UNIVERSITY OF INFORMATION TECHNOLOGY AND MANAGEMENT
In Rzeszów

FACULTY OF ECONOMICS

Major: **ECONOMICS**
Specialty: **International management**

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The Analysis of IRAN E-Readiness to Implement E-government

M.Phil, s THESIS

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Thesis accepted: .....
/supervisor's signature/

Rzeszów 2007

Dedicated to:

Iran, my most precious homeland
&
My Lovely Family

Without whom it would never have been accomplished

Contents

ACKNOWLEDGEMENT

I would like to express my most profound gratitude to my supervisor, Dr Krystof Feret whose expertise understanding, and patience, added considerably to my graduate experience. I appreciate his vast knowledge and skill in many areas integrated with his ongoing supports and encouragement.

I am mostly in debt and grateful to Prof. Andrzej Szelc for his suggestions, advice and generosity of providing me with the required materials evaluated in this study. I highly appreciate his great kindness and wish him prosperity and success now and ever.

I extend my appreciations and a huge deal of thanks to my family for the support they provided me through my entire life and in particular, I must acknowledge my wife and without whose love encouragement and support helping me through the most difficult and disheartening moments of this venture.

Preface

Today as governments face the ongoing pressure of the demand to increase their performance and getting used to the pressure of information society, the electronic government is turning into a key modernization and reform instrument. They have constantly been witnessing changes in the course of interaction with citizens from time immemorial. The present century experiences a huge wave of initiatives on the side of businesses, enterprises, and people to take advantage of the digital technology in every single aspect of lives.

Governments remain no exception in such a rapid running stream of digitalization. We all see the allocation of significant resources and budgets by governments worldwide to employ information and communication technology (ICT) in providing services for citizens and businesses. As the information and communication technology continues to grow at a rapid pace, more demands of increased quality, faster provision, accessibility and affordability services regardless of time and place arise. More demands which can be met through digitalization of electronic governments. Citizens are customers of public services and in the present time making use of modern means of communication means often a foregone conclusion They expect online facilities that will permits them to use the services of public agencies quickly and without any complication, tracking administrative processes simply and to tracing decisions as easily as possible. For instance, citizens expect more service and more transparency from public administration. In response to such demands E-government are meant to satisfy these requirements as long as the administrative processes are restructured accordingly.

The purpose of this dissertation is to present a solid grounding in the “nuts and bolts” of electronic government with an in depth analysis of e-readiness of Iran as a developing country in comparison with developed countries in the issue. With this regard the author has taken initiatives to examine the electronic government while introducing the STOPE view. In view of this the thesis tries to identify the digital economy in series of steps starting from the information technology (IT) supported value chain and value system of any organization, in government or in business, to the IT supported value system of a country. The author tries to address briefly the current trends of e-business and placing the emphasis on e-government.

The first chapter of the thesis titled “Essentials of E-government” tries to give a working understanding of the key principles and definitions associated with the functions of electronic government covering a range of definitions and history of the phenomenon. The three components E-governments including government to consumers, government to businesses and government to employees are each addressed.

The second chapter aims to illustrate the goals of electronic government in the course of interaction between the citizens and the government bodies meeting each other online. With this regard the dissertation provides a detailed account of challenges and restrictions along with their impacts on the citizens, businesses and the government agencies. With this regard we truly believe that while e government provides the governments with another way to serve citizens and businesses and bring innovation to internal operations, it is not simple and straightforward to bring about such changes. Information technology can provide alternative methods for service delivery and government operations but it requires figuring out what makes sense to do within different areas of government given different constituents, different conditions, different staff, different resources, and different priorities in different countries. A successful implementation of e-government also demands reassessing existing business processes and functions in the government.

Chapter 3 identifies the development of E government in different areas for both developed and developing countries, and also the breakdown of this chapter is describing the main concept of E readiness.

Chapter 4 touches the status of electronic government in Iran and all the path way the Iranian government has gone through to put its government into operation. Along with this, the barriers are fully reviewed and discussed and efforts are made to present a number of solutions to overcome such obstacles.

It is my intent in this dissertation to provide a clear frame work of my understanding of the electronic government and investigate its status in Iran.

It should be acknowledged that most of the work presented in this dissertation is a precise study of secondary data from a range of books, articles and web resources as well as my personal accounts of necessary data in different bodies of Iranian government.

Rahim Khaki
Poland (Rzeszów) ,August 2007

Chapter 1: Concepts and Frame of the Research

1.1. A brief glimpse of E-government

When we think about our daily interactions with government, for example applying for a passport or a driver's license, paying our utility bills, registering a personal vehicle, getting a tax or police clearance or even voting in parliament or city council election, the first thing which comes to our mind is the bitterness of the idea of standing in long lines. This bureaucratic perception on interactions with the government has been bothering citizens for a long time. We often hear people complaining about long telephone loops or governmental unresponsive and bureaucracy. Almost everyone has had the dismal experience of spending a few hours in long lines and yet being told that his documents lacked something. However in the world today which is being deeply affected by miraculous aspects of internet every single second people value their time too much to cope with the burdens of unreliable public sectors. At times, motor vehicles agencies and middle persons with expertise in dealing with long lines and not cooperative government agents appeared in the market to help citizens with the issue which has proved not be properly capable of tackling the problem. Only the emergence of internet followed by the considerable success of electronic businesses brought hopes the citizens the idea of being online rather than inline.

The growing demand of information and service exchange between the citizens and administrating arms of governments through information technology was first put into practice by application telex, telegraphs later telephone and facsimile transmission and today internet and email services.

1.2. General view of E-Government

The attempts by governments to place documents process on the internet go back to mid 1990s. With this regard governments have long sought to reach electronic fiscal reports and provide more transparent descriptions of public sector activities.[1] Thus many governments made genuine efforts to take initiatives to endorse the use of Information and Communication Technology (ICT) towards implementation of E governments.

Subsequently policies were made to direct the ideas from E commerce to E government (Stahl 2005).[2] In other words the concept of citizens of a state in the E governments is to replace that of customer in E commerce. According to Stahl, there are now world wide initiatives to introduce the idea of citizen centeredness inspired from the idea of customer centeredness in electronic commerce, however many governments are frequently accused of being considerably slow and incapable of meeting the demands of their citizens with bureaucratic dimensions. In other words the implementation of e-governments is likely to be subject to many obstacles which result in delays, inefficiency and irresponsiveness in many cases. The waves of e-government are rising through public organizations and public administration across the world. More and more governments are using information and communication technology especially Internet or web-based network, to provide services between government agencies and citizens, businesses employees and other nongovernmental agencies.

Across the world, public organizations are beginning an e-government journey by publishing static information to the Internet and establishing an on-line presence, in the hopes that they will experience increases in efficiency, effectiveness, and organizational performance[3].E-government may be defined as continuum from information provision when organizations and public agencies publish static information to the Internet to web interactive communication and E-transactions and to one stop integrated virtual governmental services As e-commerce, E-government represents the introduction of a great wave of technological innovations as well as government reinvention.

[1] Bryane Michael, Implementing and Assessing E-government, OUP, Oxford, 2005

[2] Bernd Carsten Stahl, the Paradigm of E-commerce in E-Government, De Manfort Univrsity Press, UK, 2005

[3] Jim Melitski, The World of E government and E-governance, 2001

E-government is defined as a way for governments to use the most innovative information and communication technologies, particularly web based Internet applications, to provide citizens and businesses with more convenient access to government information and services, to improve the quality of the services and to provide greater opportunities to participate in democratic institutions and processes. This includes transactions between government and business, government and citizen, government and employee, and among different units and levels of government.

E-government presents a tremendous impetus to move forward in the 21st century with higher quality cost effective, government services and a better relationship between citizens and government. One of the most important aspects of e-government is how it brings citizens and businesses closer to their governments.
Ultimately as E-government continuum leads to organizational transformation, public agencies begin implementing e-government and governance initiatives, organizational performance will be improved and services delivery will be better equipped to interact with citizens and provide services over the Internet. In addition, e-government is transforming organizations, by breaking down organizational boundaries and providing greater access to information, increasing the transparency of public agencies and citizen participation in government, enhancing communications and facilitating democratic processes.

1.2.1. E-Government in Broad Sense and Narrow Sense

To understand E-government, we must understand administrative development and reform on government in general. During two decades, Administrative reform and development have experienced TQM (Total quality Management) in1980s and Reengineering and Reinventing Government in 1990s. Government reinvention make us realized that government is actually a dynamic mixture of goals, structures and functions. E-government initiatives are complex change efforts intended to use new and emerging technologies to support a transformation in the operation and effectiveness of government derived from government reinvention. New challenge for public administration in 2000s or 21st century is to create an E-government.

E-Government can be defined in narrow sense. Electronic government is defined as, Government activities that take place over electronic communications among all levels of government, citizens, and the business community, including: acquiring and providing products and services, placing and receiving orders, providing and obtaining information, and completing financial transactions.

Broadly defined by Gartner (2000) E-government is the continuous optimization of service delivery constituency participation and governance by transforming internal and external relationships through technology, the Internet and new media. This includes Government to Citizen, Government to Employee Government to Business, and Government to Government. Recognize the implication of e-government, it can be defined as, the ability to obtain government services through nontraditional electronic means enabling access to government information and to completion of government transaction on an anywhere any time basis and in conformance with equal access requirement offers potential to reshape the public sector and build relationships between citizens and the government

Theresa A. Pardo[4]outlined its functions as follows:
1- Citizen access to government information: Providing access to government information is the most common digital government initiative.

2- Facilitating general compliance: E government can also mean providing electronic access to services that facilitate compliance with a set of rules or regulations.

[4] Theresa A. Parado. Realizing the promise of digital Government ,October 2000

3- Citizen access to personal benefits: Electronic benefits transfer and online application for public assistance and worker's compensation are examples of services that provide the citizen with electronic access to personal benefits.

4- Procurement including bidding, purchasing, and payment: Procurement applications allow government agencies to reap the benefits being realized in the private sector through electronic commerce applications. Electronic vendor cataloging, bid submissions and tabulations, electronic purchasing, and payment are government-to government and government-to-business transactions that serve both the needs of government agencies as well as their private trading partners.

5- Government to government information and service integration: Integrating service delivery programs across government agencies and between levels of government requires electronic information sharing and integration.

6- Citizen participation: Online democracy includes access to elected officials, discussion forums, town meetings, voter registration, and ultimately online voting. These services are intended to serve the community at large.

Theresa A. Pardo (2000) Viewed from technical terms, E-Government is an integrated tool comprising three enabling sets of new technology: Infrastructure, solutions and the exploitation of public portals
E-government infrastructure enabling the implementation of specific applications to address specific problems and issues of government management, so when providing Internet access and email services in public portals, the most positive impact will come from the solutions and services that can be accessed from the exploitation of public portals with these communication tools. Based on internal and external governmental telecommunication and internet infrastructure, through the exploitation of public portals of governments, provide the solutions for public service delivery.

Concluded in our comprehensive view E government can be defined as a way for governments to use the most innovative information and communication technologies, particularly web-based Internet applications, to provide citizens and businesses with more convenient access to government information and services, to improve the quality of the services and to provide greater opportunities to participate in democratic institutions and processes.

1.2.2. E-government from different perspective

There are quite a few numbers of definitions given for e-government and there is generally no agreement on a single definition. Taking into account what is expected from an e-government and it is understood it is the delivery of more convenient, customer-oriented and cost effective public services and sharing of information through electronic media. With this regard, e government should harness information and communication technologies to transform relations with citizens, businesses, and other arms of government. It is the transformation of external and internal public sector relationships, through Information and Communications Technology (ICT) in order to increase the efficiency of the delivery of government services and citizen participation. The local government of the Northampton Shire in the United Kingdom defines e-government to UK citizens as[5]:

E-Government is a national initiative utilizing technology to facilitate ongoing improvements in the services offered by central government, local councils and other public bodies such as the health service.

[5] http://www.northamptonshire.gov.uk/Democracy/eGov/eGov.htm

E-Government covers the delivery of services over the Internet, through managed call or contact centers by interactive digital TV and through mobile phones.
The local government of the Northampton Shire in the United Kingdom defines e-government to UK citizens as:
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Douglas Holmes in his book e-gov e business, strategies for e-government defines the e-government as[6]: the use of information technology, in particular the internet, to deliver public services in a much more convenient, customer-oriented, cost effective and altogether different and better way. According to Stahl [7]when those aspects of public administration which deal with tasks of executives are discharged with the application of information and communication technologies, we speak of e-government. Other similar definitions describe the same functions for the e-government as (Yee, et al)[8] defines e-government as: the application of information and internet technology to provide electronic access to government information and services. According to Yee, it resembles similar access to websites for information required to trade goods and products however provides his definition of digital government from broad and narrow dimensions. In his opinion, from a broad perspective e-government is the employment of information and communication technologies of all kinds from fax machines to wireless palm pilots towards the facilitation of daily administration of governments as an internet driven activity in order to provide citizens with services and information along with their participation and engagement.

From a narrow dimension, the electronic government the production and delivery of government services through IT applications. [9]However, the capability of cyber space has given vast dimensions to the issue of e-governments. Holmes later suggests that the movement towards introduction of electronic governments and their implementations are the results of the growing need to meet the needs of citizens through more cost efficient ways along with facilitating economic developments. Despite of being new and not much discussed, e-government wins more attention from scholars and researches all over the world. Bill Gates the president of Microsoft addressed electronic government one of the most exciting fields of electronic commerce in the near future.
A most important objective of e-government is to lead to “digital administration”, including online offerings with regard to information, communication, services and to the extent that this is feasible and legal opportunities for involving the customers of the public agencies, that is, members of the public and businesses, in a way that is built to their needs. The provision of full information from the side of the administrative procedures, online forms, are some of the examples which facilities for filing electronic applications, official notices delivered by e-mail for members of the public or discussion forums on topics currently of interest.[10]

The employment of modern information technology makes it feasible to speed up and rationalize on hand service offerings, to increase considerably the level of services provided by the agency. The transformation process under way in public and government administration is similar to that undergone by businesses which have already implemented e-business. Taking into consideration the above mentioned

[6] Douglas Holmes, Egov Ebusiness Strategies for Government, Nicholas Brealey Publishing, London 2001
[7] Bernd Carsten Stahl, the Paradigm of E-commerce in E-Government, De Manfort Univrsity Press, UK, 2005
[8] Goerge Yee, Privacy and Trust in Egovernment, National Council of Canada,2005
[9] Yinning Chen, A Comparative Study of Implementation of E-government, Ohio University Press, Ohio, USA, 2003
[10] Douglas Holmes, Egov Ebusiness Strategies for Government, Nicholas Brealey Publishing, London 2001

definitions, there are also other definitions from which the author develops his personal account of what the term e-government refers to in a far broader term touching three associated sub concepts[11].

E-government is the employment of information and communication technology to feedback government operations, engage citizens, and provide efficient and effective services for citizens, businesses and other parts of the government.

Within this broad definition, one can find four dimensions, which reflect the functions of government as follow:
1- E-services-the electronic delivery of government information, programs, and services often over the Internet but not always.
2- E-commerce-the purchase of products and services over the internet such as citizens paying taxes and utility bills, applying for passports and residence permits, and paying for recreation, or government purchasing office supplies and auctioning surplus equipment
3- E-democracy-the encouragement of citizens in the use of electronic communication vehicles, such as e mail and the internet to increase their participation in the public decision-making process
4- E-management-the application of information technology to develop and enhance the management of government, from streamlining business processes to enhancement of the flow of information within government offices

However once trying to understand the concepts of a typical electronic government development, there is the need to introduce and gain a precise understanding of a STOPE view of the development. STOPE view in this context refers to Bakery's STOPE formulation standing for Strategy, Technology Organization, People, Environment development. The next sub chapters will clearly illustrate the development e-government and the digital economy in the view of STOPE profile.

1.3. E-Government Vs E-Governance

E-governance is beyond the scope of e-government. While e-government is defined as a mere delivery of government services and information to the public using electronic means, e-governance allows citizen direct participation of constituents in political activities going beyond government and includes E democracy, E-voting, and participating political activity online. So, most broadly, concept of E governance will cover government, citizen's participation, political parties and organizations, Parliament and Judiciary functions.

Blake Harris [12](2000) summarizes the e-governance as the following:
E-governance is not just about government web site and e-mail. It is not just about service delivery over the Internet. It is not just about digital access to government information or electronic payments. It will change how citizens relate to governments as much as it changes how citizens relate to each other. It will bring forth new concepts of citizenship, both in terms of needs and responsibilities. E-governance will allow citizens to communicate with government, participate in the government's policy-making and citizens to communicate with each other and to participate in the democratic political process.

Therefore, in broadest sense, E-governance has more implications than E-Government. Understanding definition of E-Government that encapsulates a broader agenda of renewal may be more helpful to distinguish from these two different concepts but related to each other. E-Government refers to the use by government agencies of information technologies, such as web-based Networks, the Internet, and mobile computing, that have the ability to transform relations with citizens, businesses, and other arms of government. These technologies can serve a variety of different ends such as better delivery of

[11]Info Dev 2002, The Government handbook for developing countries. November, Washington DC.
[12] Blake Harris, E government 2000

government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management. The resulting benefits can be less corruption, increased transparency, greater convenience, revenue growth, and cost reductions.

1.4. A Triangle Relationship Model among Government, Business and Citizens

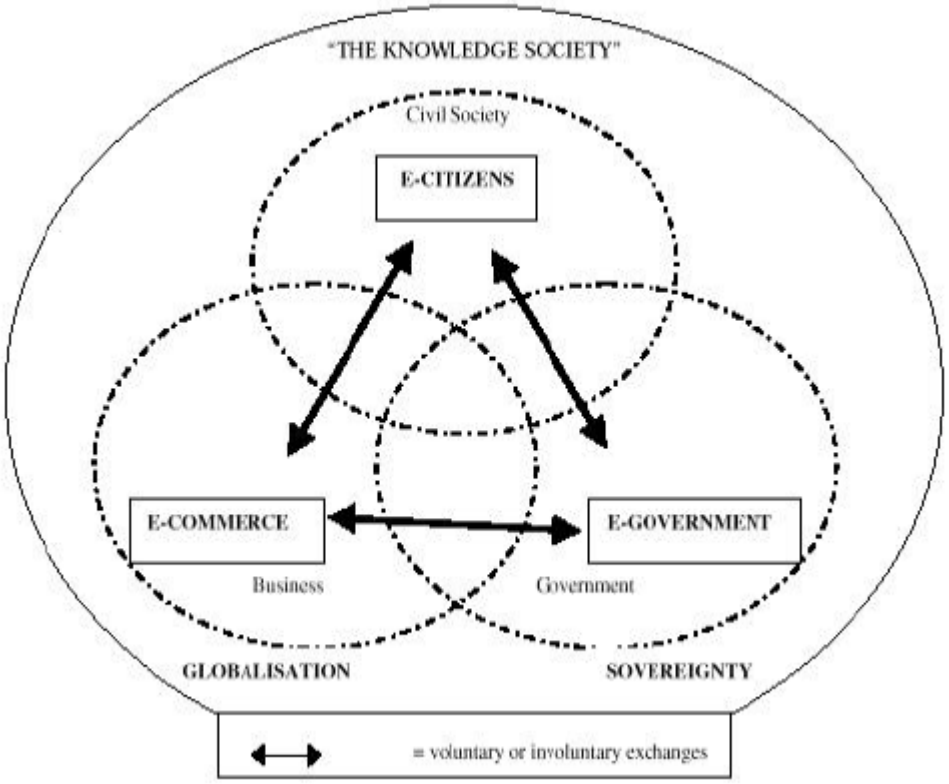
View from the definitions of E Government, we can get a triangle relationship model among government business and citizens as follows:

1- E-Government focus aspect in E Government partnership
The processes and structures that define the relationship between central government and local governments; the processes and structures that define the relationship between organizations and departments or agencies; the processes and structures that define the relationship between government and the employees; the processes and structures that define the relationship between Legislature and the Executive.

2- E-Business focuses aspect in E Government partnership
The processes and structures that define the relationship between governments and the markets, the processes and structures that define the relationship between governments and the private sector.

3- E-Citizens focus aspect in E Government partnership
The processes and structures that define the relationship between governments and citizens; The processes and structures that define the relationship between Government service delivery and citizens needs; and The processes and structures that define the relationship between countries and International institutions. The following diagram illustrates the relationship among E-Government, E Business, and E-Citizens in the context of the emergence of the so called knowledge society, globalization, and sovereignty.

Figure 1, Triangle Relationship Model among E-Government, Business and Citizens



Source Chief Executive Group Information management technology, 1999

1.5. E-Government Vision and Mission

The mission and vision statements for Interior's E-Government program provide this cohesive perspective. The mission statement conveys the purpose and use of E-Government, while the vision statement describes the desired end-state.

1.5.1. Interior E-Government Vision

Technology for citizen centered, integrated, secure services.
Interior's E-Government vision expresses the results desired from E-Government: fulfilling public expectations and capitalizing on internal efficiency opportunities enabled by information technologies. This vision also articulates the three most important values and priorities for E-Government citizen's internal integration, and security:
1- Citizens are Interior's ultimate customers, and their needs must be fulfilled
2- Internal integration is necessary for the efficient and effective management of the Department's operations.
3- Information security is critical to Interior's operations.

1.5.2. Interior E-Government Mission

E-Government enhances services for citizens and increases efficiency by using technology to improve business processes. The fundamental mission of E-Government is to better serve the public and improve internal operations by using the Internet and information technology. Because of the Internet's ability to

transcend geographic barriers, increase collaboration, establish central access points, and build communities, it will serve as the primary means of transformation.
To put the E-Government mission and vision in more tangible form, the following E-Government guiding principles were developed. These guiding principles help to define the shared values that underlie the mission and vision. They also help to set the criteria for the selection and prioritization of E-Government initiatives.

E-Government initiatives must be:

1- Citizen-focused: Government is revolutionary in its nature of citizen contact. Government services can be brought to constituents as never before but Interior's citizen-centric aspiration extends beyond the technology that delivers services. Interior will enable interactive processes that are simple, effective, and based on the user's needs and capabilities, rather than the government's organizational structure or traditional business models. E-Government initiatives are focused on citizen needs by enabling Interior employees to perform their tasks better, faster, and often cheaper.

2- Business focused: Internet technology is the enabler of Interior's E-Government strategy, but sound business processes are the foundation of service delivery. Technology solutions must exist to support the business, just as the business exists to support the customer. Customer focused business needs drive all technology decisions.

3- Transformational: E-Government is much more than creating web sites to support existing processes. Interior is re-evaluating and innovatively re designing its business processes to be more streamlined collaborative, and citizen-focused. By integrating common processes and customers, including processes involving other Departments, Interior will simplify and focus service delivery.

4- Partnership-based: A complex array of federal, state, and local agencies, as well as private sector organizations, are critical to the success of Interior's mission. The Department's E-Government approach recognizes these relationships by using expertise and capability to best serve citizens, as well as by respecting the partners' relative abilities to participate in E-Government solutions.

5- Efficient: E-Government creates the opportunity to evaluate and eliminate redundant or unnecessary steps and processes as well as to reduce costs and cycle times by transitioning from paper based to electronic processes. Interior will aggressively seek solutions with the goal of reducing long term operating costs.

6- Integrated: The Department's E-Government approach is unified and consolidated. While recognizing the unique missions and capabilities of its Bureaus and offices, the E-Government strategy reflects an approach to serving customers and improving internal processes with integrated solutions.

7- Results oriented: The Department's E-Government initiatives are business case driven and focused on tangible results. Expanded governance bodies and processes are being implemented to ensure E Government budgets are linked to critical performance aspirations identified in the Departmental Strategic Plan.

8- Secure: Increased risk of unauthorized accesses to Interior's technology infrastructure is inherent with increased authorized access. Interior will aggressively mitigate this risk through a coordinated approach involving technology tools, policy guidance, and training. As with physical security, IT security is everyone's responsibility.

9- Private: The Department of the Interior is entrusted with personal data that must be safeguarded, while still available to authorized users. Achieving this balance is a critical obligation, and E-Government initiatives are designed to address the business, legal, and procedural components of privacy issues as well as the technology solution. Unauthorized access to personal data simply cannot be allowed.

10- Transparent: E-Government initiatives create both significant resource obligations as well as potential disruptions to established work routines. The Department is committed to identifying evaluating and selecting these initiatives in a clear and open manner, based on the best value for the customer.

1.6. E-Government's Types and Characteristics

Deducted from our definition of E Government, we can further find out the types of E-Government and their features in practices of government online worldwide. Summarized from our research on E Government, normally, government identifies and drives implementation of eight types of E-government which can bring significant benefits to the Government citizens, business, employees and other nonprofit organizations and political and social organizations. Types of E-Government can be classified into 8 categories, as follows[13]:

1- Government-to-Citizen (G2C):
Provide the momentum to put public services online, in particular through the electronic service delivery for offering information and communications.

2- Citizen-to-Government (C2G):
Provide the momentum to put public services online, in particular through the electronic service delivery for exchange of information and communication.

3- Government-to-Business (G2B):
Actively drive E-transactions initiatives such as e-procurement and the development of an electronic marketplace for government purchases; and carry out Government procurement tenders through electronic means for exchange of information and commodities.

4- Business -to-Government (B2G):
Actively drive E-transactions initiatives such as e-procurement and the development of an electronic marketplace for government purchases, and carry out government procurement tenders through electronic means for sale of goods and services.

5- Government-to-Employee (G2E):
Embark on initiatives that will facilitate the management of the civil service and internal communication with governmental employees in order to make e-career applications and processing system paperless in E-office.

6- Government-to-Government (G2G):
Provide the Government's departments or agencies cooperation and communication online base on mega database of government to have an impact on efficiency and effectiveness. It also includes internal exchange of information and commodities.

7- Government-to-Nonprofit (G2N):
Government provides information and communication to nonprofit organizations, political parties and social organizations, Legislature, etc.

[13] International Journal of The Compute ,Vol. 10, No.2, 2002

8- Nonprofit-to-Government (N2G):
Exchange of information and communication between government and nonprofit organizations, political parties and social organizations, Legislature, etc.

From the above categories of E-government, we can sum up that E-Government initiatives should focus on five consumer-to-government relationships:
Citizen to Government
Business to Government
Government to Nonprofit
Government to Government
Government to Employee

First, Citizen to Government refers to the direct consumption of public services by the individual consumer for personal use. These services include licensing and permitting for hunting, fishing, and driving privileges. This will not only include the payment of taxes, fines, and fees to state and local governments, but also the payment of refunds to taxpayers.

Second, the Business to Government relationship model refers to those services consumed by entrepreneurs, businesses, and corporations, for a commercial purpose (profit or nonprofit). These include filing statements of incorporation, obtaining business licenses, assistance with site locations, and obtaining workforce information.

Finally, Government to Nonprofit, Government to Government and Government to Employee refer to the coordination of both inter and intra agency cooperation and employees to improve services inside or outside governments. This includes travel requests, purchasing requisitions payroll processing intergovernmental fund transfers, and position applications, etc.

Characteristics of E-Government Types:
With comparison and analysis of E government types, we can conclude some characteristics as follows:

Table1, Characteristics of Types of E-Government

Items	Information	Communication online	Transaction
G2C and C2G	Information requests of a firm or the citizen regarding taxes business licenses registers laws political programs administrative responsibilities, etc.	Information requests and Discussion regarding administrative Processes and products. communication with politicians authorities etc.	Online delivery of service and posting of results; electronic voting providing solution online and participation online etc.
G2B and B2G	Information requests of a firm or the citizen regarding taxes, business licenses, registers, laws business programs business policy administrative responsibilities, etc.	Information requests and discussion regarding administrative processes for business and products; communication with politicians authorities etc.	Online delivery of service and posting of results; electronic transactions of accounting, e-auditing, e procurement, e-shopping etc.
G2G	Exchange of information among different authorities and different hierarchical levels regarding administrative acts and laws, policy making, data projects or programs background information to decisions etc.	Information is exchanged among different authorities and different hierarchical levels; discussion for communication in negotiation and decision making; interaction regarding administrative acts and laws projects or programs, etc.	Inter-organizational workflow and exchange of data exchanging policy and solution online information and knowledge management etc.
N2G and G2N	Exchange of information regarding administrative acts administrative policy, data registers, laws, political programs background information to decisions etc.	Information is exchanged among different organizations and agencies; discussion communication in negotiation and decision making etc.	Intra-organizational workflow, and exchange of policy and solution data, information and knowledge management etc.
G2E	Exchange of information regarding works and performance personnel policy data, and notice for career management and development of government employees, etc.	Information is exchanged among different department or persons; communication in negotiation and decision making; interaction regarding works and performance etc.	Interpersonal workflow and exchange of personnel policy and solution, data information and knowledge management participation online, etc.

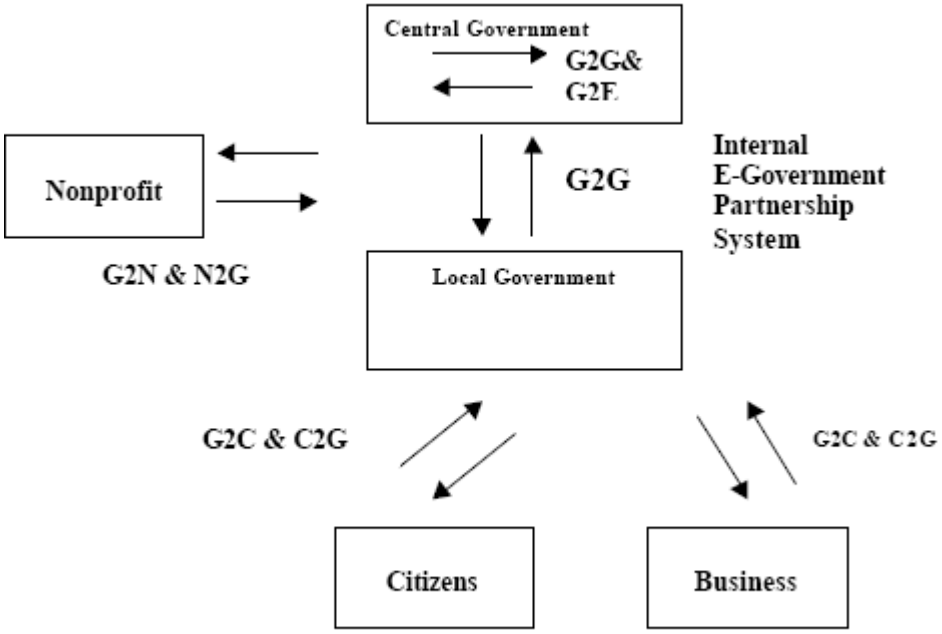
Source: International Journal of the Computer, Vol. 10, No.2, 2002, p 9

1.6.1. Broad Schematic System for E-Government Type Models

Electronic Government (E-Government) refers to the processes and structures pertinent to the electronic delivery of government services to the public. Electronic Government is functionally dependent on the assertion that E-Government internal partnership, namely, comprising Administration, Political, Civil Service, Parliament and Judiciary functions. E-Government external partnership, namely, comprising Central, Provincial/State/County or Local functionality; and information sharing as a service can be effectuated within and between Governments and between Governments, the Public Sector and the Private Sector; Government is amenable to a public service deliver model of varied complexity, which takes

cognizance of both the two characteristics of E-Government internal partnership and E-Government external partnership (Figure 2).

Figure 2, a Broad Schematic System for E-Government Models



Source: International Journal of the Computer, Vol. 10, No.2, 2002, p 10

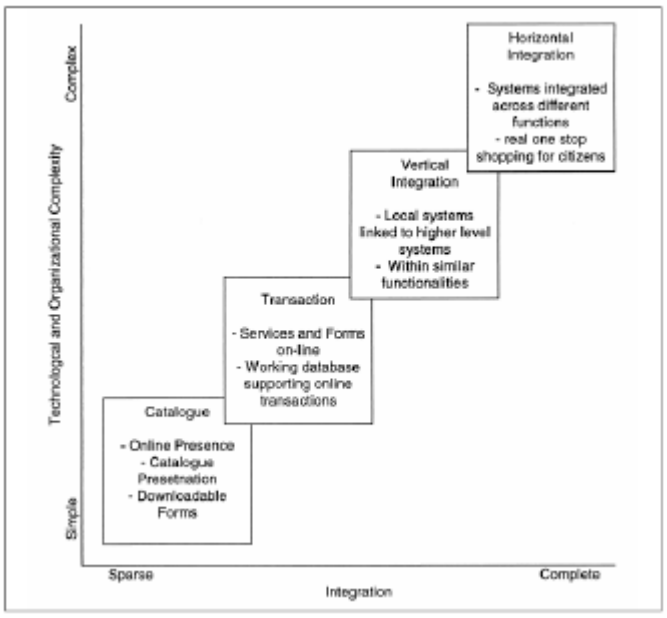
1.6.2. The Four Stage of E-Government Model

Layne 2001 describes a four stage model to develop a fully functional e-government based on technical organizational and managerial feasibilities. Four stages of a growth model for e-government include:
Cataloguing
Transaction
Vertical integration
Horizontal integration
As shown in Figure 3 these stages are arranged in terms of complexity and different levels of integration.
As we can observe in this Figure 3, four stages are arranged in terms of complexity and different levels of integration.

The first stage is called cataloguing because efforts are focused on cataloguing government information and presenting it on the web. In this first stage efforts are focused on establishing an on-line presence for the government.

The second stage, where e-government initiatives will focus on connecting the internal government system to on line interfaces and allowing citizens to transact with government electronically, can be called transaction-based e-government. At this stage, e-government efforts consist of putting live database links to on line interfaces, however, citizens' demands and changes in society will push governments to go further as the critical benefits of implementing e-government are actually derived from the integration of underlying processes not only across different levels of government but also different functions of government.

Figure 3, Dimension and stages of e government development



Source: Layne 2001

Citizens desire to see the government as an integrated information base and contact one point of government to complete any level of governmental transaction. We can refer to this as one-stop shopping concept. This integration may happen in two ways: vertical and horizontal. Vertical integration refers to local and central administration connected with different functions or services of government while horizontal integration is defined as integration across different functions and services.

In defining the stages of e-government development, the vertical integration across different levels within similar functionality will be attained before the horizontal integration across different functions, because of their different level of complexity. This last stage of e-government, vertically and horizontally integrated, represents for citizens an ideal situation, in which they have on-line access to ubiquitous government services, with levels of government and functional walls inside government transparent to them.

Stage I: cataloguing. In this first stage governments create an administration website mostly due to a great deal of pressure from external actors, demanding to get on the net. Parts of the government's non transactional information are put on the site. Main reasons why any government would want to move to this electronic cataloguing stage, is that as many citizens are able to access information on services from the private sector from the web, they expect the same access from the government.

In terms of G2C, this stage offers the least amount of functionality for the user. The typical government department home pages at this stage have a description of the department, and some links to other pages. It establishes a departmental "presence" as opposed to providing service access points to the customer.

The next step in this natural progression is to re-organize information by services, by different actions or by different events. At this stage technological requirements are relatively simple. Nevertheless, there are some challenges on managing these sites. The administrator has to balance different amounts of on line presence and allocated resources required by different departments. In a political organization this is always a problematic issue. Another important issue is the maintenance of the information. Along with procedural and policy changes web pages need to be maintained and some data presented on government websites may be temporal. Date and time stamping may be essential at this stage, along with issues of consistency in format and user-interface among different departments.

Privacy will also become an issue at this stage, as it is possible for the government to track on line activities. While this tracking information is collected toward improving the website and its offerings, this information may also be sold to external parties. Thus, several policy issues must be decided by the administration in establishing the site.

The reduced scope of the web site under this stage makes organizational challenges limited. The first challenge is assigning responsibility for the overall coordination and planning of services on the administration web site as well as its maintenance.

In many cases at this stage an internal employee, having non-technical job classifications, takes the maintenance responsibility for the site. Over a period of time, this part time responsibility may create problems of an inappropriate use of resources as the person may come to spend more and more time on site development and maintenance. Having an internal person whose skill at developing web sites is secondary to other skills may limit the ability of the site to meet customer needs.

The second problem is assigning responsibility for the answering of e-mails. Web sites often include an email address for questions from site users. Often these questions may be wide ranging and beyond the ability of the web master. Some procedure must be established to address how these emails will be handled and how quickly.

Stage II: transaction. At this stage, citizens can perform transactions, for example, renew their licenses and pay fines or taxes on-line. The quantity of these e-transactions increases and the administration is pushed to build on-line interfaces directly connected to the internally functioning government systems with minimal interaction with government staff. Electronic transactions offer a better hope for improved efficiency for both the customer and the agency than simply cataloguing information. This stage presents government on the Internet as an active respondent. It is now a two-way communication, where citizens move from a passive to active role. Citizens transact with government on-line by filling out forms and government responds by providing confirmations, receipts, etc.

The citizen-customer enters through a portal that looks at the service needs of the customer as opposed to requiring the citizens to traverse numerous sites to find the information needed. This one stop on line help centre will be available through a portal. The issue (cost, time) of integration of legacy systems comes onto the scene. As the information collected by governments may be politically sensitive, installation of appropriate security mechanisms may be an important technical consideration. At the same time, many other policy issues need to be resolved, such as authentication and confidentiality.

Stage III: vertical integration. At this stage, the focus moves toward transformation of government services, rather than automating and digitizing existing processes. Electronic government is not simply a matter of putting existing government services on the Internet; it requires a re-conceptualization of the government service itself. In the long run, the full benefit of e-government will be realized only when organizational changes accompany technological changes.

After on-line transaction services become prevalent and mature, citizens' expectations will increase. Most transaction stage systems are localized and fragmented. A natural progression will be the integration of scattered systems at different levels (vertical) and different functions (horizontal) of government services.

It is expected that vertical integration within the similar functional walls but across different levels of government will happen first, because the gap between levels of government is much less than the difference between different functions. Many administrations interact more closely with their central or local counterparts than with other departments in the same level of government.

Consequently, at stage three central and local systems are expected to connect or, at least, communicate to each other. Vertical integration goes beyond this simple interconnection. If a citizen conducts a transaction with an administration, the transaction information will be upward or downward to the appropriate

counterparts. The various levels of systems are connected and talk to each other so that results of transactions from one system can be interchanged with another system.

Physically, this may be integrated as a central database or a connected web of databases communicating with each other. Perhaps at this stage G2G transactions are more important than G2C ones. The target of vertical integration is to seamlessly integrate the central and local systems for cross referencing and checking.

Beginning in this third stage, communication and integration oriented technologies become more important. As the goal is to integrate central and local administrations, a web of remote connections is a technical prerequisite. In this remote connection and virtual transactions, several technological issues emerge: signal authentication, format compatibility of electronic data interchange, exposure level of internal legacy system to outside, etc.

Accordingly, the role played by the government employee changes. In the old traditional off line government, many government employees are responsible for processing localized governmental transactions. Once systems are integrated and automated, most transactions are automated, and the scope of activities performed by each employee will extend beyond functional department boundaries.

Development of this stage requires various levels of government to allow some flexibility in the development of their databases that meet not only their needs. Administrations have to become less proprietary about their information. Even though stage three may provide improved efficiencies, privacy and confidentiality issues must be carefully considered. A conceptually centralized database might be viewed with alarm as opposed to increasing efficiencies. Governments must consider the appropriate balance between the privacy of personal information and the right of individuals to access public records.

Stage IV: horizontal integration. The full potential of information technology, from the citizen's perspective, can only be achieved by horizontally integrating government services across different functional units. The limitations of the functional nature of both the public and private sector will become clearer as more public administrators begin to see the vision opened by the Internet. Typically, citizens requiring assistance from governments need more than one service. To overcome this problem, some administrations provide one stop service canters.

The horizontal integration of the stage four will considerably improve those efforts. Databases across different functional areas will communicate with each other and ideally share information, so that information obtained will propagate through all government functions. In addition, citizens could conduct business across a wide variety of requirements. As an example, when a citizen moves his/her home, the basic residence record could be propagated to different functional service branches of government such as the medical assistance and the local election department so that the citizen does not have to fill out a personal record form for each department or administration.

The horizontal integration of government services across different functions of government will facilitate one stop shopping for the citizen. Each organization may have to give up some power to move to this stage. Technically, integration of heterogeneous databases and resolving conflicting system requirements across different functions are major stumbling blocks for any government to reach this stage.

However, it is not only a technical challenge but also a management challenge, as demonstrated by Figure 3. Horizontal integration requires a change in the mindset of government agency directors. When thinking in terms of information needs or transactions, many directors perceive their department as most important and disregard other department's needs. With the support of the Internet, the government processes defined by specialization may not be efficient, effective, or citizen friendly. The concept of governance and management of government staff may be subject to re-evaluation from the perspective of e government. Functional specialization may not be suitable as a governing structure in e-government.

In many respects, horizontal integration provides more access for other governments and possibly businesses than it does for the citizen. However, it is important that the citizen does not perceive horizontal integration as the beginning of a society in which the electronic data collected is used to glean information about the individual. The individual remains in control because it is the individual who chooses to use or not use the capabilities of a website.

At last, we put our attempt to give a brief but general view of E-government and describe the use of technologies to facilitate the operation of government and the disbursement of government information and services. In the general sense, e-government can refer to such mundane uses of electronics in government as large-scale use of telephones and fax machines, surveillance systems, and even the use of television and radios to spread government related information. In this sense, e-government is not a new phenomenon by any means. The use of radio waves to spread disaster warnings, or to give information on voting, is a facet of e-government that has been in use for many years. In many countries with state operated media, the entire media becomes a form of e-government, helping to spread pro government messages.

Chapter 2: Goals, Challenges, and Benefits

2.1. E-Government goals

Goals reflect the high-level aims for an organization's activities. Interior's E-Government Goals define the overall purposes for which the Department will employ E-Government solutions. These are the elements that must be enhanced at Interior to implement E-Government effectively. Before E-Government solutions can make the Department's missions more citizen-centered and efficient, they must first be properly planned, governed, and supported by skilled staff and technical infrastructure.

E-Government Goal 1: Resource Protection Use technology to improve Interior's ability to protect the nation's natural, cultural, and heritage resources. Interior is the custodian of a large variety of resources. Protection programs include those for land and water, fish and wildlife, and cultural heritage resources. These responsibilities constitute a major mission for Interior and are cited as the first mission area in the Department's Strategic Plan. Interior manages thousands of protection programs, sites, and items dispersed throughout the nation. The number and complexity of these responsibilities have significantly increased over time and present coordination and scope challenges for the Department.

E-Government Goal 2: Resource Use technology to improve Interior's ability to manage resources to promote responsible use and sustain a dynamic economy. Interior has been charged with managing the use of the nation's resources since the Department's formation in 1849. This responsibility involves determining the proper use of mineral, forage, energy, water, and forest resources consistent with conservation and recreation goals. Interior generates or influences approximately 28% of the domestic energy supply and manages over 2,100 dams and reservoirs. Managing resource use constitutes the second mission area in Interior's Strategic Plan. This mission has grown increasingly complex over recent years. Numerous legislative mandates guide the Department's actions, and the tension between resource use and resource protection has been increasing.

E-Government Goal 3: Recreation Use technology to improve Interior's ability to provide recreation opportunities for America. The Department of the Interior is tasked to provide recreational opportunities to the public. Providing access to National Parks, refuges, and other public lands for a variety of recreational pursuits constitutes the third mission area of the Department's Strategic Plan. Interior manages hundreds of recreational sites and accommodates hundreds of millions of visitors each year. Reaching out to the public regarding recreational opportunities, providing access and services to visitors educating visitors, ensuring their safety, and maintaining the condition of recreational sites and lands are challenging tasks given the size and diversity of the Department's recreational responsibilities.

E-Government Goal 4: Serving Communities Use technology to improve Interior's ability to safeguard lives, resources and property; advance scientific knowledge; fulfill trust responsibilities to Indian tribes and individuals; and improve the quality of life for the communities we serve. Interior provides a large array of services to communities, which constitutes the fourth primary mission area of Interior's Strategic Plan. The Department's responsibilities include disseminating scientific information to the public conducting assessments of water quality and quantity safeguarding the public from hazards, providing direct services to Indians and Alaska Natives, managing fiduciary Trust funds, and assisting insular areas with achieving economic self sufficiency. The Department faces many challenges to fulfilling its mission of serving communities. The public's demand for scientific data and analysis has dramatically increased with the advent of information technology. Providing quality services to 1.5 million American Indians and Alaska Natives around the nation is a considerable task. Additionally, the Department is working to strengthen the public confidence in its management of Trust assets.

E-Government Goal 5: Management Support Employ E-Government solutions to achieve the Department's management excellence goals and the President's Management Agenda. Interior's fifth E Government goal focuses on improving internal operations and enabling employees to quickly execute administrative functions. This goal is designed to reduce redundant support processes and expenditures for a more efficient allocation of time and resources. Goal 5 specifically enhances the management of internal operations and supporting functions of the Department that are necessary to execute its primary mission.

E-Government Goal 6: Organizational E-Government Capabilities Reinforce the underlying structures and processes necessary to successfully develop, implement, and operate E-Government solutions. Interior's sixth E-Government goal is designed to build the organizational and technical capabilities to accomplish E-Government Goals 1 through 5. This goal will create the organizational capacity to coordinate and manage E-Government initiatives throughout the Department and ensure the proper mechanisms exist to support a transition to a robust and advanced E-Government environment.

2.2. Challenges in e-government

As we have seen before, e-government is a big opportunity to bring services to all citizens, but must also consider some challenging issues. We have yet discussed some of them, related to the stages of e government development. We are going now to consider them grouped by their areas. It will easily see that these requirements are not orthogonal, and there will be some overlaps. Really, the most significant characteristic of any successful e-government application is its quality.

2.2.1. Technical issues

Projects will not start "from the scratch", but will have to consider previous investments resulting in legacy systems. Some of them can be rewritten in new environments, while in some other cases this could be too expensive. Therefore interoperability with existing software and hardware platforms is a key success factor. It is unlikely that available resources can support a full replacement of existing applications. Designers must carefully consider portability and compatibility with future technologies. Finally, some legal aspects, like security and privacy, must be considered, as personal data are processed and stored, and financial transactions must be executed. To cope with such requirements, appropriate technical choices must be done.

Interoperability System must be interoperable; both as far as the newly developed are concerned, as well with the existing legacy applications. As a consequence it is mandatory to define open standard architectures, having well defined interfaces, to avoid heavy maintenance interventions on existing applications, perhaps completed in the recent past.

Privacy: A critical obstacle in implementing e-government is the citizens' concern on privacy of their life and confidentiality of the personal data they are providing as part of obtaining government services. The guarantee by government will not suffice unless accompanied by technical solutions, transparency of procedures and possibly. Independent auditing Privacy and confidentiality has to be highly valued in establishing and maintaining web sites.

Security: a basic task to fulfill is payment (of fines, taxes, etc.). Transaction security is an obvious requirement.

2.2.2. Economical issues

Economical issues are mainly concerned with return of investments and safeguard of the previous ones. The last point leads again to interoperability considerations and to some other considerations, like cost/benefit analysis and the effectiveness of the resulting application.

1- Costs: Implementation, operational and evolutionary maintenance costs must be low enough to guarantee a good cost/benefit ratio.

2- Maintainability: Regulations and device characteristics can vary, and the system must be capable to second the emerging needs. Maintainability is a key success factor for long living systems in a rapidly changing technical e regulatory environment.

3- Reusability: E-government must be seen as a nation wide plan. Implemented applications, or at least some of their modules, must be reusable by other administrations.

4- Portability: Independence from hardware/software platforms is a primary requisite for portable applications, to help in possible reuse by other administrations.

2.2.3. Social issues

Social issues are mainly concerned with the usability by a large variety of people. This implies that the interface must be usable by disabled or elderly people, understandable by low literacy or non native language people, etc.

1- Accessibility: Any service should be accessible by anybody from anywhere anytime. The concept of e-government is claiming for increased efficiency and effectiveness of government, but these goals will be achieved only if service will be available to one hundred percent of citizens. Even if Internet population is exponentially growing, there is a significant portion of the people who may not be able to access e-government for various reasons. Some users may have physical or cognitive limitations, both permanent as well as temporary. Some others can have limited access to ICT technologies and devices. Therefore universal access is still a mirage. Similar services must be maintained outside the web, such as physical service facilities and automated telephone response systems. Governments may want to provide Internet access through public terminals as a part of their universal access efforts.

2- Usability: Users are often non expert users, or, at least, they may use applications in a sporadic way and need guidance to find the right way to perform their transactions. Governmental web sites must be usable to be effective. This aspect has been considered in the technical regulations for the law 4/2004 which provide for a minimum accessibility level (objective/heuristic) and higher quality levels (subjective/empirical).

3- Acceptance: Successful implementation of e-government requires a re conceptualization of government. As e-government becomes a reality, the public sector organizational structure will change accordingly both internally and externally. The focus of change will be on the system efficiency and the citizens. Internally, the power conflicts over departmental boundaries and control of services will become more apparent as integration progresses. Externally, government processes will be organized for citizens' convenience instead of the convenience of the government. In other words, the integration should not be driven by efficiency and effectiveness alone. A relevant issue will be to have all the citizens well aware of the facilities offered by the e government infrastructure, and have them to trust in it. This task may require appropriate marketing actions and education of less skilled people.

2.3. Benefits of E-government

The Government Online Strategy has substantially achieved its objectives and delivered significant financial benefits to people, agencies and society; and has made a contribution to the broader government objectives. E governments are aimed to be used by every citizen, regardless of age, sex, education, etc. It

can be used by unemployed and job seekers to go on the internet and submit an application, share their skills profiles with recruitment authorities or even apply for the unemployment allowances while looking for jobs. Or other examples are, Citizens intending to travel overseas can apply for passports, extend its validity, And also Senior citizens can apply for benefits and allowances such as social security benefits and pensions. People can vote for their favorite candidate in parliament or presidential campaigns or simply fill their questionnaires during census.

Providing public services through information technology features more cost effective than traditional delivery channels of services. Governments are likely to spend more modest costs and users spend nearly zero dollars. Application of internet based technologies in e-government gives the advantage of considerable reduction in the cost for information transmission, travel expenditures, associated costs such as professional advice, venues, etc.

It might be argued that implication of electronic government claims huge budgets on the part of both the government and the citizens. Governments are required to allocate budgets on market and business planning, market research, hardware, software license fees, development supports, system engineering architecture designs, test and evaluation costs, customer interface and usability, system security, data and network architectures, human resource costs. Meanwhile the citizens as the users are subject to a number of direct and indirect costs such as computer hardware and software, computer operation and maintenance telecoms and web access charges, phones, etc. Yet the electronic government remains more cost and time effective in the long run.

Studies suggest that apart from time and cost saving effects e-governments build more trust in government[14]also serve toward the promotion of democracy[15]. E governments are also effective in terms of fight against corruption[16]. According to Snellen (2000) the structure and function of public administration is deeply affected by the implementation of electronic governments[17].

E-governments are free from a number of shortcomings associated with traditional governments. The electronic governments tend to give priority to mutual benefits to both citizens and governments and the capture of information and collection of data are no longer confined to administrative functions but to integrated resource service and knowledge focus[18].Within the body of traditional government each piece of technology is used to a limited scope of place and time whereas in the case of e-government no boundary exists while using technologies.

The Internet encompasses a wide spectrum of potential commercial activities and information exchanges. It offers firms, individuals and even governments an electronic infrastructure that enables the creation of virtual markets for goods and services where, previously, they did not exist.
We would like to take this chance to introduce briefly some benefits of E Government, as follows:

1- E-government improves efficiency:
ICT enable efficiency improvements in mass processing tasks and public administration operations. Internet-based applications can generate savings on data collection and transmission, provision of information and communication with customers. Significant future efficiencies are likely through greater sharing of data within and between governments.

[14] Heichelbech, 2002
[15] Cullen & Houghton 2000
[16] Fenner &Wehrle 2001
[17] Snellen 2000
[18] Chen at al 2005

2- E-government improves services:
Adopting a customer focus is a core element of member countries' reform agendas. Successful services are built on an understanding of user requirements, and online services are no different. A customer focus means that a user should not have to understand complex government structures and relationships. The Internet can help achieve this goal, by enabling governments to appear as a unified organization and provide seamless online service. As with all services, e-government services must be developed in the light of demand and user value, as part of an overall service channel strategy.

3- E-government helps achieve specific outcomes:
The Internet can help stakeholders share information and ideas and contribute to specific policy outcomes. For example, online information can boost use of an educational or training program; sharing of information in the health sector can improve resource use and patient care; and sharing of information between central and sub-national governments can facilitate environmental policies. The sharing of information on individuals, however, will raise privacy protection issues, and the potential trade-offs need to be carefully assessed.

4- E-government can contribute to broad policy objectives:
E-government contributes to other economic policy objectives by reducing government expenditures through more effective and efficient programs, improving business productivity through administrative simplification and promoting the information society and ICT industry.

5- E-government can help build trust between governments and citizens:
Building trust between governments and citizens is fundamental to good governance. ICT can help build trust by enabling citizen engagement in the policy process, promoting open and accountable government and helping to prevent corruption. Furthermore, it can help an individual's voice to be heard in a broad debate, harnessing ICT to encourage citizens to think constructively about public issues and assessing the impact of applying technology to open up the policy process. Policies addressing information quality and accountability are also needed. However, few expect e-government arrangements to replace completely traditional methods of information provision, consultation and public participation in the foreseeable future.

2.4. Risk in E-Government

Implementing e-Government as a major development can be a daunting task, since it can involve many factors of risk that could threaten the success of the project. Adequate risk assessment procedures may help in avoiding major pitfalls, though sometimes failures cannot always be predicted precisely. Since electronic government projects have a broad scope, risks can be found in many diverse areas. To name a few, such areas may be related to the technological foundations of the e-Government phenomenon, may be involved to the social aspect of electronic government, there can even be some political areas where risks might arise. Therefore, risk assessment in e-Government, if explored holistically, should span on a very broad and multidisciplinary environment in order to have a reasonably adequate positive effect.

2.4.1. E-Government Risk from different point of views

To support such a framework the need arises for a categorization of the various risk factors that surround e-Government projects. This part of the thesis shall introduce the main risk factors areas that will be considered for extracting risk elements to be used in the risk assessment process. Experience from the electronic commerce/business domain and the relevant literature show that some have attempted to classify risks in all sorts of high-level categories according to the nature of the risks. To name a few Tchankova[19] proposed seven different classes of risks, namely:

[19] Tchankova L. Basic Stage in Risk management, Environment management and health Vol. 13. 2002 pp 290- 297

1- Physical
2- Social
3- Political
4- Operational
5- Economic
6- Legal
7- Cognitive environment

Additionally, Liebermann[20] distinguished five different areas of risk in the eCommerce field, which are:
1- Financial
2- Physical
3- Psychological
4- Social
5- Technological

Furthermore, in the Integrated Risk Management Framework[21] the following main classification of potential risks influencing an organization is identified:
1- Political
2- Economic
3- Social
4- Technological

In that fashion and for the purposes of this research program this paper proposes the following high level classification of risk factors that surround e-Government projects:
1- Societal: referring to the risks that usually affect the way people live and interact in the society
2- Technical: such risks arise from the way information and communication technologies are used in order to serve the purposes a particular project is meant for.
3- Economical: where financial related risks are indicated
4- Political: here risks that erupt from government policies/decisions are discussed. It has to be stressed here that under the 'political' risk umbrella the legal-related risks are also included.
5- Security: since security has a major importance in e-Government projects it has to have a risk class on each own.

2.5. E-Government frameworks

To structurally develop FRAMES in its current form, various e-Government frameworks have been examined. The reason for doing so was the possible discovery of existing frameworks or models that look at the phenomenon in a holistic manner. Therefore, they could provide the foundations for the design of a risk assessment framework or even better, a suitable one could be re-used as is by 'attaching' risk assessment methods on top of it. These frameworks/models could be distinguished into two types:

1- Strategic, since they define the strategies that have to be followed to better realize e-Government
2- Operational, since they describe various architectures of e-Government systems

Four strategic designs have been found. One of them, the 'Value Chain Model'[22] demonstrates the way e Government may add value to the public sector. As such, it explores the e-Government concept from a business perspective and it is all about helping public administrators to better understand and realize the

[20] Liebermann, Y.An International Journal vol. 5 2002 pp 291-300
[21] Treasury Board of Canada Secretariat 2001 p. 9
[22] Wassenaar 2000

potential of exploiting the ICTs in the public sector. A second one attempts to set the various viewpoints from which e-Government systems may be viewed[23]. The ultimate aim of this framework is to shape the future of e-Government by setting some guidelines based on the following four perspectives:
1- Addressee
2- Process
3- Co-operation
4- Knowledge

A third strategic design for e-Government is the 'three dimensional viewing of e-Government'[24]of any e-Government system. A fourth strategic design for e-Government that has been identified from the literature review is the 'Growth Model'[25]which describes four (growth) stages that lead towards fully functional e-Government.
Likewise, the literature survey divulged two operational models for e-Government. The first one simply discusses about two different types of e-Government architectures coupled with their advantages and disadvantages[26]. These two architectures are called the 'integration' and 'fragmentation' model and basically discuss about the 'positioning' of the back office and the front office. Finally, the second operational model provides another design principle for e-Government implementations. The 'general model for e-Government initiatives'[27] describes two perspectives; the external and internal ones that are equally important for developing e-Government projects.

Such frameworks, despite the fact that they can provide holistic views of the e-Government concept from various angles have been proven unsatisfactorily for the purposes of this research. The Value Chain Model is a very useful business oriented framework, but unfortunately it is deemed that is not applications specific, as needed for this research. Then, two other strategic frameworks, the 'three-dimensional' and the 'viewpoints' ones, do pose very good designs in order to assist in setting policies and long term goals for e-Government implementations, but they seem to be rather too high-leveled for risk assessment to be efficient. In regards to the fourth strategic framework, the 'Growth Model' it has to be stressed that it is a very useful template in order to examine how e-Government projects progress. Unfortunately though, it does not describe any structural elements of such projects, thus it may not be very useful as the basis of a risk assessment framework. Furthermore, and after examining the remaining two operational models, the following may be concluded.

In regards to the 'integration/fragmentation' model it may be said that it is a nicely structured architectural model for e-Government services that is focused on the back and front office and how these are positioned, but unfortunately it does not go any deeper. For instance, what happens in the back office? As such, it is two vague for the purpose of this research programmer's aims. And finally, the 'general model for e-Government initiatives' poses a very all-round high-level framework that may provide guidelines for effective e-Government implementation, but unfortunately it is not very descriptive at a more lower, more 'apt', level so that efficient risk assessment methods could be employed.

2.5.1. Framework for risk assessment and modeling in E Government services

As explained in the introduction, the Framework for Risk Assessment & Modeling in e-Government Services aims at the provision of a methodology for efficient qualitative risk assessment in e-Government services.
The main aims of FRAMES can be summarized in the following three statements:

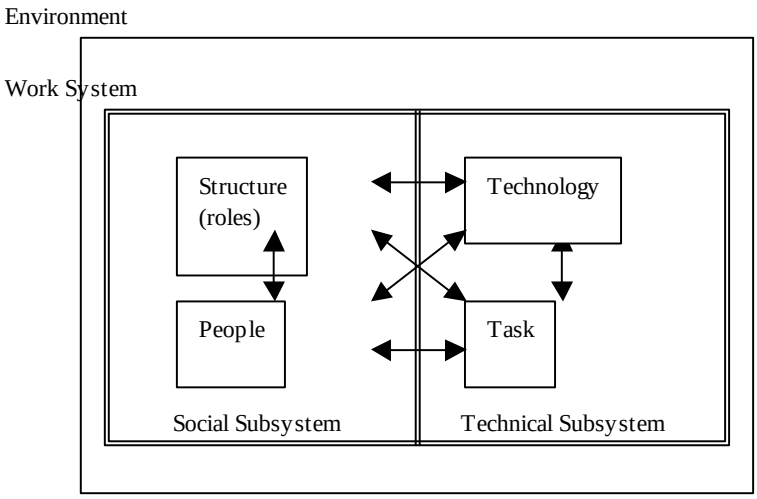
[23] Lenk K. Traunmüller, workshop on Electronic Government , Greenwich, England, IEEE Press, page 271-277
[24] Gisler, M. Spahni D. Electronic Government 2000
[25] Layne,K. Lee, J. Developing Fully functional E-government . A four stage model (2001) pp. 122-136
[26] Design Issues for Individual online Public Services DEXA conference, Greenwich England ,IEEE Press(2000) pp. 335-339
[27] Dridi, F., Pernul G., Unger, V. "Security for the Electronic Government" Trinity College Dublin, Ireland (2001) pp. 99-110

1- To provide a holistic view of an e-Government transaction service project
2- To enable the decision maker in assessing the risks involved in the development of the electronic transaction service.
3- To enhance decision-making at the feasibility stage of the project development.

Socio-technical systems[28] usually consist of two subsystems; the social subsystem and the technical subsystem, which are interdependent (Figure 4) the social subsystem contains two components:
1- The structure (or roles), i.e. Communications, authority, workflow systems
2- The people that have various such as attitudes, skills, and values

On the other hand, the technical subsystem contains two components as well:
1- The technology that is required for the system
2- The task(s) needed to achieve the goals of the system

Figure 4, Socio technical System



Source: Bostrom 1980; cited in Kavan 1999 p.297

Within that context FRAMES provides a way of implementing risk assessment in e-Services. As such, any e-Government transaction service project is seen (Figure 5) as an STS that comprises of three main socio technical subsystems that interconnect four main modules of the transaction service project. These four main modules are:
1- The customers
2- The E-Service
3- The organizational level
4- The intra-organizational service

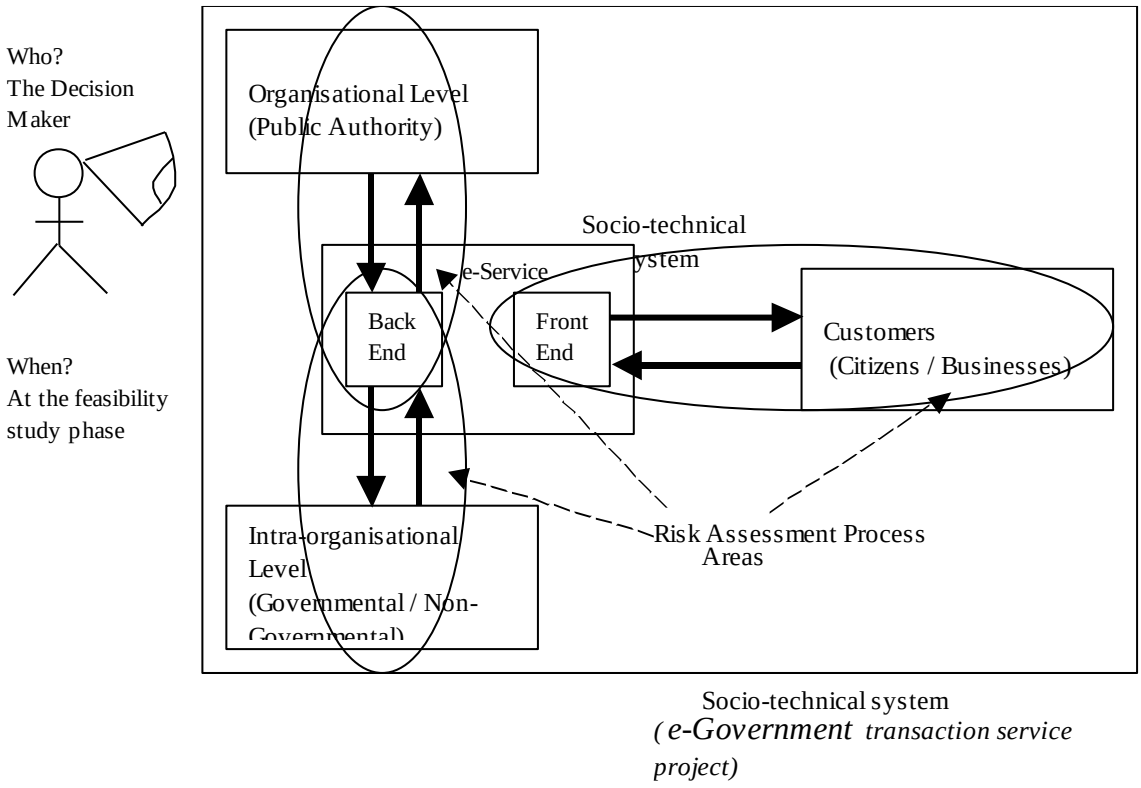
The 'customers' module mainly refers to the customers/users of the transaction service. These users can be citizens or businesses (and in some cases other governments) that interact with the front end of the system. Such interaction is understood to be in the form of using the system and/or providing feedback to the system. The second main module of FRAMES is the e-Service itself and it is divided into two main parts; a) the front end that is the main application/function that the customer is interacting with, and b) the back end that denotes the point where the eService interacts with the 'parent' organization, namely the

[28] Excellence in Client/Server Information System Implementations: vol. 37 is. 3 (1999) pp 295-301

public authority, which is responsible for the service, as well as other organizations that contribute, share information, interact with the eService. The third main module within FRAMES is the organizational level and it basically refers to the public authority that is responsible for the development of the electronic government transaction service. Within that level, the main actors / functions that support / develop the electronic transaction service can be found. Finally, the fourth main module within FRAMES is the intra organizational level that usually entails, other than the public authority, organizations (governmental or non-governmental) that are needed to support / develop the e-Service.

As it was mentioned above, within FRAMES there are three major socio-technical subsystems that are formed between the modules of the system. One such subsystem is formed by the connecting relationship of customers and the front end of the eService. A second socio-technical subsystem is formed by the connecting relationship between the organizational level and the back end of the e-Service module. And finally, a third such subsystem is formed between the back end of the e-Service module and the intra organizational level. Such subsystems are of crucial importance and are needed within FRAMES in order to better 'customize' the risk assessment process within any e-Government transaction service project. As mentioned earlier, each of these subsystems contains people that have different roles and utilize technology to achieve certain tasks that will work towards the system's goals. FRAMES understands that there are various typical high level risks within these particular areas (and this is STEPS is going to be exploited).

Figure 5, FRAMES



Source: BS-6079-3 Standard the risk assessment sub-process

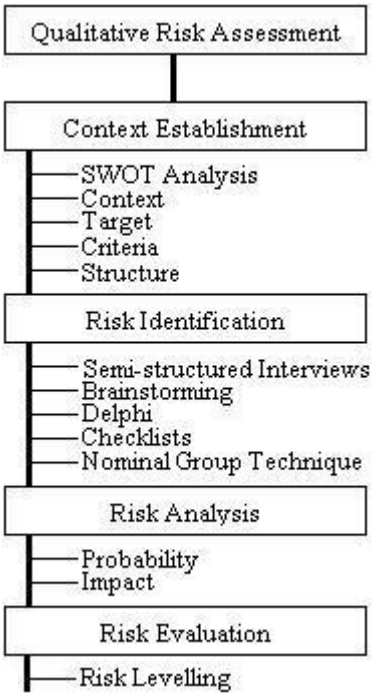
Therefore, the risk assessment process within FRAMES will consist of the following stages (figure 6):
1- Context establishment
2- Risk identification
3- Risk analysis
4- Risk evaluation

Context Establishment: The first stage of FRAMES is responsible for establishing the broad context within which risk assessment will be done. This stage mainly (but not limited to) includes knowledge acquisition, which will eventually set the measures of the various risks' impact. The knowledge acquisition stage defines the long term (strategic) goals of the system/organization, as well as the medium term (organizational) goals and the short term (management) goals. Then the risk assessor has to define the threats to these goals. Furthermore, another part of the 'context establishment' stage is to develop various criteria, such as to decide on the key actors/stakeholders. The final phase of this stage is to decide on the structure, which will tackle the issue of choosing what sort of qualitative risk assessment approach/approaches is more suitable, as well as the initial presentation of the risk assessment area to the stakeholders.

Risk Identification: Here lies the process of identifying the risks, as well as how, what or why incidents may occur. To achieve risk identification various methods can be used each of them having their own advantages and disadvantages. FRAMES will employ risk identification techniques that enable qualitative risk assessment. Some of them may be the following:
1- Semi-structured interviews
2- Brainstorming

3- Nominal Group Technique
4- Delphi method
5- Checklists

Figure 6: Risk assessment stages



Source: http://www.ejeg.com/volume-2/volume2-issue-1/v2-i1-art3.htm

Risk Analysis: It is a stage, where an estimation of both the probability of the occurrence of a risk and the magnitude of the consequences of the risk happens.
Risk Evaluation: During this process the consequences of the risks are leveled after their impact/magnitude.

Chapter3: Development of E-Government

Similar to the dramatic changes in E-commerce and e-trading, the e-government revolution offers the potential to reshape the public sector and remake the relationship between citizens and government. The wide variability in the extent to which web government is taking hold creates an opportunity to study how the e-government revolution affects public sector the e-government revolution affects public sector performance and democratic responsiveness. In the UN/ASPA global survey[29], five categories of measuring a global survey, five categories of measuring a country's e-government progress have been identified. A country's e-government progress should be identified as follows:

1- Emerging web presence: A country may have a single or a few official national government websites that offer static information to the user and serve as public affairs tools.
2- Enhanced web presence: The number of government web pages increases as information becomes more dynamic with users having more options for accessing information.
3- Interactive web presence: A more formal exchange between user and a government service provider takes place, i.e. forms can be downloaded; applications submitted online.
4- Transactional web presence: Users easily access services prioritized by their needs; conduct formal transactions online, like paying taxes; registration fees.
5- Fully integrated web presence: The complete integration of all online government services through a one-stop-shop portal.[30]

The following features characterize countries that are successfully implementing e-government projects all over the world.
E-Government should be implemented with:

1-Comprehensive: To the greatest extent possible, citizens should be able to do everything they have to do or want to do with their government through one e-government portal.

2- Integrated: All e-government applications should be integrated with each other, so citizens can avoid the need to provide the same data over and over and governments can save time and money by not needing to re-enter data.

3- Ubiquitous: Access to a jurisdiction's E-government portal and its connected sites and applications should be available to users/citizens from any Internet-capable connection, Internet appliances.

4- Transparent/Easy to Use: E government sites should be designed and operated so that the most novices of computer users can readily find the information they need, provide the information requested by the government agencies with which they are dealing, and otherwise perform all E-government transactions.

5- Accessible: The design and operation of E-government systems should, from the ground up, take into account the special needs of the disabled, and make it possible for them to use these systems as easily as the non-disabled.

6- Secure: E-government systems need to protect the confidentiality of data provided by citizens, the records created and stored by government, and the content and existence of citizen-government transactions performed over the Internet.

[29] 2000
[30] UN, 2000

7- Private: Data about citizen government transactions, and the content of those transactions, needs to be fiercely protected by the government.

8- Re engineered: It is not enough to replicate electronically the administrative processes and procedures currently in place. It is necessary to thoroughly re-evaluate the overall mission of the jurisdiction and then design a digital structure that creates a government citizen interface that simplifies and streamlines each transaction individually and the entire process of government administration generally.

9- Interoperable: An excellent e government site is one that provides appropriate and up to-date links to other e-government sites, at its own and other levels in the government hierarchy. All e-government sites need to work together seamlessly.

10- Be Developed to E-governance Systems: Developed from e-government, E-governance systems can just as easily implement democratic process, e-making of or policy, building up e-community. E-government serves not only as a means of administration, but also as a primary tool of collective and democratic decision-making, and participation for society.

3.1. E Government in Developed & Developing Countries

Every year, UN releases a report about the least developed countries (LDC) and compares their economic conditions in several various categories. 49 countries were recognized as the least developed countries, in 2002. These countries were selected based on their low GDP per capita, their weak human assets, and their high degree of economic vulnerability[31] . Implementing and developing digital government is a high-priority issue on agendas of different countries. Some countries have surpassed others in offering online services to their citizens. Indicators of education and literacy show that in Mozambique, only 7% of total population enrolled in secondary school. Indicators of communications and media show that in Bangladesh, only 3.4 % of population has a telephone, while 9.3 % are daily using newspaper[32].

However technologies of digital government have a potential to improve life of 80% of the people of developing countries, till now the developed countries like USA, Canada, UK, and Australia are leaders in digital government[33], repeating the vast majority of initial gains of implementing digital government. Actually, during recent years there has been a wider, rather than narrower, gap between developed and developing countries in Internet technological infrastructures practices, and usage. In addition to lack of enough capital for building up expensive national information infrastructure (NIT) on which the digital government is based, developing countries also lack enough knowledge and skills for developing suitable and effective strategies for establishing and promoting digital government.

Around 500 digital government programs were launched in 2001 by government worldwide[34]. The strategies of digital government have had great impact on the interaction of government with their citizens. More than 75% of Australians file their income tax online and the mayor of Minnesota get about 13000 emails from the people every week[35]. As per the 2002 Annual Global Accentor (former Anderson Consulting: AC) Study, Canada is the leader of implementing digital government. The other 10 countries are (in order): Singapore, USA, Australia, Denmark, UK, Finland Hong Kong Germany, and Ireland. According a recent survey by UN, from 190 member states, only just 36 of 169 available websites had one

[31] UNCTAD, 2002
[32] UNCTAD, 2002
[33] Annual Global Accentor Study, 2002
[34] Palmer, 2002
[35] Palmer, 2002

stop portals and less than 20 offered online transactions[36]. This obviously shows a big gap in status of current digital government implementation in different countries.

USA, compared to other countries across the world, along with Australia, Singapore, and Canada are the first leaders taking steps towards digital government. Governments of UK, France, Germany, Spain Norway, Hong Kong, and New Zealand have vowed for shifting their policies towards implementing digital government to fully use advantages of the digital information age. Other cautious implementers are Italy, Netherlands, and South Africa. Although there has been very important progress in developed countries, many developing countries have along way to get digital government. So far one third of world people have never made a phone call and 63 countries have less than 1% access to internet[37].

This section provides the necessary background for introducing the subject of the paper from a broad prospective, in order to emphasize its special importance. It identifies the digital economy in steps starting from the information technology (IT) supported value chain and value system of any organization, in government or in business, to the IT supported value system of a country. It addresses the current trends of e-business, and emphasizes e-government. The objectives and contents of the paper are then introduced.

The Value System and the Digital Economy Organizations both in government and in industry and commerce wish to enhance their value chains, and support their value systems. IT, expressed here by the letter 'e' for 'electronic', can provide added value to the internal value chain of any organization, and to its value system, provided that the value chains of its partners, suppliers, and customers, constituting its value system, can interact electronically, and in a well-designed manner.

Having most, or even all organizations of a country interacting electronically, in an efficient manner would enhance the value system of the whole country moving it to what is now known as the 'digital economy', which would lead to the well being of the society. It should be noted here that this would also be applicable to the world level. Having most organizations of a country interacting electronically, in an efficient manner, would enhance the value system of the whole country.

3.2. E-readiness divide narrows

From Economist Intelligent Unit

Almost all the countries included in the Economist Intelligence Unit's 2006 e-readiness rankings improved their scores over the last year, but the distance separating the best from the rest declined .Poorer countries are climbing up the E-readiness scale faster than richer ones, according to the seventh annual E-readiness rankings from the Economist Intelligence Unit. While virtually all countries included in the 2006 rankings improved their scores over the last year, the distance separating the best from the rest has narrowed.

The rankings also show that another divide is diminishing, that is, between upper tier countries in terms of broadband development. In recent years, North Asian countries, such as South Korea and Japan, had been world leaders in terms of broadband adoption, while other OECD countries lagged behind. Today, other developed economies such as Switzerland and Norway have caught up. Broadband penetration, as a result is becoming less of a distinction among e-readiness leaders. Other criteria including innovation information security and governments' commitment to e-commerce have emerged as being more important to a country's placing in the 2006 rankings.

Of the 68 countries ranked this year, Denmark retains its top position, followed by the US, Switzerland and Sweden. The next five countries, in order, are the UK, Netherlands, Finland, Australia, Canada and Hong Kong. Overall, Europe remains the dominant region worldwide. Among the big gainers in the 2006

[36] Jackson 2002
[37] 2002

rankings are Australia, Canada, which breaks into the global top ten for the first time, and Lithuania at 38th and, at the lower end of the scale, Algeria at 63rd.
The EIU has published the annual e-readiness rankings of the world's largest economies since 2000, using a model developed together with the IBM Institute for Business Value. A country's e-readiness, according to this model, is a measure of its e-business environment, which is measured by a number of factors that indicate how amenable a market is to internet-based opportunities.

3.2.1. The ever-spreading net

The relatively modest amount of movement in this year's rankings and the steady improvement of most countries' e-readiness scores over the past several years underline the widespread acceptance by governments of the promise of the networked economy. With very few exceptions, policymakers and other stakeholders around the world recognize the positive correlation between ICT investment and growth. Nearly all, as a result, are taking some action to improve their countries e-business environment and their efforts are bearing fruit. The developed world, for example, has made significant progress in improving the availability and quality of broadband internet, a vital component of e-readiness. In the developing world, the adoption of open-source software has been expanding business and public-sector access to IT, particularly in Latin America, where the cost of basic packaged software is too high for many small enterprises and government agencies.

In China (ranked 57th) and India (53rd), companies are increasingly investing in open source software as a cost-effective way into next-general IT platforms. The vast majority of email services in Chinese businesses, for example, reportedly run on Linux-based software. Broadband wireless technologies such as WiFi and WiMax are also beginning to play an important role in improving online access. Mobile internet access has gained favor in emerging markets not only because the networks are easier to roll out but because customers are increasingly comfortable with mobile devices. Lithuania (38th), which jumped two spots in this year's rankings, is one of many emerging markets where mobile phone penetration is several times that of fixed lines. This, plus a rapid increase in the number of WiFi hotspots in its capital and other cities, has helped improve overall connectivity for its consumers and businesses.

Voice over IP (VoIP) is another tool which is being used to enhance connectivity, in both developed and developing economies. Making use of the internet, VoIP reduces the cost of international calls for consumers and businesses alike. Positive policy decisions on voice market access over the past few years notably by the EU – have made the rapid growth of VoIP services possible and have removed the last regulatory barriers in many countries to the integration of voice calls into existing broadband services.
Nearly every economy ranked in this survey, regardless of its wealth, has taken these trends on board. When grouped into three categories a top tier of 20, a middle tier or 20 and a lower 20 this trend becomes even clearer. Comparing the e-readiness scores of these groups in 2005 and 2006, the EIU found that the top tier improved their scores by 2.5% in the year, the middle tier by just over 6% and the lower tier boosted its average score by 9%. Thus, looking forward, the digital divide should narrow further.

3.3. Concepts of E-readiness

There is no agreement on a single precise definition for e-readiness; different lobbies describe it differently. To answer this ongoing debate, a few thoughts have been outlined here to aid in this discussion. The level of e-readiness relates to communities, individuals organizations and nations. This is what they mention. The World Information Technology and Services Alliance known as WITSA states that an e-ready country requires a kind of consumer trust in e-commerce privacy and security, more trained workers and more enhanced security technology; and lower training costs; new business practices and less restrictive public policy; adapted to the information age; and lower costs for e-commerce technology, while the United Nations assess e-readiness as the public sector e-Government initiatives of member states according to a weighted average composite index of e-readiness based on website

assessment, telecommunication infrastructure and human resource endowment. The community assessment of e-readiness introduced by the Center for International Development, Harvard University has described an e-ready society is one that has the necessary physical infrastructure such as high bandwidth, reliability, and affordable prices; current integrated ICTs throughout businesses including e-commerce, local ICT sector, communities, local content, many organizations online, ICTs used in everyday life, ICTs taught in schools, and the Government in this sense e-government; strong telecommunications competition; independent regulation with a commitment to universal access; as well as no limits on trade or foreign investment.
On the other side of the story, the Computer Systems Policy Project with the acronym CSPP introduces an e-ready community is equipped with the high-speed access in a capacity of competitive market; enjoying a constant access and application of ICTs in government offices, healthcare facilities, businesses, schools and homes; user privacy and online security; and Government policies which are all favorable to promotion of connectedness and use of network.

E-business gives the potential to generate huge new wealth and transform the conventional way in which business is conducted in rather unprecedented ways[38].The application of new technology in procurement promises substantial benefits. [39]Many leaders in Governments, social organizations, businesses and around the world have considered how well to harness the power of ICT for the development process. Such factors motivate decision makers in developing countries to improve e-readiness and promote the adoption of ICT in their pertinent countries. First, ICT promises vast benefits as part of the solution to social and economic problems. Second, countries are subject to face the threat of being left further behind if they do not specifically address the growing digital divides both within and between countries. Third, the international leaders, lending agencies and foreign donors are integrating ICT into the development process as well as aid programs. The assessment of the readiness level seems to provide a guide development effort through providing benchmarks for comparison and gauging progress. Several e-readiness initiatives have been launched to assist developing countries and frequent e-readiness assessment tools have been created and used by different parties, each looking at a huge range of aspects of ICT, society and the economy.

It is also increasingly clear that ICT alone is not enough to solve the long standing imbalances, and is subject to make inequalities worse if it is not applied wisely. The infusion of the ICT into a country paints the existing landscape of discrimination, division and poverty, onto the new canvas of technology use. Perhaps the single most important reason to be ready is to gain economic superiority ICT is believed to be the victory card in businesses today. The continuing expansion of e-business and e-commerce is providing the opportunities for improved business processes which are more efficient and responsive reducing the reliance on paper transactions, resulting in reduced time and costs.

In this thesis, the author views e-readiness as the aptitude of a country to use information and communications technologies to migrate its traditional administration into the new type of administration. E-readiness reaches its most select level when the country is able to create new administrative and interaction opportunities that could not be done otherwise.
Based on a synoptic view of various perspectives of e-readiness in consideration of the of having appropriate access to the Internet technology along with an economic, social and legal climate which is conducive to administration, and the capability to introduce new administrative values, etc the following definitions come into attention:
In terms of value creation, the Computer Systems Policy Project in its 1998 assessment guides defines e-readiness as the: “ability to pursue value creation opportunities which are facilitated by the application of the Internet”. It also gives the following definition in terms of appropriate net work access:

[38] R. amit ,and C. Zott. Value creation in E business, Strategic Management Journal. Vol. 22 pp. 6-7, 2001
[39] D. Neef , E-Procurement ,Prentice Hall ,London 2001

An e-ready community owns the high-speed access within a competitive market; with constant access and application of ICTs in government offices, businesses, facilities and homes; user privacy and online security; and government policies which are favorable to promoting connectedness and use of the network"[40].

The Center for International Development, Harvard University in its 2002 Community E-Readiness Assessment views e readiness in a more broad sense covering e-government perspectives and defines an e-ready society as:
"A society which is the one that has the required physical infrastructure such as high bandwidth reliability, and affordable prices; integrated current ICTs throughout businesses including e-commerce local ICT sector, communities local content, many organizations online, ICTs which are used in everyday life, ICTs which are taught in schools, and the e-government, strong telecommunications competition independent regulation with commitment to universal access along with no limits on trade or foreign investment"[41].

3.4. Importance of E-readiness

E-readiness is considered of importance because its level can serve as a strong predictor of how well a country is capable to perform in the new administration. An e-readiness assessment seems to provide the policymakers with a detailed score card of their administration's competitiveness relative to its overseas counterparts. Further, a breakdown of indicators helps the policy analysts to identify areas of strengths and weaknesses, thus provide a balanced perspective in guiding a country through the revolution of digital transformation.
In short the e-readiness assessment is important since it enables us to
Endorsement
Actualization of e-government goals and expansion
Benchmarking progress
Collaborations
Determining vision, strategy, priorities
Easy wins

3.5. Measuring E-readiness

Considering a number of potential factors which are widely recognized as having significant impacts on a nation's e-readiness all possible criteria for each factor, scales that can be used to measure them and mathematical models that can synthesize the partial results into a single composite e-readiness indicator are investigated. In the attempt to use this consisted of starting with the superset of all the criteria and factors and measures of the prominent instruments. They are evaluated for clarity of concept distinctiveness from other measures, their logical relationship to e-readiness and ability to be measured quantitatively. Internal and external validities are also taken into account and wherever economic and technological data are available. They are also evaluated for their robustness and practical ease of use through simulations. Also organized two workshops are organized with international academic expert's policy makers and business interests to learn from their ideas regarding e-commerce readiness.

Based on the data collected using the above mentioned methodology, a list comprising eight global factors that made up e-readiness is identified. 52 variables are assembled to measure these factors. In validating the instrument, we used the Analytical Hierarchy Process with eigenvalues for consistency checking Spearman's rank correlation as well as sensitivity analysis for checking rank stability. It is counted that

[40] Computer system Policy Projects Community assessment ,1998
[41] Center of International Development Community Assessment, Harvard University

together they form a broad and yet focused collection of factors/measures in assessing the e-readiness status of any country.
Having collected data on the 52 variables across the 8 factors, the following formula is proposed in computing a composite e-readiness index for a given country,

$$\textbf{E-readiness } i = \Sigma j=1,n \; wij \; eij \; /n$$

Where
E-readiness: the overall e-readiness value
i: country
j: each of the 52 measures
wij: relative weights assigned to the 52 measures (j)
eij : individual score for each measure on a scale of 1 to 5
n: total number of measures :52
The generalized e-readiness index computing procedure can be summarized as follows:

1- Select the list of countries whose e-readiness is to be compared
2- Gather data on the individual 52 measures for each country
3- Sort the data in step by factor.
4- Choose one factor in step 3 along with its measures
5- Examine the first measure of the chosen factor. Identify the smallest and the largest values; determine the range by subtracting the smaller value from the larger
6- Create a normalized scale for the measure
7- Divide the range in step 5 into 4 equal intervals
8- Assign 1 to the smallest number in step 5
9- Assign 5 to the largest number
10- Assign 2, 3 and 4 corresponding to the interval data created in 6
11- Compare each country's value for the measure against the normalized scale in step 6
12- Assign the closest normalized values for each country
13- Repeat steps 5, 8 until all measures for the factor are exhausted
14- Compute the weighted average of the values in step 8 this gives the e-readiness value for the given factor
15- Repeat steps 4-10 until all factors are exhausted
16- Average the values of all factors this gives the e-readiness index for each country.
The philosophy for normalizing the raw data into a range 1 to 5 is to help us compare a country's e-readiness with that of other countries. The normalization scale is therefore chosen that a value of 1 represents a country that is least e-ready while a value of 5 indicates one that is most e-ready.

The above mentioned 8 factors along with their 52 measures used for calculation of e-readiness are as follows[42]:

Factor 1: Macro Economy

Adequate Regulation & Supervision of
Financial Institutions
Protection of Property Rights
Tariff & Non-tariff Barriers
Local Competition
Regulatory Framework
Government Effectiveness

[42] Bui. X Tung. College of business and administration ,University of Howaii

Political Stability
Press Freedom
Rule of Law
Control of Corruption
Soundness of Banks

Factor 2: Digital Infrastructures

Telephone per 1,000 People
Mobile Phones per 1,000 People
International Telecom
Cost of Call to USA Investment in Telecom as % of GDP
Internet Hosts per 10,000 People
Computer Processing Power (% Worldwide MIPS)
E-Government ICT Expenditure as % of GDP
Freedom on the Internet
Computers per 1,000 People
Trade as % of GDP

Factor 3: Industry Competitiveness

Technology Achievement Index National
Gross Tertiary Science & Engineering Enrolment Ratio
Admin Burden for Start-Ups
Total Expenditure for R&D as % of GNI
High-Tech Exports
(% of Manufactured Exports)
Patent Applications Granted by USPTO
Private Sector Spending on R&D

Factor 4: Culture

Culture is Open to Foreign Influence
English Language
Percentage of Population 65 Years or Older
Percentage of Urban Population

Factor 5: Knowledgeable Citizens

Adult Literacy Rate
Secondary Enrolment University
Tertiary Enrolment
8th Grade Achievement in Science
MGMT Education Available in first-class
Business Schools
Flexibility of People to Adapt to New
Challenges

Factor 6: Access to Skilled Workforce

Education Meets the Needs of Economy
Well Educated People do not immigrate abroad
Public Spending on Education as % of GDP
Extent of Staff Training Research Collaboration Companies and universities
Number of Technical Papers per Million People

Factor 7: Ability, Willingness to Invest

Composite ICRG Risk Rating International
Availability of Venture Capital
Entrepreneurship among Managers
FDI as % of GDP

Factor 8: Cost of Living and Pricing

Cost of Living based on US $100
Inflation Rate-CPI in %
GDP per Capita (PPP) in US$

3.6. E-readiness and EIU

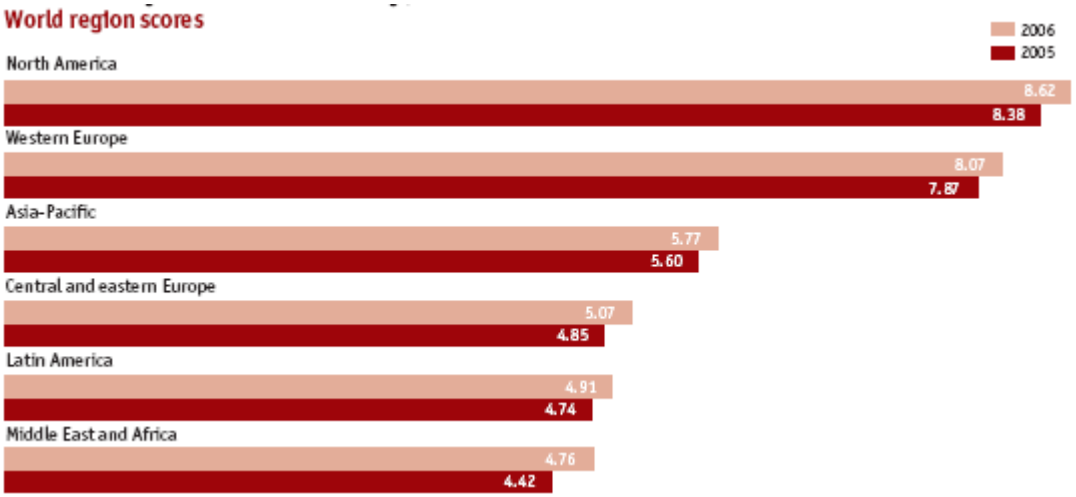
The EIU standing for Economist Intelligence Unit is sub part of The Economist Group serving as a research and advisory institution. Its mission is to provide country, industry and management analysis in global scope and incorporates the former Business International Corporation, an American company acquired by its parent organization in 1986 which has gained a reputation for its quarterly country reports country profiles, , five-year country economic forecasts, country risk service reports and industry reports. The institution also specializes in tailored research for companies that need analysis for particular markets or business sectors.
In the view of its research mission, the EUI provides a constant flow of analysis and forecasts on more than 200 countries and eight key industries. We help executives make informed business decisions through dependable intelligence delivered online, in print, in customized research as well as through conferences and peer interchange. [43]

[43] http://www.eiu.com/index.asp/22.03.2007

Every year the Economist Intelligence Unit publishes an annual e-readiness ranking of the world's largest economies since 2000. The ranking model asses the technological, economic political and social assets of 69 countries. The e-readiness rankings are a biased collection of around 100 quantitative and qualitative criteria, organized into six distinct categories measuring the various components of a country's social political, economic and of course technological development. The underlying philosophy behind the rankings is that digital business is at its core business and that for digital transactions to be widely adopted and efficient they have to thrive in a supportive environment. E-readiness derives from more than just the number of computers, mobile phones, broadband connections and in the country; also critical are the ability of citizens to utilize technology skillfully, the transparency of the business in legal systems, and the extents to which governments support the application of digital technologies.

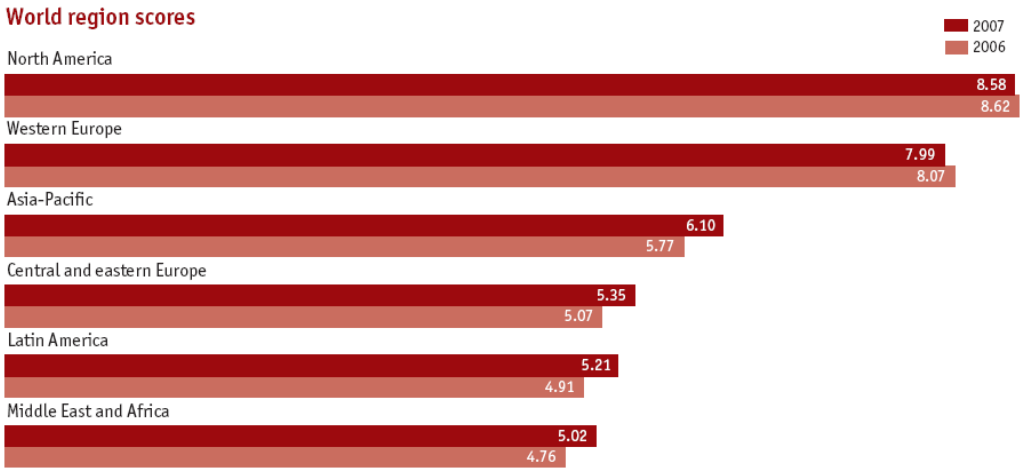
In its 2007, the EIU appreciates that the E-readiness is progressing around the world, but achieving it is growing much more complex. For example, the basic connectivity is no longer adequate to use the Internet efficiently; the connections are expected to be fast, affordable and secure. Likewise, governments are required to display their commitment to digital development not only through extensive policy, but also in more practical ways, such as delivery of public services to citizens and business via electronic channels which is the true insight and notion of electronic government.
While the core notion which underlies the definition of e-readiness remains unchanged: that each country possesses an interconnected set of infrastructural, political, commercial, legal and social attributes that when combined effectively, help the economy to grow and government and society to improve, the shifting landscape of new technologies and consumer preferences means that E-readiness is a fast moving target, and static measures will fail to capture its impact.
In this view the EIU provides scores to 6 different regions of the world which are compared in a time frame of two years: The figure illustrates the growth rate of macro regions some showing increase while some others show decrease.

Figure 7: The EIU World Region Scores



Source: EIU, 2006

Figure 8: The EIU World Region Scores



Source: EIU, 2007

3.6.1. A narrowing divide

The Economist Intelligence Unit has published an annual e-readiness ranking of the worlds largest Economies since 2000. The ranking model evaluates the technological, economic, political and social assets of 69 countries including this year's newest addition, Malta and their cumulative impact on their respective information economies.

E-readiness is the "state of play" of a country's information and communications technology (ICT) infrastructure and the ability of its consumers, businesses and governments to use ICT to their benefit. When a country does more online or, as is increasingly the case, wirelessly the premise is that its economy can become more transparent and efficient. Our ranking allows governments to gauge the success of their technology initiatives against those of other countries. It also provides companies that wish to invest in online operations with an overview of the world's most promising investment locations.

The E-readiness rankings are a weighted collection of nearly 100 quantitative and qualitative criteria organized into six distinct categories measuring the various components of a country's social, political economic and of course technological development. The underlying principle behind the rankings is that digital business is at its heart business and that for digital transactions to be widely adopted and efficient they have to thrive in a holistically supportive environment. E-readiness derives from more than just the number of computers, broadband connections and mobile phones in the country; also critical are citizens' ability to utilize technology skillfully, the transparency of the business and legal systems, and the extent to which governments encourage the use of digital technologies, as we can observe in the following tables Iran is situated in the 59th level of E readiness in 2005,with the score of 3.08 out of 10,however as we move towards the following years this situation is decreasing to 65th with the score of 3.15 out of 10(2006),and 69th with the score of 3.08 out of 10 in 2007.

Table 2, Economist Intelligence, ranking 2005

Economist Intelligence Unit e-readiness rankings, 2005

2005 e-readiness rank (of 65)	2004 rank	Country	2005 e-readiness score (of 10)*	2004 score
1	1	Denmark	8.74	8.28
2	6	US	8.73	8.04
3	3	Sweden	8.64	8.25
4	10	Switzerland	8.62	7.96
5	2	UK	8.54	8.27
6 (tie)	9	Hong Kong	8.32	7.97
6 (tie)	5	Finland	8.32	8.08
8	8	Netherlands	8.28	8.00
9	4	Norway	8.27	8.11
10	12	Australia	8.22	7.88
11	7	Singapore	8.18	8.02
12 (tie)	11	Canada	8.03	7.92
12 (tie)	13	Germany	8.03	7.83
14	12	Austria	8.01	7.68
15	16	Ireland	7.98	7.45
16	19	New Zealand	7.82	7.33
17	17	Belgium	7.71	7.41
18	14	S. Korea	7.66	7.73
19	18	France	7.61	7.34
20	22	Israel	7.45	7.06
21	25	Japan	7.42	6.86
22	20	Taiwan	7.13	7.32
23	21	Spain	7.08	7.20
24	23	Italy	6.95	7.05
25	24	Portugal	6.90	7.01
26	26	Estonia	6.32	6.54
27	31	Slovenia	6.22	6.06
28	27 (tie)	Greece	6.19	6.47
29	27 (tie)	Czech Republic	6.09	6.47
30	30	Hungary	6.07	6.22
31	29	Chile	5.97	6.35
32 (tie)	36	Poland	5.53	5.41
32 (tie)	32	South Africa	5.53	5.79

34	39 (tie)	Slovakia	5.51	5.33
35	33	Malaysia	5.43	5.61
36	39 (tie)	Mexico	5.21	5.33
37	34	Latvia	5.11	5.60
38	35	Brazil	5.07	5.56
39	37	Argentina	5.05	5.38
40	38	Lithuania	5.04	5.35
41	n/a	Jamaica**	4.82	n/a
42	42	Bulgaria	4.68	4.71
43	45	Turkey	4.58	4.51
44	43	Thailand	4.56	4.69
45	44	Venezuela	4.53	4.53
46	48	Saudi Arabia	4.38	4.38
47	50	Romania	4.19	4.23
48	41	Colombia	4.18	4.76
49	46	India	4.17	4.45
50	47	Peru	4.07	4.44
51	49	Philippines	4.03	4.35
52	55	Russia	3.98	3.74
53	51	Egypt	3.90	4.08
54	52 (tie)	China	3.85	3.96
55	56	Ecuador	3.83	3.70
56	52 (tie)	Sri Lanka	3.80	3.96
57	54	Ukraine	3.51	3.79
58	58	Nigeria	3.46	3.44
59	57	Iran	3.08	3.68
60	59	Indonesia	3.07	3.39
61	60	Vietnam	3.06	3.35
62	63	Kazakhstan	2.97	2.60
63	61	Algeria	2.94	2.63
64	62	Pakistan	2.93	2.61
65	64	Azerbaijan	2.72	2.43

Source: EIU 2005

Table 3, Economist Intelligence, ranking 2006

Economist Intelligence Unit e-readiness rankings, 2006

2006 e-readiness rank (of 68)	2005 rank	Country	2006 e-readiness score (of 10)*	2005 score	2006 e-readiness rank (of 68)	2005 rank	Country	2006 e-readiness score (of 10)*	2005 score
1	1	Denmark	9.00	8.74	35	32	S. Africa	5.74	5.53
2	2	US	8.88	8.73	36	34	Slovakia	5.65	5.51
3	4	Switzerland	8.81	8.62	37	35	Malaysia	5.60	5.43
4	3	Sweden	8.74	8.64	38	40	Lithuania	5.45	5.04
5	5	UK	8.64	8.54	39 (tie)	37	Latvia	5.30	5.11
6	8	Netherlands	8.60	8.28	39 (tie)	36	Mexico	5.30	5.21
7	6	Finland	8.55	8.32	41	38	Brazil	5.29	5.07
8	10	Australia	8.50	8.22	42	39	Argentina	5.27	5.05
9	12	Canada	8.37	8.03	43	41	Jamaica	5.03	4.82
10	6	Hong Kong	8.36	8.32	44	42	Bulgaria	4.86	4.68
11	9	Norway	8.35	8.27	45	43	Turkey	4.77	4.58
12	12	Germany	8.34	8.03	46	46	S. Arabia	4.67	4.38
13	11	Singapore	8.24	8.18	47	44	Thailand	4.63	4.56
14 (tie)	16	N. Zealand	8.19	7.82	48	45	Venezuela	4.47	4.53
14 (tie)	14	Austria	8.19	8.01	49 (tie)	50	Peru	4.44	4.07
16	15	Ireland	8.09	7.98	49 (tie)	47	Romania	4.44	4.19
17	17	Belgium	7.99	7.71	51	48	Colombia	4.41	4.18
18	18	South Korea	7.90	7.66	52	52	Russia	4.30	3.98
19	19	France	7.86	7.61	53	49	India	4.25	4.17
20	–	Bermuda*	7.81	–	54	–	Jordan*	4.22	–
21	21	Japan	7.77	7.42	55	53	Egypt	4.14	3.90
22	20	Israel	7.59	7.45	56	51	Philippines	4.04	4.03
23	22	Taiwan	7.51	7.13	57	54	China	4.02	3.85
24	23	Spain	7.34	7.08	58	55	Ecuador	3.88	3.83
25	24	Italy	7.14	6.95	59	56	Sri Lanka	3.75	3.80
26	25	Portugal	7.07	6.90	60	58	Nigeria	3.69	3.46
27	26	Estonia	6.71	6.32	61	57	Ukraine	3.62	3.51
28	27	Slovenia	6.43	6.22	62	60	Indonesia	3.39	3.07
29	28	Greece	6.42	6.19	63	63	Algeria	3.32	2.94
30	–	UAE*	6.32	–	64	62	Kazakhstan	3.22	2.97
31	31	Chile	6.19	5.97	65	59	Iran	3.15	3.08
32 (tie)	29	Czech Rep.	6.14	6.09	66	61	Vietnam	3.12	3.06
32 (tie)	30	Hungary	6.14	6.07	67	64	Pakistan	3.03	2.93
34	32	Poland	5.76	5.53	68	65	Azerbaijan	2.92	2.72

Source: EIU 2006

Table 4, Economist Intelligence, ranking 2007

Economist Intelligence Unit e-readiness rankings, 2007

2007 e-readiness rank (of 69)	2006 rank	Country	2007 e-readiness score (of 10)	2006 score	2007 e-readiness rank (of 69)	2006 rank	Country	2007 e-readiness score (of 10)	2006 score
1	1	Denmark	8.88	9.00	36	37	Malaysia	5.97	5.60
2(tie)	2	US	8.85	8.88	37	39	Latvia	5.88	5.30
2(tie)	4	Sweden	8.85	8.74	38	39	Mexico	5.86	5.30
4	10	Hong Kong	8.72	8.36	39	36	Slovakia	5.84	5.65
5	3	Switzerland	8.61	8.81	40	34	Poland	5.80	5.76
6	13	Singapore	8.60	8.24	41	38	Lithuania	5.78	5.45
7	5	UK	8.59	8.64	42	45	Turkey	5.61	4.77
8	6	Netherlands	8.50	8.60	43	41	Brazil	5.45	5.29
9	8	Australia	8.46	8.50	44	42	Argentina	5.40	5.27
10	7	Finland	8.43	8.55	45	49	Romania	5.32	4.44
11	14	Austria	8.39	8.19	46(tie)	43	Jamaica	5.05	4.67
12	11	Norway	8.35	8.35	46(tie)	46	Saudi Arabia	5.05	5.03
13	9	Canada	8.30	8.37	48	44	Bulgaria	5.01	4.86
14	14	New Zealand	8.19	8.19	49	47	Thailand	4.91	4.63
15	20	Bermuda	8.15	7.81	50	48	Venezuela	4.89	4.47
16	18	South Korea	8.08	7.90	51	49	Peru	4.83	4.44
17	23	Taiwan	8.05	7.51	52	54	Jordan	4.77	4.22
18	21	Japan	8.01	7.77	53	51	Colombia	4.69	4.25
19	12	Germany	8.00	8.34	54(tie)	53	India	4.66	4.04
20	17	Belgium	7.90	7.99	54(tie)	56	Philippines	4.66	4.41
21	16	Ireland	7.86	8.09	56	57	China	4.43	4.02
22	19	France	7.77	7.86	57	52	Russia	4.27	4.14
23	22	Israel	7.58	7.59	58	55	Egypt	4.26	4.30
24	--	Malta*	7.56	--	59	58	Ecuador	4.12	3.88
25	25	Italy	7.45	7.14	60	61	Ukraine	4.02	3.62
26	24	Spain	7.29	7.34	61	59	Sri Lanka	3.93	3.75
27	26	Portugal	7.14	7.07	62	60	Nigeria	3.92	3.69
28	27	Estonia	6.84	6.71	63	67	Pakistan	3.79	3.03
29	28	Slovenia	6.66	6.43	64	64	Kazakhstan	3.78	3.22
30	31	Chile	6.47	6.19	65	66	Vietnam	3.73	3.12
31	32	Czech Rep.	6.32	6.14	66	63	Algeria	3.63	3.32
32	29	Greece	6.31	6.42	67	62	Indonesia	3.39	3.39
33	30	UAE	6.22	6.32	68	68	Azerbaijan	3.26	2.92
34	32	Hungary	6.16	6.14	69	65	Iran	3.08	3.15
35	35	South Africa	6.10	5.74					

Source: EIU 2007

Chapter4: E-readiness of E-Government in IRAN

General overview of the Information and Communication Technology Sector in the 4th Economic, Social and Cultural Development Plan

4.1. Responsibilities:

The information and communication technology sector comprises four subsections: post, communication space, and information technology. The Ministry of Communications and Information Technology is the national body in charge of this sector in the country.
The Ministry's overall responsibilities include:

1- Policy making, guiding and supervising the developments in the space, communication and information technology sector

2- Providing standard communication facilities and guaranteeing easy access to information on economic social and cultural issues for all the citizens

3- Governing the radio wave frequency ranges in the country and safeguarding the country's rights on radio waves in the region and the world

4- Working out regulations and standards and creating Type Approvals required for post, communication and information technology services as well as space issues and making certain the regulations and standards are closely observed

5- Directing the country's space-related activities in line with technological advances and coordinating the activities of relevant executive bodies

6- Paving the way for participation of private sector and providing proper conditions for healthy competition between government and private sectors in accordance to regulations and rules

4.1.1. Features of the Information and Communication Technology Sector as outlined in the 4th Economic Social and Cultural Development Plan

1- Rapid technological developments in the sector and rise of demand for communication and information technology services

2- The sector's major role in bringing about developments in economic, social and cultural arenas and improving individual and social welfare

3- Globalization of the sector's activities and commitment to maintaining global standards as well as bilateral, multilateral and international protocols

4- Significant added value provided by the sector's activities and rapid-return on investments in the sector

5- Need for advanced technical knowledge and efficient management

6- Sector's need for foreign currency and creating a negative currency balance

7- Potential for job creation and projects with rapid end results in most fields in the sections

4.1.2. Structure

The sector, based on the envisaged overall structure, is divided into five sections:

1- Policy making section comprising the Islamic Consultative Assembly (Majlis), the government, the Ministry of Communication and Information technology, the Supreme Judiciary Council, and the Commission for Communications Regulation

2- Implementers of the policies and plans including Iran's Space Organization, Radio Communications and Regulations Organization (RCRO), Center for communication Research, Post and Communication College, and specialized mother companies

3- Regulators of the rules including the Radio Communications and Regulations Organization (RCRO) Supreme Council of Information Technology, and Iran's Judiciary Organization

4- Network makers including government-owned and private operators

5- Service providers (private companies providing services for final users)

According to the 4th development plan the Ministry of Communication and Information Technology is responsible for all the infrastructural activities in the communication section. Activities including founding, developing, maintaining and operating networks other than mother networks can be handed over to private and cooperative sections with the supervision of the government.

In the post section, the government maintains monopoly on mailings less than 250 grams, and for mailings heavier than that services will be provided on a competitive basis. In the information technology section policy making, overall development planning, providing grounds for producing, processing, distributing and saving information, and enforcing regulations and standards is the government's responsibility. In other areas of the section, private and cooperative sections will be operating.

4.2. The Information Technology Section:

It comprises applied and sub structural divisions including

A) Applied Divisions:
1- E-government
2- E-health
3- E-learning
4- E-commerce
5- E-banking

B) Sub structural divisions:
1- Security substructures
2- Communication substructures
3- Law and legal substructures
4- Socio-cultural substructures
5- Information technology engineering system (technical and executive system)
6- Information substructures including data centers, national smart card (Iran card), call centers, centers for issuing digital permits (electronic signatures), electronic identification confirming systems (CA, PKI

DTS), offices of electronic city, internet service providers, and the National Spatial Data Infrastructure (NSDI).

In all the above-mentioned divisions standards and regulations ought to be observed closely. A resource management system (resources include time, knowledge, information, human and financial resources) is a must in the information technology section. This document, the National Development Strategy in Information and Communication Technology Sector, lays out the overall objectives and strategies of the 4th development plan in the information technology section. According to article 155 of the Law of the Fourth Economic, Social and Cultural Development Plan, it is required that development strategies for each of the above mentioned divisions be worked out by the secretariat of the Supreme Council of Information Technology in accordance with the Comprehensive Information Technology System and in coordination with all relevant bodies. After ratified, the strategies will be communicated to executive bodies to be implemented. Should there be any other documents ratified prior to this one, the Supreme Council of Information Technology is required to review the previous documents in order for coordinating information technology affairs in the country.

4.2.1. Responsibilities, Features, and Overall Structure

The responsibilities of the information technology section include policy making, infrastructure, and applications. According to the law of the responsibilities and authority of the Ministry of Communication and Information Technology, the Supreme Council of Information Technology is responsible for organizing the Comprehensive Information Technology System and working out regulations and rules required in the information technology section. It is upon the ministry to provide the needed infrastructure.

The applied divisions such as E-government, E-health, E-learning, and E-commerce, which are considered ultra-sectional, each has its own administrator. The electronic government is developed by the whole executive power of the country and the Management and Planning Organization is specifically in charge of it. The Ministry of Commerce organizes and supervises electronic commerce with the private sector also playing a great role in implementing the programs. The private and government sectors cooperate in E-learning, organizations in charge of the country's education (the Education Ministry, the Ministry of Science, Research and Technology, and the Health Ministry) as represent the government and the Islamic Azad University along with technical and professional education institutes are the private sector contributors. As for the electronic health division, the Ministry of Health and the Medical System Organization act as supervisors and directors.
Realizing the objectives of each of these divisions requires that the infrastructures that were mentioned earlier be provided under the supervision of the Supreme Council of Information Technology with the collaboration of executive bodies including the Ministry of Communication and Information Technology.

4.2.2. Features

The main feature of information technology is that it is ultra-sectional. It has indeed affected all aspects of life. Therefore, all the authorities responsible for policy making, regulating, infrastructure building and service development, ought to act in concert to provide grounds for everyone to benefit from the advantages and potentials of this technology. The secretariat of the Supreme Council of Information Technology will coordinate the activities.

4.2.3. Structure

The law of the responsibilities and authority of the Ministry of Communication and Information Technology states that the Supreme Council of Information Technology has the ultimate responsibility in the information technology sector.

It is the duty of the council to draw up mid-term and long-term plans for the development of fundamental developmental and applied research studies (especially research studies that are product-oriented studies and based on market needs) in the information technology sector, and to work out the country's comprehensive information technology system. Until the end of the third development plan (2004), the Supreme Council of Information Dissemination, the Informatics Supreme Council, and the Supreme Information Exchange Security Council were also involved in decision making in the filed thus causing duplications. In order to avoid duplications, create integration in policy making, and clarify the responsibilities of the relevant bodies in the sector, this council will merge according to the regulations of the CIT Ministry and act at subcommittees of the SCIT. There are also other government organizations active in the IT sector regarding various applications of the information technology.

4.3. The section's status with regards to the twelve provisions of the fourth development plan:

4.3.1. Rapid, continuous and sustained economic development:

1- Creating synergy in economy-related sections
2- Creating strong social and economic networks through improving communications and information exchange
3- Creating job opportunities through information technology
4- Attracting domestic and foreign capital to the IT section considering the high rate of investment profit return in the section
5- Enhancing transparency in commercial interactions via promoting electronic commerce
6- Facilitating information exchange in economic sectors which will accelerate economic growth
7- Increasing national efficiency and reducing the wasting of resources
8- Economic growth by encouraging production and exportation of IT products

4.3.2. Development based on knowledge

1- Facilitating and accelerating production, distribution and access to information and knowledge in decision making.
2- Improving level of society's general and specialized knowledge.

4.3.3. Interactions with the world economy

1- Making IT products especially software products competitive.
2- Paving the way for increased economic cooperation with other countries.
3- Having stronger presence in global economy and increasing the country's share of the Market.
4- Providing grounds for Iranian firms to cooperate with large international companies.

4.3.4. Making the economy competitive

1- Facilitating entering into the world market.
2- Creating equal commercial and economic opportunities by providing information bases.
3- Improvement of social welfare through providing services and reduction of unemployment rate.
4- Reduction of wasting human and material resources at the time of natural disasters and crises.
5- Forming new approaches to protecting human security and people's personal space.
6- Building the infrastructure for extensively presenting new services like e-government, e-commerce, e-education and e-health all over the country.

4.3.5. National security

1- Developing the dissemination of information on the events and happenings.
2- Creating fundamental changes in the definition and methods of maintaining national unity.

4.3.6. Improvements of health and quality of life

1- Improving the quality of management in providing healthcare services to all the people through the e-health program.
2- Developing rehabilitation services and facilitating communication of less able people like the elderly and the disabled with others.

4.3.7. Preserving the environment

1- Creating changes in managing and organizing information with regards to environmental events and crises.
2- Helping reduce damages to the environment through reducing unnecessary trips.
3- Protecting the environment against destruction and damage via preemptive measures.

4.3.8. Cultural development

1- Fostering and developing the national and Islamic culture through facilitating social communication and information exchange.
2- Reducing education expenses by employing new methods and eliminating time and place limitations from education process.

4.3.9. Improving the administration of the country's affairs

1- Creating the national portal in order to reduce bureaucracy and facilitate the delivering of government services
2- Facilitating management and speeding up decision making at the national level
3- Reducing national expenses and increasing national economization
4- Increasing public participation through facilitating information gathering from the citizens, the private sector and government bodies

4.3.10. Judicial development

1- Creating file management systems and specialized systems of law in order to increase the precision of judicial decisions and facilitate judicial decision making
2- Reducing the time of legal procedures in courts through eliminating bureaucracy and unnecessary visits to courts

4.3.11. Land preparation

1- Providing needed management and decision-making grounds in order to properly distribute services across the country
2- Improving the management methods and means used in land preparation

4.4. Utilities, potentials, limitations and difficulties

4.4.1. Utility and Potentials (points of strength and opportunities)

A) Internal (points of strength):
1- Satisfactory level of the number and education quality of graduates in the filed of information technology compared to graduates in other fields
2- Vast opportunities for conducting research studies in the IT sector
3- Implementation of the comprehensive IT plan in most government bodies
4- High possibility of attracting investments due to high efficiency in the sector
5- Significant increase in the rate of investments in the sector

B) External (opportunities):

1- Significant increase in number of private and government-owned firms and institutions active in the development of IT

2- High demand in society for benefiting from the utilities of IT

3- Potential markets (for IT services) in the neighboring countries and the countries of Central Asia

4- Appropriate laws for encouraging foreign investments in Iran

5- Positive attitude of the administration and people of different strata toward development of IT

6- Young population of the country and high rate of creativity among members of younger generation

7- Increase in the number of graduates in the filed of information technology and the quality of their education

8- Vast employment opportunities for specialists in the field and the possibility of increasing these opportunities via more investments

4.4.2. Limitations and difficulties (weaknesses and threats)

A) Internal (weaknesses):

1- Small number of government bodies equipped with special and general integrated automatic systems

2- Considerable lack of government services and information on the web (internet)

3- Limited familiarity of government managers and staff with the accomplishments in IT

4- Unfavorable structural, managerial and legal condition for developing the applications of IT

5- Small volume of trade in the electronic sphere

6- Small presence of health services in the electronic sphere

7- Small presence of educational services in the electronic sphere

8- Small share of IT in the Gross National Product

9- Lack of access to information dissemination centers and websites

10- Insufficient volume of information production and distribution in the electronic sphere

11- Absence of capital market in the IT sector

12- Small rate of software and engineering services exportation

13- Lack of manpower specialized in interdisciplinary fields

14- Absence of grounds for web hosting in the country and reliance on foreign countries

15- Large number of decision-making bodies in the IT sector

16- Lack of laws covering various aspects of IT

B) External (threats):

1- Low family income average

2- Small share of IT expenses in families' budget plan

3- Low percentage of possession of personal computers in the country

4- Dependence of the country on the advanced countries' technology

5- Lack of competence or willingness for research and development in firms active in the IT sector

6- Existence of various sanctions against Iran

7- Growing spread of computer-related crimes

8- Lack of knowledge and skills required for benefiting from IT

9- Failure in achieving tangible results from IT projects because of the old and bureaucratic structure

10- Weak results in updating the know-how of the specialized manpower

11- Neglecting the need for congruous national information architecture and an integrated data controlling method in governmental organizations

12- Evident disharmony in governmental organizations in terms of utilizing information technology and providing services based on it

4.5. Role and status of the sector in realizing the objectives of the (20-year) perspective plan

1-Achieving an exceptional position in the region in the field of IT through:
a- Reducing the digital gap
b- Enhancing the share of the country's IT sector in the regional and international market
c- Attaining advanced technology and know-how
d- Boosting public welfare and social justice by providing IT services for all members of the society
e- Constructive interaction with other countries as well as regional and international institutions
2-Seeking to realize a knowledge-based economy via developing the infrastructures of the information society
3-Providing all IT services at all times, in all places

4.6. Overall objectives and strategies for development in the sector in the long run

A) Overall objectives:
1- Providing e-government
2- Providing e-health
3- Providing e-learning
4- Providing e-commerce
5- Providing e-banking
6- Providing communication and information security
7- Providing the infrastructures of the information and communication technology

B) Overall strategies:
1- Enhancing the capacity and improving the quality of access to IT
2- Fostering the culture and increasing the know how of IT
3- Developing manpower in the IT sector
4- Updating the laws and regulations
5- Enhancing the share of private and cooperative sectors in investments
6- Guaranteeing health competition in the sector
7- Attracting national and international financial resources
8- Gaining customer satisfaction
9- The government's pioneering in employing IT
10- Integrating the overall management of the country's IT

4.7. Quantitative objectives and executive policies in the sector

A) Quantitative objectives:
The quantitative changes in indexes during the forth development plan (2005-2009) is as follows:
1- Increasing the number government bodies possessing general integrated mechanized systems from 5% to at least 60%
2- Increasing the number government bodies possessing specific integrated mechanized systems from 1% to at least 20%
3- Enabling at least 20% of government bodies to utilize interactive services in the electronic sphere by the end of the fourth development plan
4- Increasing the number of firms active in electronic trade (at national and international levels) to at least 5% by the end of the fourth development plan
5- Increasing the number of companies that have websites to 30% by the end of the fourth development plan

6- Increasing the number of people who use e-cards from 6.6% to at least 25%
7- Connecting 100 medical treatment centers to the internet by the end of the fourth development plan
8- Increasing the number of PC's for students from 0.16 per 100 students to 2
9- Increasing the number of PC's with high-speed internet access from 0.03 per 100 students to one
10- Increasing the number of PC's for university students from 20 per 100 university students to 25
11- Increasing the number of PC's with high-speed internet access from 20 per 100 university students to 25
12- Increasing the number of e-learning courses to 20% of the whole courses by the end of the fourth development plan
13- Increasing the percentage of the employees in the IT sector to 3.3% of all government employees by the end of the fourth development plan
14- Increasing the number of secure servers to at least 10 servers per a million population by the end of the fourth development plan
15- Increasing the country's Internet Gateway bandwidth from 1195 MB to 25675 MB by the end of the fourth development plan
16- Increasing the number of up-to-date computers from three per 100 population to 7.4
17- Increasing the number of internet users from 10% to 30 %
18- Establishing ICT service centers in at least 10000 villages (with more than 500 residents) by the end of the fourth development plan
19- Increasing the number of the offices of the e-city to at last 2500
20- Increasing the number of high-speed internet ports from 13000 to 1513000 ports
21- Providing connection with the information dissemination networks for all villages with over 100 residents
22- Increasing the number of firms active in the field of information and communication technology from 1500 to 5000 firms. The quantitative objectives of the IT divided with regard to sectional and ultra sectional objectives as well as years are available in the appendix.

B) Executive policies:
1- Developing centers for the public to access IT services
2- Centralizing policy making and national supervision, and decentralizing executive management
3- Standardizing IT activities
4- Encouraging the improvement of the manpower's specialized and professional know-how
5- Amending the current laws and drafting new laws in accordance to the requirements of IT development
6- Developing public acquaintance with information technology
7- Encouraging and supporting utilization of IT in society
8- Encouraging creation of non-governmental specialized associations aimed at developing applications of IT (e-commerce, e-health, e-learning, and e-government)
9- Implementing the general and special automatic systems in government bodies
10- Creating an integrated body for controlling services provided in the electronic sphere
11- Increasing the scale of the activities of IT instruction centers and improving the quality of their work
12- Supporting copy right laws
13- Supporting and guiding activities aimed at establishing and developing public and specialized information dissemination websites
14- Creating coordination for efficient allocation of the IT recourses in government and private sectors
15- Making the most of the potentials of the country's free trade zones to procure resources required for developments of the IT sector and to increase the country's share of regional market
16- Issuing permissions for the activities of private and cooperative sectors in the filed of IT aimed at providing services and developing IT applications based on the comprehensive IT plan and under the supervision of the Supreme Council of Information Technology

17- Amending the structure of operation planning and budget appropriation in the Management and Planning Organization in accordance with the comprehensive IT plan and in collaboration with the Supreme Council of Information Technology so that allocation of funds for different economic, social and cultural sections will be done based on a unified and centralized policy and duplications will be avoided.

4.8. Major, fundamental measures

1- All executive bodies are required to work out their strategic and comprehensive IT plan based on the comprehensive IT system and in collaboration with the Supreme Council of Information Technology. The plan should be implemented after it I ratified by the council.

2- Information technology sections should be set up and developed in all executive bodies in collaboration with the Supreme Council of Information Technology and the Management and Planning Organization

3- Managers and authorities in each executive body ought to obtain from the IT office of the Management and Planning Organization the required permissions for carrying out IT projects

Other measures include:

1- Cooperation and coordination for forming a capital market in the sector
2- Working out the IT engineering framework (technical and executive framework) and drafting the needed laws, regulations and criteria
3- Drafting the rules, regulations and legal framework of the country's IT sector
4- Working out and implementing the plan for digitalizing government documents and files
5- Providing the required conditions and guarantees for implementation of copy rights laws
6- Setting up the national portal
7- Supplying IT products manufacturers and service providers with loans in Iranian Rial or foreign currencies
8- Eliminating parallel institutions and bringing transparency to responsibilities of the institutions active in the sector
9- Drafting the legal and judicial framework of doing business in the IT sector
10- Establishing a quality control system and a customer satisfaction assessment system
11- Working out strategies for making use of the potentials of the free trade zones for attracting investment and exporting services in the filed of communication and information technology in collaboration with the Supreme Council of Information Technology and Free Trade Zones' Supreme Council.
12- The Supreme Council of Information Technology ought to prepare and approve strategic documents related to e-government, e-health, e-learning, e-commerce, e-commerce, e-banking, security of the information exchange sphere, national smart card (national card), e-city offices, and other IT related applications.
13- Financially supporting product-oriented research studies in order to boost small and medium size ICT companies and improving the industries' scientific and operational capabilities
14- Developing IT parks and development centers with the aim of helping found new non-governmental institutes and firms in the ICT sector
15- Encouraging establishment of research and development centers in the country by international companies in order to transfer technology to Iranian firms.
16- Amending the structure and architecture of the government, with the cooperation of the Supreme Council of Information Technology and the Management and Planning, in areas of IT infrastructures and applications.

4.9. Definitions and method of assessing information technology indexes

4.9.1. Definitions of information technology indexes:

1- General integrated mechanized system: It is a collection of software subsystems for processing general trends process. The system is almost the same in different organizations. It is installed on server hardware systems and can serve inter organizational and ultra-organizational purposes. The system's integration helps improve interactions among subsystems and the data need to be entered into the system only once. The software subsystems include administrative, financial (accounting), back up sections complementary services, and security sections.

2- Specific integrated mechanized system: It is a collection of software subsystems aimed at operating specific functions of a certain organization. It varies in different organizations and can provide services for users from the organization or from outside the organization. The system's integration helps improve interactions among subsystems and the data need to be entered into the system only once. Examples of a specific integrated mechanized system are civil and judiciary files management system, health service providing system, specialized education systems and e-banking systems.

3- Standard national intranet: It needs at least three web pages for introducing the organization's profile objectives, strategies and policies (if any), services or products. Standard national intranet provides the visitors with the opportunity to contact the organization through the web and share their ideas with the organization. It is always accessible and is automatically updated on a daily basis.

4- Interactive Intranet: is a standard one which serves the visitors and the staff by giving them the opportunity to interact and by analyzing the data and documents.

5- Government bodies: They include all the ministries, organizations, institutes, and companies covered in article 2 of the law of government's financial regulations which was passed in 1380 (2001) and affirmed in the fourth development plan. They also include ale institutions affiliated with the three branches of power: the judiciary, the legislative and the executive powers. In general, every institution to which articles 44 and 45 of the Constitution apply is considered a government institution.

6- E-government services: are those government services which are delivered to the people, institutes or other government organizations in the electronic sphere and via ICT facilities like computer networks portals and the like.

7- Electronic interactive services: are those services provided in the electronic sphere and via ICT facilities like computer networks and portals by receiving and processing data in an on way or two way manner. The clients are at one end of the interaction and the staff at the other.

8- E-government: It is the use of information and communication technology by the government so that government bodies can deliver services to the citizens, institutions and other government organizations in a faster, cheaper, more transparent, more accessible and more comprehensive way.

9- E-commerce: the electronic transactions for buying or selling goods or services between families government employees, institutes, and organizations via connected computer networks. Ordering goods and services are done electronically and delivery of the money and services can be done online or offline.

10- E-transfer: the use of electronic service transactions for monetary, credit and finance transferring via credit cards, prepaid cards, etc.

11- Total commercial transfer: the total monetary, financial, and credit transactions based on monetary unit.

12- Firms active in e-transfers: Companies that use e-transfer in their economic activities.

13- E-health: The use of ICT in health and treatment activities. In e-health activities are mostly done online.

14- E-learning: The use of ICT in education and learning. Benefiting from the internet and multimedia systems to improve the quality of education and, to promote interaction and cooperation between education centers

15- Health and treatment center: Institutes including hospitals, clinics, and doctors' offices which provide health and treatment services

16- High speed line: A telephone line with 62 KB/S and higher speed with no need for dialing, e.g. DSL (Digital Subscriber line).

17- Information technology experts: graduates in fields related to information technology.

18- Secure services: services provided in the electronic sphere with features like privacy comprehensiveness and accessibility.

19- Secure severs: servers which provide secure services by making use of security systems (like physical and electronic security systems).

20- Content in internet terms: Useful data accessible in texts, images or charts via the internet.

21- Internet user: individuals over six years of age who use the internet at least an hour a week.

4.9.2. Method of assessing information technology indexes

1- Government bodies with general integrated mechanized systems:
Number of Government bodies with general integrated mechanized systems divided by number of all government bodies and multiplied by100.

2- Government bodies with specialized integrated mechanized systems:
Number of Government bodies with specialized integrated mechanized systems divided by number of all government bodies and multiplied by100.

3- Government bodies with standard intranet:
Number of government bodies with standard intranet divided by number of all government bodies and multiplied by100.

4- E-government services:
Number of e-government services divided by number of all government services and multiplied by 100.

5- Government bodies with interactive electronic services:
Number of government bodies with interactive electronic services divided by number of all government services and multiplied by 100.

6- Using e-government services:
Number of e-government transactions divided by number of all government transactions.

7- Share of (domestic and international) electronic transfers (based on GDP):
Value of (domestic and international) electronic transfers divided by the value of all (domestic and international) transfers and multiplied by 100.

8- Companies active in (domestic and international) transfers:
Number of (government and private) firms active in transfers divided by number of all (government and private) firms and multiplied by 100.

9- Companies with intranet:
Number of (government and private) firms with standard intranet divided by number of all (government and private) firms and multiplied by 100.

10- Number of individuals possessing e-cards:
Number of all electronic cards divided by the number of the country's population and multiplied by 100.

11- Health centers connected to internet:
Number of health centers with access to internet divided by number of all health centers and multiplied by 100.

12- Use of e-health services:
Number of e-health service transactions divided by number of all health transactions and multiplied by 100.

13- Health centers with intranet:
Number of health centers with standard intranet divided by number of all health centers and multiplied by 100.

14- Health centers using e-health:
Number of health centers using e-health to carry out their tasks divided by number of all health centers and multiplied by 100.

15- Doctors using e-health:
Number of health doctors using e-health divided by number of all doctors and multiplied by 100.

16- Number of computers for every 100 students:
Number of computers available in schools (used for educational purposes) divided by number of all computers in country and multiplied by 100.

17- Number of computers for every 100 university students:
Number of computers available in universities (used for academic purposes) divided by number of all computers in country and multiplied by 100.

18- Number of computers with access to high-speed internet for every 100 students:
Number of computers in schools with access to high-speed internet (used for educational purposes) divided by number of country's students and multiplied by 100.

19- Number of computers with access to high-speed internet for every 100 university students:
Number of computers in universities with access to high-speed internet (used for academic purposes) divided by number of country's university students and multiplied by 100.

20- Number of teachers using computer for teaching:
Number of teachers regularly using computer for teaching divided by number of all teachers and multiplied by 100.

21- Number of university professors using computer for teaching:
Number of university professors regularly using computer for teaching divided by number of all university professors and multiplied by 100.

22- Schools with intranet:
Number of schools with standard intranet divided by number of all schools and multiplied by 100.

23- Universities with intranet:
Number of universities with standard intranet divided by number of all universities and multiplied by 100.

24- Governmental and private education centers with standard internet:
Number of governmental and private education centers (schools, universities, and other institutes) with standard internet divided by number of all education centers and multiplied by 100

25- Governmental and private education centers with access to internet:
Number of governmental and private education centers (schools, universities, and other institutes) with access to internet divided by number of all education centers and multiplied by 100.

26- Courses presented via E-learning:
Number of courses (in universities, schools, and other education centers) presented via e-learning divided by number of all courses in universities, schools, and other education centers and multiplied by 100.

27- Education centers using E-learning:
Number of education centers using e-learning divide by number of all education centers and multiplied by 100.

28- Government employees in IT sector:
Number of employees in IT sector divided by number of all government employees and multiplied by 100.

29- Number of IT experts in relation to country's population:
Number of IT experts divided by number of the country's population and multiplied by 100.

30- Number of secure servers for every one million individuals:
Number of secure servers divided by number of the country's population

31- Ratio of web content in Persian to web content in other languages (in Iranian and foreign websites):
Number of Persian web pages (including HTML, PDF, and other web pages recognized by Google) divided by number of all web pages (including HTML, PDF, and other web pages recognized by Google) and multiplied by 100(Number of web pages in Persian can be found by searching for high-frequency Persian words (like prepositions) in the Google search engine.

32- Ratio of the country's data traffic to the whole data traffic:
Ata traffic inside the country divided by the total data traffic in the world (the total data traffic in and out of the country can be obtained as a number).

33- Asymmetric increase of internet bandwidth:
The total capacity of the country's information gateways

34- Number of up-to-date PC's for every one hundred individuals:
Number of PC's with less than five year in operation and with capacity to connect to internet divided by number of country's population and multiplied by 100.

35- Internet penetration ratio:
Number of internet users divided by number of country's population and multiplied by 100
The ratio can also be obtained as follows:
Internet penetration ratio=16XYWZ
X: total bandwidth (MB)
Y: number of phone lines for every 64KB of bandwidth
W: number of accounts for every ISP phone line
Z: average number of users for every account

36- City houses connected to information networks:
Number of families in cities and towns who have access to internet and the (high speed) national intranet divided by number of all families and multiplied by 100

37- Villages with access to information networks:
Number of villages (with more than 100 families) which have access to internet and the (high speed) national intranet divided by number of all villages (with more than 100 families) and multiplied by 100

38- Average waiting time for receiving high-speed data connection:
Time gap between filling out needed forms and paying subscription charges and receiving high-speed data connection

39- Number of high-speed ports:
Number of high-speed ports annually given over to people

40- Internet traffic transit:
Amount of internet traffic (data and sound) belonging to other countries which pass the country's data networks (stated in megabit per second)

41- Number of internet hosts for every 10000 individuals:
Number of internet hosts divided by number of country's population and multiplied by 10000

4.10. Quantitative objectives of the information technology sector in the country's fourth development plan

4.10.1. Penetration ratio of regular telephone, cell phone and internet use

Table 5, ratio of regular telephone, cell phone and internet use in different cites (Iran)

Penetration Ratio in 1388 (2009) (%)			Penetration Ratio in 1383 (2004) (%)			Province	
Internet users	Cell phone	Regular phone	Internet users	Cell phone	Regular phone		
۲۵/۳۹	۵۳/۰۰	۵۱/۰۰	۸/۲۴	۶/۲۰	۳۲/۲۰	East Azerbaijan	۱
۲۲.۳۴	۴۵.۰۰	۴۷.۰۰	۷.۴۸	۴.۱۰	۲۱.۲۰	West Azerbaijan	۲
۱۵.۵۴	۳۷.۰۰	۴۷.۰۰	۵.۱۶	۳.۸۰	۲۵.۱۰	Ardebil	۳
۳۸.۰۲	۶۲.۰۰	۵۳.۰۰	۱۲.۷۴	۹.۰۰	۳۰.۵۰	Esfahan	۴
۱۹.۳۱	۲۳.۰۰	۴۰.۰۰	۶.۵۳	۳.۴۰	۱۷.۹۰	Ilam	۵
۲۵.۰۷	۴۶.۰۰	۴۷.۰۰	۸.۳۱	۶.۹۰	۲۷.۹۰	Bushehr	۶
۵۷.۸۲	۷۵.۰۰	۶۵.۰۰	۱۹.۰۴	۱۷.۸۰	۴۱.۰۰	Tehran	۷
۱۸.۲۲	۲۵.۰۰	۴۲.۰۰	۶.۱۰	۳.۵۰	۲۰.۵۰	Charmahal	۸
۱۳.۹۹	۴۸.۰۰	۴۰.۰۰	۴.۰۲	۲.۱۰	۱۹.۴۰	South Khorasan	۹
۲۶.۶۵	۵۵.۰۳	۴۸.۹۸	۸.۹۸	۵.۱۰	۲۳.۲۰	Razavi Khorasan	۱۰
۱۶.۸۹	۴۷.۰۰	۳۹.۰۰	۵.۱۰	۱.۸۰	۱۳.۱۰	North Khorasan	۱۱
۲۱.۵۷	۴۶.۰۰	۴۴.۰۰	۷.۳۵	۵.۹۰	۱۶.۱۰	Khuzestan	۱۲
۱۶.۰۶	۳۰.۰۰	۴۵.۰۰	۵.۳۱	۴.۰۰	۱۹.۷۰	Zanjan	۱۳
۳۸.۳۵	۴۰.۰۰	۵۰.۰۰	۱۲.۶۳	۷.۳۰	۳۳.۸۰	Semnan	۱۴
۱۶.۵۰	۳۰.۰۰	۴۰.۰۰	۵.۷۴	۲.۷۰	۱۴.۹۰	Sistan and Baluchestan	۱۵
۳۶.۳۴	۶۰.۰۰	۵۱.۵۰	۱۱.۹۹	۷.۶۰	۲۳.۵۰	Fars	۱۶
۲۸.۱۱	۴۵.۰۰	۴۷.۰۰	۹.۲۳	۵.۱۰	۲۵.۷۰	Ghazvin	۱۷
۲۹.۳۶	۴۰.۰۰	۵۳.۰۰	۹.۹۷	۶.۰۰	۲۶.۹۰	Qom	۱۸
۱۵.۹۷	۲۸.۰۰	۳۹.۰۰	۵.۳۲	۲.۷۰	۱۸.۴۰	Kurdestan	۱۹
۲۵.۴۷	۴۲.۰۰	۴۵.۰۰	۸.۵۵	۶.۲۰	۲۱.۶۰	Kerman	۲۰
۱۸.۴۶	۳۵.۰۰	۴۲.۰۰	۶.۰۸	۴.۰۰	۲۰.۲۰	Kermanshah	۲۱
۱۵.۳۸	۲۷.۰۰	۳۹.۰۰	۵.۳۲	۳.۱۰	۱۴.۳۰	Kokiloyeh	۲۲
۲۱.۴۳	۳۵.۰۰	۴۶.۰۰	۷.۱۳	۲.۹۰	۲۲.۹۰	Golestan	۲۳
۲۱.۸۲	۴۲.۰۰	۴۸.۰۰	۷.۰۵	۶.۱۰	۲۱.۶۰	Guilan	۲۴
۱۳.۱۵	۳۱.۰۰	۳۹.۰۰	۴.۴۰	۲.۸۰	۱۷.۲۰	Lorestan	۲۵
۲۳.۵۰	۴۳.۰۰	۵۲.۰۰	۷.۶۵	۶.۱۰	۳۳.۸۰	Mazandaran	۲۶
۲۳.۳۲	۴۱.۰۰	۴۹.۰۰	۷.۶۶	۴.۴۰	۲۳.۸۰	Markazi	۲۷
۲۰.۳۰	۴۵.۰۰	۴۵.۰۰	۶.۹۳	۵.۴۰	۱۸.۵۰	Hormozgan	۲۸
۱۶.۰۸	۳۲.۰۰	۴۵.۰۰	۵.۳۱	۳.۴۰	۱۸.۸۰	Hamedan	۲۹
۳۶.۹۵	۵۱.۰۰	۵۰.۰۰	۱۲.۲۷	۹.۹۰	۳۶.۷۰	Yazd	۳۰
۳۰.۰۰	۵۰.۰۰	۵۰.۰۰	۹.۹۷	۷.۴۹	۲۶.۲۶	Whole Country	

Source: ICT.IR

Quantitative objectives of the information technology sector (ultra-sectional) in the country's fourth development plan:

Table 6, technology sector (ultra-sectional) in Iran's fourth development plan

Average growth rate during plan	*Status at the end of plan*	*Objectives during Plan implementation*	*Objectives of Development Plan*					*Status at the beginning of plan*	*Unit*	*Index*		*title*
			۱۳۸۸ *2009*	۱۳۸۷ *2008*	۱۳۸۶ *2007*	۱۳۸۵ *2006*	۱۳۸۴ *2005*	۱۳۸۳ *2004*				
64.4	60.0	55.0	۱۱	۱۱	۱۱	۱۱	۱۱	۵	*%*	Government bodies with general integrated mechanized systems	1	*IT*
82.1	20.0	19.0	۳	٤	٤	٤	٤	۱	*%*	Government bodies with specialized integrated mechanized systems	2	
38.0	100.0	80.0	۱٦	۱٦	۱٦	۱٦	۱٦	۲۰	*%*	Government bodies with standard intranet	3	
49.5	15.0	15.0	۳	۳	۳	۳	۳	۰	*%*	E-government services	4	
49.5	20.0	20.0	۳	٤	٤	٤	۵	۰	*%*	Government bodies with interactive electronic services	5	
58.5	20.0	18.0	۵	٤	٤	۳	۲	۲	*%*	Using e-government services	6	
49.5	10.0	10.0	۲	۲	۲	۲	۲	۰	*%*	Share of (domestic and international) electronic transfers (based on GDP)	7	
49.5	5.0	5.0	۱	۱	۱	۱	۱	۰	*%*	Companies active in (domestic and international) transfers	8	
77.8	30.0	30.0	۷	۷	۷	٦	۳	۰	*%*	Companies with intranet	9	
30.5	25.0	18.4	۳,۷	۳,۷	۳,۷	۳,٦	۳,۷	٦,٦	*No of Card%*	*No* of individuals possessing e-cards	10	

49.5	100.0	100.0	۳۰	۲۰	۲۰	۱۰	۲۰	۰	%	Health canters connected to internet	11
68.2	8.0	8.0	۲	۲	۲	۱	۱	۰	%	Use of e-health services	12
56.5	30.0	30.0	۱۰	۵	۵	۵	۵	۰	%	Health canters with intranet	13
49.5	10.0	10.0	۲	۲	۲	۲	۲	۰	%	Health canters using e-health	14
56.5	6.0	6.0	۱	۱	۲	۱	۱	۰	%	Doctors using e-health	15
65.7	2.0	1.8	۰,۸۸	۰,۲٤	۰,۲٤	۰,۲٤	۰,۲٤	۰,۱٦	compu ter	No of computers for every 100 students	16
4.6	25.0	5.0	۱	۱	۱	۱	۱	۲۰	compu ter	No of computers for every 100 university students	17
101.6	1.0	1.0	۱,۰۰	۰,٦۰	۰,٤۰	۰,۲۰	۰,۱۰	۰,۰۳	compu ter	No of computers with access to high-speed internet for every 100 students	18

Source: WWW.ICT.IR

Average growth rate during plan	*Status at the end of plan*	*Objectives during Plan implementation*	*Objectives of Development Plan*					*Status at the beginning of plan*	**Unit**	**Index**		**Title**
			۱۳۸۸	۱۳۸۷	۱۳۸٦	۱۳۸۵	۱۳۸٤	۱۳۸۳				
4.6	25.0	5.0	۱	۱	۱	۱	۱	۲۰	computer	No of computers with access to high-speed internet for every 100 university students	19	IT
77.8	10.0	10.0	۳	۲	۲	۲	۱	۰	%	NO of teachers using computer for teaching	20	
14.9	30.0	15.0	٤	۳	۳	۳	۲	۱۵	%	No of university professors using computer for teaching	21	
77.8	30.0	30.0	٦	۷	۷	۷	۳	۰	%	Schools with intranet	22	
38.0	100.0	80.0	۰	۲۰	۲۰	۲۰	۲۰	۲۰	%	*Universities with intranet	23	

97.4	30.0	29.0	١٠	٥	٥	٥	٤	١	%	Governmental and private education canters with standard internet	24	
90.4	*25.0*	*24.0*	٥	٥	٥	٥	٤	١	*%*	Governmental and private education canters with access to internet	25	
188.5	*20.0*	*19.9*	٥,٠	٥,٠	٥,٠	٣,٠	١,٩	٠,١	*%*	Courses presented via e-learning	26	
82.1	*20.0*	*20.0*	٥	٥	٤	٤	٢	١	*%*	Education canters using e-learning	27	

Source: www.ICT.IR

Average growth rate during plan	*Status at the end of plan*	*Objectives during Plan implementation*	*Objectives of Development Plan*					*Status at the beginning of plan*	*unit*	*index*		*Title*
			١٣٨٨	١٣٨٧	١٣٨٦	١٣٨٥	١٣٨٤	١٣٨٣				
4.9	3.3	0.7	٠,٢	٠,١	٠,٢	٠,١	٠,١	٢,٦	*%*	Government employees in IT sector	*28*	
10.2	0.1	0.1	٠,٠١	٠,٠١	٠,٠١	٠,٠١	٠,٠١	٠,٠٨	*%*	No of IT experts in relation to country's population	*29*	
82.1	10.0	9.5	٢,٠	٢,٠	٢,٠	٢,٠	١,٥	٠,٥	*In every one million*	No of secure servers for every one million individuals	*30*	
82.1	20.0	19.0	٣	٤	٤	٤	٤	١	*%*	No of secure services to all services	*31*	
58.5	1.0	0.9	٠,١	٠,١	٠,١	٠,١	٠,٥	٠,١	*%*	Ratio of web content in Persian to web content in other languages	*32*	

19.8	7.4	4.4	۱,۲	۱,۱	۰,۸	۰,۷	۰,٦	۳	%	**No of up-to-date PC's for every one hundred individuals	33	

Source:www.ict.ir

*****According to statistics provided by Ministry of Science, Research and Technology, 80% of universities have websites (not all of them are based on standards).

******Up-to-date computers make up approximately half of all the country's computers.

Table 7, the information technology sector in 4th development plan (by years)

Average growth rate during plan	*Status at the end of plan*	*Objectives during Plan implementation*	*Objectives of Development Plan*					*Status at the beginning of plan*	*Unit*	*Index*		*Title*
			1388 (2009)	**1387 (2008)**	**1386 (2007)**	**1385 (2006)**	**1384 (2005)**					
-41.8	2	-28	2	10	15	20	25	30	*Week*	Average waiting time for receiving high-speed data connection	8	
158.9	1,513	1,500	267	285	498	280	170	13	*1000 ports*	Number of high-speed ports *	9	
156.0	110	109	25	35	20	15	14	1	*No*	Number of internet hosts for every 10000 individuals	10	
134.0	4,650	4,650	2480	1240	465	310	155	0	*Mbps*	*Regional internet hubs*	11	

Source:www.ict.ir

*Out of 1513000 ports given by the end of 2009, 275300 will be given to the government sector

4.11. Resources and expenditures

Table 8, Resources in Iran

Total in 5-year plan	**۱۳۸۸ (2009)**	**۱۳۸۷ (2008)**	**۱۳۸۶ (2007)**	**۱۳۸۵ (2006)**	**۱۳۸۴ (2005)**	**Year** **Subsection**

						Information Technology
۲۳’۹۸۰	۵’۰۰۰	۴’۸۵۰	۴’۸۰۰	۴’۷۱۰	۴’۶۲۰	Government resources
۱۶’۰۲۰	۳’۳۳۶	۳’۲۸۰	۳’۲۲۰	۳’۱۹۴	۲’۹۹۰	Non-governmental resources
۴۰’۰۰۰	۸’۳۳۶	۸’۱۳۰	۸’۰۲۰	۷’۹۰۴	۷’۶۱۰	Total of resources
۲۳’۹۸۰	۵’۰۰۰	۴’۸۵۰	۴’۸۰۰	۴’۷۱۰	۴’۶۲۰	Government expenditures
۱۶’۰۲۰	۳’۳۳۶	۳’۲۸۰	۳’۲۲۰	۳’۱۹۴	۲’۹۹۰	*Expenditures of governmental sectors
۴۰’۰۰۰	۸’۳۳۶	۸’۱۳۰	۸’۰۲۰	۷’۹۰۴	۷’۶۱۰	Total of expenditures

Source:www.ict.ir

*In predictions for expenditures of non-government sectors, the sector’s 31 billion rials investment in public IT education and 12 billion rials in purchasing computers (a total of 43 billion rials) have not been taken into account as IT expenditures.

Chapter 5: Recommendation & Conclusion

5.1. Recommendation

We must now have over 1,200,000 servers in our country, but quite sorrowfully we only have probably around 200,000 servers in Iran today, because the number of the entire registered sites in Iran with .ir suffix is currently 41,000. Under such conditions that we are among the backward countries of the world in this industry, we need to encourage more and more Iranians to launch new websites, but the Regulating Plan is a step in the opposite direction since it creates horror and serious concerns in the hearts of site managers, as well as increasing meaningfully the people's acceptance of the sites.

The Regulating Plan is based on a foreign host's services, where the information of the Iranian websites is stores and processed and this is the best proof for the fact that IT field in our country is faced with serious deficiencies, so Iran with a perfect investment in this area and having its own data centers could increase the information security and speed of the internet. it has now been two years that the IT status in our country has been problematic for the private firms involved in telecom activities, reiterating, "Electronic purchases, National Internet Regulating Internet Sites and Web logs Plan, etc. have been the macro-scale plans pursued in our country all of which have received the cold welcome of the Iranian experts in the field.
As we discussed earlier during this research, we can easily conclude that to prepare for better the E-readiness and to achieve E-government in Iran we should consider some important issues as follows:

1- Gathering the essential and active organizations in the area of ICT
2- Locating a center for making decisions under direct the control of the President for extending the ICT and specially implementation of E-government
3- Utilizing the private sectors and participating the scientific elite professionals for the faster implementation of E-government
4- Using the experience of the powerful and developed countries
5- A proper and exact plan to provide facilities for teaching the citizens, Managers, and employees
6- Training the professional human source for developing and maintaining in order to achieve a better result from the E-government services

5.2. Conclusion

This thesis tried to present an executive understanding of e-government from global perspectives as well as that of Iran as a developing country. After getting an insight of the essential concepts and history of the electronic administration as well as the advantages and disadvantages offered by taking the government online along with influencing factors each effecting the quality and quantity of services offered on the world wide web, we moved the discussion toward the implementation strategies and stages employed by many countries around the world. We learned that the E-readiness index has to be considered while examining how e-ready a country is or on which point it is located on its way toward successful implementation of its e-government. With this regard we came to find the EUI e-readiness rankings index the most widely recognized and globally accepted gauging measurement. Six categories scorings were identified in measuring the e-readiness score of each country finding Denmark and the United States at the top and Iran at the bottom.

These categories including the connectivity, affordability and Accessibility Economic Environment Social and Cultural Environment, Legal Environment, study, the e-readiness of Iran where more than 70 percents of its inter city travels are made not get services but to get information we appreciated the immediate need for the implementation of government electronic services. With this regard the status of Internet within its 10 year history was fully analyzed in terms of connectivity and citizens' affordability and accessibility.

We came to know that the government of Iran adopted a dual policy against and in favor of internet boom and took initiatives to take advantage of internet in a controlled framework. Regards implementation stages in of other key prerequisite efforts was the anticipation of many IT training courses for the civil servants through TAKFA programs in order that they might be well prepared for delivery of their related services in an e-government which have proved to not be as much successful as it was expected. The internet is under strict control and limited in terms of accessibility and affordability.

From what has been discussed in this dissertation on the status of Iran toward implementation of its e-government in our case study, we can conclude that Iran is by no means e-ready to get through its ambition of digitalizing its administration. The initiatives already discussed and taken by the government have proved to be not successful, efficient and sufficient. Therefore on its pathway to accomplish delivery of electronic services to citizens and businesses, the Iranian government should truly realize that the effective development of the electronic government will require a well coordinated and participatory process that involves a wide range of stakeholders in both the public and private sectors. The adoption of the electronic government will involve the integration of many elements of technology, infrastructure business operation and public policy. The technologies must be fully operational to the operational needs to implement innovative approaches that will promote market development.

These requirements will be applicable to all sectors of society, including the public and private sectors. An effective national policy on the electronic government should be established only if disparate operational Legal, regulatory, and enforcement actions within the government, along with technical, marketing financial, and management strategies in the business sector, are closely aligned. The key concern is whether the Iranian government has the capacity to coordinate and understand the various issues and initiatives, especially in the areas of infrastructure as well as legal and social environments which must underlie all electronic service delivery. The other areas of concern and recommendations are presented as follows:

1- Consumer Protection, Privacy and Security:
The Iranian government should secure networks, access points and business-critical applications against theft, fraud electronic abuse and misuse. Therefore, a number of countermeasures and promotional programs should be undertaken to ensure the Iranian citizens that the electronic government is as secure as traditional forms of administration. The Iranian government must develop policies that build trust in electronic transactions, as there has been an increase in fraud and abuse with transactions online. There must be confidence that electronically base purchases, fund transfers and business deals are valid as traditional practices.

Personal information and finances must be secure so that consumers can be well protected against fraud and mistreatment. There must be accountability for the quality reliability and legality of products and services. This also raises issues, mainly for the Iranian government, such as national security and facilitating law enforcement protection of citizens' privacy, encouraging economic well being, and maintaining public safety. The embargoes in imposed on Iran and the absence of major credit cards which facilitate the online payment should be compensated with introduction of domestic electronic money.

2- Enhancing Infrastructure:
We concluded that the lack of appropriate infrastructure in Iran has impeded the progress of the electronic government both in the public and private sectors. It was argued that the hugest share of the infrastructure is confined to Tehran, the capital of Islamic Republic of Iran and for the vast section of the population in rural areas, infrastructure is often limited or non-existent, and is unaffordable. Hence, one of the major concerns for the government of Iran should be the need to enhance the national infrastructure to support the electronic government initiatives. However, the possibility of participating in the global electronic

marketplace and/or electronic model of service delivery is remote for the majority of the population, as there is a low and strictly controlled level of basic internet services as well as access to computers and data services in the whole country in general and the rural areas in particular.

3- Telecommunications Market and Pricing Policy:

Regulation of the telecommunication industry is an important public responsibility to support fair competition and to oversee appropriate pricing and service responsibilities. The prices charged by telecommunications operators for access to crucial services can be an important factor in determining the effectiveness and affordability of the electronic model opportunities on the whole. It is extremely difficult for smaller entrepreneurs, ISPs, and public operators to afford to connect themselves. This will inevitably form a barrier to the electronic government development. This could create economic barriers, especially for the most disadvantaged users.

The government of Iran must deal with these critical challenges to ensure the successful entrance of the electronic model of governance. Inline with its development policies the ministry of Information Technology should develop a single well defined electronic government strategy as part of its overall service delivery improvement program. In preparation for a more convenient, efficient, effective and integrated government service delivery system, the government should investigate the reason responsible for inefficiency of measures already taken.

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The University of Information Technology and Management in Rzeszow
Faculty of Economics

M.Phil Thesis Summary
The Analysis of IRAN E-Readiness to Implement E-government

Author: Rahim Khaki
Supervisor: Dr. K. Feret
Key words: E-government, E-readiness, ICT

Summary

After presenting the basic concepts of e-government, this master thesis gives an overview of the advantages and disadvantages associated with placing the government services online, introducing the structure of an e-government as well as the level of progress in developed and developing countries. It asses the e-readiness rankings for the different countries of the world and Iran as a developing country in particular toward its imitative to fulfill its plan of electronic administration. The Economic Intelligence Unit E-readiness ranking Index is introduced and employed to examine how e-ready Iran and investigate why Iran has dropped to the bottom in comparison with 68 other countries of the world evaluated. The dissertation continues with an analysis of the implementation of digital government in Iran, measures taken by the Iranian government and obstacles and barriers associated with the process. The thesis presents a conclusion of to what extend these drawbacks and barriers are at work to slow down the full utilization of electronic government in Iran. Suggestions and recommendations are provided as the dissertation closes

Wyższa Szkoła Informatyki i Zarządzania z siedzibą w Rzeszowie

Streszczenie pracy dyplomowej magisterskiej
Analiza e-gotowości w procesie wdrażania usług publicznych przez Internet. Studium przypadku Iranu

Autor: Rahim Khaki
Promotor: Dr. Krzysztof Feret
Słowa kluczowe: administracja publiczna przez Internet (e-government), „e-gotowość", ICT

Streszczenie

Po przedstawieniu podstawowych definicji związanych z funkcjonowaniem administracji publicznej w Internecie (e-government) autor dokonał przeglądu zalet i wad umiejscowienia usług publicznych online, prezentując ich strukturę oraz poziom zaawansowania w krajach rozwiniętych i rozwijających się. Praca analizuje także rankingi „e-gotowości" różnych krajów świata oraz Iranu jako państwa szczególnie zmierzającego w stronę wykorzystania sprawdzonych już rozwiązań aby zrealizować własny plan wdrożenia elektronicznej administracji. Do oceny stopnia e-gotowości Iranu został wykorzystany indeks rankingu The Economic Intelligence Unit E-readiness. Analizując ranking autor starał się ustalić przyczyny słabej pozycji Iranu w stosunku do 68 innych krajów świata, poddanych ocenie. Praca zawiera ponadto analizę stanu wdrożenia elektronicznej administracji w Iranie, mierników stosowanych przez rząd irański do jego wyrażania oraz analizę barier i przeszkód w przebiegu tego procesu. Prace zamyka zestaw rekomendacji określających jak ominąć bariery ograniczające pełne wykorzystanie elektronicznej administracji w Iranie.