EVALUATION OF READINESS OF TURKEY FOR E-GOVERNMENT

A THESIS SUBMITTED TO

THE GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES

OF

THE MIDDLE EAST TECHNICAL UNIVERSITY

BY

TUĞBA İDİKAT

IN PARTIAL FULLFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE

IN

THE DEPARTMENT OF INDUSTRIAL ENGINEERING

MAY 2004

Approval of Graduate School of Natural and Applied Sciences

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ABSTRACT

EVALUATION OF READINESS OF TURKEY FOR E-GOVERNMENT

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May 2004, 110 pages

In this study, the current situation of e-government system in Turkey was analyzed, the positive and negative aspects were stated through PEST (Political, Economical, Sociocultural, Technological Factors) Analysis, Critical Success Factors (CSFs) Method and SWOT (Strengths, Weaknesses, Opportunities, Threats) Analysis, e-government indicators of different countries were compared and finally a roadmap was suggested for a successful e-Turkey implementation.

Keywords: E-Government, information society, e-Turkey, e-citizen

ÖZ

TÜRKİYE'NİN E-DEVLETE HAZIRLIĞININ DEĞERLENDİRMESİ

İdikat, Tuğba

Yüksek Lisans, Endüstri Mühendisliği Bölümü

Tez Yöneticisi: Doç. Dr. Tayyar ŞEN

Mayıs 2004, 110 sayfa

Bu çalışmada, Türkiye'deki elektronik devlet sistemi analiz edilmiş, PEST (Politik, Ekonomik, Sosyokültürel ve Teknolojik Faktörler) Analizi, Kritik Başarı Faktörleri (KBF) Metodu ve SWOT (Güçlü Yanlar, Zayıf Yanlar, Fırsatlar, Tehditler) Analizi ile olumlu ve olumsuz unsurlar belirlenmiş, çeşitli ülkelerin elektronik devlet ile ilgili göstergeleri incelenerek bir karşılaştırma yapılmış ve son olarak başarılı bir e-Türkiye uygulaması için bir yol haritası önerilmiştir.

Anahtar Kelimeler: E-Devlet, bilgi toplumu, e-Türkiye, e-vatandaş

To my family...

ACKNOWLEDGEMENTS

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LIST OF ABBREVIATIONS

DSL: Digital Subscriber Line

ECDL: European Computer Driving License

G2B: Government-to-Business

G2C: Government-to-Citizen

G2G: Government-to-Government

IAP: Information Age Partnership

ICT: Information and Communication Technologies

ISP: Internet Service Provider

IT: Information Technology

ITU: International Telecommunication Union

LLU: Local Loop Unbundling

PIAP: Public Internet Access Point

PKI: Public Key Infrastructure

QIZ: Qualified Industrial Zone

SCI: Science Citation Index

SIS: State Institute of Statistics

SME: Small and Medium Enterprise

SPO: State Planning Organization

STAP: Short Term Action Plan

TBD: Turkish Informatics Association

TT: Turk Telekom

UAP: Urgent Action Plan

WIPO: World Intellectual Property Organization

CHAPTER 1

INTRODUCTION

Information is "gateway" to the future. This fact recognized by the world and reflects the need for Information Society, defined as "…is a stage of social development characterized by the capacity of its members (citizens, companies and public administration) to instantly obtain and share any information from any place and in the way chosen" (Telefonica, 2002). This defined stage can only be realized through implementing and exploiting the information and communication technologies in every stage of our everyday lives.

In the Information Society, one should make use of the opportunities that can be provided by the Information and Communication Technologies (ICT). In his three-volume information age analysis (Castells, 1997, 2000a, 2000b), Castells insists that 'we must treat technology seriously', he argues that the ICT revolution is 'at least as major an historical event as was the eighteenth century industrial revolution' (Castells, 2000a, pp. 5, 29). Its product is 'informational society', permeated and structured by ICT (Castells, 2000a, p. 21). In this society, organizational categories, such as city, state and nation, were displaced by 'the unit of network' (Castells, 2000a, p. 214).

Indeed, Castells' conclusion is that 'as an historical trend, dominant functions and processes in the information age are increasingly organized around networks' (Castells, 2000a, p. 500). In emergent informational societies, the paramount organizational form is the 'network enterprise' (Castells, 2000a, Ch. 3).

For governments, the implications are significant. Although they are not deteriorating in the information age, they are finding their dominance and control increasingly compromised, and are learning that to function effectively they must operate within broad networks of authority. 'Governments may retain decision-making capacity, but, having become part of a network of powers and counter powers, they are powerless by themselves' (Castells, 1997, pp. 304–305).

As recognized and clearly stated in the eEurope+ 2003 Action Plan (European Commission, 2001), the accelerated use of information and communication technologies and the advent of the Internet have put very powerful tools within the reach of citizens and governments as well as large and small businesses everywhere. This is resulting in profound changes in the internal organization of governments and business as well as in skill requirements and work organization, in the relationships amongst businesses, trading partners, citizens and governments. These technologies have a considerable impact on the whole of the economy and policies, which govern and encourage their use and implementation, are decisive in the modernization of these economies and contribute to the take-up of new opportunities for employment and inclusion in the new global economy.

The rise of Information Society, the innovations in ICT, and the striking success of electronic commerce (e-commerce) in the past few years have influenced the public sector. Electronic government (e-government) has become the catchword covering many activities and attempts to innovate and modernize the field of public administration (Wimmer, 2002a). Mark Roberti drastically framed the issue: "e-commerce has finally reached the last bastion of inefficiency – the government" (Roberti, 2000).

The main point of this research is; to propose a roadmap according to the current status of Turkey required by the e-government services to attain the objectives stated below:

1. Opportunities of Internet were recognized. As an example, at the European Council held in Lisbon, the Heads of Government and State of the EU-15 set the ambitious goal for Europe for the next decade to become *"the most competitive and dynamic knowledge-based economy in the world"*. To achieve this goal, they all prepared "E-Government Action Plans" and started to implement those. Therefore to be included in the knowledge economy, Turkey shall adopt and implement, actually exploit the use of Information and Communication Technologies (ICT).

2. Citizen is the most important factor for the government, therefore, to increase the social prosperity, to modernize the social services, and to serve the citizens shall be given great severity to fulfill the requirements of not only the present time but also the future, as people want better access to better-quality public services. The United Kingdom Government (UK DTLR, 2002) stated this issue as: *"E-government is about putting citizens ... at the heart of everything we do and building service access, delivery and democratic accountability around them. It is about using technology to break down social exclusion. It is about supporting the transformation of public agencies into more open, accountable bodies, which can enable and encourage citizens to exercise their rights and responsibilities."*

Throughout this research, in the second chapter, the literature survey was performed. In the third chapter, the methodology was defined and the analysis was performed. PEST (Political-Economical-Sociocultural-Technological) analysis was performed for the macro system analysis. To analyze the micro system, a framework constructed by Booz Allen Hamilton, Information Age Partnership (IAP) in UK and INSEAD Business School was used and a number of parameters were analyzed to compare Turkey with other countries. Furthermore, SWOT (Strengths-Weaknesses-Opportunities-Threats) analysis was performed and the critical success factors (CSFs) were defined. Additionally, some current e-government services and applications in Turkey were presented. In the fourth section, the results of the analyses were discussed, and the concluding remarks were stated.

CHAPTER 2

LITERATURE REVIEW

Throughout the 18th and 19th Centuries, the Industrial Revolution has created the Industrial Society. Whereas, the 21st Century is the time for Technological Revolution, or Information Society. We live in the Digital Era, and the rapid technological changes that have transformed the economy and society are now reaching and transforming the government as well (Stratford and Stratford, 2000). The nature of government functioning has been undergoing a rapid transformation due to the impact of technological changes that enabled delivery of services over the Internet. The corresponding issue is "Electronic Government" (e-government).

The Internet has its origin as a part of a U.S. Government research project in the 1970s. In the continuing evolution of Internet the U.S. Government played an undeniable role. Since then, Internet connected tens of millions of users through millions of computers (Kahn, 2001). Now, it is obvious that Internet is playing an important role in the transformation of the government structure.

2.1   DEFINITIONS OF E-GOVERNMENT

A number of definitions for e-government have been offered in the existing literature. Tapscot (Tapscot, 1996) defined e-government as an internetworked government.

Aicholzer and Schmutzer (Aicholzer and Schmutzer, 2000) defined by a more comprehensive view: transformation of the business of governance and transformation of governance itself.

Whitson and Davis (Whitson and Davis, 2001) saw e-government as implementing cost-effective models for citizens, industry, federal employees, and other stakeholders to conduct transactions online.

Wimmer (Wimmer, 2002a) gave a more general definition as the introduction and application of modern Information Technology (IT) in the public sector.

The Global Study of E-government (UN/ASPA, 2001), a recent joint research initiative for global E-government by the United Nations (UN) and the American Society for Public Administration (ASPA), provides a broad definition for E-government:

"E-government includes the use of all information and communication technologies, from fax machines to wireless communication devices, to facilitate the daily administration of government. However, like e-commerce, the popular interpretation of E-government is one that defines it exclusively as an Internet driven activity… to which it may be added "that improves citizen access to government information, services and expertise to ensure citizen participation in, and satisfaction with the government process." … It is a permanent commitment by government to improving the relationship between the private citizen and the public sector through enhanced, cost-effective and efficient delivery of services, information and knowledge. It is the practical realization of the best that government has to offer."

2.2   CATEGORIES OF E-GOVERNMENT

The e-government services can be categorized according to the service areas that have the greatest impact and are of the highest value to the consumers. In general, these can be organized into three categories: Government-to-Citizen, Government-to-Business and Government-to-Government services.

- Government-to-Citizen (G2C) Services: The citizen has a number of relations to the state. These include client, customer, voter, subject (to laws and regulations), claimants, beneficiaries, etc. G2C interactions vary in their level of complexity and in the symmetry of the transaction. In the simplest interaction, citizen may wish to obtain general information form government where secure communication and citizen's identity is not necessary. On a more complex level, citizens may provide information to government by identifying themselves, in which protection of privacy and secured communication in both directions are required.

- Government-to-Business (G2B) Services: Businesses do not vote, but instead, with other relations, they may act as providers to government in instances where government contracts services to businesses or operates in conjunction with them. As with G2C, G2B interactions vary in their level of complexity and in the symmetry of the transaction. The same privacy and security concerns shall apply in this area.

- Government-to-Government (G2G) Services: The relationships between different government institutions may occur at different levels or may even cross from one level to another, like supranational, national, regional and municipal levels. As with the exchanges between government and citizens, e-government exchanges between government agencies may be a

two-way process, where user provides information to trigger the flow of information. In another use, one government agency can provide information for another one to browse.

2.3   STAGES OF E-GOVERNMENT

In a major empirical survey, e-government was divided into five stages as emerging, enhanced, interactive, transactional, and seamless (UN/ASPA, 2001, p. 2).

According to this study, in the emerging stage, a government web presence is established through a few independent official sites. Information is limited, basic and static. During the enhanced e-government, content and information is updated with greater regularity. Government sites increase; information becomes more dynamic. Through the interactive e-government stage, users can download forms, contact officials, interact through the web and make appointments and requests. At the transactional stage of e-government, users can actually pay for services or conduct financial transactions online. Finally, at the seamless e-government, total integration of e-functions and services across administrative and departmental boundaries are established.

Layne and Lee (Layne and Lee, 2001) outlined the developmental stages of e-government as cataloguing, transaction, vertical integration, and horizontal integration. According to their framework, in the cataloguing stage, a departmental presence is established and this stage offers least amount of functionality to the user. Basically, efforts are focused on cataloguing information and presenting it on the web. The transaction stage is the beginning of the e-government; the citizens can be served on-line by being an active respondent. The government efforts consist of

putting on-line interfaces to provide transactional e-services, like paying fines on-line. As the number of e-transaction services increase, governments will be pressed to integrate the systems, which will lead to vertical and horizontal integration in turn. Vertical integration is the integration within the similar functional walls in the different levels of systems, whereas, horizontal integration refers to the to system integration across different functions in that a transaction in one agency can lead to automatic checks against data in other functional agencies.

Moon (Moon, 2002) frames five stages of e-government according to the degree of technical sophistication and interaction with users. First stage is simple information dissemination, second one is two-way communication, third stage is service and financial transactions, and forth stage is vertical and horizontal integration. Up to this stage Moon's framework is somewhat alike to Layne and Lee's outline. Additionally, Moon stated fifth stage as political participation. Stage five involves the promotion of web based political participation, in which government web sites include online voting, online public forums, and online opinion surveys for more direct and wider interaction with the public.

As a summary from the literature review, the stages of e-government can be briefly framed as:

1. Information dissemination and cataloguing stage

2. Interactive and transactional stage

3. Vertical integration stage

4. Horizontal integration stage

5. Political participation and policy making stage

2.4 PERSPECTIVES OF E-GOVERNMENT

It is noted in the literature that most of the existing studies are not empirical but "rhetoric" in nature focusing on the transactional structure of the processes required in the initiatives (Devadoss, Pan and Huang, 2002). This approach allowed for perspectives to be developed based on the different segments of the transaction between the government and citizens or businesses and also within the government's organizational structure itself.

The early literature and government efforts are generally administration-focused. As stated by Moon and Hinnant (Moon and Hinnant, 2001), during the 1990s, e-government became a significant component of many attempts to reform government operations, and like many other managerial practices and reforms in public organizations e-government followed private sector adoption of so-called e-commerce and e-business. To take advantages of this new era, the governments have concentrated on putting up a web page (Seavey, 1996) and the researchers were discussing the problems of providing services through the electronic medium (Duncan, 1996; Grimley, 1997; Stierholz, 1996). The main focus was internal and managerial.

However, later on, this administrative-focus has shifted to customer-focus to serve citizens and businesses by providing services, information and transactions on-line through Internet (Stratford and Stratford, 2000; Carmine and Shi. 1999; Sonal J. 1999).

It is obvious that e-government have many aspects from the views of citizens, businesses, and government itself. Therefore, many researchers have studied this phenomenon from different perspectives.

In particular, according to Lenk and Traunmuller (Lenk and Traunmuller, 2000), e-government initiatives can be understood from the e-business, citizen, knowledge, process and co-operation perspectives. Wimmer (Wimmer, 2002b) has additionally specified the organizational, legal, and cultural, societal, and political perspectives to the above stated ones.

The e-business perspective considers the use and deployment of information and communication technologies (ICT) to enhance functioning of the government (Schubert and Hausler, 2001). The impact of e-business on the public sector is the source of the transformation of the government towards electronic government (Wimmer, Traunmuller and Lenk, 2001). The deployment of e-commerce technologies can serve to successfully increase citizens' access to information, and improve functioning of the government (Csetenyi, 2000). Simply, studies that adopt this perspective took the definition of e-government to becoming electronic commerce within the government framework as pointed out by Stratford and Stratford (Stratford and Stratford, 2000).

The citizen perspective describes the end user perspective in the e-government. In a Government to Citizen (G2C) initiative, for example, the citizen acceptance of the electronic service delivery defines the success of the initiative. The need to address the concerns of the citizens and provide a safe, easy, accessible transaction is recognized in this perspective. The discussion covers the delivery mode and the concerns in accessing electronic services (Lenk and Traunmuller, 2000). A greater discussion is on accessing electronic services and the problems in providing services solely through the electronic medium (Bucy, 2000; Duncan, 1996; Grimley, 1997; Lan and Falcone, 1997; Laskowski, 2000; McConnell 1996, Shuler, 1996; Stierholz, 1996). In a way, much of the literature suggests using the electronic medium along with the traditional media to provide government services, thus addressing the digital

divides partly. Additionally, Wimmer (Wimmer, 2002b), suggested to better serve the users, electronic public services have to be developed in strong relation with the specific target groups such as public servants at one-stop service encounters, intermediaries (notaries, architects, lawyers, tax consultants), students, unemployed, families, pensioners, accounting staff of companies, etc.

The knowledge perspective recognizes workers as a source of knowledge in their respective roles. While redesigning the transactions to the e-government, these workers' knowledge should be adequately utilized ensuring a prevention of knowledge loss. This provides for the continuation of the knowledge that was accumulated over time (Lenk and Traunmuller, 2000). A critical issue discussed by Wimmer and Traunmuller (Wimmer, Traunmuller, 2000) involved adequate mapping of domain knowledge to the virtual workspace.

The process perspective talks about the utilization of IT to enhance the service delivery efficiency (Kraemer and Dedrick, 1997; Lenk and Traunmuller, 2000; Watson and Mundy, 2001). In redesigning organizations, the processes have been aided by the workflow management systems. The other spectrum of the process coordination is collaboration, which is discussed in the cooperation perspective. Redesigning the processes will lead to a rethinking of the government and of its working. Lenk and Traunmuller (Lenk and Traunmuller, 2000) pointed out that the challenge lies in the ability to fundamentally redesign the interaction between public administration and citizens (including commercial firms), which is coupled with a reorganization of the business processes within the public administration.

The co-operation perspective deals with the interaction of the various agencies and trading partners involved in a work process. In particular, according to Lenk and Traunmuller (Lenk and Traunmuller, 2000), in the initial stage of any e-government

project, having a co-operation perspective would be useful as it provides a holistic view, focusing on the support of computer-mediated co-operation in a comprehensive sense. Often, in the early stage of any e-government project, most independent agencies need to integrate themselves in the process requiring possibly, a change in technology, re-engineering of the process, new job functions, and re-training for the new functions to be performed. Hence a clear understanding of their respective organizational roles is required for a successful interaction of the various organizations in delivery of services (Devadoss, Pan and Huang, 2002). As stated by Wimmer (Wimmer, 2002b), co-operative and shared architectures and infrastructures are needed to avoid lack of skilled resources and to lower investment and maintenance costs.

According to Wimmer (Wimmer, 2002b), introducing IT to the public sector strongly impacts organizational structures. Hence, organizational change needs to be carefully implemented. Old established, strictly hierarchical, tedious and bureaucratic structures have to be replaced by horizontal network structures, one-stop Government, and more efficient organizational work structures facilitating the service- and customer-orientation as well as transparency. An adaptation, training and relocation of human resources to minimize the negative impact of the introduction of new technologies and more efficient labor schemes are required.

From the legal perspective, Wimmer (Wimmer, 2002b) suggests government activity to be strongly regulated and driven by legal frameworks including national constitutions. With the use of modern IT and communication facilities, electronic public service provision and delivery require the adaptation of laws to make electronic government solutions legally binding. The use of expert systems in helping public servants taking their decisions based on complex laws and regulations has to be addressed properly.

Finally, Wimmer (Wimmer, 2002b) stated that e-government is strongly shaped and driven by social, cultural and political factors on local, regional, national and supra-national (e.g. European) levels. Developments have to respect and enable these influences, which not only bear obstacles and hindrances towards a unique solution, but also bear huge potentials for individualism, dynamism and creativity.

As pointed out by Wimmer (Wimmer, 2002b), it is important to investigate, specify and relate all the perspectives with the others for a holistic approach, which was indented to act so through out this research.

2.5   BENEFITS OF E-GOVERNMENT

There are a number of reasons to consider implementing e-government. The following benefits were pointed out from the literature reviewed:

- A transparent government (Turkey Informatics Council, 2002).

- Improved and streamlined services with speed and convenience (O'Neill, 2000; Jordan E-Government Plan, 2000; Jenkins, 2002; Wyld and Settoon, 2002; OECD Policy Brief, 2003).

- Expanded service capability to 24x7 (twenty-four hours a day / seven days a week), at any time, at anywhere (Turkey Informatics Council, 2002).

- Realized efficiency gains, reduced human related errors and reduced unnecessary duplication of information by integrating databases and networking web sites and other gateways (Jordan E-government Plan 2000; Wyld and Settoon, 2002).

- Timesaving and more useful and useable information (Whitson and Davis, 2001).

- Cost savings, improved efficiency (Jordan E-government Plan 2000; Al-Kibsi et al, 2001; Wyld and Settoon, 2002).

- Increased satisfaction, better public decision-making, more responsive government (Al-Kibsi et al, 2001).

- Improved life standards, happy and informed citizenship (O'Neill, 2000).

- Can help build trust between governments and citizens (Turkey Informatics Council Report, 2002; OECD Policy Brief, 2003).

2.6 CHALLENGES OF E-GOVERNMENT

Although, e-government may have many promises, there are also challenges. The review of literature suggests that implementing e-government projects can be complicated and difficult. Whereas, for e-government implementation projects will have different stages, these stages will have different technical, organizational and social challenges. According to the stages simply framed in Section 2.3, these challenges can be outlined as follows:

In the first stage of "information dissemination and cataloguing" stage: From the technical point of view, the maintenance of information is important. Along with procedural and policy changes, web sites need to be maintained and some data presented on the web sites may be temporal (Layne and Lee, 2001). Responsibility assignments for maintenance of the web site and also for overall coordination and planning can be listed as organizational challenges. On the other hand, different

departments require different amounts of on-line presence and demand resources allocated to them. Resource allocation in a political organization is always a problematic issue (Layne and Lee, 2001). Finally, ensuring uniform service to the public is another issue that should be in consideration (US GAO, 2001).

In the "interaction and transaction" stage: Restructuring administrative functions and processes came into scene. As technical issues, old systems need to be integrated into new internet based platform (O'Neill, 2000), authentication/security and confidentiality/privacy issues shall be resolved (O'Neill, 2000; Layne and Lee, 2001; US GAO, 2001), management of financial transactions, delivery of integrated services, and electronic records can be listed. From organizational point, transforming the culture and resistance to new way of working are important. Also, the training of staff is required (O'Neill, 2000). In this stage the customer satisfaction shall be measured and monitored (Aicholzer and Schmutzer, 2000; O'Neill, 2000). Economic, socio-cultural and educational barriers for individual access shall be resolved (UNDP Essentials, 2001).

In the third stage, "vertical integration": Communication and integration oriented technologies become important. Format compatibility, exposure levels of internal legacy system are issues to consider (Layne and Lee, 2001). When integrating the governmental levels, boundaries become less distinguishable. The coordination and cooperation within the public organization is required (Aicholzer and Schmutzer, 2000). At different levels, flexibility is required in the development of databases that meet not only their needs and agencies become less proprietary about their information (Layne and Lee, 2001).

In the "horizontal integration" stage: Technically, integration of heterogeneous databases and resolving conflicting system requirements across different functions

and agencies are major barriers (Layne and Lee, 2001). Organizationally, when thinking in terms of information needs or transactions, many directors perceive their department as most important and disregard other agencies. Socially, it is important that the citizen does not perceive horizontal integration as the beginning of electronic data collection about the individual (Blanchette and Johnson, 1998).

In the "political participation and policy making" stage: Awareness building across all levels of society is required (UNDP Essentials, 2001). Actually, the benefits and impacts of applying technology in the opening up the policy making process to wider public input have not yet to be evaluated. At this stage all the issues shall be resolved.

Besides these challenges related to the development stages of e-government, there are some other ones that apply to all. Sustaining committed leadership, maintaining a customer/citizen focus, and overcoming the budgetary problems can be counted in this context. As Robert Denhardt (Denhardt, 1999) remarked:

"In our view, these emerging trends will turn public management both inside out and upside down. Public management will be turned inside out as the largely internal focus of management in the past is replaced by an external focus, specifically a focus on citizens and citizenship. Public management will be turned upside-down as the traditional top-down orientation of the field is replaced—not necessarily by a bottom up approach, but by a system of shared leadership."

CHAPTER 3

METHODOLOGY AND ANALYSIS

In this research, PEST (Political, Economical, Sociocultural and Technological) Analysis was used to perform a macro analysis of the system in general, namely e-government. Afterwards, the important issues to consider for the micro system were analyzed with the help of the framework constructed by Booz Allen Hamilton, IAP and INSEAD. SWOT (Strengths, Weaknesses, Opportunities and Threats) Analysis was carried out and the Critical Success Factors (CSFs) method was employed to define the important issues to consider and their performance measures.

Throughout the analysis process the related data were taken from International Telecommunication Union (ITU), Organization for Economic Co-operation and Development (OECD), United Nations (UN) and State Institute of Statistics (SIS) to ensure that the data is consistent and reliable. Additionally, Accenture, Turk Telekom, Turkish Informatics Association (TBD) Reports and Turkish National Information Infrastructure Master Plan (TUENA) were used to acquire the data. Data and information published on the Internet and technical magazines were also used to further enrich the data.

3.1 PEST ANALYSIS

3.1.1 Political Factors

The countries realized that e-government is a tool for economic growth and national competitiveness. Therefore, there is an ongoing competition between the countries for leadership in ICT in accordance with their economic policies (Hopkirk, 2002). They are transforming the philosophy and organization of the government (Ho, 2002).

With the use of modern IT and communication facilities, electronic public service provision and delivery require adoption of laws to make e-government solutions legally binding (Wimmer, 2002b). Therefore, the property laws, regulatory and legal framework, telecommunication policies and other related issues should be solved (KPMG, 2002; Chen and Wellman, 2003; Hopkirk, 2002).

Enabling nature of legal and regulatory environment for authentication, rights protection, content and liability of distributors and privacy shall be considered as important issues. Telecom regulations shall be established in a way that favoring broadband availability which results in use by and awareness building of the general public. Electronic authentication to recognize e-signatures and documents were put in place among many EU and G7 countries. Most governments signed and implemented the World Intellectual Property Organization (WIPO) Treaties related to rights protection or have an equivalent legislation in effect. ISPs are not obliged to know all the content they are hosting, rather they are at fault if they have been notified of the illegal content and failed to act on it. For privacy issues, EU countries are bound to "EU Data Protection Directive" ensuring privacy protection.

E-government initiatives enable more efficient management system and service; also enhance transparency, citizen outreach and participation (UNDP Essentials, 2001; OECD Policy Brief, 2003). To reach the intended level, government effort and stability (KPMG, 2002; Hopkirk, 2002), continual top management support and involvement (Chen and Gant 2001) are considered as important political issues.

Strong leadership shall be visible for establishing an overall strategy, setting up a dedicated organization and providing resources and funding. Setting up a dedicated organization within some budgetary influence enables easier implementation of the e-agenda (e.g. US, Canada). Stakeholder engagement through high-level forums with top businessmen from ICT industries, prominent professors and Non-Governmental Organizations (NGOs) shall be established for an effective public-private partnership (e.g. Japan, US, France, Germany).

Political corruption is also important, as it is a barrier for foreign investment to the country, and can be a support for large scale IT projects (Transparency International, 2003).

Finally, countries are involved in some international groups like EU, OECD and G7; therefore the developments in some countries may affect and make some implications to the other countries involved.

3.1.2 Economical Factors

With the use of ICT in government, a significant economic growth and national competitiveness can be created (UNDP Essentials, 2001; OECD Policy Brief, 2003; Hopkirk, 2002). A sound economy could encourage international IT firms to invest in the country (KPMG, 2002). Local and foreign investment (Hopkirk, 2002), socio-economic status and cost of connectivity (Chen and Wellman, 2003) are important

factors. The correlation between Gross Domestic Product (GDP) per capita and Internet activity is also proved to be close (KPMG, 2002, UN/ASPA, 2001; Holliday, 2002).

Cost of Internet access and access devices is an important factor boosting usage (Booz Allen Hamilton, IAP, INSEAD, 2002). The competition in the telecommunication sector can drive down the access costs. To support the penetration of access devices there are some tax incentives given to the employees and firms who want to purchase a PC (e.g. France, Sweden, US).

Government encouraging venture investing by offering legal and financial support can be seen in US through targeted tax credits and loan guarantees. Besides these, the economic and technologic conditions of a country also play roles for the financing. For the countries that are leaders in technology (e.g. Japan, Sweden) can attract high amounts of overseas investment as these provide a good test markets for global ICT firms and well-educated brainpool (Booz Allen Hamilton, IAP, INSEAD, 2002).

For embedding ICT into education to reduce the digital divide and to eliminate the IT skills shortage, considerable resources have been put behind (typically 200-400 Million Euro annually) by the G7 countries, Sweden and Australia (Booz Allen Hamilton, IAP, INSEAD, 2002).

3.1.3 Socio-Cultural Factors

Technological innovations and rapid development of e-commerce in private sector created an expectation among citizens for better delivery of services from government (Devadoss, Pan and Huang, 2002). ICT and Internet became a part of everyday life, changing the life style from "in-line" to "on-line" (Hopkirk, 2002).

Additionally, the increased attitude towards flexible working hours and more leisure time resulted in the issue of "teleworking" (Hopkirk, 2002).

The education level (UN/ASPA, 2001; Chen and Wellman, 2003; Hopkirk, 2002), consumer demand for connectivity (KPMG, 2002; Accenture, September 2002), gender, age, and geographic location (Chen and Wellman, 2003; Hopkirk, 2002) are related with Internet usage. Furthermore, IT skills and confidence in these skills, trust in medium, awareness of benefits, interest, comfort in cost and penetration of access devices can be listed as main requirements of the citizens to participate in e-government (Booz Allen Hamilton, IAP, INSEAD, 2002).

For building skills and confidence, target groups were given priority instead of trying to train all. France has a campaign to train elderly and unemployed, Germany trains women through its "Women to the Net" campaign, Japan has specified teachers as target group.

For building trust in medium, a legislative approach was shown in UK, US and Sweden through protection acts.

Governments developed networks of Public Internet Access Points (PIAPs). There also exist direct marketing campaigns through TV (e.g. UK: UK Online) to get the citizens online. Italy put the core services (e.g. tax filing) online for encouraging usage.

Ownership of plastic payment cards for payments is another factor for enabling use of online transaction services (Booz Allen Hamilton, IAP, INSEAD, 2002).

3.1.4 Technological Factors

The continuous development and innovation in ICT, computer systems and products enable new services (KPMG, 2002; Devadoss, Pan and Huang, 2002; UNDP Essentials, 2001; Hopkirk, 2002). Additionally, the Internet usage is growing very fast (Ho, 2002). These developments and innovations along with increased user expectations enable more computational speed and power at lower prices and also network at higher speed and capacity (Hopkirk, 2002).

The technological factors that should be considered can be listed as: infrastructure, connectivity, transmission speed, interoperability (KPMG, 2002; Chen and Wellman, 2003), standardization and integration of systems (Wimmer, 2002b), appropriate IT capability and R&D expenditure of government (Chen and Gant, 2001), security and safety issues (Devadoss, Pan and Huang, 2002; Hopkirk, 2002).

PC penetration in households and in government is an important indicator of system readiness to participate in and to implement the e-services (Booz Allen Hamilton, IAP, INSEAD, 2002). In Sweden, companies receive a tax relief for the purchase of computers that they then offer to their staff to buy tax-free and keep it at home. In France, there was a Public Internet Access Points (PIAPs) Programme to develop 7,000 PIAPs by 2003.

Most countries laid out standards in order to coordinate e-government efforts. France, Germany (SAGA) and UK (eGIF) put mandatory interoperability frameworks in place.

Security in government interactions is crucial for providing an effective channel. UK, Canada, Sweden and US have enabled a "Gateway", Japan established a "PKI" and Italy enabled "Smart Card" technology to provide secure e-government services. The

common trend is a one-stop, single government portal with a user-centric approach (e.g. UK: UK Online Portal, Australia: Government of Australia Portal, Canada: Government of Canada Portal, US: FirstGov Portal).

Back office and front office developments in a coordinated manner are also another focus point. Germany ensured the platform for service delivery before putting the services online. In UK, back office platforms like UK Online Portal and Government Gateway have been stressed as much as front office service delivery (Booz Allen Hamilton, IAP, INSEAD, 2002).

Quality and security of an infrastructure are important to stimulate user experience and confidence. Countries where alternative infrastructures exist (e.g. cable and DSL) have stronger infrastructure environments as this enhances competition (Booz Allen Hamilton, IAP, INSEAD, 2002).

The approach for infrastructure spreading differs across countries. Nations such as UK, pursuing a policy of market lead infrastructure-spreading face the challenge of extensive rollout. Unfortunately, rural areas remain uneconomic to wire up. On the other hand, nations such as Germany, which promote an extensive spread through co-operative approach between government and incumbent, see less price competition. The government shall do the trade off whether to prioritize extensiveness or to prioritize competitiveness. Governments of G7, Sweden and Australia have set up a framework for local loop unbundling (LLU), line sharing and interconnection to foster competition in broadband.

3.2   E-GOVERNMENT SYSTEM

There are many global researches and benchmarking studies for e-government.

The American Society for Public Administration (ASPA) and the United Nations Division for Public Economics and Public Administration (UNDPEPA) of the United Nations Department of Economic and Social Affairs (UNDESA) defined an "E-Government Index" to identify, underscore and weight the importance of the requisite conditions which enable a country to sustain an e-government environment that ensures every segment of its population has unconstrained access to timely, useful and relevant information and services. According to the 2001 assessment, among the 191 countries, the first five countries were USA, Australia, New Zealand, Singapore and Norway, respectively. Turkey was ranked as 43rd in this study.

UNDESA performed another similar study in 2003 to assess the world public sector and defined a "Global E-government Readiness Index". According to this assessment, the first five countries were respectively USA, Sweden, Australia, Denmark and United Kingdom. Turkey was ranked 49th among 191 countries.

World Economic Forum, INSEAD and World Bank defined "The Networked Readiness Index" (NRI) as a nation's or community's degree of preparation to participate in and benefit from ICT. Turkey's NRI rank was stated as 56th out of 102 countries for 2003-2004. The first five countries according to NRI were found out as; USA, Singapore, Finland, Sweden and Denmark, respectively (World Economic Forum, Global Information Technology Report, 2003).

The Global Information Technology Economy Index (GITEI) ranked 48 nations according to 6 main categories and 33 sub-categories. The main categories were; knowledge jobs, globalization, enterprise dynamism and competition, transformation
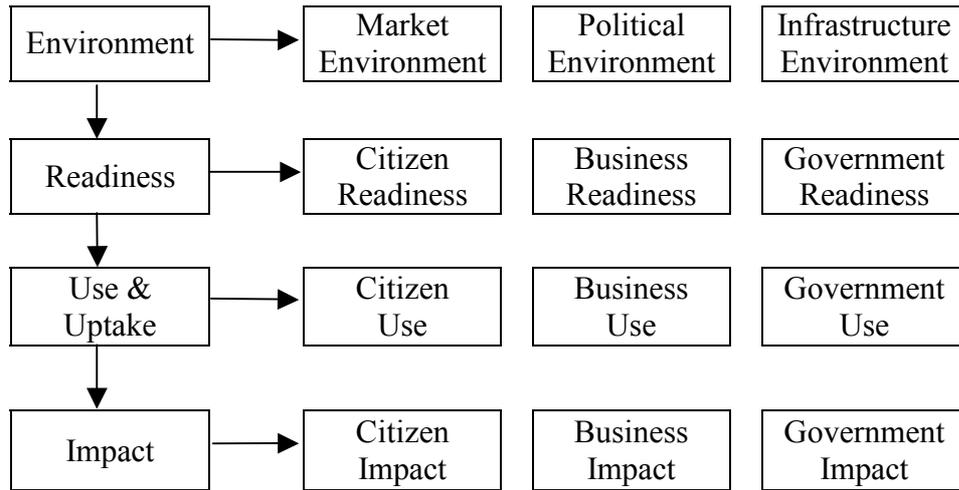
to a digital economy, technological innovation capacity and lastly, visionary government. In the 2003, first five countries were Singapore, Finland, USA, Hong Kong and Netherlands. Turkey was 40th country out of 48 countries.

The overall performance can be seen from these global studies and it is obvious that Turkey shall take action before it becomes too late. The building blocks for this total effect shall be examined and assessed to close the gaps and to find the problematic issues. Therefore, to identify a roadmap for e-Turkey, first of all, the current state shall be analyzed to identify the weaknesses and strengths and also to consider opportunities and treats. This analysis was performed by means of the framework constructed by Booz Allen Hamilton, IAP and INSEAD to analyze the e-economy.

This stated framework has four indices namely Environment, Readiness, Use and Uptake, and Impact. Three major stakeholder groups were assessed which were citizens, businesses and government. "Environment" describes the fertility of the environment for e-government, "Readiness" describes the ability of country's citizens, businesses and government to capitalize on the opportunities that a strong environment brings, "Uptake and Use" describes the uptake of online services and also the volume and sophistication of use, "Impact" describes the degree to which adoption of online services has changed the behaviors of the stakeholders.

The sub-indices defined under "Environment" are Market Environment, Political Environment and Infrastructure Environment. "Market Environment" describes the presence of the right people, skills and supporting businesses for knowledge based society. "Political Environment" describes the extent to which the policy and regulatory environment promotes the growth of Internet adoption and e-government. "Infrastructure Environment" describes the level of availability and quality of the key access infrastructure to support e-government. "Readiness", "Uptake and Use" and

"Impact" indices were analyzed for each stakeholder group: citizens, businesses and government. This framework was given in Figure 3-1.

Environment	→ Market Environment	Political Environment	Infrastructure Environment
Readiness	→ Citizen Readiness	Business Readiness	Government Readiness
Use & Uptake	→ Citizen Use	Business Use	Government Use
Impact	→ Citizen Impact	Business Impact	Government Impact

Source: Booz Allen Hamilton, IAP, INSEAD, 2002

Figure 3-1 Framework for E-Government System Analysis

3.2.1   Market Environment

The contributing factors for a strong market environment can be listed as IT literacy, supporting ICT industry, innovation culture and capability, and low cost of access.

In Turkey in school year 2000-2001, there were 58,873 schools, 16,090,785 students and 578,805 teachers (SIS Education and Culture Statistics). The number of PC per 100 pupils in 2001 was 0.81 as stated in the Turkish Informatics Council Report. This number was 13 in UK, 20 in Sweden and 3 in Italy for year 2000 (Booz Allen Hamilton, IAP, INSEAD, 2002). The number of secondary schools connected to Internet was 98% in UK, 87% in Sweden, 81% in Germany (Booz Allen Hamilton,

IAP, INSEAD, 2002). Ministry of Education is planning to connect 30% of the school to the Internet through broadband in year 2004, and 70% by the year 2005 (Ministry of Education, 2004).

The number of graduates in ICT related fields indicate the level of skilled ICT professionals entering the workforce. The related data for Turkey and some other countries were given in Table 3-1.

Table 3-1 Percentage of Graduates in Mathematics and Computer Sciences

Country	Total %
TR	**3.6**
Finland	3.6
Germany	4.8
Sweden	4.1
Australia	5.6
UK	6.4
OECD Average	4.3

Source: OECD, Education at a Glance 2003

The percentage of IT trained secondary school teachers were given as 67% (Ministry of Education, 2002). This statistic was 90% in Canada, 86% in UK, 52% in Germany, and 23% in Sweden (Booz Allen Hamilton, IAP, INSEAD, 2002).

The percentage of ICT employment in business sector employment was shown in Table 3-2.

Table 3-2 Share of ICT Employment in Total Employment

Country	Share (%)
TR*	**1.7**
Finland**	10.9
Sweden**	9.0
UK**	8.1
Australia**	5.4
OECD Average**	6.4

*Data for year 1999
**Data for year 2000
Source: OECD, ICT Sector Statistics

Additionally, researchers per 10,000-labor force were 8.6 in Turkey according to OECD Science, Technology and Industry Scoreboard 2003. This specified number was 21.69 in OECD countries, 25.63 in EU countries and 59.26 in Finland.

A supporting ICT industry contributes to support the knowledge-based society. The data related with ICT investment to the sector were presented in Table 3-3.

Table 3-3 Investment in ICT

Investment	Country	
	TR	OECD Average
Public telecommunication investment as a % of revenue	6.1	23.1
Public telecommunication investment as a % of gross fixed capital formation	1.37	3.64
Public telecommunication investment per access path (USD PPP)	9.67	156.43
Public telecommunication investment per capita (USD PPP)	5.27	169.23

Source: OECD, Communications Outlook, 2003

The ICT expenditure per GDP gives an idea about the value added to the ICT industry. The related data were given in Table 3-4.

Table 3-4 ICT Expenditures/GDP

Country	*Ratio*
TR	**1.9**
Finland	7.2
UK	13.2
Germany	17.8
EU Average	14.8

Source: 2002 European Innovation Scoreboard

In Turkey, when the year 2000 numbers were considered, the investment and expenditure in ICT sector per capita was approximately 55 Euro. This number was 514 Euro in Western Europe and 1157 Euro in the US. The improvement and development speed in Turkey was just above 20% for 2000 (Turkey Informatics Council Report, 2002), but to close the gap between Turkey and the developed countries, this development speed shall be accelerated.

High level of innovation and support for innovation can be considered contributing factors for a strong market environment. In this context, the indicative statistics point out the innovation capability and culture were R&D investment and number of patent applications.

The number of patent applications per million population to EU Patent Office in year 1999 was given in Table 3-5. Turkey has the least number of applications among the EU and OECD countries.

Table 3-5 Number of Patent Applications per Million Population

Country	*Ratio*
TR	**0.3**
UK	93.8
Germany	248.5
Finland	264.6
OECD Average	88.4
EU Average	125.0

Source: OECD Science and Technology Scoreboard 2003

Scientific publications are the major output of scientific research and are frequently used to measure stocks and flows in the world knowledge base. Scientific publications per million population (1999) were 42 in Turkey as stated in the National Science Foundation, Science and Engineering Indicators Report 2002. This indicator was 402 in OECD, 462 in EU and 979 in Switzerland. According to the Science Citation Index (SCI), Turkey was 22nd country with 9303 scientific publications in 2002 (Göker, 2003).

The Global Innovation Index produced by the Council on Competitiveness (USA) ranked the countries to determine the capacity for innovation. For year 2003, the first 5 countries ranked respectively were, USA, Sweden, Finland, Japan and Switzerland. Turkey was ranked as 28th country out of 29 countries.

R&D intensity as a percentage of Gross Domestic Product (GDP) in Turkey was 0.64 (2000) as stated in the OECD Science, Technology and Industry Scoreboard 2003. This percentage was 1.93 in EU (2001), 2.33 in OECD (2001), 3.09 in Japan, 4.27 in Sweden. As brought out in this scoreboard, during the second half of the 1990s, R&D expenditure grew fastest in Iceland, Turkey, Mexico, and Greece, all of which

had average annual growth rates above 12%. This growth was 4.7 in OECD, 5.4 in US and 3.7 in EU.

The R&D expenditure per capita was 962.8 $ in US, 776.5 $ in Japan, 536.7 in OECD Countries, 460.9 $ in EU, 403.6 $ in Korea and 39.2 $ in Turkey as stated in the OECD Statistics, 2002.

The R&D expenditure sources of financing as a percentage share of national total were tabulated in Table 3-6. As can be seen from this table, the source of R&D in developed countries were mainly from private sector and varying between 56 percent and 73 percent. This percentage is 43 in Turkey with year 2000 numbers. The percentage was 24 in year 1995. This increase has accomplished when the law of "R&D Support Resolution to the Business Enterprises" was put into legislation in June 1995.

Table 3-6 R&D Expenditures by Source of Financing

Country	*Business Enterprise (% Share)*	*Other (other national sources + abroad (% Share)*	*Government (% Share)*
Turkey	**43**	**6**	**51**
EU	56	9	35
OECD	64	8	29
US	68	5	27
Korea	72	3	25
Japan	73	9	18

Source: OECD, MSTI Database (May 2003)

The low cost of access accelerates the use and uptake of Internet and affects and the low cost of access devices affects the penetration rates.

Costs of connection in Turkey for unlimited Internet option for one month were given in Table 3-7.

Table 3-7 Connection Costs of ISPs in Turkey

ISP	*Cost (Million TL)*
TTNet (Dial up modem, 56kbps)*	9.5
Superonline (Dial up modem, 56kbps)*	18.9
E-Kolay (Dial up modem, 56kbps)*	15
İsNet (Dial up modem, 56kbps)*	15
TRNet (Dial up modem, 56kbps)*	13
Webbee (Dial up modem, 56kbps)*	14
KabloNet (Cable Connection)*	61-377
Turk Telekom (ADSL, 60-2048 kbps)**	60-465

Source: *CHIP Magazine, January 2004
**Turk Telekom, January 2004

Internet access prices and Internet hosts per 1,000 inhabitants for Turkey and some other countries were given in Table 3-8.

Table 3-8 Internet access prices and Internet Hosts per 1,000 Inhabitants

Country	*Average price for 20 hours internet access (USD PPP)*	*Internet hosts per 1,000 inhabitants*
OECD	56.4	100.6
Turkey	**54.1**	**3.6**
UK	49.7	69.4
Sweden	36.9	176.7
Finland	30.9	182.9
United States	31.7	272.8

Source: OECD Telecommunications Database, 2003

As pointed out in the OECD Science, Technology and Industry Scoreboard 2003, increased competition in the telecommunications industry has been driving down the cost of Internet access. Prices of leased lines, which provide the infrastructure for business-to-business electronic commerce, have fallen significantly, particularly since 1998, through the liberalization in Europe's communication sector. Competition was not yet strong in all markets. The Nordic countries have the lowest charges for leased lines, at about one-fifth of the OECD average. At the other end of the spectrum, the charge in the Czech Republic was more than twice the OECD average. The prices of national leased line charges (charges for some of national leased lines of 2 megabits per second, August 2002) were tabulated in Table 3-9.

Table 3-9 Price of National Leased Line Charges

Country	*Index (2 Mbit/s)*
Czech Republic	256
Japan	147
Australia	129
Canada	121
OECD	100
Turkey	**96**
United States	62
Germany	58
Finland	19
Iceland	17

Source: OECD Communications Outlook 2003

Prices for ordinary consumers also differ substantially across countries. For a dial-up Internet connection, they must often pay a fixed telephone charge, a telephone usage charge and an Internet service provider charge. The ratio of these charges differs

considerably among countries. The total cost for 40 hours of Internet access at peak times also differs noticeably. The rates including VAT in US Dollars were tabulated in Table 3-10 for 40 hours at daytime rates.

Table 3-10 Internet Access Rates for Ordinary Consumers

Country	*Fixed Telephone Charge*	*Telephone Usage Charge*	*ISP Charge*	*Total*
Czech Republic	19.7	136.4	0.0	156.1
Sweden	12.5	57.2	2.4	72.1
EU	16.5	36.7	13.1	66.3
OECD	15.9	34.7	13.6	64.2
Japan	10.9	26.0	12.2	49.1
Turkey	**8.5**	**34.0**	**6.4**	**48.9**
Finland	11.2	25.9	0.0	37.1
United States	12.6	4.7	18.6	35.9
France	13.5	0.0	20.8	34.3
Canada	15.6	0.0	15.7	31.3

Source: OECD Telecommunications Database, 2003

3.2.2   Political Environment

The contributing factors for a strong political environment can be listed as strong level of political leadership and the enabling nature of legal and regulatory environment.

For the first time in decades, Turkey has a one-party government, which indicates well for political stability and has the ability to pursue reforms effectively, in contrast to unstable coalition governments of the past. Furthermore, economic policies have

improved markedly since the last crisis in year 1997, while the breadth and depth of recent political reforms have been remarkable. The EU has acknowledged Turkey's progress in both political and economic spheres, and is now looking for steady implementation of such reforms.

In the beginning of 2002, under the coordination of TUBİTAK, the "Vision 2023 Project" was started with an objective of formulation of new science and technology policies and setting priority areas for the next decades to create a prosperous society and an economy that are based on innovation by 2023 (100th Anniversary of Turkish Republic). A steering committee was established with public and private organizations, universities and NGOs under the coordination of TUBİTAK. The decision body is Supreme Council of Science and Technology. There are four sub-projects under "Vision 2023 Project": National Technology Foresight Project, Technological Capabilities Project, Researchers Inventory Project and National R&D Infrastructure Project.

In 8th 5 Year Economical Development Plan of Turkey prepared by the SPO for years 2000 to 2005, investments in public reform and technology infrastructure, ICT and R&D studies were given high priority and to be supported to improve science and technology capability of the country. There are a number of legislative acts and regulations in favor of innovation through postponement of corporate tax not exceeding total R&D expenses, supporting R&D and venture capital, establishing technology development regions in cooperation with universities and research centers to provide infrastructure required to facilitate technological innovation.

In year 2002, the allocated resource on ICT projects were 426 Trillion TL, in year 2003, allocated resource was decreased to approximately one forth of the previous year's total and was 112 Trillion TL. In year 2004 Programme, the priority was given

to ICT projects and the e-Turkey Project with the Prime Minister's circular issued on the Official Gazette dated 31st July 2003.

The leading countries in e-government (USA, Canada and Australia) have all selected leaders for their e-government initiatives from the private sector and the citizen was at the center of the e-government vision (Accenture, April 2002).

E-government initiatives of the leading countries were focused on delivering integrated online services around citizens' needs and priorities. As stated in the report of Accenture, "Governments are learning that transformation comes not from moving services online, but from redesigning the organization to put the citizen at the center" (Accenture, April 2002).

According to a level chart constructed by Booz Allen Hamilton (Booz Allen Hamilton, IAP, INSEAD, 2002), level of sophistication can be scored. These levels, the corresponding criteria and the levels benchmarked countries through their analysis were provided in Table 3-11.

Table 3-11 Level Chart for Political Leadership

Level 1	Level 2	Level 3	Level 4	Level 5
- Government has articulated a vision for e-government - Delivery strategies with accountable government departments are not in place - No clear targets set	- Clear vision targets set - Clear strategies rippling through each level of government - Delivery responsibility is with existing agencies / departments - Unclear implementation plans	- Clear vision, strategies and targets - Funds allocated, implementation in motion - Action is driven by existing government departments or a dedicated organization	- Established dedicated organization driving / coordinating overall effort - Organization has demonstrated "teeth" and influence - Measures of progress are in place and progress tracked	- Strong dedicated organization - Senior government figures actively champion issue - Significant demonstrated impact
	France, Sweden	Italy, Japan	Australia, Canada, Germany, UK, US	

Source: Booz Allen Hamilton, IAP, INSEAD, 2002

In the gateway to e-government, T.R. Prime Ministry has prepared an E-Government Initiative Action Plan in August 2002 (T.R. Prime Ministry, 2002) with the help of thirteen working groups.

In June 2002, all the coordination, management and constitution of the required institutional infrastructure tasks were given to the State Ministry and Deputy Prime Ministry. Afterwards, from the July 2002 till February 2003, the related tasks incurred an interruption.

In February 2003, a new coordination unit, Information Society Department, within the State Planning Organization (SPO) was established with eight working groups to coordinate the information society activities. This department was prepared an

Urgent Action Plan (UAP) to realize the "E-Transformation Turkey Project". To increase the participation and the level of success, an Advisory Board with 47 members has been established. This Advisory Board consists of representatives of public institutions, NGOs and universities.

On the 4th of December 2003, a Short Term Action Plan (STAP) (SPO, 2003) for years 2003-2004 has been introduced describing the objectives, the institutions that were in charge and other related issues. In the meantime an Execution Board has been established. This board was comprised of five members, Minister of State and Deputy Prime Minister, Minister of Transportation, Minister of Industry and Trade, Undersecretary of SPO and Chief Counselor of the Prime Minister. The main duty of this board was to realize e-Transformation Turkey Project with proper decisions to monitor and steer the actions in the STAP.

STAP puts 73 actions in force under 8 sections: Strategy, e-Education and Human Resources, e-Health, e-Commerce, Standardization, Infrastructure and Information Security, Legislation, and e-Government.

These sections and responsible Institutions drawn from the e-Transformation Turkey Project STAP were tabulated in Table 3-12.

Therefore, the political leadership in Turkey can be scored as "Level 3" according to the level chart shown in Table 3-11, as there exist a clear vision, strategies and targets. Funds were allocated and the implementation has started, and the e-agenda was driven by a dedicated organization (Information Society Department).

The Advisory Board that consists of representatives of public institutions, NGOs and universities enabled the stakeholder engagement. To enhance public-private

partnership, a number of top-level businessmen from ICT sector can be included in this board.

Additionally, the main ICT non-governmental organizations (NGOs) in Turkey and their web sites were listed in Table 3-13.

Table 3-12 e-Transformation Turkey Project STAP Sections and Responsible Institutions

Action	*Responsible Institutions*
Information Society Strategy	State Planning Organization
Technical Infrastructure and Information Society	Ministry of Transportation, Telecommunication Authority, The Scientific and Technical Research Council of Turkey (TUBİTAK), National Electronic and Cryptology Research Institute (UEKAE)
Education and Human Resources	Ministry of Education, State Planning Organization
Legal Infrastructure	Ministry of Justice, Ministry of National Defense, Undersecretariat of Foreign Trade, Undersecretariat of Customs, Ministry of Transportation, Telecommunication Authority
Standards	Turkish Standards Institute
e-Government	State Planning Organization, Public Procurement Authority, State Institute of Statistics, Ministry of Internal Affairs, Ministry of Industry and Trade, General Directorate of Land Survey and Registration, State Personnel Administration, Ministry of Agriculture and Village Affairs, Ministry of Finance, Prime Ministry
e-Health	Ministry of Health
e-Commerce	Ministry of Industry and Trade, Small and Medium Industry Development Organization, Undersecretariat of Foreign Trade, Undersecretariat of Customs

Source: e-Transformation Turkey Project STAP, SPO 2003

Table 3-13 ICT NGOs in Turkey

Name of the NGO	Brief Name	WEB Page
Turkey ICT Society	TBD	www.tbd.org.tr
Turkey ICT Foundation	TBV	www.tbv.org.tr
Telecommunication Energy Services Consumer Rights Research Society	TEDER	
Internet and Law Platform	IvHP	
Free-lance Telecommunication Industry Society	TELKODER	
All Telecommunication Businessmen Society	TÜTED	
Internet Users Society	İKD	
Internet Technologies Society	İNETD	www.inetd.org.tr
All Internet Society	TİD	
ICT Correspondents Society	BMD	www.bmd.org.tr
Turkey ICT Industry Society	TÜBİDER	www.tubider.org.tr
Turkey Data Processing Services Society	TÜBİSAD	www.tubisad.org.tr
Medical ICT Society	TURKMIA	www.turkmia.org
Software Industry Society	YASAD	
Linux Users Society	LKD	www.lkd.org.tr
Internet Service Providers Society	TISSAD	www.tissad.org
Macintosh Users Society	MKD	www.elmakurdu.org.tr
Konya Computer Industry Society	KOBİD	www.kobid.org.tr
Computers Industry Businessmen Society	BİSİAD	www.bisiad.org.tr
Eye Handicapped Computer Users Society		www.korler.bilkent.edu.tr
Turkey Technology Development Foundation	TTGV	www.ttgv.org.tr
Turkey Science and Technology Research Association	TUBİTAK	www.tubitak.tr
TÜBİTAK IT and Electronic Research Center	TÜBİTAK ODTÜ BİLTEN	www.bilten.metu.edu.tr

E-services and e-applications mainly consist of the following issues:

- Integrating and sharing data systems within and among administrations,

- The use of this public information by third parties, especially the private sector, safeguarding privacy and security issues,

- Enabling digital exchange of information and transactions between government agencies, citizens and businesses,

- Recognizing the digital exchange of information and allowing electronic transactions and record keeping,

- Reaching citizens affordably and enabling citizens to reach government affordably by facilitating availability and access to information and communication services

Therefore these services and applications require an appropriate legal and regulatory environment in particular, privacy, prevention of cyber crime, security, ethical issues, electronic signatures, certification authorities and electronic contracts to create confidence, protect the rights of parties and encourage the use of e-services and e-applications.

For affordable communication services for all, there was a need for competition in the communication market. Unfortunately, the monopoly power was still enjoyed by the incumbent telecommunications operator Turk Telekom. There was a need for a comprehensive Telecommunications Law and this need has been recognized both in UAP and STAP. The ongoing efforts are to be completed in 2004. The objective of this new law is to renovate the structure of old laws and some other amending laws, and to cover all needed areas of regulation for telecommunications market, such as interconnection, licensing, universal services and numbering. The necessary

legislation for long distance telephone service was published on the Official Gazette on April 13, 2004. Additionally, Turk Telekom was ordered in both UAP and STAP to complete the necessary legislation on items such as: licensing regarding VoIP, cable platform and network provision, rights of way, local loop unbundling, co-location and facilities sharing, numbering, personal data protection in telecom sector, consumer rights and accounting separation.

Local loop unbundling (LLU) has been attempted but resulted in little competition in Germany, Sweden, US, Australia, UK, France and Italy, except Japan. There exist a lag between mandating of LLU and it is becoming effective due to two main reasons: Mechanics of LLU being complicated and incumbents tries to slow the process, furthermore the economics of reselling are fair attractive as it includes the need to pay for sales, marketing, customer service, etc (Booz Allen Hamilton, IAP, INSEAD, 2002).

In Turkey, telecommunications regulations still lack the universal service obligations and the ways in which the operators are going to be supported in underdeveloped areas. As a part of STAP, a Directive for Universal Service will be prepared by Ministry of Transportation. Incentives, financial grants, and other issues will have a legal basis after the introduction of this directive.

In 1995, as a part of harmonization with EU, the Turkish Parliament approved new patent, trademark and copyright laws. Most countries have signed, implemented and ratified the WIPO Treaties relating to these issues or have an equivalent legislation in effect.

A EU-financed project in the field of Justice and Home Affairs aiming at the strengthening Turkey's efforts in the fight against organized crime has started in

April 2004. One of the contents of this project is strengthening Institutions in their fights against Internet and High Tech Crime (EU Press Release, 05-04-2004).

A directive regarding the protection of consumers who are trading goods and services over electronic media has been published on the Official Gazette on June 13, 2003.

The Right of Information Law (Law no: 4982) has been approved and published on the Official Gazette on October 24, 2003 and is in force since April 24, 2004. The law identified the principles about the rights of citizens with regards to basis of transparency, openness and equality of public management. The law enables acquiring information from all public organizations by means of electronic media or by correspondences in which the identification of the person was legally defined by (e-)signatures. All Turkish citizens, foreign persons residing in and foreign corporates operating in Turkey that have an equivalent law in their countries for Turkish citizens have the right to acquire information. The acquired information is to be provided within 15 (under some circumstances within 30) weekdays.

The Electronic Signature Law (Law no: 5070) has been published on the Official Gazette on January 23, 2004. The law legalized e-signatures in Turkey. The law will be in force by July 23, 2004. The object of the law is to regulate the legal and technical aspects and regulate the principals about the usage. Unfortunately, there are no regulations about electronic data (e-data) in Turkish law structure and additional rules shall be regulated including the necessary conditions regarding e-data sending, presenting and preserving original e-data. Furthermore, for an effective e-procurement system, necessary regulations shall be identified for e-contracts. The e-signatures will have the same legal consequences with the signatures with this law.

In the STAP, National Information Security Law, making legal arrangements for electronic contracts and Enactment of Universal Service Regulation were envisaged for a necessary legal infrastructure to be completed in 2004.

Most of the countries have put in place a legislation to recognize e-signatures and documents. The approach to accrediting and regulating certification authorities vary among different countries. In Canada and UK this is industry led. In Germany, Sweden and Italy, government bodies regulate (Booz Allen Hamilton, IAP, INSEAD, 2002).

The Personal Data and Privacy Protection Law (Law no: 25365) has been published on the Official Gazette on February 6, 2004. This law includes arrangements on Spam. A EU Data Protection Directive binds all the EU countries and ensures the privacy protection bind.

3.2.3   Infrastructure Environment

A strong infrastructure environment can be described by high infrastructure availability, security and quality.

The existence of alternative infrastructures (e.g. cable and DSL) fosters the competition and results in a stronger infrastructure environment. Additionally, the quality and security on an infrastructure enhance the user experience and confidence resulting in high levels of use and uptake.

The broadband penetration rates were tabulated for Turkey and some other countries in Table 3-14.
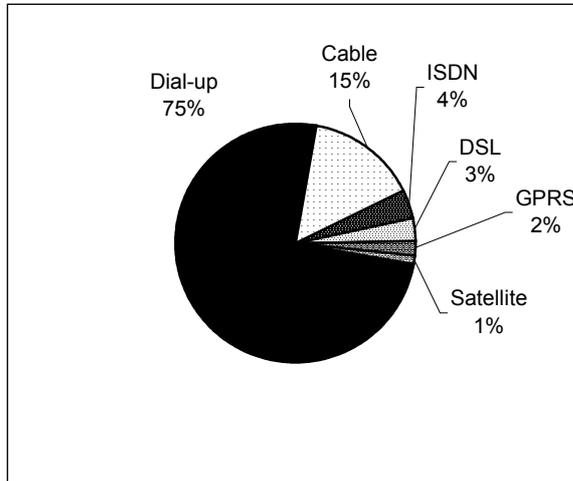
Table 3-14 Broadband Penetration Rates

Country	Broadband penetration per 100 inhabitant
Canada	13.27
Sweden	9.16
Japan	8.60
US	8.25
Finland	6.61
Germany	4.84
UK	3.63
Australia	2.65
OECD	6.06
EU	4.55
Turkey	**0.06**

Source: OECD Science, Technology and Industry Scoreboard 2003

The countries that regulated early and had an open and competitive environment (e.g. US, Canada, Japan) have lower prices and greater broadband availability. The policy approaches for extensive rollout differs among nations. Nations pursued a policy of market led infrastructure rollout faced the challenge of extensive rollout. Rural areas remained uneconomic to wire up (e.g. UK). Nations promoted more extensive rollout through a cooperative approach between the government and incumbent saw less price competition, on the other hand (e.g. Germany) (Booz Allen Hamilton, IAP, INSEAD, 2002).

The connection methods of Internet users in Turkey were tabulated in Figure 3-2. The numbers were taken from the CHIP Magazine, 2003 Survey of ISPs.

Figure 3-2 Percentage of Connection Methods in Turkey

The numbers of secure servers for Turkey and some other countries were tabulated in Table 3-15 from the OECD Science, Technology and Industry Scoreboard 2003.
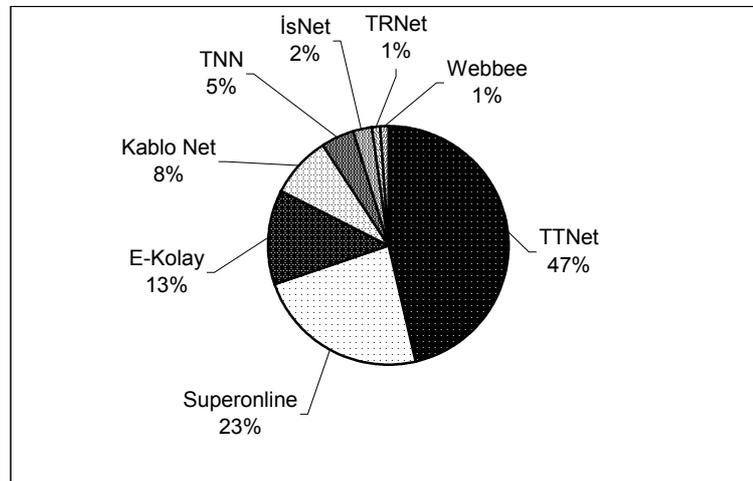
Table 3-15 Servers Assessment

Country	*Secure Servers per 100,000 inhabitants*
US	37.5
Canada	25.0
Finland	14.3
Sweden	14.0
Germany	9.7
Italy	2.0
Turkey	**0.6**
OECD	14.2
EU	8.8

*Data for year 2002
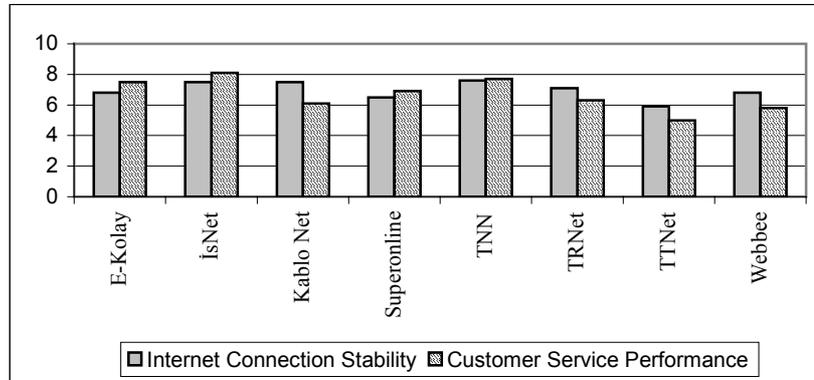Source: OECD Science, Technology and Industry Scoreboard 2003

The number of Internet Service Providers (ISPs) was stated as 92 in the web site of Turk Telekom (17/01/2004). In a study performed by the CHIP Magazine to assess the ISPs for year 2003 (CHIP, September 2003), the sector leader was found as TTNet with 47% market share. The other main ISPs and their market share in 2003 were tabulated in Figure 3-3.

Source: CHIP Magazine Survey of ISPs, 2003

Figure 3-3 ISP Market Shares in Turkey

The Internet connection stability (staying connected with offered speed) and the customer services performances were also assessed by the survey of CHIP Magazine and the results were stated out of 10 points in Figure 3-4.

Source: CHIP Magazine Survey of ISPs, 2003

Figure 3-4 ISPs Performance Survey in Turkey

3.2.4 Maturity of the Citizens

Citizen "Readiness" can be identified as the readiness of the citizens to participate in e-services given that it is available to them. The contributing factors are low barriers to uptake, awareness of benefits and the penetration of access devices (Booz Allen Hamilton, IAP, INSEAD, 2002).

Ministry of Transport and TUBİTAK performed a survey in 1997 in the scope of TUENA Project to determine the attitudes and expectations of the citizens about communication services in Turkey. According to this study, it was appeared that a significant number of citizens wanted to put ICT into their lives. In addition, according to this study, the citizens in Turkey were ready and ambitious to use ICT in their everyday lives.

ITU defined a "Digital Access Index" and performed a global ranking study in 2002. The countries were classified into one of the four digital access categories of high, upper, medium and low. The assessment categories were infrastructure, affordability,

knowledge, quality and usage. The results suggested that, besides the limited infrastructure, the affordability and education were also important factors to consider as barriers to bridge the digital divide. According to the study, top ten countries in the high access category were Sweden, Denmark, Iceland, Korea, Norway, Netherlands, Hong Kong, Finland, Taiwan and Canada. Turkey was in medium access category and was 70th out of 178 countries.

Trust in Internet, security problems experienced on Internet, IT skills, comfort with cost and perceived benefits may affect the uptake of the citizens. According to a research study by Taylor Nelson Sofres Siar Group (Taylor Nelson Sofres Siar Group, 2001), 21% of people living in Turkey considered it is safe to use the Internet and 49% considered it is unsafe.

As stated in the OECD Science, Technology and Industry Scoreboard 2003, the percentage of households in Turkey with a PC was 12.3 in year 2000. This indicator was 60% in Sweden, 55% in Canada, 53% in Australia, 51% in USA, 47% in Germany, 38% in UK and 29% in Italy.

Fixed and mobile phones implantation rates and the average annual growth rate (CAGR) of these access points for the selected countries were provided in the Table 3-16.

Table 3-16 Fixed and Mobile Phones per 100 Inhabitants

Country	*Fixed Channels*	*CAGR (1997-2002)*	*Cellular Phones*	*CAGR (1997-2002)*
Turkey	**28.1**	**2.2**	**34.8**	**70.8**
Sweden	73.6	0.8	88.9	20.2
US	65.6	0.3	48.8	20.5
Germany	65.1	3.4	72.8	48.6
UK	54.0	1.8	84.1	41.2

Source: ITU ICT Statistics, 2003

The television has a great advantage over other terminals offering access to the information society: its potential implantation. The television ownership in households was stated as 96.1% in Turkey (TUENA, 1999).

The credit cards penetration rate was 30% (Ankara World Trade Center News, 27.01.2004).

The level of use, equal adoption and level of interaction or transaction activity contributes to the citizen "Uptake and Use".

The percentage of households with access to Internet, the percentage of individuals frequently using Internet, and number of web sites per 1,000 inhabitants were presented in Table 3-17. Additionally, Internet access by income levels was presented in Table 3-18.

Table 3-17 Statistics Indicating Internet Usage

Country	*Households with Internet Access (%)*	*Individuals Frequently Using Internet (%)*	*Web Sites per 1,000 Inhabitants*
Turkey	**6.9**	**9.1**	**0.3**
Sweden	48.2	67.8	19.3
US	41.5	Data not available	46.5
Germany	27.0	Data not available	22.0
UK	40.0	55.0	24.2
Italy	18.8	18.5	6.1

Source: OECD ICT Database, 2002

Table 3-18 Households with Internet Access by Income Level

Country	Households with Internet Access (%)	Low Income Level (%)	High Income Level (%)
Turkey	**6.9**	**0.1**	**21.4**
US	41.5	14.0	77.0
Germany	27.0	14.0	55.0
UK	40.0	11.0	80.0

Source: OECD ICT Database, 2002

3.2.5 Maturity of the Businesses

Maturity of the Business can be defined as business' adoption and use of on-line technologies to change the way they work. The contributing factors to business readiness, business use and business impact can be listed as: low barriers to uptake, which requires skilled personnel, awareness of the benefits and penetration of access devices; high level of online services usage through a fair adoption among all; and cost and time savings (Booz Allen Hamilton, IAP, INSEAD, 2002).

The share of tertiary-level graduates in total employment is an important indicator of the labor market's innovative potential. The data presented in Table 3-20 shows average annual growth rate between 1997 and 2001 for the deployment and characteristics of tertiary-level graduates in employment.

Table 3-19 Employment Growth of Tertiary Level Graduates

Country	Tertiary level graduates	Total employment	Employment growth of tertiary level women	Employment of tertiary level graduates as a % of total employment
Japan	2.2	-0.5	3.4	36.5
Finland	3.1	2.2	3.7	33.6
United States	3.2	1.4	3.5	36.8
OECD	3.5	1.1	4.3	28.2
EU	3.9	1.6	4.9	24.0
Korea	4.1	1.4	5.6	26.0
Turkey	**5.9**	**-0.5**	**8.2**	**10.9**

Source: OECD Science, Technology and Industry Scoreboard 2003

As stated in the SPO 2004 Year Programme, the ICT market in Turkey has grown 12% from 2001 to 2002 and reached 9.2 Billion Dollars. In 2003, with an estimation of approximately 12% growth rate the sector will be 10,3 Billion Dollars. In the same report it was also estimated that the telecommunication sector share will be 8.5 Billion Dollars (83%) and the information technologies sector share will be 1.8 Billion Dollars (17%) in year 2003.

The IT spending to GDP ratio for year 2000 was 1.2% in Turkey, 3.3% in UK and 4.4% in US (OECD ICT Database, 2002).

In Turkey, when the year 2000 numbers were considered in the ICT sector, the investment and expenditure per capita was approximately 55 Euro. This number was 514 Euro in Western Europe and 1157 Euro in the US. The improvement and development speed in Turkey was just above 20% when year 2000 numbers were considered, but to close the gap between Turkey and the developed countries, this

development speed shall be accelerated as stated in the Turkey Informatics Council Report.

3.2.6 Maturity of the Government

Maturity of the government was identified as the preparedness of a government to engage and drive the e-agenda and deliver the e-government. Actionable strategies, a change program in place, level of coordination and standardization and system readiness through back office integration can be listed as the contributing factors to the readiness of the government. Level of usage in the organization, number of services available online and level of interaction contributes to the government usage of internal and external processes (Booz Allen Hamilton, IAP, INSEAD, 2002).

There were many ongoing e-government projects in the public sector. Unfortunately, these efforts were not carried out in coordination between different organizations. There has been a trial effort to combine "Tax ID No" and "TR ID No", but unfortunately failed to be successful. The efforts are still ongoing. The systems cannot communicate with each other. There were no efforts carried out for the disabled persons. All of the organizations have at least a website and completed the "information dissemination and cataloguing stage". All of them have started or presenting some interactive and transactional services. The preceding stages of vertical integration, horizontal integration, political participation and policy-making cannot be reached yet.

The current state of the public organizations regarding e-services was presented in Table 3-21.

Table 3-20 Public Organizations' E-services Category

Category	Number of Occurrences	Percentage
Only gives information	4	2.5
Enables communication	81	51.0
Provides forms, reports, etc	24	15.0
Total number that can be reached	**109**	**68.5**
Web page on construction	4	2.5
Problems existing on web pages	7	4.5
No web pages	38	24.5
Total number that can not be reached	**49**	**31.5**
TOTAL	158	100.0

Source: Turkey Informatics Council Draft Report, 2004

In a research named The Government Online (GO) by Taylor Nelson Sofres Siar Group (2001), it was found that the global average for Government Online usage has increased by 4% from year 2001 to 2002, and in some countries this increase has been far greater. Government Online usage was increased by +10% to 13% in Turkey and Turkey is the second best country in this category after Australia (+15% to 46%) as stated in the report.

The e-government usage in Turkey is low. Taylor Nelson Sofres Siar Group stated in their Government Online (GO) Report (2001) that the global average was 30% and in Turkey this number was 13%. According to this percentage, Turkey was classified in the low penetration class, where 0-15% Internet usage is low penetration (16-35% medium penetration, 36-50% high penetration and 51-100% very high penetration).

3.3 SWOT ANALYSIS

3.3.1 Strengths

In Turkey, as stated in the declarations of all political parties, the leaders have a parallel vision and recognize the opportunities of the e-government initiative (turk.internet.com, 03-10-2002). In the public sector, there is at least an effort to have a web site.

The government organizations started re-engineering efforts to transform their organization and workflow processes. Furthermore, to coordinate, assess and direct the e-Turkey Project (04/12/2003, Official Journal), an Information Society Department (a dedicated organization) was established within the structure of State Planning Organization (SPO). Additionally, an Advisory Board was established, as a public-private partnership consisting of NGOs, public institutions and universities is to enhance the efforts.

Some incentives were given to the e-Turkey initiatives by the NGOs such as TÜSİAD and TBV. These NGOs organized an eTR Awards to encourage the government organizations and local administrations.

The efforts on a necessary legal and regulatory framework towards a knowledge society has been started and showed a rapid progress during the last few years.

The Ministry of Education has a number of projects for the teachers, students and public, to train them in IT related subjects.

The penetration of access devices such as TVs and mobile phones are high. Additionally, an agreement have been signed between the Telecommunications

Organization, Ministry of Education and Ministry of Transportation to built the necessary infrastructure for all the schools in Turkey, even in the farthest village (December, 2003).

3.3.2 Weaknesses

Legislation framework started towards knowledge society, but yet cannot go far enough (e.g. liberalization of telecommunication sector, protection of personal data, etc.). The necessary legal and regulatory framework cannot be adopted completely according to the e-government requirements.

The break-through projects were not sustained, as they are entirely dependent on political will (Uçkan and Beceni, 2003).

The deadlines stated for the actions in the Action Plans (e.g. T. R. Prime Ministry, August 2002; SPO, 2003) were not realistic.

The legal and regulatory framework that was adopted in a fast manner may lead to some problematic issues regarding application and implementation.

The number of PC penetration and Internet access in schools, households and government is low as a result of high costs. The penetration of broadband and the usage of government online services are also low. Furthermore, the number of secure servers is low which affects the trust in medium.

The number of graduates from computer sciences is not enough for the future needs; also the admission capacities of the universities are not enough.

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The investment in ICT sector and ICT expenditure per GDP are low when compared to OECD and EU countries. R&D efforts and R&D capability of the private sector are not at required levels.

There exist no standards or interoperable systems for the public organizations. The web sites of the public organizations do not have useful content for the citizens and businesses.

3.3.3 Opportunities

An opportunity for Turkey can be stated as the efforts to join EU. These efforts include the adoption of necessary requirements related with the e-government initiative in the frame of eEurope+ Action Plan and to modernize the public services in accordance with this plan. E-Europe initiatives and action plan played a key role in raising awareness on the political side on ICT and e-government in Turkey.

The government can be positioned to learn from private sector mistakes and to take the advantage of proven technologies created by private companies (Accenture, September 2002). A common forum shall be constructed for the organization to share the experience and knowledge about the e-transformation efforts and projects.

For the large IT projects, the government can outsource the necessary components of the system from the private sector providers (UN/ASPA, 2001). Furthermore the ICT sector shall be encouraged to produce required technology.

The organizations saw that the cost savings can be realized through e-procurement (Wyld and Settoon, 2002), optimized work flows (KPMG, 2002) and complete online transactions (Accenture, September 2002). Furthermore, paper consumption

will be reduced and the communication speed will be improved (Cohen and Eimicke, 2002).

The young population is high in Turkey and every year more and more people were attending universities. The human resources required for technical personnel can be established with a suitable education program. Furthermore, as the elderly population in the OECD countries will nearly double from 13% to 25% between 1990 and 2030 (Ögütçü, 2003), this fact may make Turkey a principal source of Europe's well-educated young workforce and brainpower.

The new arrangements done in the telecommunication laws foster the competition in the communication market that results in low prices of access and high quality of the infrastructure.

The national competitiveness and significant economic growth can be achieved with the use of ICT in government (Wyld and Settoon, 2002; Chen and Gant, 2001; Norris, Fletcher and Holden, 2001).

New technologies offer striking progress in organizational performance and effectiveness (Accenture, September 2002). The interactive nature of the web could enable increased public involvement in government decision-making process (Cohen and Eimicke, 2002; Aldrich et al., 2002; Moon, 2002). Through the coordinated agency efforts a motivated workforce and a well-informed public can be created. Additionally, by making a variety of information and processes more transparent, the corruption in government can be reduced (Moon, 2002) and trust can be built between the citizens and government.

3.3.4 Threats

Information is a valuable commodity, one does not simply give it away for free (KPMG, 2002); additionally, there will be resistance within the government to the change (Al-Kibsi et al, 2001; Ho, 2002).

Intensifying global competition was raising expectations for government services and fiscal and demographic constraints were requiring governments to do more with less (Accenture, September 2002). IT personnel, IT capability, software, hardware, infrastructure, training and financial resources insufficiencies can be considered as major threats for efficient online government services (UN/ASPA, 2001; Chen and Gant, 2001; Fletcher and Holden, 2001; Ho, 2002).

Bringing e-government to all citizens require the costly construction of online access facilities. It will be many years before a sufficiently large number of citizens will go online to allow cost savings (Accenture, September 2002; Al-Kibsi et al, 2001) due to the low level of Internet penetration, low support on Research and Development (R&D) and staff (UN/ASPA, 2001). Additionally, as a result of the digital divide, citizens fail to gain access to the e-services (KPMG, 2002; Cohen and Eimicke, 2002; Fletcher and Holden, 2001; Ho, 2002). Digital divide is a major problem that should be prevented proactively.

Insufficient planning, short deadlines, rapid policy changes and underestimated project costs will result in unfinished projects and lost reputation (UN/ASPA, 2001).

The corruption in the Turkish Government is very high. In a global survey conducted by the International Transparency Agency in October 2003, (Transparency International, 2003) the degree of corruption in Turkey was 3.1 (10=highly clean and 0=highly corrupt), and Turkey was the 77th country out of 133 countries.

As the pressures build, the politicians and executives worry about their government's ability to adopt and thrive the necessary actions (Accenture, September 2002).

Low quality of the existing infrastructure may result in dissatisfaction and lack of confidence for the overall system.

Outsourcing can also be a threat to the government, as it can lead to lost control over the system, organization and information (UN/ASPA, 2001). Governments shall learn to manage risks connected with large IT projects (OECD Public Management Policy Brief, 2001). Privacy and security issues shall be given utmost importance. Unless these issues are solved completely, the systems shall not be available online.

Additionally, it should be noted that designing, advocating and accepting the overall vision requires an extensive and collective initiative involving government, parliament, business, municipalities, military, civil society groups, scientific community, media and citizens.

PEST and SWOT analyses discussions were briefly tabulated in a matrix form in Table 3-22.

Table 3-21 Summary of SWOT-PEST Analyses

	S	**W**	**O**	**T**
P	- Government stability and support - Visible leadership - Existence of a dedicated organization - E-agenda in place - "Advisory Board" to enhance public-private partnership	- Immature legal and regulatory framework - Unrealistic deadlines	- EU adoption process - E-commerce is already evolved to guide the projects for public sector (e.g. banking sector)	- Resistance to change in government - Insufficient planning or coordination - High political corruption
E	- Current economic progress attracted local investment and created an activity in the market	- High access devices costs - High broadband access costs	- Competition in ICT sector resulting in low costs - Multinational companies' investment can be attracted	- Low venture capital - Low GDP/capita - Low R&D and ICT expenditures
S	- Internet usage is increasing - More and more people are entering university - Positive attitude to Internet	- Low internet usage - Low awareness - Low levels of IT skills	- New platform for innovative new jobs - High young population to educate for IT personnel	- Digital divide - Lack of attention - Lack of trust on Internet
T	- High wireless access, i.e. cell phones	- Immature IT infrastructure - Low broadband access - Low penetration rates of access paths and PCs - No interoperability framework or standards	- Rapid innovations in technology enable new services online - Alternative access paths	- Lack of software and hardware - Low R&D capability - Security and privacy - Weak ICT industry - Low quality of the existing cable infrastructure

3.4 CRITICAL SUCCESS FACTORS

The e-government system can be briefly figured as the interaction of citizens, businesses and government through e-services in a mature market, political and infrastructure environment.

The transformation process from traditional government to e-government requires sustained leadership and coordination, standardization and interoperability, a legal framework that is supporting the system, security and privacy, availability of the infrastructure and services where the stakeholder groups can access with low costs, required skills through a fair adoption, awareness, share of knowledge and partnership.

From the PEST and SWOT analyses a number of Critical Success Factors (CSFs) were defined for the system of e-government. To find out whether the established system was a successful e-government initiative or not, these critical success factors shall be monitored according to the related performance measures. The CSFs and their performance measures were tabulated in Table 3-23.

Table 3-22 CSFs and Their Performance Measures for E-Government System

Critical Success Factors (CSFs)	Performance Measures
Sustained leadership and coordination	- Available financial resources allocated - Sustained participation - Progress in action plans
Standardization and interoperability	- Number of services provided from one portal - Number of organizations that can interact
Mature legal and regulatory framework	- Number of adopted laws enabling Internet adoption - Number of inconsistencies and problems during implementation
Security and privacy	- Number of secure servers - Number of Spam Mail or virus attacks
Availability	- Penetration rate of access devices - Number of e-services - Availability of competing access paths
Accessibility	- Penetration rate of access paths - Connection costs/GDP - Percentage of IT skilled citizens and employees - Penetration among different demographic groups
Awareness	- Trust in media - Usage rates of online services
Shared knowledge and partnership	- Existence of a common forum to share information - Existence of advisory boards of public-private partnership
Innovation capability	- Expenditure in R&D - Number of patent applications

3.5   E-TURKEY PRACTICES

All the public sector organizations in Turkey at least have presence on the Internet through a web site. Turkish Parliament, Presidency of Turkish Republic, Prime Ministry, Ministries and their affiliated organizations and municipalities have web sites that present their administrative functions, duties, organizations, related news as well as announcements, information and communication facilities.

The web sites of the Turkish Parliament, Presidency of Turkish Republic, Prime Ministry and Ministries were presented in the Table 3-24.

Table 3-23 Web Sites of Some Governmental Organizations

Governmental Organization	*Web Site*
Turkish Parliament	http://www.tbmm.gov.tr/
Presidency of Turkish Republic	http://www.cankaya.gov.tr/
Prime Ministry	http://www.basbakanlik.gov.tr/
Ministry of Energy and Natural Resources	http://www.enerji.gov.tr/
Ministry of Justice	http://www.adalet.gov.tr/
Ministry of National Defense	http://www.msb.gov.tr/
Ministry of Internal Affairs	http://www.icisleri.gov.tr/
Ministry of Foreign Affairs	http://www.mfa.gov.tr/
Ministry of Finance	http://www.maliye.gov.tr/
Ministry of National Education	http://www.meb.gov.tr/
Ministry of Development and Housing	http://www.bayindirlik.gov.tr/
Ministry of Health	http://www.saglik.gov.tr/
Ministry of Transportation	http://www.ubak.gov.tr/
Ministry of Agriculture and Rural Affairs	http://www.tarim.gov.tr/
Ministry of Labor and Social Security	http://www.calisma.gov.tr/
Ministry of Industry and Commerce	http://www.sanayi.gov.tr/
Ministry of Culture and Tourism	http://www.kulturturizm.gov.tr/
Ministry of Environment and Forestry	http://www.cevreorman.gov.tr/

The public sector efforts in Turkey are mainly management information system and decision support system efforts. A number of central databases have been developed for the public sector organizations and there are many ongoing projects. These efforts were briefly explained below:

Ministry of Justice,

- Ministry of Justice has started the effort to implement a National Judicial Network Project (UYAP) since year 2000. The main objective of this project is automation of all the judicial units and integration with the external units to achieve high quality service in justice. In other words to develop the e-justice module of the e-government studies and efforts (http://www.adalet.gov.tr).

Ministry of National Defense,

- For Military Services the necessary information can be gathered from the web site of Ministry of National Defense. The examination results for military service can also be accessed through the web site (http://www.kkk.tsk.mil.tr).

Ministry of Internal Affairs, General Directorate of Public Registration and Citizenship (http://www.nvi.gov.tr):

- MERNIS (Central Public Registration Management System) Project, which consists of creating a central public registration database, assigning a unique number for each citizen (T.R. ID No), providing modern ID cards, assessing registration and family statistics accurately and providing e-services to public organizations and citizens (http://www.nvi.gov.tr).

- KPS (Identity Sharing System) Project, which allows secure access to MERNIS database through Internet for public organizations and allows integration of public organizations and data sharing. By this system the duplication of information will be prevented (http://www.nvi.gov.tr).

Ministry of Internal Affairs, General Directorate of Local Authorities (http://www.mahalli-idareler.gov.tr)

- YB (Local Information) Project, which consists of creating a central database for local authorities in Turkey (http://www.yerelbilgi.gov.tr).

Ministry of Internal Affairs, General Directorate of Security (http://www.egm.gov.tr)

- POLNET (Police Network) is an intranet, which allows system automation, common database and public service through electronic medium.

- MOBESE (Mobile Electronic System Integration) Project, which a mobile communication infrastructure using GPRS technology for police vehicles. It integrates the geographical information systems and management information systems (GIS/MIS).

- The interactive services that can be reached by the citizens include: online denounce for traffic and public peace, online vehicle information inquiry with license plate, online driver penalty point inquiry with driver license number, vehicle inquiry which took part in accidents, inquiry of accident victim, application to driving license, registration of a car, assignment to license plate, gun license processes, application to passport, access to missing persons lists and wanted persons lists, stolen mobile phone inquiry.

Ministry of Foreign Affairs,

- Consular Database and Automation System has been implemented for a fast and better service to the citizens living abroad.

Ministry of Finance,

- Say2000i is an automation system for public accounts and acts as an infrastructure for e-finance module of the e-government services (http://www.muhasebat.gov.tr).

- HBS (Law Information System) is an e-law portal, which enables a wide number of users to access complete law legislation through a secure and fast environment (http://www.bahum.gov.tr)

- METOP (Centrally Accessible Rural Automation Project) is the connection of all the province organizations with the central system and in future to act as an e-treasury case portal. The objectives are to monitor the government cases and treasury cases through the network system in a secure, fast and effective environment (http://www.bumko.gov.tr).

- VEDOP (Tax Administration Automation Project) is the execution of all the tax transactions interactively though Internet (http://gelirler.gov.tr). The available e-services include: online "Tax ID Number" inquiry, online motor-vehicle tax transactions, online corporate tax transactions, online income tax transactions, online calculation of delinquent tax-due, overdue-tax, cash discount.

- MEOP (National Real-Property Automation Project) is the automation of center and province organizations, creating a real estate database and information system and setting up an office automation system

(http://www.milliemlak.gov.tr). By visiting this system, a person can apply to purchase a real estate from government.

- General Directorate of Retirement Funds (http://www.emekli.gov.tr) offers many interactive e-services by its web site for retired persons. These include: retirement fund ID number inquiry, retirement age/pension calculation, calculation of service period, displaying retirement pension information, displaying deductions from pension, option to choose how to get the pension, changing of address, application to receive pension notice. There is also an automation project, Health Expenditures Control System, which connects hospitals, pharmacies and the general directorate to control the health expenditures. Additionally, instead of health record cards, smart cards are given to the persons entitled. There exist also a call center for the retired citizens to perform the above-mentioned services via a phone call (+312 - 414 5434).

- State Supply Office also offers on-line purchase of the goods to the entitled government organizations (http://www.dmo.gov.tr/esatisST_NG).

- Turkish National Lottery Administration publishes the results of the lotteries by its website (http://www.millipiyango.gov.tr).

- Public Procurement Authority enables e-procurement services online through its Bidding Information System on its website (http://www.kik.gov.tr)

Ministry of National Education,

- MEBSİS (Ministry of National Education Integrated Management Information System) is an MIS that automates all the units of Ministry of Education including the ministry, center and province organizations and

the schools by a number of information systems (http://www.meb.gov.tr/mebedevlet/mebsis.htm)

- An Information Center is available to reach archives of photographs, films, videos, library, and test database (http://www.meb.gov.tr).

- An information source for distance learning students available through the information center and the studies are ongoing on distance learning module (http://bem.meb.gov.tr).

- SUDESIS (Examination Application and Assessment System) studies are ongoing to modernize the examination system and to standardize examination assessment system. The system will eventually enable online examination and assessment.

- General Directorate of Higher Education Credit and Hostels Institution management information system efforts are ongoing and the web site of the institution displays the credit/scholarship application results (http://www.kyk.gov.tr).

Ministry of Development and Housing,

- General Directorate of Land Office constructed an information system (ARBIS – Land Management Information System) that enables automation between the affiliated organizations and forms a common database of land information and maps (http://www.arsaofisi.gov.tr).

- General Directorate of Highways publishes information about the closed roads and roads under construction by its web site (http://www.kgm.gov.tr). They have ongoing efforts of building

Highways Information System and Geographical Information System for correct and easily accessible data related to roads.

- Land and Cadastre Office have built a national land data information system called TAKBIS. In this project, TAPUNET system was built for citizens for data inquiry about land and cadastre information online from anywhere (http://www.tkgm.gov.tr/tapunet/tapunet.htm).

Ministry of Health,

- Hospital Information System, Resource Management System, Health Statistics Monitoring Database System, Turkey Health Information System, Patient Monitoring Information System, Turkey Health Inventory Database, Document Follow-up Database are the information and automation systems constructed by the Ministry of Health for the e-health module of the e-Turkey project (http://www.saglik.gov.tr). For the patients, the complaints can be raised online by the Ministry's web site and the complaints can be followed by the Complaint ID Number.

Ministry of Transportation,

- General Directorate of Land Transportation has built a network system called ULAŞNET (Land Transport Information system). By using ULASNET, the related information of the drivers, motor vehicles and the companies that enter and exit through the border gates will be recorded to a database and traffic statistic analysis can be easily performed (http://www.ubak.gov.tr/tr/kugm).

- General Directorate of Railways offers online reservation and online ticket sale (https://etcdd.tcdd.gov.tr: 4443/tcddrezwebapproot/ilknet.jsp).

- General Directorate of postal and telegraph services gives "Dial-169" call center service and online service (http://alopost.ptt.gov.tr/siparis.php) that enables the person to use postal service online or from phone and delivery from home to the destination point in Istanbul, Izmir and Ankara cities.

- General Directorate of Coastal Safety and Boat Rescue Establishment publish online information about the Turkish strait vessel traffic conditions on its website (http://www.coastalsafety.gov.tr).

- State Airport Authority displays arrival and departure times of the airplanes on its website for Atatürk Airport and Esenboğa Airport with delay times (http://www.dhmi.gov.tr/limanmeydan.htm).

- Turk Telekom web site (http://www.telekom.gov.tr) offers telephone directory (http://ttrehber.gov.tr), which can also be accessed through mobile phones (http://ttrehber.gov.tr/wap). It is possible to apply online for a dial-up Internet access through TTNet ISS (http://abonekayit.ttnet.net.tr). The subscription services can be performed through the area directorates web sites for each city (http://www.fatura.telekom.gov.tr). The online services available consist of; trouble registration service for Cable TV and telephone, debt situation inquiry, telephone usage properties settings.

Ministry of Agriculture and Rural Affairs,

- For sustainable and effective use of natural resources, for determining the precise profile of the farmers, determining product profile, to determine supply and demand patterns, to monitor industry movements, planning accurate and reliable investment plans and agriculture politics, a number of information system and database studies have been performed. These

projects are Farmer Registration System, Alternative Product Information System, Sugar Beet Registration System, Organic Agriculture Information System, Livestock ID Registration System, Cooperatives Information System, Farm Accounting System, Plant Passport System and Agriculture Market Monitoring Information System.

Ministry of Labor and Social Security,

- In the Social Security Organization (SSK), many information system efforts are ongoing. Some of these are Pharmacy Information System, Drug Database, Inventory Information System, Cost Control System, Hospital Management Information System, and Drug Database Invoice System. The Call-Center Appointment System is available for the patients. The insured persons can perform and monitor their operations through the web site of the organization by the Virtual Insurance Directorate Project (http://www.ssk.gov.tr/wps/portal). The employers can perform monthly insurance notices and premium payments online.

- General Directorate of Occupational Pension Fund (BAĞ-KUR) (http://www.bagkur.gov.tr) efforts consist of BAĞ-KUR Pharmacy Automation System (BEOS), BAĞ-KUR Cardiovascular and Dialysis Project (KODS), BAĞ-KUR Hospital Provision Service, General Directorate Database Project, BAĞ-KUR Insured Information System.

- Employment Association of Turkey (ISKUR), the systems for improving the employment and enabling the unemployed to find jobs in short time, a number of efforts are ongoing. These include; Unemployed Insurance System, Job Loss Compensation Project, Job Assignment System, Work

and Profession Supervision Project, Manpower Market Information System and e-Learning Module (http://www.iskur.gov.tr).

Ministry of Industry and Commerce,

- The online services available through the web site of the Ministry (http://www.sanayi.gov.tr) can be listed as: searching the library catalogue, document follow-up, access to the industry database, making consumer complaints or complaints about advertisements, performing company or tradesman operations.

- Turkish Standards Institute web site (http://www.tse.org.tr) enable online standard search and online standard sales. There also exists a subscription database system subject to payment that enables online displaying of the standards (Standardnet).

Ministry of Culture and Tourism,

- The web site of the Ministry displays all the culture and art events and provides complete information for the tourists for all tourism diversities like winter tourism, rafting, health tourism, scuba diving, etc.

- National Library website (http://www.mkutup.gov.tr) provides library catalogue search and online reservation services for the users.

Ministry of Environment and Forestry,

- General Directorate of Meteorology provides online information about the weathercast, marine data, seawater temperatures, satellite images and all other meteorological data on its website (http://meteor.gov.tr).

- General Directorate of Forests website (http://www.ogm.gov.tr) provides online statistical data inquiry, online maps, online satellite images and other related data.

- General Directorate of Environmental Impact Assessment and Planning publishes current EIA projects and public meeting dates (http://www.cedgm.gov.tr).

Undersecretariat of Customs (http://www.gumruk.gov.tr),

- Customs Modernization Project (GIMOP) aims to automate all customs transactions to solve the troubles and to cease the unfavorable manners.

- Computerized Customs Activities (BILGE) Automation Project was developed to carry out all real-time customs facilities. The system works with data warehouse system (GUVAS), Automation Project of Enforcement Capability (GUMSIS), and Computerized TIR Transit System.

State Institute of Statistics (http://www.die.gov.tr),

- The web site of the SIS publishes all the national statistics data online through its website.

CHAPTER 4

DISCUSSION

The technological, physical and socio-cultural indicators for a successful e-government implementation were not at a required level when compared to EU and OECD countries. The current e-Turkey practices enable citizens' online information inquiry about the organizations, communication by the organizations and some online transactions. Full transaction services and political participation stages cannot be reached yet.

For a successful e-Turkey implementation a roadmap was suggested in the following paragraphs to achieve a mature market, political and infrastructure environment and mature citizens, businesses and government.

For a mature market environment:

(Lack of high quality "Brain Pool")

- ICT education in secondary schools:

- Fund ICT equipment and broadband to all schools (within a computer laboratory).

- Train the teachers through the programs available by Ministry of Education or ECDL.

- Put quality educational content online to support teaching and learning.

- Ensure all students and teachers have an e-mail address.

- ICT education in universities:

- Increase the enrollment capacities of Computer Sciences departments.

- Create a partnership between Private sector (ICT) and universities. Establish a scheme enabling to train students with IT for businesses and place them into a SME for summer practice to help them with IT issues.

(Lack of supporting cluster industries)

- Encourage venture financing through targeted tax credits and loan guarantees.

- Put in legislation strong intellectual property rights protection.

- Support ICT enterprises in the "Qualified Industrial Zones" (QIZs).

(Low level of R&D and Innovation)

- Establish an "Advance Technology Program Fund" with the government private sector partnership. This is high risk, high technology research that would not otherwise receive funding. This funding is to be awarded on some criteria like: scientific and technologic merit, potential for broad-based economic benefit.

- Provide tax incentives for R&D (not only Technoparks).

- Establish an autonomous board including prominent professors, top businessmen and specialized bureaucrats, which will prioritize top value projects and select "Advanced Technology" projects to be funded. This board is also to measure, monitor and assess the progress.

- The "Doctoral Studies" must be directed to research areas that the results can be utilized by the "Advanced Technology Projects".

- Establish a network forum, enabling share of information and experience between the voluntary experts and SMEs.

(High cost of broadband access)

- Open the incumbent's (TT) facilities to other operators (LLU) and deregulate the market. Encourage the alternatives (e.g. DSL, Cable, Fiber To The Building-FTTB, Fixed Wireless Access-FWA). This will lead to both retail competition and cross-technology competition.

- Act proactively on putting necessary legislation in order to prevent incumbent's actions to slow down the process.

For a mature political environment:

- The visible support is behind the efforts and the e-agenda is driven by a dedicated organization (Information Society Department) within State Planning Organization (SPO), but there is lack of coordination and the deadlines of the actions are not realistic. Especially, ones regarding the telecom regulations in the STAP were already postponed. With the help of the political leaders support, put some budgetary power to the "Information Society Department".

- Urgently, complete the necessary legislations regarding, universal service obligations, electronic contracts, etc. Additionally, strengthen the Personal Data and Privacy Protection Law (Law no: 25365) with strong penal enforcements.

- Stakeholder engagement shall be extended on more specific topics (e.g. Broadband Stakeholder Group, Digital Content Forum).

For a mature infrastructure environment:

(Low penetration and availability of access paths)

- Prioritize a market-led infrastructure rollout for competitiveness. Force the incumbent (TT) to open up the facilities to competitors through LLU, through a series of proactive regulatory actions: enforce to upgrade exchanges beyond metropolitan areas by revising the provision for TT connectivity and enforce TT to offer wholesale DSL.

- Instead of subsiding cost of broadband build-out, give incentives to ones that will invest in rural areas.

- Encourage extensive rollout of different technologies (DSL, Cable, etc.) in a competitive market.

(Low infrastructure quality)

- Standardize the infrastructure rollout and enable a feedback system from users to raise dissatisfaction and publish these through traditional media.

(Poor security)

- Establish PKI standards.

For mature citizens:

(Low level of IT skills)

- Push ECDL as a qualification to drive skills and common training standards.

- Create education programs through traditional media, like radio programs or newspapers.

- Focus on target groups like unemployed, women, elderly or low income.

- Develop a public-private partnership according to the target groups. (e.g. a women magazine for women, TV campaign for others).

(Perception of security as a barrier)

- Government must establish standards and a legislative approach. Enforce policies ensuring secure systems and protection of information.

(Perception of cost as a barrier and low penetration of PCs)

- Give tax incentives for PC penetration. Establish "PC tax reform": Enable companies to receive a tax relief for the purchase of computers that they then offer to their staff to buy tax-free and keep at home. Let the employees to purchase the PCs from their employers through monthly payments deducted from their salaries within (+)2 years. Finance this scheme by the banks and guarantee the loans. By this program; employees will receive cheap PCs; companies will benefit from side effects like IT literate staff; banks will be included in a low risk investment as the loans are government guaranteed; government will achieve the goal to increase PC penetration and ICT literacy; an activity will be created in the ICT market as the employees are offered an opportunity to purchase a PC that otherwise not have considered the investment.

(Lack of awareness and attention)

- Use TV, radio and newspapers for direct marketing campaigns to raise awareness and attention of the general public with the benefits and opportunities of the Internet.

- Encourage quality content in Turkish language. Put information about health, education, culture, and local areas. Coordinate dispersed fora under a central information network, enabling online sales or exchanges of goods or information, online real estate search, etc.

(Low Internet usage)

- Support the penetration of access through a "Public Places Programme". Enable Public Internet Access Points (PIAPs). Provide smart cards as an electronic ID card. These cards should contain digital signatures to constitute a single identity for the users. Develop a network of PIAPs located in the ATM Cabins of the banks.

- Spread the PC penetration among all "Muhtar"s for the districts and connect them to Internet. Enable the municipal services to be performed online and address change notifications to be done online through a Central Information System Network.

- Encourage citizens with incentives like reductions by a symbolic amount for online tax payments.

For mature businesses:

- Provide tax breaks for the cost of PCs and communications equipment.

- Put in place a tax law to promote investment in IT training of the employees.

- To fill the IT skill gap develop a "Skill for Information Age" scheme which brings businesses and universities together to ensure the IT skills being developed in graduates are those skills demanded by businesses.

- Leverage IT skills of the student and academic personnel with the companies. Develop a "Teaching Companies Scheme" in which a graduate is placed into a company for 2 years work on a project central to the companies needs.

- Develop a program to train a student interested in IT (not necessarily studying it) and place him/her into a SME for a few months (summer practice) to help them with IT issues.

- Support SMEs by providing training and resources and by providing targeted advice through "Chamber of Commerce".

- Improve the "Job Assignment System" of the Employment Association of Turkey (İŞKUR) as a job bank to enable the SMEs finding skilled staff and advertise it through TV and radio.

- Launch a "Support Network" for the businesses enabling information request, information and experience share by a government-industry partnership.

- Develop a grant scheme focused on specific industry clusters of SMEs and standards development that can be leveraged across industries. Provide funds for facilitation of the projects (e.g. constructing an industry portal for information access about tender listings, online training courses, economic forecast, project management and document management

applications, etc.). Publish these companies and projects through TV, newspapers and radio.

- Set a target for online procurement service and mandate it starting from pilots (e.g. health sector, defense sector, education sector) for paperless process.

For mature government:

- Focus on a secure "Government Portal" that can be scaled up to accommodate the growing number of services. Set standards for interoperability and publish the framework to all public organizations.

- Prioritize a number of events with a user-centered approach (e.g. moving a house) and re-design the processes according to this service.

- Set the targets centrally and mandate these for the local governments to meet the same targets. Instruct to prepare their own plans with guidelines prepare by the "Information Society Department". Encourage pathfinder pilot projects to be rolled-out across other local authorities to simulate competition and innovation and enable transfer of best practice projects.

- Train the government employees with ECDL programs.

- Establish a competitive tendering system through sponsorship from private sector. Provide tax relief for the companies that the PCs will be purchased and advertise these companies at the front offices.

- Plan the depth and number of services that will be put on-line. For the service to be user-centric develop a Government Portal though interoperable systems among cross-agencies which will be funded by cross-agencies.

- Establish an online forum to require input on potential legislations and regulations.

- Enforce the required legislation for e-procurement and e-tendering services.

- Outsource the required technology which enables further developments on the systems which will provide an opportunity for the customization, further technology development and innovation, also which eliminates being mandate to system suppliers.

These issues were figured for a successful e-Turkey implementation by means of fishbone diagrams.

The successful e-Turkey shall be consist of a mature environment, mature stakeholder groups for e-government. These components were given in Figure 4-1 by means of a fishbone diagram.
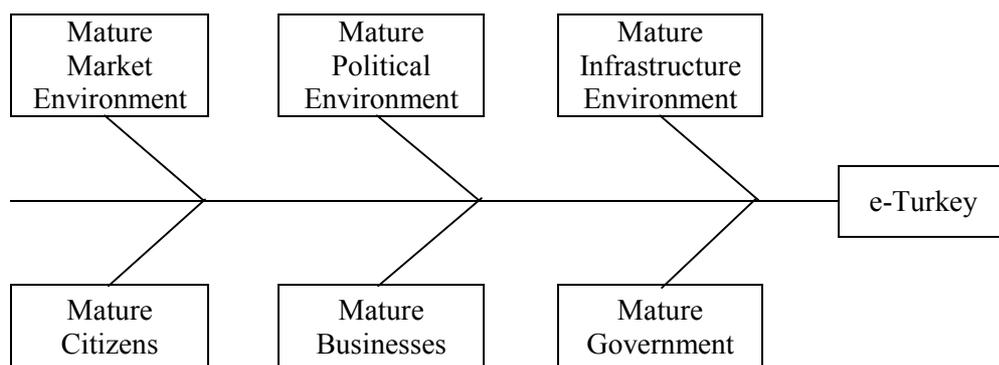

Figure 4-1 E-Turkey Components

For a mature market environment in Turkey, the necessary components were provided in Figure 4-2.
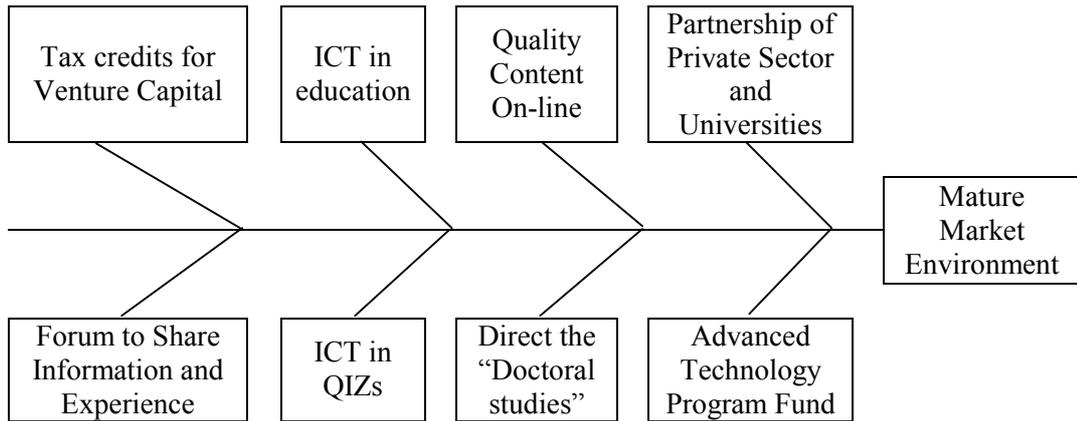

Figure 4-2 Mature Market Environment for e-Turkey

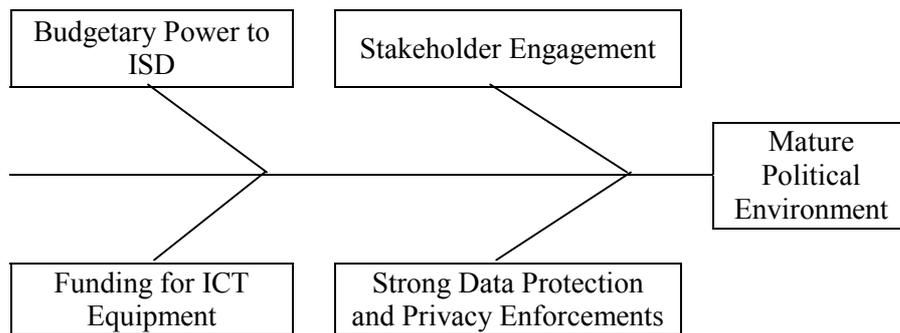For a mature political environment in Turkey, the necessary components were shown in Figure 4-3.

Figure 4-3 Mature Political Environment for e-Turkey

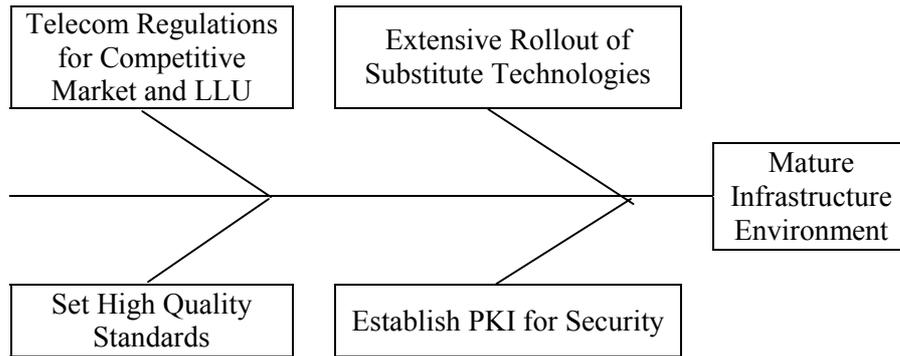For a mature infrastructure environment in Turkey, the necessary components were presented in Figure 4-4.

Figure 4-4 Mature Infrastructure Environment for e-Turkey

The necessary components were provided in Figure 4-5 for mature citizens.
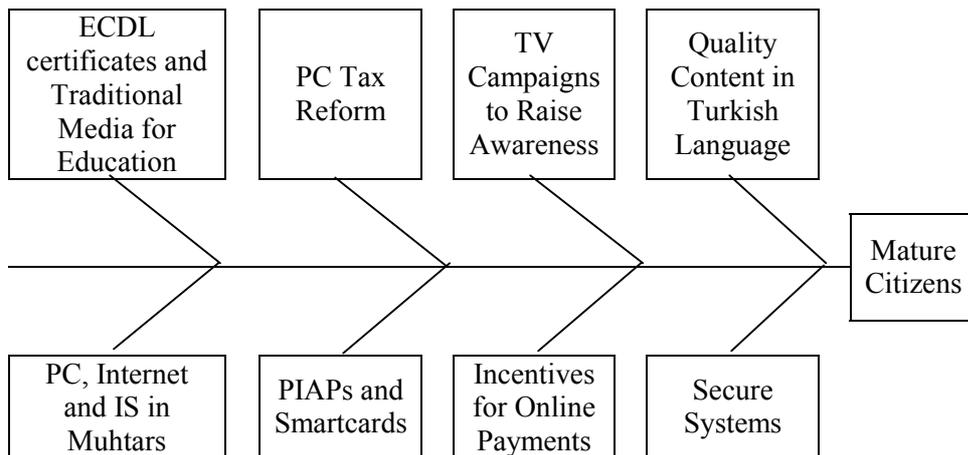

Figure 4-5 Mature Citizens for e-Turkey

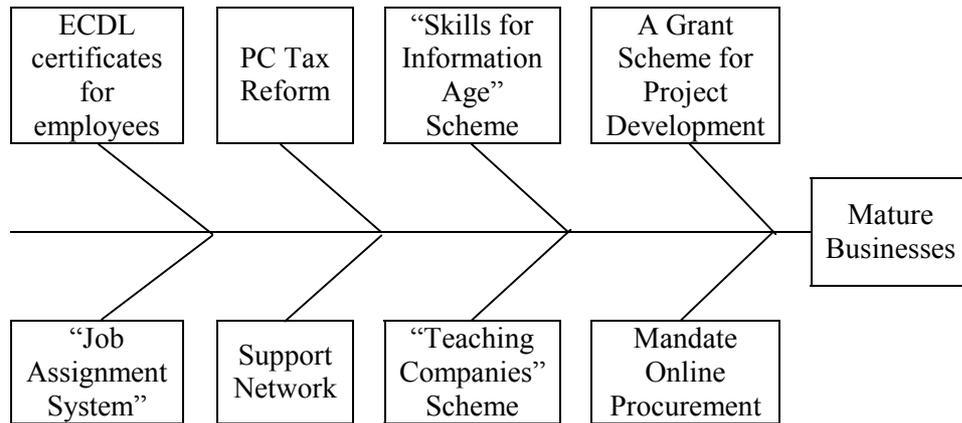The necessary components were provided in Figure 4-6 for mature businesses.

Figure 4-6 Mature Businesses for e-Turkey

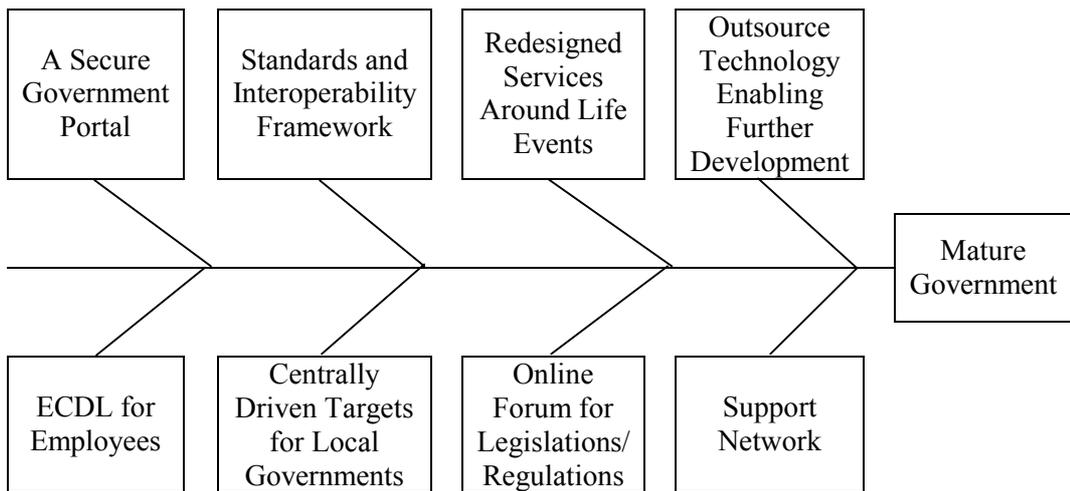The necessary components were provided in Figure 4-7 for a mature government.

Figure 4-7 Mature Government for e-Turkey

The sequence and priorities of the issues were tabulated through Table 4-1 to Table 4-5. In these tables, the estimated completion times for the issues were also given.

Table 4-1 Sequence A Issues

Issue	Sequence	Priority	Estimated Completion Time
Fund ICT equipment and training	A	1	2004
Set training standards	A	1	2004
Train teachers	A	2	2005
Focus on target groups for training	A	2	2005
Increase enrollment capacities of computer related sciences	A	2	2005
Spread PC and broadband access to all schools and libraries	A	2	2010
Put educational content online	A	3	2005
Direct doctoral studies to be utilized by the Advanced Technology Projects	A	3	
Establish necessary schemes enabling student-business interaction	A	3	2005
Use traditional media for IT education	A	3	2004

Table 4-2 Sequence B Issues

Issue	Sequence	Priority	Estimated Completion Time
Tax credits and loan guarantees for venture financing	B	1	2004
Put in place strong legislations	B	1	2005
Establish Advanced Technology Program Fund	B	2	2005
Establish an autonomous board to select Advanced Technology Projects and monitor the progress	B	2	2005
Provide training and resources for SMEs	B	2	2006
Establish a network forum for SMEs	B	3	2006

Table 4-3 Sequence C Issues

Issue	Sequence	Priority	Estimated Completion Time
Put in place the proactive regulatory actions	C	1	2004
Standardize the infrastructure rollout	C	1	2004
Establish PKI standards	C	1	2004
Force incumbent for LLU	C	2	2004
Give incentives for investment in rural areas	C	3	2005

Table 4-4 Sequence D Issues

Issue	Sequence	Priority	Estimated Completion Time
Give VAT reductions for PC penetration	D	1	2004
Put content in Turkish language	D	1	2005
Use traditional media to raise awareness	D	2	2005
Enable PIAPs	D	2	2006
Spread PC and broadband in Muhtars	D	2	2006
Open libraries and schools for the Internet use by the public	D	2	2005
Give symbolic incentives for use of online services	D	3	2004

Table 4-5 Sequence E Issues

Issue	Sequence	Priority	Estimated Completion Time
Set central targets to be met by local governments	E	1	2004
Outsource the technology enabling further technology development	E	1	2004
Establish security and interoperability standards	E	1	2005
Redesign the services around the life events	E	1	2005
Establish a government portal	E	2	2005
Put core services online	E	3	2005

Sequence A, C and D issues enable accessibility, availability and IT literacy. Sequence B issues enable businesses to be ready for the required change and sequence E issues enable government to be ready for the required change.

For the future work on the same subject, a sample survey can be conducted for the public sector workers or for the citizens to retrieve their perceptions about the e-government concept and their needs.

REFERENCES

Accenture, "Insights For Government Executives, Government Portals – The Next Generation of Government Online", Issue No 4, May 2001

Accenture, The Government Executive Series, "E-Government Leadership: Engaging The Customer", April 2002

Accenture, The Government Executive Series, "Technology in Government: Riding the Waves of Change", September 2002

Aicholzer, G., Schmutzer, R., "Organizational challenges to the development of electronic government", Proceedings from 11th International Workshop on Database and Expert Systems Applications, Springer, New York, 2000, pp.379-383

Aldrich, D., Bertot, J. C., McClure, C. R., "E-Government: Initiatives, developments and Issues", Government Information Quarterly, 2002 (19) 349-355

Al-Kibsi, G., de Boer, K., Mourshed, M., Rea, N. P., "Putting Citizens Online, Not Inline", The McKinsey Quarterly, 2001 (2) 65-73

Blanchette, J. F., Johnson, D. G., "Cryptography, Data Retention, and the Panopticon Society", Computer & Society (1998) 28 (2) 1–2

Booz Allen Hamilton, IAP, INSEAD, "The World's Most Effective Policies for the E-Economy" (2002)

Bucy, P.E., "Social Access to the Internet", The Harvard International Journal of Press/Politics 5 (1) (2000) 50– 61

103

Büke, M., "Seçim Bildirgelerinde E-Devlet", 03-10-2002, turk.internet.com

Castells, M., 1997, "The Information Age: Economy, Society and Culture, Vol. 2. The Power of Identity", Blackwell: Oxford

Castells, M., 2000a "The Information Age: Economy, Society and Culture, Vol. 1. The Rise of the Network Society", 2nd edition. Blackwell: Oxford

Castells, M., 2000b "The Information Age: Economy, Society and Culture, Vol. 3. End of Millennium", 2nd edition. Blackwell: Oxford

Carmine, S., Shi, Y., 1999, "World Wide Web Site Design and Use in Public Management, In Information Technology and Computer Applications in Public Administration: Issues and Trends", edited by G. David Garson, 246–66. Hershey, PA: Idea Group Publishing

Chen, Y., Gant, J., "Transforming Local E-Government Services: The Use Of Application Service Providers", Government Information Quarterly, 18 (2001) 343-355

Chen, W., Wellman, B., "Charting and Bridging Digital Divides: Comparing Socio-economic, Gender, Life Style and Rural Urban Internet Access and Use in Eight Countries", AMD Global Consumer Advisory Board, October 2003

Cohen, S., Eimicke, W., "The Future of E-Government: a Projection of Potential Trends and Issues", Prepared for Price Waterhouse Coopers endowment for the business of government, 2002

Csetenyi, A., "Electronic Government: Perspectives From E-Commerce", Proceedings from 11th International Workshop on Database and Expert Systems Applications, Springer, New York, 2000, pp. 294–298

Denhardt, R. B., "The future of public administration, Public Administration and Management", 1999, 4 (2) 285

Devadoss, P. R., Pan, S. L., Huang, J. C., "Structurational Analysis of E-government Initiatives: A Case Study of SCO", Decision Support Systems 34 (2002) 253– 269

Duncan, A. M., "Depository Libraries, the Internet and the 21st Century", Journal of Government Information 23 (4) 1996 217-225

EU Representation Of The European Commission To Turkey, Press Release: "EU Supports The Fight Against Organized Crime In Turkey", 05-04-2004.

European Commission, 2001, E-Europe+ 2003 Action Plan

Göker, A., "Onuncu Yılında Türk Bilim Ve Teknoloji Politikası: 1993-2003, 3 Şubat 1993 Günü Yapılan Bilim ve Teknoloji Yüksek Kurulu Toplantısında Alınan Kararlar ve Uygulama Sonuçları", 2003

Grimley, B., "Services Without the Seams", Government Executive, 29 (10) 1997

Ho, A. T., "Reinventing Local Governments and the E-Government Initiative", Public Administration Review, 62 (2002) 4

Holliday, I., "Building E-Government In East And Southeast Asia: Regional Rhetoric And National (In)Action", Public Administration and Development, 22 (2002) 323-335

Hopkirk, A., "The National Computing Center Technology Forecast 2002/2003", Issue No 1, June 2002

Jenkins, G., "Observations From the Trenches of Electronic Government", Association for Computing Machinery (ACM) 2 (44) 2002

Jordan E-Government Implementation Plan, "Launching E-government in Jordan", presented to H. M. King Abdullah II, September 2000

Kahn, R.E., "The Role of the Government in the Evolution of the Internet, 2001

KPMG, "UK Computer Market Insight", Key Note Limited, 2002, 24-25

Kraemer, K. L., Dedrick, J., "Computing and Public Organizations", Journal of Public Administration Research and Theory 7 (1) (1997) 89– 112

Lan, Z., Falcone, S., "Factors influencing Internet Use—A Policy Model For Electronic Government Information Provision", Journal of Government Information 24 (4) (1997) 251–257

Laskowski, M.S., "The Impact Of Electronic Access To Government Information: What Users and Document Specialists Think", Journal of Government Information 27 (2) (2000) 173– 185

Layne, K., Lee, J., "Developing Fully Functional E-Government: A Four Stage Model", Government Information Quarterly, 18 (2001) 122-136

Lenk, K., Traunmuller, R., "Presentation at the IFIP WG 8.5 Working Conference on Advances in Electronic Government", (Feb. 2000) (Zaragoza)

McConnell, W.B., "New Wine In Old Wineskins", Journal of Government Information 23 (3) (1996) 217– 225

Moon, M. J., Hinnant, C. C., "The pursuit of E-Government: What determines the Perceptions of E-government Effectiveness", Paper Prepared for the 6th National Public Management Research Conference, Indiana University, Bloomington, Oct.2001

Moon, M. J., "The Evolution of E-government Among Municipalities: Rhetoric or Reality?", Public Administration Review, 2002, 62:4

Norris, D., Fletcher, P., Holden, S., "Is your government plugged in?", Public Management, June 2001, 4-10

OECD, OECD Science, "Technology and Industry Scoreboard 2003", 2003

OECD Policy Brief, "Checklist for E-Government Leaders", September 2003

OECD Public Management Policy Brief, No 8, "The Hidden Threat to E-Government: Avoiding Large Government IT Failures", 2001

O'Neill, J., "eGovernment", Archives Technical Information Series No 58, 2000

Öğütçü, M., "Navigation Towards Turkey's 2023 Vision Dreams Can Come True", Stradigma, 2003

Schubert, P., Hausler, U., "E-government meets E-business: A Portal Site For Startup Companies In Switzerland", Proceedings of the 34th Hawaii International Conference on System Sciences, IEEE Computer Society, Los Alamitos, California, 2001, pp. 1700– 1708

Seavey, A. C., "Final Thoughts On Interesting Times", Journal of Government Information 23:4 (1996) 515-520

Shuler, A. J., "Civic Librarianship: Possible New Role For Depository Libraries In The Next Century?", Journal of Government Information 23 (4) (1996) 419–425

Sonal, J., 1999, "Information Technology and Organizational Change in the Public Sector, In Information Technology and Computer Applications in Public Administration: Issues and Trends", edited by G. David Garson, 41–61. Hershey, PA: Idea Group Publishing

SPO, "Information Society Department, e-Transformation Turkey Project Short Term Action Plan", December 2003

State Institute of Statistics, "Year 2002 Statistics", 2002

Stierholz, K., "US Government Documents in the Electronic Era: Problems and Promise", Collection Management 21 (1) 1996 41-56

Stratford, J. S., Stratford, J., "Computerized and Networked Government Information", Journal of Government Information 27 (3) (2000) 385–389

Tapscot, D., "Digital Economy", McGraw-Hill, New York, 1996

Taylor Nelson Sofres Siar Group, "The Government Online (GO) Report", 2001

T.C. Başbakanlık, "e-Türkiye Girişimi Eylem Planı (TASLAK)", August 2002

Telefonica, "The Information Society in Europe – Present and Perspectives", 2002

The United Kingdom Government, Department for Transport, Local Government and the Regions (UK DTLR), "e-gov@local: Towards a National Strategy for Local E-government", 2002

Transparency International, "Transparency International Corruption Perceptions Index 2003", October 2003.

T. R. Prime Ministry, "An Information Society for All: E-Turkey, E-Turkey Initiative Action Plan", 2002

T. R. Prime Ministry, "Turkey Informatics Council Report", 2002

Turkey Informatics Report, "Turkey Informatics Council Draft Report", 2004

TUENA, T.C. Ulaştırma Bakanlığı, "Türkiye Ulusal Enformasyon Altyapısı Anaplanı", 1999

Türk Telekomünikasyon A.Ş., "Telekomünikasyon İstatistikleri", 2000

Uçkan, Ö., Beceni, Y., "A Strategical Approach To Turkey's Transition Process Into Knowledge Economy: The Evaluation Of E-Turkey Initiative Within The Framework Of E-Europe+ Program", 2003

UN/ASPA, "Global Study of E-Government", 2001

UNDP, Evaluation Office, Essentials, "Information Communication Technologies for Development", No: 5, 2001

US General Accounting Office (GAO), "Electronic Government: Challenges Must be Addressed With Effective Leadership and Management", GAO-01–959T, July 11, 2001, pp. 1–2

Watson, R. T., Mundy, B., "A Strategic Perspective Of Electronic Democracy", Communications of the ACM44 (1) (2001) 27– 30

Whitson, T. L., Davis, L., "Best Practices in Electronic Government: Comprehensive Electronic Information Dissemination for Science and Technology", Government Information Quarterly 18 (2001) 79–91

Wimmer, M.A., Traunmuller, R., "Trends in Electronic Government: Managing Distributed Knowledge", Proceedings from 11th International Workshop on Database and Expert Systems Applications, Springer, New York, 2000, pp. 340– 345

Wimmer, M.A., Traunmuller, R., Lenk, K., "Electronic Business Invading The Public Sector: Considerations On Change And Design", Proceedings of the 34th Hawaii International Conference on System Sciences, IEEE Computer Society, Los Alamitos, California, 2001, pp. 1709–1718

Wimmer, M. A., "A European Perspective Towards Online One-stop Government: The eGOV Project", Electronic Commerce Research and Applications, 1 (2002a) 92-103

Wimmer, M. A., "Towards Knowledge Enhanced E-Government: Integration as Pivotal Challenge", 2002b

World Economic Forum, "Global Information Technology Report", 2003

Wyld, C. D., Settoon, R. P., "E-Government: A Catalyst For Change in the Public Sector", Proceedings of the Academy of Strategies and Organizational Leadership, Volume 7, No 1, 2002, 75-79