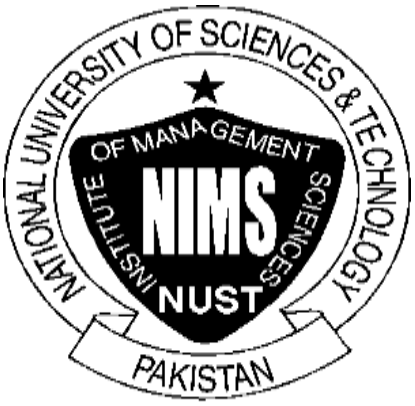


(NIMS)

NUST Institute of Management Sciences

MBA 2K2 (A)

Masters Thesis

"E-Governance in Pakistan & the Role of NADRA Databases"

By

Saman Khan

2003-NUST-MBA-119

E-GOVERNANCE IN PAKISTAN AND THE ROLE OF NADRA DATABASES

BY

SAMAN KHAN

A research study submitted in partial fulfillment of the requirements for the degree of Masters in Business Administration (MBA)

Guidance & Supervisory Committee

- ***Thesis Supervisor/Advisor***
  Mr. Hammad Ashraf

- ***Thesis Committee Members***
  Ms. Zeenat Jabbar
  Ms. Fauzia Janjua
  Ms. Asfia Obaid

Previous Qualification
BBA (Hons) from NIMS

NUST INSTITUTE OF MANAGEMENT SCIENCES

NATIONAL UNIVERSITY OF SCIENCE & TECHNOLOGY

RAWALPINDI

ACKNOWLEDGEMENTS

On the day of the completion of this research project, I would formally like to thank a few people to whom I am very grateful. Without their support, encouragement and assistance this thesis on **"E-Governance in Pakistan & the Role of NADRA Databases"** would not have been possible.

- **Mr. Hammad Ashraf**
  Assistant Professor, NUST Institute of Management Sciences (*Thesis Advisor)*

- **Mr. Mustansir Yaqub**
  Director Communications, Electronic Government Directorate, IT & Telecommunications Division, Government of Pakistan

- **Mr. Ali Raza Khan**
  Assistant Manager Finance, NADRA, Ministry of Interior

- **Mr. Zulfiqar Ali**
  Software Design Engineer, NADRA Headquarters, Data Warehouse Directorate

- **Col (Retd) Alvi**
  Officer, NADRA Headquarters

CONTENTS

EXECUTIVE SUMMARY

This thesis on "**E-Governance in Pakistan & the Role of NADRA Databases"** provides an in depth discussion on the situation of E-Government in Pakistan. E-government refers to the delivery of information and services online via the Internet. Many governmental units across the world have embraced the digital revolution and placed a wide range of materials on the web, from publications to databases. The thesis starts with Introduction, which acquaints the reader with the significance, organization and research methodology chosen for the thesis. Then a brief background on E-Government in Pakistan is given and the term itself is discussed in detail. Literature review helps to understand the important perceptions associated with E-Government. Then there is a section about E-Government in Pakistan in which the strategic roadmap for E-Government has been discussed. This chapter details the strategy chosen by the GoP for the implementation of an e-government programme. There is also a brief overview of the Electronic Government Directorate (EGD) of Pakistan. Then there is a chapter on NADRA and how its databases are supporting the implementation of e-government in Pakistan. Some other projects started by NADRA to promote good governance in Pakistan are also discussed. Furthermore, in the end the study offers a set of recommendations for the implementation of a successful e-government programme in Pakistan.

INTRODUCTION

Chapter: 1

INTRODUCTION

1.1. FOREWORD

E-Government refers to the use by government agencies of information technologies (such as Wide Area Networks, 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: better delivery of 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/or cost reductions.

Traditionally, the interaction between a citizen or business and a government agency took place in a government office. With emerging information and communication technologies it is possible to locate service centers closer to the clients. Such centers may consist of an unattended kiosk in the government agency, a service kiosk located close to the client, or the use of a personal computer in the home or office.

Analogous to e-commerce, which allows businesses to transact with each other more efficiently (B2B) and brings customers closer to businesses (B2C), e-government aims to make the interaction between government and citizens (G2C), government and business enterprises (G2B), and inter-agency relationships (G2G) more friendly, convenient, transparent, and inexpensive. E-Commerce has evolved already through four stages: 1) publishing, 2) interactivity, 3) completing transactions, and 4) delivery. To date, most e-government activity has centered on publishing.

1.2. SIGNIFICANCE & SCOPE OF THE STUDY

The focus of the thesis would be on progress and the overall situation of e-government amenities in Pakistan. One of the major topics of discussion is to identify problems pertaining to the effective implementation of E-Government services. It is expected that

the discussions in this regard would focus on the gaps existing between Pakistan and other countries regarding issues pertaining to technology, management, financing, project structuring and specialized manpower.

The focal point of the study will be on the current status of this e-government plan in Pakistan, the progress being made till now, the complications in the way and the prospects of a full-fledged implementation of the e-government plan (improved services to the citizens). Also to analyze the progress of e-government in Pakistan, the effectiveness of the projects implemented and the role of NADRA in the implementation of e-government services.

1.3. ORGANIZATION OF THE STUDY

The structure of the thesis would be arranged in the following manner:

- ***Introduction*** This would give a general overview of the concept of E-Government. Statistics will also be included with regard to Pakistan such as: Internet Users in Pakistan, Fax Machines per 1000 people, Average cost of a local call, Pakistan e-government rating, Internet service providers and phone subscribers *(Pakistan, with more than 135 million people, has less than 3 million working telephone connections)* etc. That would help in telling the phase of technology advancement in Pakistan. This chapter would also include the issues that are faced in the implementation of a full-fledged e-government programme. The benefits of an e-government programme would also be discussed.
- ***Literature Review*** This chapter would discuss the ideal strategic roadmap that an e-government leader should follow for the implementation of a successful e-government programme. Basically this chapter would entail the steps that an e-government leader of a developing country should consider before going for an e-government programme.
- ***E-Government in Pakistan*** Following topics would be discussed in this chapter:
    - The strategic roadmap for e-government in Pakistan mapped out by the IT & Telecom Division of Pakistan

    - Electronic Government Directorate of Pakistan and its projects
- ***NADRA & its Databases*** Role of NADRA and its databases in the promotion of e-government in Pakistan shall be discussed in this chapter. National Database and Registration Authority (NADRA) has developed a highly transparent and authentic National Database for its citizens. National Identity Card [NIC], passports, motor Vehicle registration, statistical data, etc., are subsidiary projects, whose success is based on authenticity of database, the intentions were to help in overall planning and development of the country particularly in social sectors.

- ***Conclusion and Recommendations*** In the end conclusion and recommendations will be given. This is for assessing whether Pakistan is sophisticated enough to need a full-fledged e-government plan or should it focus only in some areas. Recommendations will be given in the aspect of that how can Pakistan improve its current scenario in this field.

1.4. RESEARCH METHODOLOGY

Data for the research shall be collected from the following sources:

- Visits to:
    - Ministry of Information Technology
    - Electronic Government Directorate (EGD)
    - NADRA Headquarters
    - NADRA Data Warehouse Directorate
- Internet
    - Web sites of IT and Telecom Division of Pakistan, Electronic Government Directorate and NADRA.
    - Search Engines (Yahoo, Google, etc.)
- Text Books, Journals and Publications.
- Questionnaires

1.5. BACKGROUND

The concept of E-Government is not new. As far back as 1970, there was an entity within the Establishment Division, or perhaps the Cabinet Division, called the Pakistan Computer Bureau, that was tasked with automating the functioning of the federal government. In those days of course, it was simply called computerization and the more attractive term of e-government had perhaps not even been coined then. Nonetheless, the Pakistan Computer Bureau was doing exactly what the Ministry and its associated departments are currently trying to do, that is to automate the business processes within government, so as to bring about efficiencies and enhance productivity. It is true that the current usage of the term, e-government, places more emphasis on the delivery of public services to the citizen through the use of Information and Communication Technologies.

Last decade has witnessed a change in Governmental mindsets, functioning and execution. With the spread of information technologies and World Wide Web, certain demands have arisen like which touched the vital areas of Governmental functioning such as right to information, transparency in functioning and speedier decisions. Governance has become more citizens centric than ever.

Governments worldwide are faced with the challenge of transformation and the need to reinvent government systems in order to deliver efficient and cost effective services, information and knowledge through information and communication technologies. Development of Information and communication technologies catalyzed and led up to E-governance, which has now become the most talked buzzword the world over.

Before going any further it is very important to clearly understand the meaning of E governance and E government. E-Government holds for

" The use of computing and telecommunications technologies to make radical changes to the delivery of government services to their citizen customers and the general public (G2C), businesses (G2B), employees (G2E), and other governments (G2G)." [1]

[1] http://www.hipakistan.com

1.6. OBJECTIVES

With a strategic objective to support and simplify governance for all parties, government, citizens and business, by using ICT for attaining good governance, following broad objectives of the E governance can be identified:

- Improve connections between citizens and government and encourage their participation in governance
- Open up avenues for direct participation of women in government policy making process
- Reduce Poverty
- Enhance democratization and citizen empowerment.

1.7. MAJOR ASPECTS

Two major dimensions of e government can be considered as

1. Application of IT for the betterment of administration and
2. Application of governance to the cyber society.

Five pillars support the E Governance System:

- ☞ Computers: All hardware and software requirements of governance
- ☞ Connectivity: All carrier systems, bandwidth etc.
- ☞ Content: The information that is exchanged between the "consumers" of the system
- ☞ Consumers: All the human substitute systems that access and use the "content"
- ☞ Confidence Building: Those measures that help the citizens develop confidence in the e governance and encourage them to take to the e transformation.

In addition to the above, following building blocks of E governance can be identified:

- ☞ Application Architecture: Criteria and techniques with the design of applications for the state's distributed computing environment that can be easily modified to

response quickly to the changing business needs as well as to the rapidly evolving information technology to support their needs.

- ☞ Information architecture: Provides standards for accessing data for online analytical processing (OLAP), including Executive Information system (EIS) and Decision support System (DSS).
- ☞ Data Architecture: Provides access to high quality, consistent data wherever and whenever is needed. It's a prerequisite for fulfilling the requirement for data to be easily accessible and understandable by authorized users and application statewide.
- ☞ Integration Architecture: Specifies how various automated applications operations on different platforms can effectively work together.
- ☞ Network architecture: Specifies how information-processing resources are interconnected, and documents the standards for protocols, topology and wiring.
- ☞ Security Architecture: Identifies criteria and techniques associated with protecting and providing access to information resources. It facilitates identification, authentication, authorization, administration, audit and naming services.

1.8. ISSUES IN IMPLEMENTATION

On studying various E government projects, following inferences about various issues that are involved in implementation of E government can be drawn[2]:

1.8.1. Infrastructure Issues

The infrastructure issues, which are important, are poor rural telecommunications network, power problems in various states, and network connectivity. Unless these three areas are improved, an effective e government programme cannot be implemented.

1.8.2. Social and Cultural Issues

E government implementation leads to information sharing at each small unit level in the masses, high awareness and transparency in governmental functioning. This also needs a strong back end functional support to successfully maintain the e governance initiative; in

[2] http://www.i4donline.net/issue/nov03/implementation_full.htm

the absence of which the system will collapse. Due to corruption deep routed in the political and administrative system, majority of the people at the authoritative positions in the respective functional departments may dislike the transparent and smooth working after e-governance initiative. Such cultural habits are difficult to fight with which is an essential prerequisite of the e governance. Resistance of staff is also a very likely aspect, which needs to be taken care of by taking steps in advance and by spending goodwill among the employees.

On the other hand, people always fear to experiment new things, newer means of functioning. In the initial stages, any e governance project is likely to face criticism and setbacks because of lesser public participation. Further owing to lower literacy rate in majority of Pakistan, the reach of the project remains restricted to the literate people in the society.

To catalyze the tremendous social returns that are possible, the sheer magnitude of available capital must increase exponentially, and the capital must be invested strategically. Poor requirement-gathering (particularly in the case of frequent policy changes) and non-involvement of end-users during this process, poor or negligible IT awareness among decision-makers, poor management of knowledge and human resources, non-compatibility between IT projects and business processes, poor risk management, choice of technology and over-ambitious projects are among the root causes of problems in achieving significant e governance benefits.

Poor overall literacy rate and language barriers are other issues, which limit the usage such projects

1.8.3. Security Issues

Defining a security policy can be a complicated task as each Government must decide beforehand which aspects of protection are most important, thereby compromising between security and ease of use. Various security issues involved are

- Authenticity of the information sent across the web. The use of digital signatures is therefore much more required in case of Government documents.
- Confidentiality of any transaction or information available on the network is a very crucial matter and is therefore of vital importance to the successful e-government implementation. Protecting the information and important governmental documents from unauthorized users is all the more important in e-government.
- Cryptography is an important process to protect the information from unauthorized users and is an inseparable part of network security. Tested encryption software is installed before initiating the e government programme.
- Maintaining and assuring Integrity of the information is also an important aspect of digital security, which becomes all the more important in e-government. In the absence of encryption and digital signatures, information integrity cannot be guaranteed and this may lead to new forms of fraud, as digital documents are the easiest to forge.
- Continuous availability of information 24 hrs a day is important for efficient and effective functioning of the e-government system. This is in fact, a key distinguishing feature of the e-government system. Therefore any anticipated hardware problems, network errors, link failures etc. need to be safeguarded beforehand.
- Network Security by using multi level barriers is in place for effective protection of the networks. These may use password schemes, biometrics, SMART card authentication and firewalls.

1.8.4. Hardware and Software Issues

Identifying the appropriate hardware platforms and software application packages for cost effective delivery of public services is an important ingredient of the e government system. This can be achieved by

- Making the knowledge repository widely available through appropriate Demo- Mechanisms

- Offering a Basket of these models to the States, Departments both in the Center and the State, which could be suitably customized as per location and work specific requirements. Towards this end we envisage to have State level models, District level models and Ministry/Department level models;
- This offer is to be supplemented by incubating and initiating efforts in this direction by various organs of the Govt. Amendment in State laws through study and consultation.

1.8.5. Administration Issues

A strong political will and less corruption, encompassing potential changes with regard to physical, technical and human resource infrastructures and honest welfare measures are central to effective administration of e-government. A change in the mindset of people in the government and clear thinking about what needs to be achieved and where to get the expertise and solutions to achieve it in a cost-effective, time-bound manner leads to effective e-government. Setting up a governing body on e-government for the country might help. The idea should be to further the governance processes toward easier, better citizen-friendly schemes as and where required. According to an observation, hardware and software constitute only 10% of the problem, while 85% of the problem is an organization management problem that is internal to the government.

Delivery of public services like Utilities, Rural and Urban development schemes through EDI, Internet and other IT based technologies would necessitate procedural and legal changes in the decision and delivery making processes as well as institutions, which would mean a complete revamp of the Government decision management involving faster decision mechanisms, less red tapism, changes in organization structures making it more flatter, higher delegation of authority and changes in legal provisions. These measures would lead to

- Organizational and institutional changes effecting both people and methods at all interfaces of the delivery Chain

- For this, acceptance of this Changed Processes would have to be properly understood, accepted, internalized, adopted and improved to enable full advantages of the technology being adopted in the first part of Smart Governance
- De-layering of the decision making levels leading to re-engineering and appropriate sizing of the decision making machinery
- Training and acclimatization of the personnel at all levels more so at the lower rung of Government management organizations
- Loss of vested interests and assumed power as well as authority both amongst the legislature and the executive

1.8.6. Financial Issues

Apart from the ambitious work plans, the financial issues related to e governance have to be weighed in terms of available resources both in the Plan sector and outside it. It is here that leveraging of ongoing projects can be made more cost and value effective with the use of IT in a modulated fashion without any critical incremental costs. The Private sector resources have to be also carefully dovetailed with their commercial interests and those of the Government to provide Value Added Services. The Kiosks by themselves can bring in little in terms of better delivery of Services, unless the same are made economically viable and of demonstrated use to the Stakeholders, viz the Public and the Citizenry. Higher cost for high-end applications is another attention area.

1.9. BENEFITS

Following can be reaped out of an e-government programme:

- Enhanced access to information and communication across large distances
- Improved access to governmental and quasi-governmental resources and services
- Opportunities to trade or bank online through kiosks
- Opportunities to design, manufacture, and market products through Internet or intranet systems
- Education through computers or about computers or both

- ✌ Superior medical advice, diagnosis or information about local resources
- ✌ Opportunities to earn a better living by learning a new skill in the knowledge based economy
- ✌ Improving Agricultural productivity
- ✌ Technological benefits

  - With long-term resources and support, targeted applications of technology can help government agencies; community groups and other organizations deliver services more effectively and at a lower cost.
  - Technology applications can enable certain individuals, especially "early stage adopters", to spark catalytic change in their communities.
  - Technology applications can help create and sustain online and offline networks that introduce and interconnect people who are working toward similar goals.

LITERATURE REVIEW

Chapter: 2

LITERATURE REVIEW

STEPS TO CONSIDER FOR THE IMPLEMENTATION OF AN E-GOVERNMENT PROGRAMME

2.1. Why to pursue e-government

Understand that e-government is about transformation; technology is a tool. E-government is about transformation that helps citizens and businesses find new opportunities in the world's knowledge economy. It holds great potential. Yet, if e-government is not part of a larger program for reform—reforming how government works, manages information, manages internal functions, serves citizens and businesses—then it may not produce all the benefits expected from the time and money invested. Use e-government to rethink the role of government. Use it as a tool to further economic development and good governance[3].

Realize it won't be simple. Electronic government is neither easy nor cheap. Before committing the time, resources and political will necessary to successfully implement an e-government initiative, understand the basic reasons for pursuing (and not pursuing) e-government. E-government is not a shortcut to economic development, budget savings or clean, efficient government; it is a tool for achieving these goals. Especially in developing countries where resources are scarce, rushing forward with ill-conceived e-government plans can be a costly mistake, financially and politically. E-government, as with all reforms, cannot be achieved simply by drafting a law or issuing an order from political leaders. It requires changing how officials think and act, how they view their jobs, how they share information between departments (G2G), with businesses (G2B) and with citizens (G2C). It requires re-engineering the government's business processes, both within individual agencies and across government. At the same time, e-government responds to changes outside of government. How a society—its citizens, businesses and civil society—deals with government and with information is changing radically in many places. Citizens are starting to expect government services to equal those services offered

[3] www.pacificcouncil.org/pdfs/e-gov.paper.f.pdf

by and expected of the private sector. Over time, citizens will likely act more like consumers. Government must adjust to this, and e-government is one tool that can help.

Warning: Computers ≠ Reform. Use e-government and ICT as elements of a larger government modernization program. Simply adding computers or modems will not improve government, nor will only automating the same old procedures and practices. Making unhelpful procedures more efficient is not productive. Focusing only on the computers will not make officials more service-oriented toward government's "customers" and partners. Leaders should think about how to harness technology to achieve objectives for reform. ICT is an instrument to enable and empower government reform. Treating e-government as a reform process, and not merely the computerization of government operations, will contribute to building an "information society" in which the lives of citizens are empowered and enriched by access to information and the social, economic and political opportunities that it offers. This is rapidly becoming a key national priority for all countries, rich or poor. New (and old) technologies—the "e" part of the phrase—are simply means for achieving the larger goals of society. Instead of focusing on the idea of "e-government," think about creating an "I-government" or even an "I-society," where the "I" means "intelligent" or "information." Focus on issues such as how government and society process and use increasing amounts of information, and how government can be more responsive to citizen needs and input.

In one municipal government in China, creating an "information society" is seen as the foundation for its e-government plans. This idea defines the city's entire e government vision—to see its citizens, businesses, schools, public administration and service industries all become information-based. Networks and ICT are to become part of the daily work and lives of the people.

2.2. Clear vision and priorities for e-government

E-government can refer to many different things, and e-government plans come in all shapes and sizes. Thus, be sure to establish a clear vision for e-government.

Define a vision and priority areas. The purpose of government is to further the shared goals of a society. Therefore, begin the planning process by establishing a broad vision of

e-government that is shared by all stakeholders (citizens, businesses, officials, civil society groups and others). The broad vision should flow from the large goals or concerns of a society. There are too many possible reasons and goals for e-government to list them all. However, there are broad categories of goals that are commonly pursued by societies, including for example:

- Improving services to citizens
- Improving the productivity (and efficiency) of government agencies
- Strengthening the legal system and law enforcement
- Promoting priority economic sectors
- Improving the quality of life for disadvantaged communities; and
- Strengthening good governance and broadening public participation.

Within each category, different objectives might emerge. Given this, each society's vision should also be accompanied by a short list of priority areas for the e-government program. In other words, the broad e-government vision flows from a society's main concerns, and the target areas flow from the e-government vision. How the broad vision and priority areas for e-government are defined will depend upon the specific conditions and ambitions of a society. For example, a society's first concern might be to create a more accountable government. Its e-government vision will reflect that. In that case, highest priority might be given to areas such as increasing transparency in the judicial sector or fighting corruption.

Another society, however, might focus its ambition on developing itself into the business hub in its region. Its e-government vision might then highlight facilitating commerce and services for businesses online. Perhaps improving the investment regime or tax system could be priority sectors in this case. Define a vision that represents the priority objectives of government and the shared voice of all stakeholders.

Warning: Saving money should not be the broad vision that motivates e-government.

E-government should not solely be a strategy for reducing the cost of government, though this can be one valuable result. Saving money is an easy way to "sell" e-government to political leaders and the public. However, with few exceptions, e-government applications do not lower costs in the short term for government itself, though they may reduce costs for citizens and business.

E-government must be a shared vision. Encourage stakeholders government and non-government—to participate in defining the vision. If the public and private sectors are consulted only after e-government plans have been developed and implementation has begun, e-government programs risk being underused or even irrelevant. A shared vision ensures that key constituents and communities will "buy into" and support e-government programs from beginning to end. A shared vision of e-government means a shared stake in the outcome.

Involving key stakeholders—citizen groups, associations, businesses, government officials, NGOs, unions and other civil society groups—does not mean that all decisions on e-government must await broad public or across government consensus. E-government requires a champion and political leadership (discussed more fully below in Question 4 on political will). However, defining the vision and selecting priority areas need input from stakeholders, and not only a few elite experts or officials. In many countries, including developing countries, citizens distrust their governments, especially where there has been a history of dictatorship, political instability or large-scale corruption. To ensure that the public and stakeholders will be partners in the e-government effort, it is important to try to build trust in government. Lack of trust by the public can lead to the failure of or serious delay in e-government initiatives. The mechanisms for receiving input from various stakeholders will vary, but making an effort to include non-government stakeholders in building the vision for e-government will pay off. Governments must give serious consideration about who should help define the e-government vision and how to secure their input. In some places, governments can organize public meetings or conduct polls of citizens (and businesses or officials). In others, citizens and the private sector are included in committees that develop an e-government plan in an open, collaborative way.

Make the vision citizen-centered. Ultimately, e-government must be about meeting the needs of citizens and improving quality of life. Borrowing a lesson from the private sector, e-government must be customer-driven and service oriented. This means that a vision of e-government implies providing greater access to information as well as better, more equal services and procedures for the public and businesses. Even when e-

government projects seek to improve internal government processes, the end goal should be making government serve citizens better. And this means recognizing the diverse roles that citizens have as parents, taxpayers, constituents, employers, employees, students, investors and lobbyists.

Communicate the vision. Once the vision for e-government is established, it is crucial that leaders from government and non-government sectors communicate the vision and key objectives across government and to the public. Establish a communications strategy to ensure that people understand the vision, the changes that will occur and the tangible benefits for them from e-government. To communicate the e-government vision to the broadest possible audience, it is best to use the media most likely to reach target audiences. For the public and businesses, this might mean town meetings, newspapers, TV/radio broadcasts or Web sites. For civil servants, discussing the vision in speeches, department meetings or trainings might be effective. The communication strategy will depend upon the circumstances of each society and the nature of the e-government application.

Egypt's e-government vision focuses on redefining the relationship between government and citizens. Egypt is beginning to make procedures related to government services transparent. For example, procedures for registering births and getting copies of birth and death certificates are now more transparent and accessible (through a telephone hotline and the Internet). In this way, Egypt is beginning to empower people and eliminate the traditional* ad hoc *way in which officials dealt with citizens.

Corruption considered. To the extent that increased transparency, accountability and predictability (of rules and procedures) are made priorities, e-government may offer a weapon against corruption. E-government, however, does not guarantee the end of corruption. Officials who master technology-empowered processes can find new opportunities for rent seeking. Under such circumstances, e-government may simply cause an inter-generational shift in corruption toward younger, more tech-literate officials. One especially sensitive issue, right from the start, is whether fighting corruption should be part of the e government vision. Each society must answer that question for itself. For countries where corruption is a serious concern, as in many

developing countries, this question should be considered when the e-government vision and priorities are discussed. If the answer is "yes," it will be important to decide what forms of corruption the e-government program will address and how it will be accomplished.

Publicize e-government's anti-corruption goals or not? If fighting corruption is included in the vision, the next key question is when to announce the anti-corruption goal to the public. If fighting corruption is publicly announced as a major part of the e-government agenda, it could help build coalitions and public pressure for anti-corruption results. However, publicity too early in the e-government process runs the risk of causing fear and resistance from corrupt officials, who are likely to exert negative pressure even upon their uncorrupt colleagues. Another option is to not publicize the anti-corruption goals of an e government program but rather "sell" e-government (especially within the government) as a program to accomplish other goals such as improving government services, increasing attractiveness of the country for investment, reducing costs to the public/business or improving the competitiveness of the local private sector. Given the sensitivity of these issues, involvement of non-government stakeholders in the discussion is important.

Mexico's federal government established Compranet for government procurement as part of its efforts to curb corruption by automating procurement procedures. By facilitating a process of bidding and reverse bidding online, it seeks to make government purchasing more efficient and transparent. The system allows the public to see what services and products the government is spending its resources on and what companies are providing them with these services. There are more than 6,000 public sector tenders logged daily, and more than 20,000 service-providing firms are regular users. Other countries in the region are looking to imitate Mexico's successful Compranet.

2.3. Kind of e-government programme

Because every society has different needs and priorities, there is no one model for e-government and no universal standard for e-government readiness. Each society's and government's readiness for e-government will depend upon which objectives and specific

sectors it chooses as priorities, as well as the resources available at a given point in time (which might depend on budgets, donors, etc). The necessary pre-conditions for e-government depend upon a society's most important needs. For example, the level of infrastructure, legal framework and human capital needed for e-government vary with the objectives being pursued. But if requirements vary, how can a government assess readiness for e government?

Readiness for e-government is not only a governmental issue. Once a vision and priority sectors for e-government are established, it is important to assess how prepared a society is for e-government. Assessing e-government readiness requires examination of government itself—institutional frameworks, human resources (including ICT managers, procurement officers, and others), existing budgetary resources, inter-department communication flows, etc. National infrastructure, economic health, education, information policies, private sector development and other issues are also factors of society's readiness. Even in developing countries where problems of low connectivity and human resource development (including low ICT literacy) are severe, creativity and careful planning can develop specific applications, services and information that can be delivered in a targeted, useful way to identifiable audiences.

Readiness starts with political will. Though determining the key conditions depends on the goals chosen, political will—"e-leadership"—is a prerequisite for any and all e-government objectives. E-leaders must not only support e government initiatives with words but also with actions. They must build political support across government, push for change and resources, publicly take "ownership" of the project and commit their time on a sustained basis. To develop such political will, it can be important to demonstrate how supporting e-government can lead to greater electoral support from voters. Political will is discussed more fully in Question 4.

Readiness also rests on information policy. The second most important factor in e-readiness is the government's willingness to share information with the public and across government agencies/departments and different levels within them. Smooth, rapid information-sharing enables government to take a more functional approach to services, as opposed to the usual department-by department approach. A government's information policies are a key readiness consideration.

Other key factors for readiness. Although readiness depends on e-government priorities, there are certain factors that demand consideration:

• **Telecommunications infrastructure:** Telecommunications equipment and computers, while not the focus of e-government, must be addressed in any e-government plan. The level of telecommunications infrastructure needed will depend on the e-government projects pursued. Significant investment in national ICT infrastructure may be needed for certain e-government applications.

• **Current connectivity and ICT usage by government:** Understanding current ICT usage may indicate the government's readiness to manage information and e-government projects as well as whether the ICT framework meets global standards. In addition, it may help allow e-government efforts to build on previous computerization projects that have been successful.

• **Human capital within government:** Sufficient numbers of skilled, ICT literate personnel (including managers with experience in procuring, evaluating and implementing ICT solutions) are essential. Not everything can or should be outsourced to the private sector. Change management issues must also be addressed as new work practices are introduced.

• **Existing and expected budgetary resources:** It is obviously critical to ensure that the resources needed to fully achieve e-government goals exist or can be generated. Also critical is the control of funds, whether centralized or de-centralized, consolidated in one agency or allocated to many departments.

• **E-business climate:** Current environment for e-business, including the legal framework and information security, is a key criterion for assessing readiness. Establishing protections and legal reforms will be needed to ensure, among other things, the privacy, security and legal recognition of electronic interactions and electronic signatures.

• **Officials' readiness for change:** The corporate culture within government is an important aspect of e-readiness. The level of resistance to change and level of involvement by officials in setting policies and practices will greatly impact how fast or smooth the implementation of e-government will be.

2.4. Political Will

Like any government reform effort, political will is required to implement every e government project. Without ongoing, active political leadership, the financial resources, inter-agency coordination, policy changes and human effort required to plan and implement e-government will not be sustained. Political will exists when senior decision-makers have the resolve to exercise leadership in the face of opposition and setbacks.

Find where e-leaders are emerging. Nothing is more critical to the success of e-government than political will. Behind every successful e-government project is a visionary leader or leaders who push for change even through difficult moments. The right leader has authority, is willing to take risks, is willing to secure funds for the program, will commit time on an ongoing basis, and will publicly endorse and advocate for e-government.

Expect opposition and setbacks. E-government programs face many challenges. Like any ICT undertaking, there will be delays and mistakes. Technology will change in middle of the project. Complex government programs require complex software, which will have "bugs." Inside government, the bureaucracy will resist changes in procedures and possibly the increased transparency that e-government provides (see Question 7). In the face of such problems, sustained progress in e-government will be achieved only if the leadership believes that the benefits outweigh the costs and risks. Therefore, e-leaders must champion the cause of e-government and make the effort to build political support across government. This also means protecting administrative e-government positions against political patronage; do not treat e-government positions as rewards for political supporters.

MISTAKE TO AVOID: In one African country, the top thinkers on technology from academia and the private sector agreed on 15 pages worth of recommendations to the government about its ICT policy and e-government. However, because the minister in charge was not interested in the project, the recommendations languished and were not implemented. They will likely become obsolete as technologies change and the ICT sector continues growing in an uncoordinated manner.[4]

[4] www.pacificcouncil.org

Motivate political leaders. The task is to "sell" the concept of an e-government project to potential leaders in a politically appealing way. The benefits of the program to the voting public and other stakeholders need to be obvious to them. After gaining their support, it may be useful to educate leaders to be "e-literate" so they have some basic understanding of the power and potential of technology.

Remember that political will is dynamic. A successful e-government project can create good will among citizens that increases demand for e-government and thus generates further political will among political leaders. Leadership can also be found outside government—among businesses for example. Business leaders can help build momentum for e-government reform and encourage the emergence of e-government leaders. In some cases, one way to motivate leaders is to push ahead with a more modest e-government initiative and then present political leaders with a complete, successful project that they can publicly take credit for. Of course, this approach can only work if success of the project is almost guaranteed and a sufficient budget is assured.

Sustain leadership. If leaders are asked to take "ownership" of a project—for example by appearing publicly to announce or explain the project—their interest is likely to remain high. Sustained interest is important to keep the momentum of a project moving forward. Making a few speeches or issuing a few executive orders will not suffice. However, even the most enthusiastic politicians will rotate in and out of government. Support from the "customers"— citizens and business—and from the legislative branch can help sustain interest and commitment to e-government even when there is a change in political leadership.

Persevere. If you cannot find or create political will, keep trying. In some places, a motivated, visionary leader may wait years to finally reach political office and launch a major governance reform program that includes e-government. In addition, an e-leader must plan for e-government projects to continue and grow beyond the end of their leadership period (and among other political parties).

Promote. E-government budgets must include funds to promote and publicize projects through various media channels (e.g. radio, posters, public meetings, newspapers). Without promotion, the target audience may not learn about the project or use it. And

without a large number of people benefiting from the project, the benefits will not be sufficient to justify the costs. This, in turn, can undermine political will. In contrast, a strong promotion effort can generate public excitement, which can increase political will. ***The Chief Minister of India's Andhra Pradesh state, Chandrababu Naidu, has been a champion of e-government for the last six years. He spends at least one hour each day addressing some aspect of ICT or e-government. With his constant attention, the Chief Minister has led in the development of a comprehensive blueprint for e-government. He has also pushed for the introduction and use of computers and e-government applications for agencies while also securing multimillion dollar funding for statewide ICT projects.***

2.5. Are e-government projects selected in the best way?

Picking the right e-government projects, especially the very first ones, is critical. A successful initial project can become the selling point for all future efforts and create the political momentum needed to move e-government ahead. A small success story can become a powerful example that others can imitate. Like all reforms, it is important to show success early and not spend too much time on developing visions, strategies and work plans. Identify a few high-profile problems and address them with pilot e-government solutions quickly (for example, within a year or less) that will address both the back office operations of government and access/interface with the public.

Do a diagnosis. It can be helpful to start with an assessment of how a government currently uses technology and what ICT resources are available. An ICT "snapshot" might consider: Have any government units already undertaken successful projects of an e-government nature? Why did they work? What are current expenditures on technology? What have been the results? Are different units using compatible platforms? What are key obstacles current projects are facing?

Answers to these questions can provide valuable information about the current state of ICT as well as a map of existing good practices. A diagnosis can be a foundation on which to base future projects that will help prevent duplication of e-government efforts, identify economies of scale in e-government programs (e.g., with government-wide intranets and ICT contracting) and determine a good balance between centralized and

decentralized e-government initiatives. Information gleaned can also become a baseline against which progress can be measured and from which e-government leaders can be held accountable. Especially in developing countries where resources are scarce, a diagnosis can also reveal whether valuable assets, like ICT professionals, are currently being used for the highest priority goals. The diagnosis itself can be a starting point for building consensus among those charged with implementing e-government. A statement of the problem agreed upon by officials and others can be an excellent basis for further cooperation. E-government leaders must determine how public to make the results of the diagnosis if, for example, they might be discouraging to civil servants.

Shop around. Do not re-invent the wheel. Borrow ideas from other regions or countries that have successfully implemented similar projects, be it online communities or e-procurement. Visit those governments and talk with the officials in charge. This is a relatively low-cost way of learning do's and don'ts for a specific project. Of course, advice from elsewhere will need to be adapted to fit the local context.

Match the project to the vision. The goal and audience of e-government projects should be consistent with the overall e-government vision. Once this requirement is fulfilled, there are a number of additional strategies for choosing a first project. One option is to pick a project that is directly in line with pressing issues of a particular society.

In Chile, the availability of affordable housing is a critical public concern. One e-government project enables poor people to apply online for housing vouchers and subsidies thereby avoiding the time, costs and red tape of applying in person at Housing Ministry offices, which are located only in major cities. During its first 5 months of operation, some 40,000 applicants have been processed through 70 service centers nationwide.

Another option is to make the first project one that directly benefits a large number of citizens, like one that improves the process for administering a government benefit. Yet another option is to start with a project that affects all government units, like procurement or a government intranet, so all government workers have a stake in the e-government process.

Warning: The goals and target audiences must match the available technology and reflect the earlier diagnosis.

The technology chosen must be able to deliver the intended services (or information) and reach intended audiences for a given e-government project. For example, it is useless to create a website for important health information for rural communities if those communities have no affordable or regular access to the Internet.

See e-government from the user's perspective. If the target audience for an e government service has no access to the technology needed to obtain the service, e-government plans must address how to provide that technology. This may be a less immediate issue for e-government projects applied to "back office" support services, which often improve "over-the-counter" services for the public. However, matching the intended services and access to necessary technology and available resources is always a critical issue.

Pick winners. Build on existing capacity, enthusiasm and excellence within your government. An initial diagnosis may reveal certain government units that are more advanced, forward thinking or capable than others. Start with the best agencies and services—the "strongest links." Base the initial e-government programs—pilot projects—on existing centers of excellence. Sometimes the choice will not be where to begin with e-government, but which existing project to push. A few pilot projects can provide experiences that show more clearly the potential and challenges of e-government. They can be documented and used to strengthen the vision and planning processes, even if the pilot systems are replaced later with new, better systems. Pilot projects not only solve immediate problems but can also lead to a more systemic e-government effort.

Think ambitiously, but implement discretely. The common advice followed by the private sector in e-commerce— "think big, start small, scale fast"—is equally useful for e-government. Develop a long term, ambitious set of ideas for e-government (whether revealed to the public or not), but begin with a project that can be accomplished. It is risky to start with a series of large, national, cross agency projects. The e-government plan should be diverse but realistic, and training must be a part of it.

Brazil's Bahia State offers an example of bringing e-government services to communities without access to ICT. Bahia created mobile service centers (trucks equipped with computers) that travel to rural areas to deliver services to more than 400

communities in the State. These mobile units have access to computer networks and databases enabling them to issue ID cards, birth certificates and labor ID cards. Mobile health units use a similar approach bringing health services, information and electronic records for patients to the State's 100 poorest communities. Over five million people have received services to date.

Clarify existing procedures. One way to begin with e-government modernization is simply to make current procedures transparent to the public. Even this can be quite difficult. But documenting professional quality standards and operational procedures can be invaluable to support existing e-government projects, assist in training, and identify other areas for e-government reform.

Ask your customers. Citizens—the ultimate e-government "customers"—are the experts in evaluating what they want and need. Thus, another strategy is to survey citizens or businesses to identify their most pressing needs and how best to address them. Deliver something relevant and useful. Be aware, however, that sometimes government needs to be ahead of its citizens. For example, sometimes citizens will demand a service or an opportunity only after the government begins providing it. (See also Questions 2 and 10)

2.6. Planning and management of e-government projects

Effective management is vital for the success of e-government, as it is for all government or business operations. Being able to deliver a project on time and within budget, coordinate effectively among government agencies and oversee private sector partners all depends on capable management. Before moving forward with an e-government project, set up management mechanisms at both the national/state level and the project level.

Consider establishing e-government teams within government. E-government initiatives typically involve large commitments of resources, planning and personnel. They are very difficult to manage without defined teams to supervise the e-government process from start to finish. For example, e-government activities within a department should be institutionalized to ensure long-term stability and support of the new paradigm. Such teams must be provided enough budget, human resources and administrative support to carry out their duties.

Ensure the project management team has sufficient authority. Without authority from political leaders, the officials responsible for e-government implementation cannot ensure plans are carried out. Formal legal authority to oversee e-government implementation is also needed. Consider creating a central e-government agency within a ministry or as an independent body. Create teams responsible for project success at both the political level and project management level.

In Tanzania, before procuring a new, integrated Human Resources and Payroll System, the government hired an outside consultant to create a manual describing all existing HR management processes, including all the laws and regulations governing recruitment of new staff, promotions, transfers and termination of employment. The manual not only helped with preparations for procurement of the new system but also now helps identify other "quick win" reforms and serves as a useful training tool to help officials understand changes from the "old" to the new system.

For cross-agency projects, management teams need authoritative representation from each agency necessary for a project's implementation. This will keep open lines of communication and reporting, enable information sharing, and facilitate the establishment of common technology infrastructure, and common policies, standards, and security systems across departmental and agency boundaries.

Develop a work plan to implement the priority e-government projects. Vision and priorities are not enough. A detailed work plan will help steer the agencies and officials responsible for implementing e-government. The work plan should focus on at least six key elements:

• **Content Development:** including development of applications, open standards, local language interfaces, user guides and e-learning materials.

• **Competency Building:** human resources and training programs must be implemented at all levels.

• **Connectivity:** local networks and Internet connections must be applied across the relevant agencies or enterprises.

• **Cyber laws:** to provide a legal framework that supports the objectives of e-government policies and projects.

• **Citizen Interfaces:** a proper mix of delivery channels is needed to ensure that e-government is accessible and affordable for users.

• **Capital:** e-government business plans must identify revenue streams like user charges, subscriptions or budgets that will help achieve financial equilibrium.

Establish mechanisms for the continuing involvement of key stakeholders. The role of stakeholders in e-government does not end once a national vision has been set. They are a valuable resource for e-government. It is important to get feedback—particularly from users—about which elements are succeeding and which ones should be re-thought or re-designed. This is discussed further in Questions 8 and 10. Governments might consider establishing an advisory board for each e-government project comprised of users and other key non-government stakeholders critical for the implementation of the project. Advisory groups could include private sector partners, non-government experts, former officials or civil society groups.

E-government management is more than implementing projects; it means planning for capacity-building.

Training employees at all levels of the bureaucracy, including senior officials, should be an integral part of the work plan. Often the target audience will need some simple training, as well, to utilize any new e-government system. This training should also be part of the management design.

In Thailand, the government established a National IT Committee (NITC)—a ministerial level coordinating committee—and tasked the National Electronics and Computer Technology Center (NECTEC) to be the lead agency for the country's ICT and e-government efforts. NECTEC was empowered by the Cabinet to be the driving force in Thailand's ICT development and implementation of the national ICT agenda as well as specific ICT projects, training and legislative drafting. It also serves as the secretariat for the NITC.

2.7. Overcoming resistance from within the government

Civil servants may resist e-government projects, and may refuse to adopt new procedures. This problem may be more severe in developing countries where human resources may be less robust, the economy less stable and other job opportunities less plentiful.

Understand. The first step in addressing this issue is to understand why officials resist. There may be a variety of reasons including:

• Fear that the technology will make them obsolete, that they will lose their jobs;

• Fear that they will lose power and "turf" that they have created in the current system;

• Unfamiliarity with technology and fear that they will look stupid in front of others if they do not use it correctly.

Some call this phenomenon "technical shock";

• Fear that technology will mean more work for them such as, for example, having to answer constituent e-mail;

• Belief that they have nothing to gain professionally from adapting to new technology, and nothing to lose if they refuse; or

• Concern that new, automated processes will mean fewer opportunities to receive unofficial payments or bribes in return for using their discretion to help certain parties. E-government leaders must identify the most likely sources of resistance and devise a plan to overcome them. Numerous strategies can be effective, depending on the specific circumstances.

Seek "buy-in." Involve civil servants, especially those in higher levels of management, in the early stages of the e-government planning process. The best way to achieve "buy-in" is to use the suggestions of officials to improve the content or design of an e-government project. Ensure that officials understand how the e-government project will actually affect their work, and that of their subordinates, so they can help manage workers' expectations.

Warning: While inclusion is important, leaders must be careful that planning does not delay the process to the point where momentum for the project dissipates.

Explain. Explain to workers the goals of the program. Be clear that they are not the "enemy" or the targets of reform. Explain to officials what their new jobs will be. It is vital to manage expectations and respond appropriately to shifting perceptions at all stages while the e-government project unfolds.

Train. Some governments have found that, by first training the leaders of units, they created acceptance of the new system that then "trickled down" through the bureaucracy. If lower level workers are to be retained, they must also receive adequate training in advance of the new system's introduction. If they understand the new methods, they are

less likely to resist them. Do not approach training narrowly only to prepare officials for e-government applications. Capacity-building needs to enable officials to handle information adapt to changes in responsibilities and develop new competencies. Train officials to become a new kind of "knowledge-based" employee. "Knowledge management," as it is called, is a key element of e-government and should be part of any e-government project.

Evaluate. Hire an outside company—for example, an experienced consulting firm or technology company—to rigorously and regularly evaluate progress on e-government projects, paying particular attention to the relationship between project outputs and objectives. Performance-based management should be promoted.

Force. While offering training opportunities, make it difficult or embarrassing for workers not to switch to the new system.

Creating an aura of inevitability around changes can be very effective. But it is only possible with adequate political will, as discussed more fully in Question 4.

Solicit. As a way to keep workers involved and engaged, as well as to aid in the management of the e-government project, solicit feedback from them about how the system is working, any problems they have encountered and adjustments that might improve effectiveness.

Reward. Reward those who excel in the new environment. Establish benchmarks and tangible progress indicators for individuals, and then create incentives based on their performance. These might be related to professional advancement or even financial rewards. Try to allow the units who are doing the work to be credited with any cost savings and to use that money to invest in further reforms.

Praise and celebrate. Publicly, even formally, praise those who adapt to the system well. In the Middle Eastern country mentioned above, the region's political leader announced "best employee" awards based on secret evaluations, even without the direct bosses of the employees knowing they were being selected. If you are successful, do not forget to celebrate officials who are early adaptors of e-government! The best way to recognize staff will vary in different cultures, but praise is important.

In a country in the Middle East and another in Asia, leaders hired outside companies to independently evaluate progress among different government units on e-government

plans. Once the units realized they were being evaluated, they competed against one another to receive the best ranking. In one country in Asia, a senior official began to announce meetings solely through email, so workers were forced to get online in order to remain up to date and participate in operations.

2.8. Measuring Progress

Because e-government usually involves significant money, human resources, information and political commitment, accountability is critical. In developing and industrialized countries alike, whether democratic or not, the policymakers and agencies responsible for e-government are answerable for money spent, policies set and public services delivered or not delivered once the rollout of e-government begins.

Performance is the key. The test of an e-government project's success is how well the project meets its goals, for example, how well it delivers services, makes information accessible, or increases access to government. Judging both progress and performance means establishing metrics. Accountability requires measurable performance standards.

Set overall performance criteria. The institutions responsible for managing an e-government project must define the standards by which performance will be measured. The parameters or standards to measure e-government performance can be divided into two groups: (i) standards that measure a government's adoption of e-government; and (ii) standards that measure the impact of e-government applications. The following are some common standards used for these two groups:

(1) Standards measuring government performance

• Volume of transactions handled electronically;

• Response time to inquiries;

• Length of trouble-free operation of an e-government service starting from its launch;

• Number and/or percentage of public services provided electronically;

• Number of new services delivered electronically; or

• Percentage of territorial area covered by a service.

(2) Standards measuring impact of e-government applications

• Number and/or percentage of constituents or localities—"customers"—accessing information or services electronically;

• Increased convenience or efficiency in delivering information or services (e.g., reduction in number of days to deliver services) resulting from 24/7 availability;
• Length of time for procuring goods, service, info (from the government, business or citizen perspective);
• Reduction in the cost for citizens; or
• Reduction in the cost for government.

This list illustrates only some of the quantifiable criteria that might be used to assess the overall performance of an e-government project. Other standards might be developed that fit with the specific project implemented. For example, an e-procurement project might be assessed based on the volume of transactions processed, reduction in the time for the procurement process or reduction in the government's administrative costs of procurement. In contrast, a project providing health information online might be evaluated based on percentage of territory that can access the information, increased use of health services in areas where information is accessible online or increased public awareness (for example, as measured by surveys).

Set benchmarks to measure progress. Benchmarks act as a "reality check" for managers and policy-makers. They offer a way to measure on a regular basis whether or not e-government projects are advancing, sustainable and delivering what they promised. Milestones should be established to track progress. Such benchmarks might be based on:

• Specific dates;
• Comparisons with other countries/states;
• Opinion polls;
• Independent surveys (e.g., of customer satisfaction, participation, cost effectiveness);
• Measurements of private sector participation or delivery by vendors; or
• The degree of self-financing achieved by a project.

Again, these are only some examples of methodologies/standards that could be used as benchmarks. Benchmarks need to be specific and assessed consistently in order to measure progress accurately.

Consider using benchmarks to keep a "scorecard" that compares readiness and performance among agencies within the government. This creates incentives for agencies, in their effort to win recognition, to pursue e-government projects aggressively.

Remember, however, that such scorecards do not measure the success in delivering e-government services unless they are designed to do so.

Warning: Creating a Web site e-government performance. Setting up a Web site—call it "Webification"—often leads to complacency about e-government. Creating a Web site may be a benchmark, but it does not guarantee performance or customer usage. It is easy for an agency to believe that just because it creates a Web site it has electronically delivered a service. This might be true in societies that have high rates of Internet penetration, but even then it is only true for ***some*** Web sites. In places where Internet access is cost prohibitive for the average citizen, or not widely available, there is even less reason to tout the creation of general Web sites or assume they actually deliver services just because they exist.

Plan and publicize "quick wins" for e-government. E-government performance can be shown by delivering key services within an e-government initiative. Communicating the success to the public is also important. Steps to achieve "quick wins" include:

• Agreeing on achievable "quick wins" as part of the plan for an e-government project.
• Setting clear, measurable benchmarks for those "quick wins."
• Choosing the "quick wins" that will be used for a publicity campaign.
• Creating incentives for people to meet benchmarks.
• Measuring performance against the benchmarks.
• Once benchmarks are met consistently, communicating to the public about the improved performance or explaining why benchmarks are not met.

2.9. Relationship with the private sector

E-government is not something government can do alone. The private sector, in particular, has a key role to play, from the vision/planning process through implementation, monitoring and evaluation. However, the private sector and technology are not there to simply "tax, regulate, sue and control."

Treat the private sector as a partner. Companies are not merely a source of taxes, ICT services or jobs. In both developing and industrialized countries, e-government requires expertise, resources and input from the private sector. Companies can offer valuable lessons in customer service, responsiveness and adaptability to customer needs. Do not

view the private sector as merely a place for "outsourcing." Make the private sector a genuine partner in e-government. Private sector partnerships are especially promising when there is a possibility of creating revenue streams from e-government services or where e-government projects can be replicated for other agencies or governments. However, such partnerships will often require creating a new perspective among officials, particularly among emerging economies.

Replace mistrust between government and business with strong working relationships. Find companies experienced not only in technology applications but also ICT project management so e-government applications can be developed more quickly within government budget cycles. Learn from the e-commerce experiences of companies how to market services and attract/retain customers (*e.g.*, using systems for "customer relationship management").

In countries where the ICT sector is weak, governments can be models for good ICT usage. If government is an intelligent, effective user of ICT, this may help "local" ICT companies to improve their capacities. For example, large ICT contracts and projects might include capacity-building partnerships between local and multinational companies. Early planning to make sure local ICT companies participate in the e-government planning process can be critical.

Everyone needs "return on investment." Try to understand everyone's needs. Government and business need to understand each other, especially each other's need for "return on investment," or ROI. For companies, this primarily means revenues. For government, this means efficient, reliable, robust services (and perhaps a share of revenues), and increased legitimacy and trust from citizens. For officials, this means receiving support, training as well as professional opportunities and rewards for successful adoption of new procedures, work practices and responsibilities. This is important to minimize "brain drain" from officials leaving government to the private sector.

Minimizing "brain drain" requires planning. As highlighted earlier, e-government plans must include significant training for officials. As they gain valuable, new skills, such officials are often in high demand for private sector jobs, especially in developing countries where the pool of highly skilled workers may be limited. The loss of trained

personnel can be damaging to e-government projects. To minimize staff turnover, it is important to develop innovative compensation packages and professional perks. Contracts with private sector partners might include clauses designed to prevent contractors from hiring project staff away from government. Similarly, employment contracts might prevent staff from leaving jobs over a given period after receiving training or extra education.

Create realistic business models for e-government projects. Companies need to sell e-government projects to their management, and government needs to "sell" those projects to the public and its officials. The partnership can be stronger if there are people in the government who understand how companies work and people in the private sector who understand the needs of government. A solid, well-designed business plan will help.

Find each partner's strengths. Both government and business need to contribute actively to the partnership, and each should do what they do best. Companies can be a source of cost-sharing, technology and project management expertise. Government needs to promote the use of e-government among the public and officials as well as create a legal framework. Create incentives to help local companies grow and become viable partners in e-government. Commit to improving ICT manpower. Business cannot replace government leadership. Outsourcing can help relieve the government of limitations in its ICT manpower. However, the private sector cannot substitute for government in all cases; government must retain responsibility for policymaking, certain basic public services, and decisions about access and pricing. The private sector can be a key distribution channel or delivery system for services. It should not, however, define the vision or dictate the policies for e-government.

Develop formal policies on outsourcing. For many governments, outsourcing services to private companies is a new approach. To avoid wasting time and money, establish clear parameters for working with the private sector. For example, a policy should mandate that vendors be carefully evaluated before they are granted contracts. It should make clear that the company is responsible for delivering a certain level of functionality and services, no matter what the technology. Shift the burden to the experts to decide what technology to use. This will lower the risk of buying obsolete or incompatible technology for the government. Last, identify best existing government practices in dealing with the

private sector. Outsourcing requires government to use new types of contracts—with clear benchmarks for performance—that will not only ensure that hardware is installed but more importantly measure the performance of vendors and the quality of services received, especially in developing countries. Government workers will need to be trained on how to negotiate and draft such contracts.

Identify counterparts. When projects are outsourced to private companies, designate officials who will work as counterparts with the companies on an ongoing basis. To implement and manage e-government projects effectively, the private sector needs counterparts. This does not mean that government officials should direct projects. Rather, they should work with the companies to facilitate government cooperation. A key role of government is to develop sound ICT policies, for example rules for concessions, outsourcing and subsidies.

Local or multinational? In countries where the private sector, especially the tech sector, may not be well developed, this question raises significant issues. How can government access needed ICT expertise and resources while at the same time encourage the growth of a domestic ICT industry?

In the short term, the most viable (and perhaps desired) e-government partners may be multinational companies that have proven experience and capacities to deliver. However, the long-term development of local ICT companies can, and often should, be part of e-government planning. One effective strategy might be to pair an experienced multinational company with a suitable local company in the development and delivery of e-government applications. This can promote the transfer of technology and skills to local industry while at the same time ensuring that outsourcing produces results.

Warning: The private sector does not own the data. Even if private companies contract to develop and manage e-government applications, the government must ensure that such companies do not use the data that they manage, especially personal information collected from citizens and other "customers." This is crucial in order to protect the privacy of individual customers and build public confidence in e-government as a reliable, safe way to access services and information.

In one Asian country, a local government wanted to contract with a multinational company to develop e-government applications. National laws, however, prevented

government procurement from foreign companies. Restrictive laws that create near-term obstacles to e-government give government added reasons to develop incentives and programs for assisting local ICT companies to grow.

2.10. How can e-government improve citizen participation in public affairs?

Learn as you go. When it comes to e-government and public participation, all countries are developing countries. All countries, even the most advanced, are learning how to encourage, organize and manage public participation. Public participation is an important element in many stages of the e-government process, from defining a society's vision and priorities for e-government to determining e-readiness and managing e-government projects. E-government = participation, not automation. The public—which includes the private sector, civil society groups and individuals—can participate in e-government affairs in many different ways by: (i) commenting on e-government plans themselves; (ii) retrieving information (e.g., accessing information from government Web sites) or offering information (e.g., through public surveys, focus groups or emails); or (iii) participating in dialogues, both public dialogues with the government and citizen to-citizen (C2C) dialogues hosted by the government. Include all types of public participation in e-government plans. Offer different types of participation to ensure that different voices are heard. Offer the public opportunities to participate in ways that matter to them. Citizens who choose to participate in public affairs must receive some "return on involvement." If they give their time and effort, they will want something in return. They will need to know that their input is taken into account, for example by acknowledging input that is used or even publicly rewarding especially useful recommendations or assistance from individuals.

Click-and-collaborate. Participation requires collaboration. Being willing to collaborate with the private sector and civil society groups—who may possess much needed expertise and resources—is an important element of readiness.

Government must see itself as a facilitator and not simply a director of e-government projects. Lead the e-government effort, but replace command-and-control with click-and-collaborate. E-government requires moving away from a government-centered viewpoint, but this does not mean that government must step aside entirely. As described in

Question 9, there are certain roles that government must play and cannot delegate or outsource.

Citizens are the e-government experts. In the end, e-government is meant to serve citizens. Thus it is critical, especially with projects designed to serve the public directly, to assess their needs and solicit their input. As importantly, all e-government services should be piloted with the full participation of citizens before a government invests in or embarks on a full-scale, nationwide version of the project. Without this pilot-and-citizen involvement scheme, any e-government project can be very risky.

Make public input easy. Participation should not be a burden. Technology can be a powerful facilitator, allowing inexpensive and speedy channels of communication. In countries where Internet penetration is low, use traditional methods of soliciting public opinion such as group meetings, surveys, focus groups, and other means.

MISTAKE TO AVOID: Without first consulting its citizens, one city in Europe implemented, at great cost, a sophisticated online procedure for registering children for school. No parents used the new system, however, because they registered their children when they went to visit the schools.

Make sure that the public can give their input anonymously. This ensures that citizens evaluate government services and effectiveness openly. It is the only way that government will receive the information it needs to evaluate and improve its e-government programs and services, even improve policymaking.

Remember, however, that while citizens are experts, they may not demand a service until someone provides it to them first.

E-government is evaluated through public participation. Access to public services is a necessary part of e-government, but not sufficient. Facilitating, broadening and deepening openness and citizen involvement is fundamental to e-government. Evaluate the effectiveness or success of e-government through participatory dialogue and interaction. Such participation can either be discreet, one-time participation or ongoing participation by individuals or community groups (*e.g.*, some kind of "citizen steering committees" for e-government projects). The important thing is to ask the public for feedback, and ask regularly. Remember: get constant feedback from your customers. Interactive dialogues create greater accountability.

Warning: Be prepared for the flood. When e-government enables the public to communicate with government, public participation often turns into a flood of communications, and often complaints. Managing public participation and processing government-to-public contacts are big challenges for e-government.

Make sure you have the resources, personnel, training and clear policies necessary for handling public communications, queries and complaints. Mismanagement of public participation risks alienating the public and creating greater dissatisfaction with government and the e-government programs it seeks to build. It may be helpful to strengthen "offline" systems for handling public complaints, employee grievances and reports by "whistle-blowers" to improve public confidence, even before online communications are offered.

Yet, when e-government includes strong, responsive systems for "customer relationship management," e-government can be an extremely positive experience for citizens with benefits (for government, business and the public) that far outweigh the risks.

In South Africa, the government established a process through which the public can comment on draft legislation. Green papers, draft laws and regulations are posted on government Web sites. People can review policy proposals and documents online and submit comments; even before a policy issue reaches the Green Paper stage.

This kind of participation allows people to contribute directly to public policymaking. (www.gov.za.)[5]

[5] www.pacificcouncil.org

E-GOVERNMENT IN PAKISTAN

Chapter: 3

ELECTRONIC GOVERNMENT IN PAKISTAN

3.1. VISION FOR ELECTRONIC GOVERNMENT

To embark upon an aggressive programme to improve efficiency and provide quality services to the citizens of Pakistan, information technology must be inducted at all levels of government. This induction and its effective utilization will also help in motivating others to follow suit, since the government has a large bearing on all segments of the society.[6]

3.2. OBJECTIVES OF E-GOVERNMENT

The main objectives, which the government wants to achieve out of implementation of this programme, are as follows:

3.2.1. Improve the internal efficiency of government operations of all divisions/departments of the government

· Improvement in productivity of government employees by automating functions like meeting management, decision tracking, diary, scheduling, E mail and mail management

· Reduction in cost of operation of government in the long term by reducing time and effort spent in information search, retrieval and dissemination within the government

· Reduction in the cycle time for responsiveness to citizens

· Creation of synergies between various government functions through deployment of IT enabled applications and systems;

· Enabling of quick adoption of IT in government through enhancement of skills of government employees;

3.2.2. Improve quality of services delivery to citizens

· Reduction in the cost of service to citizen by providing general information e.g. Address / Contact Nos., Notifications, SROs, Rules & Regulations etc. to the public through government portal

[6] unpan1.un.org/intradoc/groups/public/documents/apcity/unpan004289.pdf

· Improvement in delivery of information and services to the general public within and outside the country

· Provision of services like electronic payment of utility bills through a network of Kiosks

· Online availability and submission of all forms of the Government of Pakistan

· Provision of general information to the citizens like Educational Institutes Locator, Medical Aid Assistance, and Information on Haj, Zakat & Ziarah

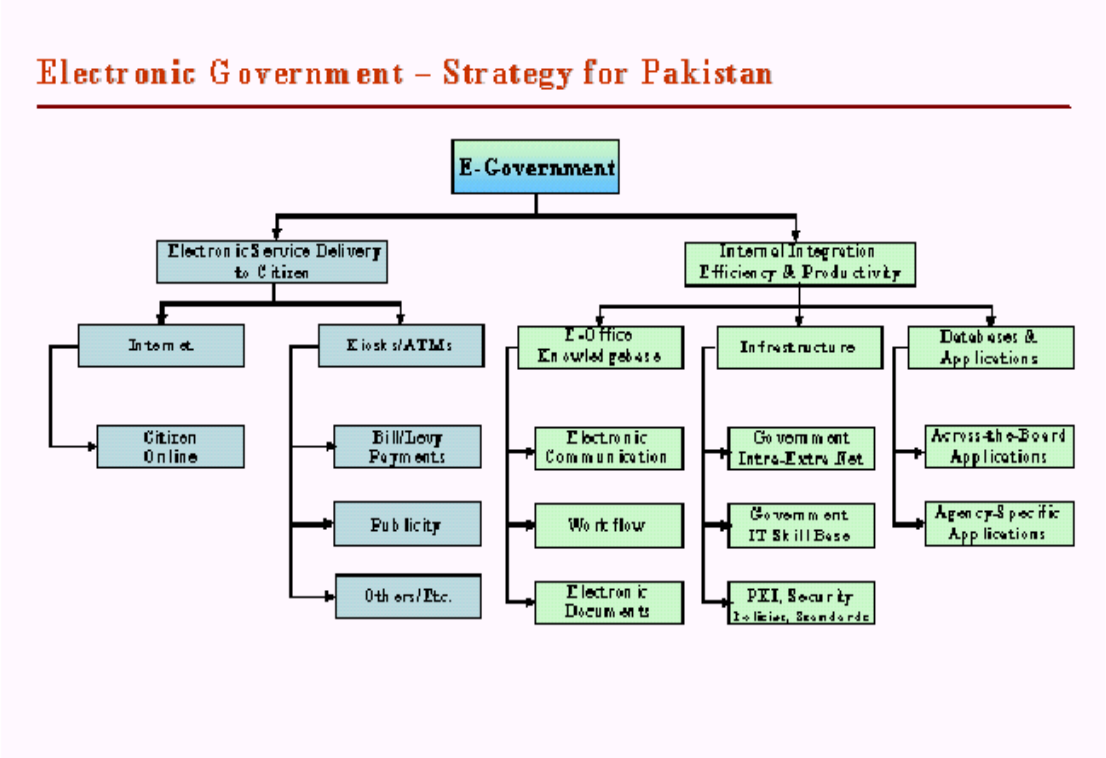
· Ensure transparency in government-public interactions

The implementation of the e-government programme is a gigantic task. It may take 5-7 years to establish the basic infrastructure of e-government because of financial constraints as well as inadequate professional know-how to undertake system reengineering of different government departments and use of IT so that use of paper is minimized. Therefore, a modular approach will be adopted to achieve the goal of e-government.

3.3. STRATEGIC ROADMAP FOR E-GOVERNMENT PROGRAMME

The IT & Telecom Division (IT&TD) started development of the programme in October 2000. Through a process of consultation and research broad vision, objectives, business strategy, IT architecture and strategy, projects and deliverables for the E-government Programme were established. The programme evolved over time by benefiting from the contributions of various stakeholders, from the public as well as private sectors, to whom presentations were made by the IT&TD. The broad roadmap for the programme is shown below:

Figure 1


Electronic Government – Strategy for Pakistan
E-Government
Electronic Service Delivery to Citizen
Internal Integration Efficiency & Productivity
Internet
Kiosk/ATMs
E-Office Knowledgebase
Infrastructure
Databases & Applications
Citizen Online
Bill/Duty Payments
Publicity
Others/Etc.
Electronic Communication
Work flow
Electronic Documents
Government Intra-Extra Net
Government IT Skill Base
PKI, Security Policies, Standards
Across-the-Board Applications
Agency-Specific Applications

Broadly speaking, the programme has been divided into two major components:

(i) Services delivery to citizens

(ii) Improving efficiency of operations of the government

The "Electronic Services to Citizens" component is further divided into two subcomponents, on the basis of the delivery channel selected, viz. Internet and self-help Kiosks. The component for improving efficiency was divided into three areas, viz. common office applications which are common across all government departments (lumped together in a broad term called E-Office), development of the basic infrastructure both physical and human, and finally development of specialized applications for different departments, these being called agency-specific applications. Initially, when the programme was formulated, it was planned to execute it as one large project, catering for all the components within the broad programme, and it was expected to cost Rs.2.5 billion ($ 40 million) over three years. A total of seventeen (17) projects were identified for implementation over this period. Additionally, it was felt that due to lack of experience and expertise in the country, and the complexity of implementation of such a massive programme, a Master Consultant be hired to supervise and integrate the implementation of the projects identified under this programme. However, as the work on implementation of the programme was commencing, the earlier view for a grand programme started to look very ambitious and risky. The main risks were that (a) entire government functioning may become hostage to a consultant, if a consultant is wrongly chosen, (b) government existing machinery may not be able to move at the speed expected for consultancy work thereby increasing consultancy costs and possibility emergence of many unforeseen issues. Also successful international experiences of step by step a pro-act of implementing smaller projects within the broad overall framework rather than starting off with one giant project were also available. It was considered that the stepwise approach had a number of advantages; viz. mistakes can be rectified sooner and with less cost, implementation skills would be built in -house and there would be less resistance from the agencies where implementation is being done. Thus, finally, the incremental (stepwise) approach was adopted.

3.4. PROJECTS UNDER THE FEDERAL E-GOVERNMENT PROGRAMME

The programme comprises of different specific IT projects that will be implemented in phases over a period of years. Details of the various projects are given in below:

3.4.1. Electronic Services to Citizens

3.4.1.1. Citizen Online – provision of services through GOP portal:

Under the Citizen Online Project the first-ever web portal will be developed for the Federal Government. The primary purpose of this portal is to provide visibility of the services offered by the various Divisions of the Federal Government, and to allow easy access to public information pertaining to all Divisions. As a part of this project, individual Division web sites for all the 36 Federal Divisions will be developed, that shall contain all the relevant information about these Divisions. The Portal is expected to be launched by the end of June 2002. The requirements for the Division web sites have been finalized with active participation from Resource Persons from all the Divisions. The minimum information which will be contained in the web sties will be as follows:

i) How to contact the Division.

ii) Policies.

iii) Rules and Regulations including Official Gazettes.

iv) Frequently Asked Questions.

v) News and Press Releases.

vi) List of Official Publications.

vii) List of all the services provided to the citizen by the Division.

viii) Job opportunities within the Division and tenders published by the Division and agencies under its control.

ix) Official forms required by the citizens will be available on the Portal.

x) Related Links.

xi) In addition, search facility will be available both on the Ministry/Division web sites and the Portal.

Three major special purpose web sites will also be deployed in the present project. These will be for Official Forms of the Federal Government, Information on Educational Institutions of Pakistan and religious Information on Haj, Ziarah and Zakat. The web site for Official Forms of the Federal Government will host all forms used by the government

or it's own internal use as well as for those used buy citizens. There are an estimated total number of 3,498 forms. All forms will be redesigned to fit A4 paper size and will be printable by end-users. Information on Educational Institutions of Pakistan will host information pertaining to admission policy and forms, examination schedules and forms, course syllabus, time table for semester / year etc; in short a prospectus of the institution. Information on Haj, Ziarah and Zakat will host information on free services, schedules, travel formalities, documents pertaining to performance of haj and umra (including multimedia films). For zakat, the web site will provide information on zakat calculation, places of depositing zakat and other pertinent information. Forms will be available for downloading by intending pilgrims for haj, umra and ziarah. An important element of this project is that a standard template will be developed for government web sites along with different standard like Web Standards and Guidelines, Metadata standards and guidelines, Internet usage guidelines for government personnel, Electronic Records Management Guidelines, Data Management Guidelines, Information Privacy Framework and Guidelines and Information Security Framework and Guidelines. These will make the subsequent work at the other federal government as well as provincial government departments much simpler and more standardized. The present phase of this project, which is expected to be completed by September 2002, will create a Portal and web sites that contain static information about the ministries/divisions only. In subsequent phases, the web sites will be made information transactional, viz. the web site of each ministry will accept forms filled online by the citizens and finally, wherever applicable, the web sites will also accept financial transactions by which time I.T. Law Infrastructure and public key (PKI) would also be in place.

3.4.1.2. Dynamic Portal for Selected Divisions

Under this project, which can be called Phase-II of the GOP Portal project, the GOP Portal will be enhanced from static to interactive information and transaction for selected Division where there is existing ability of the backend computerization to interact with the Portal and achieve the goal of electronic service delivery. Simultaneous necessary legal framework and infrastructure for financial transaction will also be put in place. This project will be a step forward in enhancing function of the GOP website portal. To illustrate, the dynamic portal will enable the following:

1. As an example, if the citizen is applying for a particular piece of information or material from the government for which the government charges the citizen, then the citizen will be able to pay online.
2. Citizens will be able to apply for ID Cards, passports etc. on-line
3. Citizens will have the facility to transmit their tax returns on-line and also make payments on-line.

3.4.1.3. Web sites for Pakistan Missions Abroad

A separate website (also accessible through the portal) is being prepared to cater for the specific needs and requirements of the expatriate and foreign community residing outside Pakistan. Under this project, web sites will be created for the 99 Pakistan Missions abroad. This project will have two components. The main part (core) will consist of information (content) common for all missions abroad. The second part will have information (content) specific to a mission in a particular country. The purpose of this project is to provide consistent information on Pakistan, its goals and policies, to the international community and the expatriate community.

3.4.1.4. Electronic Transmission of Tax Returns

Once the IT Laws and required infrastructure is in place, the Central Board of Revenue will set up back office facilities in tax departments to receive tax returns electronically. This facility will enable private sector to set up firms who will prepare and transmit returns electronically. The tax departments will save existing cost on converting paper returns into electronic databases. Citizens will benefit because they will not have to make repeated trips to tax offices.

3.4.1.5. Electronic payment of utility bills through Kiosks

Citizens face a lot of problem in payment of utility bills e.g. long queues, time constraints, unfavorable weather conditions, restricted times for payments etc. On the other hand, the utilities do not received these payments promptly in their accounts, which is a financial loss to them. The five major utilities (electric, gas and telecom companies) generate about 200 million bills annually, out of which approximately 50% are in the 12 major cities of Pakistan. Citizens receive these at different times during a month depending on the billing cycles of these companies. The utility companies have been unable to synchronize billing cycles. Thus a common citizen has to make repeated visits

during any month for payment of his utility bills. To help overcome these difficulties, the government is encouraging the banks, utility companies and private sector firms to team up and provide a solution for payment of utility bills through a countrywide network on Kiosks. The proposed network can later be extended to include payment of various federal and provincial government taxes. Initially, the kiosks are proposed to be installed in the 12 major cities of the country, which account for approximately 50% of bills generated. This network is then proposed to be extended to the rural areas. The Kiosks in smaller town or in areas where the literacy rate is low will be manned. The proposed kiosks are to be multi-function capable. Any citizen should be able to make payments by cash, credit card, pre-paid card etc. Due to the problem of utility companies having 16-digit consumer numbers, two options are being explored, viz. the utility bills may be bar-coded which contains the basic consumer data or consumers may be issued a smart card on which the basic data resides. The kiosks need to be capable of reading both types of information. Pakistan Telecommunication Company Limited (PTCL) has already invited Expression of Interest (EOI) from private sector firms for the proposed project. Other options are being implemented by various utility companies, but these suffer from two major disadvantages, viz. they are usually in partnership with certain banks and cater for the requirements of that banks customer only and secondly, they cater for individual utility companies only. Possibility of providing a single window service for all utility companies and all payments types to the general public is being examined. A big advantage of the proposed Kiosks network is that in future, the same infrastructure can be utilized for collection of provincial or local government taxes. The same facility can also be used for purposes of seeking public opinion and possibly for public voting – elections.

3.4.1.6. Salary through ATMs

ATMs are usually installed by banks for affluent customers and commercial locations. Some banks in Pakistan have installed ATMs but these are yet to be found in every nook and corner due to lack of financial viability in the eyes of the bank management. The Government has, therefore, started a pilot project for its employees in Islamabad (Federal Capital). Presently, these employees have to queue up in long lines in the first few days of the month to get their salaries and often do not have time during the office hours to go to banks. As a part of its service to citizens' initiatives, the Government, in partnership

with National Bank of Pakistan on an equal equity basis, has started a project of installation of 18 ATMs at 13 locations in Islamabad/Rawalpindi. The locations selected are near government offices and residential localities where there is a concentration of low and middle-income government employees. Under this project, 24 hours, 7 days a week banking facility will be provided to government employees. It will also benefit the banking sector, as the employees, under the new facility, will draw only required amount of cash each day and therefore, more money will be retained at the banks. The present project is expected to induce more banks to follow suit and target the low and middle-income government employees who have been neglected till now. The project will become operational in June/July, 2002. A good response to this pilot project will induce other banks to replicate this model in other cities and provincial capitals.

3.4.2. Internal Integration, Efficiency & Productivity

3.4.2.1. Electronic Office for the Government

The aim of this project is to improve internal integration, efficiency and productivity within the government. This project is being implemented in three stages. In the first stage a consultancy study will be undertaken for the Ministry of Science & Technology map and re-engineer the existing processes. In the second stage, the applications identified as a result of the consultancy study will be implemented within the Ministry of Science & Technology. In the third stage, these applications will be replicated at the other ministries of the federal and provincial governments. Work on the first phase has started. Under this study a process mapping and essential re-engineering study is being undertaken at the Ministry of Science & Technology to map the entire process and work flow in the Ministry. The purpose of this study is to understand how the Government functions, identify areas for automation and process/work flow improvements (re-engineering) that will bring about an improvement in operations and efficiency of the Ministry. Various activities to be performed during this study will include:

§ Mapping of the existing processes.

§ Proposing and Modeling essential process re-engineered processes.

§ Identifying applications to be deployed for improvement efficiency.

The broad areas that have been identified for this study include:

§ Internal communications and movement of files

This application area will include:

E-Mail management

Movement & Tracking of files etc.

Workflow within the ministry

Document repository, search and retrieval

Meeting management

Decision Tracking

§ Finance, Planning & Budgeting

This application area will include:

Management of budgets – development and non-development

Planning and reporting

Electronic interfaces to Ministry of Finance and AGPR

Interface to all other modules within the ministry

§ Human Resource Management.

This application area will include:

Recruitment, appraisal and compensation system

Training system

HR policies and planning

§ Procurement.

This application area will include:

Suppliers and product databases

Publishing, evaluation and tracking of tenders

Order placement, invoicing and payments

This study is expected to be completed in June 2002 and an implementation plan will then be prepared based on the output of this study. Initially it will be implemented at the Ministry of Science & Technology as a pilot project. Upon successful implementation of this Pilot Project, these applications will be replicated at the other Divisions of the Federal Government.

3.4.2.2. Local Area Networking within all Divisions of the Federal Government

As a precursor to the project for E-Office for the Government of Pakistan, it is proposed to implement Local Area Networks at all federal government ministries. To begin with, installation of Local Area Networks and provision of the basic infrastructure to enable internal electronic communications and tracking of paper files within six Divisions has been started. The present project is a pilot project and the Divisions have been selected based on their compact location as well as on the nature of work they do and the fact that some sort of PCs and PC knowledge is available at these locations. Based on the experience gained by the pilot project for implementation of LAN at six Divisions, a follow-on project for LAN and E-Mail implementation at all the Federal Divisions is being planned. This project, which is expected to be launched in the July 2002, will create the Federal Government intranet. The project will be implemented in close co-ordination with National Telecommunications Corporation, which is already connecting all the government secretariats located at different cities to create the government multi services data network.

3.4.2.3. IT Skills Training programme for Probationary Government Officers

To ensure that the new entrants to the public service are IT and Computer Literate, a training programme is being initiated for Probationary Officers (newly recruited) of the Government. The project envisages development of course material and establishment of information technology laboratories at the Civil Services Academy, Lahore and ten other specialized training institutions and provide faculty for imparting hands-on-training to probationary officers during their entire stay of 18 months in these academies. The objective of this project is to enable the government probationary officers to develop skills for the new operating environment of E-Government. Specifically this means imparting knowledge and getting hands-on training on personal computers so as to become fluent in using the personal computers.

3.4.2.4. Networking of all Federal Divisions

A similar project to the one described at the previous para is being initiated for in-service government officers. For this purpose, IT labs will be established at the Pakistan Administrative Staff College and the National Institute of Public Administration \

academies located in each of the four provinces. The objective of this project is to enable the in-service government officers to develop skills for the new operating environment of E-Government.

3.4.3. Infrastructure (Human, Physical and Legal)

Three types of infrastructure activities have been identified in our roadmap for e-government. The first related to the development of human skills for which a number of projects have been identified and these have been discussed at section 5.2. The second area of infrastructure relates to the networking, local and wide. Projects for these have been addressed at section 5.2 and section 2 (under multi services data network).
The third and most important area related to the development of PKI (both for the government's own use and for commercial use) and development of policies, laws and standards for secure communications within the government. Work is in progress on these areas side by side with work on the IT Laws, which will provide the legal framework for these activities.

3.4.4. Databases

Different agencies are working on development of their databases according to their specific requirements and areas of operations. One example that needs to be mentioned is the development of the national registration and identification database by National Database and Registration Authority (NADRA). This is expected to be the largest database containing comprehensive information on citizens of Pakistan and this data can be used for multiple purposes, viz. economic planning, taxation planning etc. other examples include Ministry of Interiors databases on arms licenses and Narcotics Divisions databases on narcotics statistics etc. These databases are expected to ultimately facilitate in better planning and better provision of services to citizens.

3.4.5. New Initiatives

The Ministry of Science & Technology has established a Technology Resource Mobilisation Unit (TReMU). The purpose of this is to mobilize the technical expertise of the private and public sector and create a forum for their interaction for technical review and recommendations on key IT & T projects. It is a think tank to bring the innovative ideas to fore and give it implementable shape. It will also mobilize the existing technical expertise of private sector specialists to assist the government in technical review of the

projects. A number of working groups have been formed under this initiative, each comprising of the known specialist in that field from the public as well as the private sector. Their brief is to explore all avenues within that sector and come up policies and/or viable projects for the development of that sector. The following working groups are currently functional:

§ Women in IT

§ Legal (Cyber laws etc.)

§ GIS

§ Telemedicine

§ Call Centres

§ Urdu & regional languages

§ Accreditation Council

§ Computer hardware and telecommunications equipment manufacturing

§ Computers for schools

§ Industrial Automation

§ Simulation software

§ Model IT Districts programme

§ Venture capital

3.4.6. Provincial e-government projects

The IT & Telecom Division is providing technical and financial assistance to the provinces for development of projects within the broad framework of the e-government programme. Details of projects under implementation are as follows:

(i) Setting Up an IT Infrastructure for the City District Government, Karachi (CDGK)

The project is being implemented by the Karachi City District Government. Under the Devolution Plan of the present government, the Town Administration will be central to the people for addressing solving their day to day problems and make plans for improvement in socio economic development in the area. For this purpose, the Karachi City Government would like to network and create databases in the 18 town administrations under it for more effective planning and decision making.

(ii) E-Government pilot project for Government of Sindh

The project is an initiative of the Sindh Information Technology Board. The main objective of the project is to automate the routine work of government. Under this project, LAN implementation and customized software development will be done at five Provincial Secretariat Departments (Services, General, Administration and Coordination Department, Finance Dept., Planning & Development Dept, Education Dept and Health Department. Upon successful completion this facility will be extended to other departments as well as made part of the government intranet at national level.

(iii) Website on Geo-Data for Government of Sindh

The project is being executed by Mines & Mineral Development, Government of Sindh. The objective of the project is improvement in systems & procedures of the organization to optimize efficiency; maximize benefits including income from minerals; to establish a web site on Geo-Data for providing information to the concerned organizations, as well as overseas business entities, individuals etc The project would immensely benefit the mineral sector in the province. Around 20,000 pages of information would be converted into Digital Form.

(iv) IT Training for Sindh Government Employees, Phase 1

The objectives of the project are to train 15,000 Sindh Government Employees from grade 5 to grade 20 in first phase, in the fields of Computer Training, Information Technology and Operation of Customized Applications/MIS.

(v) Development Project Management System

The aim of the project is to have a comprehensive planning and monitoring software covering all the phases of project life cycle which would be deployed in all of the 21 District Planning Offices of NWFP and in the provincial Planning and Development Department. All these 24 Planning Offices will be linked with provincial headquarter for information exchange.

(vi) Project for Development of Inter Agency Flow of Information System (IAFS)

The main objective of this project is to help the Interior Department of NWFP for efficient management of the law and order in the province. The purpose is to improve prompt access to quality and reliable information for decision making through access to databases of different offices through out the province, as well as to exchange

information on a reusable basis, by reducing time lag and paper work. The methodologies and systems to be implemented will be based on study of existing paper based system.

(vii) Geographical Information System (GIS) for Mineral Exploration/Mining in NWFP(Province)

This project, being executed by Directorate General, Mines & Minerals, NWFP (Province), is somewhat similar to the previous initiative by the Sindh government. Under this project, geo-data on minerals will be documented/compiled and made available in to potential investors through a dedicated web site.

(viii) Infrastructure Setup for IT Mater Implementation Plan Azad Jammu & Kashmir (AJK)

The objective of this project is to initiate the implementation of the IT Master Implementation, which will include the following:

§ Strengthening of IT & related section in the State

§ Establish Master Implementation Project Organization

§ Establish AJK IT Board

§ Provide users training to staff of Project Organization and AJK IT Board.

§ Promote IT and mass computer literacy and build human resources, upgrade the institutional capabilities and capacity of the government departments.

3.5. Issues in implementation of E-Government Programme

The implementation of a major programme like E-Government is not an easy task to accomplish in an established bureaucratic set-up. The following are some of the major impediments to its implementation:

(i) Resistance to change.

(ii) Technology shyness

(iii) Allocation of Resources

(iv) Cross-Agency co-operation

(v) Lack of expertise, training and right kind of human resources.

(vi) Participation of private sector

(vii) Constraints of physical infrastructure.

(viii) Coordination amongst various players (every organization wants go its way)

(x) Software costs, affordability, piracy

Electronic Government Directorate
Ministry of Information Technology

3.6. ELECTRONIC GOVERNMENT DIRECTORATE OF PAKISTAN

3.6.1. The Vision

To harness the potential of Information Technology as a key contributor to development of Pakistan.

3.6.2. The Mission

Rapidly develop the infrastructure in synchrony with the creation of excellently trained individuals and teams. Direct these at transforming our society into a prosperous and dynamic one-one that values and benefits from the creation and free flow of information and knowledge. Encourage and assist the entrepreneurial spirit, and make the fruits of this technology available to every citizen.

3.6.3. Goals

To realize the vision behind the IT policy, the following goals have been set:

- Make the Government a facilitator and an enabler to provide maximum opportunities to the private sector to lead the thrust in development of IT in Pakistan.
- Develop an extensive pool of trained IT manpower at all levels to meet local and export requirements.
- Provide business incentives for both local and foreign investors to ensure the development of Pakistan's IT sector (including the software, hardware, and service industries) and the use of its products
- Develop an enabling legislative and regulatory framework for IT related issues.
- Revitalize, emphasis, and support the country's dormant manufacturing and research and development (R&D) potential. [7]
- Establish an efficient and cost-effective infrastructure that provides equitable access to national and international networks and markets.

[7] http://pakistan.gov.pk/e-government-directorate/index.jsp

- Set up national databases that are reliable, secure, up to date and easily accessible. These would be open databases.
- Promote widespread use of IT applications in government organizations and departments for efficiency improvement and transparency in functioning and service provision, and to organize and facilitate access to public information.
- Promote extensive use of IT applications in trade, industry, homes, agriculture, education, health, and other sectors with widespread use of Internet.
- Encourage and promote the development of quality software that can capture export markets.
- Develop a tradition of electronic commerce for both national and international transactions.

- Encourage expatriate IT professionals to return to Pakistan and establish software houses or extend assistance to the local industry in the form of assignments from abroad.

3.6.4. Implemented projects of EGD

Some of the implemented projects of EGD are as follows:

- Citizen Online - provision of services through GOP portal
- Salary Disbursement through ATMs
- Process Mapping for improving efficiency at Ministry of Science & Technology
- Survey of Federal Divisions for LAN & Hardware Requirements

NADRA & DATABASES

Chapter: 4

NADRA & DATABASES

4.1. NADRA

National Database and Registration Authority was created to serve as a central repository where data pertaining to the entire population is maintained and periodically upgraded. Its objective is to modernize the country's governance through the conceptual model of data warehousing. It is scalable enough to grow systematically with newly interfaced database of user/ feeder agencies for optimizing profitability, competitiveness, and productivity. Chairman NADRA as Registrar General of Pakistan is mandated to register within his purview all persons and things, wherever and whatever they may be, to the extent and in the manner laid down in NADRA Ordinance, which was promulgated in the year 2000. It has enormous amount of data to share with internal private and public sector agencies like those working on social and industrial development programs for the enhancement of national image, security and protection.

4.1.1. Vision

NADRA, the authority, has been conceived as an instrument for implementation of Government's Vision for the next millennium and to combat all evils of undocumented population growth. The most comprehensive and statistical data is available at the National Data Warehouse. NADRA aims at including more or less every detail of every Pakistani. The quality of data is monitored through direct inputs from the user and feeder agencies, and countrywide provincial, regional and District Offices. Thus, the NADRA concept envisages availability of data including a Biographic Information Sheet of every citizen and expatriate, encompassing all relevant social and fiscal indicators. The diversity of data available within unified NADRA terminals ensures smooth planning and meaningful implementation of all governmental policies and projects, leading to good governance, a cherished dream of every Pakistani.[8]

[8] National Database and Registration Authority Brouchure

4.1.2. Evolution

To cater for a cohesive and unified approach in both Registration and Social fields for future planning, documentation of economy and for creation of a comprehensive Citizen Database during the population Census, NADRA was created on 10 March 2000 by merging the National Database Organization (NDO) and Directorate General of Registration. Pursuant to its mandate, NADRA took the challenge of data acquisition through scanning, data entering and management of citizen's database through National Data Forms (NDFs) collected from 65 million citizens of Pakistan during National Census of 1998 with extensive quality control measures for analytical interpolation or application at later stage. With the passage of time and continuous development, Central National Data Warehouse consolidated other newly created databases to be able to serve the government/other user agencies by providing vital data, which would be the basis of country's strategic and economic planning and governance.

4.1.3. Functions & Powers

The enhanced scope and the aim of NADRA is to develop and register an improved and modernized system of registration in the country through appropriate means including technologically advanced, effective and efficient computerization, automation, creation of databases, data warehousing, networking, interfacing of databases and related facilities and services. Today as a matured organization, NADRA is performing the functions in consonance with the Government's futuristic approach and are elucidated below:

a. To collect, collate and disseminate data regarding the citizens of Pakistan
b. To maintain Central Data Warehouse at NADRA through necessary liaison with concerned Government agencies.
c. To plan, organize arrange continuous updating of National Database by coordinating flow of input from various agencies.
d. To provide requisite access into National Database to all Government, Semi-Government and Private Agencies according to the policies and instructions issued by the Federal Government on, as required/authorization basis.

e. To ensure due security, secrecy and necessary safeguard for protection and confidentiality of data at individual as well as at collective basis.

f. To establish necessary liaison with Provincial Governments to ensure smooth functioning of Regional and District Offices of National Database and Registration Authority.

NADRA is vested with elaborate powers to:

1. Establish and maintain different multipurpose databases, data warehouses networking facilities, interfacing between databases, etc.
2. Develop and implement registration systems for all persons including citizens, foreigners, immigrants, and any other persons or things as may be prescribed by the Federal Government by means of issuing different identity cards including NIC (National Identity Card), NICOP (National Identity Card for Overseas Pakistanis), etc.

4.1.4. NADRA's Spectrum

Today, NADRA is functioning with speed and efficiency to establish a countrywide data communication network for linking the central data warehouse with 5 Provinces: Islamabad, Karachi, Lahore, Peshawar, Quetta and 3 Regional Head Quarters located at Sukkur, Multan and Sargodha. The quality of data is regularly updated at Provincial and District Offices for use by the authorized users and monitored through the direct inputs from the user and feeder agencies. The data collected is more comprehensive including statistical details of national and geographic resources and complete biographic details of every citizen. NADRA has an elaborate infrastructure to carry out the task assigned to it. It is in fact the biggest IT organization both in public and private sector. The human resource includes highly qualified people both in technical and management fields. Systematic and focused research and development activities have enabled it to produce indigenous solutions to solve the problems peculiar to our country. The organizational structure extends to 114 regional units thus reaching to every citizen for provision of services.

4.2. DATABASES

Databases are one of the core factors for the implementation of a successful e-governance programme in any country. The importance of databases can be judged by the fact that their significance is surely realized in the IT Policy Strategy of Electronic Government Directorate of Pakistan.

"Databases provide quick and easy access to information, which greatly facilitates the work and increases the productivity of businesses and institutions. Access to national databases is essential for coordinated and informed decision-making and for efficient planning. National databases are thus an important part of the IT infrastructure.

Both the government and the private sector should be encouraged to participate in the development of national databases. Two pilot sector projects have been identified and will be initiated shortly. The main recommendations for policy for this area are:

Encourage and accelerate government-private partnership in establishing comprehensive databases.

Ensure open and equitable access to databases. The databases to be used in the Government will be open and shall provide the utmost flexibility to integrate into the existing environment and should ensure that the systems and software caters for future needs. This is also necessary in order to ensure that the country is not exposed to the threat of a restriction of export from a single vendor.

Access to databases shall be based on open Internet standards."

4.3. CITIZEN DATABASE

4.3.1. Introduction

Citizen Database has a very crucial role to play in the existing Information Technology environment of Pakistan. Before explaining the aims, objectives and structure of the Citizen Database, it is imperative to throw some light on what a database really is.

The Data Warehouse gathers information from disparate sources, organizes it, and makes it available to the appropriate people within that organization. As demonstrated in the

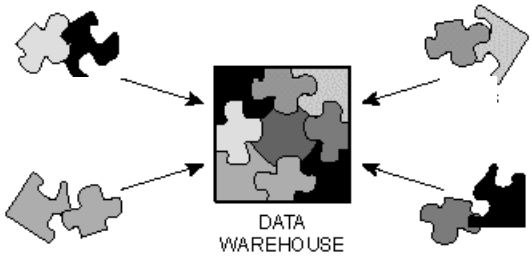


diagram below, the corporate data comprise a giant jigsaw puzzle, with each piece residing in a different area of the organization, perhaps scattered among multiple heterogeneous systems. All the pieces fit together correctly in the warehouse to allow the entire picture to be viewed and analyzed.

The challenge? Information systems are truly "distributed" in the widest sense of the word when it comes to deriving any understanding of the corporation as a whole. Most systems are installed with a local or provincial view, and their sole purpose is to solve a singular isolated problem, such as financial and utility planning, citizen tracking and identification systems. While not necessarily incorrect, this approach does present problems when cross-functional views are required in order to understand the dynamics of a situation. Today's increasingly affordable technology now makes it possible to access huge amounts of data from a variety of sources, analyze it, and derive measurable results.

4.3.2. Background

If there is a single key to survival in the next millennium, it is being able to analyze, plan and react to changing conditions in a much more rapid fashion. To do this, top-managers, analysts and knowledge workers in enterprises need more and better information. Though, Information Technology (IT) has revolutionized, but the sad truth is that in many organizations all over the world despite the availability of more and more powerful computers on everyone's desk and communication networks that span the globe, large number of executives and decision makers cannot get their hands on critical information

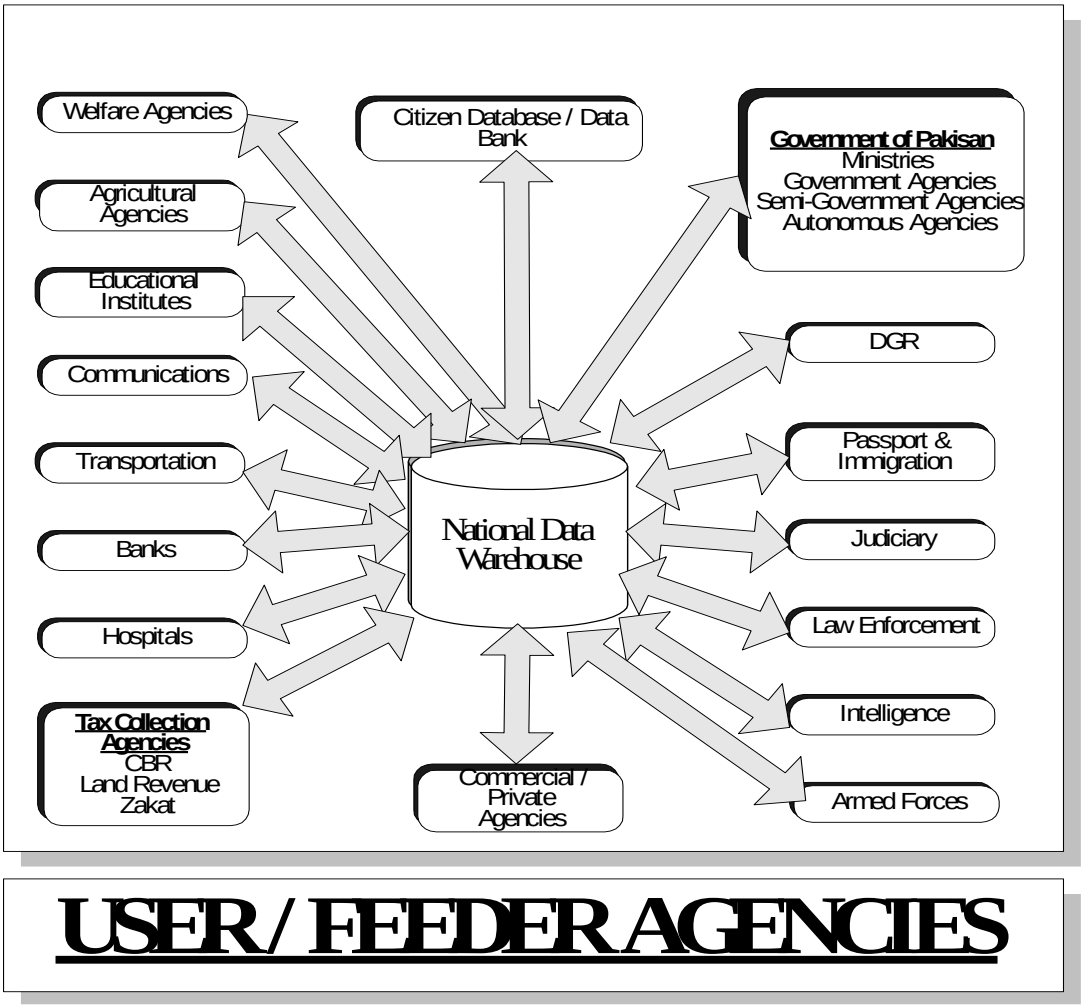
that already exist in organizations. Despite the fact that billions of bytes of data is created and stored daily, it still gets locked in computer system thus gets classified as '***data in jail***'. Experts have estimated that only a small fraction of the data that is captured, processed and stored in the enterprise is actually available to the executives and decision makers. While technologies for the manipulation and presentation of data has literally exploded, it is only recently that those involved in developing IT strategies for large enterprises have concluded that large segments of enterprise are "***data poor***".
Another problem area is the concept of creating databases, which are integrated and interfaced with each other for optimum utilization by all users ensuring economy of effort and resources. This is only possible if we switch over to latest concept of '***Ware Housing***' the data and then making it available to all users. The concept of creating a data warehouse in Pakistan was conceived before the National Census 1998, which catalyzed the emergence of **Citizen Data Bank,** which is created from the 64 millions of National Data Forms.

4.3.3. Citizens Data Base - National Data Warehouse

For the complete utilization of **Citizen Database**, it is imperative to establish elaborate Computer Network all over the country so as to make it available to all users immediately. While doing so the foundation for a National Data Warehouse to be established at Islamabad with provincial, Divisional, and District Warehouses at respective places has been laid. These Data Warehouses or Data Banks, whatever we call them, serve as the District level National Database offices as well as provide accessibility to authorized users at various levels. The data thus secured will now be available for use by all Citizens of Pakistan, District Administration Departments, Administrative Planning and Evaluation Departments, Development Project Planning Departments, Utility Management Departments, Judiciary, Law Enforcement Agencies, and all Government and Non-Government Agencies. At Regional or Provincial Level, prospective user will be Planning and valuation Departments, Judiciary, Law Enforcement Agencies and selected Commercial Organizations to start with. At District level, District Administration, Utility Management Departments, Development Project Planning

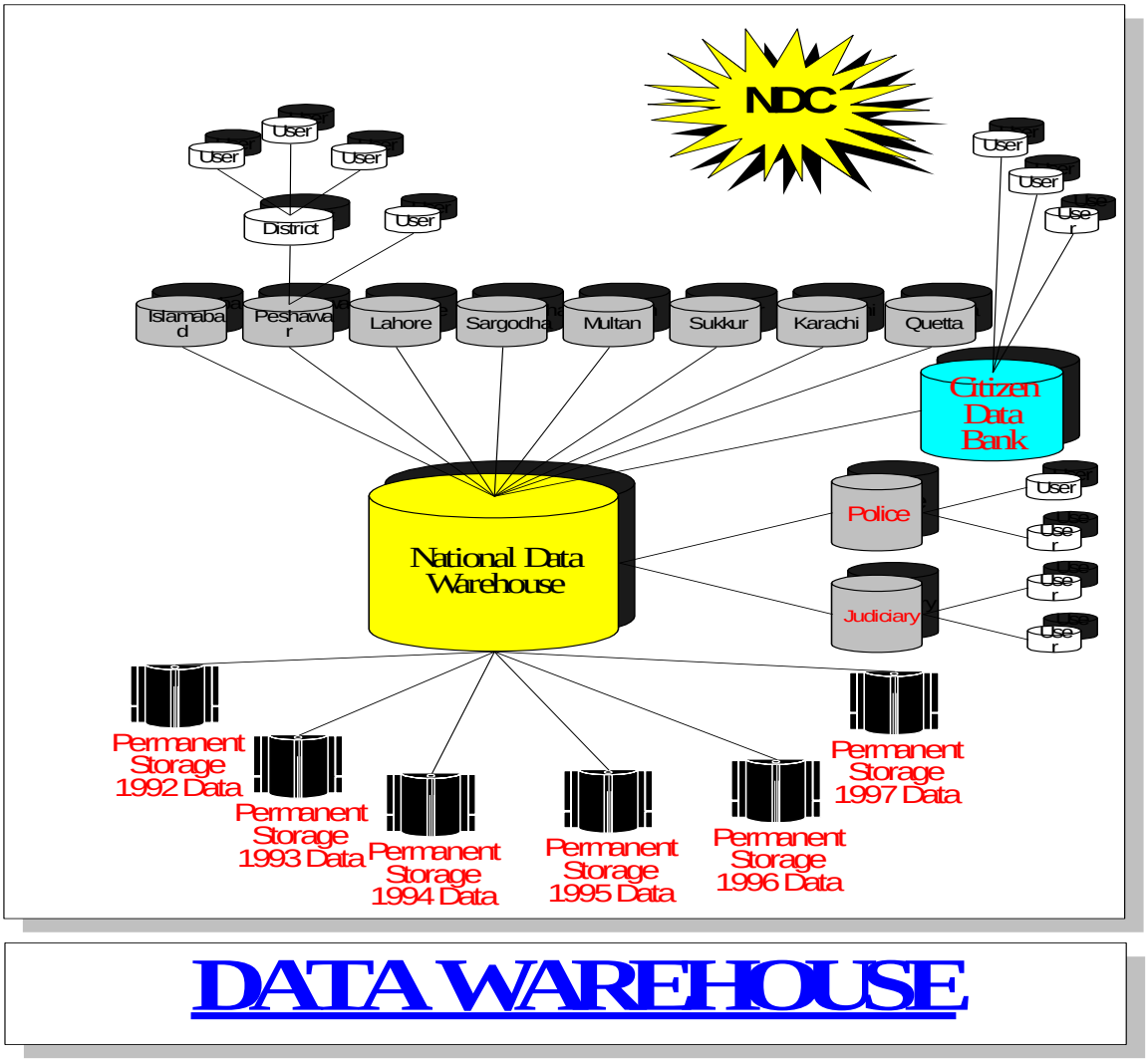
Departments and naturally the Citizens of Pakistan will be able to gain access. Citizens, in addition can access the Data Warehouse through a separate publicly available on Intranet type media, connected directly to the Central Data Warehouse.

Figure 2



Now-a-days, databases are being maintained by various departments and agencies in different formats and on diverse hardware and software platforms, which in return poses a serious data compatibility problem. There obviously, is a requirement by various agencies to share information of other sister departments/agencies. Judiciary might be requiring the conviction record being maintained by Law Enforcement Agencies and Immigration Department might like to keep them updated on the arrival of foreigners in Pakistan through various Airlines Services' Record.

Figure 3



DATA WAREHOUSE

If any two of these do come on a shared standard, there still persists a problem when a third agency wants to interface with them. Therefore, we need to have a single acceptable standard for all such user and feeder agencies. This will not only eliminate the data redundancy due to multiple copies of similar records kept by various agencies but also avoid duplicity of data, thus granting flexibility, reliability and standardization to an integrated data kept at a central location for such sharing. This lends a special credibility to the data due to its authentic source and so macro and micro level planning and decision making becomes easier and within reach of executives as well as planners. This authentic source is managed at National Database Cell.

4.3.4. Advantages of Citizen's Database

Our adversary, India did plunge into the Information Technology much earlier and at a very potent click of the hour and is now reaping the enormous advantages of the technology. Pakistan has recently proved its worth by justly intervening in nuclear advancement, and is definitely capable of creating a mark in IT as well as Data Warehousing, which is still a concept in almost all the developing countries of the world.

In addition to gaining a competitive advantage, we benefit in a number of other ways, some of which are listed as follows:

- It allows us to issue computerized NIC, to all our citizens providing the following advantages:
  - Elimination of possibility of issuing of bogus cards.
  - Computerized Family registration, which will help all the citizens to get the NICs of their children without any further hassle.
  - No visits shall be required to Registration Offices, as card will be delivered right at the doorstep.
  - Elimination of unnecessary documentation for proving identification before Law Enforcement Agencies.

- Registration in the Citizen database shall enable the citizens to get their domiciles prepared without going through lengthy and corrupted procedures.
- Family Registration in database shall allow people to claim benefits without having to prove their credentials through unspecified ways and means.
- All utility planning functions shall become very easy to manage for the local bodies as particulars of people residing in each ward shall be available at all levels of administration.
- All chances of fraud, bogus registries, Qabza Group activities on false identities will be totally controlled.
- Functions of judiciary shall be facilitated as bogus witnesses, fraudulent embezzlement shall not be possible. No one shall be able to transfer properties with bogus identities.
- Provincial Governments shall be able to register poor and needy people through computers and deserving public shall get all those benefits which are announced by the Provincial Governments from time to time.
- Poor and deserving people can also be issued with cards for free medical and for other financial assistance like Zakat etc. This shall be possible due to availability of accurate data on database.
- Government can issue Agricultural Loan Cards to farmers who can then operate them like credit cards. Data Warehouses will be able to trace transactions and keep the record of payments/receipts.
- Enforcement of Law and Order shall be facilitated as Registered Citizens can be accounted for correctly and record of undesirable elements available centrally at Data Warehouse and can be shared by all concerned agencies throughout the country.
- All transactions of hiring of houses, shops, premises and even transport shall have the support of computerized and registered documents, which can be made available by District Data Warehouses.
- Verified and Authenticated particulars will be available in the database therefore the Citizens shall not have to get their particulars attested from officials/Government Departments every time they move an application. Particulars given on an application

can always be crosschecked from the verified data available in database from anywhere in the country.

- A culture of an efficient and modern system of Governance shall be introduced in the country, which will, Inshallah, enable us to enter the new millenium as a progressive and developing country.
- We, as a country shall draw more respect from the World Community as every document (Passports, NICs and Certificates etc) a Pakistani shall be carrying abroad will have the backing of a computerized database which can be speedily checked.
- All illegal immigrants including foreigners living in Pakistan will stand identified, as they shall not be able to get themselves registered without proper identification. Their database shall also be created.
- Provincial Governments shall be able to issue following computerized documents:

  - Driving Licenses. Elimination of corruption like issue of bogus Driving Licenses.
  - Arms Licenses. Provision of updated and accurate Mohallah-wise lists and particulars of all those who possess weapons.
  - Vehicles Registration. Ensuring check on fraudulent registration and also enabling Law Enforcement Agencies to trace stolen vehicles.
  - Traders Registration Licenses. Ensuring only bonafide individuals indulge in authorized businesses like Medical Stores, Chemical Stores, Fertilizers and all other such specified goods.
  - Employees Identity Cards. To be issued by Government, Semi-Government and Private enterprises, as their identity cards shall then be authenticated by NICs.

4.3.5. Why Citizen Database is an important commodity for Data Warehouse?

The point where Citizen Database and Data Warehouse interface with each other needs here to be recognized. A Data Warehouse manages and monitors data of a number of databases independently created and handled by various agencies. Taking a number of diverse databases and trying to integrate them might be a physical impossibility without

deciding upon a standardization policy for the National Data Warehouse. We here have a golden opportunity of exercising this on a new database, which is supposed to be created and managed by ourselves and that is the Citizen's Database. During development of a data model for this database we will be able to specify the rules for standardization and that can obviously not be done without negotiation with major database handlers and data management bodies including computer-related organizations. On completion of Citizen's Database, which will be more of a pilot project for us, the data so acquired will be made available immediately for use by several user agencies and Citizens of Pakistan. The agencies requiring more data from the warehouse will then request for the same and we would negotiate with those feeder agencies having that very data for sharing. This way our data warehouse will keep growing in volume and information, which can then be shared mutually by almost all user and feeder agencies.

4.3.6. Conclusions

Citizen Database when developed completely will become an asset for the nation. It will rather be a gold mine, which will forever yield gold if kept updated. Data Warehousing is an application of computer technology, which is demanding by virtue of its inherently large size and the need to integrate this data with disparate and disjointed operational systems. All Government Departments today have taken a broad range of approaches to solving this problem, from creating monolithic centralized warehouses to distributing Data Marts, or to implementing isolated point solution Data Marts with no integration attempted. Regardless of the approach taken so far, the fundamental characteristics of the problem are unchanged, large databases derived from many systems will still require capacity to absorb the data in a timely fashion.

Other than the famous citizen database for the promotion of e-government in Pakistan, other popular initiatives of NADRA are as follows:

4.4. VERISYS AND BIOSYS

The National Database Registration Authority (NADRA), utilizing its own resources, is providing a platform for e-government and technological advancement to the public and [9]private sector. NADRA's new online identity verification service, called VERISYS, would help the financial institutions positively establish their customers' identities through a dial- up connection or virtual private network. NADRA's VERISYS is expected to serve as deterrence against corruption due to fake identities and help make Pakistan a safe and secure country.

Detailed analysis have clearly revealed that many frauds and impersonations are initiated by individuals carrying fake identities or if the concerning department/agency is unable to verify an individual against the data that he/she claims against its name. Over the years, this practice has not only maligned Pakistan’s reputation internationally but, internally, also it has exposed us to multidimensional threats and fears. The two systems would go a long way in eradicating the evil practices and also strengthen the Government's resolve to make Pakistan a very safe and secure country.

VERISYS can be helpful for financial institutions like banks, leasing companies, credit rating and government agencies that have to validate their customer status. Traditionally the financial institutions have been using the traditional method of keeping a photocopy of the NIC of their customers.

But the online application enables them to verify Customer's identity in a quick and cost effective manner. It allows them to positively establish their customer's identities through Web as well as Dial Up.

VERISYS enables these organizations in a comfortable way to register and to verify their customers at the spot, using web based application. It provides information on front image of the CNIC, the back image of NIC, additional information to verify the person by asking questions like Mother's Maiden name, Father's place of birth, Wife's name, etc.

[9] NADRA unveils systems to detect fake documents-DAWN Edition-National;30 July, 2003

About the BIOSYS (Biometrics Identification System) it is a unique solution that caters to a wide array of users and Administrators and can improve the current cash disbursement system.

This solution incorporates NADRA's cutting edge technological research in Biometrics Systems, thus eliminating the chances of ghost recipients and safeguarding against fraud during disbursement. The NADRA Biometrics Identification System (BIOSYS) can effectively be used for any transaction where identification of a person is required to be established before handing over the cash to that person.

BIOSYS is proprietary software developed by NADRA that uses state-of- the-art biometrics technology to uniquely identify each pensioner and allows fast and efficient pension administration with a simple interface.

It uses Biometrics Information (Thumb Impressions) to identify each user within a matter of seconds; greatly reducing the time it takes for imbursement officer to establish the identity of the recipient.

This system is easy to use and operate and requires very little maintenance of any sort. The Computer System requirements for BIOSYS are very nominal as it can very easily run on a standard desktop PC. A state-of-the-art finger print scanner that can scan, analyze and compare thumb impressions at very fast speeds is operated by the software and allows very accurate identification of any thumb impression. All Computer National Identity Cards carry a 2 D barcode. The thumb impression is stored in this barcode and for identification; this is matched with live thumb impression.

With the level of security breaches and transaction frauds increasing and security fears reaching new heights, it has become obvious that current security methods are not enough. The demand for Biometrics technologies, designed to protect privacy, have become the foundation of an extensive array of highly secure identification and personal verification financial transactions and personal data privacy. [10]

[10] NADRA to introduce new verification facility-DAWN-National; 28 July, 2003

The use of Biometrics technologies has accelerated globally after 9/11. Biometrics solutions are used in computer systems, military services, intelligence agencies, security organizations, law enforcement agencies, access through fire walls, networks security, physical access control to protect sensitive information, and health/medicine.

4.5. Vehicles & Arms Identification

The National Database and Registration Authority (NADRA) has innovated a new technology to help in the identification of stolen vehicles, arms etc., and minimize vehicles thievery. The new innovation immediately detects stolen vehicles and arms, one of the most important government's organizations serving as a single authentic 'point of reference and authentication' for the citizens of Pakistan.[11]

The new innovations would help in the good governance. The aims and objectives of the new innovations are as follows:

* Provide secure identification for each Vehicle or Armament that comes into the country through legal means.

* The responsibility of registration would remain a Provincial subject.

* Country wide data of Vehicles or Arms must be easily accessible to the Law Enforcement agencies on a single platform, irrespective of the area of operations.

* Efforts to register all sources of manufacture/importers of vehicles, Armaments and Ammunition

* Although nearly all provinces have progressed tremendously in the realm of motor vehicle registration yet they are isolated to their individual provinces.

* The need is to bring the identity of vehicles of the entire country on one platform.

***Concept of Registration**:*

[11] http://www.jang.com.pk/thenews/oct 2003-daily/31-10-2003/metro/k14.htm

(For Ammunition)

Generalised Registration Model

Ownership is established using the reference of independently registered entities

* This concept can be utilised for Registration/Documentation for all our present and future requirements.

* For example the Arms Licences and sale of Ammunition can be registered and documented country wise, as the process will start from the manufacturers and importers and go on to the sales outlets and end with the owner.

* It will also help to document the manufacturers/importers of vehicles and Arms dealers and ammunition suppliers.

Concept of registration:

(For Vehicles)

* Every vehicle will have its own unique identity, irrespective of its owner or its province of registration.

* This identity will be stored in the National Data Warehouse and a Vehicle Identification Number (VIN) will be issued based on the vehicle characteristics.

* A secure certificate with the vehicle characteristics and VIN will be issued along with the vehicle as it leaves the factory/port.

* Every owner will be cross-matched with the VIN in the Data Base and a smart/secure chip card will have the vehicle and owner details.

* Every province will have their own respective databases, while NADRA will have the database for the entire vehicles and their respective owners operating in the country.

4.6. Machine Readable Passports (MRP)

Govt. of Pakistan has recently introduced **Machine Readable Passports (MRP)** in an effort to curb the problems of illegal passports and rehabilitate the immigration infra-structure of the country.

The Project was developed in-house at R&D department of NADRA, Where NADRA developed first-ever machine of its own kind by bringing together the state of the art technologies. Only few nations in the world have closer features in their passports.

The new passport contains a chip and incorporates technologies such as Biometrics, Digital Printing, Recognition Techniques, Image Communication, Water Fugitives, Watermark Security features and real-time integration of the passport with NADRA's National Data Warehouse and Border Security Control.

A team of Research and Development department of NADRA has developed the first ever machine in the world for preparation of readable passport. As soon as the passport is placed on machine, the entire record of concerned person and his or her original photograph will appear on the machine. The applicant will put his or her thumb on machine. The door will be opened.

MRP is conceived to absorb the knowledge based capacity using NADRA’s state of the art data warehouse and infrastructure facilities. The project shall operate at tandem with the projects of e-government, installation of data networks and other initiatives for capacity building in the field of information technology. The project has been necessitated to overcome the serious bottlenecks, which are being faced by the implementing agencies. By the issuance of Machine Readable Passports, visas supported by and integrated automated border control system shall curb the tender cries to a great extent, consonant to the standard established by International Civil Aviation Organization (ICAO). The system being conceived shall be supported by database for an online verification of all documents. This shall eliminate human discretion at passport issuance

offices during passport making and border exit/enter points during verification of credentials of travelers by curbing any illegal practices .

The final agreement was signed between NADRA, Immigration and Passport department. NADRA is a consulting firm will be taking care of different components within the overall project framework. The new mechanism abbreviated as MRP (Machine Readable Passport) and ABC (Automated Border Control Integration Only) which incorporates latest technologies such as biometrics, digital printing, recognition techniques, image communication, machine readability and Online data support is designed to provide a comprehensively integrated system with indigenous in-puts to meet the security and passengers facilitation challenges of the future. The entire project is based on reliable technologies in the field of production, data collection and verification, personalization, data transmission to a repository and issuance of travel documents and its linkage with on-line computerized database that also houses passenger's data originating from the entry/exit points. MRP is a national project of high priority. Successful implementation of this project will be a key towards government efforts to restore the credibility of immigration infrastructure in the country. [12]

[12] http://www.pakistantimes.net/2004/08/20/national3.htm

CONCLUSION & RECOMMENDATIONS

Chapter: 5

CONCLUSION & RECOMMENDATIONS

5.1. CONCLUSION

Citizen Database when developed completely will become an asset for the nation. It will rather be a gold mine, which will forever yield gold if kept updated. Data Warehousing is an application of computer technology, which is demanding by virtue of its inherently large size and the need to integrate this data with disparate and disjointed operational systems. All Government Departments today have taken a broad range of approaches to solving this problem, from creating monolithic centralized warehouses to distributing Data Marts, or to implementing isolated point solution Data Marts with no integration attempted. Regardless of the approach taken so far, the fundamental characteristics of the problem are unchanged, large databases derived from many systems will still require capacity to absorb the data in a timely fashion.

Creation of Citizen's Database by NADRA is a historic, bold and futuristic decision and a cherished dream of all citizens of Pakistan, which once realized shall put Pakistan in the forefront in IT environment at the International Level. Pakistan has been trying to survive the Information explosion and is gasping to catch up with the technical competence of fast advancing countries. Its adversary, India did plunge into the Information Technology much earlier and at a very potent click of the hour and is now reaping the enormous advantages of the technology.

NADRA has come up as a highly technical and productive organization in the field of information technology. It has carried out the registration of citizens and has also made a major contribution towards e-government. Its efforts will definitely prove to be a stepping-stone for a better and more secure Pakistan.

Other than the commendable efforts of NADRA, there are still some inadequacies. There are no shortcuts to success. Buying the hardware, setting up the network, and typing letters on word processors instead of typewriters is a necessary but not the only

prerequisite to success in e-government. The IT Ministry of Pakistan has not been able to evolve into a paperless environment despite having spent money on consultants, and on setting up local area networks, and on commissioning studies. Changing the way people work is an enormous task. The management of change, and in particular managing to bring about attitudinal change in the workplace, is a major challenge in its own right. Introducing IT based solutions in the government without catering for all the intangibles that will make or break the project is an assured way to disaster.

What could be simpler than automating the classic file based system within Government? This system is one where a file, with notings made by putting pen on paper, moves from the desk of the Section Officer, on to the Deputy Secretary and then to the Joint Secretary, on to the Additional Secretary, with a final comment from the Secretary eventually making its way to the Minister. Given today's technology, automating this process is child's play. In actual fact, it would be safe to say that there is no example within the government where this manual system has been replaced. It is not for lack of trying. How complex can this simple task of automation be? Not complex at all. But then one should realize that it is not IT that is holding us back, but a score of other factors, all but a few of them being outside the mandate of your typical IT department.

There are some who believe that without a national public key infrastructure in place, it will be impossible to ever get rid of the paper based notings system. This is because at least on paper the handwriting and the signature lend some degree of veracity to the notings, and the various officers can be held accountable for their comments if the need arose. Digitally signing a document entails the use of a private and public key pair. The private key is known only to the person signing the document, whereas the public key is known to everybody else. Once the document has been signed with the individual's private key, it is impossible to repudiate. If anything, this provides an even greater authenticity to the signed document than a paper signature, which can be forged rather easily.

However, till such time that there is a nation wide public key infrastructure in place, an

attempt can be made to utilize the built in capabilities within most operating systems, to generate private and public key pairs that can be assigned to the various individuals in the decision making chain. Once this is shown to be workable, only then would the massive investment required to setup a government key infrastructure be justified.

Is achieving office automation, without a paper in sight, be the goal that we have set for ourselves? Or is it the automation of the back end transaction that will form the basis of all decision-making systems for the future not more important? If we can automate the National Savings Centers, does that not give us more return on investment than if we were to eliminate all paper from our offices? Will the government not run better if the budget making process was fully automated? What about automated border control? And the computerization of the vehicle registration system, as well as driving licenses? Is it not ironic that we are looking for new and exotic areas within government to apply Information Technology to, when even the basic functions within government are not automated?

But without a back end automated process in place, that effectively manages the routine day to day transactions that take place within government, such delivery of public services will not really deliver any meaningful benefits. A case in point is the very commendable effort by the E-Government Directorate to set up a government portal that contains a wealth of information about government and allied services. However, the next step that of linking these with the back end processes of the various departments can only be carried out once those departments themselves are fully automated.

5.2. RECOMMENDATIONS

1. ***Successful e-government projects require resource commitments***. This means commitments of money, staff and equipment that must be present to sustain not merely project implementation, but also ongoing project operation. Sustainability of projects requires sustainable supply of resources. This applies equally to the resource of political support. Key stakeholders must support the e-government project both internally and externally, and must continue to support it throughout its life.

2. ***Where personal data is involved, security and privacy issues must be addressed***. Projects like NADRA are taking on a great responsibility: centralising a large set of personal data (about individuals' health, criminal record, etc.), making that data accessible online, and transferring large amounts of that data via networks. Such projects must give a high priority to issues of data security and data privacy: setting in place encryption, passwords, firewalls, and personnel policies that minimise the risk of data being corrupted or accessed illegally; and setting out a clear policy about ownership, responsibility, access and use for all data items.

3. ***Stakeholder skills and awareness often need raising***. In setting up a central e-government facility, care must be taken to attend also to the skills and awareness of other stakeholders involved. Users within government must be trained: not just to use the new technologies, but also to understand and manipulate the data they are accessing. Citizens, too, must understand more about data and more about ICTs if they are to be true stakeholders in such e-government projects, rather than merely passive observers.

REFERENCES

http://www.nadra.gov.pk/

http://www.dailytimes.com.pk

http://www.dawn.com

www.pakistan.gov.pk

www.eldis.org

http://www.apnic.net

http://www.undp.org

http://www.egov.vic.gov.au/International/AsiathePacific/Pakistan/pakistan.htm

http://www.itcnasia.com/conference.html

http://www.pitb.gov.pk/itpolicy/preamble.asp

http://www.digitalgovernance.org

http://www1.worldbank.org

http://www.egovlinks.com

http://www.pakistan.gov.pk/e-government-directorate/information/info-ser.jsp

http://www.jang.com.pk

www.pakistantimes.net

http://www.hipakistan.com

www.nation.com.pk

APPENDIX

APPENDIX

Note: The following table shows e-government rank orderings for the 196 countries.

Table A-1 Complete E-Government Rankings by Country

Country	%	Country	%	Country	%
US	57.2	Greece	34.2	Barbados	30.6
Taiwan	52.5	South Africa	34.2	Ethiopia	30.5
Australia	50.7	Bosnia	34.1	Ukraine	30.4
Canada	49.6	Brazil	33.8	Turkey	30.3
UK	47.1	Latvia	33.8	China	30.2
Ireland	46.9	Iran	33.4	Tajikistan	30.0
Israel	46.2	St. Vincent	33.4	Vanuatu	30.0
Singapore	43.4	South Korea	33.4	DR Congo	30.0
Germany	40.6	Mexico	33.1	Lao PDR	30.0
Finland	40.2	Egypt	33.0	Indonesia	30.0
France	40.1	Hungary	33.0	Sri Lanka	29.8
Lesotho	40.0	Spain	32.8	Macedonia (FYR)	29.7
St. Kitts	40.0	Philippines	32.8	Cambodia	29.6
Vatican	40.0	Vietnam	32.8	Cook Islands	29.5
Bahamas	39.7	Georgia	32.7	Sweden	29.4
Malaysia	39.0	Nepal	32.7	Mauritius	29.4
Iceland	38.3	Brunei	32.7	Monaco	29.3
Belgium	38.0	Chile	32.6	Oman	29.1
Bolivia	38.0	Netherlands	32.6	Paraguay	29.0
Argentina	38.0	Croatia	32.6	Pakistan	28.8
Italy	37.8	Maldives	32.5	Algeria	28.7
Switzerland	37.7	Russia	32.5	Kuwait	28.7
Slovenia	37.6	Jamaica	32.3	Bangladesh	28.5
St. Lucia	37.0	Mongolia	32.3	Panama	28.4
Denmark	37.0	Libya	32.0	Uruguay	28.4
New Zealand	36.8	Poland	32.0	Jordan	28.1
Saudi Arabia	36.8	Slovakia	32.0	Malawi	28.0
Austria	36.8	Djibouti	32.0	Micronesia	28.0
Norway	36.5	Antigua	32.0	Palau	28.0
Estonia	36.2	India	31.8	Samoa	28.0
Peru	36.1	Lebanon	31.3	Turkmenistan	28.0
Mauritania	36.0	Thailand	30.8	Bhutan	28.0
Morocco	36.0	Cyprus-Republic	30.8	Guatemala	28.0
Luxembourg	35.9	Guyana	30.8	San Marino	27.7
El Salvador	35.6	Romania	30.7	Nicaragua	27.7
Armenia	35.3	Rwanda	30.7	Seychelles	27.6
Lithuania	35.1	Albania	30.7	Malta	27.6
Japan	34.9	Ecuador	30.7	Honduras	27.3
Bulgaria	34.5	Costa Rica	30.6	Dominican Republic	27.2

continued

Table A-1 Complete E-Government Rankings by Country (continued)

Country	%	Country	%	Country	%
Sierra Leone	27.0	Cape Verde	24.0	Yugoslavia (FR)	19.7
Myanmar	26.8	Iraq	24.0	Burkina Faso	19.6
Yemen	26.7	North Korea	24.0	Gambia	19.5
Eritrea	26.7	Tunisia	23.8	Niger	18.7
Kenya	26.7	Belize	23.8	Marshall Islands	18.6
Liechtenstein	26.6	Sudan	23.0	Benin	18.6
Angola	26.4	Gabon	22.7	Tanzania	17.6
Bahrain	26.2	Zambia	22.5	Portugal	17.5
Belarus	26.2	Cameroon	22.2	Liberia	17.3
United Arab Emirates	26.1	Sao Tome	22.0	Swaziland	16.2
Czech Republic	26.1	Moldova	21.6	Afghanistan	16.0
Ghana	26.1	Papua New Guinea	21.6	Mozambique	16.0
Madagascar	26.0	Tonga	21.3	Zimbabwe	16.0
Namibia	26.0	Azerbaijan	20.5	Central African Republic	16.0
Senegal	26.0	Uganda	20.5	Equatorial Guinea	16.0
Suriname	26.0	Mali	20.0	Nigeria	15.2
Togo	26.0	Somalia	20.0	Burundi	14.6
Grenada	26.0	Uzbekistan	20.0	Haiti	13.0
Kyrgyzstan	26.0	Chad	20.0	Qatar	12.8
Colombia	25.7	Andorra	20.0	Somalia	12.4
Botswana	25.3	Comoros	20.0	Guinea	12.3
Cuba	24.6	Cote d'Ivoire	20.0	Nauru	12.0
Fiji	24.4	Cyprus (Turkish Rep)	20.0	Dominica	12.0
Trinidad	24.4	Kazakhstan	20.0	Venezuela	9.3
Niue	24.0	Kiribati	20.0	Congo-Brazzaville	8.0
Syria	24.0	Solomon Islands	19.8	Guinea-Bissau	8.0
Tuvalu	24.0				

APPENDIX

Note: The following table shows the percentage of websites in each country that have each feature, such as online services, publications, and databases.

Table A-2 Individual Country Profiles for Selected Features

	Online Services	Publications	Data bases	Privacy Policy	Security Policy	Handicap Accessibility
Afghanistan	0%	33%	0%	0%	0%	0%
Albania	0	78	33	0	0	0
Algeria	0	76	65	0	0	0
Andorra	0	60	20	0	0	0
Angola	0	40	60	0	0	0
Antigua	0	100	0	0	0	0
Argentina	0	81	38	0	0	0
Armenia	10	90	50	0	0	0
Australia	50	100	85	96	54	23
Austria	15	93	36	0	0	0
Azerbaijan	7	40	20	0	0	0
Bahamas	33	67	67	33	33	0
Bahrain	11	32	58	0	0	0
Bangladesh	6	59	41	0	0	0
Barbados	20	40	40	0	0	0
Belarus	0	47	33	0	0	0
Belgium	11	95	21	5	0	0
Belize	0	65	12	0	0	0
Benin	0	18	9	0	0	0
Bhutan	0	0	0	0	0	0
Bolivia	0	100	50	0	0	0
Bosnia	0	7	100	0	0	0
Botswana	0	100	0	0	0	0
Brazil	6	100	50	0	0	0
Brunei	0	100	100	0	0	0
Bulgaria	0	100	23	0	0	0
Burkina Faso	0	60	20	0	0	0
Burundi	0	36	18	0	0	0
Cambodia	13	50	50	0	0	0
Cameroon	0	44	33	0	0	0
Canada	34	100	72	79	14	7
Cape Verde	0	100	0	0	0	0
Central African Republic	0	0	0	0	0	0
Chad	0	0	0	0	0	0
Chile	12	100	59	0	0	0
China	26	70	30	0	0	0
Colombia	0	74	42	0	0	0

Continued

Table A-2 Individual Country Profiles for Selected Features (continued)

	Online Services	Publications	Data bases	Privacy Policy	Security Policy	Handicap Accessibility
Comoros	0	100	100	0	0	0
Congo-Brazzaville	0	0	0	0	0	0
Cook Islands	50	50	25	0	0	0
Costa Rica	7	93	57	7	7	0
Cote d'Ivoire	0	75	50	0	0	0
Croatia	0	81	48	0	0	0
Cuba	3	42	35	0	0	0
Cyprus-Rep	0	54	54	0	0	0
Cyprus-Turk	0	0	100	0	0	0
Czech Rep	0	50	17	0	0	0
Denmark	12	92	58	0	0	0
Djibouti	0	100	0	0	0	0
Dominica	0	0	0	0	0	0
Dominican Rep	4	71	33	0	0	0
DR Congo	0	100	0	0	0	0
Ecuador	0	89	44	0	0	0
Egypt	5	74	42	0	0	0
El Salvador	0	100	89	0	0	0
Eq Guinea	0	0	0	0	0	0
Eritrea	0	33	0	0	0	0
Estonia	0	84	32	0	0	0
Ethiopia	0	63	38	0	0	0
Fiji	3	10	3	0	0	0
Finland	0	100	76	0	0	0
France	25	100	63	0	0	0
Gabon	0	67	33	0	0	0
Gambia	0	38	13	0	0	0
Georgia	0	82	55	0	0	0
Germany	59	88	56	0	0	0
Ghana	6	72	50	0	0	0
Greece	0	100	18	0	0	0
Grenada	0	0	0	0	0	0
Guatemala	0	92	25	0	0	0
Guinea	0	15	8	0	0	0
Guinea-Bissau	0	0	0	0	0	0
Guyana	0	85	46	0	0	0
Haiti	11	44	11	0	0	0
Honduras	0	67	0	0	0	0
Hungary	0	94	41	0	0	0
Iceland	6	100	22	0	0	0
India	7	97	40	0	0	3
Indonesia	4	87	52	0	0	0

Continued

Table A-2 Individual Country Profiles for Selected Features (continued)

	Online Services	Publications	Data bases	Privacy Policy	Security Policy	Handicap Accessibility
Iran	8	67	50	0	0	0
Iraq	0	100	0	0	0	0
Ireland	14	100	43	5	0	24
Israel	27	96	65	19	0	0
Italy	10	100	75	0	0	20
Jamaica	25	83	25	0	8	8
Japan	0	94	72	6	6	0
Jordan	6	44	44	0	0	0
Kazakhstan	0	100	0	0	0	0
Kenya	0	33	33	0	0	0
Kiribati	0	0	100	0	0	0
Korea, North	0	100	0	0	0	0
Korea, South	8	92	60	0	0	8
Kuwait	0	50	50	0	0	0
Kyrgyzstan	0	75	25	0	0	0
Lao PDR	0	100	50	0	0	0
Latvia	0	72	28	0	0	6
Lebanon	14	86	50	0	0	0
Lesotho	0	100	0	0	0	0
Liberia	0	67	33	0	0	0
Libya	0	100	0	0	0	0
Liechtenstein	20	0	0	0	0	0
Lithuania	7	80	60	0	0	0
Luxembourg	13	94	38	0	0	6
Macedonia (FYR)	0	76	29	0	0	0
Madagascar	0	50	0	0	0	17
Malawi	0	50	100	0	0	0
Malaysia	16	84	48	0	0	0
Maldives	0	81	69	0	0	0
Mali	0	67	0	0	0	0
Malta	6	38	6	0	0	0
Marshall Islands	0	7	50	0	0	0
Mauritania	0	100	0	0	0	0
Mauritius	0	92	31	0	0	0
Mexico	0	94	78	0	0	0
Micronesia	0	50	0	0	0	0
Moldova	0	60	20	0	0	0
Monaco	0	67	33	0	0	0
Mongolia	0	87	53	0	0	0
Morocco	0	100	0	0	0	0
Mozambique	0	0	50	0	0	0
Myanmar	0	70	90	0	0	0

Continued

Table A-2 Individual Country Profiles for Selected Features (continued)

	Online Services	Publications	Data bases	Privacy Policy	Security Policy	Handicap Accessibility
Namibia	0	50	25	0	0	0
Nauru	0	0	0	0	0	0
Nepal	0	83	67	0	0	0
Netherlands	7	87	40	0	0	0
New Zealand	48	100	48	8	0	0
Nicaragua	0	83	33	0	0	0
Niger	0	67	0	0	0	0
Nigeria	0	40	0	0	0	0
Niue	0	100	100	0	0	0
Norway	5	100	53	0	0	0
Oman	7	47	27	7	0	0
Pakistan	0	73	40	0	0	0
Palau	0	0	0	0	0	0
Panama	0	90	70	0	0	0
Papua New Guinea	9	45	27	0	0	0
Paraguay	0	83	67	0	0	0
Peru	7	100	67	0	0	0
Philippines	6	100	56	0	0	0
Poland	0	95	42	0	0	0
Portugal	0	38	8	0	0	0
Qatar	0	20	20	0	0	0
Romania	9	100	18	0	0	0
Russia	0	92	33	0	0	0
Rwanda	0	100	33	0	0	0
Sao Tome	0	100	0	0	0	0
St. Kitts/Nevis	0	100	100	0	0	0
St. Lucia	0	75	0	100	0	0
St. Vincent	0	29	24	88	0	0
Samoa	0	0	0	0	0	0
San Marino	14	29	14	0	0	0
Saudi Arabia	11	78	67	0	0	0
Senegal	0	67	50	0	0	0
Seychelles	40	60	60	0	0	0
Sierra Leone	0	100	0	0	0	0
Singapore	47	95	53	5	0	0
Slovakia	0	100	0	0	0	0
Slovenia	0	90	40	0	0	0
Solomon Islands	0	18	6	0	0	0
Somalia	0	0	0	0	0	0
Somaliland	0	50	50	0	0	0
South Africa	13	100	33	0	0	0
Spain	17	100	61	0	0	0

Continued

Table A-2 Individual Country Profiles for Selected Features (continued)

	Online Services	Publications	Data bases	Privacy Policy	Security Policy	Handicap Accessibility
Sri Lanka	0	56	44	11	0	0
Sudan	0	63	25	0	0	0
Suriname	0	50	0	0	0	0
Swaziland	0	4	0	0	0	0
Sweden	8	75	0	0	0	0
Switzerland	15	100	23	0	0	0
Syria	0	67	33	0	0	0
Taiwan	65	100	87	17	22	0
Tajikistan	0	50	50	0	0	0
Tanzania	0	13	4	0	0	0
Thailand	0	100	41	6	0	0
Togo	0	50	0	0	0	0
Tonga	0	0	0	0	0	0
Trinidad	0	11	6	0	0	0
Tunisia	0	4	8	0	0	0
Turkey	9	27	59	5	0	0
Turkmenistan	0	0	0	0	0	0
Tuvalu	0	100	0	0	0	0
Uganda	0	25	19	0	0	0
UK	30	100	67	7	0	7
Ukraine	0	71	53	0	6	0
United Arab Emirates	7	43	50	0	0	0
US	34	98	90	81	56	37
Uruguay	0	85	45	0	0	0
Uzbekistan	0	33	0	0	0	0
Vanuatu	0	100	0	0	0	0
Vatican	0	100	0	0	0	0
Venezuela	0	17	0	0	0	0
Vietnam	0	100	20	0	0	0
Yemen	0	67	50	0	0	0
Yugoslavia (FR)	0	62	23	0	0	0
Zambia	0	58	0	0	0	0
Zimbabwe	0	50	25	0	0	0

The Appendix lists e-government scores for each of the 196 countries.

Top E-Government Countries

Country	%
US	57.2
Taiwan	52.5
Australia	50.7
Canada	49.6
UK	47.1
Ireland	46.9
Israel	46.2
Singapore	44.0
Germany	40.6
Finland	40.2
France	40.1
Lesotho	40.0
St. Kitts	40.0
Vatican	40.0
Bahamas	39.7
Malaysia	39.0
Iceland	38.3
Belgium	38.0
Bolivia	38.0
Argentina	38.0

Some Statistics

Pakistan:	
Media	$0.02 (2001) [136th of 155]
Average cost of local call:	
Cinemas:	574 (1999) [21st of 69]
DVD region:	5 [47th of 171]
E-Government rating:	37.3 [118th of 178]
Fax machines:	0.8 per 1000 people [72nd of 107]
HAM radio prefixes:	6PA - 6SZ [28th of 56]
Internet country code:	.pk
International dialling code:	92 [148th of 208]
Internet Service Providers (ISPs):	30 (2000) [38th of 228]
per capita:	0 per 1000

Internet users:	1.2 million (2000) [44th of 202]	per capita: 8.13 per 1000
NationMaster pageviews:	2,109 [59th of 145]	per capita: 0.01 per 1000
NationMaster profile requests:	1463 [57th of 266]	per capita: 0.01 per 1000
NationMaster visitors:	89 [51st of 145]	per capita: 0 per 1000
Newspapers:	352 (1999) [5th of 67]	per capita: 2.38 per 1000000
Newspaper circulation:	5,558,750 (1999) [6th of 51]	per capita: 37.64 per 1000
Personal computers:	590,000 (2000) [52nd of 162]	per capita: 4 per 1000
Phone subscribers:	28.92 (2001) [151st of 184]	
Radios:	13.5 million (1997) [29th of 221]	per capita: 91.42 per 1000
Radio broadcast	AM 27, FM 1, shortwave 21 (1998)	

stations:		
Royalties and fees:	$(.) b	
Televisions:	3.1 million (1997) [51st of 215]	per capita: 20.99 per 1000
Television broadcast stations:	22 (plus seven low-power repeaters) (1997) [63th of 210]	per capita: 0 per 1000
Telephones - main lines in use:	2.861 million (March 1999) [43th of 228]	per capita: 19.38 per 1000
Telephones - mobile cellular:	158,000 (1998) [84th of 193]	per capita: 1.07 per 1000
Television standard - VHF:	PAL B	
Telephone system (domestic):	microwave radio relay, coaxial cable, fiber-optic cable, cellular, and satellite networks	
Telephone system (general assessment):	the domestic system is mediocre, but improving; service is adequate for government and business use, in part because major businesses have established their own private systems; since 1988, the government has promoted investment in the national telecommunications system on a priority basis, significantly increasing network capacity;	

	despite major improvements in trunk and urban systems, telecommunication services are still not readily available to the majority of the rural population	
Telephone system (international):	satellite earth stations - 3 Intelsat (1 Atlantic Ocean and 2 Indian Ocean); 3 operational international gateway exchanges (1 at Karachi and 2 at Islamabad); microwave radio relay to neighboring countries (1999)	
Website defacements:	39 (2001) [39th of 129]	per capita: 0.26 per 1000000