The Hashemite Kingdom of Jordan

Information Age

Policies and Strategies

An update of

JORDAN'S NATIONAL INFORMATION POLICIES
 & STRATEGIES

NATIONAL INFORMATION CENTER STUDY – August 1998

June 2001

Forward

Jordan's first strategic IT study "Jordan's Information Policies & Strategies" with subtitle "Preparing Jordan for the 21st Century" was completed in 1996 by the National Information Center (NIC) in cooperation with a team funded by the World Bank. The policies and strategies were based on several surveys and field studies conducted by the NIC during the period 1993-1995. That was the first attempt to study the Information and Information Technology needs in Jordan and to formulate comprehensive strategies and policies to address those needs.

The study was updated in 1998. Since then considerable changes have taken place in information thinking and information technology, most notably because of the Internet revolution. These developments necessitated a fundamental review and update of the policies and strategies. With assistance from Japan via the World Bank "Government Computer Capacity Improvement Project" (GCCIP), the NIC has once undertaken this task.

In 1999 H.M. King Abdullah II launched a number of initiatives to modernize Jordan. These initiatives, including E-Government, REACH, Community Information Centers and Education, each affect the information policies and strategies.

In view of these initiatives, this review and updating of Jordan's Information Policies and Strategies could not have been more adequately timed.

This report is the product of the GCCIP study by a team consisting of two Jordanian consultants and one international consultant guided by Dr. Yousef Nusseir and Mr. Fadel Sweidan both of the NIC.

Amman, June 2001

Table of Abbreviations

AMIR	Access to Micro-finance & Improved Implementation of Policy Reform
ASP	Application Service Providers
BBR	Basic Background Reports
CITU	Central Information Technology Unit – United Kingdom
CSB	Civil Service Bureau
DIC	Dubai Internet City
DP&C	Dubai Ports and Customs
EFT	Electronic Fund Transfer
ERP	Enterprise Resource Planning
EUMEDIS	European Mediterranean Information Society
GCCIP	Government Computer Capacity Improvement Project
GCR	Global Competitiveness Report
GDC	General Directorate of Curricula
GII	Global Information Infrastructure
GIS	Geographical Information Systems
HRD	Human Resources Development
HRM	Human Resources Managment
IAGC	Information age Champion- United Kingdom
ICDL	International Computer Driving License
ICT	Information And Communications Technology
IDA	Information Development Authority
IDSC	Information and Decision Support Center
Int@j	Information Technology Association Of Jordan
IPO	Initial Public Offerings
ISO	International Standards Organization
ISP	Internet Service provider
IT	Information Technology
ITCC	Information Technology Community Center- Jordan
JCS	Jordan Computer Society
JITCC	Jordan Information Technology Community Centers
JTC	Jordan Telecommunications Company
LLC	Limited Liability Company
MCIT	Ministry of Communications and Information Technology
MENA	Middle East and North Africa
MOF	Ministry of Finance
MOP	Ministry of Planning
MOPC	Ministry Of Post And Communications - Jordan
NCB	National Computer Board
NCHRD	National Center for Human Resources Development
NIC	National Information Center – Jordan
NIC-India	National Informatics Center of India

NIP	National Information Policy- Jordan
NIPF	National Information Policy Framework-Jordan
NIS	National Information System
NIS	National Information System – Jordan
NSC	National Steering Committee – Jordan
NTFIT-SD	National Task Force on IT and Software Development
OECD	Organization For Economic Cooperation And Development
OGC	Office of Government Commerce
OGC	Office Of Government Commerce – United Kingdom
PADECO	Pacific Development Company
PIU	Performance Innovation Unit
PIU	Performance Innovation Unit – United Kingdom
QCP	Quality Certification Program
RAITNET	Regional Arab Information Technology Network
REACH	**R**egulatory Framework, **E**state Infrastructure, **A**dvancement Programs, **C**apital and **H**uman Resources Development
RSS	Royal Scientific Society
SDP	Service Delivery Points
SEIC	Socio-Economic Information Center
STIC	Scientific and Technical Information Center
SW-CMM®	Quality Mark For IT Industry
TACC	Technology Access Community Centers
TACC	Technology Access Community Center- Egypt
TAS	Telecommunication Authority of Singapore
TLA	Teaching And Learning Assessment
TRC	Telecommunications Regulatory Commission
UK	United Kingdom
UNDP	United Nations Development Programme
USAID	United States Agency For International Development
VC	Venture Capital
VPN	Virtual Private Networks
WTO	World Trade Organization

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Executive Summary

I.1.   Vision and Information Policies & Strategies

Two years ago, during his speech at the World Economic Forum in Davos, Switzerland, HM King Abdullah II introduced his vision of Jordan as a knowledge-based society. Since that extraordinary speech, much has happened in the political, economical and technical fields at the global, regional and national levels. Economically and politically the world has changed. It is remarkable that the King's vision is still so much alive. It has been widely accepted and has been translated into a number of initiatives. Already the first results are evident and support for the vision has grown stronger.

However, a vision does not become reality just because it comes from the top. Policies and strategies are needed to guide its planning and implementation activities. The information policies and strategies formulated in this document should be seen in this context. After the initial euphoria and enthusiasm, it is necessary to translate the vision and evaluate: (a) where Jordan stands, (b) where it wants to go and (c) how it will get there. The collective answers to these questions constitute the policies and strategies formulated in the following chapters.

I.2.   Information Policies & Strategies in Perspective

Formulating national information policies and strategies is a difficult and time-consuming task. It needs knowledge of the issues and matters, experience with cultural change and an appreciation of the history of the nation. Fortunately, all these elements are available at the NIC through its experience with the National Information System (NIS).

Efforts have been made to establish the NIS since the mid-eighties. At that time, the idea for such a system in Jordan was a long-range vision. The NIC was established in 1993 to create, develop and manage the NIS. A number of studies were conducted during the period 1993-1995 to determine the best approach for the development and implementation of that system. The NIC became aware of the need for information policies and strategies during that period. On the basis of the studies conducted, and with assistance of the World Bank, the first version of the National Information Policies and Strategies was formulated in 1996. This version was later updated in 1998.

During the few years since 1998, information and information technologies, as well as the thoughts about these issues, have fundamentally changed. Many of the seemingly radical ideas and concepts expressed in the policies and strategies of 1998 are now widely accepted. In fact, some of them currently appear almost trivial. Other ideas expressed at that time are as relevant now, or even more relevant, as they were three years ago. New concepts have also emerged that were not part of the previously formulated policies and strategies. In particular, the vision of the King was instrumental in the development of these new ideas and concepts. These

developments necessitated the update of the policies and strategies formulated in 1998.

I.3.   Needs Assessment

Any policy or strategy has to be based on needs. Like those of 1998, the updated information policies and strategies are also based on a needs assessment.   But unlike the previous report, which utilized extensive market surveys, the current assessment relies on a number of recently completed initiatives and studies that address the needs of an information and knowledge based society.   The outputs of these studies and initiatives have been analyzed and represent a fair picture of the information economy in the public and private sectors.

The reviewed studies/initiatives are:

1. The NIS and its coordinating/administrating body the NIC;

2. The initiatives of the private sector, REACH I, and II;

3. The Education initiatives;

4. Jordan Information Technology Community Centers initiative;

5. The study on the Status of IT in the Public Sector;

6. The study on Jordan's IT Competitiveness.

None of the studies/reports directly mention that Jordan needs more or better information. Implicitly, however, every study and project document demonstrates the need for better information and knowledge. The same applies to the need to make better use of available information. This leads to the general conclusion that the value of information is still not sufficiently appreciated in Jordan.   Related to this conclusion are the following observations:

- The concepts of "management information", "marketing information" and "market research information" are hardly used. Yet to address a number of problems related to management and coordination these types of information are needed.

- With few exceptions, IT departments/sections hardly support the core-businesses of the Government organizations. The notion that core-businesses can be improved by using specific information and information systems remains a novelty to many.

- A considerable number of people are employed as operators, programmers and system administrators by computer departments of government organizations. Within the government, there are very few designated system analysts, and no business or information analysts.

Some of the other, more specific, conclusions derived from the needs assessment are listed below:

1. There needs to be much better co-ordination between the many activities and initiatives within the Information and Information Technology sector. Such coordination is needed to avoid:

    − Overlapping activities that will result in a waste of effort and resources.

    − Isolated activities that will add little value and have a high risk of unsustainability.

    Coordination will also ensure that the Government employ specialists who are sufficiently informed about the purpose and progress of the various initiatives and projects;

2. National Information policies and strategies are urgently required to provide the basis for co-ordination and management;

3. There should be more sharing of information, particularly between government organizations. Many organizations claim information secrecy and the privacy clauses in their mandate to avoid such sharing;

4. Information systems and resources for information system development need to be better shared between government organizations;

5. Administrative reform is hindered by the large number of independent and incompatible financial and human resource information systems in the public sector;

6. The NIS needs to be completed and the quality of its content needs to be improved;

7. The E-government initiative requires all available experiences in order to be successful.

> Studying the international "best practices" is a good way to learn from the experiences of other countries and to avoid mistakes. The best practices form a rich source of ideas and approaches, which can be considered for future application in Jordan. They provide also the opportunity to compare Jordan with other countries. This comparison may contribute to the strengthening of confidence and trust in the ultimate objective: the information and knowledge based society.

I.4. Best Practices

The available resources to implement an information and knowledge-based society are limited. The use of these resources should be optimized and mistakes should be avoided as much as possible. One way to avoid mistakes is to learn from experiences elsewhere. For this reason the best practices of the United Kingdom, Singapore, India, Egypt and Dubai have been analyzed. These countries have made substantial advances on the road to the information and knowledge-based society. They were selected from a large pool of potential candidate countries because they allow analysis of best practices of different types of economies and societies:

- Developed as well as developing societies;

- Arab as well as non-Arab countries;

- Small as well as large countries;

The analysis focuses on: objectives, organization and approach.

Main conclusions:

1. The road to an information and knowledge-based society is long and contains many obstacles. There is not a single country that has fully completed this task;

2. The objectives of information and/or information technology policies of the various countries are similar. They all focus on (a) improvement of government services, (b) enhancement of the competitiveness of the private sector and (c) improving the quality of life of ordinary citizens;

3. The vigor and organization with which the policies are pursued differ very much. Not surprisingly, they are compatible with the type of administration prevailing in the related country;

4. The importance of the policies and their implementation is reflected in the anchoring of the policy and implementation management: in all cases this is at a high, if not the highest, level in the government structure.

5. The "digital divide" experienced in developing countries is seen as a socio-economic challenge. In developed countries it is more likely viewed as an education issue;

6. Comprehensive master plans are considered impractical. It takes too long to prepare them and they risk becoming obsolete at the time of their completion. Instead, many countries rely on global policy frameworks and detailed plans made within these frameworks.

I.5.   Information Policy Framework

The purpose of the information policy framework is to focus national efforts on the realization of common goals and aspirations. They need to reflect a broad consensus. A framework should be applicable in the medium to long term (3 to 5 years) and should offer sufficient resilience to withstand short-term fluctuations. At the same time it should offer flexibility to accommodate changes in objectives and priorities. For these reasons the framework is formulated at a high level. It represents the "what" and "why" rather than the "how" and "when".

Many elements formulated in the previous version of the National Policy Framework are still valid. They are retained in this update although they are sometimes worded differently. Some irrelevant elements have been removed. Many of the new elements are based on, or related to, the Internet. Others relate to the vision of an information and knowledge-based society.

The structure of the policy framework chapter of the previous version has been retained, as it proved adequate to systematically cover all issues of interest. Maintaining the structure also facilitates comparisons between the old and updated versions.

The result is a large and diverse number of policy elements that cover the entire field of information and information technology from a national viewpoint. An overview of some of the more important issues covered is provided below:

- The rights of individuals to the protection of their privacy;

- The right of access to public information;

- The availability, costing and pricing of information;

- The standards, regulation and legislation needed for electronic information;

- The priority of the government to serve its citizens;

- The complementary roles of the public and private sectors in the information economy;

- The elimination of barriers that hinder public to access information;

- The strength and growth of companies active in the information economy;

- The quality of services and products of companies active in the information economy;

- The telecommunication network as a national resource;

- The utilization of the Internet;

- Application and management of Information Technology in the public and private sectors;

- Collaboration between the private sector and the public sector;

- Culture as part of the national identity;

- The collective responsibility for education and training in information and information technology skill and knowledge;

A digital divide also exists in the public sector. It adversely affects the impact of information and information technology on the efficiency and effectiveness of the government and hinders the progress on the road to information and knowledge-based society. A focused educational and training program is needed to address this challenge.

- Marketing Jordan's information and information technology capabilities;

- The management and coordination on various levels.

I.6. Strategies and Strategy Elements

Strategies are more practical and aim at a shorter period than policies. While the policy framework, describes the "what" and "why", the strategies focus on the "how". The strategy elements should be realizable within a period of approximately three years.

I.6.1 Cross-cutting dimensions

Strategies need to be seen from the viewpoint of the three cross-cutting thematic dimensions: natural, economic and human resources. From this point of view, the strategies aim at:

a. Improving, through better and more focused management, the benefits that the nation obtains from its natural resources;

b. Increasing the diversity of the economic resources through the growth of information and information technology and the added value of their products;

c. Enhancing the quality and increasing the quantity of human resources through improvement of the educational system.

I.6.2 Strategy Review

The strategy consists of a large number of strategic elements, each consisting of an objective, background information and one or more recommended actions. Following is an overview of the most relevant issues:

1. The purpose and need for different types of information varies. Production, distribution, use and management depend on these aspects. In many respects, information can be considered as a commodity to which common rules should apply;

2. Legislation is required for two core issues in the information age namely: (a) the protection of individual privacy and (b) the use of electronic documents;

3. The public sector needs to increase the quality of its services to the citizens and the private sector. It should consider the provision of these services as a high priority. Information technology can play a key role in the process to improve its quality. Cooperation with the private sector in this field needs to be enhanced;

4. IT departments in public organizations should shift the focus of their support from auxiliary administrative/financial services to core services. This will impact the complexity, reliability, availability and accessibility of information systems. The quality of these systems need to be improved;

5. Active businesses in the information and information technology sector need to contribute more to the national economy. They need to enhance their competitive position. They also should become stronger and improve their management, quality control and marketing;

6. Culture and information are complementary to each other. Information is needed to sustain a cultural heritage. Cultural information is part of the basic needs of citizens;

7. IT education has to be enhanced to increase the quantity and quality of human resources and to address the digital divide. Priorities should somewhat shift from technology to content and information. Certification is needed to further raise the standards of IT professionals and computer users. Professional institutes should support the establishment and maintenance of standards.

Chapter 1 : Introduction

This document describes Jordan's National Information Policies and Strategies. It is meant to cover the period 2001 - 2004. The document is an update of the 1998 report. The purpose of this update is to adapt the policies and strategies to the many political, technological, economical and sociological developments that have taken place since 1998.

The policies comprise a consistent set of principles and objectives applicable to information and information technology in the broadest sense. The strategies are a translation of these policies to more practical issues.

Both policies and strategies are needed to ensure compatibility and coherence of the various initiatives and activities in the field of information and technology. They form the basis for the required coordination.

Besides the introduction, this document consists of four chapters:

- Chapter 2, The Needs Assessment, which evaluates the need for policies and strategies; This paper has deduced needs by reviewing recently completed studies and reports;

- Chapter 3, The Best Practices, which analyzes the policies and strategies of a few other countries. The guiding principle for the selection of these countries, as well as the analysis itself, is the lessons that can be drawn from them and the availability of policy and/or strategy information;

- Chapter 4, The Policy Framework, which contains policy elements formulated for eight different categories;

- Chapter 5, The Strategies, which includes strategy elements for the above mentioned categories and are sub-divided by main stakeholder: citizen, private sector and public sector.

1.1 Background

Jordan is in a state of transition: it has chosen to actively move towards an information and knowledge-based society, and already the ways and means of doing business and the quality life of its citizens are changing. However, change creates uncertainty, which causes both excitement and apprehension. It can lead to successes but also to mistakes and failures. As the business climate changes, new competitors and alliances emerge. This section provides background information about these developments and addresses them in a broader context.

1.1.1 Global Developments

For many people in the world the latest information revolution has already resulted in more prosperity, better services and an improved quality of life. Businesses, governments and people embracing this revolution reap its fruits through easy access to an enormous wealth of information.

It is well known that information technology empowered by the Internet has been the driving force behind these developments and has become part of the daily life of millions of people.

The growth of the Internet was especially phenomenal during the late nineties. The so-called "new economy" became synonymous with fast growth. The extra growth attributed to Information and Information Technology in the USA is estimated to be 2 to 3 percent per year.

During the period 1998-2000, optimism about the future of these developments was without limits. The market value of Internet companies, the so-called "dot.com" companies skyrocketed on the stock markets. Then in 2001 the bubble burst and market values of technology companies plummeted. A general slump in the IT business was the result.

Historically this pattern is not new. Whenever a fundamental new technology takes off, the optimism is at first boundless. This is reflected in unrealistic (in retrospect) expectations and valuations. The return to realism is often preceded by collapse of these expectations and valuations. It is important to note that fundamental changes, caused by the new technology, are not affected by fluctuations in expectations and valuations. After the return to reality, the changes continue as before but in a more sober atmosphere of hard work. The introduction of railways in the USA at the end of the 19th century is just one historical example of such a development.

History will most likely repeat itself again. The introduction of information technology in developed countries has already resulted in more than an increase in efficiency and effectiveness; it has changed forever the way of doing business. The same can be said about the life of ordinary citizens in these countries. In marketing, for example, the Internet was initially used as a cheaper and faster means of communication. Later, as the people began understanding the full power of the Internet, marketing itself changed. The Internet is now the prime tool to create and open new markets.

These irreversible changes will continue to grow, as will the number of people taking advantage of them.

1.1.2 Regional Situation

The latest information revolution has not passed the Middle East region unnoticed and without influence. Many successful and important developments are taking place in the region. In Egypt and Dubai, for example, there is more access to available information than ever before. Compared to the USA and Europe however, there are two important differences besides the obvious cultural ones:

1. Because of physical access, abilities and financial means, the percentage of people without access to information and information channels is much higher in the region than in Western countries;

   The difference between people with access to information and those without access, the so-called "digital divide", is growing. Those with access are a privileged elite. Unfortunately, this situation will worsen with the introduction of an information and knowledge-based society, especially in the short-term;

2. The region is politically and economically divided into a number of relatively small markets. Smaller information markets imply that it is more difficult for local information providers to profitably operate in a cost-effective way. For a local hospital, for instance, it is not sensible to enable (potential) patients to make online inquiries on visit hours and and/or making appointments if only 3 percent of these patients have access to Internet (of which maybe 10 percent will potentially use the facility when wanting to visit their doctors).

   Both differences have implications for information policies and strategies. Blindly copying policies and strategies from the West could have serious economical and social consequences.

1.1.3 The Jordanian Context

> A competitive advantage of Jordan is that its small size and population allows changes be implemented comparatively quickly. Combined with its stable political system and firm leadership, Jordan can move faster and be more flexible than many other countries on the road to the information and knowledge based society.

1.1.3.1 Jordan Compared with the region

The above-described differences also apply to Jordan. In some aspects, however, Jordan compares favorably with other countries in the region:

a. The leadership and vision provided by H.M. King Abdullah II, means that priorities can be set and policies implemented without endless discussions;

b. Through the NIC, Jordan has acquired a tradition of developing and implementing information policies and strategies;

c. Deprived of the abundance of natural resources, Jordanians have developed a talent to consider new developments as an opportunity rather than a risk.

d. The Jordanian people have adopted a traditionally liberal stance towards information;

e. Jordan has a well-trained and educated population as an affordable resource.

1.1.3.2   *Jordan in the World Market*

With its small domestic market, the Jordan information and IT sector needs to turn to the world and the regional markets to seek clients and investments. In the short term, the slowdown of the international IT markets will most likely adversely affect the IT sector in Jordan.

However, this effect will most likely be temporary as the world markets are expected to recover slowly from the recent slump. Other threats may arise on the longer term, since Jordan's IT sector tends to concentrate on the lower end of the IT markets, which is more vulnerable to price competition.

1.1.4   National goals and priorities

The vision of H.M. King Abdullah II has played a crucial role in allocating a high priority to information, information services and information technology. In his vision they are considered as the key to:

- Economic progress;

- Social development; and

- Improvement of government services.

Since 1999, the year that the priority was set by the King, a number of important initiatives were undertaken to promote information, information services and information technology. The most notable initiatives were in the field of E-government, promotion of the local IT industry and modernization of the education system. The spectacular technical upgrading of the telecommunication infrastructure also belongs to the early achievements.

1.1.5   Need for co-ordination, policies and strategies

Jordan is eager to reach an information and knowledge society in the shortest possible time. Yet resources available for the execution of information policies and strategies are limited. The risk of wasted efforts and opportunities is high. Lack of co-ordination between the initiatives and activities and lack of sustainability are serious threats to progress.

Another issue is the nature of IT experts employed in various departments on projects and initiatives. These experts often concentrate on their own works without regard to the wider scope and broader impact of their activities. Cooperation and teamwork are sometimes not a strong part of their characteristics. For these reasons, high level coordination is urgently required.

Coordination can also happen implicitly through a set policies and strategies that are widely supported and adhered to. However, active coordination through a designated organization that supervises the execution of policies and strategies is usually preferable.

This organization should:

a. Keep its eyes on the overall goals and objectives of the policies and strategies; and

b. Have the wisdom and authority to ensure the proper cooperation of all people involved.

The concept of "all are marching in the right direction" is sometimes used as an excuse for lack of coordination. However, this implicit cooperation is often not enough. For example:

a) To create a world standard, high-performance telecommunication infrastructure requires coordination from all industrial sectors to ensure value for investment; and

b) The Government's financial managers must work with the IT departments to make resources available to fulfill the strategies and initiatives set forth.

Already, with the creation of the NIS and the efforts of the NIC, the mechanism for coordination and a teamwork environment have been established. However this is not enough. The mechanism needs be strengthened and the teamwork bolstered.

Some may also argue that a Master Plan or a comprehensive Action-plan is needed. Certainly a few years ago that would have been the prevailing opinion in view of the importance and complexity of the situation. However, Master Plans and Action Plans for complex developments with many uncertainties have some practical disadvantages:

- To get a consensus on a Master Plan is difficult and often even impossible since the interests of many parties are at stake. Many of the perceived threats, and therefore much of the resistance, proves unnecessary when the time of implementation comes;

- Accurate data and information necessary for a good Master Plan are often not available. To compensate for that, speculative assumptions are usually made. Obviously the figures, and thus the plans, based on such assumptions are as good as the assumptions. Yet they are used as the basis for projections and targets;

- It takes a considerable amount of time to prepare a good Master Plan. By the time it is conceived, presented and accepted it may be obsolete. This risk is particularly true for Information and Information Technology related Master Plans because of fast moving technological developments;

- A Master Plan's inherent complexity can make it difficult to understand. As a result, it is often ignored.

With respect to coordination in information policies and strategies it should be noted that countries that have made good progress on the road to information and knowledge society have no Master Plans but strong well-defined strategies and polices that include well defined targets. Initiatives and activities executed within the framework of these strategies and policies are coordinated or managed by strong organizations. These organizations are run by professional managers and encompass technicians and representatives of various stakeholders.

1.1.6 History of Information Policies and Strategies

Jordan has a relatively long history in defining and executing information policies and strategies. As early as 1985, efforts were made to establish a National Information System (NIS). That concept was ahead of its time and showed a vision that ten years later became reality through the Internet.

The concept of the NIS was approved in 1987 after being jointly proposed by the Royal Scientific Society (RSS) and the Ministry of Planning. At that time, one of the main objectives was to create an awareness about the importance of information. These efforts prepared the ground for subsequent initiatives and activities.

In 1993, the NIC was formally founded. It was mandated to establish and manage the NIS and coordinate the information activities including the formulation of the Information Policies and Strategies.

In 1996, the first comprehensive efforts were made, with the help of the World Bank, to define broad policies and strategies based on the studies and surveys conducted by the NIC during the period 1993-1995. The policies and strategies were updated in 1998.

In hindsight it is, of course, easy to spot parts of the policies and strategies that could have been better formulated or executed. History on the other hand showed that the NIC has a tradition of planning with an open eye for future requirements. It has shown that the NIC is capable of adapting and updating plans to accommodate practical realities.

1.2 Global and Specific Objectives

The global objective of Jordan's national information policies and strategies has not changed in comparison with the original Information Policies and Practices of 1996: "*to focus efforts to the realization of common objectives and aspirations*". . They have become more concrete as a result of the initiatives undertaken after the Dead Sea Forum in November 1999.

The specific objective of Information Policies and Strategies is to provide a broad framework in which information and information technology activities and developments should take place. They provide an overall direction on how to address the many and diverse challenges.

Rather than a direct handbook with "do's" and "do-not's" they provide the "what's" "why's" and "why-not's".

1.3 Scope

An information or knowledge based society affects all parts of the Jordanian society. National information policies and strategies address related issues faced by society. They span broad, nearly philosophical, issues such as the right of information to practical issues such as how to apply scarce resources in the most efficient way.

The time frame for which the policies and strategies are meant is three to five years.

1.4 Terminology and Concepts

To facilitate reading of this document, and because words like "policy", "strategy" and "information" can have more than one meaning, it is important to establish clear definitions of the main terms used.

Information: intelligence or knowledge that can be used for one or more purposes irrespective of the form it is encrypted in (text, figures, diagrams, etc.), the medium it is stored in (paper, magnetic, optical, etc.), the mode of dissemination (oral, written or audio-visual etc.), the activity that generated it (research, administration, censuses, remote sensing, etc.), or the organizing and disseminating institutions (libraries, documentation centers, archives, statistical offices, mapping agencies, geological surveys, computer centers, media and broadcasting services, telecommunications services).

Public Information: information generated by the public and private sector which is essential for active citizenship, government transparency, and democratic governance, except where limited by laws or national interests.

Information Services: services that depend very much on information such as appointments, reservations, training, planning and marketing.

National: an adjective encompassing all elements of a nation state, not limited to the government (executive branch) alone, but rather encompassing the executive, legislative, and judicial branches of the state, non-governmental organization, private associations and the individual at large.

Policy: is a statement of a specific goal or goals which are to be achieved, or to be pursued, a statement of the means by which realization of the goals will be brought about, an assignment of the responsibilities for implementation of the means, and a set of rules and guidelines regulating the activity.

Strategy: is a description of the methodologies applied to implement the policy goals using the declared means or instruments of the policy.

Action Plans: programs or projects with measurable outputs, aimed at responding to defined priority areas, and describing in detail the implementation of selected strategies derived from the policies. It includes an estimation of required resources and costs of implementation and operation of these programs and projects.

Figure 1, the National Information Policies and Strategies
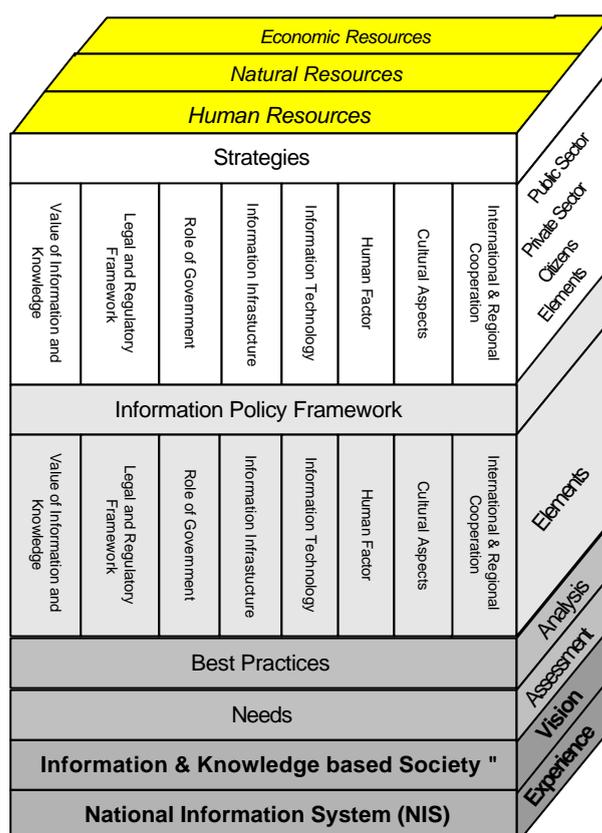
1.5   Approach

National Information Policies and Strategies must be based on the vision of Jordan's information and knowledge base society. Furthermore, it should take advantage of the experience gained through the years with the National Information System (NIS).

Based on this vision and experience, the foundation for the policies was derived by assessing the needs of Jordan's organizations towards information, information technology and infrastructure.   International best practices were also analyzed to determine what lessons could be learned from abroad.

Information strategies are based on the policies. To facilitate application they are formulated as much as possible towards the market/stakeholders. Thus there are strategies for the public, the public sector and the private sector.   Lastly, the three cross cutting dimensions "Human resources", Natural Resources" and "Economic Resources" are considered.

 For an overall picture of the approach, and structure of the report, see Figure 1.

Note that the approach and structure of this report differs somewhat from the previous report. This is because of the desire to make the policies and strategies more accessible to the stakeholders. In this regard, the following changes have been made:

- The structure has been simplified and oriented to the targeted readers (market);

- Redundancy has been minimized;

- The language has been simplified.

2

Chapter 2 : Information Needs Assessment

This chapter assesses the needs for information policies and strategies and, to a lesser extent, information technology policies and strategies. It does so by analyzing in a number of sections, the National Information System (NIS) and available recent studies about information and IT applications in Jordan.

The results of the analysis are presented in findings and/or conclusions at the end of each section. These sections start with relevant background information, objectives, scope and applied methodology. Comments on the studies are added in some cases.

The last section "Synthesis of the Needs" translates the needs, as they appear in the various sections, in broadly formulated information requirements.

The analyzed reports/documents are:

- The **National Information System** (**NIS)**, what can and should be done to add value for users of that system;

- The **REACH Initiative**, a strategy and action plan to launch Jordan's software and IT industry;

- The **REACH 2.0** study, consisting of a series of small sub-studies aimed at addressing specific problems and barriers that obstruct the progress and success of Jordan's IT industry;

- The **E-Government** plan, an aggressive and ambitious plan to modernize Government services through the application of IT;

- The **Jordan IT Community Centers (JITCC)**, an initiative that aims at bridging the digital divide;

- The **Education Initiative**, consisting of four sub-plans (Primary Schools, English Language Tuition and Computers, Curricula preparation improvements and Interim Technology plan) aimed at modernizing the education process;

- **Status of IT Applications in the Public Sector**, a collection of facts and figures about information systems and resources applied in the public sector;

- **Jordan's ICT Competitiveness,** with a large number of indicators related to the ICT competitiveness of Jordan**.**

2.1 National Information System - NIS

An analysis of the English version of the NIS and various publications of the NIC was carried out for the assessment of information needs related to the National Information System. Contrary to the other sections of the needs assessment, this section is not based on a study report. Therefore, the structure of this section differs a little.

2.1.1 Background

Efforts to establish the NIS started as early as 1985. In March 1987 the Prime Minister of Jordan issued a decree approving the NIS concept jointly proposed by the Royal Scientific Society (RSS) and the Ministry of Planning (MOP). Initially, two national centers were conceptually created: The Scientific and Technical Information Centre (STIC) to be hosted by the RSS, and the Socio-Economic Information Centre (SEIC) to be hosted by the MOP.

While the initial efforts had their shortcomings, the overall noticeable effect was the impact a strong catalyzing effect it had on information activities in Jordan. Through the initial phase, the first objective of creating and increasing awareness of the importance of information among decision makers and potential users was successfully achieved. Beyond increased awareness, this phase also spurred competition among major Jordanian institutions (both public and private) in implementing information related projects and activities. The understanding of the NIS itself evolved from a rigid institutional vision to become a set of rules and general principles to organize and guide public information to serve its general goals and national interests.

The idea of building two information centers was subsequently abandoned. In 1993 the NIC was established with the mandate to coordinate all activities necessary to establish the NIS.

Building on the experience and lessons learned from the first phase, the second phase aimed at preparing the infrastructure necessary to create an information sector and to manage it properly.

During the period 1993-1995, the NIC executed several field studies to investigate the needs for, and the best approach to the NIS. These studies involved around 1000 public and private institutions. Eventually the NIS went online in 1996. Also published in1996 was the first version of the national information policies and strategies document. It was based on the same studies as well as on the experience, gained both locally and internationally.

2.1.2 Concept

The concept of the NIS is to link information collecting and generating centers in the public and private sectors. The objective is to ensure information flow to users in the private and public sector so as to enhance their management and organizational effectiveness, thus promoting socio-economic development.

The NIS is a totally distributed system. Information is classified into sectors. Information sources are identified per sector and grouped in clusters. Within each cluster one source is defined as focal point. Detailed information remains at the source while aggregated information is kept at

the focal points. Connectivity among sources of one cluster constitutes a sub-network as part of a national network, which is the basic component of the NIS.

The 17 clusters, which have been identified, are grouped in three main categories: Human Resources, Economy and Land Resources.

2.1.3   Role of the NIC

The NIC is the catalyst, organizer and coordinator of the NIS. It is entrusted with tasks ranging from the development of information sources (in cooperation with the concerned institutions), setting up procedures and standards, providing access to the network, manpower development to the promotion and development of the information sector. The more important activities and achievements of the NIC are presented in the following sub-section:

2.1.4   Status and Achievements

- Since 1996, 11 sectorial sub-networks have been established for the economic, industrial, labor, agriculture, science and technology, social affairs, environment, health, tourism, population & human settlements and legislation clusters. The remaining clusters are in the process of establishment;

- 126 institutions, mainly from the public sector including all public universities have been linked to the NIS network. Sixty-three of these institutions are linked via leased copper or fiber-optic lines. The rest are linked through dial up lines. Internet connectivity and Email services are being provided through the network to all these institutions via international links. NIS information content and network are currently being accessed over 12,000 times per month;

- 12 studies have been conducted to identify the needs and assess the current status in the information sector. These studies include comprehensive surveys of all public sector institutions together with a representative sample of private sector organizations, in which needs assessment analysis of the status of information and information technology capacity and human resources were conducted. Furthermore, those studies also included ICT sector organizations and capacities, coupled with communications infrastructure and networking. Based on the studies, NIC has set-up its strategies and work plans to establish the NIS and to develop manpower in the Information Technology field;

- 17 committees, involving the main stakeholders, have been set-up for the coordination and organization of information per sector. Each committee selects a focal point for its sector;

- Managing and administrating the NIS network;

- Over the years, 60 training courses have been organized and held in information and information technology. 1500 public sector employees have participated in these training courses;

- Conducting and organizing workshops and seminars to promote understanding and enhance cooperation among national institutions and to implement unified procedures and standards. Twenty-five of workshops/seminars have been conducted so far;

- Formulating guidelines and procedures to facilitate best practices in various fields of information and information technology such as information system development, establishing a data processing center, preparation of technical specifications and evaluation criteria, job description for IT staff, Jordan Common Communication Format for the Exchange of Bibliographic Data. Most public institutions are using these documents;

- Assisting public organizations in defining information systems requirements, budget allocations and reviewing studies conducted for them;

- Establishing regional and international relationship with similar organizations. NIC is a member of the Regional Arab Information Technology Network (RAITNET) and the focal point of the European Mediterranean Information Society (EUMEDIS);

- Administration of the Top Level Domain of Jordan, it also does the Jordan domain registration;

- Providing Internet Services to government institutions and public universities;

- Hosting web sites for organizations, which do not have sufficient resources;

- Establishing a gateway for government institutions web sites.

2.1.5   Findings

a. The NIS approach is comprehensive. The 17 defined clusters of information cover in principle the whole spectrum of socio-economic data;

b. The collection, maintenance and presentation of information remain the responsibility of the information sources. This means that:

   – In some areas there is a substantial amount of information. In other areas there is less. What is published seems often more determined by what information is readily available than by what is needed by the users as per the action plans prepared by the sectorial committees.

   – Quality of information varies. The most common problem is that the information is not kept up-to-date in some cases.

   – Designs of different Web pages with a similar purpose differ considerably. This makes it difficult for instance to extract and analyze information from similar sources.

c. Expanding information services can sometimes increase the value of information and thus the NIS. This would mean that information would not only be provided but, at the same time, related information would be collected;

d. The structure of the NIS is more subject (and source) oriented than market oriented;

e. The ultimate responsibility of the NIC towards the information content of the NIS is unclear. A clause to define or limit liability for the quality of information should be clearly stated.

2.2   REACH Initiative (REACH I)

2.2.1   Background and Summary

This report, dated March 2000, was the result of a request of H.M. King Abdullah II to the IT industry leaders of Jordan. The report analyses Jordan's position, and its chances particularly in the regional IT market. It contains interesting information about the strengths and weaknesses of Jordan in the IT field. Very ambitious goals were set, with targets to be achieved by the year 2004 in terms of foreign direct investments (US$150 million), creation of IT related jobs (30,000) and software/services exports (US$ 550 million).   The action plan to promote the IT sector is fairly comprehensive. A monitoring system with properly defined indicators has not been set up.

2.2.2   Objectives, Scope and Approach

The report presents a national strategy for Jordan to develop a vibrant, export-oriented information technology services sector. It embraces actions in terms of:

- IT Industry Development;

- Regulatory Framework;

- Human Resources;

- Government Support;

- Capital and Financing;

- Infrastructure.

The study analyses in greater detail software and IT services other than information services such as call centers and database services.

The report was prepared through a partnership of members of the REACH initiative (some prominent members of the Jordan Computer Society) and a joint team of international and local consultants. The methodology included:

- Strategic planning brainstorm sessions;

- Surveys of local software and IT service providers;

- Collection of local and international data.

2.2.3   Findings and Conclusions

Although the report focuses on IT rather than information most of its findings and recommended actions are directly or indirectly applicable to information and organizations dealing with information:

a. Companies operating in the IT market are in general small and under capitalized. Sometimes they lack good management, marketing skills and systematic quality control. Other weaknesses are: dependence on

a few products or services, and a lack of strong relations with their workforce. Cooperation between companies is weak;

b. The available IT human resources are intelligent, technically competent, use the latest technologies, are well trusted and retain their relation with US and EU schools at which many of them studied;

c. Some of the major legal obstacles have been recently removed. However numerous barriers remain;

d. Many branches of the Government and public institutions do not acknowledge the specific characteristics of IT and the IT industry. As a consequence the IT industry is still constrained by many government regulations and practices;

e. In multilateral and bilateral trade agreements the IT sector falls often between the lines due to lack of the appreciation for its specific character and requirements;

f. Government support in areas like export, product development, enterprise development and quality certification is less than in countries with which the IT industry wants to compete;

g. Strong theoretical background, low wages and a large pool of available IT workers are competitive strong advantages;

h. Information and IT education is too theoretical and in some respect obsolete. Educational institutes rely partly on obsolete equipment;

i. Internet access in Jordan is far more expensive than in countries that Jordan's IT industry wants to compete with.

2.2.4   Comments on REACH Report

1. The IT sector in Jordan, concentrates on hardware and software. High value-added, information-rich consultancy for instance does not get due attention. Information services sectors like Call Centers and database services do not get much attention as well;

2. Internal weaknesses will prevent many companies taking full advantage of government assistance. However, few strong companies and possibly a number of foreign companies will benefit mostly;

3. Lack of marketing skills seems to be a serious obstacle to growth in the IT sector. Yet this subject gets little attention. The action plan provides only indirect support for marketing.

2.3   REACH 2.0

2.3.1   Background

The REACH 2.0 initiative is complementary to REACH I. It consists of fourteen studies/reports, each covering a certain aspect of the IT industry in Jordan.

Analyzed are the 12 (out of the 14) studies/reportsconsidered of interest to Information Needs Assessment. Two studies/reports were not considered relevant to Information Needs Assessment:

- The "E-Government study" because of another extensive specific report on that subject;

- The "Organizational review of the MoPC" because of the subsequent E-Government initiative.

The following studies/reports have been analyzed:

1. **Access Link Pricing** in Jordan, on the cost of linking to the Internet;

2. **Telecommunications and Infrastructure,** about telecommunication cost and the responsibilities of the regulatory body;

3. **Quality Certification in Jordan,** on the availability and applicability of international software certification tools and techniques;

4. **Center For Excellence** discusses the feasibility of using such a center to bridge the gap between the current quality of staff and the know-how needed;

5. **University Alliance**, analyzes needed and possible improvements of IT training and education;

6. **E-Banking In Jordan,** provides an introduction to E-banking;

7. **Building A Basic Legal Framework For E-Commerce & E-Government In Jordan,** contains an overview of legal implications of E-Banking, E-Commerce and E-Government;

8. **Export Promotion,** concentrates on the legal and regulatory aspects of export promotion;

9. **Facilitation of IPOs**, mostly about legal and regulatory aspects of IPOs;

10. **Venture Capital Funds**, on practical and legal aspects of VC;

11. **Implementing Employee Ownership In Jordan's IT Industry**, concentrates on legal aspects of Employee Ownership;

12. **Information Technology Parks** looks at feasibility of technology parks.

2.3.2   Access Link Pricing in Jordan

The subject of this study/report is the cost of Internet access. Specifically addressed are issues regarding linkage to the international telecommunications systems, which enable Internet connection.

The main recommendations relate to the creation of a free market and competitive marketplace for services. Government funding possibly through the use of negotiable bonds is also advocated.

2.3.3 Telecommunications And Infrastructure

The study/report looks at the services and infrastructure provided by the Jordan Telecommunications Company (JTC) as well as its relationship with the Telecommunications Regulatory Commission (TRC).

Rate and price recommendations include: (a) conducting accurate demand studies, (b) review of JTC pricing & pricing mechanism and (c) ensuring competitive prices.

Local Telecom recommendations include (a) checking the current telecommunications system in place, (b) substantially lowering local call charges, (c) deregulating Internet Cafes and (d) allowing local and regional 800 Numbers.

Recommendations are also made to empower the TRC in terms of ensuring its complete independence, bringing spectrum management under its control and developing its human resources.

2.3.4 Quality Certification in Jordan

The study/report looks at obtaining recognition for Jordan's developing IT industry through the application of international certification standards. For this purpose, readily available quality certification tools and techniques can be deployed.

The report concludes that there are no legal impediments preventing Jordan from developing and implementing an international standard IT Quality Certification Process. The tools and techniques are readily available and may be deployed in Jordan. Quality Certification Processes cannot, by themselves, make Jordan competitive in the world IT markets. Quality Certification Processes must be augmented by effective instruction and mentoring in world-class software development techniques, methods, and procedures.

Specific recommendations include the creation of a formal SW-CMM® knowledge transfer mechanism in order to utilize SW-CMM® as the criteria for awarding the Jordanian Quality Mark and to conduct SPI appraisals for QCP.

2.3.5 Center for Excellence

The study/report proposes a center of excellence to assist Jordanian IT businesses to compete in regional and international markets. The proposed center is modeled after initiatives in other countries and companies, which want to maintain or improve their position in the international market place. Many of the identified problems and challenges are not unique to Jordanian IT Businesses. Other companies and countries focusing on the Information Technology sector face similar problems.

Visions and achieving targets require teamwork and co-operation across industry, universities, and government organizations.

2.3.6   HRD- University Alliance

The study/report identifies opportunities for private sector involvement in training and education in its widest perspective. It is not restricted solely to the subject of university-industry alliance. It argues that attention should be given to successful arrangements, frameworks and models from other countries.

Models have been selected that make efficient use of resources and maximize return on investment. Such models can be tailored to meet local needs and opportunities. Time does not permit Jordan to go through the long learning curve in industry-academic collaboration experienced by other countries.

Four areas of opportunities were identified: (1) to provide cost-effective and relevant training, (2) to invest in and retain top IT graduates, (3) the development and delivery of university curricula in accordance with international standards, (4) to exploit IT to provide high-quality learning programs accessible to everyone.

The lack of project champions from the institutes of higher education and learning and poor Internet access and performance generally obstruct progress in the aspects of HRD.

2.3.7   E-Banking in Jordan

The study/report includes a framework to increase the understanding of E-banking and other E- services. It provides an overview of the role of payments in the E-commerce and E-banking worlds. A list of legal framework issues is added that will either have to be modified or created to enable E-banking in Jordan. Last but not least it proposes to set two major priorities for legal framework issues: Banking Statutes and the Law of Evidence.

Four layers of activity are identified as the make-up of E- services. These are (1) system services, (2) specialized business logic, (3) administration and marketing and (4) payment processing.

Three cross cutting issues are critical for success, *Security* of transactions, *Privacy* issues for consumers and the *Integrity* of messages and data.

2.3.8   Building a Basic Legal Framework for E-Commerce & E-Government in Jordan

The study/report looks at the basic components of a legal framework for electronic commerce to assess the prevailing Jordanian legal environment and to identify legislative obstacles.

An introduction to the UNCITRAL model law on Electronic Commerce could be used as the legal framework for electronic commerce. Its enactment can provide the basic first step towards building a legal framework for electronic commerce in Jordan. It also enables electronic commerce, as well as certain aspects of the "E-government" initiative, to be carried out with greater legal certainty.

An assessment should be conducted in order to further identity sector-specific amendments and additions to the legal framework that may be needed to enable electronic commerce, and related aspects of the e government initiative.

2.3.9   Export Promotion

The study/report identifies particular changes in legal and regulatory matters needed by the IT industry. It also identifies additional issues, relevant for IT export, which must be resolved as well as the potential constraint restricting female employees from working on a 24-hour basis.

The main recommendations include a review of the proposed Investment Law and Labor Law, a review of the availability and price of high-speed data circuits, encourage all IT companies to formulate a "Unique Value Proposition" and to encourage the establishment of foreign sales offices.

Other recommendations include the establishment of a knowledge-sharing forum to allow exchange of knowledge and techniques between export marketing managers, encouraging the adoption of the SW-CMM standard for the evaluation of Jordanian software producers and the use of the AMIR project methodology by Jordanian software developers.

2.3.10   Facilitation of Initial Public Offerings (IPOs)

The study/report targets the business environment needed to facilitate IT firms to use Initial Public Offerings to raise finance. Laws and regulations must be adjusted to enable IT firms to raise capital and "go public". This should be possible without requiring past records of profit, or other investment record criteria. In addition, new public 'registration' formats that provide greater likelihood for success in the capital formation process should be considered for adoption.

The report finds that neither the Companies Act nor the Securities Law of Jordan has a special application or registration for IPOs. A major hindrance to LLC conversion to a Public Shareholding Company is contained in the Companies Act. Certain directives, which have yet to be released to the public, have to 'be conditioned' for IPO registration.

2.3.11   Venture Capital Funds

The study/report is based on a comparison between VC practices in the U.S., Europe, and some developing economies, and the practices in Jordan. It is divided into two parts, Part I, "Financial Issues" and Part II, "Legal Issues".

A number of recommendations are made on Securities Law such as the provision of exemptions for investment funds and investment managers and simplifying the process of selling securities directly to a limited number of substantial and sophisticated investors.

A number of recommendations were also made on Companies Law such as permitting limited partnerships in shares and to create different classes of shares with different rights and economic interests and creating a new form of business organization, a private shareholding company, for use by

companies with a limited number of private shareholders and providing with substantial flexibility in financial structure and operation.

2.3.12 Implementing Employee Ownership in Jordan's IT Industry

The study/report reviews a number of laws and documents. It discusses the issue of employee ownership and its desirability in the Jordanian IT Industry.

a. The report concludes that Jordan's corporate laws do not provide local companies with the flexibility needed to institute the described plans. Inconsistent interpretation of ambiguous laws by Government officials is also a problem;

b. Employee ownership is a powerful tool for recruiting, motivating, and retaining quality employees. It is needed if Jordan's IT industry is to stay competitive.

2.3.13 *Information Technology Parks*

The report advises on the potential ability of IT parks to contribute to the development of a dynamic IT sector by comparing it with alternative means of support, such as zoning regulations , IT-enabled buildings and IT incubators.

New models of incubation for profit, closely related to venture capital, are emerging. Some of them are already being implemented in developing countries. Such models are likely to be relevant for Jordan; especially as and when international venture capital practices become established.

The report concludes that IT parks were not well suited to the specific development needs of the IT sector in Jordan. This is mainly due to lack of market demand, the limited number of software firms that could serve as potential tenants in a prospective park. Alternative means, such as zoning regulations and IT-enabled buildings, are available to mid-sized IT firms in Jordan at lower cost and risk.

2.3.14 Comments on REACH 2.0 Report

General conclusions that can be drawn from REACH 2.0 (in retrospect):

- Although the REACH 2.0 studies were limited in scope and time, they resulted in a number of good suggestions and recommendations;

- Missing quantification of some recommendations makes their evaluation difficult;

- Most of the conclusions and recommendations relate to legislation and regulation;

- Several studies, e.g. Venture Capital, IPO's and Employee ownership, were based on copying Western, mainly American, ideas and concepts.

2.4   E-Government

2.4.1   Summary

E-government is a means for governments to improve the transparency, accessibility and responsiveness of their services to businesses and citizens. The provision of electronic services to citizens represents an opportunity to reduce the complexity of dealing with government administration.

The report, dated September 2000, focuses on the main building blocks for E- Government. These blocks are needed to move into the area of E-services. They relate to needed technology infrastructure, education requirements and legislative reforms. The report thus presents a road map to launch a comprehensive E-government initiative. A national strategy for implementation needs to be developed.

To meet the ambitious time frame, the main building blocks are divided into *achievable and affordable projects* that are *expected to yield* direct results for government, businesses and citizens. These are:

- E-services Applications Identification – Fast Track Projects;

- Infrastructure Development;

- Legal And Regulatory Framework Development;

- Education Reform And Skills Development;

- Management And Organizational Structure Development.

The report proposes an implementation plan that focuses on the organizational structure and Fast Track Projects as a proof of concept and to launch the required services. Specific recommendations and targets are:

a. To establish a National E-Government Task Force and a Technical Coordination Unit to develop a comprehensive master plan to manage the implementation process, target January 2001;

b. To identify and initiate the first set of Fast Track Projects to prove and test e-services applications, target end of 2001;

c. To install the necessary infrastructure nationwide, target end of 2004;

d. To set up a National center For E-Government Excellence to deliver courses for public sector, businesses and citizens in cooperation with the IT sector. No target date;

e. To review laws and regulations requiring change, target November 2000;

f. To prepare and submit draft legislation and obtain parliamentary approval. Target mid 2001:

2.4.2 Findings and Conclusions

The report concludes that:

1. E-government in Jordan will remain inaccessible to most Jordanians until the availability of access points and the price of on-line data connection services is reduced;

2. The success of E-government in Jordan will depend on the coordination of the use of existing network backbones and the installation of JTC's new networks for civilian use;

3. Coordination is an important critical success factor;

4. The success of E-government will largely depend on the extent that citizens and business are assured by the Government that information privacy, accuracy and security standards are properly implemented and adhered to;

5. E-services should be designed to meet the needs of businesses and citizens. Services should be provided at single points of service crossing ministry lines;

6. In line with best practices, public sector reforms and re-engineering of processes should be seriously launched in parallel with E-government initiatives;

7. It is imperative that government agencies view businesses and citizens as important clients.

2.5 Jordan IT Community Centers - JITCC

2.5.1 Summary

Skills, productivity and quality of workforce are critical factors for long-term competitiveness in IT. Specific challenges faced by Jordan are:

- **Need for increased computer literacy.** Jordan has the potential to penetrate IT market niches such as software design, coding, testing and low-end remote processing. The relatively low level of Internet penetration poses a significant barrier to develop such skills;

- **Infrastructure constraints**. There are significant information and communication technology constraints. The high cost of access to computers in general and the Internet in particular are major barriers for the poorest and most disadvantaged sectors of society;

- **Digital Divide.** The actual participation of information-poor and isolated groups in the future information and knowledge-based society threatens to be limited. This digital divide is very much a geographical issue. Most ISP's are located in the urban areas and mainly in Amman.

The government considers the establishment of Information Technology Community Centers (JITCC) throughout Jordan as one of the steps towards meeting the above-mentioned challenges. In cooperation with the

United Nations Development Programme (UNDP), the NIC and the Ministry of Education , a project has been formulated to establish a number of such centers. The project complements several other initiatives for the use of IT in education and government.

The reviewed report, published in February 200, is a description of the project.

The JITCCs will offer electronic information and knowledge services to the literate as well as the illiterate segments of society. It will also empower local communities by using information technology. Providing access to public information through the National Information System (NIS) will achieve this. The JITCCs will also provide access to PCs, Internet, software, libraries and other IT tools on a walk-in basis. Phase I covers 20 centers countrywide.

Typical Jordanian concerns indicated that consideration should be given to:

- Cultural as well as traditional concerns;

- The management capabilities of the JITCCs;

- The development of the JITCCs into full-fledged community centers rather than just computer literacy centers;

- The sustainability of the JITCCs in terms of running cost (staff, telecommunications, support) after the initial start-up phase.

It is envisaged that the JITCCs will be connected as nodes in one national network within the framework of the NIS, which will enable them to share relevant information and knowledge.

2.5.2   Findings and Conclusions

The report recommends:

a. The phased establishment of JITCCs with project oversight being the responsibility of the National Steering Committee and the NIC as the executing agency;

b. A three-stage initial work plan;

c. To recognize monitoring and evaluation as essential for sustainability. Periodic progress reports, to be submitted to the NSC, are to be prepared by the executing agency (NIC).

2.6   Education Initiatives

The Education initiatives, undertaken by Ministry Of Education, involve four studies undertaken as separate tasks at various dates:

- Strategic Plan for the Computerization and Connectivity of Jordan's Primary Schools;

- English Language Tuition and Distribution of Computers In Public Schools;

- General Directorate Of Curricula Project;

- Interim Technology Plan.

Each of the study reports states its objectives, conclusions and recommendations.

2.6.1 Strategic Plan for the Computerization And Connectivity Of Primary Schools

2.6.1.1 Summary

The direct objective of the study was to provide guidance on the improvement of information related services. The underlying reason is to ensure that current and future generations of school children will be computer literate and will qualify to take up new jobs and positions generated by the IT sector. The study report, dated October 2000, distinguishes seven critical issues:

1. Business Planning;

2. Technology Acquisition;

3. Training and Support;

4. Security of Information;

5. Systems Integration;

6. Outsourcing;

7. Continuous Improvement.

2.6.1.2 Findings and Recommendations

The Ministry undertakes a number of different initiatives. However a unified technology implementation plan is missing. The main recommendations are:

1. A stable and consistent infrastructure for all sites is critical to the accurate exchange of information;

2. The Ministry's current strategy is to procure and subsequently maintain and support technology;

3. The current financial and HRM system does not meet the needs. Internally available resources might be insufficient to keep this in-house developed system operational. Replacement or outsourcing is recommended;

4. To develop a Cohesive Technology Plan that will consolidate all current initiatives and procurement in one department directly under the Minister Of Education;

5. To set standards for technology and infrastructure. This will allow economies of scale, easier training and support, as well as central management.

6. To consider technology leasing. Some legal and economic barriers need to be overcome to adopt a suitable leasing mechanism.

7. To Develop Process Standards. Investing in technology should be done with the idea of reducing the total cost of ownership.

2.6.2 English Language Tuition and Distribution of Computers In Public Schools

2.6.2.1 Summary

The reviewed copy of the study report is not dated. It is assumed that it was produced towards the end of 2000. It discusses the pilot implementation plan adopted by the Ministry of Education for English language tuition and computer literacy.

The plan applies to elementary and secondary levels of government schools starting from first grade. The objective is to satisfy current and future needs of Jordanian society and labor market. The study has been prepared in response to Royal directives issued to the Prime Minister in April 2000 and the English language tuition and computer literacy recommendations of the Economic Consultative Council.

2.6.2.2 Findings and Recommendations

The report recommends:

1. Enabling teachers and students to apply information technology to simplify learning, to make learning more attractive and efficient, to improve students capabilities for scientific thinking, analysis and problem solving;

2. Improving English language skills of teachers and students (reading, writing, listening and conversation). This will make it easier to use that language in higher education and in every day life. It will facilitate application of information technology;

3. Assisting teachers and students to keep in touch with information centers and reference sites through the Internet;

4. Implementing an automatic follow-up system for student interests and academic achievements;

5. Supporting and encouraging the use of PCs by teachers and students on a regular daily basis;

6. Applying information technology for upgrading teaching methodologies and curricula.

2.6.3 General Directorate of Curricula

2.6.3.1 Summary

The report covers Phase II of a sub-project undertaken by the National Center for Human Resources Development (NCHRD) on behalf of the Ministry of Education. It aims at the computerization of the complete publishing process by upgrading current services to include a comprehensive desktop publishing system with the following expected advantages for the GDC:

- Significantly improve the publishing potentials, capacity and efficiency as well as strengthening of the GDC's role in the educational system;

- More GDC independence, to improve publishing quality and saving time, effort and money;

- Increase the efficiency of the present staff and reduce the production cost of school textbooks by using desktop publishing and in house type setting;

- Improve textbook quality by connecting the GDC to the Internet.

2.6.3.2 Findings and Recommendations

Some of the risks that may hinder full and successful implementation of the project include the inability of staff to use new equipment efficiently, lack of staff loyalty in terms of employment and current vacancies in some of the important positions. The report recommends:

a. To develop a vision for the use of the new technology showing how automation can be integrated into the production environment;

b. To establish a plan for sustainable professional development including initial and refresher training;

c. To establish a monitoring and evaluation system with pre-set indicators;

d. To address recurrent costs such as maintenance, hardware upgrades, software enhancements and support costs.

2.6.4 Interim Technology Plan

2.6.4.1 Summary

The report suggests that public schools must constructively and effectively begin to offer opportunities to students in order to access and use information technology comprehensively and in a structured manner in education.

The developed interim plan is essentially a blue print for the integration of IT in the educational system. It focuses on Teaching and Learning, Administration and Efficiency as well as Decision Support. Four key dimensions are discussed:

- Curriculum. Shifting from information receiving to information finding. Concentrating on solving problems and communicating ideas;

- Learning Resources. Setting up a central clearing-house for reviewing, acquiring and recommending software and Internet sites to be used in the curriculum and the teaching process;

- Human Resource Development. This should focus on an effective and continuous program for teacher development in IT application. Teacher training centers need to adapt their programs to ensure that all teachers possess primary skills in IT application;

- Infrastructure. Technology infrastructure needs to be provided to the education system. This covers hardware, software, networks and audio-visual material, etc.

2.6.4.2   Findings and Recommendations

General recommendations are:

a. To encourage creative thinking and lifelong learning;

b. To enhance school linkages to the outside world;

c. To generate innovative processes in education;

d. To develop administrative efficiencies and enhanced decision making in the education system.

2.7   Status of IT applications in Public Sector.

2.7.1   Summary

The report, called "Status of Information Technology, its usage and development strategy in the public sector", is based on a study carried out by the NIC in response to a directive of the Prime Minister. The objective was to provide the basis for a strategy to improve the application of IT in Government such that it can better serve the citizens. The report contains:

- A large number of facts and figures about the hardware and software used in public institutions and IT personnel;

- An analysis of the figures;

- A framework for a strategy.

The data was collected in 1999 / 2000 and the report published in September 2000. There is no reason to believe that the findings and conclusions of the study have fundamentally changed since the study was carried out. Data was collected through a comprehensive questionnaire. 84 institutions completed and returned the questionnaire. The study covered computers, networks, operating systems, databases, application systems and human resources.

The study and consequently the report focus on quantitative figures rather than qualitative information. Interesting aspects such as the quality of staff obsolescence of computers and software, training and costing have not been addressed.

2.7.2   Findings and Conclusions

1. Computerized information systems in the public sector are mainly used to support internal administrative tasks of government organizations, see Table 1.

Available application systems	Number	Percentage
Administrative systems	122	29%
Financial systems	108	25%
Inventory systems	31	7%
Special systems[1]	166	39%
Total	427	100%

Table 1, Application Systems of 84 Government Institutions

2. Different Institutions seldom make use of each other's know-how;

3. Core functions supported by information systems of public institutions is extremely low. Main reasons being lack of planning, lack of qualified staff, low awareness of middle and top-management, lack of operation and co-ordination between IT sections and departments and lack of finance;

4. Some public institutions that have branches have actually connected them through a network;

5. Data entry is still widely considered to be one of the tasks of IT departments, see Table 2.

Position	No. Of employees	Percentage
Department manager	24	2%
Head of section	34	3%
System analyst	72	7%
Programmer	258	25%
Technical support engineer	53	6%
Database Administrator	9	1%
Other/ Data entry	591	56%
Total	1041	100%

Table 2, IT Human Resources of the Government Institutions

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[1] The classification "Special systems" is used in the report for systems that support core functions of Government Institutions

6. The applied Database Technology varies.

7. LAN technology is widely used;

8. Internet access and usage is limited;

9. The majority of IT staff is technically oriented rather than business oriented, see Table 2.

2.8   Jordan's ICT Competitiveness

2.8.1   Background & Summary

The National Competitiveness Team at the Ministry of Planning, in co-operation with the World Economic Forum, studies on an annual basis a number of economic clusters. One of these clusters is ICT. The results of the most recent study were published in February 2001. The study does not aim at making recommendations. However, in some cases the findings and conclusions are so striking that recommendations are almost implicit.

The team approached a number of ICT companies and ICT users (private as well as business) with questionnaires. Many of the questions are internationally standardized and related to:

- International Competitiveness;

- Characteristics of companies working in the ICT field;

    - Strength

    - Products

    - Markets

    - Size

    - Human Resources.

- ICT University Education;

- Relations between universities with ICT businesses;

- System Development policies (e.g. outsourcing versus in-house development);

- ICT Markets and Marketing Objectives.

2.8.2   Findings and Conclusions

1. Despite all efforts, the technical competitiveness of Jordan in the ICT field has not improved during the last four years, see Table 1. It remained stable relative to developed countries like USA and Ireland. However it has gone down relatively to developing countries like India and Egypt. One of the main factors contributing to this result is the brain drain, which ranks among the highest in the countries that

participated in the competitiveness survey. Of the government institutions contacted in Jordan (52 out of the total of 85) 8% were not connected to the Internet at all. 65% had limited the access to certain employees only. Only 35% of the institutions provided Internet access to all employees.

2. Internet Cafes are widely availably in the cities. They are mostly used for personal communication (email and chatting) rather than searching for information.

Figure 2, Competitiveness

Breakdown of Employment Turnover

Upgrade studies 1%
Starting business 2%
USA & others companies 12%
Local companies 21%
Gulf states companies 64%

Source: IT Survey, National Competitiveness Team, Oct. 2000
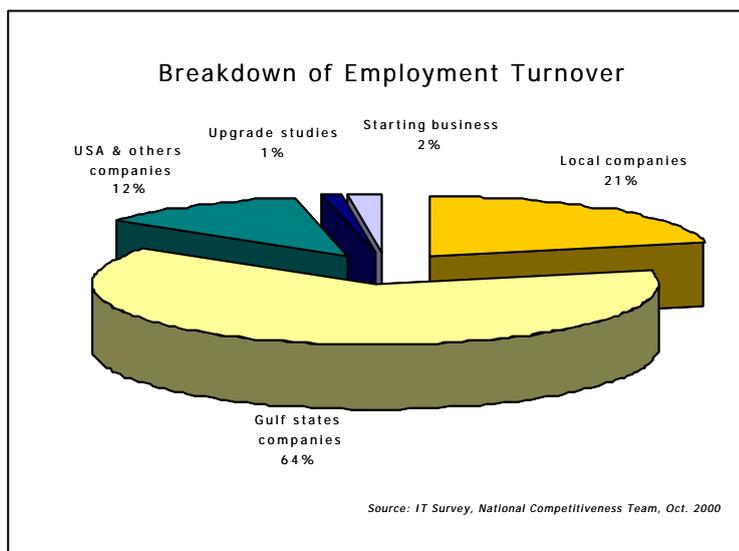
Figure 3, Breakdown Employment turnover

3. Manpower turnover in the ICT field is high at 19 percent. This is largely due to the brain drain to the Gulf States and, to a lesser extent, to the USA. The turnover for small companies is 26%. For large companies it is only 9%, see Figure 3;

Global Competitiveness Report (GCR)

The GCR, Technology Index 1996 -2000

More Competitive

U.S
Ireland
Israel
India
Egypt
Jordan's Overall rank
Jordan

1996   1997   1998   1999   2000
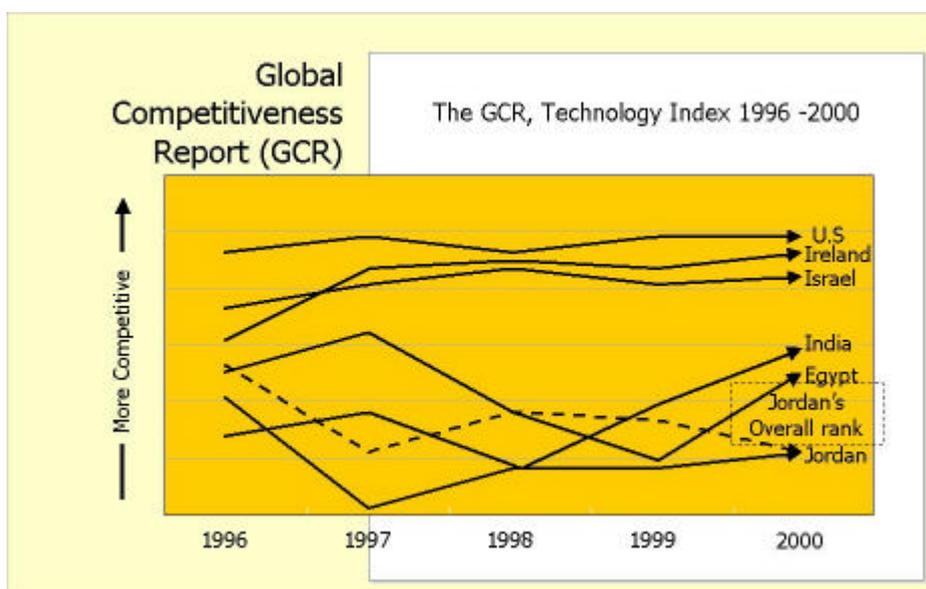
4. One of the main reasons for the brain drain is low remunerations. For example the starting salaries in the UAE are 5 to 6 times higher than those in Jordan, see also Figure 4;

Average Yearly Starting Basic Salary

Source: IT Survey, National Competitiveness Team, Oct. 2000
National Information Technology Salary Survey, jdresources.com
Gulf Business Magazine, volume 4, issue 9, Jan 2000
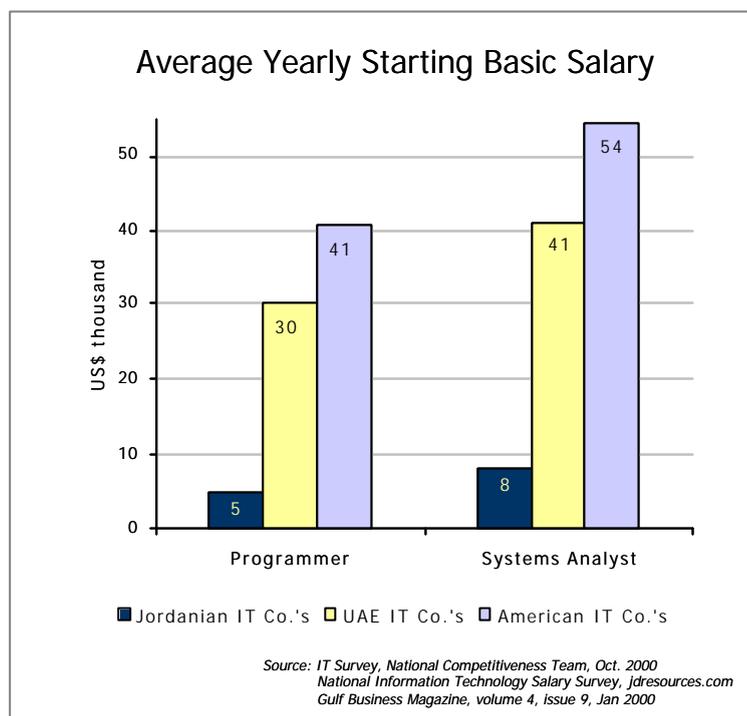
Figure 4, Comparison of starting salaries

5. Most ICT companies have no training policy. Training is mostly limited to top management;

6. Training in information technology at universities is almost limited to Computer Science, Information Systems and Computer Engineering. There is a widespread feeling that education provided by universities does not match the needs of the ICT industry;

7. 415 companies are operating in the ICT sector. 66% of the companies are small. 25% are medium sized. Only 9 % are large in terms of staff and relative turnover;

8. Nearly 60% of the surveyed companies are active in export with a combined turnover of around US$ 110 million. Most exports are in the form of software to Arab countries. In comparison, the home-market was US$ 69 million. Only 10% of the surveyed companies use E-commerce tools to support the export activities;

9. Most sought overseas partners (50 %). They are companies for which low added value out-tasking can be done, such as programming;

10. Finance and credit facilities are hard to get;

11. Over 50% of the systems in government are developed in house. 26% are developed through outsourcing;

12. Satisfaction with outsourced systems is over 50% ;
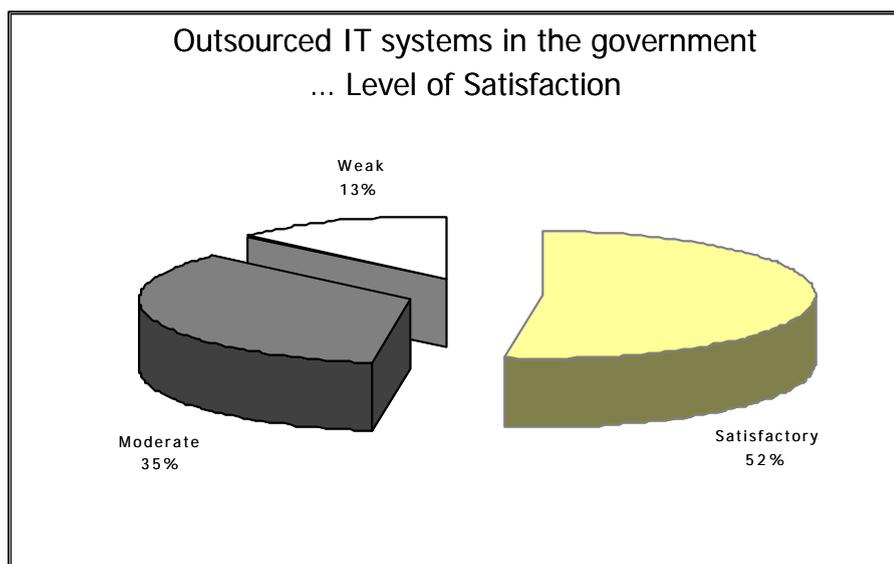
Figure 5, Satisfaction with Outsourced Systems in Government

13. Use of incubator projects is low (2 only);

2.9 Synthesis of the Needs

This section contains a synthesis of information needs based on the analysis in the previous sections. Most needs affect the NIC in one way or another. Responding to the needs will mean that the NIC provides more leadership and practical support to the information and information technology movements in Jordan. This is compatible with calls from the public and private sectors.

2.9.1 Need for National Coordination

The second revolution in information and information technology is going on unabated around the world. Powered by the Internet, whole heartily embraced by businesses and especially young people, this revolution will completely change the world. The recent world slump in the prospects of IT companies in general, and Internet companies in particular do not really affect the impetus of the revolution. However, it stripped the Internet of some of its glamour and rhetoric. Governments and businesses concentrate more on what matters at the end: real added value through information and information services.

The current situation in Jordan is in general a good starting point for the information revolution. However some parts of the country and population are not yet ready for the information age. The initiatives that are undertaken aim at addressing this problem. Other initiatives aim at aspects like improving the competitiveness of the ICT private sector and modernizing the public sector using ICT.

Some of the resulting activities overlap. Affected people, such as the ICT managers and staff in the government, are confused. Past coordination efforts have been relatively successful, but with so many players in the field the need for enhanced national coordination is urgent. Best practices, as

described in Chapter 3, show that this need is also felt in other countries on the road to the information based society.

Because of its experience and accumulated know-how, the NIC is almost by default the organization that has to be entrusted with this national coordination role.

2.9.2   Need for Information Policy

Effective national coordination requires policies and strategies that are supported by the stakeholders. Such policies and strategies need to be transparent and have to be defined on a high level:

- "This is where we are";

- "That is where we want to go";

- "This is how we are going there"

To avoid the risk for major costly mistakes and delays, information and ICT policies and strategies have to be based on a comprehensive realistic assessment of the current situation.

2.9.3   Information and Information Sharing Needs

Nowhere in the studies/reports reviewed, the need for information has been directly expressed. However indirectly, through expressed problems, stated challenges and formulated objectives, the need for more information and better access to existing information is apparent.

For instance government departments need addresses, locations, telephone/fax numbers and email addresses of central and local government institutions. Such simple information is not readily available. Each business or government organization has to maintain and develop its own list. Overall waste of resources and lack of efficiency are the result.

Another example is the secrecy clauses found in many of the by-laws of government institutions. This secrecy, for which there is often no real reason, prevents government institutions from sharing information. Lack of transparency and duplication of efforts are the result.

2.9.4   NIS-Needs

2.9.4.1   Completion of the Information Clusters

11 sectorial sub-networks have been established. The remaining 6 clusters are in the process of establishment. They should be completed as soon as possible.

2.9.4.2   *Improvement of Quality*

Substantial efforts have been put into the development and implementation of the NIS. The result is an enormous amount of information available through the system. During the development and implementation process the quality of information got less attention than the quantity. Some organizations participating in the NIS have either underestimated, or cannot afford the structure and resources needed to keep their information up to date. As a result some of the information is out-dated while other important information is missing . Weaknesses in some parts of the system affect the image of the whole system. As a consequence of the isolated weaknesses, NIS cannot yet be promoted and marketed as a label of a quality product that generates broad interest.

In the current organizational set-up, the NIC is responsible for the coordination and promoting of the NIS. The information sources are responsible for the contents and quality of their information. This de-centralized organizational structure makes it difficult to address this issue. Some sort of quality control mechanism is needed.

2.9.4.3   *Extending the Scope*

At present the functions of the NIS are limited. They only allow provision of information to its users. With the current technology, this scope could be expanded to collect information from the users as well. This technology could be used to:

- Improve information quality, e.g. by collecting information from users about errors they encounter and about their wishes and needs;

- Improving the service offered to the users, e.g. by offering subscription facilities to certain types of information;

- Widen the scope of the NIS, e.g. by providing access to the services that the various information sources offer; e.g. to sales and reservations services;

Another potential add-on to the NIS might be to charge users and collect fees for certain types of data

2.9.4.4   *Polishing the User Interface.*

The above mentioned extensions and improvements imply more market orientation. Creating special interfaces or portals per type of user could further increase market orientation. Like in other countries special portals

> The market penetration of the NIC is not sufficient. Creating new interfaces and improving the quality will help increase this penetration. However this is probably not enough for a fundamental change. Focused market research is needed to determine the potential and actual customers and to find out what these customers need. This research may lead to conclusions regarding scope, content and presentation of the NIS. It can also provide the basis for a focused market campaign

could, for instance, be created for citizens and for business people. In this way access to information would become easier.

The market penetration of the NIC is fairly low. Creating new interfaces and improving quality will help increase this penetration. However this is probably not enough. Focused market research is needed to determine potential and actual customers and to find out what these customers need. This research may lead to conclusions regarding scope, content and presentation of the NIS. It can also provide the basis for the focused market

2.9.5   Information Access Needs

The fundamental rights of people to access information are almost universally recognized. Bringing this principle into practice is not so easy. To eliminate economic, psychological and physical barriers and to make the people aware of the existence of useful information takes time. It is difficult and above all expensive. A comprehensive approach that encompasses cost, awareness and local physical access points is needed.

2.9.6   Need for Coordination of Government Activities

The major and leading party in the Information and Information Technology field is the government through its 85 institutions. Most of these institutions have their own IT sections or departments. While the quantity and quality of their staff is often insufficient, these sections and departments are expected to provide a full range of services. Duplication and waste of efforts on a large scale is the result. More then anywhere else cooperation and coordination are needed to save money and utilize scarce resources for fundamental improvements.

2.9.7   Need for Resource (re-) Allocation and Resource Generation

The call for more resources to achieve ICT policy objectives is frequently heard. The high priority attached to information and information technology should be matched with an increase in the allocation of funds. However, reality has to be faced that possible investments in information and information technology have still to compete with each other and with other investments. The policies and strategies related to IT projects and resources should be based on the same principles as the ones for other areas of development and economy:

- The highest priority should be in general allocated to the projects with the best cost/benefits ratio:

- Resources are to be used in the most optimal way and duplication should be avoided;

- Whenever possible, users and beneficiaries have to carry the cost of the services that they enjoy.

2.9.8   Human Resource Requirements

Jordan, like any other country in the world, experiences a shortage of manpower in the information and information technology sector. One of the reasons for this in Jordan is the ICT brain drain. Because of its renumeration structure, the public sector suffers the most of the manpower shortage. By simply raising salaries, even if that was feasible, would not solve the problem as demand outstrips supply. Any real solution needs to address the core of the problem, the imbalance between demand and supply.

In specific areas the imbalance is larger than in others . Most people employed in IT in the public and private sectors of Jordan perform low or lower type jobs like data entry and programming. More sophisticated skills like business analysts; system analysts and project managers are rare. Recent statistics of 52 public sector institutes, for instance, showed that of their total of 649 IT staff, 255 people are employed as programmers and 299 as data entry, support staff or operator. Only 24 staff members are systems analysts while 25 are project managers. The remaining 46 people work as network and system administrators.

A consequence of the shortage in sophisticated skills is an emphasis on "doing things right" rather than "doing the right things". Many government IT departments spend the most part of their efforts on supporting routine services like human resources and accounting systems rather than supporting core activities.

Jordan needs to put more attention to the development of high-end skills. At the same time, these skills should be marketed more actively as people often do not realize their importance.

2.9.9   E-government Requirements

The recently launched E-government initiative has profound consequences on information and information technology in the public sector. Related developments have moved into a higher gear. Ambitious goals have been set within the framework of newly defined, service oriented, objectives. New projects have been initiated and even a special organization has been established to plan and manage E-government activities. Most of this is fully compatible with the national information policies and strategies. In fact, the E-government initiative has given an extra impetus to these policies and strategies.

For the E-government initiative to succeed, all available and appropriate national resources and experiences have to be mobilized and applied. Know-how and experience gained through the NIS and accumulated within the NIC during the last seven years is of enormous value. It should be applied, or at least taken into consideration, during the planning as well as the execution of the E-government activities

3

Chapter 3 : International Best Practices

3.1   Introduction

This chapter presents a brief analysis of the documented information policies and strategies of five countries. The purpose of the analysis is to learn in general from the experiences of successful countries and to determine the common critical success factors in the fields of information in general and knowledge application in particular. The wide range of differing initiatives and approaches of these countries can also provide a source of inspiration for potential policy and strategy elements in Jordan. With these objectives in mind, the criteria for selecting the five countries were:

- Several years of active policies and strategies;

- Progress on the road to an information and knowledge based society. In this respect it is worth noting that, according to various standards, even the most advanced countries still have a long way to go on the road to a full information and knowledge-based society;

- Well-documented and accessible policies and strategies.

As a whole the analysis is meant to present a fair picture of information policies and strategies of developed and developing countries, small and large countries and regional Arab countries. The following countries have been selected:

The **United Kingdom,** as a representative of developed western countries that are relatively advanced in the use of information and knowledge. The UK has a strong and transparent organization for the development, as well as implementation of policies and strategies. It also has a good partnership between the private and public sectors and it is widely known for its innovative ideas.

Singapore, as a small country that has rapidly and successfully transformed itself from a developing to a developed country. It is recognized as belonging to the group of the most advanced countries in the world with respect to the application of information and knowledge. It has an ambitious set of policies and strategies and it willingly accepts the risks related to the application of untested technologies, in particular in the public sector.

Egypt, as an economically dominant country in the region with a long history in information policies and strategies that are somewhat comparable with those of Jordan.

India, as the largest, or one of the largest developing countries in the world, that has, through the use of focused strong policies, managed to become a major player in the global information technology market.

Dubai, as a small country in the region that has moved rapidly, through relatively recent decisive actions, in the direction of an advanced information and knowledge based society.

Subjects of interest for international best practices analysis are:

- The actual policies and strategies;

- The organization(s) that develop(s) and implement(s) policies and strategies;

- The approach to their development and implementation;

- The progress made on the way to an information and knowledge-based society.

3.2 UK Information Policies And Strategies

3.2.1 Introduction

The UK rates among the highest developed countries in the world. Its population is well educated. Its degree of computer literacy is high and it can afford the latest technologies. This places the UK in an excellent position to move forward and profit fully from the many predicted advantages of the information and knowledge age.

The UK government is fully aware of these potential advantages. At the same time it realizes that exploiting these advantages requires co-ordination and leadership that has to come from the central government. Active interest and support from the highest level in the government is needed.

It has formulated ambitious strategic goals, adopted a wide range of policies and setup an implementation organization that ensures strong implementation support from the various branches of government and the private sector. Last, but not least, active monitoring and evaluation procedures have been implemented, which will ensure that possible deviations from targets will be noted in an early stage. All this makes the UK information age policies and practices fascinating to analyze.

The central issue in the UK objectives and approach is not *information* but *services*; these services depend on information **and** technologies. In the UK policies and strategies technologies are considered as the critical issue. Information policy issues are pragmatically addressed when they come up during the definition and/or execution of policies and strategies.

The UK also passed a comprehensive Data Protection Act in 1998 which was designed to make new provisions for the regulation of the processing of information relating to individuals, including the obtaining, holding, use or disclosure of such information. The act covers the rights of data subjects, responsibilities of data controllers, exemptions and enforcement.

> The UK initiatives are financed through normal budget means. Re-allocating of priorities is done extensively to keep the total cost down. Where and when appropriate, financing is facilitated by allowing commercial services to mix with government services. Private companies may market their services and/or products, for instance, through public sector Internet portals.

3.2.2 Organization

Research and policies are prepared by a Performance Innovation Unit (PIU), which includes an almost equal number of representatives from the private and the public sectors. Small working groups operate under the PIU. The PIU reports, through a Cabinet Secretary, directly to the Prime Minister.

An E-Government Minister ensures cabinet political support of the initiatives. The highest level of responsibility for actual government implementation for both E-Government and E-Commerce lies with the Government E-Envoy.

Information Age Champions (IAGC's) are high-ranking authorities, one in each key institute/organization to spearhead implementation and pre-empt resistance. IAGC's work closely with the E-Envoy. Central IT Unit (CITU) is a small unit of the Cabinet Office, that does coordination and monitoring. A special office, Office of Government Commerce (OGC) formulates E-Commerce policies and prepares decisions. It works closely with the CITU.

The relative success of E-Government and E-commerce is measured yearly or half-yearly through benchmarking against the progress in a number of countries such as Sweden and Australia. Indicators for this purpose have been established. One of the main purposes of bench-marking is to learn from experiences elsewhere. Monitoring and benchmark results are published through the Internet in annual reports. Critical comments are invited and welcomed.

3.2.3 Objectives And Scope

The UK policies and strategies are primarily geared towards purpose and stakeholders. For these reasons two different broad initiatives have been taken for which two different sets of policies and strategies apply: E-Government and E-Commerce.

The **E-Government initiative** aims at the government/public sector tasks and responsibilities. It's policy and strategies are part of a much wider initiative to modernize the government. In this context, the strategic objectives for the government and public sector have to be seen:

1. To (re) build government services from the citizen's point of view. The focus is on the citizen and on his/her needs for convenient, secure and easily access able services;

2. To improve government services;

3. To make government services more accessible, especially to the benefit of minority groups, disabled people, and people living overseas;

4. To make better use of available services.

As may be noted, each of these objectives is about services. Improving the use, content, provision and collection of the information part of these services lies at the core of those objectives.

The E-commerce initiative aims at making the UK the most competitive market in the information age. Its objectives are thus at least as ambitious as the E-Government ones. But as the real achievements have to come from the private sector operating in that market, its scope is limited to the environment in which E-commerce can flourish. The objectives, applicable to all main stakeholders (government, private sector and citizens) are designed to remove barriers in understanding of, and trust in access to, information:

- To increase understanding of E-commerce. This applies to potential advantages as well as to risks. Education, training and public awareness are key issues;

- To ensure trust. People and organizations should execute electronic transactions with the same level of trust as classical physical transactions. In case of conflict, the stakeholders should be able to fall back on a legal and regulatory system that is as trustworthy and affordable as the system for classical business;

- To ensure proper physical as well as affordable access to E-commerce channels. It is recognized that deprived citizens and possible small businesses need special provisions.

In the UK, E-government and E-commerce scope are taken in the widest possible context. Any action of any person or organization that has something to do, directly or indirectly, with the government is included in the E-government scope. Any enquiry or transaction that is electronically transmitted is seen as part of E-commerce.

The policies are defined in a general widely applicable way. The strategies are much more down to earth. The targets for the strategies are practical and defined in measurable terms. For instance, in 1997 the UK government set as target such that it should be possible by 2002, to perform 25 percent of all central government services electronically. By 2005 this should be 50 percent and by 2008 it should be 100 percent.

As the initiatives have the form of a business plan they have attached timeframes. Regular updates take place.

3.2.4 Approach

The approach of E-government is very much like the development and execution of a corporate business plan. A vision is formulated and policies and strategies are defined to achieve them. Some of these strategies are specific to the type of service. Some of them are cross cutting and deal with issues like smart cards, electronic signatures and data-standards.

Specific, quantifiable targets are set to measure progress. Openness and transparency are applicable to all levels. Attractive looking, yet comprehensive, reports about the plans and progress achieved are available to everybody and easily accessible through the Internet.

Normal budget procedures are followed for the financing of initiatives. Re-prioritizing is extensively done to (re)-allocate scarce financial and manpower resources to the most important tasks. The private sector is involved and private initiatives are encouraged. One of the ways of keeping the cost of the E-government initiative down is by allowing commercial services to be mixed with government services. Thus for instance advertisements are allowed on the Government portals (provided that the aim of the advertisements is compatible with government policies).

A similar approach applies to E-commerce. Policies and practices are aimed at creating and using the needed environment and it is interesting to note that the UK government sees itself mainly as coordinator and facilitator. In that role, it identifies areas of overlap and/or gaps.

3.2.5 Conclusions

1. Information and knowledge based society is taken very seriously by the UK Government. It is one of the priority areas and is well treated, mature and comprehensive;

2. Although technology driven, E-Government and E-Commerce initiatives are professionally "marketed";

3. The objectives show a high degree of ambition. At the same time most of them seem feasible and to a large extent could be applied elsewhere;

4. The powerful figures of an E-envoy and Information Age Champions appear to be successful in pre-empting organizational and bureaucratic resistance.

3.3 Singapore's Information Policies And Strategies

3.3.1 Introduction

Singapore markets itself as the ideal platform for companies with regional or global ambitions to launch or expand their business operations in the region. This is mainly due to its location at the crossroads of Asia as well as the availability of world-class transport and financial infrastructures and an open telecommunications market. Singapore has a policy of thinking fast and acting globally taking full advantage of technology, knowledge and talent, which are being pushed beyond national boundaries.

Singapore's Infocomm Development Authority (IDA) is at the center of such activities. It has a vision to create a digital future for Singapore and a mandate to listen, develop policies, promote and regulate the market.

The IDA was established in December 1999 through a merger of the National Computer Board (NCB) and the Telecommunication Authority of Singapore (TAS). The IDA is a statutory board under the Ministry of Communications and Information Technology (MCIT). Its formation recognizes that IT and telecommunications are no longer separate industries but have grown and converged together into a new info-communications sector. The IDA oversees IT and telecommunications, related or emerging ICT industries, as well as the technical aspects of broadcasting regulation.

3.3.2   Organization

The following five functional groups operate in IDA's key areas of responsibility and work:

- Policy & Regulation Group;

- Online Development Group;

- Infocomm Development Group;

- Technology Group;

- Government Systems Group.

Within these groups exist many divisions each performing a specific task.

3.3.3 Objectives And Scope

The IDA's mission is to spearhead Singapore's drive to be a vital global ICT center, transforming Singapore into a knowledge-based digital economy and society in order to realize the benefits of the digital future. It is both a regulator and promoter and the IDA does not see this as being contradictory in roles. To achieve its objectives, IDA works closely with industry, community and other government agencies.

As a **policy maker**, IDA formulates a clear and transparent framework that supports the diverse promotional efforts to establish Singapore as a leading ICT hub in Asia. As a **regulator**, IDA levels the playing field so that competition and collaboration can expand and consumers can benefit. As a **developer**, IDA works to influence and to ensure that Singapore's ICT industry is a major engine of economic growth. It also initiates and co-ordinates efforts to create and lead e-government as wells as efforts to position Singapore as a trusted e-commerce hub. As a **promoter**, IDA is chartered to bring Singaporeans online and put Singapore on the world's ICT map.

> The policies and strategies are formulated through a series of public consultations. IDA issued public consultation documents outlining the proposed strategies and policies. These documents were then circulated to the public. A series of meetings were organized to discuss them. IDA gives extensive consideration to the views and proposals contained in the comments.

3.3.3 Approach

The IDA's strategies are:

- To promote aggressively and develop the ICT industry, to position Singapore as a node in regional and global information economy, attracting and developing competent manpower, and maintaining a transparent, pro-business and pro-consumer regulatory environment;

- To encourage businesses, whatever sector they are in, to adopt ICT as a competitive lever whether in improving internal business processes or providing external ICT-enabled online service delivery and electronic commerce. The public sector to be an exemplary showcase for the use of ICT in its operations;

- To promote ICT as a means to enhance the quality of life for citizens, so that the benefits of ICT are available to all sectors of society;

- The IDA has also defined the following four pronged approaches to build trust and confidence in E-Government and E-Commerce in general;

  - To establish a secure environment. This includes adopting a secure Public Key Infrastructure and introducing Risk Assessment and Profiling Services;

  - To establish confidence in E-Business. This includes introducing E-Commerce Insurance, introducing Credit Bureau Services, introducing Escrow Services and making available Alternative Dispute Resolution;

  - To build user confidence. This includes Issuance Of Trust Marks and Addressing Privacy Concerns;

  - To raise user awareness.

3.3.4 Conclusions

1. Government-Industry partnerships are strongly encouraged by the IDA;

2. Trust is essential to success in the on-line world especially when related to E-Government and E-Commerce;

3. The IDA has placed a strong emphasis on the challenge of taking into account new initiatives and work efforts. Constant industry consultations and feedback are encouraged;

4. The IDA has adopted a promoter/regulator approach;

5. The IDA realizes that the ICT revolution cannot be master-planned. The objective should be to find a common understanding of the direction to take and execute with speed and flexibility. Sense and respond effectively to changes;

6. The IDA also defines three distinct sectors for ICT, the public sector, the private sector and the people sector;

7. Information and information technology related activities have full government backing and support.

3.4 Egypt's Information Policies And Strategies

3.4.1 Introduction

Effectively governing a large and complex society as in Egypt requires ample and adequate information. Hence, the Information and Decision Support Center (IDSC) was initiated to support the Egyptian Cabinet's decision-making process in socio-economic development. It also acts as a catalyst for building Egypt's information infrastructure. Ever since its establishment in 1985, the IDSC has been working on the process of building up Egypt's Information Technology (IT) industry and decision support infrastructure, in addition to developing a base for the nation's software and hi-tech industries.

IDSC evolved around Egypt's dedicated efforts to join the global IT revolution, and institutionalizing the decision making process through accessing information. IDSC was also established with the long-term vision of providing public access to information, particularly to businesspeople and investors.

Over the past one and a half decades, the IDSC has pursued its basic goals of setting up an information core for the Cabinet's decision-making process, and has also created channels for the local and international flow of information.

The IDSC is not a ministry as such. It reports directly to the Prime Minister. It should also be noted that the IDSC is not the sole player in this field. Initiatives and actual projects were discussed and implemented in Egypt well before IDSC came to existence, a prime example in this case would be the Egyptian Science And Technology Network, which came into existence in 1981.

3.4.2 Organization

A three level architecture for information infrastructure and decision support was conceived for the IDSC to fulfill its strategic role.

- **Level I--IDSC Base.** IDSC staff functions within the context of the center's operational goals and utilizes the available expanding facilities.

- **Level II---The National Node.** The IDSC links the Cabinet with existing information resources within the country and creates channels of co-operation with ministries and national agencies.

- **Level III---International Dimension.** The IDSC extends its activities to the international arena by participating in international co-operation agreements and accessing worldwide databases via state-of-the-art telecommunications facilities.

3.4.3 Objectives And Scope

The mission statement of the IDSC is stated as empowering and enhancing the decision-making process by using state-of-the-art technologies and managerial support. This is achieved through the following objectives:

- Developing information and decision support systems for the Cabinet and top policy makers in Egypt;

- Supporting the establishment of end-user information and decision support centers in the different ministries and governorates;

- Encouraging, supporting and initiating informatics projects that will accelerate Egypt's management and technological development;

- Participating in international co-operation programs and agreements, particularly in the areas of information and decision support.

In terms of E-government, the IDSC's main objectives are:

- To motivate the Egyptian society to set foot in the e-world as a means to accelerate the process of economic and social development;

- To mobilize the Egyptian human factor and initiate effective interaction within the entire society, which will give Egypt a prestigious status internationally;

- To demonstrate the international and national experiences that illustrate the necessity of grasping the digital opportunities in the midst of developmental challenges;

- To present the Egyptian experience drawn from the past and introduce it to the world;

- To promote new initiatives as a means to increase the transformation rate of the Egyptian society towards an information society.

The DSC's role within the Egyptian Cabinet is an integrator, a facilitator and an expediter of the information and decision making process. It also organizes conferences with a regional and international presence to discuss IT related issues and exchanging experiences, applications and information about E-Business.

The IDSC has adapted its policies to the needs of the new information age in terms or re-ordering priorities, expanding the capacity to cope with change, new legislation, reshuffling the economy and re-defining workplaces.

The IDSC launched the official E-government web site as the first step towards the Egyptian E-government to establish an updated Information Network with durable links to key Egyptian sectors, as well as developing the Information Systems that constitute a key element of national issues important to development. A comprehensive list of official government websites provides useful information on each ministry/department/service. In many cases detailed procedures and pre-requisites for each service are also described. Specific information areas covered to date include almost all the areas required for government level decision making.

3.4.4 Approach

The IDSC initially did not consider "information" as a fundamental issue. The main efforts were instead concentrated on information technology and securing quick successes. In order to support the decision-making process, the IDSC also adopted a top-down approach as opposed to starting with a solid foundation. This approach was altered at a later stage. Eventually, Egypt through the IDSC, has identified that:

a. Timely, transparent and accurate information is a fundamental human right;

b. Information is a key ingredient for setting the standards where education, employment, growth, and development are involved;

c. Information is a guarantee to the individual's effective contribution to the welfare of the society;

To this effect, the IDSC is currently involved in a number of projects:

* Human Resources Development Program;

* Decision Support Centers;

* National Society Building Programs.

The government actively promotes software exports and IT incubator projects. The IDSC's main strategies are:

* Supporting Decision Making Process;

* Building Egypt's Information Society;

* Promoting International Co-operation.

A number of dimensions have been identified in order to implement e-business strategies.

3.4.5 Conclusions

- On a regional level, Egypt has realized the importance of information in the decision making process at a relatively early stage;

- Extensive use is being made of best practices in both developed and developing countries;

- The IDSC operates at a Cabinet level emphasizing the importance of its objectives within the government. There are a number of other players in the field;

- The IDSC has adopted an integrator, facilitator and expediter approach;

- Considerable value has been added to the information on the IDSC and government websites by including the provision of services.

3.5 India's Information Policies And Strategies

3.5.1 Introduction

India is one of the largest developing countries in the world. It is known for its successful drive to become a major player in the software industry. It is also known for its complex government organizations and bureaucracy. Not surprisingly this bureaucratic organization also applies to information policy formulation and execution, which fall under the responsibilities of both the federal and the state governments.

The scope of this section is limited to the federal government policies and strategies.

> In a few years India has managed to become one of the largest software exporting countries of the world. The factors contributing to this formidable accomplishment are (1) the abundant availability of young, IT professionals, (2) aggressive marketing by the private industry, (3) strong effective support, from the government. The success is a paradigm for effective coordination and cooperation between public and private sectors.

3.5.2 Organization

Many ministries, centers, taskforces, high level committees and (special) advisors etc. are active in the area of Information and Information Technology policies. For an outsider, the relationship between all these bodies is difficult to visualize and understand.

The most prominent organizations appear to be:

- The National Informatics Centre of India (NIC-India), which is traditionally the focal point for the information and information technology drive. Since its establishment in 1977 it has grown into a

gigantic organization covering a wide range of activities from consultancy to video conferencing and website hosting. Besides huge headquarters in the capital it has offices in all 25 states and 540 districts. NIC-India is also responsible for the installation and operation of a nation-wide satellite network NICNET, with 1400 nodes that are in operation since 1988;

- The Ministry of Information, whose tasks include bringing coherence in the planning and execution of many initiatives and projects;

- The National Task Force on IT and Software Development (NTFIT-SD) set up in 1998 with a mandate to formulate the National Informatics Policy. Similar to most organizations in India, the NTFIT-SD is large and has a huge task in hand. Its members include politicians, senior civil servants, representatives of the army and navy as well as successful private sector businessmen. The director of the NIC-India is also a member of the taskforce.

3.5.3 Objectives and Scope

The policies and strategies evolve around:

(a) Citizens and their quality of life. Hence, the citizen - government interface assumes a very important position with respect to the entire delivery mechanism of India's administrative set-up;

(b) The economic aspects of information technology. Stimulation and promotion of this sector are actively and vigorously pursued.

The NTFIT has published on its website three policy reports " Basic Background Reports – BBR's). The latest one BBR 3, which was published in April 1999, outlines the long-term national IT policy. It covers a wide area of topics from strategies, policies, human resource development and IT research and development. Public discussions facilitated through the website about the issues are encouraged.

3.5.4 Approach

The policies described in BBR-3 are oriented towards:

- Creation of an appropriate investment climate;

- Streamlining the procedures for minimizing uncertainty;

- Increasing the velocity of business;

- Growing a proactive enterprise with market aggressiveness and inventive resilience.

The strategies based on the policies are mostly quite practical. They can be divided into Private Sector IT strategies and Citizen IT strategies:

3.5.4.1   *Private Sector IT Strategies*

Major Private Sector IT strategies include:

1. De-licensing and de-regulating the import of software productivity tools should upgrade productivity of the Indian Software Industry. Companies and organizations will be encouraged to allocate budgets for the purchase of such tools. International product certification should be compulsory;

2. The per capita productivity levels in India should compete favorably with those of leading industrialized nations by the year 2008;

3. Government will fund a number of study projects to understand the problems precipitated and solutions required under conditions of high growth rates;

4. Encourage migration of mathematical talents into mathematically oriented software development through adequate number of scholarships;

5. Implement the existing Copyright Law;

6. Establish a string of "IT Enabled Services Habitat Parks" in various cities;

7. Establish the Indian Institute of Global Services. The mandate of this institute would be to provide market intelligence on domestic and global services industry.

3.5.2.1 Citizen IT Strategies

Major Citizen IT Strategies include:

1. Government-wide electronic information infrastructure should be created to simplify service delivery, reduce duplication, and improve the level and speed of service to the public;

2. Government and the private sector have to invest to develop the nationwide information infrastructure necessary for E-Commerce;

3. Encourage the establishment of Internet Service Providers (ISPs);

4. The government and the private sector would need to collaborate to put in place an Electronic Fund Transfer (EFT) system, which is considered critical to the successful implementation of Electronic Commerce;

5. Computers should be made cheaper to increase their penetration. The possibility of procuring cheaper second-hand computers available elsewhere should also be explored;

6. Re-engineering of existing government processes and procedures is essential to bring about transparency in working, reducing bureaucratic controls, increasing efficiency and productivity, reducing cost of service delivery.

7. The Freedom of Information Act to be enacted which shall ensure rights of citizens to have access to information;

8. State Institutes of Public Administration shall be re-engineered to help bring about IT-Responsive State Governments and to orient their thinking on the Citizen-IT Interface;

9. A National Institute of Smart Government shall be set up;

10. Delivery of services should be on "Transaction fee" basis. Private sector should partner with government in electronic delivery of services. Implement a Business Model for join partnership of government and private sector to electronically deliver services on a sustained basis;

11. Service Delivery Points (SDPs) with simple to use graphical interfaces will have to be set up at convenient locations for citizens to access services. These will be established by the private sector. SDPs serving citizens in rural areas should be given special attention;

12. Citizens must have unique identification Cards - the Citizen ID. A single card should help the citizen interact with the Services, make payments, vote electronically, obtain ration card, passport, driving license and so on.

3.5.5 Conclusions

a. Public and transparent discussions form the cornerstone of developing India's National Information Policy;

b. National Task Forces are used to formulate policies and strategies;

c. Most strategies are practical and simple;

d. Information and IT are meant to break through the bureaucracy;

e. Too many players in the field with distributed mandates. This is mainly due to the huge size and the unique experience of governing on such a large scale.

3.6 Dubai Information Policies And Strategies

3.6.1 Introduction

The United Arab Emirates (UAE) is one of the leading industrial, commercial and trading centers in the Middle East. The UAE's plan to economically diversify into the non-oil sectors has been largely successful due to a combination of an open, liberal, and pro-business environment coupled with a strong telecommunications and information technology infrastructure.

The Government of the UAE has been the prime instigator in the advancement of information technology in the Arab region. It has funded significant projects such as Dubai Internet City, a free trade zone created specifically for e-commerce and information technology related industries. Furthermore, the government takes legal issues associated with technology related offenses (cyber crime, copyright infringement, piracy, etc) very seriously.

The government has consistently supported policies to create an atmosphere in which trade and industry can flourish. Policies regarding the advancement of information technology have been aimed at encouraging investors to establish their enterprises in the UAE and at assisting local business people.

3.6.2 Organization

Several organizations play an important role in the formulation and execution of information and IT policies and strategies.

> The Dubai approach demonstrates that direct involvement and commitment of leadership can speed up the implementation of information age in public organisations. A combination of incentives for successes and warnings for failures prove an effective way to ensure the cooperation of all involved officials. The abundant availability of financial resources obviously facilitated the undertaking.

3.6.2.1 The Ministry Of Finance

The Ministry of Finance is the controlling body for the e-government gateway website, and all government agencies and stakeholders dealing with information technology framework are involved in this comprehensive project. The government Gateway "Portal " has links connecting their web sites to member agencies.

3.6.2.2 Dubai Internet City

Dubai Internet City (DIC) is regulated by the "Dubai Technology, Electronic Commerce and Media Free Zone Law No. (1) of 2000". The DIC is a corporate entity known as Dubai Technology, Electronic Commerce and

Media Free Zone, which is financially and administratively independent. Its main premises are in the Free Zone, and it is part of the Government. The DIC is one of a chain of ten Free Trade Zones in UAE that offer unique advantages to the IT industry.

3.6.2.3 The National Telecommunications Company ETISALAT

ETISALAT has a monopoly on electronic communications and controls almost all aspects of the telecommunications industry. Its services and products are modern. The organization has successfully maintained a high quality of service that is on par with western societies. However, ETISALAT services are, on average, more expensive than those in many other nations. This is why some segments of the population are precluded from enjoying many of the higher end value-added services.

ETISALAT has also hindered the growth of the telecommunications market in several ways. Censorship regime imposed with the support of the government has deterred some potential users. Access speeds are also a concern; however, ETISALAT is upgrading its services regularly.

The ETISALAT monopoly needs to be looked into within World Trade Organization (WTO) rules. Definitive plans have not yet been made with regards to the privatization of the telecommunications sector.

Two Internet Service Providers (ISPs) have applied to establish services in the Dubai Internet City (DIC). Services would be limited to the DIC and ETISALAT will remain a telecommunications monopoly throughout the rest of the Emirates.

3.6.2.4 Individual IT Departments And Semi Public Institutes

To encourage and stimulate the growth of information technology in the UAE many of the individual emirates have established IT-related departments. For example, in Dubai, the Chamber of Commerce set up a department to handle electronic commerce related issues and to encourage the development of on-line business.

3.6.3 Objectives and Scope

The general objective is to promote Dubai as a center for technology, electronic commerce and media. Specific objectives formulated to pursue the general objective, range from amendments in legislation and regulations to providing practical assistance to businesses and research centers. The specific objectives include:

- To draw up strategies and policies, and methods of implementation thereof, in order to promote Dubai as a center for Technology, Electronic Commerce and Media;

- To execute studies and advise the Government on laws appropriate to the regulation and promotion of information, information technology, electronic commerce and media;

- To protect data and information as well as intellectual property rights;

- To control crimes associated with Electronic Commerce;

- To promote research and development in IT. The recent establishment of a center of excellence has to be noted.

From Dubai e-government point of view, the initiative will involve applying for any sort of transaction, such as driving licenses, identity cards, e purchasing, work permits, trade licenses, through the Internet. This is also expected to contribute to paperless archiving and information sharing. Government employees will be able to communicate with each other and share information electronically.

3.6.4   Approach

The UAE's new e-government system could be described as: "Government offices will still remain open to the public, but simple transactions like bill paying, queries and license renewals and applications will ultimately be done from the consumer's home". The government uses the Internet as a means of cutting down on paperwork and lowering labor costs by automating the system.

The E-government initiative will apply to all types of transactions, such as driving licenses, identity cards, E-purchasing, work permits, trade licenses. It is also expected to promote paperless archiving and information sharing. Government employees will be able to communicate with each other and electronically share information.

One of the first government agencies to offer services over the Internet was Dubai Ports and Customs (DP&C), which announced the launch of 'E-Mirsal', the first e-government / e-commerce solution to go live as part of its 'IT Vision Year 2000' plan. Recently, Ministry of Finance and Industry has started providing the following electronic services:

- Applying for Industrial Licenses;

- Registering in the Supplier's Record;

- Purchasing online Tenders;

- Certificates of Origin.

As part of these services Ministry of Finance and Industry released the **e-dirham**: a Smart Card as the official paying method through the Internet for the government ministries services fees.

The Technology, Electronic commerce and Media Free Zone (Dubai Internet City promotes a diversity of activities and businesses such as:

- The design, development, use and maintenance of everything relevant to Information Technology;

- Electronic Commerce;

- Telecommunications and media services;

- Provision of services through the Internet or through any other medium including banking, financial services, insurance, education, call centers, marketing operations, information and recreation services;

- Integrated marketing and public relations services:

- Assembly and packaging of products manufactured within or outside the Free Zone:

- Import, export and storage of products:

- The development and manufacture of products:

- Warehousing, logistics, distribution and redistribution services.

3.6.5   Conclusions

In conclusion we can extract the following main points in the Dubai's Information Policies and Strategies:

- Dubai is leading the way in implementing e-government in the UAE. It is striving to position itself as a major technology driven economic center in the world, not just as a regional hub;

- The leadership is directly involved and exerts pressure on civil servants to adapt quickly to the new information age. This is done by offering incentives for successes and warnings for failures;

- Practical policies aim at attracting foreign technology firms to the free trade zones. These policies are part of the diversification efforts.

- Dubai's computer systems are modern and relatively new. This implies an in-built advantage over many western countries, which are still struggling to replace relatively old computer hardware and software;

- Strong government support is offered for educational opportunities in information technology. A clear policy has been adopted to make basic computer skills a key curriculum in lower education institutes;

- The cost of Internet access is still relatively high. A digital divide exists between the various regions of the UAE:

- The tight schedule set for developing the e-government structure has created a situation where work is being done on the ground before any clear definition of information policies and strategies.

3.7   Best Practices Conclusions

Wealth of Ideas

1. The analysis of information policies and strategies of other countries provides a wealth of ideas.

Objectives and Scope

2. The objectives and scope of the information policies and strategies all aim at:

    –   Improving government services;

    –   Economic advancement through enhancement of the competitiveness of the private sector;

    –   Improving the quality of life of the ordinary citizen.

3. The priority and vigor by which these objectives are pursued varies and depends on the developing stage of the country. It appears that developed countries (UK and Singapore) consider information policies and strategies more as being part of their overall policies and strategies. Developing countries see the Information revolution as an opportunity that should not be missed.

Organization and complexity

4. All organizations charged with formulation and execution of information policies and strategies are centralized and operate at a high level within the government's hierarchy, either as a ministry (Singapore, India) or as a bureau attached to the Prime Minister (UK, Egypt).

5. In two countries (India and Singapore), the ministries charged with the information policies and strategies are in fact mergers of the telecom ministries and the (more) traditional information bureaus/centers. Dubai is still an exception.

6. The degree to which the formulation and execution of the policies are dispersed varies and depends very much on the size of the country and government complexity. India's organization for instance is heavily bureaucratic; Singapore is centrally concentrated, while the UK's organization breathes democracy.

7. Direct and active involvement by a country's leadership can have a positive contribution as in the case of Dubai.

Approach

8. The most successful countries (UK and Singapore) have a strong cooperation between the public and private sectors. These countries have also the most explicitly formulated targets. Only in the UK the monitoring and evaluation of the results has been made a separate issue.

9. The digital divide is apparent in all countries. In developing countries it is considered a geographical problem, while in the developed countries it is considered more a matter of education and prosperity.

10. All countries have well defined policies and strategies. Implementation is achieved through coordinated initiatives and projects. Comprehensive master plans/ action plans are not made.

4

Chapter 4 : National Information Policy Framework

4.1 Introduction

This chapter describes the national information policy framework (NIPF). The purpose of the framework is to focus national efforts on the realization of common goals and aspirations. As such it reflects a broad consensus of the main stakeholders. As a framework it should be applicable to the medium to long term (3 to 5 years) and offer sufficient resilience to withstand short-term fluctuations. At the same time it should offer flexibility to accommodate changes in objectives and priorities. For these reasons the framework is formulated on a high level. It represents the "what" and "why" rather than the "how" and "when".

The content is an update of the framework that was defined and formulated in 1998. This update takes into account:

- The changes in thinking about information and knowledge;

- The effects of the ongoing revolution in information technology;

- The IT related initiatives that have recently taken place in Jordan.

Like the 1998 version, the information policy framework consists of eight policy elements. These elements represent aspects for which policies are required. They are largely complementary:

1. **Value & Knowledge of Information,** provides broad general guidelines for dealing with information and knowledge;

2. **Legal and Regulatory Framework,** deals with the approach to rules and regulations that affect the establishment of an information and knowledge-based society;

3. **Role of the Government,** outlines the responsibilities of the Government as main provider of information and information services, the major user of information and information technology and legislator/regulator;

4. **Information Infrastructure,** describes the policies regarding main elements of the infrastructure that is needed for collecting, processing, storing and dissemination of information;

5. **Information Technology,** deals with investment in, and the application of, Information Technology in general and of the public institutes in particular;

6. **Cultural Aspects,** seeks to address the cultural changes that are the consequence of the information and knowledge based society or that are needed for the establishment of that society in Jordan;

7. **The Human Factor,** approaches the Human Resource development changes needed in Education for the information age;

8. **International & Regional Cooperation,** puts Jordan's developments within the context of the information revolution that is spreading all over the world.

4.2   Policy Elements

The value of information depends on its usage, availability and the environment in which it is applied. The opposite is correct as well: the way information, and its specialists, are treated depends on the value of the information for the environment. Four economic classifications can be applied in this respect:

A, Industries where **information is the product**. An example is the publishing industry. All core business functions relate to the collection, processing and distribution of information.

B, Industries, where **information is part of the product**. An example is the banking industry. No activity in modern banking is possible without specific information. The investments in information technology infrastructure and the recurrent cost to collect, process and distribute information demonstrate the crucial role of information in these organizations.

C, Industries, which depend almost totally on **information to market and sell the core products.** The modern airline industry for example cannot market and sell its products without sophisticated reservations systems. The industries falling traditionally in this category invest heavily in information technology and try to get competitive advantages through a better use of information and information technology.

D, Industries, which need **information to report and plan operations.** Many traditional industries, such as farming and food retail, fall in this category. Information in this category, although important for business success, is not considered a core issue or competitive issue. This industry will not easily employ its own information specialists. Rather it prefers to buy the information (if it is not free).

4.2.1   Value & Knowledge of Information

Information derives its value through usage and application. Making information available for useful purposes and to people, who need it, is one of the most fundamental issues of the information age. Therefore the first and overall objective of the NIPF is:

To create an environment conducive to the free circulation of information and to enable Jordanians, through skills and knowledge enhancement, to use information wisely.

The conditions, under which information is managed and made available, depend on its character. Three types of information can be distinguished:

1. Valuable stocks of information, which can be enhanced and traded on the emerging domestic and international information markets, qualify as a national resource. Their development, growth and value enhancement must be part of any major national developmental plans;

2. Information of importance for active citizenship, government transparency, and democratic governance has to be considered as public goods or public information. As such, it must be made accessible to all citizens;

3. Information neither falling into the category of national resource nor into that of public goods & services, regardless of the sector it was generated in, should be traded as a commodity based primarily on its value-added content and the market's demand and supply dynamics.

Recognizing that information has a substantial value implies recognition of the necessity to protect it like any other item of value. Indeed, in all three categories there is potential for substantial loss and harm if information is maliciously or benignly modified, destroyed, corrupted, or replaced.

Reports on the performance of a major corporation, electronic bank teller transactions, private personal or medical records, and reports on possible measures discussed by a government are only a few examples of information seriously threatened by malicious or negligent actions. This is the background for the NIPF's security and integrity policy objective:

To develop and apply an array of procedures, technologies, legislation and enforcement measures to achieve a satisfactory degree of protection of information at the various levels.

National security and political stability are matters of paramount importance that deserve specific security and possibly some restrictions that are developed and applied under NIPF national security objective.

Information related to national security and political stability of democratic governments is of particular sensitivity. Such information needs to be protected while providing for the appropriate mechanisms for the control and accountability of organizations that have access to that information.

4.2.2 Legal and Regulatory Framework

Much has been accomplished during the last few years in the areas of legislation and regulation to:

a. Eliminate barriers to a true and fair information and knowledge-based society;

b. Create a climate favorable for industries based on information, knowledge and information technology.

Still many issues have to be addressed. Underlying related policies can be divided into two main categories:

- Category A, Universal crosscutting policies related directly to information. These policies will help establish the emerging information and knowledge based society in Jordan in a more formal manner.

  Two sub-categories can be distinguished:

  – Balancing rights/interests policies;

  – Access/dissemination rights policies.

- Category B, Policies to reform existing specific legislation and regulation, which have been identified as a barrier for the development of the economy in general and the information industry in particular. Also in this category, two sub-categories can be differentiated:

  – Coordination policies;

  – Electronic information policies.

Legal and regulatory policies per sub-category are outlined below.

The protection of rights of individuals and the promotion of fair competition are universal crosscutting legal issues. These issues were also relevant in the pre-information/pre-knowledge based society. However modern technologies have further highlighted the necessity to address them.

The issue of electronic information is new. It is the consequence of the emergence of new technologies. Embedding these technologies and their products in society as well as promoting their application means that laws and regulations have to be adapted to cater for their specific characteristics.

4.2.2.1   Balancing rights and interests.

The NIPF requires legislation to balance the rights of the government and private organizations to collect information on the many facets of individual and collective activities in Jordan, and the rules governing the purpose and use of such information collections. Related to this issue are:

- *Right of Privacy*: The fundamental privacy premise relates to the rights of individuals to know: (a) what type of information is collected about them, (b) when that information is collected, (c) how that information is legitimately used;

- *Right of Integrity*: Any information collecting organization is responsible for the integrity of the data collected about individuals. Individuals will have to be granted access to all information collected about them. Upon notification, collecting organizations have to correct any false, inaccurate or incomplete information;

- *Right of Confidentiality*: Any organization that collects information about individuals is responsible for the confidentiality of that information. Generic information extracted or construed from information about individuals and/ or groups of individuals, should not reveal confidential information about any such individuals and/or groups.

4.2.2.2 Access and Dissemination of Public Information

- *Transparency to government operations, publicly owned corporations and other public processes*. To support transparency, which is a cornerstone of any democracy, **the NIPF requires legislation and regulation to be established, within the limitations of privacy and national interest, regarding the responsibility of government and public agencies to compile, process, publish, and make accessible information related to their mandates. Transparency can and should be further supported by providing easy access to public information.**

- *Equitable Access to information. Access to information and telecommunications services* is critical for the social and economic advancement of individuals, organizations and society. Some socially or economically disadvantaged groups may not be able to afford such access. **The NIPF requires the establishment of a "safety net" insuring equitable (both socially and geographically) and affordable access to at least some basic information and telecommunications resources and services.**

- *Pricing of Information and Information Products and Services*, the price of information and information services has to be set in principle, in a manner similar to the price of all other essential products and services, by market forces. This might slow down the development and deployment of urgently needed services. Therefore a frequently used model in the industrialized world to promote the rapid deployment of basic services up to a level, where market forces can regulate them, is to limit the number of (public, private or joint) suppliers but regulate the operations of such. **The NIPF supports such a model for a rapid deployment of basic information and telecommunications services across Jordan (i.e. basic telephony services, Internet access, public information and data communications services etc.). It requires that the legal framework for regulations for such operations will not only be developed but also be effectively applied.**

- *Interpretation and understanding of intellectual property rights, access and use of information* is subject the intellectual property right law. While this law is clear, it's understanding by the public it is not always clear. Not everybody, for instance, is aware that according to this law it is absolutely legal to make copies of legally acquired documents and software for someone's own use. **The NIPF supports efforts to raise the awareness of the public on the issue of intellectual property rights, in particular on its background and practical implications.**

4.2.2.3 Coordination

- *Information Industries*, with the emergence of new industries comes the need to set professional standards, provide legal means of preventing and solving conflicts and provide professional liability insurance. **The NIPF encourage these matters to be solved by and through the appropriate professional organizations.**

- *Information Professions*, the emergence of information as an over-arching element in the development of all sectors of modern society has created a number of new professions and skills, which are not acknowledged or appropriately recognized by the current public employment or by professional certification regulations, both of which still reflect mainly the needs of an industrial society. It is important to reform the applicable regulations in a comprehensive way allowing for the fair rewarding of professionals in this emerging sector and attracting more human resources into acquiring these highly needed skills. **The NIPF requires therefore periodical review of laws and regulations organizing information related professions.**

- *Regulatory framework for the coordination of national policies*, The NIPF is embedded in a wider web of national policies in the different sectors. There is a need for coordination and linkage between these policies. Such coordination cannot be left to the insight and initiative of individual civil servants, departments or ministries. **A regulatory framework should be aimed at a decentralized cluster structure inciting and obliging institutions to publish their data in forms useful and useable by others, so that activities of each institution are known to others, duplication of efforts could be rapidly identified, and coordination becomes simpler.** This is embodied in the concepts and adopted structure of the NIS.

4.2.2.4 Electronic Information

Reforms and amendments of a large number of individual laws and regulations needed for an effective implementation of E-commerce and E-banking are necessary. Many of the required reforms and amendments relate to the legal recognition and regulation of electronic transmitted information contained in messages and transactions.

- *Electronic Information, Messages and Transactions, the* **NIPF** *supports standards, regulation and legislation that aim at recognizing, facilitating and promoting electronic documents, messages and transactions.* The principle of non-discrimination should be promoted. According to this principle, information shall not be invalidated, or rejected as evidence in court merely because it has been generated, stored or transmitted in electronic form. A critical condition is the adequate assurance of the integrity and, where pertinent, attribution of an electronic data message or record.

- ***E-commerce, Rules for international and national ecommerce should not be carved out for separate consideration.*** International trade, both traditional and electronic, operates under an existing set of national and international rules for jurisdictional determinations and enforcement of judgments. Proceeding with one set of Convention of

changes marked "for traditional international trade only" while carving out electronic commerce will leave the rules for E- commerce in legal limbo and only increase legal uncertainty for E-commerce. Such legal uncertainty may itself become a barrier and contribute to distortions in the marketplace.

- ***E-crime, seen, as crimes against the information infrastructure rather than traditional crimes facilitated by modern information processing and communication, will have to be prevented, detected and punished. Rules and regulations for this purpose might be needed and will be supported by the NIPF.***

4.2.3 Role of Government

The government has a special role in guiding the nation on the road to the information and knowledge society because:

1. It is the main provider of services to its citizens and businesses. Most, if not all, of these services consist partly of, or are based on, collecting or providing information;

2. It is a key economic factor in the supply and distribution chain. This applies in particular to the Government's role as buyer of goods and services and as an employer;

3. It is the dominant player in the field of information and information processing;

4. It provides legislation and regulation to the private information industry and society

Due to these factors the government has a special responsibility in many of the core issues in the information field.

4.2.3.1 Quality, Availability and Accessibility of Public Information Services:

The prime duty of the government is to serve its citizens. The quality, access and the availability of its services contribute to a fair prosperous society and a dynamic market economy. The government is not only responsible for the quality of its many services including the provision of public information, but also for their availability and accessibility to its citizens and the private sector.

When developing systems and processing information, it is the government's priority to service the needs of all Jordanians rather than its own internal needs.

As for the presentation and dissemination of information, encouraging steps have been taken through the adoption of the NIS and the establishment of the NIC*. Yet customer orientation needs to be continuously improved and be applied to all services provided by government and its institutions.*

4.2.3.2   Relationship Between Public & Private Sectors in Information and Information Services:

The flexibility and adaptability of the private sector is much larger than that

> The ultimate generator of Jordan's wealth is the private sector. The government needs to encourage and promote that sector while protecting national interest and those interests of the individual citizens. Considering the vision on information and knowledge as the base for Jordan's development, this is particularly relevant to the information and information related industry sectors.

of the public sector. Therefore**, private sector services and products should be used for improving the functioning of public sector institutes and the delivery of their services.** Policy implications are:

- *To consider licensing parts of the public sector's information services to the private sector if and when that might be more economical and/or improve the quality, accessibility and availability of these services.* By involving, for instance, the private sector in payment processing or the provision of land information, the flexibility and efficiency of the private sector can be applied to increase the quality of the services and at the same time keep the cost of these services down;

- *To encourage public institutions to engage the private sector in the development and delivery of information services.* For instance, it is well known that the public sector experiences problems in attracting the right caliber and number of information technology specialists. One reason for this is its salary structure. By engaging the private sector information industry, the consequences of this constraint can be minimized while the private sector gets more opportunities and development chances.

Note: in many parts of the world, public and private sector organizations distinguish between core business information tasks and non-core business information tasks. These organizations outsource their non-core business tasks to specialized organizations when this can be done more efficiently and/or more economically.

4.2.3.3   Collection, Generation, Storage and Dissemination of Public Information:

The value of information and information services depends on its users, usage and transparency. Often, it can be enriched and becomes of interest to more users when placed in context and time and/or when geographical analyses are added. *When government institutions provide services then the potential enrichment and extended use of information about these services has to be taken into consideration when and how this information is to be stored, retrieved and disseminated.*

Also, in retrospect, the frequency and information usage need to be monitored to enable evaluation and possible improvement of collection, generation, storage and dissemination strategies.

An example is the recruitment of government employees. Individual vacancies are of interest to all potential candidates and should be publicized on a wide scale together with requirements, salaries, benefits etc. Information about responses, progress and selection process results contribute to the transparency of the recruitment information. Information about vacancies and recruitments has in the past been of interest for scientific and practical policy purposes.

4.2.3.4   Management of the Life Cycle of Information:

Governments of industrialized countries have a mechanism for categorizing information into different levels of importance, validity, duration and classes of dissemination. Rules are applied to move such information into different categories as its importance and sensitivity changes. There are no similar and generally applicable mechanisms and rules in Jordan. Where such mechanisms and rules exist they are limited to simplistic models. As in many developing countries, the more subtle differences between various levels of classification and the implications for handling multiple classes of information dissemination across the entire government apparatus are not well understood. There are also no comprehensive mechanisms for declassifying information, which is an important tool for establishing historical information and providing a measure of transparency on government's handling of sensitive information. ***The government must therefore develop a comprehensive set of rules and guidelines for managing information over its entire life cycle, supported by appropriate legislation where necessary, and applicable not only to the top tier of government but down to the smallest units.***

4.2.3.5   Government's de-facto leading role

Its key role in the supply and demand chain in general and the dominant role in information and information services put the government in a de-facto leading position for modernizing society and business. ***Prudent yet decisive steps have to be taken consistently to lead Jordan on its way to an information and knowledge-based society.*** *Such steps are for instance needed to create acceptance of electronic commerce. One way of doing this is embedding electronic commerce in its procedures.*

4.2.3.6   Facilitation and Coordination

Public as well as private organizations do not like interference in their business. In an information and knowledge-based society these organizations however have a common interest in the elimination of barriers related to information and information services. This is where coordination and facilitation are most needed. Barriers can be found, or may develop, in the areas of *awareness*, *trust* and *access*.

Facilitation and co-ordination does not mean that the government is solely responsible for eliminating the barriers. On the contrary, where and when possible the government should act in partnership with the private sector. The NIS and the NIC are the vehicles through which most of this partnership can and should take place. Steps have already been taken to define the decentralized structure required for interacting with the different sectors and initiating coordinating activities., However, there is, still need for further development, refinement and enforcement of these

coordinating structures, as well as for a greater political and material support. The past successes of the NIC warrant it as the basis for national coordination of information systems and services in Jordan. The needed mandates include*:*

- Promoting the government's label in information and information services. The value of that label is so large that protection and promotion goes beyond the responsibilities of individual government institutions;

A wide *awareness* of what information and information services are available and how to use them is crucial for the future of the nation. The coordinating and, more important, facilitating role of the government in this areas manifests itself in education, training and promoting public awareness about current and future information developments

Trust in information and information services provided by public and private organizations implies not only a high degree of accuracy, completeness and timeliness of information. Misuse and abuse of information has to be avoided to a degree that people and organizations feel secure in using information and information services. Open and easy to use channels are needed for complaints and related feedback. Ultimately rules and procedures have to be set for awarding compensation to individuals and organizations, which have suffered from mistakes and abuse.

Access to information and information services is probably the most important barrier on the road to the information and knowledge-based society in Jordan. Without practical government strategies the digital divide would only increase.

- Definition of responsibilities of the different institutions and organizations constituting the NIS for the development of information sources and resources available in Jordan;

- Coordination of activities (including the determination of suitable procedures) to ensure the implementation of relevant legislation and of such administrative and organizational procedures;

- Preparation of proposals for national policies and strategies related to the information sector, amend such proposals as needed to reflect changes in needs and technologies, and formulate the strategies for the implementation of the policies;

- Preparing and implementing administrative and organizational procedures and arrangements for the sharing of national resources necessary to support the supply, marketing and distribution of Jordanian information in the Arab world and internationally;

- Support and promotion of sectorial information systems and related secondary networks and specialized services;

- Supporting research and development in the field of library sciences, information and documentation, and information technology applications and standards.

4.2.3.7   National Bibliography:

The government has the responsibility to promote and support national intellectual production in all areas, as well as record, publish, protect and disseminate such production and provide the means for its bibliographical control through appropriate information legislation and other means.

4.2.4   Information Infrastructure

A sound and comprehensive infrastructure, is a pre-requisite for a thriving information and knowledge based society. Elements of this infrastructure are:

4.2.4.1   Publishing Industry and Mass Media:

These are the most traditional and well-established components of the information infrastructure in Jordan. They have well defined mechanisms for the valuation of information both in the generation and dissemination phases. They play an important role in promoting the needed attitudes for the sharing and dissemination of information.

Recent developments such as the joining of the WTO, establishing of transparent intellectual property rights, and removing censorship present new challenges to the publishing industry and mass media. They create an environment in which new markets and/or new products can be developed. They enable Jordan to become the publishing hub for the entire region. The industry must be encouraged to use this opportunity.

The NIPF recommends carefully designed incentives to assist the mass media and publishing industries:

- To improve their marketing;

- To improve the quality of their products and services to competitive international levels;

- To modernize their production and dissemination technologies;

- To address new and innovative areas of content.

Such incentives may vary from removing remaining import/export barriers, introducing tax incentives on export of goods and services, supporting international quality recognition, establishing national awards for best products and best quality etc.

4.2.4.2 Telecommunications Industry

The information world is becoming an electronically networked world. Adequate and affordable telecommunication products and services are essential for information and knowledge based society in general and the global participation of Jordan's information sector in particular.

The licensing of private mobile telephone services, the privatization of Jordan's telecommunications company (JTC) and the upgrading of its telecommunication network were all important, positive and needed steps in the right direction. Also positive are the ambitious plans, currently being executed to extend and upgrade rural telecommunication access.

However the telecommunication monopoly granted for another four years to JTC inhibits competition in services, quality and prices during that period. Costs of international connections are a matter of special concern. Competitive low international telecommunications costs, in particular for Internet, are vital for the success of development of Jordan IT sector. Unfortunately these costs are still substantially higher than in other countries.

Also a matter of concern is the cost of upgrading the rural telecommunication network. While this is necessary to address the problem of the digital divide, it would be unwise to cross subsidize and pass this cost on to the business users in urban areas in the form of higher prices.

Another example is transparency. It is the common interest of the nation and JTC to make optimal use of the new network infrastructure. Idle infrastructure, or part of it, represents a loss that can never be recovered. Transparency in cost and demand structures is needed to determine optimal use.

The NIFP, recognizing that the cost and price of telecommunications are of national interest, recommends that:

- **True competition in the telecommunications field will be introduced as soon as this is economically feasible;**

- **Cost and demand structures are determined and evaluated to set targets for the exploitation of the new modern telecommunications infrastructure;**

- **Taken into account JTC's monopoly until 2004, the Telecommunication Regulatory Commission (TRC) should be strengthened as much as needed to enable it to supervise JTC effectively and to design policies and practices that will support national policies;**

- **If cross subsidizing is needed then this should be transparent and socially and economically justified. E.g. in most countries it is**

commonly accepted that private consumers of services in urban areas pay partly for extending these services to rural areas.

4.2.4.3   ISP's

Growth and development of ISP's is hindered by:

- The relative high communications cost.

- A marketing approach by which most ISP's concentrate on competition in the existing market (estimated 30.000 customers in total in the year 2000) rather than on the potential market (estimated 500,000 customers);

- The large investment needed in the form of equipment and licenses;

> Internet Service Providers (ISP's) are needed to provide access services to the Internet for most business and private persons. Healthy, diversified and competitive ISP's are needed for a sound development of the Internet market. Potentially ISP's can develop to become Application Service Providers (ASP's) which provide a range of additional services such as Internet hotels, various forms of IT support and Virtual Private Networks (VPN). The potential added value of such services for national and even regional clients, and thus for Jordan, is therefore substantial.

The policy of NIPF encourages:

a.   The ISP's to co-operate especially in the promotion of their industry and the sharing of their facilities;

b.   Easier procedures to start ISPs;

c.   Fair competition.

4.2.4.4   Internet

In Jordan the use of, and access to, the Internet is high for the young and the well-educated part of the society. It is low in the rest of the society, particularly in the rural areas. Initiatives taken to address this issue, which is part of the "Digital Divide", include the upgrading of the telecommunications network and the establishment of community IT centers. These physical developments are needed and important. Content and awareness of this content is however needed to make people use the new facilities.

The NIPF encourages the development of such content and initiatives that increase the awareness of existing content.

4.2.4.5   Computer Industry

Computers have become a commodity. Component manufacturing and assembling can only be done economically on a very large scale. Added value of such manufacturing and assembling is low. Therefore, the development of such manufacturing and assembling facilities in Jordan has no priority.

However, the availability of a broad range of affordable computer products and related services is a prerequisite for information and knowledge based society. Jordan's liberal policies regarding the import of computers have resulted in a stable computer supply industry and a growing range of related services including peripherals supply industry, computer training, computer installation and configuration, and computer maintenance and repair. Yet the price of these products and services is still a major barrier for citizens and small businesses.

The NIPF encourages measures that will result in lowering this barrier. These measures might for instance include tax incentives to companies, schools and other organizations to provide computers to staff and pupils (for schools).

4.2.4.6   Software Industry

Jordan's software industry currently markets mainly international standard software products developed elsewhere. Product development is limited and concentrates on custom-made software. The industry is fragmented and made up of a large number of small companies.

The recent introduction and enforcement of intellectual property rights removed a main obstacle for the further development of this industry. Developed software is less likely to be pirated and the chance of reselling it with or without minor modifications has increased.

Other obstacles to software development however include:

- The size of Jordan and the small average size of Jordanian companies result in a relatively small software home-market;

- The prevailing opinion that custom developed software better suits the need of an organization;

- The absence of product quality guaranties;

- The absence of well established customer protection measures.

These barriers affect also the chances of Jordan to attract international investments in the software industry.

The NIPF supports measures to remove these obstacles. For instance by;

- **Promoting a common regional market for software products;**

- **Encouraging the introduction of standard contracts, quality certificates, and product awards.**

Information services have existed in one form or another for quite some time: libraries, community centers, professional associations, trade & export promotion organizations, marketing research firms, and the media have all provided some form of information services. The majority of these services were provided as part of a larger sector-specific mandate. The recognition of the central role of information coupled with the rapid strides of technology have redefined information services as an industry with a significant economic potential and social impact.

Call centers (on the low end of the market) and complete outsourcing of IT departments (on the high end of the market) are just examples of information services that have become products of their own in Western countries.

4.2.4.7   Information Services Industry:

Information services depend on other sectors and on awareness and demand. *The NIPF requires that this young industry in Jordan be promoted by:*

- **Conducting regular market research on the size of the potential demand for these services;**

- **Eliminating legal and other barriers;**

- **Making the private sector investments in this field more attractive;**

- **Providing start-up incentives, and contributing public information inputs in compliance with established guidelines.**

4.2.5   Information Technology Policy

The need to invest in Jordan's *"infostructure"* **and upgrade it to world-class level is well recognized.** The previous sections of this report have shown that these investments should not to be limited to information technology only. Investment choices should be made wisely and be spread over all elements of the infrastructure.

However, a significant part of the available resources are, and should be, invested in core information technology. A gap still exists, and it will likely remain between the required or desired investments and the available resources. With the increasingly tight budget of government and the challenging task of rapidly upgrading a large and diverse public sector, there is an urgent need to establish a valid practical and sound policy to

coordinate investments in information technology for the government. This co-ordination should apply particularly to:

a. Common information systems and services;

b. Mobilization of resources;

c. Application of resources;

d. Selection of technologies.

4.2.5.1 Information Technology Management and Investment in the Public Sector

The public sector is made up of a large number of ministries, institutions and bureaus. Many of these organizations have their own IT departments to serve their needs. Collectively, they form the largest user group of information technology in Jordan. These IT departments operate largely independent of each other. Setting of priorities, evaluation of possible projects, mobilization of funds, selection of methodologies, determining technical system standards, setting of performance standards are just samples of areas in which the IT departments operate independent of each other.

Another aspect of concern is the managerial and technical know-how. Many IT staff, often the very good ones, leave the civil service. Training the remaining staff is not systematically pursued. Programmers are promoted to managers without additional training. The combination of lack of coordination and lack of training leads to a serious under-utilization of resources. Examples:

- Each IT department develops, maintains and supports its own budget, accounting and human resource systems. The result is a wide variety of different internal administrative systems for accounting, human and inventory, which essentially perform the same functions;

- Much of the efforts of the IT departments, probably between 50 and 80 percent, are devoted to the maintenance and support of the above-mentioned systems;

- A large proportion, probably 70 or 80 percent, of information systems in the government do not support core tasks but internal administrative systems only;

- Some information systems do not have sufficient maintenance funds. This applies in particular to externally financed information systems, as donors in general do not finance operational costs;

- Occasionally, information systems are being developed and subsequently not used;

- Each IT department is free to set, or not to set, their own standards for security and safety of information and services. Management of the organizations, served by these IT departments, are often not aware of the implied risks;

- A plethora of more or less proprietary operating systems, communications protocols and computing environments spanning several technology generations are in use. Even Arabic coding used for the representation of Arabic information on computers is not unified.

> The coordination of Information Technology in government organizations is limited. It evolves mostly around the acquisition of information technology in government. Selecting product, vendors and approving expenditures are the subject of coordination. The recent E-Government initiative and possible future initiatives such as the reform of the Civil Service are likely to increase the need for more coordination because these initiatives:
> a. Require connectivity between systems that are currently not compatible;
> b. Put pressure on the IT departments to do more for the same, or a just little more, money;
> c. Demonstrate the quality, or lack of it, of the systems directly to outside stakeholders;
> To increase this coordination without introducing another layer of bureaucracy is a challenge.

The NIPF urges the adoption of the following co-ordination policies regarding administrative information systems and their development as well as, IT procurement, budgeting and training.

1. *Different administrative systems within one organization should be made functionally compatible.* Similar administrative systems of different public sector institutions should be functionally and technically compatible and be based on a common suite of software. These systems should be centrally developed and maintained. Implementation should be centrally coordinated and operations should be standardized.

   IT organizations responsible for development and maintenance of these systems should reside under a ministry or organization that has the most interest in it. For instance financial information systems should be the responsibility of the Ministry of Finance. Human resource oriented systems should be the responsibility of the Civil Service Bureau.

2. ***Outsourcing****,* should be encouraged when private companies are able to provide good services for a competitive price. This applies in particular to the development of information systems. Advantages;

    – Transparent cost of investments;

    – Specific needed know-how becomes available if and when needed;

    – Better management of projects.

3. ***Procurement of software, hardware, training and other services should be made as much as possible under framework contracts*** by which the government centrally negotiates prices (per unit or as lump sum) and conditions in advance. Subsequently, any public sector IT department that needs products and services falling under such contracts can just call them off. Such contracts will not only save money, they also promote standardization and simplify procedures. An example of such a deal is the recent Microsoft agreement.

4. ***Investments in systems and services for specific purposes should be carried out and budgeted for by the departments that will benefit the most****.* This measure will create ownership and prevent over demanding.

5. ***Costing standards should be defined that will assist with budgeting for operational and maintenance of information systems and cross cutting IT services.***

6. ***Training of IT managers should be improved.*** General management, business analysis, project management, systems analysis and planning should be modules of a standard IT management-training package.

7. ***Co-ordination between IT managers should be improved.*** Annual, or semi annual seminars/workshops, centered on technical and managerial topics of common interest are an example how this can be done.

8. ***National Information Standards should be defined, established and published for a range of issues.*** Most of these standards may have the form of a recommendation but some will need to be mandatory. The standards might cover equipment, networks, software and information organization. They should be based on open systems concepts as defined by international and Arab standards, dominant (de facto) industry standards and best practices of governments in industrialized countries.

9. ***Only proven technologies are to be applied.*** The mandate of public institutions does not cover IT experiments.

It should be noted that the above policies:

- Imply increased communication between IT departments and between IT departments and coordinating bodies;

- In principle do not require more funds;

- Do not need to increase the bureaucracy.

4.2.5.2   Supporting Local Information Technologies:

The NIPF aims at increasing the IT content of information related industries by:

- Creating the appropriate environment for stable local supply industries in the areas of computers and peripheral equipment, software tools and applications and publishing;

- Encouraging and supporting local or cooperative research & development aimed at producing software serving the country's development plans, upgrading Jordanian products and services to world class quality, or adapting IT to national and regional needs to make it more accessible and marketable to the region in general and Jordan in particular;

- Promoting and supporting the national publishing industry, in particular those components related to information media in Arabic language and those supporting a national information and informatics industry.

The survival of a culture is in its acceptance by the people. Its flourishing is in its appreciation by an increasing number of people. Acceptance is dependent on establishing that a culture is a viable way of life despite ongoing changes. Appreciation of any culture requires broad and deep knowledge of that culture, its products, and the roots of its philosophies, values and beliefs. The new information media provide tremendous opportunities for the survival as well as the appreciation of culture.

4.2.6   Cultural Aspects

The ongoing information revolution has implications on cultural development in Jordan. Falling barriers are exposing Jordanians to foreign cultures, products, interests and values. That exposure is an advantage if it is used to develop sensitivity to, and understanding of, other cultures, and if the new media are used for communicating to others the values and the rich Arab/Islamic culture of Jordanians. Such exposure also represent a risk if Jordan's people are not well prepared for it, and hence restrict themselves to a passive, receiving role.

Thus the information revolution can be looked at as either a challenge or as a threat. The recent initiatives leave no doubt that Jordan chooses to consider it as a challenge.

4.2.6.1   Promoting National Identity

Under autocratic regimes the definition of national identity and culture is relatively simple, although rarely accurate. Under a pluralistic regime, such as the nascent Jordanian democracy, it is a much more complex process as the many social and political groups develop their own perceptions of their identity and culture.

The NIPF promotes the use of the new information dissemination and exchange mechanisms for an active national dialog. The subject of this dialog should be the different perceptions. It's objective is to assist the new Jordanian identity to emerge as developed and accepted by the majority.

4.2.6.2   Survival of National Culture:

The NIPF promotes the use of modern tools by Jordanians to contribute actively to the content creation and dissemination. Through this contribution Jordanians assert (to themselves and to others) that their culture is not one of the past but also of the present and the future. By informing others about Jordan and its society, they expose the world to their culture and values and thus increase understanding and appreciation. Their mere presence in the new information exchange corrects misconceptions and modifies the perception of the world about Jordanians and their culture.

4.2.6.3   Preservation of National Heritage

This is usually achieved by physically preserving products of that heritage from destruction, and by disseminating knowledge about national heritage to as many people as possible. The new tools of the information revolution can support these functions. Many items of national heritage such as manuscripts, drawings, artifacts and crafts are stored in protected locations such as museums; some are in less accessible locations such as foreign museums and private collections. In many cases the fragility of the stored items prevents their circulation and hence limits the dissemination of knowledge about them. The new technologies are making it possible to record accurate images of these items, which can be stored reliably for a very long time at an affordable cost. Subsequently these images can be distributed and be made globally accessible. By disseminating knowledge about such items, knowledge is disseminated about the heritage they belong to. ***It is an integral part of the NIPF to support all activities aiming at preserving information on items that are part of national heritage, and at disseminating such information widely.***

4.2.6.4   Usage of the Arabic Language

Jordan is fortunate in having a well-educated population. The upper tier managers in the public and private sectors as well as its technocracy are fluent in English, the dominant language of the new media. Use of this new

media and technologies is currently limited mainly to the upper social and managerial tier and their families.

If the challenges of the new age are to be met, Jordanians of all walks of life must participate individually and collectively in the broad array of information activities related to the changes in the global environment. For this reason the language issue is highly relevant.

Attempts are being made to introduce and use Arabic standards in media and IT on a broad scale. These attempts were only partly successful. Reasons:

- A full application of these standards is expensive and is rarely done. Without knowledge of English, such IT is difficult to be applied wholly and its benefits cannot be fully reaped;

- Less popular and less frequently used IT products are often not adapted to Arabic standards at all;

- Adaptation to Arabic standards is nearly always done with a considerable time lag. By the time IT products are adapted to Arabic standards, these products are already obsolete;

In view of these experiences and considering the vision on the information and knowledge-based society for all Jordanians, more proficiency of English in broader levels of the society is highly desirable. Arabic language, being the core of the national culture and heritage, should however be preserved.

It is therefore that the core NIPF policy elements in this matter are:

a. Non-technical information produced or disseminated through modern IT and aimed at the Jordan society should be collected and presented in the Arabic language;

b. Information on the use of IT might be in English. This applies in particular in professional environments;

c. Training in English, especially technical English, should be made widely available and affordable to all Jordanians. Modern media form the obvious channels.

4.2.6.5   Jordan as Regional Intellectual and Cultural Center

Jordan maintains good relations with the many different cultures and political systems in the region. It has good universities, a well-educated population. Its hospitality is well known and its national heritage attracts many people from all over the world. This environment makes Jordan a prime candidate to become a regional Intellectual and Cultural Center.

The NIPF supports this by:

- **Broad support for all forms of domestic and regional intellectual production that actively use the new tools, channels and media;**

- **The recording, publishing, protection and dissemination of cultural and intellectual production, as well as the means for its appropriate bibliographical control including legislation;**

- **Actively supporting communication between individuals and groups of people who share interest in intellectual, scientific and cultural issues.**

4.2.6.6   Protection against harmful Information

Some types of available information are incompatible with Jordan's cultural and religious values and standards. Some types are even offensive to certain classes of the society. Such Information may distort the mind of the people and their relations with others and is therefore considered harmful.

To counter the threats by this information the NIPF aims at:
1. **Strengthening the awareness of culture and national values in general and educating citizens about the dangers of harmful information;**

2. **Protecting vulnerable parts of the society, especially young children from access to harmful information;**

3. **Applying technical and legal measures to prevent production and dissipation of harmful information as long as this is technically and economically feasible;**

4. **Cooperation with international organizations to explore ways of dealing with this international and undesirable phenomenon.**

4.2.7   The Human Factor

Central to all the above-described developments are the Jordanian people. They are both objects and instruments of the changes taking place. The information revolution is providing unprecedented chances for a better quality of life. Human individuals and groups have to use these chances. The results will depend on the quality of the individual's or group's education, knowledge, skills, social attitudes and allegiances. Trained and qualified human resources are the most important resource required for the ultimate success.

4.2.7.1   Information as an Instrument for Human Development

Key to the increased productivity of society is the productivity of the individual and his/her capability to act as an effective member in groups and collectives. Effective participation in such collective entities requires (a) awareness of the issues and (b) knowledge of their context and implications (c) coordination of action. Awareness, knowledge and co-ordination are information intensive areas and their effectiveness depends on the information skills of citizens at all levels. To enhance these skills modern tools such as "tele-learning" may be applied in the national educational system at the primary, secondary and post-secondary level. Such enhancements must focus on information literacy in a systematic and integrated way.

The importance of preparing future generations for the post-industrial society does not detract from the importance of assisting and supporting the current generations. These generations have also to adapt to the radical changes, maintain a set of relevant skills and enhance their capabilities to prepare the next generations properly. The challenges posed by the emerging global order require broadly based national capabilities in training and updating the working force at all levels.

The NIPF proposes to address the information literacy issue in the education system, encompassing multiple skill and knowledge areas:

- **Innovation drive and innovation techniques;**

- **Attitudes in information seeking, analyzing and sharing;**

- **Communications skills;**

- **Information organization, storage and retrieval methodologies;**

- **Information processing and telecommunications tools.**

The NIPF requires that the concept of continuing education must be evolved to a life-long learning process. Such evolution needs must be reflected in a human resources development system that is more flexible and more transversally interconnected than the present educational and training systems.

Solely the government cannot provide the resources necessary for such shift. There is an important opportunity and need for the private sector to contribute in this process.

4.2.7.2 Educating and Training of Information Professionals

A small but important group in the entire transformation process forms the information professionals such as computer engineers, system analysts, software programmers, librarians, reporters and intelligence officers. They are essential for initiating and leading the transformation process. They must help establish the new information culture and must both pioneer ideas, projects and attitudes in uncharted new areas. These professionals are the catalyst for new developments in established areas.

Policies and strategies developed under the NIPF must pay particular attention to this small but important group, its role and its needs.

Of particular importance are academic and other institutions preparing and graduating professionals in the multiple specialties of information. These institutions need to be developed, modernized and encouraged to establish centers of excellence in their fields. The general conditions governing their establishment and operation should make it easier to obtain and update the necessary resources for achieving these objectives.

The NIPF affirms the necessity to adopt measures for attracting highly qualified and specialized human resources to work in the institutions of the information sector.

4.2.7.3   Brain drain of Information Professionals

Information Professionals are not only in demand in Jordan. Other countries, in the region as well as the rest of the world, suffer from shortage of qualified Information Professionals. These countries often offer better conditions for work. As a result many professionals opt to leave the country. From an individual point of view this is understandable and from the national economic point of view it results in extra national revenues in the form of remittances. The other side of the coin is that the quantity and quality of the leaving professionals threatens the transformation process. This is in particular the case for government institutions, which cannot offer sufficient attractive remuneration packages.

The NIPF recognizes that there is no easy solution for this problem. It encourages however creative measures:

a. To ease the effects of the brain drain;

b. To let Jordan benefit from the experience gained by the very best of the emigrated professionals.

4.2.8   International & Regional Cooperation

The complex developments driving the emerging new economy can be seen to have two dimensions for Jordan:

- An international dimension, in which Jordan has to improve its global competitiveness;

- A regional dimension reflected in the vision of a common market in the Middle East and North Africa (MENA) that will play its role in the global economy dominated by powerful economic blocks and associations;

The policies and strategies derived from the NIPF must take these two dimensions into considerations.

4.2.8.1   The International Dimension

Major economic blocks are actively designing and implementing their infrastructure and assets appropriate for the new global economy. In the U.S. these plans are most known under the GII (Global Information Infrastructure) while in Europe it is referred to as the "Information Society". Jordan must participate in these processes. Active participation in international organizations, conferences and exhibitions is important but not sufficient anymore. The value of information resources is not only continuously increasing but technology is enabling access to these resources globally regardless of where they are actually located. Therefore the markets targeted by Jordan should not be limited to domestic and regional markets. There is much to be won in making Jordan an attractive location for the storage and exchange of *foreign* information and

knowledge. The last few years much has already be done in this respect. Much more however can be done.

The NIPF requires action to be taken to:

- **Promote and market Jordan as international hub for the distribution of information and knowledge;**

- **Improve the attraction of Jordan for such storage and exchange of knowledge;**

- **Enhance and package Jordanian information to address foreign markets demand as identified by focused market research;**

- **Ensure that national standards are compatible with international and dominant world standards.**

This marketing approach could generate revenue streams fueling the economy and paying for the world-class infrastructure (both physical and human) deployed by Jordan. It is that infrastructure, in its broadest definition, coupled with appropriate strategies to implement the free flow of capital, goods, services and labor that will determine the success of Jordan in becoming a service hub for modern information industries.

4.2.8.2 The Regional Dimension

Regional markets can be seen as part of the international markets in which Jordan has specific advantages: geographical vicinity, common language, similar cultures, similar needs and aspirations. Regional markets with common information standards, homogeneous and reliable telecommunications networks, and lively exchange of information for regional development can provide challenging opportunities for Jordanian information industries. It is in Jordan's interest to support any development strengthening the potential and capabilities of these markets.

Information sectors in the countries of the MENA region are gaining strength in particular through the rapid increase of Internet usage. Yet access to information related to the markets and cultures in neighboring countries is still difficult if not impossible. Indigenous information providers (both public and private) within the region must be further encouraged to enlarge their targeted audiences and reach regional users. Regional "network" initiatives such as RAIT-NET and Peacenet, are important promotion tools in this context.

The NIPF supports all activities aiming at:

- **Defining, using and enforcing common standards in all facets of information handling in the MENA region;**

- **Aggregating, where economically viable, information resources for the purpose of better addressing local, regional and international markets;**

- **Aggregating information demand for the purpose of lowering information cost and negotiating better conditions with suppliers;**

- **Removing barriers preventing free exchange of information related to regional markets and cultures.**

5

Chapter 5 : Information Strategies

This chapter describes the strategic elements aiming at achieving the overall information policy objective:

To create an environment conductive to the free circulation of information and to enable Jordanians, through skills and knowledge enhancement, to use information wisely.

5.1 Introduction

5.1.1 Strategies versus Policies

Strategies are, by nature, more practical and aim at a shorter period than policies. While Chapter 4, the National Information Policy Framework, describes the "what" and "why", this chapter focuses on the "how". The chapter describes these in terms of "**strategy elements**". These elements should be realized within approximately the next three years.

Each strategy element consists of an objective, some background information and one or more recommended actions. The strategy sections follow the same sequence as those of the policies in Chapter 4:

- **Information Value & Knowledge** describes the creation, appreciation, application, quality, quantity and pricing of information;

- **Legal and Regulatory Framework** outlines the main legal and regulatory issues that need to be addressed. Detailed legal and regulatory recommendations can however be found as part of strategy elements in all sections;

- **Role of the Government** covers the strategic elements, in which the government plays a major, or <u>the</u> major, role. It focuses on issues like the role of coordinator and the government's dominating position in the demand and supply chain;

- **Information Infrastructure** describes information sources, media, channels as well as with companies active in the information and information technology sector;

- **Information Technology** covers the strategic elements related to the management of information technology;

- **Cultural Aspects** addresses the potential positive and negative consequences of the information age on culture;

- **The Human Factor** consists mainly of strategic elements that touch on human resources development;

- **International & Regional Cooperation** outlines the strategy for the regional and international relations.

The sections are sub-divided by type of stakeholder:

a. The Citizens, or people of Jordan;

b. The Private Sector, the collection of companies and institutions that ultimately generate wealth for the nation;

c. The Public Sector, which serves both the citizens and the private sector.

5.1.2 Cross Cutting Dimensions

In Jordan, like anywhere else, wealth and prosperity are ultimately generated from a combination of three sources: *natural* resources, *economic* resources and *human* resources. These resources can be considered the cornerstones, or dimensions, of economic progress. Strategies to improve the utilization, quality and quantity of these resources are in general cross cutting, as they touch on many economic sectors.

> The information age will positively affect the quality, quantity and management of the natural, economic and human resources of Jordan. Its overall effect will be an acceleration of the economic growth and an improvement of the quality of life of the citizens.

5.1.2.1 Natural Resource Dimension

Unlike some of its neighbors, Jordan lacks an abundance of mineral resources. However it is not poor in natural resources. Its main strengths are its unique natural beauty and historical monuments. Its main weakness is the limited availability of water. Not only is the average supply of water low in comparison with many countries, it also varies considerably from year to year. Meeting the basic water needs of the growing population is a continuous challenge.

Information strategies obviously cannot contribute to a growth in natural resources. They can, however, enable better management. This is particularly true for the two critical resources: natural beauty and water.

- Better use of the nation's natural beauty leads to an improvement of the tourist industry. This is a complex industry dependant on information. To set good policy objectives require information and a deep understanding of the competitive position of Jordan and the ever changing taste of the tourists. Strategic plans to implement tourist policies are not easy to realize. They involve capital-intensive infrastructures, which require up-front finance and have a long payback period. Tourist operations are also complex. To accommodate large numbers of tourists and to deliver high value services require large-scale cooperation and exchanges of information between different and

independent organizations. Without modern information technology, such cooperation and exchange of information is not possible.

The information age will facilitate the development and operation of the management systems needed for the tourist industry. A number of strategic objectives expressed in this chapter can and will strengthen the planning and operations of this industry:

− The *information value and knowledge* strategic elements, which aim at improving marketing and market research disciplines, are directly applicable to the tourist industry. Selecting the right tourist business targets and choosing the correct means to achieve these targets will depend on market and marketing information.

− The strategic elements that improve *information infrastructure* will provide better services to tourists. They will enable the tourists to access information sources wherever and whenever they choose.

− The strategic elements related to the application of *information technology* support an unparalleled improvement of the services on an individual basis.

• Better use of increasingly scarce water resources is also information dependent. Statistical predictions of future supplies and demands for water are only possible with information systems using advanced technology such as Geographical Information Systems (GIS). Water rationing and distribution can be refined and improved far beyond the rough way it is currently done.

The most important strategic elements that support the improvements in planning and utilizations of water are:

− The information technology elements that will enable development of more complex water management systems than the ones used at present.

− The information infrastructure elements that enable large-scale collection of better geographical data.

5.1.2.2 Economic Resources Dimension

Taking advantage of the economic opportunities offered by the Information Age is likely its most important overall objective. The two basic assumptions, which have proven valid in a number of other countries, are:

a. The application of information and information technology accelerates the productivity of industry.

b. The information and information technology industry *itself* can be a source of economic growth and prosperity.

Understanding that Jordan's productivity can be improved in numerous ways, the national information policy primarily aims to establish new information and information technology businesses and to encourage the growth of existing ones.

A large number of strategic elements support this policy:

- The ***legislation and regulation*** strategy elements seek to create a stable, reliable investment climate for both local and foreign investments; emphasizing Jordan's strategic positions;

- The ***information infrastructure*** strategy improves the ground on which a wide variety of information-related businesses can grow and flourish;

- The ***information technology*** strategy elements ensure that state of the art technology, and knowledge about the application of this technology, are available to new and existing industries;

- The ***government role*** strategy encourages competition on the basis of quality and performance.

5.1.2.3   Human Resources Dimension

Information and Information technology are primarily a matter of human resources. The information and information technology industries, as well as the application of information and information technology, require well-educated and well-trained people. The human resource information strategic elements seek to increase the quality and quantity of Jordan's available human resources. The targets of these elements are people of all classes, all ages and all regions. This will lead to the bridging of the digital divide and improve the standard of living of many citizens.

Specific categories of elements, which contribute directly or indirectly to the improvement of the quality of human resources, are:

- The ***human resource*** development elements, which focus on the education and training of the population;

- The ***information infrastructure*** elements, which will enable access to information and education to all groups of the population independent of the location of their homes;

- The ***government role*** elements, which provide the necessary coordination for these developments.

5.2   Information Value & Knowledge

Throughout their development process, countries have always focused on technologies, most recently, information technology. It is assumed that the introduction or the expansion of information technologies automatically leads to improvement in the quality of life and/or the profitability of companies.   However, the point that is too often missed is that the real benefit to a modern society comes not from the technologies, but from information and its application.

Strategic elements that relate to information and its application are listed in this section.

5.2.1   Citizens

- **The collection, analysis, publication and exchange of information should be free within the boundaries of intellectual property rights, privacy rights and should take into account the national interests and cultural values**. The sources and suppliers of information remain responsible for the content and quality of offered information. Depending on the issue, a number of rules may apply to the generated and published information. These rules should lay in the law and/or public regulations.   The generators and/or suppliers of information are, in principle, liable if these rules and/or regulations are ignored.

  Recommended Actions:

  1. Media should actively solicit citizens to express their opinions and thoughts. The only valid reason to deny publication of information is when it, in principle, exceeds preset boundaries.

  2. Internet Providers should facilitate and encourage the formation of discussion forums.

- **The quality of information should be the full responsibility of the information supplier**.   As with all goods and services, consumers of information need to be assured of quality information.   In this regard, the suppliers of information should be liable if their information is inaccurate or incomplete.   Difficulties in proof and compensation need to be resolved.

  Recommended Action:

  1. A national watch group organization should be created with the appropriate power to follow up complaints arising from inaccurate information.

The cost of information has to be carried either by beneficiaries or by others through subsidizing. Similar to public services, subsidies can only be justified for public information. These subsidies should benefit citizens who cannot afford the normal price.
The price of information has to be determined by the market. A healthy competition will keep the price down and ensures a good quality.

- **Healthy competition in the supply of information should be promoted to ensure the availability of a wide range of information and make it affordable**. In general, intellectual property rights strive to protect sources of information. This protection of the suppliers of information should be balanced by the protection of consumers, see above, and by competition.

  Recommended Actions:

  1. Encourage competition in information supply.

  2. Remove subsidies except for public information (see below), which distorts competition.

- **Public Information should be treated in principle in the same way as Public Services**. Just as the government is offering public services, it also has to offer public information. In fact, public services and public information go often hand-in-hand as services relate to information and vice versa. Social elements are important in public services and public information. Citizens depend on public services and information. Pricing, availability and access are essential elements to be considered from the public point of view. Often, subsidizing information cannot be avoided. However some financial contribution from the users for the information, even if it is minimal, is strongly recommended. Such contributions are needed to make the recipients appreciate the value and to minimize the burden on the government budget.

  Recommended Actions:

  1. Accelerate the establishment of Jordan Information Technology Community Centers (JITTCs) to improve Internet and Information Technology access in remote areas.

  2. Eliminate price and other barriers for the access to the Internet by positive discrimination of elderly, women and deprived parts of the society.

- **The price of information offered by the public sector, except for the public information itself, should pay for its costs**. While the objective of the public institutions is not to make profits, institutions that supply information for certain purposes and target groups should, at least, recoup their costs.

  Recommended Actions:

  1. Amend by-laws to enable a more realistic pricing of the services and information that government institutions provide.

  2. Encourage service and information supplying government institutions to recover at least part of the cost of service they provide.

- **The exchange of information through the Internet and Email should be promoted**. Such exchange enriches the quality of life of citizens and can act as a catalyst to popularize the new media. In all countries, many people and businesses began using the internet in this way. While using these facilities they discover, and start applying, other facilities. Using the new media for the exchange of information will also contribute to the bridging of the digital divide. For these reasons, the sending and receiving of information should be easily accessible, available, reliable and affordable.

  Recommended Actions:

  1. Increase awareness of the Internet and Email information exchange facilities through publications in the media.

  2. Organize trainings for common citizens.

  3. Encourage facilities such as the printing and delivery of Email as an addition to the standard postal services. This will benefit people in remote areas who do not have access to Internet and will encourage Email as an alternative to regular post.

- **The collection, compilation and publication of local information should be promoted through broadcasting media, newspapers and the Internet**. Local information is big business in many countries. All channels can be used for the distribution of local information.

  Recommended Actions:

  1. Amend the law so that private broadcasting services can be established at the local level.

  2. Support organizations that wish to organize or provide local information on a profit or non-profit basis, by providing advice, expertise and possibly lending equipment.

- **The implementation and enforcement of intellectual property rights should be completed**. Jordan has passed the necessary laws and created the organizational infrastructure to enforce these laws. However implementation is not yet 100% and citizens do not always understand its implications, especially those related to copyrights. Some people feel that implementation and enforcement of the law is not yet balanced and fair.

  Recommended Actions:

  1. Review the guidelines and mechanisms for implementation.

  2. Increase awareness of the implications of the intellectual property rights issue through a focused campaign in the public media. This campaign should also cover the implementation approach.

5.2.2   Private Sector

- **Individual companies, chambers of commerce, chambers of industry and organizations of individual companies need to pay more attention to information and knowledge related issues such as market development, marketing, quality control and investment**.   These disciplines are under-developed although essential to the future success of the Jordan private sector, in particular, the information and IT sectors.   Strategic elements to be considered within initiatives such as REACH are:

    − **Individual companies need to cooperate more and exchange information and knowledge about products, markets and market share**. Cooperation between companies is limited or occurs on an ad-hoc basis. In a number of areas, such as market size, market share and customer (lack of) payment discipline, exchange of information can be to the benefit of all cooperating partners. To increase such kind of cooperation is primarily the responsibility of chambers of commerce, the chambers of industry and trade organizations.

    Recommended Actions:

    1. Define per industry type information areas of common interest.

    2. Assign per industry type an independent organization to collect, analyze and publicize product and market data. The collected data should be treated as confidential while the publicized information should be aggregated sufficiently to avoid damage of the interest of individual participating organization.

    3. Amend the rules and regulations of the chambers of commerce and the chambers of industry to make cooperation of individual companies mandatory.

– **The information and knowledge market should be further explored and exploited**. Jordan Information and IT companies that operate in the international market concentrate tend to focus on low value-added and vulnerable activities such as software coding. The opportunities offered by other information services are not appreciated. Those services in the high end of the market, such as information and IT consultancy services, are yet to be developed. The Arabization of software and low-end services such as call centers, have also not yet been explored.

Recommended Actions:

1. Provide tax and other financial incentives to the development of truly new (for Jordan) types of businesses.

2. Seek international technical assistance to develop new products and/or new markets.

Most managers agree that information is important. In practical situations it appears that the value of information is not appreciated. Examples:

The concepts of management information are rarely applied.

Market research and marketing are rare disciplines in the private and public sector of Jordan. As market research and marketing data are seldom systematic ally collected, strategic decisions of companies have often been based on the intuition of the management rather than on sound market information and market analysis.

– **Marketing as a discipline and business function needs to be enhanced**. From surveys and studies, such as the REACH reports, it appears that Sales and Software Development are the main activities of companies active in the Information Technology sector. The value of market information is not appreciated in Jordan as much as elsewhere.

Recommended Actions:

1. Organize marketing seminars.

2. Enhance and promote marketing as a science at universities.

– **Quality Control and the introduction of standards, such as the ISO, are to be enhanced**. What is stated about the marketing applies to quality control as well. Especially for the export markets, the quality is an issue that needs to be addressed. Its importance goes beyond the individual companies, as its affects Jordan's reputation and the value of the Jordan label.

Recommended Actions:

1. Promote quality assurance through tax and financial incentives.

2. Give preferential treatment to ISO certified companies when government contracts are tendered.

> The NIS is a unique concept and the result of a great vision. It needs to be completed and its quality needs to be improved. In particular the updating of the information needs to be enhanced and better organized.
>
> A more active marketing is needed to increase the market penetration of the NIS. The marketing has to go hand in hand with market research to find out what improvements in the information content and presentation are required.

- **The NIS needs to be completed and improved. Most clusters have been implemented.** The remaining clusters have been partly implemented for organizational and financial reasons. Improvement in the quality is needed. Information obsolescence is in particular a problem because of the decentralized responsibility for updating.

Recommended Actions:

1. Complete the implementation of all clusters of the NIS.

2. Improve the quality of the information of the NIS on a continuous basis. Organizations responsible for this updating do need to make more efforts and give more attention to the quality issue.

3. Design and implement procedures to ensure that the NIS quality is regularly checked.

4. Generate feedback from the NIS users and potential users as the basis for future improvements. Such "market" data can be collected by:

   - Measuring automatically the usage of the individual data elements.

   - Inviting users during or after access of the NIS to comment on their requirements.

   - Annual or semi annual surveys.

- **The marketed penetration of the NIS has to be increased.** No accurate figures are available about the actual usage of the NIS and its clusters. However various market indicators show that the awareness about the potential benefits of the NIS is relatively low. Product improvement, e.g. more and better information, and a nicer product wrapping, e.g., an attractive presentation of the information, are needed but will not be enough to increase the market penetration in the short to medium term. Active marketing based on market research per targets group is needed.

    Recommended Actions:

    1. Market the NIS actively by raising awareness and provide special services to various types of industry.

5.2.3   Public Sector

Traditionally the public sector operates somewhat secluded when it comes to providing and exchanging information. In practice information is often considered classified whenever it is not explicitly stated that the information is public or at least to be shared. This approach hinders the free flow of information, inhibits new initiatives to improve the services and leads to duplication and thus waste of efforts.

- **The information collected or processed by government and semi government institutions has to be grouped in four classes: public, personal/private, and classified and normal trade.** By-laws have to be scrutinized and might need to be amended to reflect this classification. In general, too much information in Jordan is treated as classified. This is not accessible to the public, other government organizations or interested parties. This is contrary to democratic principles, hampers co-operation and progress and leads to duplication of efforts.

    Within and among government organizations many differences in access procedures exist for the same type of information. Some of the differences are based on by-laws. Other differences are based on interpretation only. Access by civil servants to their files for instance is not allowed in some institutions while it is open, or partly open, in other institutions.

    Note: the definition for the four mentioned groups are:

    − Public information is information needed or related to active citizenship, government transparency, and democratic governance.

    − Personal/private information is information that relates to natural or logical persons and of which disclosure could harm the privacy of these persons..

    − Classified information is information of which disclosure would/could harm the interest or purpose for which it was collected. Authorizing rules for its access need to be drafted taking into account the needs of other organizations.

- Normal tradable is any other information collected or compiled during the normal operations.

Recommended Actions:

1. Define and publish common standard rules and procedures for access to the various types of personal information.

2. Scrutinize and amend, if needed, the by-laws of the government organizations to reflect the classification.

- **Government institutions need to share more information to increase efficiency and avoid duplication.** Many government organizations use the same or similar information but duplicate data collection. Examples are the personal data and the identification, location and addressing of public sector institutes. As governmental organizations are paid with public finances the utilization of these funds should be as cost-efficient as possible.

Recommended Actions:

1. Assign the responsibility for the collection, analysis and publication of the common information to specific government organizations. Their by-laws might need to be amended to reflect the new responsibility.

2. Amend the budget rules and manpower allocation to enable these organizations to execute their new responsibility properly.

Sharing information lies at the core of administrative reform in general and E-Government in particular. Reasons why information is not shared between government organizations include:

- Legal accountability as expressed in laws and by-laws

- Incompatible and unreliable information systems

- Unawareness of its importance

- Human instinct that says that information is power

- Lack of coordination.

Each of these reasons had to be addressed to ensure that information is shared and duplication of efforts is avoided.

5.3   Legal and Regulatory Framework

Much has been accomplished during the last few years in the area of legislation and regulation. Most noticeable is the enforcement of intellectual property rights.

Equally fundamental, although less important for everyday life, is an information life cycle law that legalizes the gradual declassification, depending on age and type, of confidential and secret information.

To move Jordan to the information age requires many changes in legislation and regulation. Within the framework of the REACH and E-government initiatives many laws and regulations, which need to be changed for that purpose, have been identified. Most of these changes are necessary to remove specific obstacles and barriers. Others are required to introduce the concept of electronic documents and electronic signatures.

Two new areas of legislation are of primary importance for the information age, as they are needed for the adaptation of other laws. These laws concern " Personal Privacy " and the equality of paper and electronic documents.

The strategic elements formulated in this sector deal with the fundamental issues, *personal privacy*, the introduction *electronic documents and signature*s and the *information lifecycle*. One strategic aspect is listed that deals with the practical issue of the many *by-laws of the government*

Protection of personal privacy is in principle a matter of democracy rather than of the information age. However as the information age will result in the sharing on a large scale of information, including personal information, privacy protection becomes essential to prevent that the information age will come at the cost of the privacy.

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institutions that need to be reviewed and adapted to allow for effective sharing of information.

5.3.1   Citizens

- **An umbrella law, or set of laws, is required for the protection of personal privacy**. It is of primary importance and needed as the basis of changes in other parts of the legislation that deal with the relation of citizens with the private and public sectors.

  Personal privacy and protection has in more to do with democracy than with the information age. However the information age will result in the sharing of much information between organizations and this necessitates a comprehensive privacy protection. It may be noted that such laws were introduced many years ago in some European countries. Some of these laws are so strict that they prohibit Government offices of using Email for certain types of information.

  The scope of personal data that needs to be protected covers facts as well as opinions about people and includes authorization and the intention, for which data is obtained, stored or disclosed.

Aspects to be considered include:

- Processing, which needs to be fair and lawful

- Scope of the processing, which needs to be within clear boundaries

- Relevance of its purpose, which should be adequate, relevant and not excessive

- Accuracy

- Aging of information

- Security of the storage

- Protection against transfer outside the boundaries for which the data security applies.

Also to be taken into account are the right of citizen to check the contents and the right to update information to avoid undue problems.

Recommended Action:

1. Appoint a commission, in which the various interested stakeholders are represented, to study this matter and prepare the appropriate legislation.

5.3.2 Private Sector

One aspect of the information age, electronic business, or E-business, will be a key issue in the coming years not only for the private sector but also for citizens and government. E-business requires the legal equivalence of electronically generated and paper documents and electronic authentication (electronic signatures).

- **A primary law should be established that confirms in principle the equivalency of written and electronic documents**. Numerous laws and regulations refer to "written" documents. Many, if not most, of these laws and regulations have to be amended to allow for electronic documents. Rather than changing these laws and regulations on a piece by piece basis and going through the same arguments over and over again it is much more efficient to introduce a set of guidelines on how to implement the principle of equivalence between "paper" and "electron" documents.

Recommended Action:

1. Appoint a commission of legal experts to study this matter and prepare the needed guidelines.

- **Legislation should be put in place for the acceptance of electronic signatures**. The implementation of electronic signatures has to follow subsequently. This legislation issue has much to do with the previous one because of the authentication aspect of electronic documents.

Without a solid solution for authentication, most applications based on electronic documents cannot be legally implemented.

It should be noted that this matter is rather complex in few of the various purposes for which "signatures" are applied. All these purposes have to be taken into account. There is probably no "one solution that fits all". Each application has to be considered and judged on its own merit.

Recommended Actions:

1. Appoint a commission of legal experts to study this matter and prepare the needed changes in the legislation.

2. Assign the task of authentication and administration of electronic signatures to preferably, and independent, organization.

Implementation of electronic signatures is not as a simple task. Signatures are used for many different purposes and in different circumstances. Different solutions might be needed depending on these purposes and circumstances.

5.3.3 Public Sector

- **The transition to the Information Age needs the adaptation of a large number of rules and laws that govern the operation of government institutions.** These rules and laws need to be analyzed and subsequently changed. Without proper measures, and considering the natural resistance to change, many structural changes will be delayed unless a practical approach ensures that these changes will occur in parallel.

To avoid undue delays after passing the above-mentioned fundamental laws, each government organization needs to provide a plan that will:

- Outline the general obstacles for the use of electronic documents and the exchange of information.

- List the procedures and official documents that need to be changed to allow for electronic documents and information exchange.

Recommended Actions:

1. Establish a commission that studies in general the practicalities of the use of electronic documents in government institutions. The objective of this study should be to formulate guidelines for the use of electronic documents.

2. Encourage all government institutes to prepare a plan for the adaptation of their by-law and other regulations that are needed for introduction of electronic documents and the exchange of information.

- **Information life cycle regulation and legislation need to be introduced to legalize the gradual lifting of classification of specific documents after the passing of a specific period of time**. It is generally accepted that documents might be classified because disclosure would/could harm the interest of persons, organizations or the nation. However as time passes, this risk diminishes slowly and eventually vanishes totally. For this reason, and in the interest of the public, the originally imposed classification should be gradually lifted.

  Most democratic countries have already formalized this de-classification process.

  ### Recommended Action:

  1. To appoint a commission in which legal experts and interested stakeholders are represented to study this matter and prepare the legislation and implementation of progressive declassification of information.

5.4 Role of the Government

The government has a special role in the field of information and information technology because it is (i) the main supplier of services and information, (ii) a key stakeholder in the supply and distribution chain, (iii) a dominant player in the information and information processing and (iv) the legislator and main regulator, This role is implicitly as well as explicitly apparent in many of the strategic objectives formulated in this chapter.

The strategic elements formulated in this section concern:

- The relation of the public sector with the citizens and the private sector

- The common interests of public and private sector

- The cooperation among government organizations

- The financing of government information and information technology activities

- The coordination and management of the national information and information technology activities.

5.4.1 Citizens

The strategy regarding the role of the government the supply of information in general and the public information in particular is outlined in 5.2.1. The protection of the citizens and its privacy are detailed in 5.2.2.

- **When undertaking new activities or reviewing on-going information and information technology activities, Government organizations should give priority to the improvement of the quality of services for the citizens and the public sector**. This shift in strategy is compatible with the E-government initiative.
  Most of the services provided by IT departments in the past were aimed at supporting the internal administration. This was partly due to tradition and unawareness on the side of management of the support that information technology can offer.

  Recommended Actions:

  1. Inform management of government institutions on the support that information technology can offer for the core businesses;

  2. Raise the standards for the quality of the core information systems so that non-IT staff will interface directly with information systems;

The information age demands improvement of government services to the citizens and the private sector. Such improvement needs re-engineering of the service processes. This is only possible through the application of modern information technology. The services of the IT departments therefore have to shift from support of administrative and financial functions to support of core functions, This evolution has to be guided by the management of government institutions which should fully accept its responsibility for information and the application of information technology.

- **Government services should be made available, easily accessible and as conveniently as possible, to the citizens for whom these services are intended.**

  Services should be of the same quality throughout the country. By offering the services electronically, the citizens can use them around the clock.

  Manual services however should also in the future remain available for citizens who, for whatever reason, do not want to (or cannot) use electronic services.

  Recommended Actions:

  1. Implement or extend information systems, which support services, in the governorates and local branches of government institutes. Alternatively or in addition, these provincial and local branches should be offered direct access to the central information systems;

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2. Re-engineer service processes to meet the needs of the citizens as well as the needs of the government organizations;

3. Make services available through the Internet when this can be more convenient for the citizens.

5.4.2 Private sector

- **E-commerce has to be implemented to increase the efficiency of the private sector and to enhance the competitiveness of Jordan's private sector**. For this purpose legal and practical barriers should be eliminated. The practice of E-commerce should be promoted.

  Considering the dominant position of the government in the supply and distribution chain, it is inconceivable that E-commerce will be implemented successfully without the government embracing its concept. One of the objectives of the fast track E-government projects for Taxation & Social Security and Selling to the government is to prove the concept of E-commerce.

  A large number of activities are needed to make E-commerce a common practice. Many of these activities have to be undertaken by, or in cooperation, with the private sector.

  Recommended Actions:

  1. Introduce and promote electronic payments on a wide scale for the execution of financial transactions with the government.

  2. Implement legislation and regulation to allow appropriate technologies for payment of taxes and government services.

- **The private sector should be more involved in the Information and Information Technology activities of the government through contracting and/or outsourcing.** The private sector and public sector can both enjoy advantages from more involvement of the private sector:

  – The private sector can benefit from the business and the opportunity to gain experience in new fields,

  – The public sector can benefit through access to knowledge and technologies for which it does not have enough, experience.

  Recommended Actions:

  1. To promote outsourcing and/or contracting as a way to address permanent or temporary human resource shortages.

  2. To exchange best practices regarding contracting and outsourcing between IT managers

- **The quality of services and products rendered by the private sector to the public sector in the fields of information and information technology should be improved**. The responsibility for the lack of quality of some of the rendered services and products lies with the private sector as well as the public sector. A main reason is the tendering practice, which emphasizes cost rather than quality, Other reasons are (1) specifications, which are sometimes ambiguous, (2) contracts, which are at times vague, (3), standards for pre-qualification, which are often not well defined. Best practices of local and international organizations should be taken into account when the procurement procedures are reviewed.

  Recommended Actions:

  1. Amend the government tendering rules and procedures to ensure that the quality of the offered services and products are considered as important as the price.

  2. Standardize government specifications for goods and services. For large contracts they should be drawn up by specialists and/or evaluated by specialists.

  3. Standardize tender documents, contracts, and pre-qualification.

  4. Improve arbitrage rules.

  5. Form a committee, in which a number of IT specialists from government organizations participate, that will devise the amendments. This committee should seek the advise from representatives of the private sector.

The quality of information technology services and products of the private sector to the public sector has to be improved. The main barriers stem from the current procurement procedures, which focus mainly on the price. **Recommended measures** are improvement and standardization of: (1) Specifications, (2) Tendering, (3) Contracts.

- **Innovativeness of the private sector should to be encouraged and promoted**. Many of the companies in the Information and Information Technology sector are small and cannot afford large investments in innovative research projects or products. Yet innovation and creativity is needed as the basis of the future successes of the private sector.

  Recommended Actions:

  1. Promote innovation through incubation projects by (a) more funds, (b) more publicity to increase awareness, (c) clear flexible rules for pre- qualification.

  2. Charge an independent committee with specialists from the private and public sectors with the tasks to supervise the selection and execution of the incubator projects

5.4.3   Public Sector

Overlap in activities and duplication of efforts lead to a waste of resources and are the main reasons why the government services are not sufficiently supported by the IT departments. Other reasons are lack of managerial capabilities in general and unawareness of the potential power of management information systems. Last but not least the budget system does not allow for proper budgeting of IT operations and capital spending. This causes many practical problems for the government organizations and IT departments. It also prohibits proper management reporting about the cost of information and information technology. These problems need to be addressed by an overhaul of the information and information technology management structure and the introduction of a strong coordination.

- **The government should consider improving the management of its human and financial resources and its transparency through the implementation of an integrated computerized government management system.** Like any government, the government of Jordan is continuously faced with the challenge to achieve ambitious goals with scarce resources. Within the next few years it faces tasks like the implementation of administrative reforms, the restructure of the civil service and the implementation of E-government. All this is difficult, if not impossible, without proper information about its human and financial resources and comprehensive tools to manage these resources.

  Integrated information and management systems are widely used as a tool for the management of large private and public organizations. Also a number of developing countries have embarked on projects to implement such comprehensive systems. The implementation however is costly and has far reaching implications. Therefore it should be well prepared.

  Recommended Actions:

  1. To study the best practices of development and implementation of government integrated management systems in developed and developing countries.

  2. To undertake a study on the organizational, technical and economic feasibility on an integrated government management system. If such a system is feasible then the output of this study should be (a) a strategic plan for the implementation and (b) a detailed plan for the initial phase.

The development, maintenance and operation of human resource and financial management systems, which are tailor-made per government institution, inhibit effective and efficient management, leads to compatibility problems, and results on a large scale in waste of scarce financial and human resources. The implementation of an integrated government wide management system, based on an appropriate methodology such a Enterprise Resource Planning (ERP), should be considered.

- **Government organizations should improve the management of their IT departments**. The functions of the IT departments evolve gradually from support of administrative functions to support of core functions. This change has repercussions for the management of these departments. As the success of the government organizations become dependant on the success of these departments, the management cannot be left to technical experts alone.

  Recommend Actions:

  1. Design and implement a management training program for public sector IT managers. Rather than technology oriented, this program should focus on general business planning, resource management, financial analysis etc. Successful completion of this program should be mandatory for IT managers.

  2. Design and implement an IT management course for high-level civil servants. This course should not only focus on raising IT awareness but also on organizational issues related to IT and the management of technical oriented people. Successful completion of this program should be required for positions of Assistance General Secretary and above.

  3. Introduce yearly updated business plans, which evaluate past and outline future IT departments ' plans to improve their services.

  4. Establish IT Management committees, chaired by the management of the government organizations, for each government institute. This committee should act as a steering committee and be responsible for the IT investment proposals and execution of the mentioned business plans.

- **IT managers of government organization should improve cooperation and learn form each other's experience.** The responsibilities of IT managers are wide and their tasks are demanding. The technological, organizational and financial problems faced by the IT managers are often similar. More communication would enable these managers to learn from each other and cooperate to address common problems.

  Recommended Actions:

  1. Organize seminars on specific topics on a yearly or half yearly basis.

  2. Produce a newsletter on a monthly basis.

  3. Establish an organization of IT managers in government, which will be charged with the organization of seminars and the publication of newsletters.

- **Communication between and among Government organizations has to be strengthened**. One of the problems within and among government organizations is the lack of exchange of information and experiences. This is partly due to the absence of communication channels.

  Recommended Actions:

  1. Promote discussion forums, for instance, through the Internet, about topics of general or specific issues.

  2. Promote Email usage for communication between departments and among government staff.

- **The government budget system should be amended to allow for specific information and information technology budgeting and subsequently financial reporting**. Information and information technology expenditures are budgeted and reported at present under the budget-lines: *studies*, *capital equipment* and *office furniture*. This promotes budgeting and accounting creativity but hampers the information and information technology developments. It also distorts the financial management information produced by the General Budget Department and the Ministry of finance.

  Recommended Actions:

  1. Amend the budget law such the various types of investment and operational costs can be properly budgeted and accounted for.

  2. Amend by-laws of the government institutions to allow for tasks to be executed that benefit multiple government organizations.

- **The Information and Information technology coordination and management of the government should be strengthened**. Continuously choices have to be made in the area of information and the application of information technology. The implications of these choices affect the whole nation. To ensure the balance between the various interests and to promote the support of the interested parties, the management structure is needed that reflects the available experience and which has the moral and legal authority to take/propose decisions and supervise the implementation of these decisions.

  Recommended Actions:

  1. Form a permanent top information and information technology management committee in which the various parties are represented.

  2. Appoint high-level "champions" in all government institutions who liaise with the management committee and who are dedicated to the drive to the Information age.

  3. Form technical working committees under the guidance of the permanent committee.

The present budget system has no special provision for information and information technology investment and recurring costs. This leads to uncreative in budgeting and reporting, which distorts proper financial reporting. Most used budget lines for information technology costs and investments are: studies, equipment and office furniture. Other budget lines, such as telephone and communication costs are also included.

Review and modernization of the budget system is long overdue and urgently needed. Proper cost types are needed plus the facility to share cost among government institutions.

4. Publish a newsletter for interested parties and general public about the issues that are (to be) studied, the decisions that have been taken and the progress of the implemented decisions.

5.5 Information Infrastructure

This section describes the strategic elements needed for the creation and maintenance of the modern information infrastructure that is needed as the basis for (a) the competitive information supply to the citizens, (b) for economic growth. The issue of the cost of the information infrastructure has already been partly addressed in section 5.2.

5.5.1 Citizens

- **The information infrastructure should be accessible to all citizens within a reasonable distance of his/her living.** Access to information is a basic right to the citizens. This is already the case for radio, TV and printing press. However access to the new information medium, Internet, is lacking in remote areas. Also the access is experienced as dominated, and accessible to, professionals and young people only.

  Recommended Actions:

  1. Quickly establish new Community Technology Centers in remote areas.

  2. Investigate making school computers available to the general public outside of normal school hours, so as to make more extensive use of available resources.

  3. Explore increasing public internet access through installation of accessible computers in banks, postal offices, libraries and public buildings.

The information and information technology home market is small. This forces businesses to compete in the regional and international markets. However most companies are either too small or too weak to operate successfully in the ever more competitive regional and/or international markets. Measures, needed to strengthen these companies, should include (1) capital injections, (2) loan guarantees, (3) management support, (4) merger and cooperation support.

5.5.2 Private Sector

- **The existing information and information technology industry should be strengthened.** A large part of the existing industry is too fragmented; the average size is too small and the capital basis is too weak. Even the larger companies are small when measured by international standard. Management is generally too much focused on survival on the short term and does not focus on measures needed to compete successfully on the long term in the international and regional markets. The strengthening should be done through a combination of (a) mergers of the weaker companies, (b) strengthening of management where needed and (c) accelerated growth of the stronger most successful companies.

  Recommended Actions:

  1. Form a venture capital fund, which on a pure economical basis, participates in companies that need capital for growth. The participation should in principle be limited to the medium term to enable the revolving use of the funds. Temporally outside management participation might be a condition to benefit from the fund.

  2. Seek technical assistance and make experienced managers available for the medium term on a part time basis to improve management and selected disciplines such as marketing and quality control.

  3. Encourage and promote mergers and take-overs to form stronger and bigger companies. Again experts, financed in the framework of technical assistance projects, could prepare such mergers and take-over.

- **The establishment of new innovative information and information technology oriented companies should be encouraged.** Talented people with bright ideas should get the chance to bring their ideas into practice. Elimination of technical and administrative start-up barriers as well as modest direct or indirect support are needed.

  Recommended Actions:

  1. Create a "one stop shop" that will advice and assist with the administrative aspects of starting new companies.

  2. Improve tax breaks and other financial incentives for the short to medium term, e.g. three to five years.

  3. Offer bank guarantees for potential companies based on sound business plans.

- **The establishment of branches of international information and information technology companies and/or their cooperation with local companies should be promoted.** The purpose of the new companies should not be extra competition on the local market but rather to establish Jordan as the basis for penetration in the regional markets.

  Recommended Actions:

  1. Market Jordan better through foreign trade missions and the oversea embassies.

  2. Compile a coherent and consistent set of financial and administrative stimulating measures.

  3. Offer one stop shop advice and support for potential candidates.

- **The ISPs should be strengthened and their market should be increased.** Most of the local ISPs are small, have a small number of customers and offer a limited product range. These ISPs form a weak part of the infrastructure needed for the Internet.

  Recommended Actions:

  1. Encourage technical and financial cooperation for instance through the sharing of equipment, staff and housing facilities.

  2. Encourage cooperation in marketing for instance through-shared advertisement and promotion campaigns.

  3. Encourage the addition of more products and services such as instance Web hosting, Web design, management and operation of Internet and Email servers, training.

- **The telecommunication network should be considered a national resource. Its use and application are to be optimized from the national point of view.** For practical reasons the JTC has been given telecommunication monopoly until 2004. The interest of a private company is not necessarily compatible with the interest of the nation. The telecommunication tariffs for instance are high compared with the other countries in the region. These tariffs affect the competitive position of the private sector in Jordan. To guard the national interests the Telecommunications Regulatory Commission has been established.

  Recommended Actions:

  1. Strengthen the TRC so that it can operate on the same technical and financial/economic level as JTC.

  2. Consider recommendations of the TRC to JTC and the government as public information and published them.

5.5.3 Public Sector

- **Private sector and public sector (e.g. government) should offer complementary information services via each of the media**. As in most developed societies, Jordan's government and public sector use the media channels to provide information and services to the public. However there is no necessity of any of the sectors to have a monopoly over any of the media. The private sector should be offered better changes to own, administrate or participate in, information channels.

  Recommended Actions:

  1. Ease the regulations, which regulate the involvement of the private sector in the management, ownership and participation in the Radio and TV.

  2. Implement the decision taken in 2000 to designate the NIC as the official Internet channel for the government and public sector.

5.6 Information Technology

This section describes the strategic objectives and suggested actions/decisions regarding the acquisition and management of information technology.

5.6.1 Citizens

- **Information Technology must be made available on a larger scale.** The continuous trend of lower prices and the local preferential treatment of computers have resulted in lower prices for computers. The cost of computers however is still too high for many citizens.

  Recommended Actions:

  1. Extend the preferential tax treatment of computers to auxiliary computer equipment such as printers.

  2. Promote the assistance of private and public companies to their staff with the acquisition of information technology in general and computers in particular.

  3. Facilitate and promote trading of second hand computers. Companies in developed countries replace their computers for technical and financial reasons after three years. These computers can be procured and imported for very low prices. For private simple applications such as text processing, email and simple Internet access, such computers can be very well used for another two to three years especially if they are upgraded modestly.

5.6.2   Private Sector

- **Promote the use of information technology by the private sector**. Like in the government institutions the application of information technology in many local industries is limited to the support of administrative functions. The concept of using the information technology to support the core business functions and to strengthen the relation with suppliers and customers is still unknown to many companies.

  Recommended action:

  1. To increase information technology awareness in the private sector.

Sharing of information among government institutions is required on a large scale to improve services and efficiency. However the jumble of different technology platforms forms a barrier for such sharing. The budget system for instance cannot interface directly with the government accounting system due to different database platforms.

It is recommended that the number of platforms on the medium term to be reduced.

5.6.3   Public Sector

- **The range of platforms for operating systems, database management systems, communication management systems and systems development tools should be limited within the government institutions**. The wide range, that is currently used, creates incompatibility and communication problems and necessitates the maintenance of a wide range of technical skills. Only mainstream open platforms should be considered. To limit dependence on one vendor, the policy of two vendors might be considered for the total government. Each government institution should, in principle, maintain one set of platforms only.

  Recommended Actions:

  1. Select for the public sector two ranges of platforms which meet mainstream and openness criteria.

  2. Negotiate blanket long-term contract for the supply and maintenance of the software products.

  3. Allow individual government institutions to select their platforms from a list of pre-approved platforms.

- **IT department and sections of government institutions should focus their activities on (a) system development and implementation, (b) cross cutting services related to communication and IT training, (c) IT consultancy on the applications, potential improvements and (d) acquisition and management of external services and products.** Partly for historic reasons and partly for pragmatic reasons, the operation and administration of many systems of government institutions is still done by the IT department. Principally this is wrong as this creates ambiguity in the responsibility for the information. In practice it has major disadvantages because it leads to duplication of efforts and sub-optimal use of information.

  Recommended Actions:

  1. Prepare a plan for each government institution to transfer the operational and administration tasks related to application systems to the user departments.

  2. Transfer operational staff to the user departments

  3. Train staff of the user departments to operate and administrate the systems.

  4. Experiment with IT departments acting like service centres. A service centre provides services but the serviced departments carry the cost for the services

- **IT departments should concentrate their efforts on the support of core functions of the government institutions, which they serve**. Probably 70 to 80 percent of the current efforts of the IT departments are used to develop, maintain and operate stand-alone systems, which support the financial and administrative functions. These functions are very much standard and cover functions such as: payroll, accounting, car movement, inventory and diwan. Improvement of core functions as propagated for instance within the framework of the E-government, are impossible unless the human resource used for the development and implementation of these administrative functions are freed for the more essential systems.

  Recommended Actions:

  1. Centralize and assign the tasks for the development and maintenance of the standard administrative systems to one or more central organizations.

  2. Consider the purchase of ready made software as the basis for common administrative systems. As these systems are very much standard and used all over the region, it might be possible to acquire high quality software at a competitive price.

  3. Create a steering group of IT managers to supervise the centralized development and maintenance of administrative systems.

- **The management and security of the internal and external communication networks of the government organization has to be improved.** It is an understatement to say that the local networks, wide area networks and Internet connections of many government institutions are not managed in the best possible way. Overspending, long transaction response times and loss of data and information are possible consequences. The management of the government organizations is seldom aware of the risks for which it is ultimately responsible.

    Recommended Actions:

    1. Raise the awareness of the network risks on which the government institutions depend for their operations.

    2. Make (certified) training of the network administrators mandatory.

    3. Select and apply standard tools to monitor the use of the networks. These tools will enable better capacity planning and load balancing. They also enable to a certain extent to monitor and optimize the network utilization of individual government employees.

    4. Design and implement standard safety and integrity procedures.

    5. Assign the task of scheduled and unscheduled audits of the safety and integrity procedures to an independent organization.

    6. Encourage government organizations, in particular the smaller ones, to out source the network administration.

5.7   Cultural Aspects

The information age influences the culture. It affects (a) the creation, (b) the spread and (c) the enjoyment of culture. The strategy elements formulated in this chapter seek to influence these changes. They aim at maximizing the positive effects and minimizing the negative effects.

Note: Information and information technology have cultural aspects. Culture, visa versa has information aspects. Both aspect types are addressed in this section.

5.7.1   Citizens

- **Information Technology should be better applied to make culture available and accessible.** Culture is a source of enjoyment and education. It enriches the life of citizens. The Internet and computer systems complement radio, TV and the printing press as channels to distribute and access culture. Contrary to these traditional channels, it can offer citizens active participation in the creation of culture.

> Culture plays traditionally a somewhat subdued role in the national policy of Jordan. It is often not considered a priority area. For the quality of life and for the richness of the society however it is as essential as information. Furthermore, the national culture is an indispensable element of the national identity.
>
> The information age offers great opportunities to enrich the national culture. It can also enable large sections of the population the possibility to enjoy the many facets of culture. Not using these opportunities, which require only relatively modest means, would be an act of oversight, which will not be considered kindly by future generations.

Recommended Actions:

1. Take the cultural requirements more in consideration when equipping schools, hospitals, community centers etc, with information technology, e.g. through the addition of multimedia and an interface to the Internet.

2. Promote the establishment of E-libraries and E-museums.

3. Promote Arabisation of cultural information offered through electronic media.

- **Cultural programs and initiatives must be adapted and enhanced taking advantage of the information technology**. The information technology offers the possibility to people (a) to enjoy culture in an interactive way (b) to share thoughts and ideas about culture in an unprecedented way and (c) to add information to culture and arts that increases its value.

Recommended Action:

1. Emphasize in the cultural support programs the added value that information technology can offer.

- **Citizens have to be protected against undesirable side effects of globalization of the information provision**. Unfortunately, globalization of information creation and distribution through the Internet does also present threats to national culture and its values. The legal and technical methods to counter these threats are still limited and might remain so for a while. Countering such threats has to be a mixture of raising public awareness and using the available technical and legal possibilities. In this respect there is not so much difference with the strategies to counter harmful consumer products.

Recommended Actions:

1. Raise the awareness of the public about the dangers posed by harmful information.

2. Cooperate with regional and international organizations to fight cultural threats.

3. Promote the use of software options to prevent access for children to access undesirable information via the Internet.

5.7.2 Private sector

- **ISPs and Internet content providers should enrich their products more by adding cultural elements to the information that they provide**. This can be done directly, for instance, by adding art like music, theatre, drama, films and paintings, to the contents. It can also be done indirectly by adding information about cultural events and organizations and promote discussion groups.

Recommended Action:

1. Promote the addition of cultural elements and cultural discussion forums to the Web sites of the ISPs and contents providers.

- **Market research and marketing of national culture should be undertaken more actively and more systematically**. Culture and art need marketing and market research. Focused and systematic collection of market and marketing information are needed to ensure that the business opportunities offered by culture and arts can be fully used.

Recommended Action:

1. Promote culture marketing and market research.

5.7.3 Public Sector

Promote and support the creation and distribution of culture and arts.

- **The government should fully use the opportunities of the Internet and electronic media to promote and support culture and arts**. Books, music and drama can all be published on the Internet. Also cultural events and cultural organizations can be promoted through the Internet.

  Recommended Actions:

  1. Create a cultural portal to be used to publish (a) various types of culture and arts, (b) upcoming cultural events (c) links to Web sites of cultural organizations.

  2. Use information technology in an exemplarily way in cultural publications of the government.

5.8 The Human Factor

Training and education of citizens form the biggest challenge that has to be faced on the road to the information and knowledge-based society. This is the reason why enormous efforts and the large investments are made in the education initiatives and the technology centers. The strategies underlying these efforts and investments have to be pursued and deserve the highest priority.

5.8.1 Citizens

- **Current initiatives to upgrade the education system and bridging the cultural divide need to be pursued, if possible with more vigor**. The special target groups of these initiatives are the young people, on whom the future of Jordan depends, and the disadvantaged people especially in the rural areas. If anything critical has to be stated in these initiatives then it is about the speed of implementation. Such criticism appears however unjustified when the circumstances and constraints are taken into account.

Recommended Action:

  1. Continue the education initiatives with renewed vigour.

- **To increase the knowledge and information aspect in the education system.** Compared with many other countries Jordan has many Information Technology specialists in the computer science and programming area. It has much less specialists in the systems and information area. The professional level of the specialists in systems and information can be improved.

  Recommended Action:

  1. Improve the system analysis, information analysis and information management curricula of the education programs.

5.8.2 Private sector

- **The professional standards in the area of information and information technology should be raised.** Programmer, network administrator, system analyst, and IT manager are not well-defined professions. For computer users the term "computer literate" is also not well defined. Yet it is widely used, for instance in, recruitment programs. The absence of good definitions and standards for professionals leads to (a) inflation in the professional standards (b) sub-optimal recruitment and promotion procedures (c) less quality in the application of information and information technology.

  Recommended Actions:

  1. Introduce one or more types of a certified "ICDL driving license" for non-IT professionals who use information technology and want to be classified as computer literate.

  2. Promote certified training for IT professionals.

  3. Encourage established computer institutions to take a more pro-active role in raising professional standards.

5.8.3 Public Sector

- **The public sector should appeal more to information and information professionals.** The large turnover of such professionals in the public sector is a well-known and recognized problem with serious consequences. Low remuneration is one, but not the only reason for this phenomenon. Outsourcing of activities can only partly solve this problem. A creative and comprehensive approach is needed to address this challenge.

  Recommended Actions:

  1. Introduce attractive incentives for scarce, but much needed IT professionals.

  2. Experiment with new types of contracts. Bonuses, for instance, could be attached to targets such as the successful completion of projects or the normal completion of long-term employment contracts.

  3. Create a work environment that induces stability.

  4. Provide more financial assistance to long-term training and educational programs aimed at the civil service.

  5. Increase the professional challenge to IT professionals, for instance through job-rotations.

5.9   International & Regional Cooperation

A relatively small country like Jordan has by nature a great interest in International and Regional Cooperation. Through this cooperation Jordan can:

−   Share in the developments for which it lacks sufficient financial or human resources;

−   Obtain assistance for socio-economic development projects;

−   Get access to regional and international markets.

Strategic elements formulated in this section aim at maximizing the benefits that can be derived from the international and regional cooperation in general and in the area of information and information technology in particular.

5.9.1   Citizens

- **Citizens should become more actively involved in international and especially, regional cooperation**. International and regional cooperation is not only a matter of the private and public sectors. It is also a matter of individuals and groups of individuals. The mutual understanding of people and the quality of life of individuals can be enhanced through the exchange of information and the organization of events in, for instance, culture, training and education.

Recommended Action:

1.   Promote the use of the Internet and the Email to exchange information regionally and internationally and to increase the understanding and appreciation for different cultures and people.

5.9.2   Private sector

- **A common regional market for information and information technology products should be established as soon as possible**. Such a market needs to encompass as many countries as possible.

Recommended Action:

1.   Seek regional cooperation and support for the establishment of a regional common market for information and information technology.

5.9.3   Public Sector

- **Jordanian diplomats should be more active to support private sector marketing efforts.** Jordan diplomats and foreign staff have to play an active role to support the marketing efforts of the private sector. They can only do this when they are conversant with the issues and have good relations with the private sector. For this purpose, they should not only be computer literate but also familiar with the many initiatives taken to transform Jordan to an information and knowledge-based society.

  Recommended Actions:

  1. Require all diplomats to be fully computer literate.

  2. Increase the awareness of diplomats in the various information and information technology activities and initiatives through news letters, seminars, etc.

  3. Raise awareness of the support that Jordan's embassies can offer to the private sector through detailed publications on the Internet and brochures.

- **The results of international cooperation should be further optimized through (1) improved coordination, (2) enhanced monitoring of results and impacts.** Emphases is at present on the acquisition of assistance and funding of projects rather than on the coordination of the projects and monitoring and evaluation of result and their impact. Overlap and duplication may occur and the opportunity to learn from the past experiences is not fully utilized.

  Recommended Actions:

  1. Develop and implement a comprehensive information system to support the management and coordination of the development projects executed with external assistance.

  2. Define a set of standard impact, result and effect indicators as the basis for the systematic monitoring and evaluation of the projects.

  3. Develop and implement a monitoring and evaluation system to follow up development projects.

- **The information management and communication, needed for the maintenance and enhancement of relations with regional and foreign countries, should be improved.** Information about relations with regional and foreign countries needs to be properly managed. It needs to be made available to diplomats and others when needed and where needed.

  Recommended Action:

  1. Develop a comprehensive regional and foreign relations information system.