ADANA SCIENCE AND TECHNOLOGY UNIVERSITY

THE SOCIAL SCIENCES INSTITUTE

MANAGEMENT INFORMATION SYSTEMS DEPARTMENT

ASSESSMENT OF SAP USAGE: AN EMPIRICAL RESEARCH IN ISTANBUL

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Advisor: Prof. Dr. FATMA NUR TUĞAL

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To The Social Sciences Institute Directorate of Adana Science and Technology University:

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ABSTRACT

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Intense competition, further intensified with the impact of globalization, has made it a more significant issue for companies to adapt to new technologies. The changes, experienced in the world which is evolving into a universal village with the impact of developing technology and the increasing customer demands have led the companies to search for new solutions. While in the past, manufacturing enterprises used to devote their physical capital investments mainly to equipments such as roads, dams, factories, factory buildings and machinery, they nowadays devote their physical capital investments to the information systems and to the hardware and software used in the process of integrating technological developments into the companies.

In the digitizing world, the Enterprise Resource Planning (ERP) software, which collect a company's data from different departments such as production, finance, human resources, marketing into a single database, has become very popular. The integration provided in these systems, where all departments use a single database, has increased the productivity of the companies. Many problems, such as the problems experienced when the reports submitted by the top management from different departments are inconsistent, when the time spent preparing the reports is more, when the information of the same raw material, product or customer is recorded differently by different departments, have disappeared with the use of ERP software. Nowadays, companies use different applications in this field, and SAP software, which is one of these different applications, has taken its place in the top row in the business world.

If employees refuse to adopt the new systems or applications created, this will lead uninfluential and inefficient use of the systems. At this point, the reasons of employees'

usage behavior should be examined. Due to the fact that the preferred SAP software is a new technology, the acceptance by company employees is influenced by many variables. In this context, many theoretical models have been developed. Technology Acceptance Model 2, one of the theoretical models each of which has significance, is based on this study.

The aim of this thesis is to try to find out the reasons for employees' tendency to use SAP software in the companies that prefer to use SAP application as ERP software in Istanbul, by using the Extended Technology Acceptance Model.

In the study, a new model was developed, based on the Extension to Technology Acceptance Model, including subjective norm, image, job relevance, output quality, result demonstrability, perceived usefulness, perceived ease of use, intention to use, and usage behavior factors. By means of this model, variables, affecting the usage behavior of users in companies using SAP software in Turkey, have been examined. It is envisaged that the perceived ease of use and the perceived benefit will affect the SAP use and acceptance.

Within the scope of the fieldwork conducted for the purpose of the study, the companies using SAP in Istanbul were identified in accordance with the information received from the SAP consulting firms, and a questionnaire was applied to the employees of the companies face to face or via e-mail.

According to the results of the study, it is seen that the perception of subjective norm, perceived usefulness and perceived ease of use are the variables, which are influential on the intention to use SAP. Furthermore, relationship hypotheses, established between the estimated set-up time of SAP and the actual set-up time of SAP, and the type of training of SAP and the level of satisfaction of employees, have been tested and verified.

Keywords: Information Systems, Enterprise Resource Planning, SAP, Extended Technology Acceptance Model

ÖZET

SAP KULLANIMININ DEĞERLENDİRİLMESİ: İSTANBUL İLİ KAPSAMINDA AMPİRİK BİR ARAŞTIRMA

Zeynep İNCE

Tez Danışmanı: Prof. Dr. Fatma Nur TUĞAL

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Küreselleşmenin etkisiyle daha da şiddetlenen yoğun rekabet, firmaların yeni teknolojilere adapte olmasını yüksek önem arz eden bir konu haline getirmiştir. Gelişen teknoloji ile evrensel bir köye dönüşen dünyada yaşanan değişimler, artan müşteri talepleri, firmaları yeni çözümler aramaya yönlendirmiştir. Eskiden üretim işletmeleri fiziksel sermaye yatırımlarını ağırlıklı olarak yol, baraj, tesis, fabrika binası, makine gibi ekipmanlara ayırırken günümüzde bilgi sistemlerine ve teknolojik gelişmelerin şirketlere entegre edilme sürecinde kullanılan donanım ve yazılıma ayırmaktadır.

Dijitalleşen dünyada, bir firmanın üretim, finans, insan kaynakları, pazarlama gibi farklı departmanlarının verilerini tek bir veritabanında toplayan Kurumsal Kaynak Planlama (KKP) yazılımları oldukça popüler hale gelmiştir. Tüm departmanların tek bir veritabanını kullandığı bu sistemlerde sağlanan entegrasyon firmaların verimliliğini arttırmıştır. Farklı departmanlardan üst yönetime arz edilen raporların tutarsız olması, raporların hazırlanması için harcanan zamanın fazla olması, aynı hammadde, ürün ya da müşteriye ait bilgilerin farklı departmanlar tarafından farklı kaydedildiği durumlarda yaşanan sıkıntılar gibi birçok problem KKP yazılımlarının kullanımıyla ortadan kalkmıştır. Günümüzde firmalar bu alanda birbirinden farklı uygulamalar kullanmakta olup onlardan biri olan SAP yazılımı iş dünyasında üst sıralardaki yerini almıştır.

Eğer çalışanlar oluşturulan yeni sistemleri ya da uygulamaları benimsemeyi reddederlerse bu durum sistemlerin etkin ve verimli bir olmayan şekilde kullanılmasına yol açacaktır. Bu noktada çalışanların kullanım davranışının sebepleri incelenmelidir. Tercih edilen SAP yazılımının yeni bir teknoloji olmasına bağlı olarak, firma çalışanları tarafından kabulü birçok değişken tarafından etkilenmektedir. Bu bağlamda birçok teorik

model geliştirilmiştir. Her biri önem arz eden teorik modellerden biri olan teknoloji kabul modeli 2 çalışmada temel alınmıştır.

Bu tez çalışmasının amacı, İstanbul'da KKP yazılımı olarak SAP uygulamasını tercih eden işletmelerde çalışanların SAP yazılımını kullanma eğilimlerinin nedenlerini genişletilmiş teknoloji kabul modelinden yararlanılarak ortaya konulmaya çalışılmasıdır.

Çalışmada genişletilmiş teknoloji kabul modelinden uyarlanan ve sübjektif norm, imaj, iş uyumu, sonuç gösterilebilirliği, algılanan kullanışlılık, algılanan kullanım kolaylığı, kullanım niyeti ve kullanım davranışı faktörlerini içeren yeni bir model geliştirilmiştir. Bu model aracılığıyla İstanbul'daki SAP yazılımını kullanan firmalardaki kullanıcıların kullanım davranışını etkileyen değişkenler incelenmiştir. Algılanan kullanım kolaylığı ve algılanan faydanın SAP kullanımı ve kabulünü etkilemesi öngörülmüştür.

Çalışmanın amacına yönelik olarak yapılan saha araştırması kapsamında, SAP danışmanlık firmalarından alınan bilgiler doğrultusunda İstanbul'da SAP kullanan firmalar belirlenmiş ve firma çalışanlarına yüz yüze ya da e-mail yoluyla anket uygulanmıştır.

Araştırmanın sonuçlarına göre subjektif norm, algılanan fayda ve algılanan kullanım kolaylığı algısının SAP kullanım niyeti üzerinde etkili olan değişkenler olduğu görülmektedir. Ayrıca SAP nin tahmini kurulum zamanı ve gerçekleşen kurulum zamanı ile SAP eğitiminin türü ve eğitimdem elde edilen memnuniyet düzeyi arasında oluşturulan ilişki hipotezleri sınanmıştır.

Anahtar Kelimeler: **Bilgi Sistemleri, Kurumsal Kaynak Planlama, SAP yazılımı, Genişletilmiş Teknoloji Kabul Modeli**

ACKNOWLEDGEMENTS

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LIST OF ABBREVIATIONS

IS	**:**	Information Systems
IT	**:**	Information Technologies
TPS	**:**	Transaction Processing System
MIS	**:**	Management Information Systems
DSS	**:**	Decision Support Systems
EIS	**:**	Executive Information Systems
ES	**:**	Expert Systems
ERP	**:**	Enterprise Resource Planning
MRP	**:**	Material Requirement Planning
MRP II	**:**	Manufacturing Resource Planning
SAP	**:**	Systems Applications and Products
IDT	**:**	Roger's Innovation Diffusion Theory
TRA	**:**	Theory of Reasoned Action
TPB	**:**	Theory of Planned Behavior
DTPB	**:**	Decompossed Theory of Planned Behavior
TAM	**:**	Technology Acceptance Model
TAM2	**:**	Extended Technology Acceptance Model
SPSS	**:**	Software of Statistical Packages for Social Sciences

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INTRODUCTION

As the consequence of globalization, borders are disappearing, global economic competition is intensifying and transactions of enterprises getting more and more international. Because of the developments in communication and information technologies, countries and businesses are getting closer to each other. In the previous centuries, while enterprises were supposed to compete against their opponents in local market, now they can be competing against foreign enterprises in their country or foreign enterprises from another country. To acquire competitiveness is related to the usage of strategy, system and information technologies in management framework. The enterprises that use information technologies have competition advantage by supporting all the aspects of their business with ease.

Today, usage of information technologies is not an option anymore. On the contrary, it is a necessity and an obligation. Information technologies help enterprises to acquire an ability to adapt in fields like purchasing, public relations, financial affairs, accounting, manufacturing and transportation. Every day in information technology new developments are underway. Enterprise resource planning(ERP) system has emerged an original system in the sequel innovations in information systems.

This system must be used in order to decrease the amount of time in delivery (design, procurement, production, distribution), to execute the production in accordance with varying customer demands, handling the communication between supplier firm, producer firm, seller firm, that constitute supply chain, and customers in required level and to use resource planning to make sure activities are being handled in accordance with effectiveness, productivity and performance standards. It names as corporate resource planning or enterprise resource planning in literature.

ERP is a software system that keeps functions like supply, production, distribution and financial resources that are located various locations together in order to satisfy customer demands in the most suitable way and it also helps functions like planning, coordination and control to improve effectiveness and efficiency.

Not only is there a considerable amount of competition in the context of Enterprise Resource Planning programme use around the world, but also there exist various

companies which provide ERP applications. Being the biggest ERP software company across the world, SAP has been specialist in the field of it (Al-Mashari, and Zairi, 2000, 301). It was the SAP company that offered SAP software as an ERP software for the market.

As a computer-aided and completely onboard business management mechanism, SAP encompasses all the dynamic parts of a firm, and ensures them to attain uttermost competitive supremacy. SAP presents such an combined only system that all units of firm use. As an automation and support software, SAP constitutes a client / server information processing technology for the business process in numerous industry areas.

Information technology was accepted in some industries and spread rapidly. However, in some industries, it was resisted and it failed to get popular. What pushes users to this is their attitudes to information technologies. Why do users accept or refuse the offered technology? What are the reasons behind their approach? In order to answer these questions, the models that answers how technology acceptance is executed are helpful.

This thesis study, which examines usage of the SAP in companies of Istanbul, consists of four chapters. Initially, information systems, information technologies and pros and cons of these systems, varieties and information systems used in enterprises are examined so as to establish a basis for ERP programme.

In the second chapter of the study, the definition of ERP system, general aspects, its scope, and the reasons for the enterprises to use ERP explained. Later on, usefulness of the ERP systems for effective management are presented. Additionally, faced changing in ERP cutover, ERP implementation process, and the pros and cons ERP system are represented. At the end of the chapter, SAP company and software, which is one of the biggest software companies in the World, and all the details of SAP R/3, which is one of the most up to date and preferred software of SAP,(www.sap.com.tr) are explained in full detail.

In the third chapter of study, models that are being used in the constitution of technology acceptance model, TAM, developed by Davis in 1986, is a model that developed to estimate approach against usage of computer and information technologies and user behaviors and TAM 2, an upgraded version of TAM is explained.

In the fourth chapter of study, study's purpose, scope, method and evaluation of study findings constitute the methodology and analysis part of the study. A survey was conducted in which employees of the companies that uses SAP software were participated in the research study chapter. By the helping of TAM 2, relations between the variables that affect the SAP usage behaviors of employees were examined. Additionally, relationship hypotheses established.

In the conclusion of the study, a theoretical assessment has been made, and suggestions for solution have been presented in the light of the findings obtained from the survey.

CHAPTER 1

INFORMATION SYSTEMS

1.1.   The Scope of Information Systems

Information systems has many advantages in business for many years. With the globalizing World, it has more important role from the point of processing, generating and collecting data in functional areas in the organization.

An information system is the organization of the collection, processing and spreading of information in an enterprise by combining it with the sources of human, software, hardware, communication networks and data. Basic structure of the information systems consists of input, models, output, technology, database and control (O'Brien, 2006, p.24).

All computer-aided information systems are, in general, a human-machine system consisting of a combination of elements such as hardware, software, data, human and processes (methods). All information systems are based on technology and human elements. The hardware are physical devices that are used to convert data into information. The hardware includes the peripheral devices, used to indicate the computer itself, the change, the storage, the transmission and the display of the data. In general, any physical device in the information system is called hardware. System and application programs are all called software (Moise, 2006, p.90). The system consists of processes and softwares, which operate and direct software and hardware components, and enable them to operate and to be utalized in an integrated manner. The operating systems direct the application programs of the hardware and enable them to be run.

On the other hand, the human element is very significant in information systems. Because today, errors in information systems are largely due to human and organizational problems rather than technological ones. In enterprises, the human element in computer-aided information systems takes place in two groups. The first group is the group of users, who are the IT managers using the information system for their needs. The second group is the group of information processing staff, performing activities related to the operation of the information systems (Scott, David, Hearnshaw, and Hilary, 1993, p.23).

The enterprises want to benefit from all these elements at the maximum level faultlessly, and so that gain many advantages through these elements.

1.1.1. Information Technologies

Information technologies is a subsidiary of information systems. IT can be described that as the computer and communication technologies which allow the collection, processing, and the transmission of the information (Evaristo, and Karahanna, 1998 p.53).

After the transformation from industrial society to information society, incredibly developments brought societies closer together and made the world like a small village. In the early 1980s, as information technology became cheaper, personal computers entered our lives. In the process that followed, with the development of the Internet in the 1990s, people were able to access any information more easily at any time and from any location.

Today, information technology is used by many institutions. From the simplest to the complicated, all problems can be solved by computers. Internet technology, which is realized by connecting millions of computers all over the world to a network, provide access to large information and information banks. Suddenly a person connected to the internet can access the information bank in any place and transfer it to the information computer from which they are obtained.

In the second half of the 20th century, with the rapid developments in technology and the introduction of advanced technologies into human life, the transition from industrial society to information society took place. Today, every day a new technological product is offered to the use of people and these products facilitate human life (Sarıhan, 1998, p.17).

Information society has made important and fundamental changes in the first decade. The main reason for this rapid transformation is the high flexibility of people to adapt to these technologies with the speed of new technological development. People are

more conscious of technological innovations than the previous process and have wider possibilitiess (Özçağlayan, 1998, pp. 16-22).

Some develeopments in the information and communication technologies is given in the table 1.1.

Table 1.1. Historical Development in the Informati on and Communication Technology

1830s	First telegram was developed
1840s	The fax machine was took out a patent
1870s	The telephone was devised
1890s	The radio was generated
1920s	First television signal was send
1940s	MARK-series computers were designed in Harvard University
1950s	It is the first time commercial computers were product. First generation computers were designed.
1960s	Second Generation computers were formed.
1970s	Microsoft company was established by Bill Gates. 3G & 4G computers were designed.
1980s	IBM introduced personal computer firstly. Apple_Mac computer was presented.
1990s	Control of internet was released by US Government. Windows 95 was introduced.
2000s	50 million internet sites play a part in the world
2010s	Windows 7 putted on the market.

Source : Boczko, T., (2007). Corporate Accounting Information Systems, China: Prentice Hall, p:115-117

With changes in the information and communication technologies, development and alteration in operation, communication and management process of businesses have continue increasingly.

The basic characteristics of information in the information society can be summarized as continuous production and increase, being transportable, divisible and

shareable in communication networks (Deniz, 1999, p.88). By way of increasing technological possibilities, which execute transactions, information popularize day by day. Individuals, businesses and nations that use strategic information are one step ahead of competitors.

The dizzying developments in information technology in recent years have increased the use of the internet in organizations, and have made the vast majority of its activities electronic. This has increased the importance of efficient and effective use of scarce resources. The use of IT systematizes the information flow in the organization, and makes it more standardized. (Klopping and McKinney, 2004: 38). So that low business qualifications in traditional organizations with IT have left the place to specialize in single and limited business skills.

1.2. Pros and Cons of Information Systems

The usage of the information systems offers a great deal of benefits. Careful planning as well as expertised implementation is needed so as to achieve the benefits. The achieved benefits provided by the well implemented technology-aided mechanism are as attached below:

- Gaining new opportunities against competitior
- Reducing costs
- Enhancing the expansion prospective of the firm
- Saving time through systematic decision process
- Assisting decision maker

Gaining new opportunities against competitior

There are two particular benefits against competitor of these systems to the firms. İnitially it is to provide low cost leadership and the second is, product differentiation opportunities to recognize. With the help of these two ways, businesses can expand their competitive coverage (Mata, Fuerst, and Barney 1995, p.492).

Today, it is easy to see some companies that decreasing the cost of the asset they produce and acquire competitive advantage by the help of information technologies in

varios sectors. Firms can have some opportunities, which either through representing the goods and services unequivocally, and moreover, supplementing novel qualifications and supplying a qualified delivery after the sales (Barney, 1991, p.105). So that enterprises attain a variety of benefits through developing perceived changes between products. In this process companies form any product more attractively.

Reducing costs

The documentation during the management process is notably reduced by the helping of computer technologies, while the changing World scale the quantity of the work load and sets of documents up. In a broader sense, the systematic structure, which are aided by computers, are more proper and more coherent check against manual ones; and hence, the raw data gets cheaper, which represents a reduction in the initial data processing. (Besanko, Dranove, and Shanley, 2001, p.228).

Enhancing the expansion prospective of the firm

Researches conducted has been show that bureaucracy is an obstacle for the development of companies and lack of accurate information in these systems. For these reason companies will cope with impediments, and will enhance selling of their products(Chaston, and Mangles, 1997, p.51). Consequently, the expansion prospective of the companies will continue to develop.

Using the technological innovations, lots of enterprises will strengthen market share, and will acquire their rivals and prospective customers. (Kotler, Philip and Sidney, 1969, p.13). Exempligratia the salesman using a computer is able to both check the stocks and close a deal. Quicker and on time-service would ensure advantage over the rivals.

Saving time through systematic decision process

Many of employees and executives and decisions all of them constitute the dynamic of the organization. They are accurate and unquestionable judgements. Even so enterprises attach importance to these such as promotions of customers to formerly sales or taxation law and legislation (Daft, and Richard, 1991, p.562). In order to obtain good results or to make sure that organization delivers their duty well, these decisions must be taken into the account.

No matter how complicated decision factors are, information system set will be able to come up with a decision according to algorithm which is fixed rules set (Miller, and Doyle, 1987, p.116). Therefore, technology-based information systems gain great favor for business with standardized operational decisions. This helps business to carry on with accuracy and also help management issues.

Assisting decision maker

Plenty of studies to develop information systems aimed to enhance the quality of decision-making of mankind. The purpose of this is to make sure the manager access the information with ease. Usage of information systems help decisions to be cohere and accurate by means of implementing decision making function.

In recent years, developments in decision support system (DSS) and executive information systems (EIS) have enabled the managers to make prospective strategic decision. In businesses, these crucial decisions that McLeod have long term outcome, are supported by the computer based information and decision models. Thus it helps to make strategic decisions by examining the long term outcome of various options (McLeod, 2005 p.158).

As a result of advancing computer-based artificial intelligence and expert systems, it has made it possible to increase the quality of making decision much more. In addition to the stated advantages, information systems offer advantages such as speed, productivity, stock reduction, analysis capability, engineering and design support to businesses.

The negative aspects of information systems and technologies, and increasing complexity of the technologies used in companies rise the costs. As mentioned above, they are costly in short-term, yet cost effective investments in the long term.

1.3. Types of Information Systems

In the information systems, we generally encounter six major types. Those can solve different types of problems in businesses by using different options. In the titles following, those six significant varieties of information systems are described.

1.3.1. Transaction Processing System (TPS)

Transaction processing system (TPS) is that carries out routine and repeating recordings of any business. This system is responsible for saving data which appears as results of daily operations and keeping them ready to derive necessary reports. (Güneş, and Ataizi, 2009 p.148).

Put it differently, the TPS is a computerized-database that it execute daily transactions relevant data of the all of the company or per units which are human resources, purchasing, accounting, supply chain, manufacturing, auditing, and so on. (Avison, David and Fitzgerald, Guy 2003, p.8). Mistakes might impede daily operations of any business; moreover, they might stop them wholly. Hence, this system has to be designed so as to have an assistant procedure which allows to continue even though system collapsed.

1.3.2. Management Information System (MIS)

Management information system is a mechanism that collects, arranges and distributes the information. Furthermore it allows managers to provide the functions. MIS is a system that provides and develops meaningful information at the right time. Management need those information so as to provide the life and development of any business so that it plans, organizes, carry out, and control activities of organization. (McNurlin, and Sprague, 2005, p.148). In the light of this information, the management information system briefly can be described that it supports the managers in order to reach

on the information in time and provides the collection of information correctly for decision. To decide is a processing of data (Benbasat, and Zmud, 1999, p. 9). That means, the manager will look into the obtained information and data, analyze it, evaluate it and decide how to solve it by seeing the problems. But, in order to accomplish this, information and data obtained by the system should be accessed. The fundamental necessities of a management are employees, capital, machine-equipment, which are supplied by the MIS.

To know qualifications of system acquires the process reality and chance in the topic of applicable. It is notional or realistic mechanism. Cognitive systems generally include instant cases from actual life or extraordinary theory based construction. Active systems composed of equipment, people etc. MIS regarded as an integrated organism which is formed individuals and software (Keen, and Peter, 1987, p.258).

The system providing information around the organization, has open system qualifications. The management information system is a dynamic system because it enables the system to control itself with the help of the feedback mechanism. MIS is an integrated system consisting of many subsystems and covering the organization and meeting the needs of management (Alavi, Leidner, and Dorothy, 2001, p.117)

1.3.3. Decision Support System (DSS)

Decision-support system are computer-based systems that are designed to help for gathering information needed and analyzing them to develop alternatives and to evaluate the decision alternatives (Turban, Aronson, and Liang, 2005, p.103). The purpose of these systems is to provide the managers with the information and analytical support that will give them the opportunity of better controlling and directing of decision making.

Being a reciprocal structure assisting the disorganised or semi-organised decision and thoughts, DS system supplies both information and models besides procuring medium for data use, solving the difficulties, and assisting the executives through subdividing the posts which need specific decision and experience. Robotised office jobs, systems support the staff and the executives to set sight on real trade issues, especially the critical decisions of top executives; However, in virtual they are incapable of meeting

the needs, while incorporated into MIS. Thus, they were changed into information system(Alter, 2006, p.137).

Most judgements made by top executives are both intricate and non-structural, bearing ambiguity and risk, while most decisions of the junior administrative officer are basic ones. Eventhough the MIS often help to solve the basic and cliched problems, DSS often solves the semi structural and non structural ones; moreover, allows decision making function to be applied with the support of computers (Turban, Aronson, and Liang, 2005, p.109). In this context, combining human intellect, information technology DSS aims to resolve intricate issues both efficiently and reciprocally. These days, enterprises use DSS very common because, with the support of data processing system, it provides the executitves with information needed, and it rises the impact of the decision making. Provided information is supplied to decision maker, this means MIS; However, if model and algorithmic design are accumulated, it means DSS.

DS system enables managers to make more effective decisions by converting the data provided into processable information and forwarding this data to the manager who is in the process of making decision. By means of this structure, DSS forms an important part of information system. DSS, basically a computer aided information system, takes the necessary data and information from the MIS and / or database, and analyzes them with optimization techniques or statistical methods, and helps the executive to make better decisions (Chiasson, Mike, and Chris, 2001, p. 20). For this reason, DSS is neither only a human-based system nor a computer aided system. It is a computer aided human machine system that generates the information and decision alternatives that DSS administrators need in decision making process.

The basic characteristics of DSS are that it supports personal and team decisions, solves the semi structural and nonstructured issues, helps decision makers at the administrative level, and supports independent of each other or sequential and compatible with each other decisions; and moreover, are that it can be utilized in all phases of the decision making process, can adapt to the decision making method and behaviour of the decision makers, can adjust to developing conditions and decision settings, is user-friendly, concentrates more being efficient than productivity in decisions, supplies the user with auditing in the system usage.

1.3.4. Executive Information System (EIS)

Executive Information Systems (EIS) is the use of computer technology to support the information needs of senior management executives. These systems were developed to solve the unexpected and unstructured problems of the executives because they are not as flexible as the management information systems. EIS is a highly interactive system that provides executives and administrators with flexible entry into information for general business situations and for controlled transaction results. These systems are sometimes also called executive support systems. Senior executive information systems were designed to assist the executives in the discovery of information at any time, as the executive desires (Özgen, and Ölçer, 1996, p.114). The functions that senior executive information system applications should have can be listed as: accessing different databases simultaneously, running in the different hardwares in the same way, working with customer-service technology in different hardwares, integrating varying applications, transporting application between platforms, providing facilities for decision support and analysis, capability to be developed easily.

Information used in the senior executive information system is conducted from various sources in addition to the inventory control system, financial affairs, and budgeting of the firm as well as independent each other of basic datas from news services. After collected and purified, it is converted into single information or a truth in order to supply EIS users with the examined information; afterwards, it is presented to the senior management (Langerwalter, 2000, p.46).

1.3.5. Expert Systems (ES)

Expert systems are computer softwares that behave like the problem solving and decision making processes of a specific field specialist that uses knowledge bases with experimental and theoretical knowledge. These systems are computer programs that mimic logical structure of people and are adapted to bring a solution to the problems, just like a professional does. According to other definition, they are computer programs developed by experts to perform functions such as designing, composition, planning, diagnosing, interpreting, summarizing, checking and referencing. (Dillard, Jesse, and

Yuthas, 2001, p.345). It can be defined that thanks to the information obtained from the specialists, they are computer programs by which a specialist can reach the performance in a restricted and well defined work.

Expert systems, considered as a kind of artificial intelligence systems, are computer programs, each of which is designed to have expert knowledge in a particular context. In this way, they provide the decision maker with expert knowledge to decide. In order for a computer program to behave like an expert, it needs to be able to do what the individuals do (Abacoumkin, and Ballis, 2004, p.415). In some cases, experts refer to others' views in order to solve their problems. Expert systems are therefore designed to be questionable, able to explain logical continuum and operations, and to demonstrate the accuracy of the consequences.

ES can be indicated as follows: they can be used in a limited area of application, include limited expert knowledge on that field, take on the role of an adviser in the light of this information, form a comment or suggestion on a problem (Afgan, and Carvalho, 1996, p.204).

An expert system consists of an *Information Base* containing facts, rules and other information about a particular problem; *The Deduction Mechanism* containing the information stored to produce the probing solution, a *User Interface* providing communication with the user, and an *Information Acquisition Module* helping to improve the knowledge base. Knowledge Base and Deduction Mechanism constitute the basic elements of the system. Although the Knowledge Base and Deduction Mechanism are designed as separate units, they interact with each other. This sharp distinction between knowledge base and problem solving methodology is a base structure of the improvement of an expert system. This discrepancy demonstrates two dimension. Preliminarily that properties indicate that the rule-base associated with other problem can be replaced with the existing rule-base; a varied system have been formed. Another point is that facilitate multiple use of same information by the expert system in different processes such as scanning, explaining, obtaining and acquiring new information for the solution. The reason for this is the creation of a knowledge data base that enables the expert system to know what it needs to know to store, rather than what it needs to do, by running the problem-solving methodology, in other words, the deduction mechanism separately.

This allows the information about the problem to be expressed purely by excluding all the references about where and how to use it (Liao, Hsien, 2005, pp. 95-96).

In expert systems, the structuring of expert knowledge in a structured way is the source of the intelligent behavior of these systems, and the intelligent use of knowledge to produce new facts and information is the result of intelligent behavior of these expert systems. Rule-based systems are used extensively because of the simple representation of information according to IF ... IS SO rules. They are, moreover, shifting from their original fields of use in chemistry, geology, mathematics and medicine to engineering (Wong, and Hamouda, 2003, p.219).

Today expert systems are successfully used in the fields, such as computer systems installation, error analysis in complex machines, financial management, industrial process control, career planning, personnel selection, resource balancing, medical training, medical diagnosis, military training, tax consultancy, debt consulting, etc.

1.3.6. Office Automation System (OAS)

The office automation system, facilitates the computing task and communication in offices and commercial organizations. The system, which include multifarious tools, has been steered specifically to the system. They generally provide information with a significant portion of the information that is less structured or unstructured, sent or stored. Secretaries, officers and desk clerks often use office automation systems because their professions involve general office works. Executives and professionals use OAS, as well because their jobs include general office functions (Ellis, Clarence, Nutt, and Gary, 1980, p.34). For example; they enable to use it to leave messages and to prepare presentations. These systems are a combination of various technologies based on electronic and computer to increase the efficiency of the employees working in the offices. The office automation system allows computers, telephones, fax, telex, modem and photocopy to be used in an integrated manner (Gümüştekin, 1998, p.150). In recent years, thanks to especially the development of personal computers, to the fact that they communicate with each other, have made it easier for users to do office works in less time, more reliably, and in relation to each other.

An advanced automation system used for office work consists of various subsystems, such as database administration systems, documentation accessing mechanism, text revising structure, graphic systems and computerized communication technologies. Computerized communication systems altered the course of many commercial activities. Communication-web allows the transmission of voice silent messages and spontaneous transfer of the data between the firm and its clients. E-mail and voice mail constitute an influential communication ground between people, even if they are out of office. Facsimile machines allow copying and transmission of documents via telephone lines, electronic interview forms provide convenience for people to work together in other areas (Iraz, 1999, p.48). Today, office automation systems have created a general purpose platform for all information systems.

1.4. Use of Information Systems in Enterprises

Activities of an enterprise may range from casual and tedious ones to future-oriented management strategies and policies. If these are considered to be two opposite ends, while the information which is going to be used in the former is easy, handy to use, factual and comprehensive, the information which is going to be used in the latter is considered as intricate, to depend on estimations and assumptions, which are impossible to process in a particular way (Türk, 2003, p.61). As enterprises grow and reach to a significant size at the national level, their activities will be impressed by varying internal and external circumstances. In this case, it will be harder to scrutinize the strategic and political administrative activities of the organizations; Furthermore, it will be hard to assess the information unless using a PC.

Firms set up their information systems to be able to respond to their competitors in a dynamic environment, to their customers, suppliers and sellers. The change of external environment and business problems necessitated replacing the old system and installing a new system instead. These new information systems to be installed must be based organization and compatible with firms.

It is no doubt that there exists no single system to administer whole business operations. Enterprises use differing information systems, which concentrate on different sorts of problems, and on different business functions. In addition, they are specialized in

a specific fields (Nonaka, 1998, p.13). Hence, any change in one field does not necessarily spread to other fields.

Businesses also set up information systems to monitor activities within the company, and to manage internal problems arising from a variety of reasons. Generally, these systems are divided into to their particular functions and varieties of problems that they focus on. Additionally, IT have an important influence on the redesign of business structures and business processes. These processes mentioned are operations for producing products and services, selling, delivery of goods and services to consumers, after selling client/services and relations (Chrıstoherand, Powell, and Philip, 1991, p.82). With the information systems, it is possible in general sense to obtain advantages such as increasing the system efficiency, offering higher quality G&S to customers, decreasing costs, developing different product range based on information, and rising competition power.

Furthermore enabling older processes to work better in organization, information technologies allow them to break down old rules, and foresee the new working approaches and new opportunities for competition. Moreover, with usage of information technologies, cost advantage have been ensured and stability of decisions are increased.

For instance, the computer usage communication network in the online sales, production, and in the inventory control system have a good oppportunity on control over stocks. In consequence of this check, stocking of some products unnecessarily at certain points is prevented, and their delivery to other points is provided. The use of information technologies in the business makes it possible to plan the stock shipment by determining the optimal stocks for each warehouse of the routine products. These possibilities result in very significant stock reductions, which consequently lead to a reduction in costs, as well. The businesses, of course, need more knowledge to reach the global markets, which consist of markets with different characteristics and structures. Information technology is the greatest aid for decision-makers in obtaining timely, meaningful, usable, consistent information, and making consistent decisions based on this information.

With output of information technologies, datas which a company needs are as just distant as too little computer keys are. Developments in information technology have a signficant status in all marketplace, increasing competitiveness of enterprises. The

future of information technologies is determined by the needs and technological innovations of people and/or enterprises using information technology products. Businesses are always in need of technological products that reduce costs, provide better service, make staff more productive, improve managerial decision-making, and that are used in order to gain competitive advantage (Bubley, and Bennett, 1994). Because, whether in the domestic market or in the foreign markets, the products that are more successful on the market, are the products that will meet the needs of the consumer, and therefore, meet the needs of the producers of the products that will meet those requirements.

Thanks to information technology, information can be found not only in one place but also in as many places as necessary, with the use of common databases. Considering that all parts of a business are interacting with one another as a system, the information that one department is using can be used in another department at the same time if the common databases are used.

CHAPTER 2

ENTERPRISE RESOURCE PLANNING

2.1. The Development of Enterprise Resource Planning

Enterprise Resource Planning (ERP) is a business software system that enables sharing of common information and of activities within the enterprise, enabling the integration and automation of critical departments of business processes, and enabling a real-time access to information and the creation of information (Davenport, 1998, p.30).

ERP is a means that combines datas related to activities which include all supply chain (finance, human resources, production, sales, and marketing) and management functions (Ramayah, Roy, Arokiasamy, Zbib, and Ahmed, 2007, p.279).

Looking at the historical development of the ERP system, it is seen that the origin of this system dates back to the 1960s. The initial manufacturing practices were often limited to inventory control and purchasing. In reality, these were accounting software products used by accountants to calculate the value of the inventory. In the 1970s, this focus shifted to the material requirements planning system, which calculated the material requirement (Gibbon, and Aisbett, 1999, p.73).

Material Requirements Planning (MRP) is a production planning usage technique designed for calculating the supplies for the needs. MRP is a simple technique, but it does not take into account the constraints on resources or deviations from the program; therefore, it can produce unreasonable solutions when used alone. MRP II or Manufacturing Resource Planning Systems were created in the 1980s in order to eliminate these shortcomings of MRP. There is a need to plan and manage manufacturing processes, to consider environmental and organizational issues that affect business and manufacturing processes in the current market environment. The MRP II system has only overcome some of the deficiencies of the MRP system by using limited capacity programming and senior manufacturing management systems.

Capacity planning could also be done with MRP II systems, which have superior features than MRP systems in terms of manufacturing and distribution activities (Karakanian, 1999,p.3).

By the 1990s, MRP II was further developed and structured to include all the functions of an enterprise, such as engineering, finance, human resources, project management. This system was named as the Enterprise Resource Planning (ERP) System (Seethamraju, 1999, p.136). MRP II / ERP production management systems are systems based on computer networks designed to plan and carry out all kinds of activities in enterprises and to exchange data between these plans. Table 2.1. summarizes the historical development of ERP systems:

Table 2.1. The Historical Development of ERP Systems

System Type	Time	Objective	Focus Point
Order Point Systems	1960s	Forecasting and inventory management using historical data	Cost, inventory systems supporting high volume production environments
Material Requirements Planning (MRP)	1970s	Quantitative and temporal planning of production and material processes on demand basis	Production integration and planning
Production Resource Planning (MRPII)	1980s	Implementation and monitoring of capacity planning and manufacturing plans at workshop level	Integration of all production resources, detailed cost reports and quality

Table 2.1. The Historical Development of ERP Systems (Continued)

System Type	Time	Objective	Focus Point
Enterprise Resource Planning (ERP)	1990s and beyond	Integration of all units in enterprise by adding customer and supply dimensions	Integration of production, supply and customer data

Source: Summer, M., (2005). Enterprise Resource Planning, Prentice Hall, New Jersey, p:3.

Briefly, ERP based client production system. Namely, appearing as applications like e-trade, e-booking, e-university, e-state and as an industrial administrative structure in 2000s, the ERP have been a client-oriented industrial administrative system, and been demended extensively in Turkey as well as other countries across the world.

Businesses that aim to provide customer, employee and managerial satisfaction put into effect Customer Relationship Management (CRM) which protect existing customer and offer value added service in all areas according to the results from the customer information and data analysis (Fui, Fiona-Nah, and etc. 2003).

According to the researches, in the last few years, many organizations have begun implementing Enterprise Resource Planning (ERP) systems by using the softwares of companies, such as SAP, PeopleSoft and Oracle. ERP Market is among the fastest growing markets in the software sector (www.oracle.com). A study by APICS (a consulting and training company) has revealed that 34.5% of APICS member companies with revenues over $ 1 billion plan to buy an ERP system or upgrade their current program (Umble, Haft, and Umble, 2003:249)

2.2. General Properties of ERP System

The ERP concept has been widely used in companies such as European and USA firms recently, and attained a great deal of success in computer-based industrial management techniques. In Turkey as well as other countries, the ERP computer program

is becomming more and more trendy particularly in extensive companies and other various fields.

The unique features of Enterprise Resource Planning concept is which they specialized to adjust to divergent on demands of varied industries and segments, this is the reason why it is becomming increasingly popular in Turkey and in the whole world. Despite the industries are adjusted to nonstandard based the size of the companies or the demands of them , the known features of the ERP programme are below (Sumner, 2005, pp. 92-94)

- It is the most comprehensive and general form of software, targeting many sectors and must be configured before it can be used.

- Pre-configured templates have been created from the software's extensive version. This templates have been customized by diversified industries and firm size.

- After the resource planning software has been loaded in the first and second form it is specialized to structure of firm.

The general opininons about the defining characteristics of ERP systems can be summarized as follow:

- It has present a formula to solve any problem in the company

- It has use all of sectors in the market as base and after setup of system they have been adapted to firms in the direction of demand ands wishes.

- It has an integrated database which is consisted of fundamental datas and datas belong to management process.

2.3. Reasons for the Enterprises to Use ERP

There are many factors making the use of ERP applications mandatory. Just a few of the main factors are to obtain a single institutional resource to meet the information needs of the enterprises, to reach the same database at once, and to integrate their business systems into one platform, as much as possible.

The companies that do not use ERP try to execute their business implementations by combining paper-based systems and scattered, non-interrelated software. As a result, as there is no general over all knowledge on their hands, they face a great difficulty in management (Soliman, and Youssef, 1998, p.889). Therefore, they have to spend a lot of time and effort to get the necessary and important information.

Many manufacturers need technological assistance to meet the increasing customer demand for product renewal, faster delivery, better quality and better service. When we are to think of a global company, it will need to have real-time accurate information so as to coordinate and control resources in very different and distant locations. Decision making process involves different time zones and different geographical regions. Sometimes decisions may have to be made simultaneously with different opportunities from different geographical locations. For example, in order to meet customer demands in an Asian country, the production capacity at a branch in Australia may have to be increased, depending on the purchases of materials supplied from European countries and Canada. Sometimes the machines may break down or other important events, which can reduce or stop the production capacity in one place, can occur, and the production capacity in another place may have to be changed to meet the customer demand. Such changes in the plans may require rapid changes in decisions regarding the material flow, logistics and production schedule that will impact a firm's global production network. If the production systems are not well integrated, more time and effort will be spent in order to access the information, and an optimum performance will not be achieved. (Hagman, 2000).

Enterprises tend to use ERP for various reasons. For example, they use ERP to integrate the scattered system and collect it under a single roof. By using ERP, it is possible to increase the quality and visibility of information. Besides, Integration of commercial transactions and systems, and integration of acquired business information for the existing technology infrastructure is provided by ERP. It is very necessary to change old and unfashionable systems, and to obtain expandable systems that will enable to grow in business life.

Besides all these, ERP is also important to increase business success, to increase customer satisfaction, to simplify all ineffective and complicated tasks, to have an opportunity to develop new business strategies, and to adapt to a global business life.

2.4. Usefulness of the ERP Systems for Effective Management

When evaluating advantages of -ERP concept in the one title includes a negative situation of eliminating some few benefits. ERP system. This essential study by Shang and Seddon (2002) divides ERP software benefits into five parts:

- Usefulness from the Point of Operational
- Uselfulness from the Point of Managerial
- Usefulness from the Point of Strategic
- Usefulness from the Point of IT- Infrustructure
- Usefulness from the Point of Organizational

2.4.1. Usefulness from the Point of Operational

Operational advantages emphasize the developed management process and daily operations. These are primary benefits which emerges from the ERP system. One of the operational benefits is performance improvement. Increment in the amount of sales thanks to customer contentment and cheaper price can lead to higher profits, which can be transferred to shareholders.

Utilities of the ERP software from the point of operational have been categorized as the following:

- Decreasing stock and costs

- Production performance increase,

- Enhanced supply chain,

- Cycle-time reduction

- Checking costs speedly

2.4.2. Usefulness from the Point of Managerial

The centralized data and improved analysis capabilities have been presented by ERP systems. ERP gives executives real time and coherent information that develops decision making. Observation of institutional data from one center and the chance to be able to access to decision-consistent data supplied by ERP systems can prompt better choices, and are consequently useful to executives regardless of the possibility that most directors don't merely depend on computer based data to make decisions. Particular decisions can be computerized to limit process downtime (i.e., by utilizing computerized sending of workflow errands if there should arise an occurrence of nonattendance of the primary individual in control) (Shang and Sheddon, 2003, p.80).

Another managerial benefit of ERP ssytems is better resource planning. The expenses to inspect the staff can be decreased thanks to better "understanding:" ERP systems are committed to enhancing process clarity, more performance information than any time in recent memory is instantly accessible, and this information can be "pierced" at a particular institutional level in a particular functional unit. Davenport accordingly claims that managers will be able to show courage to embrace ERP systems with the intention in order to infuse more discipline to their organizations. Furthermore, ERP systems can constitute an environment of internal organization to reduce the need for middle executives by ensuring the staff access to imperative business data (Davenport, 1998, p.7). Additionally, progress in individual and group performance is one of the usefulness from the point of managerial.

2.4.3. Usefulness from the Point of Strategic

There are various strategic utilities of ERP systems, such as encouraging the expansion of the companies as well as promoting strategic alliance, which is a cooperative agreement between two or more independent entrepreneurs to provide mutually strategic advantages (Bartol and Martin, 1998, p.87-88). Today, strategic cooperation is more often achieved in sectors, which require high technology, where global competition is intensely experienced. ERP systems have acquired such an "industry standard" status in some

sectors that a company will have difficulty to make due without a perfectly adaptable ERP foundation. Client-oriented items or services can be provided at a cheaper price, and information-based connections with clients and product providers can be established in order to encourage product differentiation and services so that assist business expansion (Davenport, 1998, p. 126).

Another strategic benefit of ERP systems is business innovations. The way to improve business innovations is always to be able to adapt to new ideas and changes easily. With the right business model innovation, companies should make rational plans by developing their strategies, and keep the cost leadership in the market. At the same time, by continuously following the market, companies should see the needs and wishes of their customers before their competitors. In this direction, they can achieve success by product differentiation (Finney and Corbett, 2007, p.334). ERP systems assist the companies, and support them in the process of cost leadership, product differentiation, and sustaining the competition.

Moreover, when the points on the different projects of the companies are combined, all the structure behind e-commerce seems to have been built on an integrated ERP approach. The ERP system was designed for e-commerce from logistics to marketplaces, from e-transformation to omni-channel, and it has shown that the important thing is that all the fiction is concerned with adapting to the speed of online world and to the efficiency requirement of the competition. Last strategic advantage is to constitute external relationships (with clients and providers). Using ERP frameworks, associations can make an "E-empowered" business condition, prepared to take an interest in client and provider accomplice networks (Frank, 2004, p. 423). ERP frameworks are based on "best practice" models, as sellers have incorporated understanding from other ERP extends in their plans, helping associations to import "best of class" forms and to close the hole to industry leaders: this approach of both enhancing and institutionalizing procedures ought to likewise prompt better coordinated effort amongst associations and their business condition.

2.4.4. Usefulness from the Point of IT-Infrastructure

Information Technologies (IT) have build litheness of companies for both nowadays and future changes. It gives oppurtunities which decreasing cost. ERP systems

may be viewed as a way to defeat interior programming executive challenges: rather than handling perilous, complicated domestic application improvement ventures, companies buy a ready, completely useful, very much reported, and demonstrated programming item.Regardless of the possibility that the expenses of actualizing - choosing , adjusting, conveying, and training - ERP programming bundles are high, they are by and large cheaper than those brought about by creating specially designed programming. In addition to, it rounds documentations out (English,1999, p.24). Finally to provide some positive circumstances about IT development can be increased IT infrastructure possibility. In the late 1990's, numerous specialists communicated the dread that product applications could deliver blunders, or even could pause as they put away the year data in a two-digit design (e.g., "10" indicating "1910" or "2010"): the origin of this incident is to be found in the beginning of manufacturing of the software, when software engineers needed to spare space by putting away dates into as meager memory as possible, instead of furnishing applications with the ability to work after Year 2000. Instead of re-building all conceivably influenced applications, numerous companies chose, while the Year 2000 drawing closer, to supplant their applications by new systems (Galoppin and Caems, 2007, p. 23). Additionally, these are as follows:

- Readapting business processes to IT
- Decreasing work-load

2.4.5. Usefulness from the Point of Organizational

Companies has many usefulness of the ERP systems for effective management from the sight of organizational. ERP system assist organizational changes. As an immediate result of ERP reception, institutionalized and streamlined business forms guaranteed to better help organizational adjustments, with ERP frameworks playing the part of an apparatus to execute a "business change infrastructure." What's more, while considering the employment market, the institutionalization of application use encourages companies to discover ERP experts with better training, i.e., utilizing a job profile, like "SAP SD professional " (portraying people with experience on how to utilize the SAP ERP Sales and Distribution module functionality), on both IT and business.

The most significant organizational impacts of an ERP usage are enhanced clarity among the departments, and the integration of operational processes among institutional functions. ERP systems necessitate a thorough reevaluating of business exercises, and the development of continuous mutual learning processes for all concerned, besides thorough reorganization of exercises and more computer-based jobs (Yousef, 2010, p.30).

Another one of the advantages is is empowerment. Better domestic knowledge thanks to combination of information and process and a more grounded use of IT bolstered forms in ERP conditions can present ERP users more energy to get associated with the business, play a visible role in processes, to make accurate and truthful decisions in their business environment, or to partake in organizational development processes; additionally, a significant part of the administrative works concerning documentation of business exercises can be handled through the ERP system. Moreover, middle executives who only gather and transmit business-related data to the staff are not required in this model at all (Zach, 2012, p. 23).

Additionally, establishing common vision is an important organizational advantage. A company that embraces an ERP system can encourage a common comprehension of its business framework, as the framework forces a standard business glossary and enforces its users to establish a outlined and documented process environment. In view of this widespread term and rich process (information) feedback, ERP systems can lay a typical base for discussing and characterizing future business headings.

Other advantages can be categorized as follows:

- Changing work patterns
- Shifting work focus
- Increased employee morale and satisfaction

2.5. Faced Changing in ERP Cutover

A comprehensive preparation before apply to ERP is the key of achievement. ERP implementation must be carefully managed in order to provide utility an ERP solution. It is important for companies to be aware of predetermined critical issues in any ERP package. Without patient and careful planning ERP applications are wasting corporate resources instead of providing competitive advantage (Düzakın, 2002, p.205).

Problems in ERP implementations are described in 10 articles (Babaei, 2015, p.16):

1. The senior management's system commitment,

2. Ineffective communication of users,

3. Inadequate training given to the user,

4. Failure of user support,

5. The lack of effective project management methodology,

6. Conflicts between departments,

7. Making plans with old applications,

8. Compliance of project team members,

9. Failures in rearranging business processes,

10. Correct understanding of the conditions of change.

2.6. ERP Implementation Process

Although ERP systems appear like only a software from an external perspective, it is a management approach which redounds much more novelty. This software is to have access that approach. In addition, it is the long term duration which does not be concluded just setup process from the point of enterprises. Therefore ERP process is the troublesome and demandingness term. Primarily, the process, which begins with the determining of

the needs, is followed which choosing necessary ERP programme, and arranging the installation process.

2.6.1. Determining Needs

Before Enterprise Resource Planning, it has done some wrong things by firms that have started to be implemented is the opinion which software to be bought deal with the some issues of companies. However this is out of the question for a software that doesn't answer to the needs of the enterprise could solve all of problematical issues of the enterprise (Nıcolaou, 2004, p.13). In this sense, in beginning to implement ERP systems is to determine the scope of the system to which a enterprise needs.

As the first step, companies must decide the future targets, plans and later it must develop needs of Enterprise Resource Planning. Ensuring that, the enterprises can use ERP project business plan. Business-scenarios are prepared by planning in which departments and functions ERP systems are should be used (Klaus, Rosemann and Gable, 2000, p.148). So that, it can be seen what ERP system can provide to businesses.

2.6.2. Choosing ERP System

The adaptation of selected enterprise resource planning methods and different, customized business logic let the enterprises to gain the flexibility, effectiveness. Notwithstanding compatibility, improvement and integration into the enterprise does not easier process.

The aggregation of an resource planning system into the enterprise should not thought such as setup of a program in the compact disc. Costs of the systems are very high, and adjustment of the enterprises to the system is quite difficult; therefore, determining the true ERP package before implementating software is significant. (Eralp,1999, p.102).

Selecting nice looking or trend ERP package cause the enterprise suffer great damage both in terms of cost and time. For this reason, to make a right decision, the needs

of the enterprise should be determined well which is the first step will bring failure because the wrong decision will also effect another processeses in an important way.

Deciding of the ERP programme is an essential issue for future of companies. According to the logic of ERP system, it is irrecoverable investment when considering cost of them, difficult sides of configuration process and loss of procurement. Judgements of this subject covers several negative thoughts such as shutdown of workplace.

Therefore, companies must be attentive while selecting ERP package. Configuring and determining free of error ERP is sensitivity process. If necessary ERP package has been selected correctly as it was expected companies have attain high performance

A business which prefer Enterprise Resource Planning that focus on several subtitles to determine appropriate ones of ERP consultancy firms. The subtitles is summed up four groups. It has been listed as follows (Injazz, 2001, p.379).

- Being functional
- Being reliable of consultancy firms
- Support services
- Calculating the costs

Being Functional

While determining the ERP system, the customized programme to has been taken has to be appropriate functionally. That is to say, it must include solution methods to respond the management processes quickly.

The coordinated planning of numerous supply, production and distribution centers can be sustained, to a certain extent, by planning these centers separately within themselves. Nevertheless, as the work load enhances, the geographical field which is given service expands and the number of workers escalate, it is to be essential for the enterprises's future to make planning from a headquarter. It is necessary to gather client orders and estimated sales datas collected in the sales-point, distribution centers chain to plan based on distribution channels, manufacturing and supply centers to accumulated

datas; at this stage, to determine the funding source supports with which the centers will provide each other, such as information, man power, machinery, materials, and energy; and to aggregate the distribution, production and supply master plans, determined on the basis of these centers, in a single center. (Siriginidi, 2000, p.385).

ERP system gather a lot of elements in the firm. All of these elements can not be expected to take the similar properties and needs in. Thus, it is a significant issue that ERP systems to have been loaded are due to be sufficiently flexibile and functional. When the data, which is to reach the center, are gathered, it is necessary to primarily comply with the needs of the center and the legal requirements; and in addition, it is necessary to make arrangements, in the sources of the data, that is, in the supply, production and distribution etc. centers, according to the needs of operations. (Cebeci, and İsmail, 2007, p.17).

As clearly seen, one of the most essential issues in determining a correct ERP is whether the system will make available to headquarters, departments, or the branches with this flexibility.

ERP software provides the above mentioned flexibility with the variables they have. They are assumed functional for the enterprises as long as they can provide this flexibility. These variables are listed as systematical variables, organization variables, integration variables, functionality variables, and movement variables (Newcomer, 2004, p.46).

The systematical variables/parameters have confirmed how the constituents of system will work, in other words, answer certain questions such as modules of an ERP software, number of users. Organizational variables has been defined by construction of the organization. To exemplify, businesses of the holding company, the distribution-agencies have been determined by way of those parameters. Integration-parameters are parameters that associate financial department with production, logistic and purchase department.

The most significant prosperities of the integration-parameters are adapted to the laws of the respective countries. It is unlikely that the software via parameters that do not fully comply with the law will be effective. Functionality-parameters are parameters that

determine how the properties of the products, the units of measurement, the production prescriptions, and etc. are organized. The last of these parameters are the movement parameters that provide tracking of follow-up of sales movements, quota, production movements, and that allow the comparison of expected movements with the actual movements (Newcomer, 2004, p.48).

Referred parameters are significant for companies that have considered implementing ERP system. Because of some lack of in the paratemers can cause organizational disturbances, it is necessary that analyze the parameters of the companies resource planning which companies choose.

Being Reliable of Consultancy Firms

It is the most significant that consultancy company which present SAP or each of others should be trustable, therefore because business partnership will occur in the long term period.

Not any enterprise resorce planning programme have formed all variables that have occured some factors such as functionality, flexibility (Fui, Hoon, Janet, and Shang, 2001).

Ever since this system has released, lots of variables has been putted to provide flexibility in accordance with demands of the clients and still has wanted new things by them (Karsak, and Özoğul, 2009, p.663). So that, firms should have researched that whether ERP companies are innovator or not.

Support Services

ERP applications are thought like temporary project by companies which use services. Actually, it is not correct. Because, taken services by the supplier firm throughout and following the configuration of the ERP have great importance. When ERP companies increases power of support more and more, configuration process, training of users, technical support develops (Kerimoğlu, 2006, p.28).

Calculating the Costs

One of the significant topics in ERP cutover from the point of businesses is how much cost will be. The cost of enterprise resource planning; purchasing software package, setup process, support and hardware costs. The setup and hardware costs of the ERP systems can surpass software costs.

Extension of the time limit of the setup be pioneer to enhance costs and go wrong process of companies (Everdingen, Hillegersberg, and Waarts, 2000, p.28). It is esssential that ERP package configuration conscientiously and the proper resources have been chosen for the project.

In Enterprise Resource Planning costs, both primarily investment cost and on the based total-cost of ownership (TCO) composed of operational costs have been evaluated by companies (Elragal, and Haddara, 2010, p.101).

There are many cost factors in ERP cutover process. These components have been showed in Table 2.2. It is significant that each of elements such as

- Software
- Devices / Tools
- Consultant Support
- Standardized or Customized Trainings to Firms
- Staffing

A great majority of costs has been spend to the software components. Analyzing costs of system at the beginning of the continuum and by taking into consideration factors of cost that can be one of the significant issue in the ERP cutover period.

ERP installation and operational costs has been given as percentage value in the Table 2.2.

Table 2.2:ERP Installation and Operational Costs

ERP Cost Components	Ratio in Total Cost (%)
Software	35,8
Equipment	25,8
Consultancy	23,1
Education	7,7
Staff	6,8
Other	0,7
Total	100,0

Source: Haddara,M., (2012). Exploring ERP Adoption Cost Factors, Department of Information Systems, Faculty of Economics and Social Sciences, University of Agder, Kristiansand 4604, Norway, pp. 256.

2.7. The Pros and Cons of the ERP Systems

Enterprise Resource Planning allows to react the threats in the market more quickly. It contributes to the decrease of inventory costs and holding costs through efficient inventory management and control. ERP enables to use of production and distribution resources such as materials, workmanship, machinery-equipment, information between regions and / or workplaces efficiently and jointly (Jongkyum, Andreas and Miklos, 2013, p.67). ERP systems admit of being done real timely profit loss and cost analysis.

Enterprise Resource Planning has provide support to increase competition power to the changing production conditions by reacting rapidly. It can simulate possible results

by creating sample scenarios and can increase customer satisfaction through developing customer service levels (Morris, and Laksmana, 2010, p.61).

Based on from each other quite different functions, units, enterprises and countries which uses ERP, common and central coordination must be created and do away language, geography and time boundaries. Thus, a manager can easily follow the various activities of the factory in another country. With the ERP system, the customer can order an order over the internet, by searching for a single unit, and then follow the progress of the order he gives. Since the system is standardized, the information is the same throughout the whole organization (Krumbholz, and Maiden, 2001, p.192).

ERP not only integrates the entire organization from one end to the other, but also provides information on related functions that want to work more efficiently. Product oriented decisions can be tracked in real time, from production to sales, by connecting more effectively to sales-focused decisions in a shorter period of time (Tanyaş, 1994, p. 34). Thus, decision-making becomes faster and easier

By combining and integrating information with the ERP system, more efficient use of resources can be achieved. Thus, more added value can be obtained with less resource use. Additionally, ERP system enables more accurate and consistent reports to be prepared automatically (Mabert, and Venkataramanan, 2000, p.54). Another one advantage in ERP system, the information is readily available and the end user can easily access the information when they need.

ERP system is intended to reduce the work process and costs throughout the enterprise. Thanks to the high level information integration and the ability to reach the most up-to-date information, the organization responds instantly to market, customer and business situations (Beşkese, Berna, and Tanyaş, 2003, p.150). So that inventory control and supply / demand balance is provided

By not counting the benefits of ERP software, these products offer great advantages for company executives, but at the same time they can cause some troubles because of the programs are getting better day by day. Given the disadvantages of ERP software as follows (Rajagopal, 2002, p. 92):

- The use of this system within the company is limited to a few cases.

- The cost of the ERP software to use can be extremely high. This is the most contemplated part by the firms.

- It is not suitable for large organizations whose construction is planned and may cause institutional escape of the system.

Additonally, beginning to use this system in the company may cause restructuring of many units within the institution (Heizer, and Render, 2001, p.296). This case is costly and time consuming process.

2.8. Systems Applications and Products (SAP)

With the help of SAP consultants, who are very satisfied with the phenomenal success of SAP, this application has attracted a great deal of interest in ERP market. Courses and pannels about ERP are not appreciated by the readers / participants unless they contain information about SAP.

SAP, located in Walldorf, Germany, is a partnership formed in 1972 by a group of engineers who aim to unify business processes with technology. Founded by three IBM engineers, it is nearly a 30 year old company with management. In the ERP market, SAP R/3, which is an ERP software, is used by many as synonyms for ERP. SAP is the leader in its field with a market share of around 30% so openly that it will accept no questions. SAP is the world's largest business software solution company with a 1999 roll of 5.49 billion USD. It has over 13,000 customers worldwide. 10 of the top ten companies among sssFortune's 500 largest companies use, 8 out of the top ten most profitable companies, and 7 out of the top ten companies with the highest return on investment (ROI) use SAP R/3.

Evolving not only to transform the world of information technology, but also to change the way the enterprises work for a period of 45 years of experience and with approximately 345,000 customers now SAP is stronger application than ever, and has fed its founders with a pioneering spirit that inspires them to continuously transform the IT industry (www.sap.com).

Due to a single and unified sales strategy, a large number of SAP R/3 consultants are needed. Six major consulting companies are SAP's business partners. Intense demand generates very high levels of hourly wages for SAP consultants.

SAP drove its first product to the market in 1979, and SAP R / 2 has become a model success for mainframes. Currently, there exist SAP R/2 applications, actively running. SAP R/3, the locomotive product of SAP, emerged in 1992, and created a very shock wave. SAP R/3 came on the market with modules to meet all the needs of a typical industry in a phenomenal functionality, such as sales & distribution, material management, production planning, financial accounting, check and control, project management, process control, and quality management (Chen, I. J. 2001: 380).

SAP markets all industrial products that can be designed. These; textile, automative, pharmaceutical-chemical, energy, food products, consturction materials, electrical and electronics and technology. Nowadays, many companies prefer SAP software. These firms can be shown as an example: Nestle, Ernst and Young, Deloitte, Sabancı, Koçtaş, Vestel, Microsoft, ADCO, Ekol Logistics.

Prior to SAP, the enterprises used to be managed in accordance with the manager's experience, and the decision used to be made accordingly. This sometimes was time-consuming for the enterprises. Even though many successes were achieved in this way, the costs of mismanagement and decisions prevented companies from becoming competitive. SAP solutions accelerate the management and decision making processes. In addition, thanks to the reporting solution of SAP's, more appropriate decisions are made. As a result of these factors, the enterprises will be more competitive.

Due to the increased business volumes, and to the difficulty of following traditional office and accounting programs and workflows, enterprises direct their attention to ERP software to control the processes from a single program, and to improve the business processes. (Scapens, R., 1998:47)

Therefore, after SAP's ERP solution, business processes are integrated into each other, and are easily to followed. The history of companies can be tracked thanks to storing, archiving and receiving reports that contain information. Thus, the enterprises can take more realistic steps about their future projects.

2.8.1. Properties of SAP R/3

SAP has developed a Client-Sever Architecture that provides the benefits of Open System (OS), based on the hardware or hardware choices of SAP R/3 customers. SAP has also customized R3, for instance, IBM's AS/400 platform has been moved to traditional data centers. The R3 version is also available for leading O/ZS platforms, such as VMS, Unix, OS/400, MVS, and later, has provided an unrivaled advantage to end users, releasing a version within Windows NT.

SAP R/3 has provided an opportunity to take advantage of the leading features of Oracle, Infomix and finally the Microsoft SQL server, which are leading Relational Database Management System (RDBMS) software. SAP R/3 supports a variety of integrated hardware, software and RDBMS products from distributed computers, by using some standard protocols. It integrates with the standardized workflow software, such as R/3 Lotus Notes, and has interfaces that support electronic mail, EDI (Electronic Data Interchange) and office programs (Ms Word, Excel, etc.) (Galoppin and Caems, 2007, p. 38).

All these have made SAP a success. The secret of SAP's success is that it is a strong, quality and mature product, has a strong R&D support, that it has a process-based approach rather than a technology-based approach, that it has partnerships with consultants firms and information technology companies, and it has strategic sales, and that it reserves its own capital into software and training. It is mature enough to meet the functional needs of a large global company. This includes best business practices, global accounting norms, the currencies, trade practices, and multilingual support. SAP also offers different special modules for different industries such as banks, hospitals and trading companies (www.sap.com.tr). SAP allocates more than 10% of its annual budget to R&D not only for technology researches but also for finding globally the best business practice. SAP annual budget More than 10% devotes to R & D not only for technology research but also for finding the best global business practice. Consulting firms also assist SAP with information technology vendors (hardware and software) to a large extent. For every $ 1 that SAP earns, SAP's business partners earn $ 4.5.

Consulting companies, such as Price Waterhouse, have set up the SAP Competence Center with their own investment opportunities. Hardware vendors (such as HP and Compaq) are pre-installing themselves to help end users (Altınkeser, 1999). SAP, which operates with local representatives and local companies all over the world, established SAP Turkey in 1995 to organize its activities in Turkey. SAP continues to improve the R/3 package in the direction of customer demands. Along with recent developments in Internet technology, new versions of the product have been prepared to integrate directly into e-commerce transactions. SAP, in addition to ERP systems, provides Customer Relationship Management (CRM), Supply Chain Management (SCM) and Relationship Management (SRM) solutions under mySAP.com.

The SAPR/ 3 System manages the whole uniform workflow, and personalized error data during the processing of purchase documents. It does not matter whether purchase requisition is due to planning flow, cost center needs or sales. SAP R/3 always allows the recipient to identify the source of the request. If desired, procurement documents may be subjected to a flexible approval process. Customers have significant purchasing orders, including past supplier prices and long-term contracts. It is possible to have the price comparison automatically rolled out for each purchase. In addition, vendor evaluation enables the vendor to sellect the highest quality product and service provider. These features minimize the cost of procurement (Victor, Mayr, and Amon, 1999, p.175). Automatically updated the date of purchase orders, the goods and billing information, and the timelines of daily transactions are delivered to the user as information.

CHAPTER 3

THEORETICAL MODELS RELATED TO ACCEPTANCE OF INFORMATION TECHNOLOGIES

Enterprises are integrating different technological systems into their companies with the objective of increasing their performance, of getting better performance from their employees and of having things done easier. However, the fact that new systems are not fully adopted by employees can prevent them from being used effectively. It is one of the problems of the enterprises, and therefore of the researchers as well, to investigate the causes of resistance of the employee to the use of innovation, and to increase the use of systems by making new changes in this regard. The models created to explain the behaviors were then used to investigate factors affecting the acceptance and the use of technology, and they later formed the basis for models exploring the acceptance of information technologies. The Technology Acceptance Model (TAM) is one of the most effective and most frequently used models. The Theory of Reasoned Action (TRA), which sets the stage for the development of TAM, is an important model, in describing the behavior, developed by Fishbein and Ajzen (1975). Theory of Planned Behavior (TPB) has created a new model by adding the 'perceived behavioral control' variable to TRA, assuming that it is unlikely in real life to assume that it is entirely under the control of the person whether to realize and perform the behavior, which is considered to be one of the most important assumptions of TRA. Consequently, this section will mention the models, which are important to the acceptance of technology, and are most commonly mentioned in the literatüre.

3.1. The Theory of Reasoned Action (TRA)

TRA, developed by Ajzen, suggests that human behavior intentions are influenced by attitudes and personal norms. The objective of TRA is to understand and predict the behavior that individuals consciously intend. TRA assumes that most behaviors are

optional (situations in which one can decide whether or not to conduct the behavior) (Ajzen, 1991, p.183). And for this reason, behavior can be estimated by the intention variable. Behavioral intention is a measure of the likelihood of someone performing a given behavior. In order to understand and predict behavior according to TRA, it would be sufficient to ask the person a simple question whether she intends to achieve the behavior (Ajzen and Fishbein, 1980).

Although the intention variable is the variable that immediately precedes the behavior, the relationship between intention variable and behavior depends on two factors: First, on the fact that the intention variable is in accordance with the behavior in terms of action, scope, target and time; And secondly, on the fact that behavioral intention does not change before accomplishing the behavior. Although there is often not a perfect fit between behavioral intentions and behavioral variables, people often act in accordance with their own intentions (Ajzen and Fishbein, 1980). Figure 3.1 shows the relationships between the variables in the TRA.

Figure 3.1. The Theory of Reasoned Action
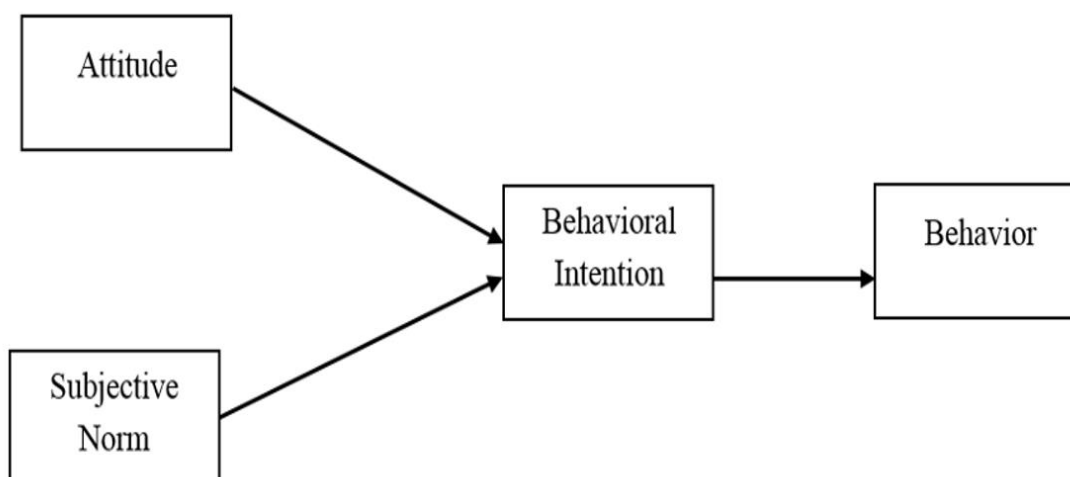
Source: Madden, T. J., Scholder Ellen, P. S, and Ajzen , I. (1992). A Comparison of the Theory of Planned Behavior and the Theory of Reasoned Action, Society for Personality and Social Physchology Vol:18, No:1, p. 4

The subjective norm shows "her belief about the thoughts of those who are important to her concerning whether she is to carry out an action or not". As seen in Figure 3.1, behavioral intention variable is affected by behavioral attitudes and subjective norms.

Attitude and subjective norm are influential on behavioral intention. The intention is the precursor to the actual behavior (Kaya and Tekin, 2003, p.3). In addition, this model is insufficient to explain the behaviors that require certain knowledge and skills, or that require cooperation of another person.

3.2. Theory of Planned Behavior (TPB)

Theory of Planned Behavior (TPB) was created by Ajzen in 1991 on the basis of the Causal Behavior Theory. In addition to the Causal Behavior Theory, the model was developed by adding "Perceived Behavioural Control" item to the theory (Ajzen, 199:181-183). Figure 3.2 shows the model related to the Theory of Planned Behavior (TPB).

Figure 3. 2. Planned Behavior Theory
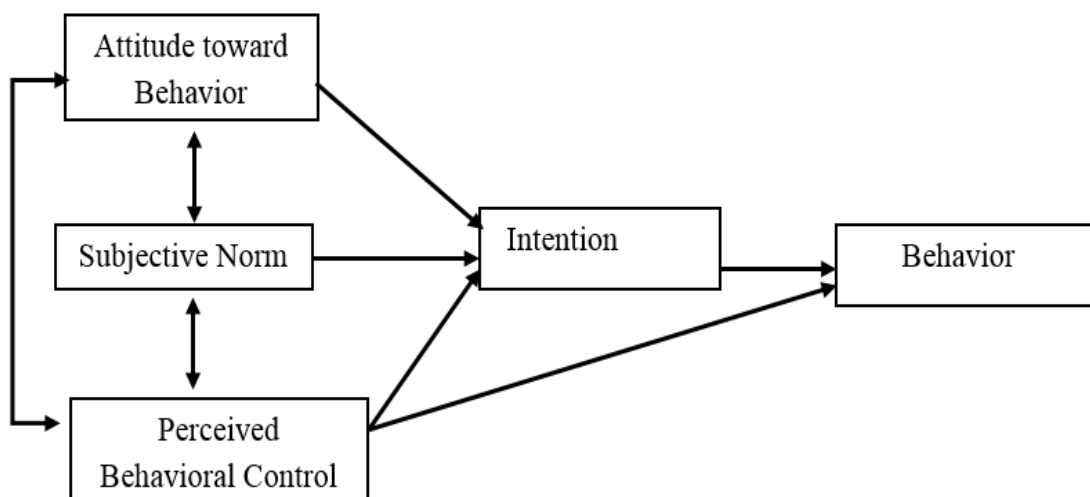
Source: Ajzen, I. (1991). The Theory of Planned Behavior. Organizational Behavior And Human Decision Processes,50, p.182.

According to Theory of Planned Behavior, the intention of the individual to perform an action is not realized only by his will. "Attitude toward Behavior", "Subjective Norm" and "Perceived Behavioral Control" factors affect the individual's "Intent to Behavior". These factors collectively influence the individual's actual behavior. Ajzen (1991) explains the relationship between behavior and perceived behavioral control variable on two grounds. First, if we think that intent is constant, the effort shown to achieve behavior successfully rises with the positive increase in behavioral control. Secondly, the perceived behavioral control variable can sometimes be used instead of this variable to measure the actual control variable. In the absence of necessary resources and opportunities, we may not be able to perform the behaviour sufficiently (Ajzen, 1991, pp. 182-184).

In theory, the attitude towards behavior is the positive or negative evaluation of the individuals towards the realization of the behavior as the predecessor of the intention. The subjective norm is the social pressure on the person. Perceived behavioral control explains how easy or difficult it is for an individual to exhibit a behavior.

As a general rule, the more positive the *"attitude toward behavior"* is, the more acceptable the *"subjective norm"* is, and the stronger the *"perceived behavioral control"* is ,in short to say, the more adequate the control over the behaviors is, the stronger the intention to fulfill the behavior will be(Fusilier, and Durlabhji, 2005, p.237).

3.3. Decomposed Theory of Planned Behavior (DTPB)

Decomposed Theory of Planned Behavior (DTPB) was developed in 1995 by Taylor and Todd. This model is an alternative version of the Theory of Planned Behavior. In DTPB, these variables are subdivided so that the behavioral attitude, subjective norm, and perceived behavioral control variables can be understood better and more easily. The first determinant of behavior is behavioral intent. Behavioral attitude, subjective norm and perceived behavioral control items are also preserved in DTPB, just as in TPP. (Taylor and Todd, 1995a, pp. 151-152).Taylor and Todd have indicated that these variables explain behavioral intent.

They point out that the environmental impacts, which are thought to be important to users, reveal the subjective norm; that this variable is influential on intention; that the perceived behavioral control variable has an effect on self-confidence, facilitating situations that technology has; and that resources have effect on both intention and behavior of use (Chau and Hu, 2002, p.301).

3.4. Roger's Diffusion Theory (IDT)

The fore most one of the most important research topics on new communication technologies is how these technologies are accepted and spread (implemented). In the research conducted in this respect, answers were sought to the questions of who uses these new technologies, at what speed they adapt to these innovations, and how these innovations affect them (cited by Kaş, 2015, p.44 from Karasar, 2004, p.118)

According to Rogers, information, in the decision-making process of compliance or rejection, goes through five steps. They, where individual principal tries to get data which support him to reduce uncertainties on innovation are knowledge persuasion decision implementation confirmation.

Initially, peeople masters novelty and its factors. At the process of being persuaded, he shapes his attitude towards innovation by assessing the advantages and disadvantages of innovation to himself. During the decision making stage, the individual acquires additional information about the innovation and decides to accept or reject the innovation. At this stage, the people is especially affected by the assessment of the other people. In other section implementation, emerges while compliance is determined. In the last stage, the individual verifies and strengthens his the decency (Erdem,2011:38-39).

The Innovation Decision Process described by Rogers is modeled in Figure 3.3.

Figure 3.3. A Model of Stages in the Innovation Decision Process
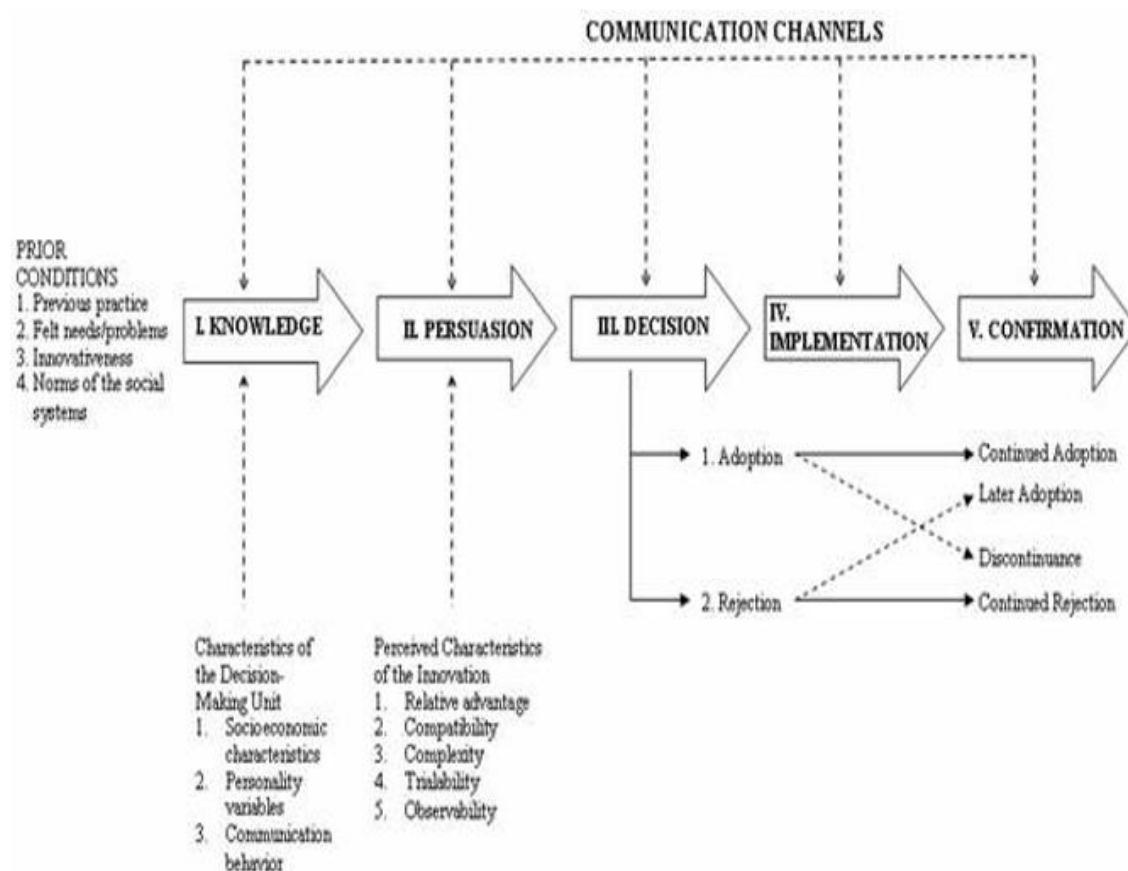
Source: Rogers, E. M., (1983). Diffusion of Innovations, (3th edition), New York: Free Press.

3.5. Technology Acceptance Model

The Technology Acceptance Model (TAM), developed by Davis in 1986, has emerged as a very powerful model (Davis, 1989, p. 992). Being the most widely used model due to its robust theoretical infrastructure and testability, the Technology Acceptance Model takes Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1980) and the Theory of Planned Behavior (TPB) (Ajzen, 1985) as a theoretical base to itself.

As abstract concepts such as belief and appraisal used in TRA weakened this theory, TAM was developed to compansate this weakness. The most essential aim of the TAM is to constitute the based model which could be used for diversified information

systems in the organizational settings. In other words, it is to predict and to explain the use of technology by measuring the ease of use & perceived usefulness, which is perceived after that system. As a result of many empirical tests, it has been shown that the Technology Acceptance Model is a robust and consistent model for describing technology acceptance behaviors (Aktas, 2007 p. 23-25). Technology Acceptance Model has been used in many technology fields with different control variables under different conditions, such as hospital information systems, ERP, and project management systems.

TAM examines why people are resistant to computer use, and the development of use and the changes in the nature of the system, by understanding people's choice of technology acceptance, and by estimating how users will respond to the changes. According to TAM, inadequate user acceptance is a barrier to the adoption of information technology. TAM is regarded as a parsimonious and a strong model established by indicating the least possible number of correlations (Lee et al., 2006, p.67). TAM argues that acceptance of users is determined by two main factors, Perceived Usefulness and Perceived Ease of Use (Venkatesh and Morris, 2000, p.117). The Technology Acceptance Model is shown in Figure 3.4.

Figure 3.4. Technology Acceptance Model
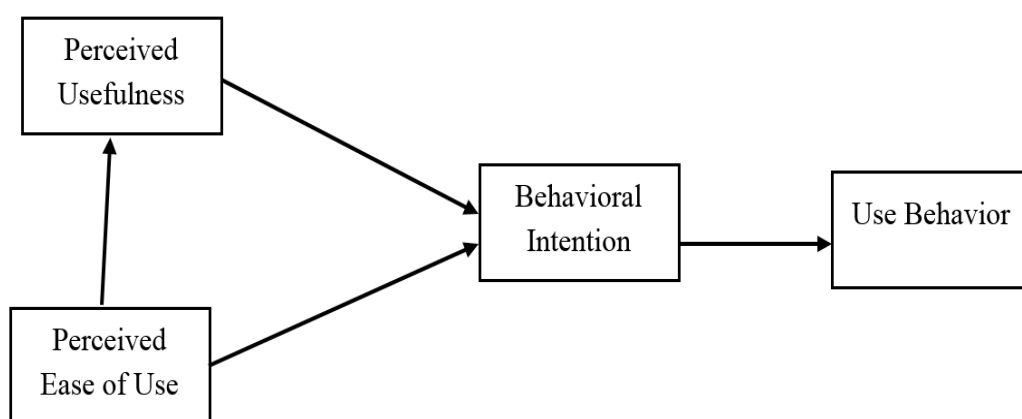
Source: Davis, F. D., Bagozzi, R. P. and Warshaw, P. R. (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. Management Science, Vol: 35, No: 8, pp. 985.

The variables of perceived usefulness and perceived ease of use are considered as the main variables that determine the system use (Davis, 1989, Venkatesh and Davis, 1996). Perceived usefulness can be expressed as "the degree of personal perception that a person increased his business performance as a result of his use of a particular system". The Perceived usefulness depends on the scope of the application's contribution to the increased performance of the user. (that the work takes a shorter time to do, that he can produce higher quality products, etc.). The Perceived ease of use refers to the "degree of personal perception of an individual that using a particular system does not require effort". Perceived Ease of Use can also be expressed as an effort by the user to take advantage of the application (Davis, 1989).

Perceived usefulness may be influenced by the perceived ease of use and external factors. The relationship between perceived usefulness and perceived ease of use can be explained as follows: If we consider a system where everything is equal, the more systematic the system becomes, the more beneficial the system becomes. That is, improvements in perceived ease of use can lead to increased performance, and thus leads the perceived usefulness related to technology to increase (Venkatesh and Davis, 2000).

The behavioral intention to use behavior is the possibility that a person performs a certain behavior. Just as in TRA, the use of computer in TAM is explained by intent to use. There are studies that find a correlation between intention to use and use (Taylor and Todd, 1995b:151).

Davis et al. (1989) investigated whether 'attitudes toward use' in TAM, developed by Davis (1986), were fully mediating on the effects of 'belief variables' (perceived usefulness and perceived ease of use) on 'intention to use'. In order to explain the intention to use of the WriteOne Word program, they tested whether there was a change in the factors affecting the intention of 107 MBA students, 1 hour after and 14 weeks after the introduction of the system respectively. Both times, it was found that there are unexpected relationships between belief variables and intentions. 14 weeks later, it was found that 'the perceived usefulness' in the original TAM explained 51% of 'intention to use'; and that 'the perceived ease of use' has less important effect on 'the intention of use' than 'the perceived usefulness' has; and that this effect diminished over time. Furthermore, the effect of 'the attitude variable related to use' decreased

significantly at the end of the 14th week. And this revealed that 'the attitude towards use' does not convey fully the extent of the effects of 'belief variables' on 'intention to use'.

According to the results of their analysis Davis et al. (1989) concluded that people's use of computers can be predicted very well from their 'intention to use'. 'Perceived usefulness' is the main determinant of 'the intention to use variable', and perceived ease of use is the second most important determinant of 'intention to use'. For this reason, they have developed a model that explains 'the intention and use of TAM' developed by Davis (1986), simplifying it further. The model developed by Davis et al. (1989) is shown in Figure 3.4. This model was not added 'subjective norm variables' because They have come to the conclusion that 'subjective norms' have no effect on 'intention to use' when used optionally. However, they also stressed that further studies are needed to reach a general conclusion about subjective norms. For this reason, Venkatesh and Davis (2000) extended the model by adding new factors to TAM, and they also added new factors that may affect 'the perceived usefulness' and 'intention to use variables'. This new model is also called Technology Acceptance Model 2 (TAM2).

3.6. Extended Technology Acceptance Model (TAM2)

In the TAM2 model, the variables considered to affect 'the perceived usefulness' are divided into two as 'social impacts' and 'Cognitive assistive processes'. Variables related to social impact are defined as subjective norms, volunteerism and image, and 'Cognitive assistive processes' are defined as job involvement, output quality, outcome demonstrability, perceived ease of use. The correlation between subjective norms and intention to use is based on the correlation between TRA and TPB models.

In TAM2, subjective norms are thought to have a positive effect on perceived usefulness. If the user believes that a person that is important to him thinks that it is a good idea for him to use the system, this belief may later lead to formation of a perception that the system is really useful. As a result of the perceived usefulness, he may want to use the system. In addition, the model was added that subjective norms affect the image positively. The correlations between these two variables is explained as follows: When the user believes that the social group members that are important to him should use the

proposed system, the user may have a perception that his image will also increase within that social group (Venkatesh ve Davis, 2000, p.189).

In that study, the mediation impact of the experience variable on the correlation between the subjective norm and perceived usefulness, and on the subjective norm and intention to use, was also investigated. In initial stage of implementation and in the development phase of the system, it is expected that the impact of subjective norms on 'the perceived usefulness' and 'the intention to use' will be higher. Because in these stages, people have little knowledge about the system. And for this reason, their perceptions of what the people, who are important to them, think gain significance in these stages.

Variables related to 'cognitive assistive processes, affecting perceived usefulness, enable users to compare what their system can do and what they need in their work. The variable of outcome demonstrability was derived from the study of Moore and Benbasa , 1991, p. 201), and it was defined as "the degree of easily visibility of the benefits of innovation to potential users". If a system can produce influential work-related results, but shows these results in a difficult way to understand, system users may not really understand how useful the system is. And its correlation with the work shows "the degree of personal perception that how suitable the target system is with the work that the person does". In other words, it shows the cognitive decisiveness of the person concerning how much the goals that the person determines about his work overlap with the resulting outcomes of using the system. TAM2 also considers the user considerations (output quality) about how well the system performs the specified tasks while examining the effect of the system's correlation with business on the perceived usefulness (Venkatesh and Davis, 2000).

TAM2 model was tested using four different systems in four different organizations. While two of these systems are the systems mandatory to use, the other two systems are voluntary to use. The model variables were measured in each organization at three different times (before implementation, 1 month after the implementation, and 3 months after the implementation), and it is aimed to understand how the variables, which can affect the gained experience and the perceived usefulness, changed in time.

When the results were examined, perceived usefulness and perceived ease of Use were found to be important variables in explaining Intention to Use in all three time periods. It was found that Subjective Norms have an effect on Intent to Use, only in the systems mandatory to use, and that this effect diminishes as experience is gained. Intention to use was found to be influenced by variables related to all social impacts (subjective norms, volunteerism and image) and 'cognitive assistive processes' (job involvement, output quality, outcome demonstrability, perceived ease of use) through perceived usefulnesss variables.

The model developed by Venkatesh and Davis (2000) is shown in Figure 3.5.

Figure 3.5. Technology Acceptance Model 2
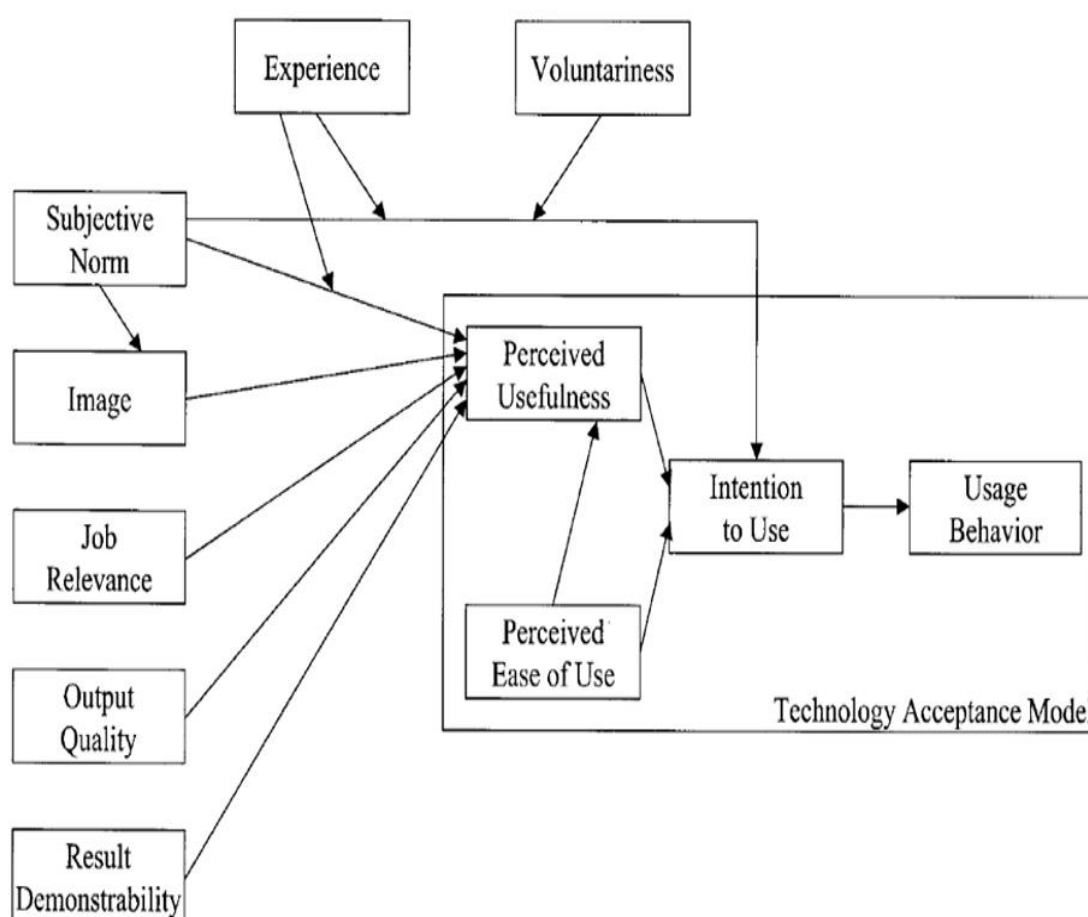
Source: Venkatesh, V., and Davis, F. D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies, Management Science, Vol: 46, No:2, p.188

In order to be able to adapt to rapid technological developments and to be able to sustain their assets in a competitive environment, organizations prefer their staff to be creative individuals who have high-level of knowledge, are constantly renewing, are equipped with improvable skills and techniques.

Scientific studies in recent years have included political, social, cultural, organizational and behavioral dimensions rather than technical aspects of information technology applications (Jensen and Aanestad, 2007, p. 29).

The studies on the variables of the TAM2 model were listed in the following Table 3.1.

Table 3.1. The studies on the variables of the TAM2

Variables	Definitions	References
Perceived Ease of Use (PEOU)	The degree to which a person believes that using a particular system would be free of effort. (Davis, 1989).	Davis (1989); Davis(1993); Park(1994); Igbaria, Iivari & Maragahh (1995); Straub, Limayen & Karahanna (1995); Venkatesh and Davis(1996); Vallacher & Kaufman(1996); Chau (1996); Gafen and Keil(1998); Compeau, Higgings and Huff(1999); Karahanna, Straub& Chervany(1999); Amoako-Gyampah(1999); Venkatesh and Davis (2000); Heijden(2000); Venkatesh and Morris(2000); Venkatesh and Davis (2003); Kaya and Şenel Tekin (2003); Shih(2004); Vijayasarathy(2004); Yang and Yoo(2004);Hung and Chang (2005); Shih(2006); Belkhamza and Wafa(2009); Bağlıbel and Samancıoğlu(2010); Akça and Özer(2012); Türker A. & G. (2013)

Table 3.1. The studies on the variables of the TAM2 (Continued)

Variables	Definitions	References
Perceived Usefulness(PU)	The degree to which a person believes that using a particular system would enhance his or her job performance(Davis , 1989).	Davis (1989); Davis(1993); Igbaria, Iivari & Maragahh(1995); Straub, Limayen & Karahanna (1995); Venkatesh and Davis(1996); Vallacher & Kaufman(1996); Dansky(1999); Karahanna, Straub& Chervany(1999);Venkatesh and Davis (2000); Heijden(2000); Koufaris(2002); Kaya and Şenel Tekin (2003); Chrismar and Patton(2003);Yang and Yoo(2004); Shih(2004); Hung and Chang (2005); Shih(2006); Amoako-Gyampah(2007); Khalifa & Shen(2008);Tung & Chang(2008); Belkhamza and Wafa(2009); Bağlıbel and Samancıoğlu(2010); Akça and Özer(2012)
Behavioral Intention(BI)	The degree to which an individual's readiness to perform given behavior (Azjen, 1991).	Ajzen(1991);Mathieson(1991); Szajna(1996); Agarwal & Prased(1997-1999); Al-Gahtani and King(1999); Amoako-Gyampah(1999); Venkatesh and Davis (2000);Venkatesh & Morris(2000); Szymanski & Hise (2000); Brown and etc (2002); Koufaris(2002); Hu…etc(2003); Gefen(2003); Mathieson…etc(2004); Chen and Shen(2005); Fusilier & Durlabhji(2005); Cheong and Park(2005); Shih(2006); Amoako-Gyampah(2007); Tung & Chang(2008); Khalifa & Shen(2008); Belkhamza and Wafa(2009);Türker A. & G. (2013)

Table 3.1. The studies on the variables of the TAM2 (Continued)

Variables	Definitions	References
Usage Behavior(UB)	Behavioral control can, together with intention, be used to predict behavior (Azjen, 1991). Perceived ease of use and perceived usefulness, which are the two important considerations affecting the usage of information systems (Venkatesh,2000)	Mathieson(1991);Adam, Nelson and Todd(1992); Chau (1996); Agarwal & Prased(1997-1999); Venkatesh and Davis (2000); Szymanski & Hise(2000); Venkatesh(2000); Venkatesh& Morris(2000); Kaya and Şenel Tekin (2003); Venkatesh, Morris and Davis(2003); Hu…etc(2003); Yang and Yoo(2004);Chen and Shen(2005); Benbasat and Barki(2007); Özer,Özcan & Aktaş (2010)
Subjective Norm(SN)	The degree to which an individual perceives that most people who are important to him for the system usage (Fishbein & Ajzen, 1975; Venkatesh & Davis, 2000).	Fishbein and Ajzen(1975); Lucas and Spitler(1999); Venkatesh and Davis (2000); Venkatesh and Morris(2000); Chau and Hu(2001); Ma, Anderson & Streith(2005); Rutherford & De Vaney(2009); Peker(2010); Bağlıbel and Samancıoğlu(2010)
Image (I)	The degree to which an individual perceives that use of an innovation will enhance his or her status in his or her social system (Moore & Benbasat, 1991).	Moore &Benbasat (1991);Venkatesh and Davis (2000); Venkatesh and Bala (2008);

Table 3.1. The studies on the variables of the TAM2 (Continued)

Variables	Definitions	References
Job Relevance(JR)	The degree to which an individual believes that the target system is applicable to his or her job (Venkatesh & Davis, 2000).	Venkatesh and Davis (2000); Chrismar and Patton(2003); Shih(2004); Venkatesh and Bala (2008); Kim(2008); Park(2009); Peker(2010); Bağlıbel and Samancıoğlu(2010)
Output Quality(OQ)	The degree to which an individual believes that the system performs his or her job tasks well (Davis,2000)	Venkatesh and Davis (2000); Chrismar and Patton(2003); Venkatesh and Bala (2008); Park(2009); Peker(2010) ; Bağlıbel and Samancıoğlu(2010)
Result Demonstrability (RD)	The degree to which an individual believes that the results of using a system are tangible, observable, and communicable (Moore & Benbasat, 1991).	Moore & Benbasat (1991) ;Venkatesh and Davis (2000); Chrismar & Wiley(2002); Slyke, Comunale, Belanger(2002) Mun, Jackson & Park(2006); Venkatesh and Bala (2008); Peker(2010);
Voluntariness(V)	The degree to which potential adopters perceive the adoption decision to be non-mandatory" (Agarwal and Prasad 1997, Hartwick and Barki 1994, Moore and Benbasat 1991)	Hartwick and Barki(1994); Venkatesh and Davis (2000); Anderson and Schwager(2004); Venkatesh and Bala (2008); Erdem(2011)
Experience(E)	There is theory and evidence to suggest that the direct effect of subjective norm on intentions may subside over time with increased system experience. Hartwick and Barki (1994)	Venkatesh and Davis (2000); Shih(2006); Venkatesh and Bala (2008); Erdem(2011)

Some studies on TAM model and ERP concepts in literature seperately are presented as shown below:

Vijayasarathy (2004), have to developed Technology Acceptance Model to predict intention of customers who prefer online shopping. These model is formed to find that how compatibility, usefulness, ease of use affect attitutess on-line shopping. In study compatibility, usefulness, ease of use, and security have been found to be significant predictors of attitude towards on-line shopping.

Brown et al. (2002) have established an integrated model combining TAM and TPB to investigate the factors that may affect the intention of the computer-based banking system, which is obligatory in the banks. The analysis of the study was conducted by collecting questionnaires from 107 people who used the computerized banking system. According to the results, perceived behavioral control and subjective norms can explain 50% of the intention to use. On the other hand, There was no significant effect of the attitude variables related to the perceived benefit and use on the intention to use. In the adaptation of a new system, although the perceived benefit and the perceived ease of use are the main variables, Brown et al. have come up with the fact that the factors that could affect the use of technologies that are compulsory to use, show a different course than the factors that may affect the use of optional systems.

Linjun, Ming-te, and Bo (2003) indicate that computer-based communication technologies have an important place in the cultures of developed economies, and that by means of the transition of technology culture from the West to the East, the East can now benefit from the communication technology that the West possesses. According to the authors, the adoption of technology is even easier with the understanding of innovative culture.

Tetlumbe (2000), proposed a methodological approach to assessing the success of ERP projects without considering cost.

Kwon and Lee (2001), presented that the developed ERP maintanence and support system to adapted changes easily.

Scott, J. E., and Kaindl, L. (2000), have examined that cooperation between ERP vendors and customers to increase the functionality of ERP packages theoretically.

In this section, the theories developed about the variables affecting the acceptance of technology, The Technology Acceptance Model (TAM), and Extended Technology Acceptance Model 2 (TAM2) were mentioned in details.

CHAPTER 4

RESEARCH STUDY

In the section up to this point, literature studies related to the usage of the SAP in firms have been included. In this section, the importance and purpose of the research, the methodology and hypotheses of the research, the analysis of the collected data and the findings will be given.

4.1. The Importance and Purpose of the Research

ERP software, which started to have been used all over the world since 1990s, and attracted great interest by the enterprises, has started to get great attention in our country in recent years as well. ERP applications, which are also an extension of the change engineering approach, make a big change not only in the field of production but also in all processes of the business. All these developments prepared the birth of ERP projects. The situation we are dealing with is the establishment of sub-structures that will ensure that information is processed in the best possible way and that beneficial results are obtained. Enterprise Resource Planning (ERP) solutions that are easily implemented, are reconfigurable and are adaptable to changes in technology provide the businesses with the capability to do business anywhere in the world.

The most significant advantage of ERP projects is that they make it easy to access the information. The first rule of the success in competition is the efficient use of the resources. Businesses must have a network of information and an integrated working structure, where they can control every flow, from planning to sale, from shipping to finance. The starting point of ERP is the need to monitor the resources in the most efficient way at all times and the need to create a set of strategies relatedly, from customer relations to production planning. Enterprises that know what they want to achieve with the ERP Project are able to achieve maximum efficiency; because, such projects mean that the process of change of the enterprise is put into a system. With this method created, productivity increases and success becomes an inevitable end. One of the basic elements of a successful ERP project is that there should be a software that is appropriate for the structure of the company in terms of technology and functionality.

In this study, the use of SAP, one of ERP softwares, is examined. The use of SAP software, which forms the ideal solution by presenting different variations to large, medium and small-scale enterprises, has been examined through the extended technology acceptance model. The success of an ERP software such as SAP, the efficient and effective use of the investment and the change achieved depend, to a great extent, on the rapid adoption and use of new technologies by the employees. For this reason, it is important to identify the factors that are effective in increasing the acceptance and use of ERP systems by the employees. In this respect, the aim of this study is to evaluate the adoption and use of this new system by the users according to the extended technology acceptance model in the companies using SAP software which is one of the ERP systems in our country. This work, which aims to identify the main reasons behind the behavior of enterprise employees to adopt and use SAP technology, is based on the Extended Technology Acceptance Model (TAM2), because it is based on social psychology-based researches, such as Ajzen and Fishbein's Theory of Reasoned Action, whose scientific and statistical bases are robust, and which are among the respected models explaining technology adoption and use.

4.2. The Methodology of the Research

In the preliminary work done before starting the research, it appeared that both primary and secondary data were needed. Prior studies were initially examined in order to collect secondary data. Printed documents in the electronic environment were collected. Moreover, the theses including similar topics in the Library of Higher Education Institution were examined. Finally, articles on the subject matter in domestic and foreign scientific journals that can be reached were scanned. Thus, the literature review was completed.

In this part of the study, the model of the study and the hypotheses, the design of the questionnaire and the method used in the research, data collection, the stages of reliability analysis are explained respectively.

4.2.1. Model of the Research, Hypotheses, and Sample Selection

The topic of this thesis is 'Assessment of SAP Usage: An Empirical Research In Istanbul ''. The adapted model used in the research is given in the Figure 4.1.

Figure 4.1. Research Model (Adapted From Venkatesh and Davis, 2000)
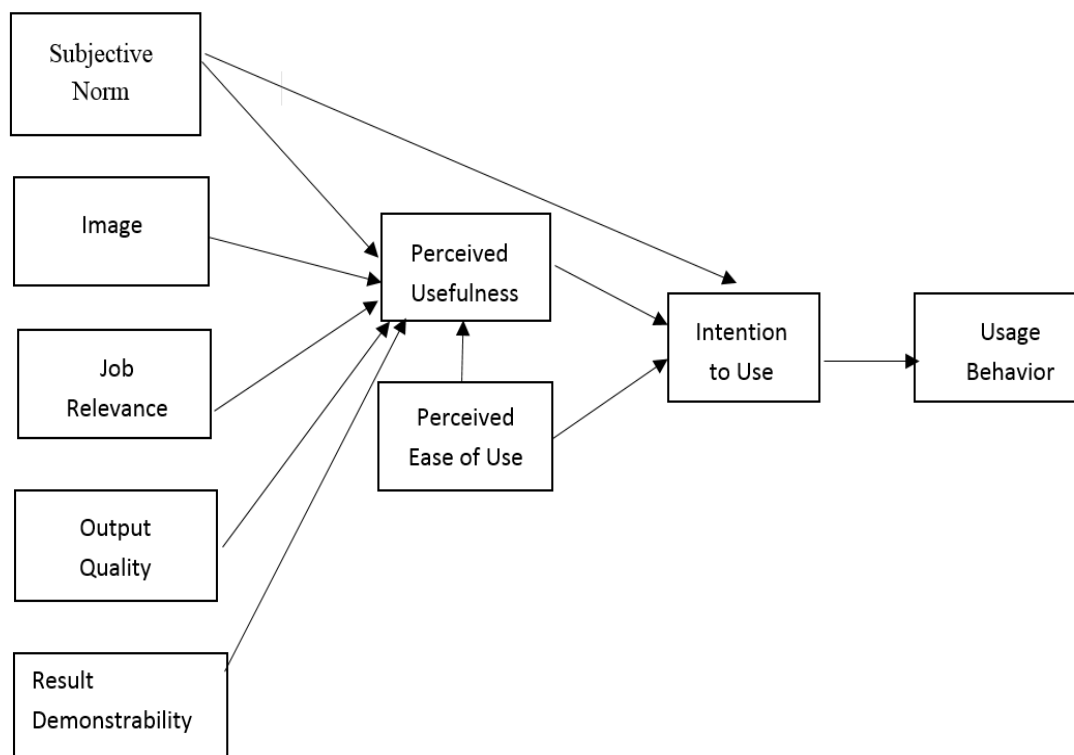
In the model, experience and voluntariness variables are removed. The reasons why experience and voluntariness variables are removed are due to the necessity of using SAP in the companies, where the survey have been conducted. The reason for the exclusion of the experience variable is that it is not so desirable to ask for too personal information and that is required to use advanced statistical techniques.

The suggested model, which is referred to as TAM2, is displayed in Figure 4.1. TAM2, which has used TAM as the starting point, includes additional theoretical components covering social impact processes (subjective norm, voluntariness, and image) and cognitive instrumental processes (job relevance, output quality, result

demonstrability, and perceived ease of use). Defining each of these components, we aim to develop the theoretical reasoning for the causal relationship of the model.

Hypotheses and the design of survey has made according to the adapted model in figure 4.1. The established hypotheses can be divided into two parts; relationship hypotheses and hypotheses related to TAM2 (Extended Technology Acceptance Model).

The hypotheses which will be analyzed in this thesis are presented as shown below:

H1: There is a relationship between subjective norm and the intention to use

H2: There is a relationship between subjective norm and perceived usefulness.

H3: There is a relationship between image and perceived usefulness.

H4: There is a relationship between output quality and perceived usefulness.

H5: There is a relationship between the result demonstrability and perceived usefulness.

H6: There is a relationship between perceived ease of use and perceived usefulness.

H7: There is a relationship between perceived ease of use and the intention to use.

H8: There is a relationship between perceived usefulness and intention to use.

H9: There is a relationship between estimated set-up time of SAP and actual set-up time of SAP.

H10: There is a relationship between type of training of SAP and level of employees satisfaction from training.

H11: There is a relationship between type of training of SAP and number of employees in company.

H12: There is a relationship between company sector and the reason of choosing SAP.

H13: There is a relationship between number of employees and the reason of choosing SAP.

4.2.2 Preparing the Questionnaire Form

Prepared to assess the acceptance and use of SAP software according to the extended technology acceptance model, the questionnaire (Appendix-1) is composed of three parts.

The first part consists of questions that determine the demographic characteristics of the participants. The second part consists of questions that involve participants' company information as operating time of business, legal structure of business, operating sector of business etc. The third part consists of open-ended SAP related questions.

Concerning the other questions in the third part of the questionnaire, the Likert scale was used, measuring the degree that a user agrees or disagrees about an object, an attitude, or a statement directed to him or herself (Ferguson, L. W., 1941:54). The questions in this part of the questionnaire were prepared with a five-point Likert type scale and consisted of 23 questions. The questions in this part of the questionnaire were prepared with a five-point Likert type scale and consisted of 23 questions.

The user was directed questions about the SAP software to measure variables such as perceived usefulness, perceived ease of use, intention to use, volunteerism, subjective norm, image, job relevance, output quality, result demonstrability variables, which are effective in Technology Acceptance Model 2 developed by Ventakesh and Davis (2000). During the implementation of the questionnaire, the respondents were asked to respond to what extend they approve the twenty-three judgments, by considering the statements of 1: Strongly disagree, 2: Somewhat disagree, 3: Neither agree nor disagree, 4: Somewhat agree, 5: Strongly agree. The applied questionnaire to the participants is in the Appendix.

4.2.3 Application of Questionnaire and Collection of Data

The universe of the research is the business employees using SAP software in Istanbul. For the research, many SAP consulting firms such as Itelligence, Vektora, ARETA, ACRON, etc. were interviewed respectively, and the names of the companies they served were requested. Some of the consulting firms have stated that they cannot share information according to the privacy policy. A questionnaire, one of the primary data collection methods, was applied to company employees who were reached in accordance with the data we obtained from the SAP consulting firms that made internet browsing and information sharing. The questionnaire was applied to the employees of the enterprises using SAP. Many companies have been e-mailed, and some companies were interviewed individually.

In line with the information obtained from the SAP consultancy firms located in Istanbul, a sampling for the study was created. It was based on the companies located in Istanbul and using SAP.

Because of the universe is a conceptual $n = t^2 .p.q/d^2$ formula was used for calculating sampling number n. Calculations result have been 170 and the survey applied to 177 participants. (For reliability q and p value have accepted 0,05, d value have accepted 0,075 and t value have accepted 1,96.). Because the answer of 6 participants is not adequate, the analyze have conducted with 171 participant. A pilot study of 30 people have been conducted without all the surveys implemented. This pilot study have used in the reliability analysis of the likert scale. Some of the questions, which could not be clearly understood and answered in the pre-survey application, were reformulated, some of them were removed from the questionnaire, and the final questionnaire form was achieved.

There are many methods of sample selection in statistics. For example stratified sampling, cluster sampling, simple random sampling, arbitrary sampling, quota sampling etc. The most common used of these methods is the simple random sample. Simple random sample is the most common and the least costly sampling method. But for this research simple random sampling is not applicable. Because, the prepared questionnaire was applied to the employees who working in companies that using SAP. For this reason, arbitrary sampling have been used in this study.

4.3. The Analysis of the Collected Data

A survey form have designed to analyze and have applied 177 participant who providing the necessary features. Because of that the answers of 6 participants is not adequate, the analysis have proceeded with 171 participant. A pilot study of 30 people have been conducted for doing reliability analysis of the likert scale. The likert scale used in the research that has given in Appendix.

The likert scale consist of 8 parts. The first part measures 'intention to use', the second part measures 'perceived usefulness', the third part measures 'perceived ease of use', the forth part measures 'subjective norm' , the fifth part measures 'image', the sixth part measures 'job relevance', the seventh part measures 'output quality' and finally the last part measures 'result demonstrability'. Reliability analysis should be performed separately for each part.   All analyzes carried out with SPSS 24.

4.3.1. Reliability Analysis

In order to determine the internal consistency of a scale, the Cronbach Alpha coefficient developed by Cronbach is used. This technique computes a single coherence factor for the whole, taking into account the inter-part common relationship. This internal consistency coefficient is based on the assumption that all the questions or items in the measure measure the same property. The low internal consistency coefficient of Cronbach Alpha may indicate that it is measuring several features together. Because the obtained alpha value is considered as a sign of the homogeneity of the test. For this calculated internal consistency coefficient, the general acceptance is at least 0.60 (Krippendorff, K. ,1978:143).

The scale used in this study was divided into seven groups when measuring the internal coherence that is consistency, of each of the 23 attitudes. In these eight groups in line; Intention to use result demonstrability, perceived ease of use, job relevance, image, output quality, perceived usefulness variables were tried to be measured.

Table 4.1. Reliability Statistics of Likert Scale

Variables	Items	Cronbach's Alpha
Intention to Use	-If we assume that I have access to the SAP I would intend to use the software in my work. -I guess I will use the SAP in case you have access to it.	,953
Perceived Usefulness	-Using the SAP improves my performance at work. -Using the SAP rises my productivity at work. -Using the SAP increases my efficiency/ effectiveness at work. -I find it useful for my job to use the SAP	,848
Perceived Ease of Use	-The use of the SAP is clear and straightforward for me. -Interacting with the SAP does not require much mental effort of mine. -I find it easy to use the SAP. -Using SAP allows me to do things easily.	,823
Subjective Norm	-Those who have an influence on my behaviour think that I need to use SAP. -Those who are significant to me think that I need to use SAP.	,871
Image	-Those using SAP in the organization are more prestigious than those who do not. -Those using SAP in the organization have a higher profile. -Using SAP in the organization is a status symbol.	,843
Job Relevance	-The use of the SAP is important to my business. -The use of the SAP is relevant to my job	,086
Output Quality	-The output quality I get from using the SAP is higher. -I do not have any particular problem with the output quality from using the SAP.	,669
Result Demonstrability	-There is no specific difficulty in discussing the results of using the SAP with other employees. -I believe I can discuss the results of using the SAP with the other employees. -The results of using the SAP are pretty obvious to me. -I am having difficulty explaining the benefits of using the SAP.	,609

If Cronbach alpha statistics are between 0,60 and 1,00, which means that the scale is reliable and can be used. In the table 4.1 Cronbach's alpha statistics have obtained. As can be seen in the table 4.1, value of Cronbach alpha of intention to use, perceived usefulness, perceived ease of use, subjective norm, image, output quality, result demonstrability scales are between 0,60 and 1,00. Therefore it can be said that these scales are reliable and useful. On the side, value of Cronbach alpha of job relevance scale have obtained ,086. This value is much smaller than the valid 0,60 value. So this means that 'job relevance' scale is not reliable and can not be used in this study. Consequently the study does not contain hypotheses about the 'job relevance' scale.

4.3.2. Descriptive Statistics

In this section, descriptive information are given about demographic characteristics of the participants and companies information that using SAP.

Table 4.2. Descriptive Statistics of the Sample (Personal Information)

Age	Frequency	Percent
25-35	90	52,6
36-46	38	22,2
47-57	20	11,7
58 and over 58	23	13,5
Total	171	100,0

Gender	Frequency	Percent
Female	62	36,3
Male	109	63,7
Total	171	100,0

Education Level	Frequency	Percent
High School	38	22,2
Bacholer's Degree	103	60,2
Master Degree	24	14,0
Doctorate	6	3,5
Total	171	100,0

Table 4.2. Descriptive Statistics of the Sample (Personal Information) (Continued)

Daily Computer Usage Time	Frequency	Percent
1-4 hours	5	2,9
4-7 hours	59	34,5
7-10 hours	49	28,7
More than 10 hours	58	33,9
Total	171	100,0

Information on the age, gender, education level and daily computer usage of participants is shown in table 4.2. As seen; 90 out of 171 participants are between 25-35 years old. 38 out of 171 participants are between 36-46 years old. 20 out of 171 participants are between 47-57 years old. And finally, 23 out of 171 participants are over 58 years old.

As seen; 62 out of 171 participants are female and 109 out of 171 participants are male. In other words, %36,3 of participants are female and %63,7 of participants are male in the universe. In table 4.2. as seen; 38 out of 171 participants are high school graduates. 103 out of 171 participants have bacholer's degree. 24 out of 171 participants have master degree and 6 out of 171 participants have doctoral degree. In other words, %22,22 of participants are high school graduate, %60,23 of participants have bacholer's degree, %14,04 of participants have a master's degree and %3,51 of participants have doctoral degree in the universe.

Additionaly, in table 4.2. can be seen; 5 out of 171 participants use computer between 1-4 hours, 59 out of 171 participants use computer between 4-7 hours, 49 out of 171 participants use computer between 7-10 hours, 58 out of 171 participants use computer more than 10 hours daily. Additionaly, can be said, %2,92 of participants use computer between 1-4 hours, %34,50 of participants use computer between 4-7 hours, %28,65 of participants use computer between 7-10 hours, %33,92 of participants use computer more than 10 hours.

Table 4.3. Descriptive Statistics of the Sample (Company Information)

Service Duration of Participants	Frequency	Percent
0-3 years	21	12,3
4-7 years	54	31,6
8-11 years	63	36,8
12 and more than 12	33	19,3
Total	171	100,0

Business Operating Years	Frequency	Percent
1-10 years	34	19,9
10-20 years	5	2,9
20-30 years	32	18,7
30-40 years	19	11,1
40-50 years	57	33,3
More than 50 years	24	14,0
Total	171	100,0

Business Legal Structure	Frequency	Percent
Collective	5	2,9
Limited Partnership	6	3,5
Limited	26	15,2
Inc.	134	78,4
Total	171	100,0

Business Operating Sector	Frequency	Percent
Textile	13	7,6
Automotive	17	9,9
Pharmaceutial-Chemical	21	12,3
Energy	23	13,5
Food	11	6,4
Electrical-Electronics	5	2,9
Construction Materials	6	3,5
Paper	9	5,3
Retail	26	15,2
Packaging	5	2,9
Machinery&Industrial Automation	10	5,8
Service Industry	25	14,6
Total	171	100,0

Table 4.3. Descriptive Statistics of the Sample (Company Information) (Continued)

Employee in the Companies		
	Frequency	**Percent**
10-49	51	29,8
50-249	31	18,1
More than 250	89	52,0
Total	171	100,0
Companies' Production Mode	**Frequency**	**Percent**
Serial Production	113	66,0
Order Production	32	18,7
Flexible Production	21	12,3
Project Type Production	5	2,9
Total	171	100,0

As table 4.3 shows, the number of participants of service duration between 0-3 years are 21, the number of participants of service duration between 4-7 years are 54, the number of participants of service duration between 8-11 years are 63 and the number of participants of service duration 12 and more than 12 years are 33.

Information on the business operating years of participants is shown in table 4.3. As seen; 34 out of 171 companies have been working for 1-10 years, 5 out of 171 companies have been working for 10-20 years, 32 out of 171 companies have been working for 20-30 years, 19 out of 171 companies have been working for 30-40 years, 57 out of 171 companies have been working for 40-50 years and then 24 out of 171 companies have been working more than 50 years. In other words, %19,88 companies have been working for 1-10 years, %2,92 companies have been working for 10-20 years, %18,71 companies have been working for 20-30 years, %11,11 companies have been working for 30-40 years, %33,33 companies have been working for 40-50 years and %14,04 companies have been working more than 50 years. It can be said that the vast majority of companies have been working 40-50 years.

As the table 4.3 shows, the number of collective companies are 5, the number of limited partnership companies are 6, the number of limited companies are 26, the number of Inc. companies are 134. The total frequency are 171.

Information on the business operating sector is shown in table 4.3. As seen; 13 out of 171 companies have been working on textile sector, 17 out of 171 companies have

been working on automotive sector, 21 out of 171 companies have been working on pharmaceutial-chemical sector, 23 out of 171 companies have been working on energy sector, 11 out of 171 companies have been working on food sector, 5 out of 171 companies have been working on electrical-electronics sector, 6 out of 171 companies have been working on construction metarials sector, 9 out of 171 companies have been working on paper sector, 26 out of 171 companies have been working on retail sector, 5 out of 171 companies have been working on packaging sector, 10 out of 171 companies have been working on machinery&industrial automation sector and then 25 out of 171 companies have been working on service industry sector. In other words, %15,20 companies operating sector are retail, then %14,62 companies operating sector are service industry, after that %13,45 companies operating sector are energy. The least active company sector in the study is electrical-electronics with %2,92.

As the table 4.3 shows, the number of companies with employees between 10 and 49 are 51, the number of companies with employees between 50 and 249 are 31 and the number of companies with employees more than 250 are 89. Looking at the results, it can be said that the vast majority are large-scale companies.

Information on the companies' production mode is shown in table 4.3. As seen; frequency of companies that doing serial production are 113, frequency of companies that doing order production are 32, frequency of companies that doing flexible production are 21, frequency of companies that doing project type production are 5 and totaly 171. As seen, the vast majority frequency of production mode is serial production.

Table 4.4. Descriptive Statistics of the Sample (SAP Information)

Describe the SAP Software in Business	Frequency	Percent
-It is a complex package consisting entirely of modules from a single vendor.	104	60,8
-A Mixed system program (based on a single vendor, and made for other vendors or you in particular)	67	39,2
Total		
	171	100,0

Table 4.4. Descriptive Statistics of the Sample (SAP Information) (Continued)

Estimated Duration of SAP Installation	Frequency	Percent
Less than 6 months	33	19,3
6-12 months	91	53,2
12-18 months	38	22,2
More than 18 months	9	5,3
Total	171	100,0

Realization Duration of SAP Installation	Frequency	Percent
Less than 6 months	6	3,5
6-12 months	82	48,0
12-18 months	61	35,7
More than 18 months	22	12,9
Total	171	100,0

The State of Being Satisfied of Training from SAP Company During Installation	Frequency	Percent
Yes	93	54,4
No	78	45,6
Total	171	100,0

The Reason of Selecting SAP	Frequency	Percent
-Being a pioneer company	74	10,7
-Running smoothly	88	12,7
-Powerful corporate portal	103	14,9
-E-Business solution	55	7,9
-Working with multiple languages and countries	96	13,9
-Providing a Web-based solution	115	16,6
-Low Cost	35	5,1
-Professional in business solutions	127	18,3
Total	693	100,0

Table 4.4. Descriptive Statistics of the Sample (SAP Information) (Continued)

Encountered SAP Installation Difficulties	Frequency	Percent
-Restructuring of the processes	145	24,6
-Challenges in change management	130	22,1
-The reaction of employees to change	127	21,6
-Inadequate technical assistance provided by the software company	61	10,4
-Software cost	85	14,4
-The reaction of senior management to change	41	7,0
Total	589	100,0

As can be seen in the table 4.4; there are 104 participants who define SAP software as ''It is a complex package consisting entirely of modules from a single vendor''. There are 67 participants who define SAP software as '' A Mixed system program (based on a a single vendor, and made for other vendors or you in particular)''.

As the table 4.4 shows; the number of estimated duration of installation less than 6 months are 33. The number of estimated time of installation between 6-12 months are 91. The number of estimated duration of set-up between 12-18 months are 38. The number of estimated duration of installation more than 18 months are 9.

As table 4.4 shows; the number of realization duration of installation less than 6 months are 6. The number of realization duration of installation between 6-12 months are 82. The number of realization on the duration of installation between 12-18 months are 61. The number of realization time of installation more than 18 months are 22.

When comparing the 'estimated duration of installation' and 'realization duration of installation', while it is observed that the majority of participants predicted that the installation would be between 6-12 months, most of the actual installation duration is between 6-12 months. However, the number of estimated duration of the installation less than 6 months are 33 and the number of realization duration of installation is less than that of 6 months are 6. Additionally; the number of estimated duration of installation more than 18 months are 9, the number of realization duration of installation more than 18

months are 22.In additionaly can be said that percentage of the largest realization is %26,9 between 6-12 months.

Information on the state of being satisfied of training from SAP company during installation is shown table. According to table 4.4 the number of participants of being satisfied of training from SAP company are 93 and the number of participants of being non-satisfied of training from SAP company are 78.

In table 4.4, the number of participants selecting SAP for the reason that 'being a pioneer company' are 74. The number of participants selecting SAP for the reason that 'running smoothly' are 88. The number of participants selecting SAP for the reason that 'powerful corporate portal' are 103. The number of participants selecting SAP for the reason that ' e-business solution' are 55. The number of participants selecting SAP for the reason that 'working with multiple languages and countries' are 96. The number of participants selecting SAP for the reason that 'providing a web-based solution' are 115. The number of participants selecting SAP for the reason that 'low cost' are 35. The number of participants selecting SAP for the reason that 'professional in business solutions' are 127. The total number are 693 because of using multiple response question.

In other words, 'professional in business' is the option which has the largest share with %18,33 percentage. Then, 'providing a web-based solution' is the option which has the second share with %16,59 percentage. The option 'low cost' which has the least share with %5,05 percentage.

In table 4.4, the number of encountered SAP installation difficulties that 'restructuring of the processes' are 145. The number of encountered SAP installation difficulties that 'challenges in change management' are 130. The number of encountered SAP installation difficulties that 'the reaction of employees to change' are 127. The number of encountered SAP installation difficulties that 'inadequate technical assistance provided by the software company' are 61. The number of encountered SAP installation difficulties that 'software cost' are 85. The number of encountered SAP installation difficulties that 'the reaction of senior management to change' are 85.   The total number are 589 because of using multiple responses to the question.

4.3.3. Testing Hypotheses

In this section, the hypotheses established according to adapted model from TAM 2 will be tested. To testing hypotheses correlations analysis and regression analysis will be used. The level of relationship between the variables is determined by correlation analysis and the functional form between the variables is determined by the help of regression analysis.

Table 4.5. Correlation Analysis of Model Variables

		1	2	3	4	5	6	7
1.Intention to Use	Pearson Correlation	1	,699	,320	,517	,514	,640	,523
2.Perceived Usefulness	Pearson Correlation	,699	1	,408	,633	,666	,814	,660
3.Perceived Ease of Use	Pearson Correlation	,320	,408	1	,391	,428	,440	,542
4.Subjective Norm	Pearson Correlation	,517	,633	,391	1	,573	,717	,602
5.Image	Pearson Correlation	,514	,666	,428	,573	1	,682	,581
6.Output Quality	Pearson Correlation	,640	,814	,440	,717	,682	1	,697 **
7.Result Demonstrability	Pearson Correlation	,523	,660	,542	,602	,581	,697	1

As can be seen in the table 4.5 there is significant relationship between variables. There is a significant and strong relationship in the positive direction between the variables of intention to use and perceived usefulness (r=0,699), between the variables of intention to use and subjective norm (r=0,517), between the variables intention to use and image (r=0,514), between the variables intention to use and output quality (r=0,640) and between the variables intention to use and result demonstrability (r=0,523). There is a

significant and weak relationship in the positive direction between the variables of intention to use and perceived ease of use (r=0,320).

There is a significant and strong relationship in the positive direction between the variables of perceived usefulness and subjective norm (r=0,633), between the variables of perceived usefulness and image (r=0,666) and between the variables of perceived usefulness and output quality (r=0,814) and between the variables perceived usefulness and result demonstrability (r=0,660). Additionally, there is a significant relationship in the positive direction between the variables perceived usefulness and perceived ease of use (r=0,408).

There is a significant relationship in the positive direction between the variables of perceived ease of use and subjective norm (r=0,391), image (r=0,428), output quality (r=0,440), result demonstrability (r=0,542).

There is a significant relationship in the positive direction between the variables of subjective norm and image (r=0,573), output quality (r=0,717), result demonstrability (r=0,602).

There is a significant relationship in the positive direction between the variables of su image and output quality (r=0,682), result demonstrability (r=0,581).

Finally, there is a significant relationship between the variables of output quality and result demonstrability (r=0,697).

Regression analysis have been used to determine the functional form between variables.

H1: There is a relationship between subjective norm and intention to use.

Table 4.6. Regression Results of Relationship Between Subjective Norm and Intention to Use (N=171)

Dependent Variable: Intention to Use			
Independent Variable:	**β**	**t**	**p**
Subjective Norm	**,**517	7,848	**,**000
R= ,517; R²= ,267; F= 61,592; p= ,000			

When the value of Sig. (p value) is examined in the table 4.7, it is seen that 0. This means that H_1 hypothesis is proved.

In the table 4.6 the R^2 value, which indicates the percentage of explaining the effect of subjective norm on the intention to use, is 0.26. In other words, the subjective norm explain for 26% of the intention to use.

H2: There is a relationship between subjective norm and perceived usefulness.

Table 4.7: Regression Results of Relationship Between Subjective Norm and Perceived Usefulness (N=171)

Dependent Variable: Perceived Usefulness			
Independent Variable:	β	t	p
Subjective Norm	,633	10,635	,000
R= ,633; **R²= ,401;** **F= 113,095;** **p= ,000**			

The value of Sig. (p value) in the table 4.7 is 0. This means that H_2 hypothesis is supported.

In the table 4.7 the R^2 value, which indicates the percentage of explaining the effect of subjective norm on perceived usefulness, is 0.40. In other words, the subjective norm explain for 40% of perceived usefulness.

In the table 4.7, beta value has been calculated 0,633. This value indicated the subjective norm explain the perceived usefulness strongly.

H3: There is a relationship between image and perceived usefulness.

Table 4.8. Regression Results of Relationship Between Image and Perceived Usefulness (N=171)

Dependent Variable: Perceived Usefulness			
Independent Variable:	β	t	p
Image	,666	11,612	,000
R= ,666; **R²= ,444;** **F= 134,836;** **p= ,000**			

When the value of sig. is examined in the table 4.8, it is seen that 0. This means that H_3 hypothesis is supported.

The R^2 value, which indicates the percentage of explaining the effect of image on the perceived usefulness, is 0.444 in the table 4.8. In other words, the image explain for 44% of the perceived usefulness.

In the table 4.8, beta value has been calculated 0,666. This value indicated the image explain the perceived usefulness strongly.

H4: There is a relationship between output quality and perceived usefulness.

Table 4.9. Regression Results of Relationship Between Output Quality and Perceived Usefulness (N=171)

Dependent Variable: Perceived Usefulness			
Independent Variable:	**β**	**t**	**p**
Output Quality	,814	18,203	**,**000
R= ,814; **R²**= ,662; **F**= 331,340; **p**= ,000			

The value of Sig. (p value) in the table 4.9 is 0. This means that H_4 hypothesis is supported.

In the table 4.9 the R^2 value, which indicates the percentage of explaining the effect of the output quality on the perceived usefulness, is 0.662. In other words, the output quality explain for 66% of the perceived usefulness.

In the table 4.9, beta value have calculated 0,814. This value indicated the output quality explain the perceived usefulness strongly.

H₅: There is a relationship between result demonstrability and perceived usefulness.

Table 4.10. Regression Results of Relationship Between Result Demonstrability and Perceived Usefulness (N=171)

Dependent Variable: Perceived Usefulness			
Independent Variable:	**β**	**t**	**p**
Result Demonstrability	,660	11,431	**,**000
R= ,660; R²= ,436; F= 130,670; p= ,000			

The value of Sig. (p value) in the table 4.10 is 0. So, can be said that H_5 hypothesis is supported.

The R^2 value, which indicates the percentage of explaining the effect of the result demonstrability on the perceived usefulness, is 0.436 in the table 4.10. In other words, the result demonstrability explain for 43% of the perceived usefulness.

In the table 4.10, beta value has been calculated 0,660. This value indicated the result demonstrbility explain the perceived usefulness strongly.

H6: There is a relationship between perceived ease of use and perceived usefulness.

Table 4.11. Regression Results of Relationship Between Perceived Ease of Use and Perceived Usefulness (N=171)

Dependent Variable: Perceived Usefulness			
Independent Variable:	**β**	**t**	**p**
Perceived Ease of Use	,408	5,806	**,**000
R= ,408; R²= ,166; F= 33,712; p= ,000			

When the value of Sig. (p value) is examined in the table 4.11, it is seen that 0. So, can be said that H_6 hypothesis is accepted.

In the table 4.11 the R^2 value, which indicates the percentage of explaining the effect of perceived ease of use on the perceived usefulness, is 0.166. In other words, the

perceived ease of use explain for 16% of the perceived usefulness. This is a low percentage for the perceived ease of use explain of the perceived usefulness.

In the table 4.11, beta value has been calculated 0,408. This value indicated the perceived ease of use explain the perceived usefulness weakly.

H7: There is a relationship between perceived ease of use and intention to use.

Table 4.12. Regression Results of Relationship Between Perceived Ease of Use and Intention to Use (N=171)

Dependent Variable: Intention to Use			
Independent Variable:	**β**	**t**	**p**
Perceived Ease of Use	,320	4,386	**,**000
R= ,320; **R²**= ,102; **F**= 19,237; **p**= ,000			

In the table 4.12 the value of Sig. (p value) is examined 0. So, can be said that H_7 hypothesis is supported.

In the table 4.12 the R^2 value, which indicates the percentage of explaining the effect of perceived ease of use on the intention to use, is 0,102. In other words, the perceived ease of use explain for 10% of the intention to use. This is a very low percentage for the perceived ease of use explain of intention to use.

In the table 4.12, beta value has been calculated 0,320. This value indicated the perceived ease of use explain the intention to use very weakly.

In this situtation H_7 hypothesis is accepted (the perceived ease of use explain of the intention to use), but explaination percentage is very low. So, can be said that the perceived ease of use has a weak impact on the intention to use.

H8: There is a relationship between perceived usefulness and intention to use.

Table 4.13. Regression Results of Relationship Between Perceived Usefulness and Intention to Use (N=171)

Dependent Variable: Intention to Use			
Independent Variable:	**β**	**t**	**p**
Perceived Usefulness	,699	12,692	**,**000
R= ,699; **R²=** ,488; **F=** 161,088; **p=** ,000			

The value of Sig. (p value) in the table 4.13 is 0. So, can be said that H_8 hypothesis is supported.

The R^2 value, which indicates the percentage of explaining the effect of the perceived usefulness on the intention to use, is 0.488 in the table 4.13. In other words, the perceived usefulness explain for 48% of the intention to use.

In the table 4.13, beta value has been calculated 0,699. This value indicated the perceived usefulness explain the intention to use strongly.

Table 4.14. Regression Model Summary Relationship Between Variables of Intention to Use and Perceived Ease of Use, Perceived Usefulness (N=171)

R	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
,700[a]	,489	,483	,541

The R^2 value, which indicates the percentage of explaining the effect of perceived ease of use, perceived usefulness on intention to use, is 0.489 in the table 4.14. In other words perceived ease of use and perceived usefulness explain for 48% of the intention to use.

Table 4.15. Regression Model Summary Relationship Between Variables of Perceived Usefulness and Result Demonstrability, Image, Subjective Norm, Output Quality (N=171)

R	R Square	Adjusted R Square	Std. Error of the Estimate
,834[a]	,696	,689	,350

The R^2 value, which indicates the percentage of explaining the effect of result demonstrability, image, subjective norm, output quality on perceived usefulness, is 0.696 in the table 4.15. In other words result demonstrability, image, subjective norm, output quality explain for 69% of the perceived usefulness.

H_9: There is a relationship between estimated set-up time of SAP and actual set-up time of SAP.

Table 4.16. The Statistics Value of Relationship Between Estimated Set-up Time of SAP and Actual Set-up Time of SAP (N=171)

	Value	Asymptotic Standard Error	Approximate T	Approximate Significance
Ordinal by Ordinal	,648	,074	6,625	,000
N of Valid Cases	171			

When the value of Sig. (p value) is examined in the table 4.16, it is seen that 0. So, can be said H_9 hypothesis is proved. It means that the duration of the SAP installation that participants predicted and the actual SAP installation time coincide with each other.

In the table 4.16 the Gamma Statistic value is 0,648. It means that the estimated set-up time of SAP and the actual set-up time of SAP coincide with each other strongly.

H_{10}: There is a relationship between type of training of SAP and level of employees satisfaction from training.

Table 4.17. The Statistics Value of Relationship Between Type of Training of SAP and Level of Employees Satisfaction From Training (N=171)

	Value	Asymptotic Standard Error	Approximate T	Approximate Significance
Ordinal by Ordinal	,753	,075	6,614	,000
N of Valid Cases	171			

The value of Sig. (p value) in the table 4.17 is 0. So, can be said that H_{10} hypothesis is supported. It means that the type of training of SAP and the level of employees satisfaction from training in a relationship each other.

The Gamma Statistic value is 0,753 in the table 4.17. So can be said the relationship degree is very-high.

Table 4.18. Crosstable Between Type of Training of SAP and Level of Employees Satisfaction From Training (N=171)

Do you believe that you have received sufficient training from SAP company during installation?	Yes	No	Total
Training designed by business processes	66	20	86
Standard training of SAP company	27	58	85
Total	93	78	171

The frequency of satisfied with 'training designed by business processes' in the table 4.18 are 66. The frequency of non-satisfied with 'standard training of SAP company' in the table 4.18 are 58. So, it can be said that the participants be pleased with the type of 'training designed by business processes'.

H_{11}: There is a relationship between type of training of SAP and number of employees in company.

Table 4.19. The Statistics Value of Relationship Between Type of Training of SAP and Number of Employees in Company (N=171)

	Value	Asymptotic Standard Error	Approximate T	Approximate Significance
Ordinal by Ordinal	,010	,132	,075	,940
N of Valid Cases	171			

The value of Sig. (p value) in the table 4.19 is 0,940. Because of p>0,001, it can be said that H_{11} hypothesis is rejected. It means that there is not a relationship between type of training of SAP and number of employees in company.

H_{12}: There is a relationship between company sector and the reason of choosing SAP.

Table 4.20. The Statistics Value of Relationship Between Company Sector and the Reason of Choosing SAP (N=171)

	Value	Asymptotic Standard Error	Approximate T	Approximate Significance
Ordinal by Ordinal	,261	,149	-1,833	,067
N of Valid Cases	171			

When the value of Sig. (p value) is examined in table 4.20, it is seen that 0,067. Because of p>0,001, it can be said that H_{12} hypothesis is rejected. So there is not a relationship between company sector and the reason of choosing SAP.

H$_{13}$: *There is a relationship between number of employees and the reason of choosing SAP.*

Table 4.21. The Statistics Value of Relationship Between Number of Employees and the Reason of Choosing SAP (N=171)

	Value	Asymptotic Standard Error	Approximate T	Approximate Significance
Ordinal by Ordinal	,104	,188	,553	,580
N of Valid Cases	41			

The value of Sig. (p value) in table 4.21 is 0,580. Because of p>0,001, it can be said that H$_{13}$ hypothesis is rejected. It means that there is not a relationship between number of employees and the reason of choosing SAP.

CHAPTER 5

RESULTS AND RECOMMENDATIONS

Researching the factors that affect the use and the acceptance of information technology is important for both firms and employees. Successful implementation of adapted technologies can increase firms' performance, while failed practices can lead to undesirable consequences, such as financial loss or employee dissatisfaction (Venkatesh, 2000). The failure of adaptation of new technologies to achieve expected results has increased the importance of researching the factors which affect the use of information technology for firms and researchers (Compeau and Higgins, 1995).

Especially in today's conditions in which global competition is rapidly increasing, enterprises aim high efficiency with maximum service quality, minimum cost and optimum timing in the services they offer. This situation requires the enterprises to manage the production, supply, planning, distribution, after-sales service phases as a whole. Integrated management of these stages provides a great advantage in terms of enterprises. The use of Enterprise Resource Planning systems, which have positive effects on users and business, has become widespread in recent years in many sectors (Siriginidi, 2000). ERP systems especially SAP software that the enterprises prefer to invest in due to reasons, such as increasing organizational efficiency, production and service quality, and enabling effective decision making, are investments with long installation times and high costs. The adoption and acceptance of this investment by the employees is very important for this investment to achieve success. For this reason, determining the effective factors on the use of ERP systems and SAP software by the employees in the enterprises will lead to the arrangements to increase the usage of such technologies.

TAM is one of the most commonly used models to explain the acceptance and use of technology (Venkatesh, 2000). TAM has considerable advantages due to its focus

mainly on the use of information systems, to its dependence on social psychology, and due to the fact that the validity and reliability of the variables used in the model were confirmed by many studies. While the previous studies that examined the acceptance of ERP systems in the enterprises use TAM or the other models generated by the variables from different theoretical models, in this study, it was aimed to contribute to the literature by both filling in the gap in the literature on this subject and providing a detailed explanation in the literature by using TAM2, which is an expanded form of TAM with the variables of social impact processes and cognitive impact processes.

The model of the study shows that ERP system and SAP software users have a perception of ease of use and perception of usefulness from the variables that are influential in the use and adoption stages of the system, and that these perceptions are very effective on usage. Subjective norm was also revealed to be an effective variable in the use and acceptance of ERP system and SAP software. In the light of the findings of the researches and the questionnaire surveys, the following results were obtained:

In this thesis, the topic defined as '' Assessment of SAP Usage: An Empirical Research In Istanbul ". Firstly, a literature study that include TAM (Technology Acceptance Model) and TAM 2 (Extended Technology Acceptance Model) has been done. After the literature study, the research model that includes variables of 'subjective norm', 'image', 'job relevance', 'output quality', 'result demonstrability', 'perceived usefulness', 'perceived ease of use' and 'intention to use' (Figure 4.1) has been adapted from 'Extended Technology Acceptance Model'. In order to consduct the research study, a questionnaire form including likert scale that measures variables of the model has been designed. The designed questionnaire form has been applied 177 participants and the answers has been collected. Finally, hypotheses that related the thesis topic have been established and the established hypotheses have been tested.

Before testing hypotheses, reliability analysis has been conducted for likert type scale. According to reliability analysis results, likert scale's variables of 'subjective norm', 'image', 'output quality', 'result demonstrability', 'perceived usefulness' has been to be found reliable. However, likert scale's variable of 'job relevance' have been not to be found reliable. For this reason, the research hypotheses have been not included hypotheses that related variable of 'job relevance'.

According to the analysis results, out of 13 hypotheses 10 hypotheses are proved. (Hypothesis 1, hypothesis 2, hypothesis 3, hypothesis 4, hypothesis 5, hypothesis 6, hypothesis 7, hypothesis 8, hypothesis 9, hypothesis 10). According to these proved hypotheses, there are relationship between variables of subjective norm and intention to use, between variables of subjective norm and perceived usefulness, between variables of image and perceived usefulness, between variables of output quality and perceived usefulness, between variables of result demonstrability and perceived usefulness, between variables of perceived ease of use and perceived usefulness, between variables of perceived ease of use and intention to use, between variables of perceived usefulness and intention to use. In addition to the proved hypotheses, the regression analysis results said that, the variables of perceived ease of use and perceived usefulness explain for 43% of the intention to use and the variables of result demonstrability, image, subjective norm, output quality explain for 68% of the perceived usefulness. Additionally, hypothesis 9 and hypothesis 10 are proved. So, there is a relationship between estimated set-up time of SAP and actual set-up time of SAP and there is a relationship between type of training of SAP and level of employees satisfaction from training. Details are given in cheapter 3.

Hypothesis 11, hypothesis 12 and hypothesis 13 are rejected. Consequently, there are not relationship between the variables of type of training of SAP and number of employees in company, between the variables of company sector and the reason of choosing SAP and between the variables of number of employees and the reason of choosing SAP.

The hypotheses which will be analyzed and supported in this thesis are presented as shown below:

H1: There is a relationship between subjective norm and the intention to use

There is a positive correlation between the subjective norm and the intention to use. In this study, subjective norm was found to have an effect on intention to use. People move to use the system with the influence of people around them. Accordingly, as the ideas of the people, who are thought to be important to the individual, increase in the direction of the necessity of the new technology, person's intention to use, that is, the desire to use the new technology, will increase, as well.

There are different approaches in the literature on whether subjective norms affect the intention to use. Venkatesh and Davis (2000) revealed that significant effects of subjective norms on intention to use are only valid in mandatory situations, and that this effect is not significant when used arbitrarily. Lee et al. (2006), revealed results similar to those by Venkatesh and Davis (2000). They revealed that the subjective norms are significant on the intention to use of WebCT only for mandatory use, but are not that significant when used arbitrarily and as the user gains experience with the system. Moreover, Taylor and Todd (1995b) revealed that the addition of subjective norms and perceived behavioral control variables to the model has little effect on the percentage of disclosure of intention to use.

The fact that the subjective norm has a positive effect on the intention to use may be due to the fact that the employees attach importance to the managers' considerations in order to reach the targets set by the managers. If managers think that it is important for employees to use the ERP system, and therefore, the SAP software, the employees tend to act in this direction and use the system. In addition, an employee, who believes that this system should be used, thinks that the other employees should also use this system, and may influence his colleagues in this direction (Irgav, 2011, p.48).

H2: There is a relationship between subjective norm and perceived usefulness.

In the light of the findings of the survey and questionnaire studies, there is a positive relationship between the subjective norm and the perceived usefulness. The results of the analysis are consistent with the literature. In TAM2, subjective norms are thought to have a positive effect on perceived benefit. If the user believes that it is a thought that it is useful for him/her to use the system by someone important to him, then this belief may consequently lead to the development of a perception that the system is really useful. As a result of the formation of the perceived benefit, he/she may want to use the system.

According to Venkatesh (2000) , technology acceptance model 2 clarified to 60% of the variance in perceived usefulness. The effect of subjective norm on perceived usefulness (internalization) was essential at preimplementation and one month postimplementation process.

According to use the inadequacy of information in the face of innovations creates ambiguity. People get in contact with their friends and colleagues, who may have knowledge about the subject, in order to have an opinion in the face of uncertainty, and are significantly influenced by those who have been contacted. This affects their perception that the innovation will benefit them, or that it will not have any benefit to them (Plouffe, Vandenbosch, and Hulland, 2001, p.72). Accordingly, as the subjective norm increases, the amount of the benefit that people perceive about the new technology will increase, as well.

H3: There is a relationship between image and perceived usefulness.

The findings are consistent with the literature. Perceived usefulness can be expressed as "the degree of personal perception associated with an increase in his work performance when a person uses a particular system" (Davis, 1989). Davis et al. (1989) concluded that the most important determinant of the intention to use is the perceived usefulness. In addition, TAM is able to account for most of the variability of the intention to use through the variables of perceived usefulness and perceived ease of use (Plouffe et al., 2001).

As theorized in TAM2, subjective norm will emphatically affect the image suppose that the key members of one's social group of his colleagues believe that he has to perform a certain behavior, (e.g., utilizing a system), performing that behavior will rise his or her status in the group (Blau, 1964, Kiesler and Kiesler 1969, Pfeffer 1982 ; cited by Venkatesh, 2000, p. 189). Hartwick and Barki (1994) revealed that albeit subjective norm significantly affected the intention before framework development, the impact inclined to be nonsignificant three months after the implementation.

According to Moore and Benbasat(1991), people who use system in the organization are more prestigious than people who do not. Additionally, using system is regarded as a status symbol in an organization. The results of the analysis show that there is a positive relationship between the image and the perceived usefulness.

In Kelman's study (1958) '' individuals often respond to social normative influences to establish or maintain a favorable *image* within a reference group '' (Venkates, 2000, p.189).

If the user thinks that the social group members, who are significant for the user, are supposed to use the suggested system, there may be a perception that the user's image in this social group will also increase (Venkatesh ve Davis, 2000) Considering all, the image has a positive effect on the perception of perceived usefulness.

H4: There is a relationship between output quality and perceived usefulness.

There is a positive relationship between the output quality and the perceived usefulness. The findings are consistent with the literature. According to Venkatesh and Davis (2000), the degree to which the employee believes that he will do his job better with the new technology he uses is called the output quality.

Correlation between perceived output quality and perceived usefulness has been experimentally indicated earlier (Davis et al. 1992). It is anticipated that output quality will be experimentally different from, and will clarify the significant difference in, expect that perceived usefulness will be far beyond the job relevence since an alternate decision process is included. With regards to image theory (Beach and Mitchell 1996, 1998), resolutions concerning job relevence are more appropriate to appear as a compatibility test, seeing that the systems considered not to be job relevance are excluded from one's decision of further consideration. However, resolutions of output quality are less likely to be utalized for excepting the options. Rather, they are more suitable to appear as a profitability test, where one would be prone to pick a system which will convey the most astounding output quality, considering a decision set including various appropriate systems.

In the study conducted by Venkatesh and Davis (2000), it was shown that the output quality causes the employee to think that he fulfills his duty well, and affected the degree of perceived usefulness. Accordingly, as the output quality increases, the perceived usefulness will also increase.

H5: There is a relationship between the result demonstrability and perceived usefulness.

There is a positive relationship between the result demonstrability and perceived usefulness. The findings are consistent with the literature. In users' work, as the level of satisfaction with the result demonstrability increases, the perception that the system is beneficial also increases. Accordingly, as the result demonstrability of the new technology used increases, the perceived usefulness will also increase.

Agarwal and Prasad (1997) revealed that there is a significant relationship between intention to use and result demonostrability. The correlation between result demonstrability and perceived usefulness is additionally coherent with the model of job qualifications, which accentuates knowledge of the real consequences of business activities as a key mental state emphasizing the work stimulus (Hackman and Oldham 1976, Loher et al. 1985).

The result demonstrability variable in Venkatesh and Davis (2000) was derived from the study of Moore and Benbasat (1991), and was defined as "the degree to which the benefits of innovation are easily visible to potential users". According to Venkatesh (2000), the result demonstrability directly affects the perceived benefit.

H6: There is a relationship between perceived ease of use and perceived usefulness.

There is a positive relationship between the perceived ease of use and the perceived usefulness. The findings are consistent with the many studies (Davis,1989; Venkatesh, 2000; Handy et al, 2001; Peker, 2010; Turan, 2011; Akbulut, 2015). Although it is a contrary to the TAM (Davis et al, 1989) that there is no significant relationship between perceived ease of use and perceived benefit, there is no significant relationship between perceived ease of use and perceived benefit in a number of studies (Hong and Tam, 2006; Chen and et al, 2004; Wu and et al, 2007). Davis (1989) described the

decision to use information technology by a person using a particular system as perceived usefulness. Davis(1989) explains that the perceived ease of use has a direct and strong influence on perceived usefulness. Therefore, the user gets more efficiency with the ease of use. The idea of perceived ease of use is that the user makes less effort, and that the users know how to use the system. According to Venkatesh (2000), perceived ease of use is important to determine the users' acceptance and use of newly emerging information systems. Igbaria et al. (1995) revealed that user training, computer experience, organizational support and system quality are important in explaining the perceived ease of use and the perceived benefit. In addition, it was also revealed that the perceived ease of use has had a strong impact on the perceived benefit.

Perceived benefit in TAM is influenced by external factors as well as it is affected by perceived ease of use. The designer can also increase the perceived benefit perception of the technology by adding new functions to the design features of the system or by making the access to the existing functions easier. Perceived ease of use is also influenced by external factors, just as perceived benefit is. System features (menus, icons, mouse, etc.), training, documentation and user support counseling can be considered as the external factors that can affect perceived ease of use (Davis et al., 1989).

Perceived benefit may be affected by perceived ease of use and external factors. The relationship between perceived benefit and perceived ease of use can be explained as follows: If we consider a system where everything is equal, the more systematic the system becomes, the more beneficial it becomes. That is, improvements in perceived ease of use can lead to increasing of the performance, thereby increasing the perceived benefit of technology (Davis,1993; Venkatesh ve Davis, 2000). It is the degree to which one believes that his performance or productivity will improve with the help of the system he uses. In his study, Davis (1989) also defined the perceived ease of use as the degree of belief that the individual uses the new technology without difficulty. In this case, the fact that an individual believes that he will use the system without any difficulty, will create his idea of increasing the performance in his work, and will affect his decision to use the new information technology. Accordingly, as the idea of the users, which the use of new technology is easy, increases, the idea of the users, which the use of new technology is benefitial, will also increase.

H7: There is a relationship between perceived ease of use and the intention to use.

The following results were obtained in the light of the findings of the survey and questionnaire studies:

There is a positive relationship between the perceived ease of use and the intent to use. The results of the analysis are consistent with the literature. The perception that the system is easy to use is influential on the users' acceptance of the system, which makes the use of the system successful. It will positively affect the use of the system when the user of the ERP system SAP software thinks that the use of the system will improve the efficiency and productivity of his work, will help him to provide access to business information, and to prevent errors. Accordingly as the perception of users, that the use of new technology is easier increases, the intentions of the users to use it, that is, their willingness to use the new technology will increase.

Furthermore, contrary to the expectations in the literature, no significant relationship was detected between the perceived ease of use and the intention of using e-mail in the study of Mutlu (2012). In Turan's (2011) study, his hypothesis of examining the impact of the degree of the classroom teachers' perceived ease of use of information and communication technologies over their intention to use the technology, was tried to be determined by regression analysis, and according to the results obtained, the intention of perceived ease of use was not found statistically significant.

H8: There is a relationship between perceived usefulness and intention to use.

There is a positive relationship between perceived usefulness and intention to use. The result obtained is that the perceived benefit overlaps with the earlier studies on the related structure. According to Davis (1989), if there are many benefits provided by technology, the ultimate step in deciding on the use of technology is the intention towards behavior.

According to Venkatesh and Davis (2000), there is a positive relationship between the intention to use and the variabe of perceived benefit. In fact, through perceived benefit, the intention to use was revealed to be influenced by the variables related to all social effects (subjective norms, volunteerism and image) and by all the variables related

to cognitive support processes (job relevance, perceived ease of use, output quality, outcome quality, etc.). Accordingly, as the amount of perceived usefulness by the users of the new technology increases, the intention of the users to use, that is, the desire to use that technology, will increase.

The findings are consistent with the literature. As it is indicated by Venkatesh (2002), the perceived ease of use clearly has an impact on the perceived benefit due to the fact that the easier the software is the more efficient it is as well as the more useful it is. In Aktas's study (2007) , it appears that the perceived usefulness of accountants' behavior towards the use of information technology has a positive and significant effect on the intent. As indicated by Chismar et al. (2003), the perceived benefit is a vital indicator of the user intention. Chismar et al. (2003) additionally put forward that the perceived benefit is the mere fundamental element for the medicals so as to anticipate the system utilization

On the contrary to the literature, the results of the study conducted by Kurulgan and Paşaoğlu (2013), it was revealed that the perceived benefit towards the use of information technology has no effect on behavioral intentions Additionally, in Turan's study (2011), there was no correlation between the degree of the classroom teachers' perceived ease of use of information and communication technologies and their intention to use the technology.

H9: There is a relationship between estimated set-up time of SAP and actual set-up time of SAP.

There is a positive relationship between the estimated set-up time of SAP and the actual set-up time of SAP. Therefore, the expectation of the users is met. Hence, this may be considered one of the reasons why SAP software is preferred in ERP systems. Nestle case can be showed as an example. Estimated set-up time of SAP is consistent with actual set-up time of SAP in Nestlé case just as in many companies.

But in a short time it has emerged with the experienced Nestlé SAP case that the implementation of large software is related not only to set-up time of the software but also to system acceptance. Nestlé signed a contract of 200 million US Dollars with SAP in order to establish an ERP system for all of its companies globally in June in 2000.Nestlé 's objective was to constitute a centrally manageable structure with the SAP system.

Experts at Nestlé have realized that business processes need to be standardized in order to be able to sustain their existence in the competitive environment of the global world. In the project to be carried out, it is planned that transition will be achieved by 3 years in the regions where Nestle is most involved. Nestle has quickly realized that implementing large software applications is not just about software, but also about Change Management. Nestlé learned in a very painful way that starting to use the software is more than just installing it. Dunn (vice president and CIO of Nestlé USA) says, in the event that you are shifting to SAP, this implies you are changing the way individuals work, and he adds you are testing their standards, their convictions and the way they have gotten things done for some, numerous years (Glick, 2001, p.24).

Regularly, as on account of Nestle USA, companies will experience significant misfortunes and troubles amid the usage, yet still have the capacity to rescue a fruitful venture. The vital point to consider is that the plans should be sufficiently adaptable to shift mid-stream in order to cope with the hindrances that show up amid the venture, and companies must get their work done before starting an ERP project.

H10: There is a relationship between type of training of SAP and level of employees satisfaction from training.

According to the findings obtained after the analysis, the relationship between the type of training of SAP and the level of employees' satisfaction from training was determined as a positive one. The satisfaction rate of the employees who received the training of "training designed by business processes" is higher.

According to Adshead's study (2002), in terms of most of the companies, there should be a widely appealing moderate methodology where people grasp that the product won't take care of each of the challenges that company faces, and not each of the procedures in the organization can be re-designed to match the product. In any case, insightful venture pioneers with earlier ERP execution experience will disclose to you that there are a few traps to abstain from amid ERP ventures. The most important pitfall to keep away from in ERP utilizations is not to undervalue of the significance of training. It is widely observed that software users are given a training of a few days on the use of new product, and they do not reuse the software again for quite a long time. Software

users require a comprehensive and progressive training, and need to be included in the overall testing of the software if conceivable.

H11: There is a relationship between type of training of SAP and number of employees in company.

H11 is not supported. The type of training of SAP given to the firm is not determined by the number of employees. They are determined according to the complexity of the modules, to the demands of the senior management and to the staff's compliance to the system or industry (https://training.sap.com/us/en/courses-and-curricula).

H12: There is a relationship between company sector and the reason of choosing SAP.

H12 are hypothesis of correlation, and were rejected. The hypothesis was rejected in direction of the results of the survey applied to the employees of particular companies. They serve many areas, such as automotive, wholesale, textile, metal, service industry, merchandising, chemistry, and education. All of these companies, whose sectors are different from each other, prefer SAP. References of SAP consulting firms can be showed as an example.

H13: There is a relationship between number of employees and the reason of choosing SAP.

When the research results are evaluated, "a relationship between number of employees and the reason of choosing SAP" is not supported. H13 is rejected. The ADCO firm can be given as an example in this case. ADCO, which imports petroleum additives and has 4 employees, prefers SAP application. Considering the number of employees, ADCO, which won the title of being the smallest company using SAP, manages its business processes with SAP's Enterprise Resource Planning solution. With the SAP project, ADCO uses the same system and technology as its large customers, such as Shell, Mobil, and BP, who have a large number of employees. The project, which started in 2006, was completed in 2007. Thus, the co-operation between ADCO and SAP has been the beginning of a new era, especially for small and medium-sized enterprises. This ended the perception that only the large-scale companies prefer SAP software. (http://global1.sap.com/turkey/company/press/pdf/Sap Turkey SF.pdf).

In accordance with the information and the findings conducted through literature review and the survey handled, the following can be suggested to the companies:

Findings clearly indicate that the ease of use and benefit perception of the new system is important to users. Subjective norm seems to be a very influential variable on intention to use. For users, the thoughts of both their colleagues and administrators are important. Therefore, management support is one of the most fundamental issues in the successful accomplishment of the project. For this reason, the management should conduct studies that will help users to form the perception of ease of use and benefit according to the characteristics of employees.

Perfect configuration of the system technically does not essentially mean that the system will succeed. Adoption and successful of the system by the employees is the most important factor that will make the system successful. For example, if the company informs its employees that the benefits of using the system will contribute to the company's benefits over the long term, this will motivate users, and will help them to perceive the new system as useful. Therefore, this situation will also affect the employees' intentions to use positively.

Training is the most important tool in perceiving a project complex, in not approaching it with the prejudice and in adopting it at ease. For this reason, the privatized trainings provided by the unit responsible for the project will affect the perception of the ease of use of the system positively in the technical support users who will be supplied with by the unit progressively. It would be beneficial for management to support employees by raising awareness of the system, providing information about the system, training, technical and remote support tools. It should be remembered that this process is not just a software change process, but also a process that changes the way people work. In order to be able to smoothly complete this process, which we can call change management, without any challenges, providing employees with confidence that their training will not be done only in the transitional stages, that they will be supported on an ongoing basis, and their needs will always be responded, will also increase the employee satisfaction, and keep them away from turnover.

ERP software and SAP is often used by large-scale enterprises. For this reason, the thesis has been carried out within the scope of Istanbul province, where big size companies operate. The majority of the enterprises operating in our country are medium and small-scale enterprises. When it is considered that medium and small sized enterprises are in the forefront of productivity (cost, quality, customer satisfaction), and that they are working in this increasingly competitive environment, small and medium sized enterprises should be encouraged to implement this software program.

In future studies, sector-based, region-based, across Turkey or in a single firm can be conducted. As a result of the day to day development of SAP applications and the low cost new systems developed for companies with a small number of employees , the relationship between company's reasons to choose SAP, and the relationship between the size of the company or number of employees can be researched in the coming years.

APPENDIX LIST

1. **Likert Scale Adapted According to the Extended Technology Acceptance Model**

		Strongly Disagree	Somewhat Disagree	Neither Agree Nor Disagree	Somewhat Agree	Strongly Agree
INTENTION TO USE						
ITU 1	If we assume that I have access to the SAP I would intend to use the software in my work.					
ITU 2	I guess I will use the SAP in case you have access to it.					
PERCEIVED USEFULNESS						
PU1	Using the SAP improves my performance at work.					
PU2	Using the SAP rises my productivity at work.					
PU3	Using the SAP increases my efficiency/ effectiveness at work					
PU4	I find it useful for my job to use the SAP					
PERCEIVED EASE OF USE						
PE OU1	The use of the SAP is clear and straightforward for me.					
PE OU2	Interacting with the SAP does not require much mental effort of mine.					
PE OU3	I find it easy to use the SAP					
PE OU4	Using SAP allows me to do things easily.					
SUBJECTIVE NORM						
SN1	Those who have an influence on my behaviour think that I need to use SAP.					
SN2	Those who are significant to me think that I need to use SAP					
IMAGE						
I1	Those using SAP in the organization are more prestigious than those who do not.					
I2	Those using SAP in the organization have a higher profile					
I3	Using SAP in the organization is a status symbol					

JOB RELEVANCE						
JR1	The use of the SAP is important to my business.					
JR2	The use of the SAP is relevant to my job					
OUTPUT QUALITY						
OQ 1	The output quality I get from using the SAP is higher.					
OQ 2	I do not have any particular problem with the output quality from using the SAP					
RESULT DEMONSTRABILITY						
RD1	There is no specific difficulty in discussing the results of using the SAP with other employees.					
RD2	I believe I can discuss the results of using the SAP with the other employees					
RD3	The results of using the SAP are pretty obvious to me					
RD4	I am having difficulty explaining the benefits of using the SAP					

2. Questionnaire Form

USE OF SAP IN ENTERPRISES
EXTENDED TECHNOLOGY ACCEPTANCE MODEL QUESTIONNAIRE FORM

Dear Participant,

This questionnaire is related to the application of the master's thesis '' Assessment of SAP Usage: An Empirical Research In Istanbul '', the variables that play role in the acceptance of SAP by the users were taken into account within the framework. These thesis yewhich is being prepared at Adana Science and Technology University Institute of Social Sciences. The purpose of the questionnaire is to measure the use of SAP in enterprises that receive SAP consultancy within Istanbul.

Please fill in the following information in line with your thoughts. Thank you for giving a time.

Researcher: Zeynep İNCE
Email: zynpince@gmail.com

Personal Information:

1. Your age: 25 - 35 ( ) 36 - 46 ( ) 47-57 ( ) 58 and above ( )
2. Your Gender: Female ( ) Male ( )
3. Education Level: High School ( ) University ( ) Master ( ) Doctorate ( )
4. Service Duration: 0-3 Year ( ) 4-7 Years ( ) 8-11 Years ( ) 12 Years and Over ( )
5. How many hours a day do you use a computer? None ( ) 1-4 hours a day ( ) 4-7 hours a day() 7-10 hours a day ( ) More than 10 hours a day ( )

Information about the company:

1. How long has your business been operating?
0-10 Years ( ) 10-20 Years ( ) 20-30 Years ( ) 30-40 Years ( ) 40-50 Years ( ) 50 Years and Over ( )

2. Indicate the legal structure of your business.
Collective ( ) Limited Partnership ( ) Limited ( ) Inc. ( ) Other (Please specify) …………

3. In what sector does your business operate?
Textile ( ) Automotive ( ) Pharmaceutical-Chemical ( ) Energy ( ) Food ( ) Electrical-Electronics ( ) Construction Materials ( ) Paper ( ) Retail ( ) Packaging ( ) Machinery & Industrial Automation ( ) Other (Please specify)......

4. How many people are working in your business?
Between 0-9 ( ) 10-49 ( ) 50-249 ( ) 250 and Over ( )

5. What is the mode of production of your business?
Serial Production( ) Order Production( )Flexible Production( )Project Type Production( )

SAP Information:

1. Please list the effectiveness of each of the following factors in your firm's decision to use SAP, from 1 to 8 by importance.

To ensure interdepartmental alignment and order between departments in business process management ( )
To provide improvement in operational decisions ( )
To standardize the business systems ( )
To ensure the coordination between geographically distant units ( )
To replace the old systems ( )

To ensure SAP usage by the Group of affiliated companies ( )
To restructure the company organization structure ( )
To make communication effective and efficient with suppliers and customers ( )

2. Specify the reasons why your firm selects SAP software from the ERP software package programs.

Being a pioneer company ( )   Running smoothly ( )

Powerful corporate portal ( )   E-Business solution) ( )

Working with multiple languages and countries ( )   Providing a Web-based solution ( )

Low Cost ( )   Professional in business solutions ( )

3. Which of the following best describes the SAP software in your business?

It is a complex package consisting entirely of modules from a single vendor ( )
A Mixed system program (based on a single vendor, and made for other vendors or you in particular) ( )

4. What was the estimated time for SAP installation in your business, and the time it actually took to comply?

- Estimated time for installation: less than 6 months ( ) 6-12 months ( ) 12-18 months more than 18 months ( )
- Time of realization of installation: less than 6 months ( ) 6-12 months ( ) 12-18 months more than 18 months ( )

5. What are the challenges faced by businesses in setting up their SAP systems?

- Restructuring of the processes ( )
- Challenges in change management ( )
- The reaction of employees to change ( )
- Inadequate technical assistance provided by the software company ( )
- Software cost ( )
- The reaction of senior management to change ( )
- Other (Please specify) ....

6. Which of the following is the training your business took in installing SAP software?

- Trainings designed by business processes ( )
- Standard training of SAP company ( )
- Not trained ( )

7. Do you believe that you have received sufficient training from SAP company during installation?

Yes (we have had enough training) ( )   No (we have not had sufficient training) ( )

Each expression is rated as "1- Strongly Disagree, 2- Somewhat Disagree, 3- Neither Agree Nor Disagree, 4- Somewhat Agree, 5-Strongly Agree.

		Strongly Disagree	Somewhat Disagree	Neither Agree Nor Disagree	Somewhat Agree	Strongly Agree
INTENTION TO USE						
ITU 1	If we assume that I have access to the SAP I would intend to use the software in my work.					
ITU 2	I guess I will use the SAP in case you have access to it.					
PERCEIVED USEFULNESS						
PU1	Using the SAP improves my performance at work.					
PU2	Using the SAP rises my productivity at work.					
PU3	Using the SAP increases my efficiency/ effectiveness at work					
PU4	I find it useful for my job to use the SAP					
PERCEIVED EASE OF USE						
PE OU1	The use of the SAP is clear and straightforward for me.					
PE OU2	Interacting with the SAP does not require much mental effort of mine.					
PE OU3	I find it easy to use the SAP					
PE OU4	Using SAP allows me to do things easily.					
SUBJECTIVE NORM						
SN1	Those who have an influence on my behaviour think that I need to use SAP.					
SN2	Those who are significant to me think that I need to use SAP					

VOLUNTARINESS						
V1	I volunteer to use SAP					
V2	My executive does not need me to use SAP					
V3	Despite being helpful, using SAP is not essentially a must in my job.					
IMAGE						
I1	Those using SAP in the organization are more prestigious than those who do not.					
I2	Those using SAP in the organization have a higher profile					
I3	Using SAP in the organization is a status symbol					
JOB RELEVANCE						
JR1	The use of the SAP is important to my business.					
JR2	The use of the SAP is relevant to my job					
OUTPUT QUALITY						
OQ 1	The output quality I get from using the SAP is higher.					
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RD1	There is no specific difficulty in discussing the results of using the SAP with other employees.					
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RD3	The results of using the SAP are pretty obvious to me					
RD4	I am having difficulty explaining the benefits of using the SAP					

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