ADOPTION AND UTILIZATION OF INFORMATION SYSTEMS IN AN EMERGING TURKISH INDUSTRIAL TOWN: A CASE STUDY ON GAZİANTEP

A THESIS SUBMITTED TO
THE GRADUATE SCHOOL OF INFORMATICS
OF
THE MIDDLE EAST TECHNICAL UNIVERSITY

BY

YASEMİN SALİHOĞLU

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE

IN

THE DEPARTMENT OF INFORMATION SYSTEMS

APRIL 2003

Approval of the Graduate School of Informatics

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ABSTRACT

ADOPTION AND UTILIZATION OF INFORMATION SYSTEMS IN AN EMERGING TURKISH INDUSTRIAL TOWN: A CASE STUDY ON GAZİANTEP

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April 2003, 95 pages

This thesis analyzes factors motivating and inhibiting the adoption of information systems in enterprises in Gaziantep by a scale generated on Rogers' theory of diffusion of innovation. These factors are grouped into four as administrative, technological, environmental, and organizational characteristics in the scale built. Structured interview method was used while collecting the data. It was interviewed with 20 firms, operating in various sectors in Gaziantep. Results of the study showed that, within the fifteen factors studied, five of them had significant effects on the rate of information systems utilization. These factors were the relative advantage of information systems, the quality of information systems infrastructure, CEO's attitude towards information systems, employees' knowledge about information systems, and the service quality of the vendor.

Keywords: Theory of diffusion of innovation, information systems adoption, information systems utilization

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GELİŞMEKTE OLAN BİR SANAYİ ŞEHRİNDE BİLİŞİM SİSTEMLERİNİN BENİMSENMESİ VE KULLANIMI: GAZİANTEP ÖRNEĞİ ÜZERİNE BİR ÇALIŞMA

Salihoğlu, Yasemin

Yüksek Lisans, Bilişim Sistemleri Bölümü

Tez Yöneticisi: Prof. Dr. Semih Bilgen

Nisan 2003, 95 sayfa

Bu çalışmada, Rogers'in yeniliklerin yayılma teorisine dayanılarak hazırlanan bir ölçek aracılığıyla, Gaziantep ilindeki işletmelerdeki bilişim sistemlerininin benimseme düzeyleri araştırılmaktadır. Hazırlanan ölçekte, şirketlerin bilişim sistemlerini benimseme düzeylerini etkileyen etkenler, yönetimsel, bilişimsel, çevresel, ve örgütsel olmak üzere dört grupta incelenmistir. Veriler toplanırken, yapılandırılmış görüşme yöntemi kullanılmıştır. Gaziantep ilinde farklı sektörlerde faaliyet gösteren 20 firma ile görüşülmüştür. Bu dört grupta incelenen toplam onbeş etkenden beş tanesinin bilişim sistemleri kullanma oranına etkisi olduğu görülmüştür. Bu faktörler bilişim sistemlerinin sağladığı avantajlar, bilişim sistemleri alt yapısının kalitesi, yöneticilerin bilişim sistmelerine karşı tutumları, çalışanların bilişim sistemleri bilgi düzeyi, şirket dışı bilişim hizmetleri veren anlaşmalı kurumun servis kalitesi olarak belirlenmistir.

Anahtar Kelimeler: yeniliklerin yayılması teorisi, bilişim sistemleri benimsenmesi, bilişim sistemleri kullanımı

To the memory of my father

ACKNOWLEDGEMENTS

This thesis could not have been completed without the support of many people. First of all, I would like to express my profound gratitude to my thesis supervisor Prof. Dr. Semih Bilgen, and my coordinators Assoc. Prof. Dr. Onur Demirörs and Dr. Altan Koçyiğit for their guidance and encouragement.

Thanks are extended to my thesis committee, Assist. Prof. Dr. Erkan Mumcuoğlu and Assoc. Prof. Dr. Erol Sayın for their comments, and to all my friends, especially Resim Alioğlu, Nil Yıldırım, Zeynep Güleryüzlü, Didem Paşa, Oya Deniz Koçgil, Alpay Ertürkmen, Burcu Akkan, Beray Gençsoy, Meltem Sönmez, Çiğdem Gencel, for their support, advices, and encouragement during my more stressful moments.

I would like to thank to Timuçin Çetin and his family, Korkut Erturküner and his family, Mehbare Kileci, and Bade Oral for their help in arranging the meetings.

Finally, thanks to my family for being so supportive throughout and for all their encouragement, inspiration, and moral support.

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LIST OF ABBREVIATONS

ATM	Asynchronous Transfer Mode
CEO	: Chief Executive Officer
CII	: Confederation of Indian Industry
DSL	Digital Subscriber Line
EU	: European Union
EUR	: Euro
GAOSB	: Gaziantep Organize Sanayi Bölgesi
GOS	: Gaziantep Organize Sanayi
GTO	: Gaziantep Ticaret Odası
IS	: Information Systems
ISDN	Integrated Services Digital Network
ISP	Internet Service Provider
IT	: Information Technologies
KOBİ	: Küçük ve Orta Büyüklükteki İşletmeler
PC	: Personal Computer
SBS	: Small Business Service
SME	: Small and Medium Sized Enterprise
SPSS	: Statistical Package for the Social Sciences
UNECE	: United Nations Economic Commission for Europe
VoIP	Voice over Internet Protocol
VPN	: Virtual Private Network

CHAPTER 1

INTRODUCTION

The emergence of information systems has been one of the most important technological developments in recent years. Advances in ICT have made it possible to diffuse and access information at a speed and on a scale never seen before. There are rapidly evolving needs for new skills, while old ones are becoming obsolete. Changes in customer needs and work patterns forced companies to utilize information systems. At the beginning, information systems were considered as a support tool. As time passed, role of information systems in organizations has changed. They not only enable changes in the job routine, but also lead to organizational transformation (Fink, 1998; Chan 2000).

Small and medium-sized companies are indispensable driving agents of economies of countries. Moreover, characteristics of small and medium-sized companies, when compared to larger organizations, are more suitable for information systems implementations (Moreton and Chester, 1996). However, factors affecting the adoption decision and attitude of small and medium-sized companies towards information systems employment should be studied in order to figure out the needs and expectations of small and medium-sized companies. Rogers' theory of innovation diffusion provides tools for

evaluating the rate of information technology diffusion and classifies factors facilitating or inhibiting information systems adoption and implementation (Fichman, 1992).

1.1 INNOVATION AS A FUNDAMENTAL ECONOMIC DRIVER

Innovation is a major driver of economic growth and it is defined as the development, deployment and economic utilization of new products, processes and services. Innovation generates improvement in labor quality and capital stocks. Technological and non-technological innovations like improved management practices, organizational changes, and improved ways of producing goods and services enable firms to respond to more sophisticated consumer demand. Countries that can rapidly develop new products, processes and services base on new technologies and apply them efficiently have the highest level of economic growth. It seems like that innovation is essential for sustainable economic growth. It is suggested that in the long run, countries will get greater economic rewards if they acquire, exploit, and distribute knowledge effectively (OECD, 2001a).

1.2 INFORMATION SYSTEMS ADOPTION AND UTILIZATION AS AN INDICATOR FOR INNOVATION

In the recent growth performance, innovation and information technology are closely related. Some modifications in innovation process and their impact on innovation arise with the help of information technology. On the other hand, in

the absence of changes in innovation system, some of the effects of information technology could not have been realized (OECD, 2000a).

> ICT plays a major role in innovation process. As a result of technological change, monopoly character of telecommunication market has been removed. Consequently, sector's productivity has been improved and costs are declined. These changes are all resulted in development of ICT goods and services. ICT is a key technology for speeding up the innovation process and reducing cycle times, resulting in a closer link between business strategies and performance. ICT has fostered greater networking in the economy, as it has facilitated outsourcing and co-operation beyond the firm. It also appears to be a major driver of globalization process. ICT has played an important role in making science more efficient and linking it more closely to business (OECD, 2000a).

A key factor in broad-based growth is effective diffusion and use of technology. Information systems utilization has contributed significantly to aggregate growth in several OECD countries in the past few years. It has played an important role in restructuring of firms, introducing changes in work organization, reorganizing transactions, reducing routine transaction costs, and restructuring supply chains. As a result of more efficient manufacturing, inventories and overheads have been reduced; design and production have become integrated. Although information systems utilization has positive effects on performance, productivity, competitiveness, employment, etc., some of the countries have slow rates of information systems adoption. Barriers to competition, cost of investment tools, associated costs of communication and use can be reasons for slow rate of adoption (OECD, 2001a).

The role of information systems and innovation in economic growth is improved in a dynamic entrepreneurial economy. Entrepreneurship connects new technologies and innovation. As the number of innovative firms increase, growth prospects are improved (OECD, 2001a).

There exists a difference in the information systems usage among firms. Skill and knowledge intensive industries use information systems applications more than traditional industries. Large companies are more likely to use them than small ones.

Product and service cycles are relatively short in information systems sector; these result in rapid innovation. Increase in processor and memory performance, decline in memory costs, and expand in communications capabilities are examples of rapid and ongoing innovation in information systems. They are the source of new products in both information systems and other sectors. Efficiency gains, productivity growth, and related economic and social returns across economy are the significant contributes of these innovations (OECD, 2002a).

Information systems can also act as an enabler of innovation. Impact of information technology on innovation can be grouped into nine categories. Davenport (1993) stated these categories as follows:

- Automational- eliminate human labor from a process and produce a more structure process,
- Informational- capture information for purposes of understanding,
- Sequential- change the sequence of process,
- Tracking- closely monitor process status and objects,
- Analytical- improve analysis of information and decision making,
- Geographical- coordinate process across distances,
- Integrative- coordinate task and processes,

- Intellectual- capture and distribute intellectual assets,
- Disintermediating- eliminate intermediates from a process.

This thesis is based on Rogers' theory of diffusion of innovation. Emergence of information systems is accepted as an innovation and this theory provides a useful perspective on how to improve information systems assessment, adoption, and utilization (Clarke, 1991). According to Rogers, there are five attributes of an innovation. These are relative advantage, compatibility, complexity, trialability, and observability. Rogers suggests that all these attributes, except complexity, are positively related with the rate of adoption (Rogers and Shoemaker, 1971).

Previous studies have showed that rate of information systems adoption is also related with the organizational characteristics (Gupta and Capen 1995; Levy and Powell 1998; Thong 1999). These characteristics are flexibility of organization (Levy and Powell, 1998; Levy et al. 1998; Lassila and Brancheau 1999), existence of an internal expert (Cragg and Zinatelli, 1995), employee's self-efficacy (Carlson 1999; Cragg and Zinatelli, 1995; Thong 1999), and product innovativeness (Fink 1998; Levy and Powell, 1998; Runge and Lee, 2001; Lee and Baek, 2002). In addition to organizational factors, environmental factors like competitive pressure (Carlson 1999; Thong 1999; Runge and Lee, 2001; Lee and Baek, 2002), and existence of external support (Cragg and Zinatelli, 1995; Chambers and Parker 2000); and administrative factors like owner self-efficacy (Cragg and Zinatelli, 1995; Harrison et al. 1997; Fink, 1998; Carlson 1999; Thong 1999; Seyal et al. 2000; Runge and Lee, 2001; Lee and Baek, 2002) and owner innovativeness (Cragg and Zinatelli, 1995; Harrison et al. 1997; Fink, 1998; Levy

and Powell, 1998; Carlson, 1999; Thong 1999; Chambers and Parker, 2000; Runge and Lee, 2001) have impact on rate of adoption.

1.3 SELECTION OF GAZIANTEP AS CASE STUDY

'Anatolian Tigers' is the name given to successful industrial towns. Not only the integration of entrepreneurial spirit with the historical and cultural accumulations in production industries but also the macro economic policies applied may cause the emergence of these successful industrial towns. With the effect of market-directed and export-oriented system implemented after 1980s, several traditional Anatolian towns have shown an unforeseen success in production industry, especially in textile and clothing (Varol, 2002).

Gaziantep has import and export contracts with 94 countries (Gaziantep.net, 2002). Moreover, it has four organized industrial zones with a total area of 24 million m^2. In these industrial zones, there are 400 factories in operation (GTOa, 2002). With its industrial infrastructure and entrepreneurship, Gaziantep has been one of the most important industrial centers of east and southeast Anatolia. Adopting itself to ever changing and developing conditions in Turkey and in the world made Gaziantep a leading example of "Anatolian Tigers" (Varol, 2002). In order to visualize the information systems utilization in this highly industrialized town, Gaziantep was selected as the case study.

1.4 STRUCTURED INTERVIEW AS RESEARCH METHOD

Structured interview was chosen as the research method. There are many advantages of structured interview. First of all, format of questions and answers are strict in structured interview. This tight control over questions results in standardization. Identical questions with pre-coded answer are asked to each respondent. These closed questions speed up the interview for both interviewer and respondent, improve the reliability of interview, and expedite later processing data. Moreover, pre-coded answers convey more exact meaning.

In this study, a structured interview tool with three main parts was designed. First part of it focuses on the profile of the company. Second part of the interview is about the usage of IS within the company. Information systems adoption motivators and inhibitors are studied in the third part of the interview.

1.5 SUMMARY OF THESIS

This thesis is composed of five chapters. Previous research on information systems adoption and utilization in small and medium-sized enterprises is summarized in Chapter 2. Research methodology is explained in detail in Chapter 3. Design of interview, scales, and data collection method are also discussed in this chapter. Results of the interview are discussed in Chapter 4. Finally, Chapter 5 concludes the work, explain the limitations and give suggestions for future work.

CHAPTER 2

LITERATURE REVIEW

Technological innovation has created and implemented new technology, products, and production and service capabilities. It is stated that product design, production systems, skill and knowledge base, materials and equipment are altered by innovations. The quality, effectiveness, and productivity of processes are enhanced by technological innovation (Edosomwan, 1989). In this chapter, innovation, information systems, adoption of information systems will be discussed based on the literature review.

2.1 INNOVATION

An idea, practice, process, object, or service perceived as new by an individual is called innovation. In other words innovation can be defined as "transformation of an idea into a marketable product and service, a new or improved manufacturing or distribution process, or a new method of social service" (Elçi, 1999). Attributes of innovation are relative advantage, compatibility, complexity, trialability, and observability and they determine rate of adoption of innovations (Rogers and Shoemaker, 1971). These attributes are discussed in detail in next section.

Unexpected occurrences, incongruities, process needs, industry, market and demographic changes, new knowledge and change in perception may be suggested as opportunities for innovation. Innovation may be of three types: radical, incremental, and system innovations. Ideas that cause significant changes in the whole industry are called radical innovations. Incremental innovations are small but significant ideas that improve products, processes, and services. System innovations, like communications networks or satellite operations, can only be completed with several resources and after many labor-years (Edosomwan, 1989).

Innovations may also be classified based on their components. An innovation may consist of an idea component and an object component. Innovations must have the idea component; however, there may be innovations with an ideational component, but with no physical referent, like new ideologies, events and rumors (Rogers and Shoemaker, 1971).

The degree to which an individual is relatively earlier in adopting new ideas than the other members of his system is called innovativeness (Rogers and Shoemaker, 1971). Muller (2001) states that an innovative firm may perform two main functions. First of all, it may control external and internal information so as to support the accumulation, application and evolution of its knowledge. Secondly, as a result of the development of its knowledge base, it generates a specific form of information, i.e. innovations. Therefore, innovation is a continuous activity: it may lead to an increase in the firms' competitive advantage and market share. Organizations with effective innovation

management systems may develop, manufacture, and provide products and services so that they can increase their market share. As organizations utilized innovations, they may respond to market changes quickly, increase their revenue through increased market share, improve delivery performance, develop new organizational structures, and sustain long-term process improvements and developments (Elçi, 1999).

In Muller's (2001) study, capital scarcity, management qualifications, difficulties to obtain technical information and know-how required for innovation projects are listed as the limiting factors for SMEs in the process of innovation projects. She suggested that knowledge-intensive business services, such as consultancy, training, research and development, and computing services, act as complementary innovation assets for SMEs. Being an information source for SMEs, functioning as an interface between the environment and SMEs, detecting and analyzing of problems, participating to the problem-solving process, catalyzing evolution and innovation capacity of SMEs are important functions of knowledge-intensive business services. In other words, knowledge-intensive business services act as co-innovators.

2.2 INFORMATION SYSTEMS ADOPTION AND UTILIZATION DRIVERS

Factors affecting adoption and utilization of information systems applications can be divided into four main groups. These four groups are CEO characteristics, Technological-IS characteristics, Organizational Characteristics, and

Environmental Characteristics (Thong, 1999). With small differences, grouping of the factors among various authors are nearly the same.

Factors studied by different researchers are shown in Table 1. If the factor has a positive effect, then it is marked as "+"; if it has a negative effect, it is marked as "-". If the factor has no effect on information systems adoption, it is marked with "0".

2.2.1 CEO CHARACTERISTICS

2.2.1.1 CEO's IS Knowledge and IS Self-Efficacy

Having a technological vision and doing the right thing at the right time are the enablers of IS adoption. Studies (Thong, 1995; Taylor et al. 2001; Akkaren ,1999) have shown that if CEOs have more idea about IS and their benefits, they are more likely to adopt IS applications.

IS Self-Efficacy is defined as the capability to use IS applications and computer (Baek and Lee, 2002). Since small and medium sized enterprises (SME) usually lack an internal expertise, it is the CEO who guides them towards IS adoption.

Cragg and King (1993) find out that the owner with a low level of IS knowledge discourage others from exploring other applications. Moreover, lack of IS self-efficacy results in a long and painful implementation phase. Due to the lack of IS knowledge of owner, it was difficult to move forward from introduction phase

Factors studied under this title are:

- IS knowledge of CEO (Thong, 1999; Fink 1998),
- IS self efficacy of CEO (Runge and Lee, 2001; Baek and Lee, 2002; Harrison et al. 1997),
- Education level of CEO (Seyal et al. 2000; Cragg and Zinatelli, 1995; Levy and Powell, 1998; Harrison et al. 1997; Lassila and Brancheau, 1999).

2.2.1.2 CEO's Innovativeness

CEO's innovativeness is the enthusiasm of CEO to prefer risky solutions that have not been tried before and change the structure of the company. The greater the support from the CEO, the more likely the IS will be adopted.

Factors studied under this title are:

- CEO's Innovativeness (Runge and Lee, 2001; Thong, 1999; Harrison et al. 1997),
- Vision of owner (Levy and Powell, 2000; Cragg and Zinatelli, 1995; Chamber and Parker, 2000),
- Top management support (Fink, 1998; Carlson, 1999).

Table 1 Factors affecting information systems adoption in SMEs

		Researchers studied factors of IS adoption*																						
		Rungе&Lee, 2001	Baek&Lee, 2002	Thong, 1999	Seyal et al. 2000	Gupta&Capen, 1996	Harrison et al. 1997	Lassia&Brancheau, 1999	Stroeken & Knol, 1999	Cragg&Zinatelli, 1995	Levy&Powell, 1998	Kagan et al. 1990	Cragg&King, 1993	Cragg, 1996	Youngjean, 1999	Munasinghe& Jayawardena, 1998	Akkaren& Cayaye, 1999	Chamber & Parker, 2000	Carlson, 1999	Munro&Huff, 1985	Taylor et al. 2001	Bajaj, 1998	Dixon, (1999)	Agarwal&Prasad, 1998
group name	factor name																							
CEO Char	owner self-efficacy	0	+	+	+	+		+	+		+	+					+	+		+		+		+
	owner innovativeness	0	0	+	+				+	+	+	+		+			+	+	+	+			+	+	0
Env. Char	competitive pressure	0	0	0	+				+			+		+	+										
	external support				+				+	+	+			+		0	+	+		+		+	+		
IS Char	relative advantage	+	+	+				+						+	+			+		+			0	+	0
	compatibility		+	+	+			+												+				+	+
	complexity		0	-				-	-		-							-		-		-		-	0
	trialability							+	+																
	availability				+				+		+		+							+	+	+			
Org. char	flexibility								+			+													
	internal expertise							+	+		+			+				+	+		+	+	+		
	employee's self efficacy			+	+				+		+			+				+	+		+	+	+	+	+
	social pressure	+	+			0																			
	financial slack		+		+			+			+	+		+		0			+	+					
	business size			+		0	+						+												
	business type					+		+				+	+												
	business strategy integ.								+			+				+	+								
	information intensity			+	+							+					+								
	product innovation	+	0		+			+	+			+								+				+	

*0= factor has no effect on adoption
+= factor has a positive effect on adoption
-= factor has a negative effect on adoption

2.2.2 ENVIRONMENTAL CHARACTERISTICS

2.2.2.1 Competitive Pressure

It is suggested that competition in the market place of the business will make the firm more likely to adopt IS. In the case of SMEs, competitiveness is an important motivator or inhibitor of IS adoption and use.

Customer needs have the highest priority in most of SMEs. For SMEs, customers who purchase large quantities are preferred rather than large numbers of customers with small purchases. They monitor the customers and their individual requirements to keep their loyalty. In the competitive environment they operate, being able to respond to customer's requirements quickly make SMEs valuable.

In order to respond to market effectively, SMEs may utilize information systems (Levy et al. 1998). Small companies gain competitive advantages as they utilize IT: they increase their production speed, they can introduce new production technologies, they may respond to any customer need, easily. As a result of IS adoption, the structure of the industry may change, and this may modify competition rules, create competitive advantages, generate new businesses.

Factors studied under this title are:

- Competitive pressure (Runge and Lee, 2001; Lee and Baek, 2000),
- Competition (Thong, 1999),
- Competitive forces (Carlson, 1999).

2.2.2.2 External Support

Due to the lack of independent information systems department and internal information systems experts within the SME, external support is needed for implementing and using information systems. Consultants provide IT planning, implementation, problem solving and maintenance. IS effectiveness is positively related to consultant effectiveness. Therefore, the quality of the consultant is another important parameter. When compared to internal expertise, main disadvantages of external expertise are their higher costs and lack of control over them.

However, subcontracting with an external expertise has additional advantages. They lower the start-up costs, provide better service, lower the investment required from the manufacturer, improve the quality and integration of the information, and allow the manufacturer to specialize resources (Fink, 1998; Lassila and Brancheau, 1999; Stroeken and Knol, 1999; Cragg and Zinatellli, 1995; Cragg and King, 1993; Youngjean, 1999; Munro and Huff, 1985; Taylor et al. 2001; Chamber and Parker, 2000).

2.2.3 IS CHARACTERISTICS

2.2.3.1 Relative Advantage

Relative advantage is the degree to which using the IS is perceived as being better than its precursor (Runge and Lee, 2001). In other words, relative advantage is the expected benefits these technologies will bring to company. A

firm may want to improve its outdated accounting systems and save time, whereas the other may want to improve working life by redesigning the tasks. Another firm may want to improve planning and control phases to obtain economic benefits. It is suggested that, if it is believed that IS will increase effectiveness and efficiency, the firm is more likely to adopt IS (Baek and Lee, 2002; Thong, 1999; Harrison et al. 1997; Cragg and King, 1993; Cragg, 1996; Akkaren, 1999; Chamber and Parker, 2000; Dixon, 1999).

2.2.3.2 Compatibility

Compatibility of information systems is the degree to which it is perceived as being consistent with the existing vision, past experiences, and needs of the potential organization (Thong, 1999). Usually, packaged systems are suitable for SMEs since they are affordable and require low IS expertise. When a customized solution is required, external design and programming is needed. These extras are accompanied by system errors, delays, and need for maintenance. Those may slow up the implementation process and discourage the end-users (Baek and Lee, 2002; Thong, 1999; Fink, 1998; Harrison et al. 1997; Chamber and Parker, 2000; Dixon, 1999; Agarwal and Prasad, 1998).

2.2.3.3 Complexity

Complexity is the degree of difficulty associated with understanding and learning IS applications (Kwon and Zmud, 1987). It is suggested that the IS adoption and usage are inhibited by the difficulty of IS applications.

Factors studied under this title are:

- Complexity (Thong, 1999; Harrison, 1997; Cragg and Zinatelli, 1995; Chamer and Parker, 2000),
- Ease of use (Baek and Lee, 2002).

2.2.3.4 Trialability

Trialability is the degree to which one can try an IS application before making an adoption decision. It is suggested that IS adoption is effected by the degree of trialability (Harrison et al. 1997; Lassila and Brancheau, 1999).

2.2.4 ORGANIZATIONAL CHARACTERISTICS

2.2.4.1 Flexibility

Flexibility is the degree of how organizations respond quickly to customer requirements. Levy and Powell (1998) studied the interaction between the SME flexibility and IS. They argue that IS and SME get along together since they both have a flexible structure. Flexibility enhances the speed of adoption of IS in SMEs. They argue that the flexibility of small firms depends on the available human resources, organization structure, the characteristics of CEO, and the needs of customer. However, their research resulted that SMEs show a relative inflexibility. Since they have a narrow product range, the role of IS is to increase efficiency and effectiveness rather than increasing flexibility (Lassila and Brancheau, 1999; Levy and Powell, 2000).

2.2.4.2 Internal Expertise

This factor discusses the effect of the availability of internal expertise within the firm. In most of the small firms, internal expertise is limited. The main reason for this is that small firms usually cannot afford to hire internal IS specialist. If the employees of companies are knowledgeable about information systems, they may be more willing to adopt and utilize information systems.

Factors studied under this title are:

- Internal Expertise (Cragg and Zinatelli, 1995),
- Employee's IS Knowledge (Thong, 1999),
- Employee's Self Efficacy (Dixon, 1999),
- Corporate Culture (Cragg and Zinatelli, 1995; Carlson, 1999).

2.2.4.3 Social Pressure

Literature suggest that as employees' self efficacy increases, they are more likely to use IS applications (Runge and Lee, 2001; Lee and Baek, 2002). Within small companies, ones who use IS applications may be more prestigious than those who do not.

Factors studied under this title are:

- Social Pressure (Runge and Lee, 2001),
- Image (Harrison et al. 1997; Lee and Baek, 2002),
- Ownership of PC (Seyal et al. 2000).

2.2.4.4 Financial Slack

SMEs may resist investing in IT when they lack financial resources. When a company has excess financial resources, they may tend to change their vision and tend to adopt IS systems applications. Organizations may lower the cost by correct resource allocation like in the example of U.S. West (Bhattacherjee, 1998). They have utilized the existing network, unused machines, and office space to reduce the initial capital for the project.

Factors studied under this title are:

- Financial Slack (Harrison et al. 1997; Lee and Baek, 2002),
- Financial Resources (Cragg and Zinatelli, 1995; Levy and Powell, 2000),
- Lack of financial Resources (Chamber and Parker, 2000),
- Sale of Business (Seyal et al. 2000).

2.2.4.5 Business Size

Small businesses have limited resources and infrastructure to facilitate IS adoption. This condition is called resource poverty (Thong, 1999). Resource poverty results from conditions like being in a very competitive environment, financial constraints, lack of professional expertise, and susceptibility to external forces. As business size increases, barriers to information systems adoption may disappear. It is suggested that business size is positively related with the level of adoption (Kagan et al. 1990; Gupta and Capen, 1996; Thong, 1999).

2.2.4.6 Type of Business

Companies in different sectors have different information processing needs. Those in more information sensitive sectors are more likely to use IS applications (Kagan et al. 1990, Lassila and Brancheau, 1999; Levy and Powell, 2000; Seyal et al. 2000).

2.2.4.7 Information Intensity

The level of information intensity of the product or service is highly related with the degree to which the information is present in that product or service. Different sectors have different information needs, and those who have more need are more likely to adopt IS (Thong, 1999; Levy and Powell, 2000).

2.2.4.8 Product Innovation

Product innovation is the degree to which a firm's ability to devise new organizational forms enhance its ability to exploit new opportunities internally (Runge and Lee, 2001). It is suggested that if a firm has already utilized an application, then he will be more likely to adopt various forms of IS applications.
Factors studied under this title are:

- Product Innovation (Runge and Lee, 2001),
- Innovativeness (Lee and Baek, 2002),
- Observability (Harrison et al. 1997),
- Voluntariness of Use (Harrison et al. 1997),

- Corporate Culture (Carlson, 1999),
- Social Background of Firm (Levy and Powell, 2000),
- Firm's capacity to change (Levy and Powell, 2000),
- Feedback (Dixon, 1999).

2.3 PREVIOUS WORKS ON TURKEY

Elçi (1999) studied the innovation management in Turkish industrial companies. In her survey, companies were categorized into three, based on their innovation performance.

> First group had highly developed and effective innovation management system with measures for improvement and development. Second group had relatively effective innovation management system, but insufficient in focusing on all aspects of it. Third group had been trying to establish an effective system but not having the capability for setting it and therefore needed support for improvement (Elçi, 1999).

She designed an innovation management program to increase innovative capabilities of firms. In her study, it was also emphasized that technological innovations, if managed successfully, provided competitive advantage, sustainable economic growth, and social welfare. Moreover, she highlighted the need for 1) governmental promotion of technological innovation among the industry and 2) leveraging private investments in innovation to provide competitive advantage.

Necessity of employing high quality staff in other to keep up with competitive environment was discussed in Section 2.2.4.2: Internal Expertise, however, Elçi (1999) stated that most of the SMEs complain about not having enough resources for hiring such staff.

Varol (2002) studied the entrepreneurial networks in local industrial development. In her study she stated that companies were using Internet for getting information about foreign markets not for making business contacts, yet. They tried to find information about niche markets, ways of renewing existing products, or diversifying the products. However, they did not attempt in making innovations. Main reason for being less innovative was that the characteristics of same of the sectors, especially textile and construction, did not give possibilities to radical innovations (Varol, 2002).

Çakmaklı (1999) research was about small and medium businesses expectations and awareness of Internet and extranet, and the status of Internet use. Although he intended to cover all SMEs all around Turkey, he got responses from İstanbul, Kocaeli, and Izmir. He found out that majority of the firms participate in his survey –about 48%- had an independent information systems department or at least one person dealing with information systems applications. 70 % of the firms had e-mail addresses and one third of the respondents owned a web page. E-mail usage in the fields of communication, information and customer relationships was found to be the most important ones for the respondents. However, in his study, he mentioned that:

> Seventy five percent of the respondents believe that the Internet has not yet attained to a broad mass audience. Among the reasons of inadequate widespread of Internet, the most important ones are cited as 'inadequate use of Internet in commerce', 'lack of comprehending importance and benefits of the Internet', 'lack of Internet infrastructure in Turkey'.

He concluded that in order to increase the Internet usage by SMEs, government and SME supporting organizations should take necessary measures and provide support; the media should highlight importance of Internet technologies.

Öncel (2001) analyzed effects of Internet, intranet, and extranet on organization management and suggested solution for SMEs. He prepared a questionnaire and selected a sample from the members of Kobi-Net. He got responses from SMEs in Bursa, Eskişehir, and Kütahya. Among 24 firms he interviewed, although all of them adopted Internet, only 4 of them were using intranet, rest of them were neither utilized intranet or extranet. 41% of the respondents published a web page in order to make the advertisement of their firm and get competitive advantage. All of the respondents said that Internet had a significant effect on marketing. He emphasized that firms lacked of computer and Internet usage habits. He also stated that firms had not utilized hierarchical information systems usage based on organizational roles. He resulted that firms had not exploited information systems effectively.

Kula and Tatoğlu (2001) studied the Internet usage in SMEs and their expectations of and attitude towards Internet. They performed a survey of 237 SMEs with Internet connection. 90% of the respondents were from Marmara, Mediterranean, and Aegean region. 60% of the firms had web pages. They were using Internet mostly for e-mail, searching other web pages, and marketing research. Respondents stated that Internet was an effective way of communication, the most important way of doing business in the future, and a significant means for improving company's image.

Dereli and Baykasoğlu (2002) examined Internet and e-mail usage of the entrepreneurships in Gaziantep Organized Industrial Zone. While sampling, they selected firms that had declared their e-mail addresses and/or web pages in Gaziantep Organized Industrial Zone Handbook. They checked the validity of those addresses. Method they used while checking the validity of e-mail addresses was sending e-mail messages to firms and asking for response. At the end of their study, they found out that number of firms with valid web page addresses were sixty-two. Although, number of valid e-mail addresses was 115, only 34 of them replied their message. They concluded that entrepreneurships have not utilized Internet technologies effectively.

Durmaz (2002) proposed an Internet adoption model by SMEs. He studied the effects of three factors: perceived benefits; organizational readiness; and external pressure, on Internet adoption. He explored why SMEs decided to adopt the Internet and investigated how SMEs get benefits from the adoption and diffusion of the Internet within their organization. Perceived benefits and organizational readiness were found to be the most crucial issues affecting Internet adoption. Reaching market information, optimizing business process, and effective communication were stated as the main advantages of Internet adoption. He concluded that although rate of Internet adoption by SMEs have been increasing, SMEs were not totally aware of the opportunities of Internet.

2.4 GAZİANTEP

Previous studies on information systems penetration and utilization (Albayrak 1994; Parlaz 1997; Çakmaklı 1999; Kula 2001; Öncel 2001) focused, mainly, on companies in Ankara, İstanbul, and Izmir. These are the three most developed cities in Turkey. Information systems availability and awareness are relatively high in these cities. Information systems infrastructure is better than other parts of Turkey. Therefore, it was necessary to conduct a survey in a city other than the above three in order to visualize the picture of information systems usage in those cities.

Gaziantep has been a traditional market center throughout the different periods of history. In the Ottoman Empire period, having located in the main crossing of silk-trade road made Gaziantep a transit center that joined west Anatolia and Europe and the northern Anatolia and Middle East countries. After the World War 1, Gaziantep became the cultural and economic center of eastern Anatolia. The most important factor in the development of entrepreneurship in Gaziantep was its ethnic structure. There were Christians and Jewish living in the city and those ethnic minorities were controlling the trade and industrial production. With the emigration of these people after the World War 1, local people filled the positions in these sectors. In the 1930s, among the cities in the east and southeast, which benefited from 'law for the Encouragement of Industry', Gaziantep came the first. During this period, Gaziantep textile industry has shown an important improvement. In the 1950s, it had become a center of small-scale industries in the maintenance of vehicles and machines. In 1968, it was in the list of priority regions in development. Major transformation towards the liberalization policies

led to free market economy development, foreign trade liberalization, and price control elimination in 1980s. Several Anatolian towns have shown great improvements in textile and clothing industry in this period by responding to new opportunities in the foreign markets. Gaziantep was one of the most important of these towns in southeast Anatolia (Varol, 2002).

As a result of outstanding economic activities mainly based on manufacturing of industrial products and trade, economy of Gaziantep has been developing with a rapid acceleration especially during the period of 15 years between 1980 and 1996. 4 % of Turkey's total big sized industrial enterprises are in Gaziantep. In terms of employment, 66 % of overall employment is provided by large scaled enterprises and small sized enterprises provide 34 % of employment. 28.72 % of the active population of Gaziantep works in various branches of manufacturing industry. When the ratio of the secondary industry sectors in Gaziantep is compared with their equivalence in Turkey, it can be seen that 75 % of small industries throughout Turkey are composite of three broadly equal sub-groups, namely the textile, forestry products (furniture, etc.) and machinery and equipment industries. As for Gaziantep, these three sectors constitute 71 % of all small industries and the share of the textile and food industries reaches 55 %. With a 29.82 percent the textile industry remains the leading sector that provides the largest employment in Turkey and it provides more than half of overall employment (51.12 %) in Gaziantep. Following the textile industry, the three sectors creating the largest employment both in Turkey and Gaziantep are the food, machinery-equipment and chemical industries (GTOb, 2002).

2.5 SMALL AND MEDIUM SIZED ENTERPRISES

2.5.1 DEFINITION

Definition of Small and Medium Sized Enterprise (SME) varies in different countries. Each country has a definition based on its cultural, regional and industrial characteristics. United Nations Economic Commission for Europe (UNECE, 1998) and Confederation of Indian Industry (CII, 2000) lists the definition of SMEs in different countries. SME definitions in different countries and in different application areas are compared in Table 2. What is accepted in common is that an enterprise is defined as an SME if its number of employees does not exceed 250, and it is independent.

The EU defines SMEs as companies which have fewer than 250 employees, either have an annual turnover not exceeding EUR 40 million or an annual balance sheet total not exceeding EUR 27 million, and are independent, i.e. other companies hold no more than 25 % of the capital or voting rights, are defined as SME (SBS, 2002).

SME definition in Turkey also differs within institutes. State Statistical Institute defines SME as independent companies with 200 employees at most (KOBINET, 2002).

Table 2 Definition of SMEs in different countries

Country	Category of Industry	Official SME Definition
Canada	Manufacturing	Independent Firms having <200 employees
China	SME	Depends on product group: usually <100 employees
Indonesia	SME	<100 employees
Japan	Manufacturing	<300 employees
	Wholesale Trade	<50 employees
	Retail Trade and Services	<50 employees
Korea	Manufacturing	<300 employees
Mexico	SME	<250 employees
Portugal	SME	<500 employees
United States	SME	<500 employees
European Union	SME	<250 employees
Albania	SME	<250 employees
Romania	SME	<200 employees
Azerbaijan	SME in industry SME in transport SME in construction SME in retail trade	<250 employees <75 employees <150 employees <50 employees

2.5.2 CHARACTERISTICS OF SMEs

MacGregor (1999) suggests that the organizational environment that the small companies operate is strongly influenced by the owner, and has centralized power and control. Small businesses work with small management teams; employees are close and loyal to team. There exist informal and inadequate planning and control systems. They have limited ability to obtain finance, limited product, technology, and market share. Their product/service range is narrow. They lack specialist and qualified staff. They do not have control over business environment. They are reluctant to take risks, and they desire to be independent. Their decisions are intuitive instead of rational, their leadership is personal but

not task oriented, and their education experience and skill are practical but narrow.

Magnusson (2001) compared SMEs with large companies. She recognized that SMEs have shorter decision processes and more flexible organization structure. However, when compared to large companies, SMEs have less resources in time, money and knowledge/IS expertise; slower technical development; lower awareness of advantages with information systems; large dependency in the top manager; fewer contacts with external knowledge sources; a greater dependency in external actors who contribute with knowledge.

KOBINET (2002) lists the characteristics of SMES as follows:

- They produce more and offer a more diversified range of products with less investment,
- They create employment with lower investment costs,
- They are affected by economic fluctuations less, due to their structure,
- They are more flexible in adapting to changes in and diversification of demand,
- They are more prepared to adopt technological innovation,
- They contribute to inter-regional development,
- They mitigate effects of a skewed income distribution pattern,
- They encourage, channel and mobilize individual savings,
- They are an indispensable support and are complementary of large industrial enterprises,
- They are an element of balance and stability of political and social systems,

- They are one of the main guarantees of democratic society and liberal economy.

Considering the literature cited above, it is clear that SMEs are widely accepted as significant agents of national economies. Furthermore, the last reference explicitly states that SMEs are "more prepared to adopt technical innovation. This is why in this work, it has been decided that a study focusing on SMEs is worthwhile.

2.5.3 THE ROLE OF SMEs IN TURKEY

SMEs account for 99.5 % of all manufacturing industry. 61.1% of total employment in manufacturing industry belongs to SMEs. Value added share of SMEs is 27.3%. The distribution of enterprises, employment, and value added by size of firm in the Manufacturing Industry are shown in Table 3. Table 4 lists the economic indicators of SMEs in various countries (KOBINET, 2002).

Table 3 The distribution of enterprise, employment and value added by size of firm in the manufacturing industry, Turkey

	ENTERPRISES		EMPLOYMENT		VALUE ADDED	
Number of Workers	Number	%	Number	&	Trillion(TL)	%
1-9	186574	94.4	545809	35.6	20.7	7.7
10-49	7972	4.0	175660	11.5	17.2	6.4
Small Sized Industry	194546	98.4	721469	47.1	37.9	14.1
50-99	1405	0.7	97356	6.4	14.6	5.4
100-199	842	0.4	1116319	7.6	21.0	7.8
Medium Sized Industry	2247	1.1	213676	14.0	35.6	13.2
KOS (Small+Medium)	196793	99.5	935144	61.1	73.5	27.3
200+(Large Sized)	982	0.5	595601	38.9	194.9	72.7
TOTAL MANUFACTURING INDUSTRY	197775	100	1530745	100	268.4	100

Table 4 The economic indicators concerning small industrial enterprises in the various countries

	FRA	GER	IND	ITALY	JAPON	S.KOREA	TR	U.K	U.S.A
The rate of small enterprises to the total number of enterprises	99.9	99.8	98.6	97.0	99.4	97.8	98.8	96.0	97.2
The employment rate of small enterprises (%)	49.4	64.0	63.2	56.0	81.4	61.9	45.6	36.0	50.4
The investment rate of the small enterprises (%)	45.0	44.0	27.8	36.9	40.0	35.7	6.5	29.5	38.0
The production rate of small enterprises (%)	54.0	49.0	50.0	53.0	52.0	34.5	37.7	25.1	36.2
The export rate of the small enterprises (%)	23.0	31.1	40.0	-	38.0	20.2	8	22.2	32.0
The credit rate given to the small enterprises (%)	48.0	35	15.3	-	50.0	46.8	3-4	27.2	42.7

2.5.4 ROLE OF INFORMATION SYSTEMS IN SMALL AND MEDIUM-SIZED ENTERPRISES

Different researches in different countries have shown that in general there exists a positive attitude towards IS applications (MacGregor and Bunker 1999). Characteristics of small businesses, when compared to larger size organizations, seem to be more suitable for information systems contributions. First of all, they have a closer relationship with the customer. Due to their flexible structure, they are able to respond quickly and effectively to changing demands (Levy and Powell, 1998).

Although larger companies seem more willing to use information technologies, information systems adoption level of SMEs increases day by day. SMEs realized the importance of information systems in running their operations. Moreover, big

companies want to speed up and streamline operations, so they push SMEs to adopt information technologies, like e-commerce (Igbaria et al. 1998).

Main reasons for the slow adoption rate in SMEs are:

- the lack of management enthusiasm and entrepreneurship, external pressure and support;
- the perceived lack of suitability for their business, its complexity and cost;
- the need for immediate returns, resistance to change, survival in the short term; and
- the perceived security risks of information technologies (Chambers and Parker, 2000).

Adoption of information systems improves the performance of SMEs and helps them to survive in competitive environments. At the beginning, the reasons for IS utilization were lower costs of production, coordination, and transactions. Nowadays, it is more critical for companies to add value to the product, process, or service. Many of these gains now come from value adding rather than simple cost reduction. As information systems costs fall and their use becomes more commonplace, small and medium-sized enterprises (SMEs) have begun to take the advantage of information systems (Levy et al. 1998).

The role of information systems within an organization may act as an initiator, facilitator, and enabler (Chan, 2000). As an initiator, information systems act as an agent of change. By the use of information systems, new operations may be initiated. New requirements are imposed and need to be solved by the usage of

information systems. As a facilitator, information systems enable users to complete tasks easier. Information systems help users to carry out works that could not be done before. As an enabler, information systems provide various procedures to maximize gains and to meet the objectives (Chan, 2000).

2.6 QUALITATIVE RESEARCH & STRUCTURED INTERVIEW

Methods of analysis and explanations that qualitative research is based on, involve understanding of complexity, detail, and context. Producing rounded understandings on the basis of rich, contextual, and detailed data is the aim of qualitative research (Mason, 1996). Qualitative research focuses on words rather than numbers as the unit for analysis. That is qualitative research transforms information from observation, reports, and recordings into data in the form of written word. Detailed description of events or people is necessary in qualitative analysis. Because the evaluators study the selected issues in depth and detail, this type of research is usually deal with small sample sizes (Patton, 1990; Denscombe, 2000).

There are three ways of data collection in qualitative analysis: (1) interviews; (2) direct observation; and (3) written documents. In interviews, direct quotations from people about their experiences, opinions, feelings, and knowledge are used as a data source. Detailed descriptions of people's activities, behaviors, and actions are gathered from direct observation. Organizational or program records; official publications and reports are the examples of written documents used in qualitative analysis (Patton, 1990).

Interview types can be grouped into three: unstructured, semi-structured, and structured. Unstructured interviews are informal interviews. There are a number of themes, which are aimed to explore, and researchers ask questions about these topics. Pre-ordered questions are asked in the semi-structure interview. These questions are usually open-ended and the responses should be taped for later transcription. The structured interview is defined as a purposeful conversation in which interviewer asks prepared questions and respondent answers them. In structured interviews, it is assumed that there is a common vocabulary for all potential respondents; question formats are equally meaning to all; the context of each question is obvious (Web Ref 1, 2003). In other words structured interview can be considered as an oral presentation of a written questionnaire. Questions are set in advance. Each interview is conducted in exactly the same way. The questions and their order are the same for all respondents. The researcher determines the range of possible responses.

There are many advantages of structured interview. First of all, it is quick and easy to answer the questions. Secondly, answers are easy to code and analyze. Thirdly, it has a clear direction of inquiry. Fourthly, its degree of reliability is high. Fifthly, it produces comparable data. Finally, interviewer biases are reduced by structured interview.

Structured interview also have some limitations. First of all, it is not flexible. Secondly, since there are limited number of responses, participants may give

responses which do not reflect their true feelings exactly. Finally, when compared to open-ended interview, data gathered may be limited (Web Ref 1, 2003).

2.6.1 UNIT ANALYSIS

Type of data collection and focus for the analysis of data depends on unit of analysis. In qualitative studies, unit of analysis may be individual people, groups of people, particular kind of events, occurrences, or incidents. In selecting and making decisions about the appropriate unit of analysis, the key issue is to decide what it is wanted to say about at the end of the study (Patton, 1990).

2.6.2 SAMPLING

Sampling methods used in researches can be divided into two: random probability sampling and purposeful sampling. In random probability sampling, sample size is a function of population size and confidence level. Simple random sampling enables generalization from the sample to a larger population; stratified random and clustering sampling increases confidence in making generalizations to particular subgroups. In purposeful sampling, it is aimed to select information rich cases for in-depth study. These cases are selected such that analyzing them will clarify the issues under study.

There are different strategies enrolled in purposeful sampling. Evaluation purpose is the main criteria in selecting the strategy. One of them is extreme case sampling. In this strategy, unusual conditions or extreme outcomes are studied

in order in to improve more typical programs. In intensity sampling strategy, information-rich cases manifesting the phenomenon of interest intensely are selected. Maximum variation sampling identifies important familiar patterns that intersect variations. In order to describe some particular subgroup in detail, homogeneous sampling is applied. Typical case sampling illustrates what is normal. Stratified purposeful sampling exemplifies characteristics of particular subgroups of interest and facilitates comparisons. Critical case sampling is another strategy used in purposeful sampling. Main argument behind critical case sampling is that if it is true of this one case it is likely to be true of all other cases. Therefore, it permits logical generalization and maximum application of information to other cases. Chain sampling identifies cases of interest by asking a number of people who else to talk with. Criterion sampling picks all the cases that meet the predetermined criterions of importance. Theory based sampling is based on the potential manifestation of representation of important theoretical constructs.

CHAPTER 3

METHOD

3.1 SURVEY PREPARATION AND SURVEY CONTENTS

Papers about adoption and utilization of information systems in small and medium sized business were searched on online databases and journals. Among 130 pre-selected papers, 25 of them were selected to be examined deeply. As summarized in the preceding chapter, factors studied in each paper were compared with each other. Factors with different names but same definition were renamed and regrouped. Based on the literature review, administrative, environmental, technological and organizational factors are accepted to influence the adoption and utilization of information systems. With small differences, grouping of the factors among various authors were nearly the same. Results of this phase of the study have been presented in Chapter 2.

Previous studies about IS utilization in Turkey (Parlaz, 1997; Çakmaklı, 1999; Öncel, 2001) mainly focused on e-commerce. Organizational, technological, administrative, and environmental analysis of information systems usage was missing. Those studies were performed in the western part of Turkey, especially

Ankara and İstanbul. In order to investigate information systems penetration in southeastern part of Turkey, Gaziantep has been selected as the research area.

Structured interview was selected as the research method because many questions can be asked in a short time, data analysis is simple, and responses can be directly compared and easily aggregated (Patton, 1990). Next step, after the selection of method, was to determine the items to be studied in the interview. It was aimed to cover all the factors studied before. However, this was difficult to evaluate. Hence, within the four main groups of characteristics, fifteen factors were selected. The whole set of factors investigated by the interview are listed in Table 5. The first column of Table 5 shows the characteristic groups of the factor. Second column of the table lists the previously studied factors. Third column of the table is the name of the factor that is used in this study for the factors listed in the second column.

While preparing the questions, both national and international surveys and questionnaires on IS adoption and utilization were examined in detail. Related questions were adapted from those surveys (Moore and Benbasat, 1991; Albayrak, 1994; Thong and Yap, 1995; Parlaz, 1997; Kendal et al. 1999; Levy et al. 1999; ACOA, 2000; IT Barometer Survey, 2001; Nissen 2001; Benamati and Lederer, 2001; Öncel, 2001; Kula and Tatoğlu, 2001). It was tried to make questions simple, clear, and short.

Table 5 Factors analyzed in the interview

Group Name	Previously Studied Factors	Factor Name Used in this thesis
CEO Characteristics	IS knowledge of CEO, IS self efficacy of CEO, Education level of CEO	CEO's IS Knowledge and IS Self-Efficacy
	CEO's innovativeness, Vision of owner, Top management support	CEO's Innovativeness
Environmental Characteristics	Competitive pressure, Competition, Competitive force	Competitive Pressure
	External support	External Support
IS Characteristics	Relative advantage	Relative Advantage
	Compatibility	Compatibility
	Complexity, Ease of use	Complexity
	Trialability	Trialability
	IS availability	IS Availability
Organizational Characteristics	Information intensity	Information Intensity
	Internal expertise	Internal Expertise
	Employee's IS knowledge, Employee's self efficacy, Corporate culture	Employee's Self Efficacy
	Social pressure, Image, Ownership of PC	Social Pressure
	Financial slack, Financial resources, Lack of financial resources	Financial Slack
	Product innovation Innovativeness Observability Voluntariness of use Corporate culture Social background of firm Firm's capacity to change Feedback	Product Innovation

The interview was composed of three main parts. In the first part of it, there were seven demographic questions. These were asked to learn the profile of the

company. These questions were about job title of respondent, nature, type, size, annual sales, and years of establishment of business.

Second part of the interview was about the usage of IS within the company. Eight questions were prepared to find out the existence of an individual IS department, availability of e-mail address and web page, usage of communication channels through Internet, and number of information systems in use. These questions were asked to identify the usage of Internet, intranet, extranet, and VPN; to determine if the respondents were familiar with telnet, e-mail, news groups, chat, and video conferencing; and to find out if the organization has IS applications in fields of advertisement, public relationships, customer relationships, export and import, accounting, inventory tracking, and human resources.

Information systems adoption motivators and inhibitors were studied in the third part of the interview. Nine questions were asked in this section. Question #16 was composed of four sub-questions. With these sub-questions, it was aimed to figure out the academic qualification of CEO: whether CEO has taken any courses, involved in any in-house or outside training, or studied individually. Question #17 had six sub-questions. These questions were about information systems experience of CEO. It was aimed to evaluate CEO experience in using computer packages and computer languages; building models in computer; participating in non-technical and technical design of information systems. Question #18 and question #19 were about the advantages and disadvantages of information systems, respectively. Each item in these questions was related to

one of the factors studied. By this way, it was possible to determine not only the perceived benefits and drawbacks of information systems but also thoughts of CEO about factors affecting information systems adoption. Questions #20 -#25 were in the form of short and simple sentences asking CEO's and employees' opinion. Attitude toward information systems (question #20), information systems compatibility (question #21), competitive pressure of the market (question #22), information systems trialability (question #23), the existence of internal expertise (question #24) and product innovativeness (question #25) were investigated in these questions.

3-point scale was used throughout the interview. The end-points were "very important" to "not at all important" for questions number 15, 18, 19; "strongly agree" to "strongly disagree" for questions number 20-25. For questions number 15,18-25, another option "no opinion" was presented to the respondents. A copy of interview is available in Appendix A.

3.2 SELECTION OF FIRMS

3.2.1 CONTENT VALIDITY

It was necessary to discuss the details of the interview with a consultant in order to check the content validity. Two meetings were arranged with the European Union Business Center consultants. This center serves for SMEs in Gaziantep. It is the aim of European Union Business Center to provide information and consultancy services for SMEs. Therefore, it was thought they might improve content of the interview since they have more experience with SMEs.

Based on their recommendations, questions were asked by giving examples and questions were divided into two, those for CEOs and those for employees. Also, the respondents were optionally required to indicate the size category of their companies.

3.2.2 PILOT STUDY

A pilot study was performed in order to check the interview questions. At the beginning of the study, it was planned to use a 5-point Likert Scale. After pilot study, it was observed that, respondents selected the choices of point 5,4, and 1. It was decided to use a 3-point scale. By this way, evaluation of the answers would be more reliable (Gorland, 1999;Jessup, 1999). Lund (1999) said, "…v*alidity falls as the number of points on a scale approaches ten."* Question #17 had, initially, six sub-questions. After pilot study, it was rearranged. It was aimed to get information about information systems experience of the staff. However, sub-questions about participating in non-technical and technical design of information systems were not understood clearly. So, it was decided to exclude these questions from the interview.

Another point observed during pilot study was the length of interview. In order to shorten the time for completing the interview, some of the questions in demographic part were omitted. Initially, there were seven questions. After pilot study this number was reduced to four. Initial and final forms of the interview are presented in Appendix A.

As discussed in Section 2.6.1, unit of analysis should be determined based on purpose of the study. In the study, organization was the unit of analysis. In order to analyze organizations objectively, it was decided to get at least three responses per company: CEO, information systems staff, and an end user. While performing the data analysis, score of the organization for each question were calculated by taking the average of the responses of the organization. Within the strategies discussed in Section 2.6.2, chain sampling approach was used. The process began by asking the question "who should I talk with?" to two consultants, one was working in Gaziantep Free Zone and the other was the owner of a human resources consultancy company. The chain of recommended informants got bigger as new information rich cases are accumulated. As a result, the study is completed with twenty cases. Summary of case descriptions are available in Appendix B.

CHAPTER 4

RESEARCH RESULTS

4.1 SAMPLE DESCRIPTION

It was interviewed with 20 firms. 7 of them were textile companies. 13 of them were operating in different areas from automotive sector to tourism sector. The distribution of the firms according to the sector is shown in Table 6.

Table 6 Sample profile by the sector

Sector	**Frequency**	**Percentage**
Textile	7	35
Tourism	2	10
Health Services	2	10
Other	9	45
Total	**20**	**100**

7 of them had an independent information systems department; 7 of them had one of the staff as responsible for the information systems applications although they were not an information systems expertise. 6 of them did not have either an information systems department or an information systems expertise. Those 13 firms, who did not have an independent information systems department, work with application service providers.

19 of the firms had e-mail addresses. 18 of them had web pages. The only firm that was not an Internet adopter was planning to use Internet in one-year time. 14 of them were connecting to Internet using dial-up connection, 5 of them were using cable modem. There were two reasons for this low level of cable modem usage. First of all, cable modem service was not available in the locations where 8 of the 14 firms operate. Secondly, one of the firms that preferred dial-up connection used Internet rarely and they said that it was unnecessary for them to switch to cable modem.

6 of them had established Intranet, 3 of them were using extranet. None of the firms has utilized virtual private network, however one of them were planning to build their virtual private network in six-month time. 10 of them subscribed at least one newsgroup. 8 of them were using chat programs for in-firm communication. Video conferencing was not popular within the firms.

19 of them were using information systems applications in information and communication field, 17 utilized it for inventory control and/or accounting. Half of the companies implemented information systems applications for their human resources department. Sample profile by information systems characteristics are shown in Table 7.

Table 7 Information systems characteristics of the sample

	Frequency	Percentage
Information Systems Department		
IS department	7	35
IS specialist	0	0
Someone related	7	35
Neither have IS department or IS staff	6	30
E-mail address	**19**	**95**
Web Page	**18**	**90**
Internet Connection		
Dial-up	14	70
Cable modem	5	25
No connection	1	5
Internet Technologies		
Intranet	6	30
Extranet	3	15
VPN	0	0
E-mail	19	95
Newsgroups	10	50
Chat	8	40
Video conferencing	3	15
Information Systems Applications in Use		
Advertising and Public Relations	14	70
Information Retrieval and Communication	19	95
Customer Relation	13	65
After Sales Support and Services	12	60
Buying Goods and Services	14	70
Export and Import	12	60
Accounting	17	85
Inventory Control	17	85
Human Resources	10	50

Although it was aimed to obtain at least three responses per company: CEO, information systems staff, and an end user, it was not possible to contact the planned staff due to restrictions imposed by some of the company owners, or unavailability of the personnel. It was interviewed with the employees in 11 firms, so questions 16 and 17, which were about the computer literacy and

information systems experience, were asked to respondents.10 of them had employees that were interested in studying in information systems, 9 of them had employees that had taken courses in school. In-house training was enrolled in 8 of them and 7 of them had had outside training provided by vendor or consultant. Among these firms, all of the employees interviewed had scored their computer experience on using computer packages such as spreadsheet, word processing, or data management, as very good or average. 5 of 11 firms had employed workers with experience of using computer languages such as SQL, ORACLE, ACCESS, and 3 of 11 had employees with experience on programming in computer languages such as COBOL, FORTRAN, C, and JAVA. Responses for question number 16 and 17 were summarized in Table 8.

Table 8 Information systems experience of the employees

	Frequency*	**Percentage**
Computer Literacy		
General courses at school	9	81
Outside training	7	64
In-house training	8	73
Self-study	10	91
Computer Experience		
Using computer packages	11	100
Using computer languages	5	45
Programming in computer languages	3	27

* Total number of cases is equal to 11.

All the respondents agreed with the statements 18.2, 18.3, 18.4, 18.6, 18.12, 18.13, and 25.2. More than half of the firms were disagree with the statements 19.5, 19.6, and 20.4. Statements 18.2, 18.3, 18.4, 18.12, and 18.13 were about relative of information systems; we can conclude that all the respondents were aware of the perceived benefits of information systems. Responses of the firms to statements 18.1-25.2 are shown in Appendix C.

4.2 INFORMATION SYSTEMS ADOPTION LEVEL

CASE A was a construction firm and they had utilized information systems in the areas of information and communication, import and export, accounting, daily cash registry, inventory control and human resources. CEO of the firm stated that they were planning to work with China and it would be feasible if they started e-commerce.

CASE E was always in contact with its agencies in abroad through Internet. They have been using a common database for questions and problems. They discussed the problems and possible solutions in this site. They also had the chance to detect and fix the failure on-line by the help of a device installed on cars. Since they could immediately find solutions, they saved time and improved customer satisfaction. Another advantage of information systems stated by the manager of the firm was that problem and task tracking was easier than manual methods.

CASE G had extranet connections with its two vendors. They used a common database and this enabled reliable and fast reservations. It was also possible to make on-line reservations from CASE G' web site. These two features increased customer satisfaction. However, they complained about being so dependent on computers, they could not do anything if their system was down. One of the employees depicted this dependency with these words "we cannot even calculate 2*2 without computer."

During the interviews, the importance of service quality of the vendor was mentioned. CASE M was the first firm that used information systems in accounting department in Gaziantep. Since then, they worked with the same vendor in the accounting department because they were satisfied with its services like in- house and outside training, free of charge updates and upgrades. Most of the firms in Gaziantep worked with application service providers, even though they had separate information systems departments. When they faced a problem that they cannot solve it, they worked with their vendor. Most of the respondents complained about charges for maintenance and repair. CASE B and CASE C said that they preferred to contract with vendor on an annual basis, and they did not want to make any additional payments when they faced such problems.

Most of the textile firms had utilized information systems in their production units. CASE M had divided its information systems tasks into two: production and accounting. In the production department, they had an employee responsible for production automation. When they automated their production line, they had problems due to their product types. They adapted the automation system by the help of vendor firm of production automation system. They work with an external expertise in the accounting department. It was stated that one of the drawbacks of information systems usage was that end-users usually memorize steps in the processes in some specific tools. As a result of this, when faced with a problem, that requires creativity, they cannot solve it without the help of an expert.

CASE K was the only firm that planned to build VPN. It was aimed to control not only the factory stocks but also the dealer stocks on-line. They had a dynamic IT infrastructure. In the current system, they had two servers and they were planning to increase the number of server to five. They have planned their IT investments in two-year periods. They were operating in Windows environment, although they complain about its security bugs they did not want to shift to UNIX environment. Main reason for this was that number of persons with experience of UNIX environment was limited in Gaziantep. Moreover, rate of UNIX usage was low. These two reasons would result in dependency of an expertise, and their systems would not work without that expertise, so they preferred Windows platform. Another important department in their company was the design unit. Their designers worked in computers that were connected to production line, so that they could send a design to workbenches and start weaving.

CASE I had 85 computers and all correspondence were filed in computers. Their user authentication was based on organizational hierarchy, which is all of the employees did not have equal rights while using the system. By year 2004, all of the employees would use computer. They had an independent information systems department; however they worked with consultancy firms only when they were not sure about the solution. They were active members of an e-trade portal.

CASE I and CASE K were the textile companies that were interested in working from home for their employees in design departments. Employers said that their designers would work better if they felt better and more comfortable.

CASE O had offices in five different locations in Gaziantep and in order to decrease their communication costs within locations, they were planning to utilize VoIP. However, current laws did not allow the usage of VoIP, so they were waiting for de-regulations. They also mentioned that most of the firms in Gaziantep wanted to employ VoIP but complained about the regulations. CASE O, like CASE M had divided its information systems activities into two: those related with production and those related with network. In the production department, they had maintenance contracts with vendors, whereas in the network unit, they worked individually. In case of a problem, they tried to fix it; if they could not manage to repair it, they changed the defected part.

Although CASE O had Internet connection and all the computers were able to connect to Internet, employees were not allowed to use Internet during work hours. They had a limited time and limited access right to Internet. Though employees complained about these restrictions, managers said that it was necessary to do so because employees' efficiency was decreased when everybody had Internet access; they were using Internet for their personal needs not for company' tasks.

CASE R was the only firm that did not have an Internet connection. However, the owner of the firm was planning to buy a new computer and use that computer for Internet connection. He also emphasized that they were at the beginning of the road to information systems adoption and level of information systems awareness was increasing day by day. He also stated that their generation had

difficulty in adaptation to new technologies. Next generation, that is the 3rd generation CEOs, were more energetic about information technologies. Although his company did not have Internet connection, he was aware of the benefits of information systems and he had utilized information systems applications in accounting, inventory control, and customer relationships. Moreover, he was aware of the competitive advantage he would gain as they used information systems. During interview he said, "We have to improve our services so that we can keep our customers. Information systems enable us to improve our services."

CASE S was computerized in all departments and they employed white-collar workers. They were the first company who got ISO 9001 certificate in Gaziantep. One of the CEOs declared that they were open to new technologies and new products. Their branch office in İstanbul dealt with sales and it was said that e-commerce was employed in that office rather than Gaziantep.

4.3 INFORMATION SYSTEMS ADOPTION CHARACTERISTICS

When statements about competitiveness of environment -statements 22.1, 22.2, 22.3- were analyzed, it was observed that the rivalry among textile companies in Gaziantep was very intense and all textile companies believed that their customers could easily switch to another company for similar services/products without much difficulty. In addition to textile industry, construction companies also had an intense competition. On the contrary, there were two cases, CASE S and CASE T, who believed that their customers could not be satisfied with the

services of the others' and would not switch to another company, although there were many products/services in the market which were different from theirs but perform the same function. CASE S stated that even their customers switched to another company; sooner or later those customers would turn back because any other company could not compete with service quality.

There were two other extreme cases, CASE D and CASE H, those were strongly disagree with the statements 22.1, 22.2, 22.3. CASE H declared that they were the only human resources consultancy firm in Gaziantep, and therefore competitive pressure did not exists in the market they operated.

Even though CASE D, H, S, and T strongly disagreed with the statements 22.1, 22.2, and 22.3, they kept on targeting new markets or segments. When their level of information systems adoption were compared, CASE D, S, T were found to have level of information systems above the average. CASE H was using information systems in five different areas and the average of the firms was 7. Reason for this low rate of adoption can be explained as follows: As described above, CASE H was a human resources consultancy firm and three of the application areas: import and export, accounting, inventory tracking, given in statement 15 were not applicable in CASE H.

CASE H and CASE R ticked 1-strongly disagree- for statement 18.1 -better financial control. It may be because CASE H did not utilized information systems for accounting, but work with a consultant for accounting services. Although CASE R had utilized accounting programs and was aware of benefits of internet

banking, they did not trust Internet or information technologies and thought that owner control was obligatory in financial parts of the business. Another point to be discussed about statement 18.1 was that most of the respondents did not understand statement 18.1 until examples of information systems applications like internet banking, accounting programs were given. CASE R was the only firm that strongly disagreed with statement 18.5 -sharing information-. That answer could be expected when we considered that CASE R was a non-adopter of Internet.

Statement 18.7 was about reduction of staff as a result of employing information systems. Cases who ticked 1 for this statement said that although information systems enabled them to do the same work with less number of workers, it increased the need for information systems experts and they concluded that number of workers did not really decreased so much. Moreover, it was observed that employees perceived this statement as a disadvantage of information systems though it was in the group of advantages.

Statement 18.9 'working from home' was a very important advantage of information systems for the designers in textile sector and for the CEOs who had small babies. In some cases, working from home was confused with taking work home.

Responses to statements 18.4, 18.12, 18.13, and 19.5 asking if information systems provided better quality of work and work done more quickly, were all

high and consistent with each other. This meant that all cases were aware of the fact that information systems increase efficiency and effectiveness.

Statement 19.7 was about reduced security as a result of Internet. The owner of the firm, CASE R, said that he did not trust Internet at all, and he would never connect the computer that they hold company files to Internet. CASE I and CASE M also complained about the viruses and hackers. One of the CEOs in CASE I said that "Others cannot reach to a folder in my filling cabinet in my office, but they can get a folder form my computer." CASE K did not complained about viruses as CASE I, M, and R and they pointed out the importance of anti-virus and firewall programs and they emphasized that those programs should be updated in order to prevent damages.

Statement 19.9 was about the difficulty in measuring the benefits of information systems. Three cases, CASE G, K, and Q, declared that they had no difficulty in measuring the benefits. Common characteristics of these cases were that they had high level of information systems adoption and they were active users of information systems. It was observed during the interviews that even though firms thought that information systems had a lot of relative advantage, they wanted to see the reflection of information systems usage in their annual profits. In addition to this, most of them claimed their level of information systems usage would increase if there happened to be a trend in information systems usage, or an obligation by the government.

When their opinion about advantages and disadvantages of information systems were asked, CASE T mentioned the perceived benefits of information systems utilization in accounting and personnel department. They said that life was very difficult before information systems adoption. CASE P said that their telephone traffic within the departments reduced after they installed their patient recording system.

CASE B complained about how fast improvements occurred in information systems and they had difficulty in following the changes. According to CASE N, it was expensive to build a network of their own and utilize information systems. CASE G complained about being so dependent on computer such that they used computer even for simple mathematical calculations. CASE N talked about the physical problems encountered due to computer usage of long hours.

CASE E, CASE K, and CASE P talked about the systems failures. CASE E said that if you were addicted to the system so much, then you could do nothing in case of a system failure. On the contrary, CASE K did not afraid of system failure since they had resources to solve the problems. CASE P mentioned the quality of the end users such that an end-user with no computer skills may cause to collapse of system.

CASE J and CASE N were not pleased with the increase in e-mail traffic. CASE J said that people did not talk to each other anymore. What was conflicting in CASE N words was that although they complained about e-mail traffic, they

decided to give the orders by e-mail in order to avoid misunderstandings or incomplete tasks.

Only three cases, CASE K, CASE M, and CASE Q ticked the score 1 for statement 20.2 ' I have seen what other companies have achieved with computers', since they were the early adopters of information systems, and they said that "we do not follow others, but others follows us.".

Statements 25.1 and 25.2 were about product innovativeness. Responses to these questions were consistent within the firms except five cases: CASES D, F, J, O and Q. During interviews with these five cases, it was observed that although they were willing to enter new markets, they did not want to produce new products. Main reason for not producing new products may be due to the financial problems. Another reason may be the sector they operate did not allow them to produce new services.

4.4 COMPARISON WITH OTHER CITIES

Varol (2002) stated that companies in Gaziantep followed the recent developments in their sector, work on renewal of the existing products and the diversification of the products, but they did not likely to make innovations. It was also mentioned that the characteristics of textile sector did not allow making radical innovations. During interview with the director of CASE A, he also mentioned that there rarely came out an innovation in construction sector. Varol (2002) also stated that entrepreneurships used Internet just for getting

information about foreign markets. However, this was not the case in Gaziantep anymore; they started using Internet for making business contacts.

Elçi (1999) stated that companies that were successful in innovation management were tried to establish a close relationship between universities and/or research centers. Varol (2000) also discussed that the problem in Turkey was the absence of cooperation between industry and university. In the interviews, most of the respondents complained about lack of cooperation, however, it was interesting that university members and the entrepreneurs blame each other for being uninterested about the topic.

Results of our study on the rate of Internet communication technologies usage supported Kula and Tatoğlu (2001) results. They found out that e-mail was the most frequently used communication tool in SMEs and video conferencing was the communication tool they used seldom. When entrepreneurships attitude towards Internet were compared, they showed similarities. Cases in Gaziantep, like cases in Kula and Tatoğlu (2001), regarded Internet as an alternative way of communication and doing business in the future and moreover they thought that Internet improved their company's image. They suggested that level of Internet usage would increase as access costs for the Internet decrease. According to OECD 2001a, when costs for 40 hours of Internet use at peak times were compared, Turkey had the second lowest Internet access cost for the Internet in OECD countries. During interviews, none of the respondents complained about the Internet access costs, they wished to have cable modem connection and faster Internet.

Respondents in Gaziantep talked about Internet problems similar to Çakmaklı (1999) findings like the lack of Internet infrastructure in Turkey, lack of awareness of importance and benefits of the Internet, insufficient use of e-commerce, lack of government support.

Öncel (2001) studied the effect of Internet technologies on organizations in Bursa, Eskişehir, and Kütahya. None of his respondents move into e-commerce, but they had electronic catalogues and they received orders via e-mail, telephone, or fax. On the contrary, entrepreneurships in Gaziantep were aware of the benefits of e-commerce and some of them were active member of e-trade portals, whereas others were planning to employ electronic business models. When intranet and extranet usage in Bursa, Eskişehir, and Kütahya compared with Gaziantep, utilization rates were higher in Gaziantep. 16 % of the firms interviewed had established Intranet and none of the respondents used extranet in Öncel (2001) study. Rate of Intranet and extranet usage within the companies interviewed in Gaziantep were 30 % and 15 %, respectively. In Öncel (2001) study, firms were mainly using information systems in advertising and he stated that they were not aware of the benefits of information systems and did not utilized information systems effectively. On the contrary, firms in Gaziantep employed information systems in information and communication, accounting, and inventory control departments.

Durmaz (2002) evaluated the Internet adoption in SMEs. In his study, perceived benefits were found to be the most significant factor affecting Internet adoption.

He grouped perceived benefits into three: relative advantage, communication, and business tool. Information retrieval and communication with other parties were given as the examples of relative advantage. In our study, in addition to above examples, increase in efficiency and effectiveness were given as the examples of relative advantage. Communication role of Internet was defined in a similar way. Like results of our study, results of Durmaz (2002) study indicated that SMEs were using the Internet as a communication medium in addition to telephone and fax. Most important factor inhibiting the Internet adoption was stated as having non-adopter business partners (Durmaz, 2002), while main reason for not adopting Internet was stated as lack of Internet security by the owner of CASE R.

Organizational readiness that was enthusiasm and level of Internet knowledge of the employees and the owner was another important factor affecting Internet adoption decision (Durmaz, 2002). As mentioned in Section 4.2, when compared with 2nd generation CEOs, 3rd generation CEOs were more likely to adopt information systems. During case studies in Gaziantep, it was observed that enthusiasm of the staff increased the level of adoption. Last factor studied in Durmaz (2002) was external pressure. However, like in our study, Durmaz (2002) concluded that external pressure was not a driving force for the SMEs for adoption.

Dereli and Baykasoğlu (2002) analyzed the validity of e-mail and web addresses of the companies in Gaziantep Organized Industrial Zone Handbook and they figured out a very pessimistic picture for Gaziantep. However, their methodology

might have some limitations, such that: they had taken the addresses from Handbook. There might be spelling mistakes in the addresses; some addresses might be updated after handbook published. In addition to these, reason for low rate of response was very common in that type of responses. They concluded that effective utilization of information systems in Gaziantep was missing. On the contrary, results of our study showed that companies were aware of the relative advantage of information systems and rate of information systems adoption was likely to increase as end users satisfaction increased.

CHAPTER 5

CONCLUSIONS

Using the theory of diffusion of innovation, this thesis has examined the factors affecting the decision to adopt information systems and level of information systems utilization. Those factors can be grouped into four: CEO characteristics, environmental characteristics, information systems characteristics, and organizational characteristics. Within these four main groups, fifteen factors were studied in detail by structured interviews. Questions asked in the interviews were adopted from previous studies (Thong 1995; Çakmaklı 1999; Moore and Benbasat 1991). Content validity of the questionnaire was checked with three consultants that had experience in working with SMEs and arranging interviews. Chain sampling strategy was employed while selecting the cases. In chain sampling it was aimed to get information rich cases by asking the question "who should I talk with?". At the end of the study it was interviewed with twenty cases.

5.1 MAIN FINDINGS

The first aim of this survey was testing the factors affecting the decision of information systems adoption. However, all the firms in the sample have already

adopted information systems, so there were no non-adopters. It was not possible to compare the groups of adopters and non-adopters.

Second aim of this study was to identify the factors affecting the level of information systems adoption. It was observed during the interviews with the respondents that most of the users were aware of the perceived usefulness of information systems but they have not satisfied with the results. All of them agreed that life became easier after they had utilized information systems, but they were not sure if their annual profits were increased as a result of information systems usage. Since they could not observe a direct increase in their profits due to information systems usage, they were not pleased with the results. When it was asked how level of information systems adoption could be increased, most of them believed there were two ways: 1) government would force them in order to use information systems, or 2) there would happen to be a trend in information systems usage and all of them would be influenced from each other. An interesting result obtained in the interviews was that although all of the firms were using e-mail in their contracts with foreign countries, they also faxed a copy of the contract to their customer. They did not completely rely on e-mail. This, of course, related to the non-existence of sufficiently reliable security and trust mechanisms for full e-commerce.

Lack of Internet security in general was another problem companies face. Although they had anti-virus programs or firewall applications, they did not completely trust Internet because of Internet viruses and hackers. Respondents said that Internet infrastructure lacked quality in Gaziantep. When the question

about videoconference usage was asked, some of the respondents said that they could not utilize video conferencing due to the problems in infrastructure.

CEO attitude towards information systems applications was another point discussed in the meetings. Most of the companies in Gaziantep were family-based. Therefore, head of the family usually made the final decision and they were less willing to adopt new technologies. However, CEOs of the third generation were more likely to use information systems.

The idea of working from home was also discussed with the respondents. In some cases, working from home was confused with taking work home. Especially textile companies were interested in working from home for their employees in design departments. Employers believed that efficiency and effectiveness of their designers would increase if they work in a place that they felt better and comfortable.

It was found out that employees IS knowledge and quality of the vendor had significant effects on information systems usage. Internal IS specialists and external consultants worked together in Gaziantep, such that when firms faced a problem and could not solve it, they got in contact with the external consultants. At this point, another problem arises. Most of the respondents complain about charges for maintenance and repair vendors requested every time they faced problems and they preferred to contract with vendor on an annual basis.

As a result, it was found out that among the fifteen factors studied in the survey, five of them had significant effects on the rate of information systems utilization. These factors were the relative advantage of information systems, the quality of information systems infrastructure, CEO's attitude towards information systems, employees' knowledge about information systems, and the service quality of the vendor.

5.2 LIMITATIONS AND FUTURE WORK

This study has a number of limitations. First of all, since the sample size was relatively small, qualitative analysis method was employed. However, they are disadvantages of qualitative analysis: 1) data may be less representative due to small sample size, 2) the researches own identity, background, and beliefs have a role in the creation of data and analysis of data, and 3) there is a possibility of transforming the meaning of the data.

The second limitation was that as a result of small sample size, there were no non-adopters in the sample. Therefore, the analysis of factors affecting the decision of information systems adoption is missing. It is necessary to conduct the questionnaire to non-adopters of information systems. In order to overcome these limitations, sample size can be increased and factors affecting information systems adoption and utilization can be analyzed by quantitative methods. Moreover, this survey was conducted only in one city, Gaziantep: research area can be expanded for a comparative study that covers different cities.

It is assumed that a company adopts information systems if it uses at least one of the applications mentioned in questions 11-15. However, Kim (1996) discusses the disadvantages of using a single-item question to measure system utilization. A better measure of system utilization can be developed.

In this study, only the relationships between variables have been discussed. Further research can examine the causal links by the help of a longitudinal study thorough repeated visits that would enable observing developments within companies.

REFERENCES

ACOA, (2000), "Information Technology Progress & Performance Questionnaire: Does Your Manufacturing or Service Company Measure Up?", URL: www.acoa.ca/e/business/innovation/question/itquiz.pdf, Accessed 2002, December.

Agarwal, R., Prasad, J., (1998), "The Antecedents and Consequents of User Perceptions in Information Technology Adoption", Decision Support Systems, 22, pp.15-29.

Akkaren, J., Cavaye, A.L.M, (1999), "Factors Affecting Entry-Level Internet Technology Adoption by Small Business In Australia: An Empirical Study", Proc. 10th Australasian Conference on Information Systems, pp. 1071-1083

Albayrak Ö., (1994), "An Empirical Study to Observe and Evaluate Management Information Systems' Success in a Domestic Bank", Master of Science Thesis for the Department of Management and the Graduate School of Business Administration of Bilkent University, Ankara.

Bajaj, A., Nidumolu, S.R., (1998), "A Feedback Model to Understand Information System Usage", Information & Management, 33, pp. 213-224.

Benamati, J., Lederer, L.A., (2001), "How It Organizations Handle Rapid IT Change: Five Coping Mechanisms", Information Technology and Management, 2, pp. 95-112.

Bhattacherjee, A., (1998), "Management of Emerging Technologies: Experiences and Lessons Learned at US West", Information and Management, 33, pp. 263-272.

Carlson, P., (October 1999), "Information Technology and Organizational Change", Proceedings on the Seventeenth Annual International Conference on Computer Documentation.

Chambers, T.A., Parker, C.M., (2000), "Factors Motivating and Inhibiting the Use of Web Commerce by Rural Small Businesses", 11th Australasian Conference on Information Systems, Brisbane, Australia, December.

Chan, S.L., (2000), "Information Technology in Business Processes", Business Process Management Journal, Vol. 6, No. 3, pp. 224-237.

CII, 2000, "Definition of SMEs in Asia and other Countries", CII URL: http://www.ciionline.org/busserv/ ssi/smes_othercountries.html , Accessed 2003 January 20.

Clarke, R., (1991), "A Primer in Diffusion of Innovations Theory", URL: http://www.anu.edu.au/people/Roger.Clarke/SOS/InnDiff.html, Accessed 2003 January 20.

Cragg, P., (1996), "Adoption of the Internet by Small Firms", AusWeb96 The Second Australian Worldwide Web Conference, http://ausweb.scu.edu.au/aw96/paperseb.htm, Accessed 2002, December.

Cragg, P.B., King, M., (1993), "Small Firm Computing: Motivators and Inhibitors", MIS Quarterly, Vol. 17, No. 1, pp 47-63.

Cragg, P.B., Zinatelli, N., (1995), "The Evolution of Information Systems in Small Firms", Information and Management, Vol. 29, 1995, 1-8.

Çakmaklı, İ., (1999), "Small and Medium Business Expectations and Awareness of Internet and Extranet", Master of Science Thesis in the Graduate School of Social Sciences of Marmara University, İstanbul.

Davenport, T., H., (1993), "Process Innovation: Reengineering Work thorough Information Technology", Ernst&Young, USA.

Denscombe, M., (2000), "The Good Research Guide", Buckingham, Open University Press.

Dereli, T., Baykasoglu A., (2002),
URL:, http://www.gantep.edu.tr/~dereli/email.htm, Accessed 2002, January.

Dey, I., (1993), "Qualitative Data Analysis: A User-Friendly Guide for Social Scientists", London, Routledge.

Dixon, D., R., (1999), "The Behavioral Side of Information Technology", International Journal of Medical Informatics, 56, pp. 117-123.

Edosomwan, J., A., "Integrating Innovation and Technology Management", USA, John Wiley and Sons, Inc.

Elçi, Ş., (1999), "Innovation Management in Turkish Industrial Companies", Master of Science Thesis in the Program of Science and Technology Policy Studies of Middle East Technical University, Ankara.

Fichman, R.G., (1992), "Information Technology Diffusion: A review of Empirical Research", URL,
http://www2.bc.edu/~fichman/Fichman_1992_ICIS_IT_Diff_Review.pdf, MIS Sloan School of Management. Accessed 2002, January.

Fink, D., (1998), "Guidelines for the Successful Adoption of Information Technology in Small and Medium Enterprises", International Journal of Information Management, Vol. 18, No. 4, pp. 243-253.

GAOSB, (2002), "Gaziantep Organize Sanayi Bölgesi Müdürlüğü" URL: http://www.gaosb.org, Accessed 2003 April 10.

Gaziantep.net (2002), "Gaziantep Sanayisi", URL: http://www.gaziantep.net, Accessed 2003 April 10.

GOS, (2002), "Gaziantep Organize Sanayi 2002", Olay Yayıncılık, 2002

Grapentine, T., (1995) "Dimensions of an Attribute", American Marketing Association, URL: http://www.grapentine.com/articles/dimensns.pdf, Accessed 2003 April 7.

GTO, (2002), "Gaziantep Sanayinin Yerleşim Alanlarına Göre Dağılımı", URL: http://www.gto.org.tr, Accessed 2003 April 10.

GTOa, (2002), "Gaziantep Sanayinin Yerleşim Alanlarına Göre Dağılımı", URL: http://www.gto.org.tr, Accessed 2003 April 10.

GTOb, (2002), "Economic And Commercial Structure Of Gaziantep", URL: http://www.gto.org.tr, Accessed 2003 May 19.

Gupta, U., G., and Capen, M., (1996), "An Empirical Investigation of the Contribution of IS to Manufacturing Productivity", Information and Management, Vol. 31, pp. 227-233.

Gorland, R., (1991), "The Mid-Point on a Rating Scale: Is It Desirable", URL: http://marketing-bulletin.massey.ac.nz/article2/V2Note3.pdf, Accessed 2003 April 13.

Harrison, D.A., Mykytyn, P., P., Riemenschneider, C., K., (1997), "Executive Decisions About Adoption of Information Technology in Small Business: Theory and Empirical Tests, Information Systems Research, Vol. 8, No. 2, pp. 171-195.

Igbaria, M., Zinatelli, N., Cavaye, A.L.M, (1998), "Analysis of Information Technology Success in Small firms in New Zealand", International Journal of Information Management, Vol. 18, No. 2, pp 103-119.

IT Survey, (2001), "IT Barometer Survey, Denmark. Questionnaire for 2001", URL: http://www.byg.dtu.dk/faggrupper/byggeled/rh/ITbarengquest.pdf, Accessed on December 2002.

Jessup, L., L., "Barriers to Youth in Acquiring Literacy Response", A special Project of the Adult Basic Literacy Program Tillsonburg and District Multi-Service Centre, URL: http://www.nald.ca/fulltext/pat/Barriers/page16.htm, Accessed 2003 April 13.

Kagan, A., Lau, K., Nusgart, K., R., (1990), "Information Systems Usage Within Small Business Firms", Entrepreneurship Theory and Practice, pp. 25-37.

Kendal, J., Tung L., L., Chua K., H., NG, C., H., Tan, S., M., (1999), "Electronic Commerce Adoption by SMEs in Singapore", URL: http://www.quino.net/ec_adoption_by_sme_s_in_singapore.pdf, Accessed 2003, April 25

Kim, J., W., (1996), "An Empirical Investigation of Factors Influencing the Utilization of Execution Information Systems", PhD. Dissertation for The Graduate College in University of Nebraska.

KOBINET, (2002), "The Situation & Importance of SMEs in Turkey", URL: http://www.kobinet.org.tr/english/services/infobank/economy/001.html, Accessed 2003 April 25.

Kula, V., Tatoğlu, E., (2001), "KOBİ'lerde Internet Kullanımı: Tutum ve Beklentiler Üzerine Bir Değerlendirme", URL: http://www.kobinet.org.tr/hizmetler/bilgibankasi/ekonomi/OAKDocs/OAK-T19.pdf, Accessed 2002, January.

Kwon, T.H., Zmud, R.W., (1987), " Unifying The Fragmented Models of Information Systems Implementation" in J.R. Boland, and R. Hirschheim, Critical Issues In Information Systems Research, Wiley, pp 227-252.

Lassila, K. S., and Brancheau, J. C., (1999), "Adoption and Utilization of Commercial Software Packages: Exploring Utilization Equilibria, Transitions, Triggers, and Tracks", Journal of Management Information Systems, Vol. 16, No. 2, pp. 63-90.

Lee, J. and Baek, S.I., (2002), "Adoption of Internet Technologies in Small Business", International Journal of Digital Management, No. 1.

Levy, M. and Powell, P., (2000), "Information Systems Strategy for Small and Medium Sized Enterprises: An Organizational Perspective", Journal of Strategic Information Systems, 9, pp 63-84.

Levy, M., and Powell, P., (1998), "SME Flexibility and the Role of Information Systems", Small Business Economics, 11, pp. 183-196.

Levy, M., Powell, P., and Galliers, R., (1999) "Assessing Information Systems Strategy Development Frameworks in SMEs", Information and Management, 36, pp. 247-261.

Levy, M., Powell, P., Yetton, P., (1998), "SMEs and The Gains From IS: From Cost Reduction to Value Added", IFIP Proceedings, pp 377-392.

Lund, M., (1999), "The Study Behaviors of Physical Education Students at Grant MacEwan Community College ", Master of Arts Project in Faculty of Physical Education and Recreation of University of Alberta, Edmonton, URL: http://www.artsci.gmcc.ab.ca/people/lundm/methods.htm , Accessed 2003 April 13.

MacGregor, R.C., Banker, D.J., (1999), "A Comparison of Real Estate Brokers' Computer Training Needs with other Small Business Sectors: An Australian Perspective", Journal Of Real Estate Practice And Education, Vol. 2, No. 1.

Magnusson, M., (2001), "E-commerce in Small Businesses- Focusing on Adoption and Implementation", 1st Nordic Workshop on Electronic Commerce, Halmstad, Sweden, May 28-29.

Mason, J., (1996), "Qualitative Researching", London, Sage Publications.

Moore, G.,C., and Benbasat, I., (1991), "Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation", Information Systems Research, Vol. 2, No. 3, pp. 92-222.

Moreton, R. and Chester, M., (1996), "Transferring the Business: the IT Contribution", McGraw Hill.

Munasinghe, L., Jayawardena, D. P. W., (1998), "Factors Influencing IT Applications in Small and Medium Scale Industries in Developing Countries Case of Sri Lanka", URL: http://www.lrv.eps.ufsc.br/IFIP-WG-9.5/Ifip-cd/ifip/1b6.html, Accessed on 2003 November 22.

Munro, M.C., Huff, S.L., (1985), "Information Technology Assessment and Adoption: Understanding the Information Centre Role", Proceedings of the Twenty-First Annual Conference on Computer Personnel Research.

Nissen, B., (2001), "The Internet Adoption Decision in Small and Medium Enterprises (SMEs)", Special Topics in International Marketing.

OECD (2001a), "Science, Technology, and Industry Outlook, Drivers of Growth: Information Technology, Innovation and Entrepreneurship", OECD, Paris.

OECD (2002a), "OECD Information Technology Outlook. ICTs and The Information Economy", OECD, Paris.

OECD, (2000a), "A New Economy? The Changing Role of Information Technology in Growth", OECD, Paris.

Öncel, M., (2001), "Bilgi teknolojisinin bir aracı olarak Internet, intranet, ekstranetin işletme yönetimi üzerinde etkileri ve KOBİ`ler için çözüm noktaları", Master of Science Thesis in the Graduate School of Social Sciences of Dumlupınar University, Kütahya.

Parlaz, Ş., (1997), "KOBİ'lerde Yönetim Sistemi Kurulurken Karşılaşılan Sorunlar ve Bir Uygulama", Master of Science Thesis in the Graduate School of Social Sciences of Marmara University, İstanbul.

Patton, M.,Q.,(1990), "Qualitative Evaluation and Research Methods", USA, Sage Publications.

Rogers, E. and Shoemaker, F.,F., (1971), "Communication of Innovations: A Cross-Cultural Approach", The Free Press, New York.

Runge, J.J. and Lee, J., (2001), "Information Technology Adoption Among Small Retailers", 2001 USASBE/SBIDA Annual National Conference, 2001: An Entrepreneurial Odyssey, Orlando, Florida, URL: http://www.usasbe.org/conferences/2001/proceedings/papers/072.pdf.

SBS, 2000, "Small and Medium Enterprise (SME) Definitions", URL: http://sbs.gov.uk/defaultphp?page=/ statistics/smedefs.php >, Accessed 2003 January 20.

Seyal, A.H., Rahim, M.M., Rahman N.A., (2000), "An Empirical Investigation of Use of Information Technology among Small and medium Business Organizations: A Bruneian Scenario", The Electronic Journal on Information Systems in Developing Countries, Vol. 2, No. 7, pp. 1-16.

Stroeken, J.H.M., and Knol, W.H.C., (1999), "IT Scenarios for Small and Medium-Sized Enterprises", 3rd International Conference 'Technology, Policy and Innovation' in Austin, U.S.A.

Taylor, M.J., Reading, M., Sheehan, J.F., and Mulhaney, A., (2001), "Soft Issues in Small-Scale Network Development and Implementation: A Case Study in an SME", Systematic Practice and Action Research, Vol. 14, No. 3, pp. 239-249.

Thong, J.Y.L., (1999), "An Integrated Model of Information Systems Adoption in Small Business", Journal of Management Information Systems, Vol. 15, No.4, pp. 187-234.

Thong, JYL. , Yap, CS., (1995), "CEO Characteristics, Organizational Characteristics and Information Technology Adoption in Small Business", Int. J. Mgmt Sci., Vol.23, No. 4, pp.429-442

UNECE, (1998), "Definitions of SMEs in Countries in Transition", URL: http://www.unece.org/indust/sme/def-cit.htm, Accessed 2003, January 20.

Varol, Ç., (2002), "Entrepreneurial Networks in Local Industrial Development: A Comparative Analysis of Denizli and Gaziantep Cases", Doctor of Philosophy Thesis in the Department of City and Regional Planning of Middle East Technical University, Ankara.

WebRef1, (2003), "Interviews Types",
URL: http://www.rouncefield.homestead.com/files/as_soc_method_17.htm,
Accessed on 25 May 2003

Yongjean, J., (1999), "The Roles of Supporting Organizations for Making the Best Use of Information Technology in Korea", APO Symposium, Sri Lanka, URL: http://woosuk.woosuk.ac.kr/~yongjean/p1999-2.html, Accessed 2003 April 18.

APPENDICES

A: INTERVIEW CONTENTS

Table 9 Turkish copy of the close-ended questions asked in the interview

Question	Initial Copy*	Final Copy	To whom it is asked
1. İşletmenin hukuki yapısı nedir?	1	0	
2. Firmadaki göreviniz nedir?	1	1	ALL
3. Firmanızda kaç kişi çalışmaktadır?	1	1	ALL
4. Firmanızın ana faaliyet alanı nedir?	1	1	ALL
5. Firmanız kaç yıldır sektördedir?	1	0	
6. Firmanız uluslararası ticaret yapıyor mu?	1	1	ALL
7. Firmanızın dolar bazında 2002 cirosu ne kadardır?	1	0	
8. Firmanızda Bilgi İşlem Bölümü ve/veya Bilgi İşlem elemanı var mı?	1	1	ALL
9. Internet teknolojisi ile ne derede ilgilisiniz?	1	1	ALL
10. Internette hangi erişim yöntemini kullanıyorsunuz?	1	1	ALL
11. Firmanızın e-posta adresi var mı?	1	1	ALL
12. Firmanızın web sayfası var mı?	1	1	ALL
13a. İşletme olarak Internet kullanıyor musunuz?	1	1	ALL
13b. İşletme olarak intranet kullanıyor musunuz?	1	1	ALL
13c. İşletme olarak extranet kullanıyor musunuz?	1	1	ALL
13d. İşletme olarak VPN kullanıyor musunuz?	1	1	ALL
14a İşletmenizde, Internet üzerinden iletişim teknolojilerinden telnet kullanıyor musunuz?	1	1	ALL
14b İşletmenizde, Internet üzerinden iletişim teknolojilerinden e-mail kullanıyor musunuz?	1	1	ALL
14c İşletmenizde, Internet üzerinden iletişim teknolojilerinden use-net kullanıyor musunuz?	1	1	ALL
14d İşletmenizde, Internet üzerinden iletişim teknolojilerinden IRC kullanıyor musunuz?	1	1	ALL
14e İşletmenizde, Internet üzerinden iletişim teknolojilerinden video konferans kullanıyor musunuz?	1	1	ALL
15b1. Tanıtım ve halkla ilişkiler alanında bilişim teknolojilerinden faydalanıyor musunuz?	1	1	ALL
15b2. Bilgi alışverişi alanında bilişim teknolojilerinden faydalanıyor musunuz?	1	1	ALL

- "1" means, item exists in the questionnaire
- "0" means, item is excluded from the questionnaire

Table 9 Turkish copy of the close-ended questions asked in the interview (cont.)

Question	Initial Copy*	Final Copy	To whom it is asked
15b3. Müşteri ilişkileri alanında bilişim teknolojilerinden faydalanıyor musunuz?	1	1	ALL
15b4. Satış ve sonrası hizmetler alanında bilişim teknolojilerinden faydalanıyor musunuz?	1	1	ALL
15b5. Mal ve hizmet alımı alanında bilişim teknolojilerinden faydalanıyor musunuz?	1	1	ALL
15b6. İhracat ve ithalat alanında bilişim teknolojilerinden faydalanıyor musunuz?	1	1	ALL
15b7. Muhasebe alanında bilişim teknolojilerinden faydalanıyor musunuz?	1	1	ALL
15b8. Envanter takibi alanında bilişim teknolojilerinden faydalanıyor musunuz?	1	1	ALL
15b9. İnsan kaynakları alanında bilişim teknolojilerinden faydalanıyor musunuz?	1	1	ALL
15b10.Diğer alanlarda bilişim teknolojilerinden faydalanıyor musunuz?	1	1	ALL
16.1 Okul hayatınızda bilişim sistemleri konusunda aldığınız dersler var mı?	1	1	Employee
16.2 Bilişim sistemleri konusunda şirket dışı eğitimlere katıldınız mı?	1	1	Employee
16.3 Bilişim sistemleri konusunda şirket içi eğitimlere katıldınız mı?	1	1	Employee
16.4 Kişisel olarak bilişim sistemleriyle ilgili çalışmalarınız oldu mu?	1	1	Employee
17 Aşağıdaki alanlardaki bilgisayar tecrübenizi lütfen değerlendiriniz. (3: çok iyi, 2:orta, 1: az)	1	1	Employee
17.1 Kelime işlemcisi(word), spreadsheet, hesap tablosu uygulamaları (excel), veri yönetimi gibi bilgisayar paketlerinin kullanımı	1	1	Employee
17.2 SQL, ORACLE, DBASEIV, FOXPRO, ACCESS gibi bilgisayar dillerinin kullanımı	1	1	Employee
17.3 Bilgisayarda finansal, istatistiksel ve grafiksel modeller oluşturma	1	1	Employee
17.4 COBOL, FORTRAN, BASIC, PASCAL, C, C++ gibi bilgisayar dillerinde programlama	1	1	Employee
17.5 Fizibilite arastırması veya ihtiyaç analizi gibi bilgisayar sistemlerinin teknik olmayan süreçlerine katılım	1	1	Employee
17.6 Bilgisayar sistemlerinin sistem analiz, geliştirme ve uygulama gibi teknik süreçlerinde rol oynama	1	1	Employee

- "1" means, item exists in the questionnaire
- "0" means, item is excluded from the questionnaire

Table 9 Turkish copy of the close-ended questions asked in the interview (cont.)

Question	Initial Copy*	Final Copy	To whom it is asked
18- Bilişim sistemlerinin şirketinize sağladığını düşündüğünüz avantajları lütfen önem derecesine göre belirtiniz. 3:cok önemli, 2: önemli, 1:tamemen önemsiz; 0:fikrim yok			
18.1 Daha iyi finansal kontrol	1	1	ALL
18.2 Daha iyi iletişim	1	1	ALL
18.3 Daha iyi iş kalitesi	1	1	ALL
18.4 İşlerin daha hızlı yapılması	1	1	ALL
18.5 Bilgi paylaşımı	1	1	ALL
18.6 Bilgiye daha hızlı erişim	1	1	ALL
18.7 Personel sayısının azaltılması	1	1	ALL
18.8 Müşteri memnuniyetinin artması	1	1	ALL
18.9 Evden çalışabilme	1	1	ALL
18.10 Büyük ölçekli verilerle başedebilme	1	1	ALL
18.11 Yeni personeli cezbetme	1	1	ALL
18.12 İşlerin daha kolay yapılması	1	1	ALL
18.13 Üretkenliğin arttırılması	1	1	ALL
18.14 Düşündüğünüz diğer avantajlar	1	1	ALL
19- Bilişim sistemlerinin şirketiniz için dezavantajlarını lütfen önem derecesine göre belirtiniz. 3:cok önemli, 2: önemli, 1:tamemen önemsiz; 0:fikrim yok			
19.1 Yüksek yatırım gerekliliği	1	1	CEO
19.2 Sürekli güncelleştirme ihtiyacı	1	1	ALL
19.3 Uyumsuz yazılım	1	1	ALL
19.4 Çok fazla bilginin varlığı	1	1	ALL
19.5 Verimin düşmesi	1	1	ALL
19.6 Özel beceri gerekliliği	1	1	ALL
19.7 İletişim nedeniyle bilgi güvenliginin azalması	1	1	ALL
19.8 Standart ve uyum eksikliği	1	1	ALL
19.9 Yararların ölçülebilmesindeki zorluk	1	1	ALL
19.11 Çalışanların yeni sisteme uyum güçlügü, eski yönteme olan bağlılık	1	1	ALL
19.12 Düşündüğünüz diğer dezavantajlar	1	1	ALL
20.2-25.2 numaralı cümleler hakkındaki düşüncelerinizi lütfen belirtiniz. (3: kesinlikle katılıyorum, 2:katılıyorum, 1:kesinlikle katılmıyorum)			
20.2 Diğer şirketlerin bilgisayarlarla neler başardıklarını gördüm.	1	1	CEO
20.3 Çalışanlarımız bilgisayarların kullanımını kolay buluyor	1	1	ALL
20.4 Çalışanlarımız işlerini elle yapmayı tercih ediyor	1	1	ALL
20.5 Çalışanlarımızdan bilgisayarı aktif olarak kullanmalarını bekleriz.	1	1	ALL

- "1" means, item exists in the questionnaire
- "0" means, item is excluded from the questionnaire

Table 9 Turkish copy of the close-ended questions asked in the interview (cont.)

Question	Initial Copy*	Final Copy	To whom it is asked
21.1 Bilişim sistemleri çalışma tarzımıza tam uyuyor.	1	1	ALL
21.2 Bilişim sistemleri çalışma tarzımızda değişiklikler gerektiriyor.	1	1	ALL
21.3 Bilişim sistemleri, çalışma tarzımızı tamamlıyor.	1	1	ALL
22.1 Benzer servislerden veya ürünlerden faydalanmak amacıyla, müşterilerimiz kolaylıkla başka bir şirketle anlaşabilirler.	1	1	ALL
22.2 Faaliyet gösterdiğimiz pazarda, işlevleri aynı oldugu halde, ürünlerimizden farklı pek çok ürün bulunmaktadır.	1	1	ALL
22.3 Faaliyet alanımızdaki şirketler arasında oldukça yoğun bir rekabet yaşanmaktadır.	1	1	ALL
23.1 Herhangi bir bilişim sistemleri uygulamasını kullanmaya karar vermeden önce, farklı örneklerini deneyebileceğimiz birçok firsat oldu.	1	1	ALL
24.1 Bilişim sistemlerinin geliştirilmesi için firmamızda her bakımdan yetkin uzmanlarımız vardır	1	1	ALL
24.2 Bilgisayar ve yazılım konusunda, anlaşmalı oldugumuz danışman kadar bilgili bir çalışanımız yok	1	1	ALL
24.3 Sistem kurulumu sırasında ve sorunlarla karşılaşıldığında, teknik konularla ilgilenmesi için sirket dışı danışmanlarla çalışırız.	1	1	ALL
24.4 Yeni teknolojilerden haberdar olmak için kendi çalışanlarımız yerine, danışmanımız olan kuruma güveniriz.	1	1	ALL
25.1 Şirketimiz yeni ürün hatları ve/veya servisler geliştirmektedir.	1	1	ALL
25.2 Şirket olarak, yeni pazarlara ulaşmak için girişimde bulunmaktayız.	1	1	ALL

- "1" means, item exists in the questionnaire
- "0" means, item is excluded from the questionnaire

Table 10 English copy of the close-ended questions asked in the interview

Question	Initial Copy*	Final Copy	To whom it is asked
1. What is the nature of your business?	1	0	
2. What is your position?	1	1	ALL
3. What is the number of your employees?	1	1	ALL
4. What is your type of business?	1	1	ALL
5. For how many years have you been in the sector	1	0	
6. Are you enrolled in international trade?	1	1	ALL
7. What is your annual sales turnover in 2002?	1	0	
8. Is there an information systems department or expertise in your company?	1	1	ALL
9.To what degree are you interested in Internet?	1	1	ALL
10. How do you connect to Internet?	1	1	ALL
11. Does your company have an e-mail address?	1	1	ALL
12. Does your company have a web page?	1	1	ALL
13a. Do you use Internet?	1	1	ALL
13b. Do you use intranet?	1	1	ALL
13c. Do you use extranet?	1	1	ALL
13d. Do you use VPN?	1	1	ALL
14a Do you use telnet?	1	1	ALL
14b Do you use e-mail?	1	1	ALL
14c Do you use use-net?	1	1	ALL
14d Do you use IRC?	1	1	ALL
14e Do you use video conferencing?	1	1	ALL
15b1. Do you use information systems in advertising and public relations?	1	1	ALL
15b2. Do you use information systems in information retrieval and communication?	1	1	ALL
15b3. Do you use information systems in customer relations?	1	1	ALL
15b4. Do you use information systems in after sales and support?	1	1	ALL
15b5. Do you use information systems in buying goods and services?	1	1	ALL
15b6. Do you use information systems in export and import?	1	1	ALL
15b7. Do you use information systems in accounting?	1	1	ALL
15b8. Do you use information systems in inventory	1	1	ALL
15b9. Do you use information systems in human resources?	1	1	ALL
15b10. Do you use information systems in any other area?	1	1	ALL

- "1" means, item exists in the questionnaire
- "0" means, item is excluded from the questionnaire

Table 10 English copy of the close-ended questions asked in the interview (cont.)

Question	Initial Copy*	Final Copy	To whom it is asked
16.1 Have you had training in the use of computers through courses at College or University?	1	1	Employee
16.2 Have you had training in the use of computers through outside training provided by vendor or consultant?	1	1	Employee
16.3 Have you had training in the use of computers through in-house company training?	1	1	Employee
16.4 Have you had training in the use of computers through self-study?	1	1	Employee
17 Please indicate your actual experience with computer (3: very good, 2:average, 1: little)	1	1	Employee
17.1 Using computer packages such as spreadsheet, word processing, or data management	1	1	Employee
17.2 Using computer languages such as SQL, ORACLE, DBASEIV, FOXPRO, ACCESS	1	1	Employee
17.3 Building models on computers such as financial, statistical, or graphical?	1	1	Employee
17.4 Programming in computer languages such as COBOL, FORTRAN, BASIC, PASCAL, C, C++	1	1	Employee
17.5 Participating in the non-technical design of computer systems such as feasibility studies or requirement analysis?	1	1	Employee
17.6 Participating in the technical design of computer systems such as systems analysis or design and implementation	1	1	Employee
18- Please indicate what do you think about the advantages IS provides at this work place? (3: very important; 2: important; 1:not important; 0:no idea)			
18.1 Better financial control	1	1	ALL
18.2 Better communications	1	1	ALL
18.3 Better quality of work	1	1	ALL
18.4 Work done more quickly	1	1	ALL
18.5 Sharing information	1	1	ALL
18.6 Faster access to information	1	1	ALL
18.7 Reduction of staff	1	1	ALL
18.8 Satisfying customers	1	1	ALL
18.9 Working from home	1	1	ALL
18.10 Handling large volumes of data	1	1	ALL
18.11 Attraction to new staff	1	1	ALL
18.12 Doing job more easily	1	1	ALL
18.13 Enhance effectiveness	1	1	ALL
18.14 Other advantages	1	1	ALL

- "1" means, item exists in the questionnaire
- "0" means, item is excluded from the questionnaire

Table 10 English copy of the close-ended questions asked in the interview (cont.)

Question	Initial Copy*	Final Copy	To whom it is asked
19- Please indicate what do you think about the disadvantages IS provides at this work place? (3: very important; 2: important; 1:not important; 0:no idea)			
19.1 High cost of investment	1	1	CEO
19.2 Continual need to upgrade	1	1	ALL
19.3 Incompatible software	1	1	ALL
19.4 Too much information	1	1	ALL
19.5 Risk of inefficiency from IT	1	1	ALL
19.6 Greater know-how required	1	1	ALL
19.7 Reduced information security	1	1	ALL
19.8 Lack of standards/coordination	1	1	ALL
19.9 Difficult to measure benefits	1	1	ALL
19.11 Belief that old ways work best	1	1	ALL
19.12 Other advantages	1	1	ALL
Please indicate your opinion about the statements 20.2-25.2. (3: strongly agree, 2:agree, 1:strongly disagree			
20.2 I have seen what other companies achieved with information systems	1	1	CEO
20.3 My employees find computers easy to use	1	1	ALL
20.4 Our employees prefer to complete their tasks manually.	1	1	ALL
20.5 We expect our employees to use computers./ My superiors except me to use computers.	1	1	ALL
21.1 Using information systems fits into my work style.	1	1	ALL
21.2 In order to use information systems, I have to alter the way in which I perform my job.	1	1	ALL
21.3 Information systems is integrated with the way I perform my job.	1	1	ALL
22.1 It is easy for our customers to switch to another company for similar services/products without much difficulty	1	1	ALL
22.2 There are many products/services in the market which are different from ours but perform the same function.	1	1	ALL
22.3 The rivalry among companies in the industry my company is operating is very intense.	1	1	ALL
23.1 Before deciding whether to use any information systems applications, we have had a great deal of opportunity to try several of them.	1	1	ALL
24.1 Our firm has had employee(s) with sufficient expertise for all aspects.	1	1	ALL

- "1" means, item exists in the questionnaire
- "0" means, item is excluded from the questionnaire

Table 10 English copy of the close-ended questions asked in the interview (cont.)

Question	Initial Copy*	Final Copy	To whom it is asked
24.2 Our firm has not had an employee who was knowledgeable about computers and software to the same degree as the external vendor/consultant whom we used.	1	1	ALL
24.3 Our firm has relied upon our vendor/consultant, as opposed our own employees, to solve hardware and software problems when they arose.	1	1	ALL
24.4 Our firm has depended upon our vendor/consultant, as opposed to our own employees, to inform us of new technology.	1	1	ALL
25.1 My company offers new product lines or services.	1	1	ALL
25.2 My company targets new markets or segments.	1	1	ALL

Table 11 Factors studied and corresponding question numbers

Statement Number	Factor Studied
18.1	Relative advantage
18.2	Relative advantage
18.3	Relative advantage
18.4	Relative advantage
18.5	Information intensity
18.6	Information intensity
18.7	Product innovation
18.8	Competitiveness
18.9	Ease of use
18.10	Relative advantage
18.11	Social pressure
18.12	Relative advantage
18.13	Relative advantage
19.1	Financial slack
19.2	Information intensity
19.3	Compatibility
19.4	Information intensity
19.5	Relative advantage
19.6	Information intensity
19.7	Information intensity
19.8	Compatibility
19.9	Result demonstrability
19.11	Employee's self efficacy
20.1	Attitude towards usage
20.2	Attitude towards usage
20.3	Attitude towards usage
20.4	Attitude towards usage
20.5	Attitude towards usage
21.1	Compatibility

- "1" means, item exists in the questionnaire
- "0" means, item is excluded from the questionnaire

Table 11 Factors studied and corresponding question numbers (cont.)

Statement Number	Factor Studied
21.2	Compatibility
21.3	Compatibility
22.1	Competitiveness
22.2	Competitiveness
22.3	Competitiveness
23.1	Trialability
24.1	Internal/external expertise
24.2	Internal/external expertise
24.3	Internal/external expertise
24.4	Internal/external expertise
25.1	Product innovation
25.2	Product innovation

B: CASE DESCRIPTIONS

Case A

Case A is a construction firm. It does not have an independent information systems department, works with vendors. However its employees had taken computer courses at school. In-house and outside training was given when necessary.

Case B

Case B is an 8 year-old textile firm producing 100% cotton yarn. It has with 50 employees. It has totally automated its production. It also has import and export contracts. However, it does not have an independent information systems department; it works with an application service provider.

Case C

Case C is a 70 year-old textile firm producing acrylic, synthetic, polyester and cotton yarn. it does not have an independent information systems department; it works with an application service provider.

Case D

Case D is a 30 year-old heavy industry machinery company producing pressure vessels, steam boilers, superheated water boilers, heat exchanger, solar water heating systems, steel storage tanks, fixed ground and movable truck type LPG storage tanks, chlorine tanks, heavy steel structures and mechanical equipment, dam equipments, electromechanical equipments and their erections as a

complete unit. It has an independent information systems department; it also works with an application service provider.

Case E

Case E is a 4 year-old company providing automobiles, heavy-duty vehicles and services. It has an independent information systems department.

Case F

Case F is a 75 year-old company providing health services. It does not have an independent information systems department. It works with an application service provider.

Case G

Case G is a 5 year-old travel agency with ten employees. It has an "A-group certificate numbered 4057". They are an authorized selling agency of Turkish Airlines, IATA and SETUR. They provide services in the field of education in foreign countries, tour and journey organizations, in and out plane ticket reservations, renting car. It works with ASP.

Case H

Case H is a human resources consultancy firm with 5 employees. It is the only firm in Gaziantep that provides human resources services. It neither have an independent IS department nor internal IS expertise. It works with vendors.

Case I

Case I is a 25 year-old textile firm producing synthetic carpet yarn, polypropylene bag, PP stable fiber. It has an independent information systems department, and also work with ASP when needed.

Case J

Case J is a textile firm established in 1995 with capacity of 2.400 Tons/year Acrylic and Acrylic-Wool mixed yarns. It can produce single or double plies, weaving and knitting yarns and fancy yarns, at 17.000 m2 closed fields with 250 workers and 8.728 spindles. It has an independent information systems department.

Case K

Case K is a 25 year-old textile firm producing carpets. It takes place in the first 500 establishments of Turkey and exports its product to more than 30 countries in the world. It has an independent information systems department.

Case L

Case L is a food company producing, reselling, importing, and exporting biscuits, cakes, and chocolates, etc. It has 100 employees. It does not have an independent information systems department and work with application service providers.

Case M

Case M is a textile firm producing socks. It is one of the early adopters of information systems in Gaziantep, however it does not have an independent information systems department and work with vendors.

Case N

CASE N is a dealer of a lighting firm. It works with vendors. Even they do not have an independent IS department, they are energetic about

Case O

Case O is a 40 year-old textile firm who is a producer, reseller, importer, exporter of textile nets, knotted nets, natural textile fibers. It has an independent information systems department.

Case P

CASE P is a medical center operating since 1993. It is one of the first runner-ups in modern hospital management systems. They had Quality System Certificate TS - EN ISO 9000. It has an independent information systems department.

Case Q

Case Q is a 7 year-old advertisement and organization agency providing digital media services to companies. They do not have an independent IS department, however its staff is knowledgeable about IS.

Case R

Case R is a seller of industrial catering equipments. It neither have an information systems department nor work with an application service provider. It is the only firm that does not have an e-mail address.

Case S

Case S is a corrugated board and packaging firm. They trade in Turkey and in international markets. It is ISO 9002 certificated. Online order is available via its web page. They have an information systems department in their İstanbul branch, whereas in Gaziantep, they have a non-IT staff dealing with information systems applications.

Case T

Case T is a 10 year-old tourism firm. It does not have an independent information systems department; however there are staff employed for information systems applications.

C: RESULTS OF THE INTERVIEW

Table 12 Results of the interviews with Cases A-E

Question #	Possible Responses	CASES				
		CASE A	CASE B	CASE C	CASE D	CASE E
3			150			
4		const*	textile	textile	HM	Auto
6		1	1	1	1	1
8	internal IS expertise					
8	IS department				1	1
8	someone related to IS		1	1		
8	no	1				
8	I do not know					
9	user	1	1	1	1	1
9	designer					
9	supervisor					
9	all					
9	none					
10	x.25					
10	ISP	1	1		1	1
10	Cable Modem			1		
10	ISDN					
10	DSL					
10	Leased Lines					
10	ATM					
10	Satellite					
11	yes (1); no (0); plan	1	1	1	1	1
12	yes (1); no (0); plan	1	1	1	1	1
13.1	yes (1); no (0); plan	1	1	1	1	1
13.2	yes (1); no (0); plan	0	1			1
13.3	yes (1); no (0); plan	0				
13.4	yes (1); no (0); plan	0				
14.1	yes (1); no (0); plan	0			1	1
14.2	yes (1); no (0); plan	1	1	1	1	1
14.3	yes (1); no (0); plan	0		1	1	1
14.4	yes (1); no (0); plan	1		1		1
14.5	yes (1); no (0); plan	0				1
15.1	yes (1); no (0); plan	0		1	1	1
15.2	yes (1); no (0); plan	1	1	1	1	1
15.3	yes (1); no (0); plan			1	1	
15.4	yes (1); no (0); plan	0		1	1	1
15.5	yes (1); no (0); plan	0	1	1	1	
15.6	yes (1); no (0); plan	1	1	1	1	1
15.7	yes (1); no (0); plan	1		1	1	1
15.8	yes (1); no (0); plan	1		1	1	1
15.9	yes (1); no (0); plan	1		1	1	
16.1	yes (1); no (0)	1			1	0
16.2	yes (1); no (0)	1			0	1
16.3	yes (1); no (0)	1			0	1

- const: construction; HM: heavy-machinery; Auto: Automotive

Table 12 Results of the interviews with Cases A-E (cont.)

Question #	Possible Responses	CASES				
		CASE A	CASE B	CASE C	CASE D	CASE E
16.4	yes (1); no (0)	1			1	1
17.1	range [1,3]	2			3	2
17.2	range [1,3]	1			2	2
17.3	range [1,3]	3			0	1
17.4	range [1,3]	1			1	0
18.1	range [1,3]	2.2	3.0	3.0	2.0	3.0
18.2	range [1,3]	2.3	3.0	2.0	2.0	3.0
18.3	range [1,3]	3.0	3.0	3.0	2.0	2.5
18.4	range [1,3]	3.0	3.0	2.0	3.0	2.5
18.5	range [1,3]	2.5	3.0	2.0	2.0	2.0
18.6	range [1,3]	2.7		3.0	2.0	3.0
18.7	range [1,3]	1.0		2.0	2.0	2.0
18.8	range [1,3]	2.8	3.0	3.0	1.0	3.0
18.9	range [1,3]	1.7	3.0	1.0	1.0	2.0
18.10	range [1,3]	2.5	3.0	2.0	2.0	3.0
18.11	range [1,3]	2.8	3.0	3.0	2.0	2.0
18.12	range [1,3]	3.0	3.0	3.0	2.0	2.5
18.13	range [1,3]	2.4	3.0	2.0	2.0	3.0
18.14	range [1,3]					
19.1	range [1,3]	1.0	3.0	2.0		
19.2	range [1,3]	2.4	3.0	3.0	1.0	1.0
19.3	range [1,3]	2.6	3.0	2.0	1.0	1.0
19.4	range [1,3]	2.0		2.0	1.0	1.5
19.5	range [1,3]	1.2		2.0	2.0	1.5
19.6	range [1,3]	2.5		2.0	1.0	1.0
19.7	range [1,3]	3.0	3.0	3.0	2.0	2.0
19.8	range [1,3]	2.7	2.0	3.0	1.0	2.0
19.9	range [1,3]		3.0	3.0		
19.11	range [1,3]	1.3		3.0	1.0	1.5
20.2	range [1,3]	2.0	3.0	3.0		
20.3	range [1,3]	2.2	2.0	2.0	3.0	2.0
20.4	range [1,3]	1.0	1.0	2.0	1.0	1.5
20.5	range [1,3]	2.5	3.0	3.0	3.0	2.5
21.1	range [1,3]	3.0			3.0	2.0
21.2	range [1,3]	2.0				2.0
21.3	range [1,3]	3.0	3.0	3.0		2.5
22.1	range [1,3]	3.0	2.0	3.0	1.0	1.0
22.2	range [1,3]	2.0	3.0	2.0	1.0	3.0
22.3	range [1,3]	3.0	3.0	3.0	1.0	2.0
23.1	range [1,3]	2.2	3.0	3.0	3.0	1.0
24.1	range [1,3]	1.0	2.0	1.0		
24.2	range [1,3]	3.0	2.0	2.0		
24.3	range [1,3]	3.0	2.0	3.0	2.0	1.0
24.4	range [1,3]	2.0	2.0	2.0	1.0	1.0
25.1	range [1,3]		2.0	3.0	1.0	3.0
25.2	range [1,3]		3.0	3.0	3.0	3.0

Table 13 Results of the interviews with Cases F-J

Question #	Possible Responses	CASES				
		CASE F	CASE G	CASE H	CASEI	CASE J
3		5	10	3		
4		HS*	tourism	HR	textile	textile
6					1	1
8	internal IS expertise					
8	IS department				1	1
8	someone related to IS					
8	no	1	1	1		
8	I do not know					
9	user	1	1	1	1	1
9	designer					
9	supervisor					
9	all					
9	none					
10	x.25					
10	ISP	1		1	1	1
10	Cable Modem		1			
10	ISDN					
10	DSL					
10	Leased Lines					
10	ATM					
10	Satellite					
11	yes (1); no (0); plan	1	1	1	1	1
12	yes (1); no (0); plan	0	1	1	1	1
13.1	yes (1); no (0); plan	1	1	1	1	1
13.2	yes (1); no (0); plan		1		1	
13.3	yes (1); no (0); plan		1			
13.4	yes (1); no (0); plan					
14.1	yes (1); no (0); plan			1		
14.2	yes (1); no (0); plan		1	1	1	1
14.3	yes (1); no (0); plan		1	1		1
14.4	yes (1); no (0); plan		1	1	1	
14.5	yes (1); no (0); plan					1
15.1	yes (1); no (0); plan		1	1	1	1
15.2	yes (1); no (0); plan	1	1	1	1	1
15.3	yes (1); no (0); plan		1	1		1
15.4	yes (1); no (0); plan		1	1	1	
15.5	yes (1); no (0); plan		1		1	1
15.6	yes (1); no (0); plan					1
15.7	yes (1); no (0); plan		1			1
15.8	yes (1); no (0); plan		1		1	1
15.9	yes (1); no (0); plan			1	1	1
16.1	yes (1); no (0)		0			1
16.2	yes (1); no (0)		1			1
16.3	yes (1); no (0)		1			1
16.4	yes (1); no (0)		1			1
17.1	range [1,3]		3			3
17.2	range [1,3]		1			2

* HS: health services; HR: human resources

Table 13 Results of the interviews with Cases F-J (cont.)

Question #	Possible Responses	CASES				
		CASE F	CASE G	CASE H	CASEI	CASE J
17.3	range [1,3]		1			2
17.4	range [1,3]		1			3
18.1	range [1,3]	3.0	2.5	1.0	3.0	2.7
18.2	range [1,3]	3.0	2.5	3.0	3.0	3.0
18.3	range [1,3]	3.0	3.0	3.0	3.0	2.7
18.4	range [1,3]	3.0	3.0	3.0	3.0	2.7
18.5	range [1,3]	3.0	3.0	3.0	2.0	3.0
18.6	range [1,3]	3.0	3.0	3.0	3.0	2.7
18.7	range [1,3]	2.0	1.0	1.0	3.0	2.0
18.8	range [1,3]	3.0	3.0	3.0	2.0	2.3
18.9	range [1,3]	2.0	1.0	3.0	3.0	1.7
18.10	range [1,3]	3.0	3.0	2.0	3.0	2.3
18.11	range [1,3]	3.0	2.5	2.0	2.0	2.7
18.12	range [1,3]	3.0	3.0	3.0	3.0	2.7
18.13	range [1,3]	3.0	3.0	3.0	3.0	2.3
18.14	range [1,3]					
19.1	range [1,3]	2.0	3.0	2.0	2.0	
19.2	range [1,3]	3.0	3.0	2.0	1.0	1.7
19.3	range [1,3]	1.0	2.5	2.0	1.0	2.7
19.4	range [1,3]	1.0	2.0	3.0	3.0	1.3
19.5	range [1,3]	1.0	2.0	2.0	1.0	1.3
19.6	range [1,3]	1.0	1.0	1.0	1.0	1.7
19.7	range [1,3]	3.0	3.0	3.0	3.0	1.7
19.8	range [1,3]	1.0	1.5	2.0	1.0	1.7
19.9	range [1,3]	2.0	1.0	3.0	2.0	
19.11	range [1,3]	1.0	2.0		1.0	2.3
20.2	range [1,3]	3.0	2.0	2.0	3.0	3.0
20.3	range [1,3]	2.0	3.0	2.0	2.0	1.7
20.4	range [1,3]	1.0	1.0	1.0	1.0	1.7
20.5	range [1,3]	3.0	3.0	3.0	3.0	3.0
21.1	range [1,3]		3.0	3.0		3.0
21.2	range [1,3]				2.0	3.0
21.3	range [1,3]	2.0	3.0			3.0
22.1	range [1,3]	3.0	3.0	1.0	2.0	
22.2	range [1,3]	2.0	3.0	1.0		3.0
22.3	range [1,3]	3.0	3.0	1.0	3.0	3.0
23.1	range [1,3]	2.0	2.0		3.0	3.0
24.1	range [1,3]	1.0	1.0	1.0	3.0	
24.2	range [1,3]	3.0	3.0	3.0	2.0	
24.3	range [1,3]	3.0	3.0	3.0	3.0	3.0
24.4	range [1,3]	2.0	3.0	3.0	2.0	3.0
25.1	range [1,3]	1.0	2.0	3.0	3.0	1.0
25.2	range [1,3]	3.0	2.0	3.0	3.0	3.0

Table 14 Results of the interviews with Cases K-O

Question #	Possible Responses	CASES				
		CASE K	CASE L	CASE M	CASE N	CASE O
3						250
4		textile	food	textile	lighting	textile
6		1	1	1		1
8	internal IS expertise					
8	IS department	1				1
8	someone related to IS			1		
8	no		1		1	
8	I do not know					
9	user	1	1	1	1	1
9	designer					1
9	supervisor					
9	all					
9	none					
10	x.25					
10	ISP		1	1	1	1
10	Cable Modem	1				
10	ISDN					
10	DSL					
10	Leased Lines					
10	ATM					
10	Satellite					
11	yes (1); no (0); plan	1	1	1	1	1
12	yes (1); no (0); plan	1	1	1	1	1
13.1	yes (1); no (0); plan	1	1	1	1	1
13.2	yes (1); no (0); plan	1			1	plan
13.3	yes (1); no (0); plan	1			1	
13.4	yes (1); no (0); plan	1				
14.1	yes (1); no (0); plan					
14.2	yes (1); no (0); plan	1	1	1	1	1
14.3	yes (1); no (0); plan				1	1
14.4	yes (1); no (0); plan					1
14.5	yes (1); no (0); plan					plan
15.1	yes (1); no (0); plan	1	1		1	
15.2	yes (1); no (0); plan	1	1	1	1	1
15.3	yes (1); no (0); plan	1	1			1
15.4	yes (1); no (0); plan	1				1
15.5	yes (1); no (0); plan	1	1	1	1	
15.6	yes (1); no (0); plan	1		1	1	1
15.7	yes (1); no (0); plan	1	1	1	1	1
15.8	yes (1); no (0); plan	1	1	1	1	1
15.9	yes (1); no (0); plan	1				1
16.1	yes (1); no (0)		1	1		1
16.2	yes (1); no (0)		0	0		1
16.3	yes (1); no (0)		1	1		0
16.4	yes (1); no (0)		0	1		1
17.1	range [1,3]		3	3		3
17.2	range [1,3]		1	1		2
17.3	range [1,3]		2	3		3
17.4	range [1,3]		3	1		3

Table 14 Results of the interviews with Cases K-O (cont.)

Question #	Possible Responses	CASES				
		CASE K	CASE L	CASE M	CASE N	CASE O
18.1	range [1,3]	3.0	3.0	2.5	3.0	3.0
18.2	range [1,3]	3.0	3.0	3.0	3.0	3.0
18.3	range [1,3]	3.0	3.0	3.0	2.0	3.0
18.4	range [1,3]	3.0	3.0	3.0	2.0	3.0
18.5	range [1,3]	3.0	3.0	2.5	2.0	3.0
18.6	range [1,3]	3.0	3.0	3.0	3.0	3.0
18.7	range [1,3]	3.0	1.0	2.0	1.0	2.0
18.8	range [1,3]	3.0	3.0	3.0	1.0	3.0
18.9	range [1,3]	3.0	2.0	2.0	2.0	3.0
18.10	range [1,3]	3.0	3.0	3.0	1.0	3.0
18.11	range [1,3]	3.0	3.0	2.5	2.0	3.0
18.12	range [1,3]	3.0	3.0	3.0	2.0	3.0
18.13	range [1,3]	3.0	3.0	3.0	2.0	3.0
18.14	range [1,3]					
19.1	range [1,3]	1.0		1.0	1.0	3.0
19.2	range [1,3]	3.0	3.0	2.0	3.0	3.0
19.3	range [1,3]	3.0	3.0	1.0	1.0	2.0
19.4	range [1,3]	1.0	2.0	3.0	1.0	2.0
19.5	range [1,3]	1.0	1.0	1.5	1.0	2.0
19.6	range [1,3]	1.0	1.0	2.0		1.0
19.7	range [1,3]	3.0	1.0	2.0	3.0	3.0
19.8	range [1,3]	1.0	2.0	2.0		1.0
19.9	range [1,3]	1.0		3.0	2.0	3.0
19.11	range [1,3]	1.0	2.0	3.0	3.0	
20.2	range [1,3]	1.0		1.0	2.0	3.0
20.3	range [1,3]	2.0	3.0	2.0	1.0	3.0
20.4	range [1,3]	1.0	1.0	2.5	2.0	1.0
20.5	range [1,3]	3.0	2.0	2.5	3.0	3.0
21.1	range [1,3]	3.0		1.0		
21.2	range [1,3]			2.5		3.0
21.3	range [1,3]		3.0	1.0	3.0	
22.1	range [1,3]	2.0	3.0	3.0	3.0	3.0
22.2	range [1,3]	3.0	2.0	3.0	3.0	3.0
22.3	range [1,3]	3.0	3.0	3.0	3.0	3.0
23.1	range [1,3]	3.0	3.0	3.0	2.0	1.0
24.1	range [1,3]	3.0		1.0	1.0	3.0
24.2	range [1,3]	1.0		3.0	3.0	1.0
24.3	range [1,3]	1.0	3.0	2.0	3.0	1.0
24.4	range [1,3]	1.0		3.0	3.0	2.0
25.1	range [1,3]	3.0	3.0	2.0	3.0	1.0
25.2	range [1,3]	3.0	3.0	3.0	3.0	3.0

Table 15 Results of the interviews with Cases P-T

Question #	Possible Responses	CASES				
		CASE P	CASE Q	CASE R	CASE S	CASE T
3				12	250	
4		HS	AS*	cater.	CB	tourism
6			1		1	
8	internal IS expertise					
8	IS department	1				
8	someone related to IS		1	1	1	1
8	no					
8	I do not know					
9	user	1	1		1	1
9	designer		1			
9	supervisor					
9	all					
9	none			1		1
10	x.25					
10	ISP				1	1
10	Cable Modem		1		1	
10	ISDN					
10	DSL					
10	Leased Lines					
10	ATM					
10	Satellite					
11	yes (1); no (0); plan	1	1	0	1	1
12	yes (1); no (0); plan	1	1	0	1	1
13.1	yes (1); no (0); plan		1	plan	1	1
13.2	yes (1); no (0); plan				1	
13.3	yes (1); no (0); plan					
13.4	yes (1); no (0); plan					
14.1	yes (1); no (0); plan					
14.2	yes (1); no (0); plan	1	1		1	1
14.3	yes (1); no (0); plan				1	1
14.4	yes (1); no (0); plan		1			
14.5	yes (1); no (0); plan				1	
15.1	yes (1); no (0); plan	1	1		1	1
15.2	yes (1); no (0); plan	1	1		1	1
15.3	yes (1); no (0); plan	1	1	1	1	1
15.4	yes (1); no (0); plan	1		1	1	1
15.5	yes (1); no (0); plan	1	1		1	1
15.6	yes (1); no (0); plan		1		1	
15.7	yes (1); no (0); plan	1	1	1	1	1
15.8	yes (1); no (0); plan	1	1	1	1	1
15.9	yes (1); no (0); plan	1			1	
16.1	yes (1); no (0)	1			1	1
16.2	yes (1); no (0)	0			1	1
16.3	yes (1); no (0)	1			1	0
16.4	yes (1); no (0)	1			1	1
17.1	range [1,3]	2			2	2
17.2	range [1,3]	2			1	1

* AS: advertisement services; cater.: industrial catering; CB: corrugated board

Table 15 Results of the interviews with Cases P-T (cont.)

Question #	Possible Responses	CASES				
		CASE P	CASE Q	CASE R	CASE S	CASE T
17.3	range [1,3]	1			3	1
17.4	range [1,3]	1			1	1
18.1	range [1,3]	3.0	2.0	1.0	3.0	2.5
18.2	range [1,3]	3.0	3.0	3.0	3.0	3.0
18.3	range [1,3]	3.0	2.0	3.0	2.0	3.0
18.4	range [1,3]	2.0	2.0	3.0	3.0	3.0
18.5	range [1,3]	3.0	3.0	1.0	2.0	3.0
18.6	range [1,3]	3.0	3.0	2.0	3.0	3.0
18.7	range [1,3]	2.0	1.0	1.0	3.0	2.5
18.8	range [1,3]	2.0	3.0	2.0	3.0	3.0
18.9	range [1,3]	2.0	1.0	2.0	2.0	1.0
18.10	range [1,3]	3.0	2.0		3.0	3.0
18.11	range [1,3]	3.0	1.0		3.0	3.0
18.12	range [1,3]	2.5	3.0		3.0	3.0
18.13	range [1,3]	2.0	2.0	3.0	3.0	3.0
18.14	range [1,3]					
19.1	range [1,3]	1.0	3.0	3.0		1.0
19.2	range [1,3]	2.0	3.0	2.0	3.0	2.0
19.3	range [1,3]	1.0	2.0	3.0	2.0	2.0
19.4	range [1,3]	1.0	1.0		2.0	1.0
19.5	range [1,3]	2.0	1.0	1.0	1.0	1.0
19.6	range [1,3]	2.5		1.0		2.0
19.7	range [1,3]	1.5	2.0	3.0	3.0	3.0
19.8	range [1,3]	1.0	2.0	3.0	1.0	2.0
19.9	range [1,3]	3.0	1.0			
19.11	range [1,3]	1.0			1.0	2.0
20.2	range [1,3]		1.0	3.0	2.0	
20.3	range [1,3]	2.5	3.0	3.0	2.0	3.0
20.4	range [1,3]	1.5	1.0	1.0	1.0	2.0
20.5	range [1,3]	1.5	3.0	3.0	3.0	3.0
21.1	range [1,3]	3.0	3.0			2.5
21.2	range [1,3]	3.0		2.0	3.0	2.0
21.3	range [1,3]	3.0				
22.1	range [1,3]	3.0	2.0	3.0	1.0	1.0
22.2	range [1,3]	3.0	2.0	3.0	1.0	1.0
22.3	range [1,3]	3.0	2.0	3.0	3.0	3.0
23.1	range [1,3]	3.0	3.0	1.0	3.0	1.0
24.1	range [1,3]		2.0	1.0	1.0	
24.2	range [1,3]		1.0	2.0	3.0	
24.3	range [1,3]	1.0	1.0	2.0	3.0	1.0
24.4	range [1,3]	2.0	1.0	2.0	1.0	2.0
25.1	range [1,3]	3.0	1.0	3.0	3.0	3.0
25.2	range [1,3]	3.0	3.0	3.0	3.0	3.0