the financial services market (Scott and Shepherd, 2002).

4.6.2 What are the Differences between ERP for Manufacturing Firms vs. Service Firms?

For public vs. private sector, some of the issues for manufacturing vs. service are different. Service sector companies do not need inventory management (IM) and manufacturing modules as manufacturing sector, but they “do create a product in the service they deliver”. Service companies may not have some of the complex public sector financial requirements, but they “have strategic assets vital to the delivery of their service, that is, the people they have on staff”. This situation creates the critical need to look at the staff/employee and skill information maintained in human resource modules (Malis,1999).

Another difference between service and manufacturing sector companies is CRM module's usage. In manufacturing sector CRM includes customer relationships, contacts making with customers. In service sector CRM includes sales performance, given proposal, which proposal is in what condition.

4.7 THE REASONS OF TURKISH ORGANIZATIONS ADAPTING ERP SOLUTIONS?

Due to the Nevzat Saldanlı's conclusions about current situation in Turkish ERP market, larger firms such as holding companies had already been adapted to the ERP systems. In the past recent years, because of the necessity of "being fast and current in the sector", those firms had to move to ERP systems. Therefore, for today's business, it is possible to say that mostly small & medium-sized enterprises are in need of more or different software applications like "ERP systems". Larger firms only go to upgrades in their current working systems.

In that condition, because of their high ERP implementation rates to identify and understand the "Small and Medium-sized Enterprises" with their existing applications becomes necessary. And also, searching their reasons of deciding to go ERP and determining the challenges that necessitate SMEs is dynamic to adjust quickly to such kind of changes, will help us to understand the existing conditions in Turkish ERP market.

4.7.1 What Exactly are SMEs?

Small and Medium-sized Enterprises play a critical role "in the economy of developed and developing countries with their flexibility and ability to adapt" (Gunasekaran, Forker and Kobu, 2000; Narendam, Strom and Whileley, 1995). By providing employment opportunities, those enterprises also have significant contribution in the economic progress.

Moreover, SMEs' importance for economic issues they are also important for social & political issues. Considering the social conditions their contribution to medium class character and dynamism to adjust quickly to changes make them essential. SMEs in the world (KOSGEB, 2005);

- are open to all innovations in terms of technology, markets and production methods,
- consider the market as the whole world markets and give importance to achieving knowledge about the whole world markets,
- see their reason of existence as competition; therefore, support competition,
- accept "growth" as the most important critical success factor.

4.7.2 Challenges for Small and Medium-Sized Enterprises (SMEs)

Uyumsoft's Sale and Marketing Director, Binnur Berber mentioned that in Turkish market, companies (especially SMEs) are growing very fast but their management & employee structures do not change in parallel with that growth - come same. In addition, drawbacks will come out during this growing. Vendors take an important role in that part with their consultancy identity and prepare future vision to these growing firms to solve their problems.

For SMEs in Turkish market, exactly same challenges are mentioned with the worldwide enterprises. Today, Aberdeen research shows that for small and medium-sized enterprises management of operating costs in an active way is very important. Further, SMEs' insufficient funding is another important challenge[4]. However, these smaller companies are also concerned about customer acquisition and retention - getting and keeping a loyal customer base. In addition, they "state worry about the potential for commoditization of their products or services".

SMEs reported their key challenges in Aberdeen research – for looking at what links to ERP solutions today:

- Lack of clearly defined SMEs vision, mission and goals
- Ineffective communication of SMEs strategies and initiatives
- Inability to clearly determine and plan for customer demand

[4] For more information, see ERP in Small and Midsize Business: The 2004 Benchmark Report on Aberdeen.com).

- Last minute cancellation or change in the plan, schedule, execution and implementation
- Insufficient funding for SMEs strategies and initiatives

About more SMEs' key challenges in Turkish market

- Being unconscious about ERP systems applications
- Lack of infrastructure issues
- Insufficient/inappropriate staffing in the companies

4.7.3 ERP Application to SMEs

Small and medium-sized enterprises are adapting ERP systems more and more, although ERP projects are absolutely expensive and highly risky ventures for them. In addition, generally in Turkey SMEs lack the knowledge and resources to specify requirement and manage the ERP project and recognize changes related to ERP implementation. So there is clearly a need for an efficient ERP implementation methodology to help SMEs to select the right ERP system and manage the implementation processes and also the changes in operations and information management.

"ERP requirement specification" is the most critical method that should be practiced in an ERP implementation methodology for SMEs'. Instead of modeling all "processes in the way they usually work or are designed to work, this method concentrates on the critical points in company's processes". Here are the critical points that are shown in figure 4.6 (Vilpola and Kouri, 2005):

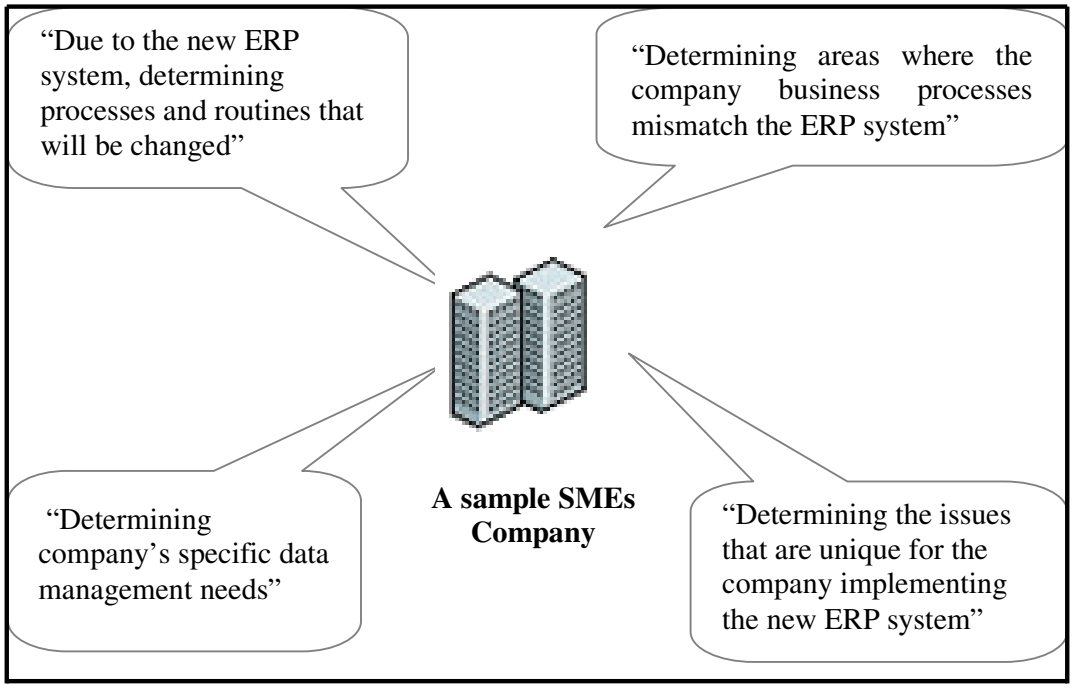


Figure 4.6: ERP Requirement specification

Those points are called "critical" because they have great potential to complicate the ERP implementation process.

ERP vendors/consultancy firms enables SMEs to manage all their key business operations in a single, many times online, application that includes complete accounting, customer relationship management, human resources management, warehousing and product assembly, and time and billing.

If the company was a small medium-sized enterprise, and the implementation was limited to a defined area of the company, or the company used only a few pieces of the ERP system 3-7 month implementation period will be possible. But if a company wants to install an ERP software package with it's nearly all pieces, real transformational ERP efforts generally run between eleven months – one and a half years on average for small and medium-sized firms.

During ERP applications, based on the number of connected users and the modules required, the price of software and implementation will vary widely. As an indication of the total price, "quotes received recently for several SME clients range from $60,000 for a job shop with a few users to $200,000 for a 20 user ERP system" (Homer,2003).

4.7.4 Obstacles of ERP Application to SMEs

Today, most SMEs in Turkey have been forced to buy and install separate, expensive software packages to manage their business. In addition they "then spend an even greater amount of money on hardware to run the software, and resources to install, maintain, and integrate the data from these diverse systems" (NET Return, 2003)

The findings showed that those kinds of problems faced by SME's are not much different from the ones stated in other countries, they are more or less the same. The major problems the Turkish SME's are confronted with can be summarized as (Söğüt, 1997):

- Technical needs – especially hardware needs that the enterprises should complete before starting the ERP implementation.
- Lack of Innovation Systems – will cause adaptation and integration problems within the new system in the organizations.
- Insufficient Financial-Credit Facilities – Generally in Turkey, banks do not lend money accounting to the feasibility study or investments of the SMEs. In general guaranties asked from the banks in return of credits are the biggest obstacles that entrepreneurs are facing up with.
- For users, do not trust the new system – they especially do not trust the processes in the software platform, they want to see every thing on paper also in their hand.
- Difficulties and time losses in data transfer from the existing system to the new one.
- Inadequate personnel training – Lack of trained personnel is another obstacle for SMEs. Economic competition and need for adaptation to technological innovations entail employment of better trained employees.
- Lack of top management support – at the beginning they wanted to take part in the project but later they could not see themselves in the new system applications.

- Lack of Planning and Managerial Facilities.
- Hidden costs of ERP – underestimated items such as training, integration and testing costs will cause trouble for the SMEs if they are not strong enough to meet them.
- Conflicts with the consulting firms – exp. lower service quality than it should be.

CHAPTER 5

CASE STUDY

5.1 CASE: AN APPLICATION OF ERP TO A SME IN TURKEY

One of the main advantages of moving towards an ERP system is "ERP has certain consequences for the companies' organizations and the professions of their employees". Moreover, companies must be able to measure the performance and also cost effectiveness of their ERP systems. In this research, I have presented many of these characteristics and advantages of the ERP projects and written down how they could be installed in the organizations.

In that part of my research, in order to get further information of a firm that is installing an ERP system and to identify concrete details, there is a case study I have conducted in a SME company (Atılım Cable). Their high ERP implementation rates and the challenges for SMEs' in their ERP projects are the main reasons of why I chosen such a company's ERP system application as the case study.

5.2 COMPANY BACKGROUND

Atılım Cable is one of the important manufacturing companies in Turkey serving domestic and international markets in the production and sale of cable with its 60 personnel. Atılım was established in 1990 and started to produce its existing products in its own facilities where is based on 20.000 sguare meter, 3500 square – meter. Today, 40% of Atılım's production is exported to the international market and 60% is used for home market. In 2005, the company registered revenues of 25 million USD and a net profit of 3 million USD.

Atılım products are in two main groups, “PVC” and “Rubber” covered cables with various kinds of special products for the special requirements. Especially the company is specialized in Rubber covered cables. Atılım takes the competitive advantage of producing rubber-covered cables with their low prices and high quality. The company’s rubber covered products are Weld Cables, HO5RR – F Cables, H07RN – F Cables, Deep Water Pump Cables and Flexible control cables.

Atılım could test cables in the company’s laboratory with high educationed technicians. Atılım had international quality certificate ISO 9002 and environment certificate ISO EN 14001. Qualified personnel have taken their education and now they give trainings to their own workers. In the company’s laboratories, they are trying to produce different insulation materials, which will decrease the cost of product and will increase the mechanical properties of the cables. Atılım is producing every type of cable as per TSE, IEC and BSI standards. Every Atılım workers are responsible of their own sections’ working. This chain of quality goes all the way to the top and forms total quality of Atılım.

5.3 SENKRON IMPLEMENTATION

Soon after year 2002, according to the changes in the market conditions in Turkey, Atılım’s top management raised the issue of implementing an ERP solution. They were in the need of a new system and wanted to eliminate the disadvantages of not using the central database information system. Still keeping the “end product stocks’ data” in papers, not following “raw material, semi product and end product stocks” in instantaneous and correct form, time losses during the supply chain processes, in the different located sales stores - selling the same product to more than one customer and many similar challenges such like those are some of the important reasons why Atılım have decided to implement an ERP system.

By using the ERP system, Atılım want to provide an effective information usage between the different departments in the company such as sale, manufacturing and shipping. And also minimize the drawbacks that are mentioned above.

5.3.1 Choice of ERP Solution

A company while choosing an ERP solution should apply eight critical steps (they were metioned in chapter 4 in section 4.1.1 in details). The initial steps consisted in deciding which ERP software to use, determining processes clearly in the firm and after developing strategies to reach the firm's aim and targets.

Atılım had a number of ERP alternatives to choose from, but the choice essentially boiled down to Senkron and other two vendors. The decision was soon taken Senkron. Mr. Emre Ciddi, the project manager of ERP software implementation explains Atılım's choice of Senkron ERP system, "Among the alternatives, Senkron's ERP software package was the best one with its great usability and less complicated modules. Because of dynamic staff necessity and our company's policy that is "to make more job with less staff", the software we will use must be less complex. One of the competitive advantage of Senkron was, its processes had already been tried and tested before for specific needs of the cable-manufacturing sector. Moreover, the other one was, Senkron is one of the 15-20 firms that enter KOSGEB's provider list. Also it is an important preference reason for us."

5.3.2 Strategy of Implementation

Current literature defines three commonly used way of installing ERP: (1) The "big bang strategy", (2) The "franchising strategy", (3) The "slum dunk strategy".

The Big Bang – A full big bang implementation involves having all modules at all locations implemented at the same time. That is the reason of why the big bang is the most ambitious and difficult approach in ERP system applications. Getting everyone in the organization to cooperate and accept a new system at the same time is a "tremendous effort" (O'Brien, 2001).

The Franchising Strategy **–** Generally large & diverse firms that do not share many common processes across business units employ this approach. Individual ERP software packages with its own database are installed in each unit while linking common processes (such as financial bookkeeping) across the enterprise (Koch, 2006).

The Slum Dunk Strategy – The slum dunk is generally for smaller companies interested in experimenting with ERP, by starting with a few key processes or some particular modules. The aim is “to get ERP up and running quickly and to ditch the fancy reengineering in favor of the ERP system’s "canned" processes” (Koch, 2006).

Atılım chose the slum dunk strategy for five key functions forming the initial implementation stage: material management, sales, production, quality control and purchasing. Cost accounting, manufacturing-planning modules was to be implemented in the second stage. And the last part of the project maintenance module was going to be implemented. The main reasons for selecting a slum dunk strategy were access the ERP implementation process and associated resource requirements over time so as to decline resistance from employees & users and increase the efficiency of the project.

Mr. Ciddi explained the decision, “Just think that all modules were to be implemented at once. The workload would be too heavy for each department and for the key people in those departments. Another thing I believe is that a major one-shot change would cause more resistance and reactions, and that could lead to chaos in the company.”

5.3.3 Implementation Schedule

The implementation team, including four full-time professionals - manufacturing, technical and business oriented people. Three of those professionals in the project team are from Senkron and the project manager is from Atılım. The team started with getting the customer & supplier and the raw material lists from the accounting program that the company (Atılım) used according to the products before. During the “product tree” preparation, they gave individual attention to entering the products with high production rates. ERP implementation in the company was started with the “sales module” implementation.

At the first stage, it became possible making input and output controls by using the product stocks.

At the second stage, the values in the product trees and product routes are updated. The product routes were completed and by that way semi product routes are formed.

Following the updates, raw material stocks began to be used in MRP applications of the new system.

Following the “sales module”, the “quality control module” was implemented. Material entry, process control and the last inspection experiments’ data were determined in material base. Using experiment results data were formed and orderly current experiments began to be applied in the new system. For the “cost accounting module”, the connected data - that were connected from production department to see all products’ costs in different processes and different machines - were entered the new system.

After the first stage applications in the project were completed, Atılım and Senkron had an installation kick-off meeting. In the meeting, they decided to complete the new system requirements and to train users in the related departments. As system requirements, due to the need of “Microsoft Windows XP” in client server the capacity of the PCs in Atılım were developed. Following key users in each department and the Senkron executives both started user training.

Next to the trainings, the new system partially went live and brought some drawbacks with its installation. Here are the important difficulties Atılım has faced during the ERP system installation.

- User resistance to the new system: They compare their current system with the installed one (the new ERP system). They mostly think about their current system and also want to continue using it,
- Difficulties and time losses in data transfer from the current system to the new one,
- Lack of top management support - at the beginning they wanted to take part in the project but later they could not see themselves in the new system applications,
- Technical needs - especially hardware needs, more number of PCs
- Insufficient/inappropriate staffing,
- Inadequate personnel training - mostly lack of computer usage in personnel

- For users, do not trust the new system: They especially do not trust the processes in the software platform, they want to see every thing on paper also in their hand,
- Company personnel's knowledge of ERP systems is very limited and they don't recognize the changes in operations, routines and data management related to ERP implementation. Their capability to manage the ERP selection and implementation process is inadequate.

It took nearly 9 months to implement the first five modules (material management, sale, production, quality control and purchasing) that were up and running by 2006.

5.4 THE NEXT PLANNED STEPS FOR THE ATILIM ERP

Following part of the project in the second part, Atılım is eager to implement effectively the "manufacturing planning module" and "cost accounting module". In accountancy department, after the related data entry to the system is completed, it is going to be possible to reduce mistakes and time losses during the preparation of propositions. Due to the manufacturing planning module implementation completion, the efficiency will increase by planning the manufacturing orders in periodic time.

The last part of the project, the company aims to implement the "maintenance module" for planning all machines maintenance cycles and supply their pursuit.

5.5 RESULTS

The results of the initial implementation in Atılım were announced to be satisfactory. However, the first four months of the Senkron implementation had been really tough. Because of intensive user trainings, users had difficulty in adapting to change and showed resistance. Another reason that influenced users in the company negatively was inadaptable module parts of the software. For a while, they had to work on those parts in the program but later according to key users' suggestions from departments Senkron had made necessary changes and elevated the software. In addition, than the benefits of both Senkron and the stock control system began to show.

Here are the benefits Mr. Ciddi mentioned that are seen after the initial implementation completion. As results:

- Supply adequate documentation and by that way eliminated unnecessary documents or data,
- Take the advantage of standardization in manufacturing (now have standard processes that feed a common database),
- Productivity has increased and it has had a significant effect on the company's structure,
- Take the advantage of seeing order pursuance before
- It becomes possible to watch employees' performance in details,
- Inventory control

Currently, a team of four people maintains and implements the systems and handles technical support to the company.

CHAPTER 6

CONCLUSIONS

The results of my study have implications for both academic researches and the companies that want to install ERP systems. For academic researches, this study provided insights into the Turkish ERP market and gave important details including ERP implementation methodology.

In this research, I used interview method to collect information about "ERP implementations in Turkey". With the idea of getting qualified conclusions from the software providers (vendors), I had tried to make contacts especially with the dominant and the professional ones in the Turkish ERP software market. According to that purpose, for seeing the conditions by the global software providers' sight I made interview with "Oracle" and "Microsoft Business Solutions". In addition, for seeing the conditions by the local software providers' sight and for understanding their situation in Turkish market, I made interview with "Senkron", "LOGO Business Solutions", and "UyumSoft Information Systems".

Due to the interviews, in Turkish ERP market everyday balances are changing. While global software providers such as SAP, Oracle are losing their locations, others, local firms are growing up their market shares. Therefore, price competition and business competition between them become available. In the past years, local software providers are worried about not providing qualified service. Now in sale and after sale processes they have become more qualified and started to finish projects faster than the past. Nowadays, "global large firms know everything" image has changed also. With customers' just starting trust the local software provider have started to take the advantage of being "local".

Especially last 2-3 years in Turkish market, most of ERP projects result in success. Software providers have begun to minimize time overruns, motivation losses, and vendor defaults.

My findings can help the companies that want to install ERP systems, to predict likely weaknesses in their organizations' ERP implementation plan and lead to better planning. I believe that whether selecting an ERP system or another enterprise solution should decide in a definite methodology and systematic way. A comprehensive methodology contains a period, which starts from determination of corporate goals to different parameters of solution.

In Turkish ERP market, large firms such as holding companies had already been adapted to the ERP systems. In the past recent years, because of the necessity of being fast and current in the sector, those companies had to move to ERP systems. Therefore, for today's business, it is possible to say that mostly small & medium-sized enterprises are in need of more or different software applications like "ERP systems". These smaller companies are also concerned about customer acquisition and retention - getting and keeping a loyal customer base. For large firms we can say they only go to upgrades in their current working systems.

In Turkey, many customers are generally unconscious about ERP systems applications. Because customers mostly think ERP systems as set of activities that provide development of accounting applications for small and medium-sized enterprises.

Because of their high ERP implementation rates to identify and understand the "Small and Medium-sized Enterprises" with their existing applications becomes necessary. And also, searching their reasons of deciding to go ERP and determining the challenges that necessitate SMEs is dynamic to adjust quickly to such kind of changes, will help us to understand the existing conditions in Turkish ERP market.

In SMEs market, mostly manufacturing firms are in the need of ERP systems. "Sales and distribution management" is very important for firms and connected modules are very popular. Moreover, in manufacturing firms "manufacturing" modules carry

importance in ERP system applications. The usage of all ERP modules as a whole is not common in small and medium-sized companies. In many SMEs, especially CRM module is not preferred in ERP applications because of the company's direct (face-to-face) contact with its customers.

In my research, in order to get further information of a firm that is installing an ERP system and to identify concrete details there is a case study I have conducted in a SME company - Atılım Cable. Taking that study as a reference it is possible to say, ERP projects are mostly long-term projects. If a company want to install an ERP software package with its nearly all pieces, real transformational ERP efforts generally run between two and three years, on average. Therefore, handicaps will be formed with the lack of individual communication and trust between customers and vendors. In this condition, it is necessary to form a group that its members could understand each other clearly and have qualified communication between them. Before ERP system installation, there is need for arranging in both three areas: (1) Hardware needs, (2) Getting ERP licence, (3) Checking the current project team members.

For an implementation's success, testing the system is very important. The drawbacks in the testing step will cause project time overruns. Mostly for SMEs, it is too often that user's resistance to the new project. They will compare their existing system with the installed one and think about the old one. Many times in companies the personnel's knowledge of ERP systems is very limited and they don't recognize the changes in operations, routines and data management related to ERP implementation. Their capability to manage the ERP selection and implementation process is inadequate. So user training is an important issue in this context. Users should be helped to understand the conceptual frame of the new system, and helped to know what to expect from the new system besides operational use.

APPENDIX A

THE SOFTWARE PROVIDERS IN TURKISH ERP MARKET

System Name	Vendor
abas ERP	Abas Business Software
abas Trade/ abas Ticari	Abas Business Software
Add-ABM Performans	Artı Deger Ltd. Şti.
Adonix X3	Boğaziçi Yazılım
AIS	Anadolu Bilişim A.Ş.
Anahtar ERP	Glosis Bilgi. Ltd. Şti.
AnNet	Anka Bilgi Teknolojileri
Axapta	Microsoft
BaanERP	SSA Global
BilisimERP	Bilisim
Birikim	Usta Yazılım A.Ş.
BOSIYS	BOS Grup
CANIAS ERP	IAS A.Ş.
Cheona ERP	Chenoa Bilişim A.Ş.
Corfeva	Corfeva
CRANE	Hitit Computer Services
CSB System	CSB-System Türkiye
D@ERP	TeGeMe . Ltd. Şti

Dinamo ERP& E-Business	Diyalog
Docuart ERP	Docuart Bilgisayar ve İletişim
EFESPRO	EFES Yazılım Ltd. Şti.
Entegre W3	Netsis Yazılım
ENTERPRISE MODEL	Model Bilgi İşlem
ETA SQL	Eta Bilgisayar
Fusion	Netsis Yazılım
Fusion Standart	Netsis Yazılım
GENOM	Genom A.Ş.
Güneş Sistemi	Link Bilgisayar A. Ş.
IBPro	Kaledata
IFS ERP	IFS
IKAPS	IDECON Bilişim Ltd. Şti.
Senkron ERP	Senkron
I3	Cybersoft
JDEdwards One	Oracle Bilgi. Sistemleri
JDEdwards World	Oracle Bilgi. Sistemleri
Keus	YD Yazılım Ltd.Şti.
Kg-Palaimon	Korgün Ltd. Şti.
Likom Gusto	Likom A.Ş.
LOGİN ENTEGRE FOR WINDOWS	Login Bilgisayar
MAPICS SyteLine 7	Ekip Mapics Bilgisayar Ltd.
MAPICS XA	Ekip Mapics Bilgisayar Ltd.
MFG/PRO eB2	QAD
MILLENIUM MANAGER	Şahin Bilgisayar
MISus	YD Yazılım Ltd.Şti.

My e-RP	Mikro Yazılımevi
mySAP All- in- One	SAP
mySAP ERP	SAP
MYTR Kurumsal	My Yazılım Ltd. Şti.
Navision	Microsoft
Online Director E-Business Suite	Tol Bilgi İşlem Hizmetleri
Oracle e-Business Suite	Oracle Bilgi. Sistemleri
Oracle J.D. Edwards	Globalsoft A.Ş
PARTNER	Nebim Yazılım
PeopleSoft Enterprise	Oracle Bilgi. Sistemleri
PickSmart	AXIS Information Tech.
Plantumweb	Minerva Yazilim A. Ş.
PrismERP	Wonderware
ProMax	Promax
P/5 ERP	AVC Proje Danış. A.Ş.
My.SAP ERP	SAP
TAI KKPS	TAI Hav. ve Uzay San.
TesPROD	İletişim Bilgisayar Ltd.
ÜKP	Gordion Bilgi Hizmet Ltd Şti.
Unity	Logo
UP PRO	Turktıcaret.Net
UYUMSOFT Information System	Uyumsoft A.Ş
VEGAWIN MPR II	Vega Yazılım Ltd.Şti.
WinSpend	SFS Grup

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