GOVERNMENT OF IRAQ
EGOVERNMENT
STRATEGY

2007-2010

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1.0 EXECUTIVE SUMMARY

The Government of Iraq is in the unique position of developing an eGovernment Strategy in an environment that is receptive to innovative ideas. These information and communications ideas will be catalysts of a positive future. Enduring leadership is required from a respected group from within the Government of Iraq structure to drive new initiatives. Due to the current state of security since 2003, Iraq finds itself coming to terms with how to progress as a nation. The strategic intent of the government has to address issues on social, economic and political fronts.

Firstly, the transformation of government must be a common goal. An eGovernment Strategy has the power to redefine every aspect of how a government conducts its business. Implemented well, it cuts across every function of the business of government. Done poorly, it leaves disruptive elements of process and outdated practices that only serve to confuse the new methods.

The path to prosperity depends on the treatment of certain things; none more significant than the way in which the government chooses to gather data on its citizens in order to provide much needed services to all Iraqis. If careful attention to data gathering is not forthcoming, the base of the pyramid representing social and political cornerstones may well collapse. Some fundamental questions need to be answered before Government Ministries and agencies will be able to make sustainable progress regarding eGovernment initiatives. These questions appear easy, but as the strategy reveals, the answers will be difficult to obtain if a high degree of open collaboration does not occur.

Devoid of any baseline rules of engagement (through laws, policies, procedures), government agencies will only be able to deal with each other on an emotional level. Interactions including exchanging data and inter-Ministerial projects will be limited by the adhoc conditions which will be applied to each interaction. There is no guarantee that when a variable such as a new Minister or Director General IT occurs, that the rules of engagement are repeated or repeatable.

Chance of Success

The eGovernment Strategy will have the best possible chance of success if the process moves forward with high level support and sponsorship

Some of the toughest questions are laid out below, bearing in mind Appendix J lists 270 data driven projects, all with high priorities attached. These projects have implementation time frames of between 6 months and 5 years. Half of these are considered cross-cutting projects, which, by the definition of collaborative eGovernment, require government Ministries and agencies to share data.

Given the context of the current religious and factional situation in Iraq, the five golden questions are as follows:

Determining the purposes for gathering the data

Getting a baseline understanding of the type of data to be gathered

Determining the rules regarding the use, re-use and dissemination of the data

Determining who has access to the data

Determining access restrictions to the data (in the form of clearance levels)

The value of any eGovernment Strategy lies within the ability of the key stakeholders to work together to achieve common and agreed upon targets. Within Iraq, there are a number of fundamental issues to be addressed before the Government can move forward under the banner of an integrated strategy.

This strategy will have the best possible chance of success if certain things are agreed upon. The entire process needs to be carefully supported, resourced and funded. If this process attempts to move forward without an influential and high level sponsor, it has less chance of being ever realized in practice.

The GOI will be best placed to achieve results if all are aware that emphasis should be placed on capturing the whole journey of workflow related change.

Careful criterion selection is needed to identify strategic intent long before the foundations for an eSociety are laid. The Government of Iraq (GOI) has a number of choices, including agreement on the motivations behind pursuing this strategy. The list is long and the verbiage simple, but within each 'strategic direction' lays complex issues needing clarification and resolution.

Through the actions of this document, the Government of Iraq is seeking to use the eGovernment Strategy to:

1. Develop basic government functions that best serve the citizens in need of those services
2. Develop vital government-to-government associations leading to greater sharing of information, systems and governance mechanisms. This type of collaboration can result in well researched proposal documentation when Ministries require new IT systems, or aggregated cost savings when government agencies collaborate to produce economies of scale through their purchasing
3. Alleviate poverty and assist disadvantaged citizens through the provision of access to ICT-supported government services
4. Enhance the skills of Ministry employees in order to assist their delivery of services, starting with the very basic such as access to social safety net offerings
5. Increase the international acceptance and competitiveness of Iraq as a respected regional player with genuine ICT capacity

The Government of Iraq actively participates at many important international gatherings regarding government policy and C21 implementations. One of the goals of the government is to gain international acceptance in the regional ICT community. Full membership in the Arab IT Association would help this cause, giving others confidence in the direction of the economy and its ambition.

The pathway to eGovernment is progressing from the development of a number of high level 'policy and strategic statements' toward the setting of standards, laws and other critical regulations. Capacity building select government staff will also propel the agenda as participating Ministries and government agencies are able to train and retain key personnel. If the government decides the focus should be on ICT skill development and embarks on this aggressively, all of the systems in place by 2010 will be managed by qualified and skilled personnel. If this does not occur, citizen services will languish, and the common Iraqi will be totally unaware of any supposed 'new economy' benefits.

Crucial business decisions will be made over the coming months and years, and the need to understand the connection between business and technical realities is crucial. When the total cost of ownership is overlooked by the Ministry looking for a quick win or quick implementation, what may be overlooked is sustainability in the long run. Section 3.4 poses this question and warns of the need to carefully consider long run costs.

The provision of secure communications within a trusted environment permeates the entire document, which can be turned into an opportunity for this economy. The security situation within many parts of Iraq has caused a sharp rise in the use of communications devices and technologies. Many Iraqi citizens are comfortable with the use of mobile phones and rely on these for a variety of daily uses. Harnessing this 'innovative' mentality could help the growth of ICT and private development in the coming years. The birth of a knowledge economy is possible.

A National Steering Committee with appropriate and adequate representation could drive the ICT agenda within Iraq on a number of levels, and across a number of layers. A number of best practice examples from around the

world have shown this route to be highly effective, if it has the right visibility within the Office of the Prime Minister. It could introduce a number of initiatives including key acts of parliament and the establishment of eGovernment departments within Ministries. It can also champion collaboration mechanisms and help develop channels for cross-agency communication, something which does not score highly at the present time.

With the inclusion of short term targets and key action items over the next 3 years, the document also mentions eGovernment breakdown points, and potential points of weakness. These were included as reality checks, stating the risks and challenges associated with embarking on such a daunting task. Re-engineering a nation can easily meet any number of roadblocks; the purpose for inclusion here is to simply point them out. This includes managing expectations as well the eGovernment initiatives themselves.

The strategic nature of projects, large and small, pilot and enterprise wide are reviewed. The reality check involves the inclusion of a section outlining strategic budgeting and appropriate planning, within a portfolio management context. Certain 'people' questions are posed, in an attempt to marry budget cycles with human investment and human resource allocation. Following this is a chapter reviewing the importance of leadership, and how this is yet another critical variable driving eGovernment initiatives. Another 'human' factor, leadership or its lack of, can be pivotal to eventual success or failure.

Chapter 6 reviews enabling infrastructure and reviews communications infrastructure, including fiber optic networks, copper networks and satellite options. A case for wireless networks gives the alternate view for greater use of terrestrial networks. Solutions such as WiMAX are discussed as a viable alternative for broadband access.

The service-oriented approach is reviewed, with the hope of providing Ministries the flexibility of providing universally accepted interfaces for all users. The only way to build an enduring integration infrastructure is to base it on data structures. The power of XML is explored. XML is shown as an ideal way to model the data and allow the communication between the numerous systems and agencies participating in eGovernment. Another note of caution warns of technology lock-in, which is a theme repeated in the section stating the downfalls of vendor lock-in. The paradox is explored with the government objective of a permanently open, transparent and responsive set of processes and the often closed proprietary supporting technologies used to implement ICT projects.

The high level design architecture for basic eGovernment solutions is explored in Chapter 7, with a focus on security, scalability and performance, accessibility and availability and manageability. These themes continue on into the investigation of data centers (including the establishment of a National Data Center), with a sample architecture and interoperability framework completing the picture. This topic is high on the agenda of both vendor and government official, with much work needed on both the business and technical feasibilities before a solution can be arrived at.

The Government or Iraq is evaluating the world's best examples of how to kick start economic development through infrastructure provision. There are some standout examples of alternate models which fill the gap when traditional approaches seem limited. One such example is referenced from the country of Canada, and its multi-billion dollar investment and not-for-profit best practice example, CANARIE. As the theme of infrastructure provision continues, chapter 8 provides highlights the desperate need for action within the utilities sector. The value of a viable electricity sector quickly points out the potential value of a sector badly in need of reconstruction and momentum.

Topics change in chapter 9, where standards return to the table in the form of an eGovernment Interoperability Framework. The ICT environment can be greatly assisted if the government demands technical standards be adhered to when government communicates within itself. Questions of interconnection, data exchange and accessibility are explored in depth in this chapter. One of the thought bubbles emphatically state "As data becomes valuable information, formal terms and conditions governing information validity, access to, and use of, personal or sensitive information must be agreed in all projects seeking to share, join up or integrate information across traditional boundaries." The theme of securing the personal information of all Iraqi citizens cannot be understated,

and the government must recognize its duty to request, store and retrieve that information for the sole purpose of benefiting the individual Iraqi citizen.

The value of securing information with respect to world's best practices standards, ISO17799, continues the theme in chapter regarding securing information. Some of the topics presented include establishing security requirements, carrying out security risk assessments, and selecting suitable controls for the environment. From a legislative point of view, this section of work requires Ministry-wide understanding and government wide mandates. A necessary area of eGovernment that can yield tangible results such as codifying intellectual property rights is reviewed. A small case study example concludes chapter 10 citing the country of Estonia's battle in 2007 with Cyberwarfare, and the way in which national ICT assets can be ferociously attacked and crippled. Sophisticated attacks can destroy government information infrastructure even with all of the safeguards in place. The Government of Iraq can certainly note the lessons learned from that example.

Train to Retain

If only 20% of government employees could be trained to master ICT applications, Iraq could retain up to 50% of these staff beyond the year 2010.

One of the first steps of a nation as it becomes an information society is its presence on the Internet. Chapter 11 reviews the way in which government agencies and Ministries can register their country level domain through the DOT IQ process. This is certainly one of the preconditions for providing a public presence and public face to Iraqis looking to access services.

The technical theme is suspended in chapter 12, as business fundamentals are reintroduced. The value of presenting a legitimate business case is outlined and an overview of high level principles are included to validate the role a business case plays within transparent decision making. A list of reasons stating the benefits of writing a business prior to committing government resources (financial and human) are included. The transparency theme continues into chapter 13 as the procurement environment in Iraq (current and future) is presented. Management of the procurement process follows, with two compact sections on managing contracts and confidentiality clauses being examined.

In chapter 14, we revisit the theme of securing information. As homeland security can take many forms, the focus on identity management and identification systems is investigated. The chapters begin to merge as elements of this section resonate with earlier chapters discussing data centers and the storage of citizen information. Three case studies are presented: automated passport system; identity management – census database; and the Iraqi Financial Management System. They are presented with the purpose of showing the critical importance of collaboration and information sharing as cross-cutting projects. The risks and challenges associated with such government wide enterprise solutions still remain as a reminder of the many things that can go wrong when Ministries refuse to work with each other.

The final chapter gives a brief look at potential performance indicators. The saying 'if you can't measure it, you can't manage it' also forces the reader to realize that portfolio management is embedded within all ICT projects. A table is included with three columns: eGovernment Indicator; Description; Measurement.

The comprehensive appendix covers a wide variety of areas. It includes: an eGovernment Readiness Checklist; country level domain through the DOT IQ process; the contemporary investment climate in the country; a best practice example of a user friendly gateway to government services through the Kansas portal; the value of exploring open source alternatives within the Brazilian experience with Linux; exploration of an eGovernment Contact Center model; vendor management and why to pay attention to relationship building; a competency checklist for Iraqi government workers; the complete list of proposed enterprise wide government ICT initiatives; as well as practical examples of website standards and minimum security checklists.

2.0 SHORT TERM TARGETS

The task of leading the eGovernment agenda in Iraq over the short term is no small job. This section includes the 'Top 10' project priorities as considered by the National Chief Information Officer and selected review team, as well as the breakdown of deliverables by category: structural, project, and statutory.

The implementation of eGovernment is essential and extremely timely with a number of Gulf countries having accelerated their programs in recent times. Iraq needs to coordinate its eGovernment strategy with project implementations in order to compete in the region, and be recognized as a country serious about public sector reform. However, as with other regional nations, a number of limitations have been identified that limit the potential of eGovernment projects:

Initial and ongoing financing of eGovernment initiatives

Creating a uniform standard between government agencies (from project feasibility to project management and post-evaluation)

Standardizing computer platforms (operating systems and hardware)

The digital divide in Iraq has the potential to widen due to the infrastructural differences between urban and rural/remote areas. Computer literacy is considered extremely low in some areas, and as a result, the concept of eGovernment is almost meaningless in those instances. Many government agencies outside the larger urban centers have primitive ICT. A program outlining the introduction of PCs and telecommunications connectivity will also assist the chances of planned initiatives.

Legislation needs to be reviewed and amended in order to facilitate the introduction of eGovernment initiatives. Outdated laws will hinder the establishment of eGovernment. Progress is being made with the new Transactions Law and the Trade and Investment Law. Further work is being done on Procurement Law, with the areas of eBanking and eSignature needed to further business development in these areas.

The establishment of an easy to use Intranet for government entities is necessary to commence the eGovernment journey. As Ministries develop their intranet, employees can potentially have access to a document management system, payroll and benefits information, and all aspects of human resource management information.

Government agencies traditionally operated as separate entities, each with their own computing environment. Other Gulf nations have addressed the issue of transforming government by outlining 'major and necessary' steps needed to achieve this. They include:

- New or amended legislation
- Necessary government policies, procedures aimed at transforming government service provision
- Government incentives to invigorate the private sector and ICT service industries

2.1 'Top 10' Database Driven eGovernment Initiatives

After in depth consultation with a selected group of Government of Iraq Chief Information Officers (CIOs) regarding a 'Top 10' list of critical eGovernment projects, the following were agreed upon in order of relative priority:

1. Cabinet Ministry – Basic office automation and Internet systems (Estimated Time = 12 months). The ability to deliver this application would prove the concept of the value for provision of necessary eMinistry infrastructure in all Ministries. The higher level objective of transparency and integrity in government would be achieved.

2. Ministry of Interior – Civil Information System/National ID Cards/Civil Registry (Estimated Time = 24-30 months). Implementation of a single database to reduce forgery would allow the application to 'work across multiple Ministries'. The transparency of this solution would achieve high levels of integrity for the government.

3. Ministry of Interior – Government Employee ID System (Estimated Time = 12 months). According to the group, implementation of this solution would 'help us cut out multiple salaries. These are being received by ghost employees who plague current databases'.

4. Ministry of Labor and Social Affairs – Social Security System (Estimated Time = 36 months). The review chose this as a priority implementation as it is a 'gateway through which we look after the interests of the Iraqi citizen'.

5. Ministry of Labor and Social Affairs – Health Insurance System (Estimated Time = 24 months). The review chose this as a priority implementation as it is a 'gateway through which we look after the interests of the Iraqi citizen. This would be greatly strengthened by a law protecting health data gathered'.

6. Ministry of Finance – Budget Preparation System (Estimated Time = 16 months). According to the review team, this application will become a key piece in the efficient execution of ICT projects.

7. Ministry of Health – Medical Cards System & Medical Records System (Estimated Time = 18 months). The idea of these implementations is to take away as much burden from the Iraqi citizens as possible. This type of government wide initiative will have a direct impact on all Iraqi citizens.

8. Ministries of Education/Higher Education & Scientific Research – Student Enrolment System (Estimated Time = 18 months). This initiative will have an impact on every single family in Iraq. It will lift the burden from families as they have to labor through an 'old economy' process of two systems of enrolment for secondary school and for tertiary entrance. The introduction of automation will remove most of the burden from the current procedure, and will also help combat corruption. The transparency of the process will provide a fair and equitable system of entry into some of Iraq's best tertiary institutions. At present, it is plagued with methods favoring the wealthy and the connected.

9. Ministry of Housing and Construction – Housing & Property GIS Overlay (Estimated Time = 36 months). This is considered a vital application as a GIS Portal will greatly assist a number of Ministries in their quest to plan services based on population and other spatial data.

10. Ministry of Foreign Affairs – Diplomacy, Negotiation & Treaty Database (Estimated Time = 24 months). A successful implementation would show Iraq to be serious about interfacing with other nations through a sophisticated system. It would also compliment the current infrastructural plans to link all Iraq Embassies

through a secure intranet system. Security risk assessments carried out in 2007 have highlighted the need for a secure system with access abilities by all satellite offices through a hub and spoke topology.

As is evidenced from the above, only a truly coordinated effort on the part of the Ministries involved will achieve the desired results of delivering at least 50% of these projects within their estimated time frames. This means that the pathway to success will need to include:

1. Confirmation by the National Steering Committee eGovernment Iraq that these projects are the priority in order to move forward with the eGovernment program. Endorsement and cooperation needs to come from the Office of the Prime Minister. This clears political roadblocks as they arise

2. Confirmation that inter-ministerial committees will be formed quickly given the nature of the interrelated projects. The value being provided across government, and in recognition of the value these will bring to the end user, the Iraqi citizen, have to be foremost in the minds of the strategic and technical teams

3. Confirmation that feasibility and business plans are completed which include detailed budget breakdowns and risk management strategies. Given the complex environment within Iraq at the present day, realistic allowances must be made for slippage potential as well as articulated countermeasures to avoid this

4. Confirmation that carry-forwards (from one financial year to the next) will be permitted to ensure completion of projects that overrun their initial projections be properly funded and resourced

2.2 Structural, Project and Statutory Objectives

The following tables give a quick glance at the eGovernment action items until 2010. They have been categorized into structural, project and statutory objectives. It should be stressed that failure is almost guaranteed when collaborative arrangements between stakeholders is weak and political influences dominate.

Structural Objective	Description	Time Frame
Ministry & Government Agencies Register High Level Domains (DOT IQ)	High level domain registration allows Ministries and other government agencies to create their web presence	50% of all GOI Ministries and agencies have a web presence by 2010, using their unique .gov.iq identifier
Single Entry Portal	Providing the official 'one-stop' for citizens of Iraq to commence their 'business with government' in a secure environment. See conclusion (Appendix E) for value statement	By 2010, the iraq.gov domain can be functioning and attract millions of users
Feasibility for IT Cluster & Government Contact Center	Investigation of Science Park development (through public/private partnership) to further ICT-related innovations and applications	Feasibilities completed within the time frame of this document
Establishment of National Steering Committee eGovernment Iraq (NSCeGI)	An inclusive committee established with the right mix of stakeholders and thought leaders in an open public/private dialogue	By 2008
Establishing eGovernment units within key Ministries	This consolidates the ratification of a National Steering Committee and gives it practical project focus	By 2008-2009
Establishing Inter-agency working groups	The true value of eGovernment begins to surface when collaborative cells begin to work with each other as data is shared between Ministries (e.g. migration of Census database project into government-wide	By 2008-2009

	payroll)	
Establishing reporting mechanism to the Office of the Prime Minister	Once the NSCeGI is established, a prioritized list of milestones drawn from this strategy document can be regularly reported to the Office of the Prime Minister	By 2008 (after creation of the NSCeGI)
Promotion of a 'PCs for All' program	The only way to proceed down the pathway of modernizing an economy using ICT is	20% of total population (~3 million) using computers by 2010
Digital Ministries	Digitizing the information within Ministries providing the foundations for Intranet systems; including Enterprise Search feasibility (to significantly enhance Ministry internal search capabilities)	20% of Ministries by 2010
Intranets developed by Ministries and government agencies	Gives government employees access (in a self service environment) access to database management system and human resource information	Implementation in over half of all government Ministries and agencies by 2010
Government Employee Level of Clearance	Feasibility into how to assign varying levels of clearance to government employees restricting their access to sensitive information	By 2008-2009
Establishing International ICT Credibility	As a method of 'self determination', the GOI can aim to host and manage eGovernment Conferences (in conjunction with appropriate transparent private sector support)	Host at least one major annual event, and a number of smaller events (within Iraq and the region)

Project Objective	Description	Time Frame from Commencement
Cabinet Ministry	Basic office automation and Internet systems	12 months
Ministry of Interior	Civil Information System/National ID Cards/Civil Registry	24-30 months
Ministry of Interior	Government Employee ID System	12 months
Ministry of Labor and Social Affairs	Social Security System	36 months
Ministry of Labor and Social Affairs	Health Insurance System	24 months
Ministry of Finance	Budget Preparation System	16 months
Ministry of Health	Medical Cards System & Medical Records System	18 months
Ministries of Education/Higher Education & Scientific Research	Student Enrolment System	18 months
Ministry of Housing and Construction	Housing & Property GIS Overlay	36 months
Ministry of Foreign Affairs	Diplomacy, Negotiation & Treaty Database	24 months

Statutory Objective	Description	Time Frame from Commencement
Freedom of Information Act	To allow the public the right to have access to government documentation	30-36 months
Privacy Act (Privacy of Personal Information Act)	Protecting the personal data of Iraqi citizens as they allow their data to be collected. The expectation is that the government will not disclose sensitive data to any third party for any purpose	30-36 months
Data Protection Act	The protection of information stored in government databases intended to provide services to Iraqi citizens	30-36 months
eGovernment Administration Act	To formalize the processes and procedures provision of governance mechanisms. It will set the boundaries and guidelines of engagement	24-36 months
Corporate Reporting of Financial Information	The requirement of the private sector to disclose certain data to government for auditing and taxation purposes	30-36 months
Health Information Protection Act	The medical records of Iraqis, as gathered to assist their health needs from a public health system perspective need to be protected as a professional courtesy	30-36 months
Electronic Record Keeping and Archiving Standard for Government Agencies	A system created to ensure that data captured is recorded and archived in a framework allowing for universal access. All agencies will be required to meet the guidelines for electronically published material for new website content	30-36 months
Digital Signature Law	Allowing Iraqis to accept electronic signatures as a way of transacting without the need for paperwork, but carrying the same authority	30-36 months
Cybercrime & Cybersecurity Law	A system clearly mandating punishments for attempts at using electronic methods (including identity theft) to defraud or profit illegally	30-36 months
Metadata Standard for Public Websites (government)	Ensuring that GOI Ministries and agencies websites comply with metadata standard	30-36 months
eGIF	Mandate electronic government interoperability framework (Technical Standards V1.0	24 months

Table 1: Short Term Targets 2007-2010

2.3 Broader eGovernment Objectives- Target 2010

The Government of Iraq has to commission a number of endeavors to produce ‘quick wins’ for the eGovernment program. Due to the lack of coordination displayed in the past, a number of key coordinated projects are needed. These include:

1. Design, launch and construction of a comprehensive national portal offering relevant and searchable information regarding government, services and relevant news
2. Shared Services Agreement and Initiatives across government
3. Telecommunications and Communications commitment to broaden Internet access
4. Alliance partnerships – with local and international ICT vendors (including re-sellers)

The United Nations eGovernment Readiness Survey 2004 assessed how willing, ready and able governments around the world are to exploit the opportunities offered by ICT to increase the quality of life for their people. Access to basic social services can be accomplished through the careful feasibility and execution of key projects.

The survey assessed the public sector eGovernment initiatives according to a weighted average composite index of eReadiness. Key inputs were website assessment, operating telecommunications infrastructure and human resource utilization. Idle and ill-equipped human resources remain one of Iraq's current weaknesses and also biggest untapped strengths with the national unemployment rate of approximately 20% (2006).

It is noted that despite progress, the lack of infrastructure and education are serious barriers at producing an enabling environment. Threaded through these is the safety situation, as a constraint for attempting to operate in a regular and orderly business environment.

2.3.1 Iraqi 2010 Vision

Iraqi 2010 Vision

A government sector delivering integrated services and improved opportunities for community participation. Maximizing the extensive Iraqi Telco network & emerging wireless technologies

- The Iraqi Public Sector begins to deliver effective and efficient services through a 'Whole of Government' perspective
- Iraq is a full participating and voting member of the Arab IT Association Arab League of Nations able to enjoy strong relationships with its neighbors Jordan, Egypt, Syria and the United Arab Emirates
- eGovernment initiatives are considered as an integral component of business planning processes across government.
- Knowledge sharing tools and processes are shared across the GOI providing a more unified way of dealing with the customer.
- Public sector employees recognize the opportunities of eGovernment to deliver citizen-focused services and incorporate the principles of eGovernment into their day-to-day work.

2.3.2 Institutional Framework

For the successful management and cultivation of eGovernment, institutional mechanisms need to be a priority. World best practice examples show that success in eGovernment requires:

a. Effective interagency coordination
b. Accountable eGovernment personnel
c. Direct and regular access of these personnel to political leaders

2.3.3 Infrastructure Requirements

Telecommunications and ICT infrastructure is a prerequisite to the establishment of eGovernment. Short term investments need to be incorporated into the longer term strategic infrastructure plan mapping coverage, penetration and quality of service expectations. One of the limiting factors to government service provision in Iraq at present is the inconsistency of electricity supply. Steps need to be taken to ensure a supply of power to the urban areas where the government agencies operate, in order for service to the community to continue.

2.3.4 Legal Framework

The development of an effective legal framework for eGovernment requires coordination among agencies (preferably a coalition derived and sanctioned from the National Steering Committee eGovernment) in drafting and enforcing practically related laws and regulations.

The Central Provisional Authority (CPA) Orders 2004 remain as the Law of Public Contracts (Order 87) with the Regulations recently released and gazetted (2007). Presently, there are no procurement departments within many government offices. Another limiting factor is that procurement committees exist for only six months.

One program worth noting is the creation of the well staffed Procurement Assistance Center (PAC) operating within Baghdad (2007) and employing a mix of local Iraqi nationals and foreign advisors aiming to spread the basic principles of procurement as a government wide initiative. The impacts of the program will assist the future of eProcurement initiatives, as it is building the capacity of purchasing officers as well as giving structure to the processes they employ when buying on behalf of government.

Incremental 'e' Development

Achievable results will be better than spectacular but failed ambition

2.3.5 Iraqi Membership in the Arab IT Association

For Iraq to be considered a truly regional player and participant in IT, acceptance into the Arab IT Association is of primary importance.

The Arab ITA is an Arabic professional non political body following the Council of Arab Unity in the League of Arab States dedicated to serve the needs of the Arab IT community. Its mission is to provide a forum within which the normally competitive IT companies in the Arab world could work together to improve the industry and to maintain the high level of business practice among its membership.

The Arab ITA was formed in 2001 with participating countries being Egypt, Jordan, Kingdom of Saudi Arabia, Kuwait, Morocco, Palestine, Syria, and the United Arab Emirates.

The members of the Arab ITA focus on:

- IT Services
- Internet
- eCommerce
- IT-enabled Services
- Software

The value of Iraq membership into the Arab ITA would come in many forms, including accelerated maturity of the government sector and welcoming greater private sector development within Iraq and the region, as government replaces 'old economy' thinking with contemporary ways of thinking and solutions.

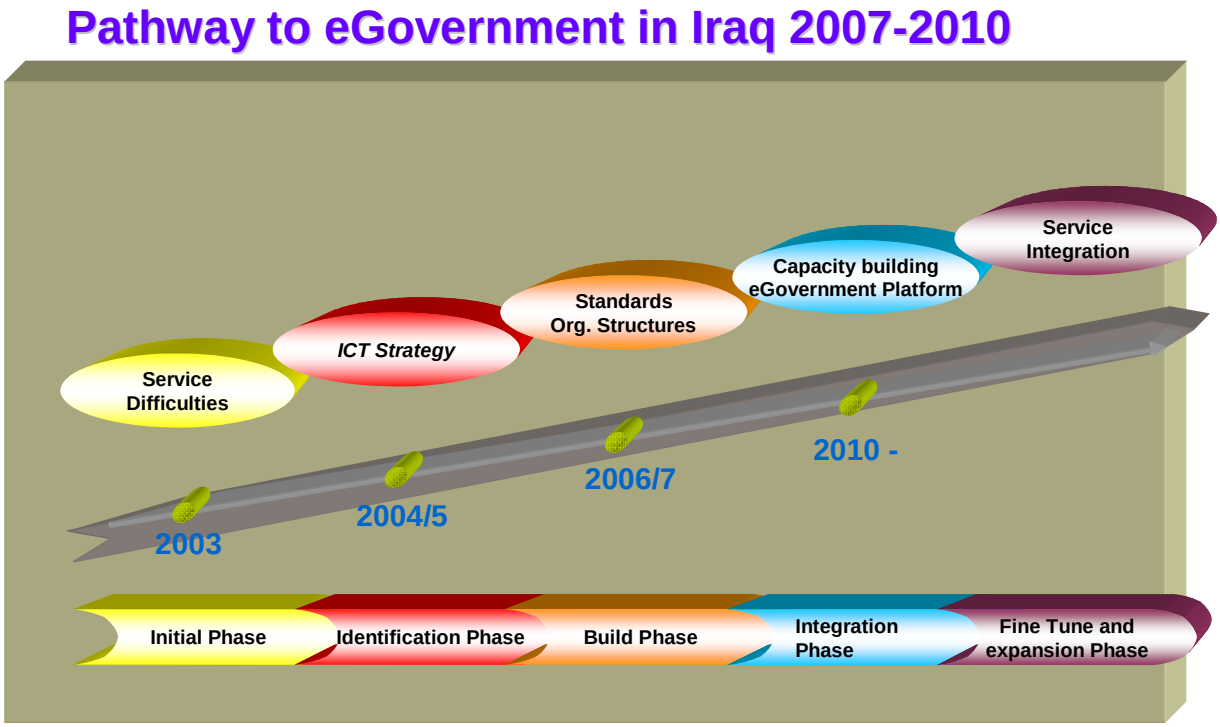


Figure 1: Pathway to eGovernment in Iraq 2007-2010

3.0 EGOVERNMENT VISION

The Government of Iraq wishes to deliver basic services to its citizens, wherever they may live, in a form able to be received by the people. This vision demands a unified government position with active involvement from key Ministries and thought leaders. A sound governance structure within government is needed to support the particular needs of e-government transformation.

The extent of the challenge is clear. Without input from a wide range of groups, an incomplete and potentially poorly constructed system will result. Samples from at least three distinct groups are vital:

- The people who will administer the systems – The Government of Iraq
- The people who will be called upon to shape and produce the systems – private sector and other partners
- The people who will use the systems – The citizens of Iraq and other interested parties

The greater the number of empty chairs at the table, the greater the challenge will be. If the building blocks are misplaced in the early stages of development, the task of replacing or reshaping them becomes increasingly difficult over time.

The Challenge

The challenge is clearly a public and private sector one. The greater the number of empty chairs at the table, the greater the challenge

This eGovernment Strategy combines priority eGovernment initiatives and projects, identifies first steps and targets and gives a clear roadmap as to what is needed to achieve these. The degree of implementation success will depend on a minimum amount of factors coming together well at the same time. These include:

- Political will and the identification of a champion
- Ownership by a critical mass of strategic Ministries
- Agreement on the goals of forwarding eGovernment within this country
- Inter-Ministry agreement as to co-operative and collaborative sharing arrangements (knowledge and skills)
- Agreement on a way forward (projects and desired outcomes)

In order for a manageable eGovernment implementation program, a number of ‘first move’ initiatives need to be outlined and agreed to.

3.1 eGovernment Stakeholders

The citizens of Iraq, government agencies, the private sector and political leaders are all key stakeholders of eGovernment. A number of Iraqi Ministries are already acknowledging the cultural shift that needs to take place in the minds of their leaders. This is seen through working with the private sector to further the government’s drive to begin along the path to a measured eGovernment program.

3.2 The Benefits of eGovernment

The adoption of e-government innovation and strategic planning will have benefits for government in the delivery of more effective and efficient information and services to the citizens of Iraq. The key benefits for both agencies and citizens are outlined below:

- Minimizes Iraqis needing to know how government is organized or who provides the information and services they require;
- Assists in the development of a culture of integration and collaboration within and between government;
- Allows easier access for Iraqis to participate in government decision-making;
- Provides greater choice for Iraqis to access the information and services that best suits their circumstances;
- Allows Iraqis to access information and services at times more convenient to them and within a safe environment;
- Allows government agencies to deliver information and services more effectively, cheaply and conveniently.

Bridging the digital divide through ICT infrastructure improvements will have the objective of allowing poor and disenfranchised Iraqis gain equal access to government and information services.

The adoption of eGovernment innovation and strategic planning will have benefits for government in the delivery of more effective and efficient information and services to citizens of Iraq.

1. Government IT Services – The development of the government information network should provide information service to all government agencies for improving public services. The missions should be: basic infrastructure transportation services connecting users to a high speed government information network; network services consisting of secure email, multimedia applications, web hosting, distributed computing services, application and information services, and program delivery services.

2. Reduce the Digital Divide – by working with and between all levels of government (including local government) to co-ordinate activities. The government can claim success when the poorest neighborhoods have access to basic ICT infrastructure, giving them access to government for the first time.

3. Housing key Government of Iraq information within a secure National Data Center. The value of a knowledge management approach to information storage and access will help mature the handling of critical information. The key to this project will be the information security component to maintain the integrity and protection of collected data.

4. Assisting the development of a culture of integration and collaboration within and between all levels of government in Iraq

5. Allowing easier access for citizens to participate in government decision making by receiving the basic services required to function within this newly forming society

6. Giving Iraqis greater choice to access the type of information and services that best suits their individual circumstances

7. Creating a totally new environment for suppliers and government to interact. Online trading eliminates the need for paper-based activities relating to processing orders and getting paid through the use of email and the Internet. Information and services are delivered more effectively, cheaply and conveniently

3.3 eGovernment Implementation Roadblocks

Old economy ways of doing the business of government plague many emerging economies. At present many layers of government of Iraq are said to operate using old economy ‘bricks and mortar’ methods. It does not help that

blackout periods of no electricity are the norm rather than the exception, with periods of only 1-2 hours of grid electricity being standard at many Ministries. Reliance on generators has become a permanent operating expenditure within a departmental budget. This will be addressed in chapter 8 which refers to the state of electricity provision within the country and the remedial efforts taking place or being planned.

Added to the power shortages, transactions at all levels can be characterized by process inefficiency, poor service quality, wastage and redundancies. The move from the office of the Prime Minister in mid-2007 to request Ministries to focus on their 'organizational development' processes is in recognition of these facts.

From the point of view of the end user, the Iraqi citizen, the public sector has to overcome:

- *A high level of fragmentation and duplication*
- *Poor execution and completion of planned improvements*
- *Low accessibility to government information by the public*

This last point is one of the cornerstones this strategy seeks to overcome in its three year life span. Transforming government is characterized by four stages of 'growth', similar to the 1960 W.W. Rostow model introducing the 'Five Stages of Economic Growth'.

One fact that should not escape policymakers is the fate of another 'emerging market' which attracted the following commentary on its progress:

"Even with the current public sector reforms which have placed emphasis on privatization, deregulation, monetization of benefits (to aid the citizen), anti-corruption act and initiative to improve due process and transparency, public analysts says little may be achieved if government business continues to be conducted the old way".

The final clause is noteworthy of comment. The fact that reform becomes meaningless if support is not forthcoming underlines the need for collaborative effort.

Finally, the conclusion is reached that:

"For government to enhance its image, provide an environment where it is easier to comply with rules and regulations and decentralized power and decision-making and utilize resources in value-added activities, analysts say governments at all levels must embrace electronic government or e-Government."

The achievement of transparent and decentralized government is an outcome not supported by all. The pursuit of eGovernment is, by definition, an agreement by government to share the way in which it reaches decisions, organizes itself, and engages the citizens of Iraq.

The focus for eGovernment in Iraq should be to increase the convenience and simplicity of Iraqi citizen interaction with all levels of government.

3.4 eGovernment Business and Technical Realities

Entrance into the 'new economy' demands a minimum level of understanding of how business and technical realities converge. A decision to invest has many facets to it. Once the government Ministry or agency outlines how a certain technical application will enhance its ability to service the 'client' (that is the Iraqi citizen), it needs to

marry the technical solution with business realities. The business case will investigate the various technology options and, done carefully, will provide a total cost of ownership viewpoint.

Figure 2: CMoore eGovernment Application Development Expectation

Decision makers can use the CMoore eGovernment Development diagram to measure the success of their eGovernment implementation. The time dependent outcomes are explained in order as follows:

- As an application is being installed (such as the database for a financial management system), it is expected that errors are to be found
- As the application is installed on the chosen hardware, the number of bugs should significantly reduce after stress testing and be ready to roll out around the 6 month mark
- The application should remain stable for around 2 years, at which point the introduction of Service Packs as either upgrades or fixes are applied. This can last for the remainder of the useful life of the software application, after which time, new technologies and ways of conducting business will have changed. This often requires a complete overhaul and the evaluation of new alternative application packages

The Government of Iraq decision makers in each Ministry need to be aware of the different software options available in the market. If they require a government wide and enterprise strength solution, the business case should include analysis on the stability of the implementation based on the CMoore diagram.

If this is considered, they will be better informed before the decision to buy is made. This is guaranteed to save them both resources and time once the integration work begins. The actual time saved and financial resources invested wisely could easily add into the billion dollar category.

The due diligence component of evaluating the track record of selected vendors includes:

- Investigating vendor claims regarding functionality
- Investigating vendor claims on the ability to offer systems integration and other technical support
- Investigating the track record of previous implementations of a similar scale
- Verifying references from previous customers – government and private

The transformation of government services can be severely limited if the above is not taken into consideration by qualified Government of Iraq decision makers. The decision to provide electronic government services is not only a financial one. The existence of a prepared business case will also help expose some of the elements illustrated above.

3.5 Transforming Government – Characteristics of the Four eGovernment Stages

Since 2003, the Government of Iraq has made significant progress in attempting to reposition its service delivery to citizens. Through a number of delivery agents and partners, substantial nationally-driven projects have been undertaken. These include reconstruction efforts within the financial, legal, utilities and banking sectors. Capacity building efforts have been paramount in this sustained effort to retool the workforce, and equip it for the demands of a new society. Much of the transformation has ICT as a major component and contributing factor. The dramatic uptake in cell phone (or mobile phone) use is an example of this thirst for connectivity.

Key stages of government agency development are best described by the Gartner 'Characteristics of The Four Stages of eGovernment' service transformation model. Organizational improvements are built into each stage which acts as a building block for the proceeding one.

The key elements of the four stages are briefly outlined to illustrate how the Iraqi Public Sector will progress toward a transformational model of government service delivery. At the national level, each Ministry will progress according to its purpose and ability to respond to the current environment and needs of citizens. There are no distinct boundaries between stages, and Ministries may progress to a more complex stage in some aspects, but still be dealing with other internal issues from a previous stage.

3.5.1 Stage One: Online Presence

This stage is represented by government agencies raising public awareness of their purpose and services through a web presence. Government department basic service offerings are offered, including the type of services provided and some detail regarding operations. Contact details are also given to enable citizens requiring further information a contact point. There is limited opportunity for citizen interaction or interactive two-way communication without using traditional channels of service delivery. Information manipulation is also limited. The Ministry of Foreign Affairs and the Central Bank are contemporary examples of agencies with websites offering information about what their agency does, the service being provided and how they operate.

3.5.2 Stage Two: Interaction

This phase represents the primary development of citizens interacting with government via online facilities. Within Iraq over the past few years, this also represents a difficult phase to navigate through, due to the security situation. Whilst citizens may still access information and services through traditional channels, such as by phone or in person, phase two represents an environment in which citizens can order and execute services online. The reliability

of telecommunications infrastructure determines the success or failure of this phase. This is also problematic in Iraq at the moment.

The use of information databases and search mechanisms increase citizen and government interaction during this phase. Progress toward this (2007-2010) for Iraq will be a positive move, as citizens need to be given greater access options when dealing with government service offerings. As physical safety rates highly at present, it is paramount for a stable underlying infrastructure to facilitate G2C interactions. This phase also introduces the creation of common entry points which reduces the need for citizens to understand government structures before they access government services. Another potential benefit for all is the initiation of high-volume transactions in some instances.

3.5.3 Stage Three: Transaction

Moving from phase two to three will be a notable moment in the recent history of Iraq, as in this phase, citizens freely choose their preferred method of accessing government services. This can be online, wireless or PDA technologies for example. During stage three, government agencies undertake incremental business process reviews in order to offer services through a variety of channels. The convenience factor for citizens and businesses using government services should be noticeably better, as the structures of government further dissolve.

There is an increase in shared services and collaboration between agencies results in greater information sharing and service initiation. Identity management and security concerns are effectively managed so that e-government service delivery is high. Personalization of service delivery is common, and value-adding ensures services are in high demand. Communication between citizens/business and government has evolved into more of a dialogue between parties as services are further refined to suit market demands.

3.5.4 Stage Four: Transformation

The mechanisms of eGovernment are hidden from the public, as seamless interaction is offered and expected. Relationships are completely transformed as the integrated service delivery model and citizens, government and business co-exist with minimal friction. Multiple service delivery channels exist, and are being constantly expanded. The mechanisms of eGovernment are taken for granted as part of everyday life and the ‘e’ gradually loses meaning to be just ‘government’.

Service delivery mechanisms mature to a point where a trusted environment of interaction between Iraqi and Citizens and business have an implicit trust and confidence in their engagement with government, and the concept of ‘government as a servant of the public’ is truly realized as personalized, pro-active service delivery mechanisms become standard.

The distinctions between agencies at all three levels of government (local, provincial, national) become minimally important as collaborative service delivery is a standard operating procedure. Achieving an optimal outcome for the citizen within the shortest amount of time is expected. Government services are highly personalized, independent of channel of delivery or service provider.

Government achieves a high rate of transparency, as citizens are able to participate as little or as much as they wish in influencing government decision-making and policy outcomes.

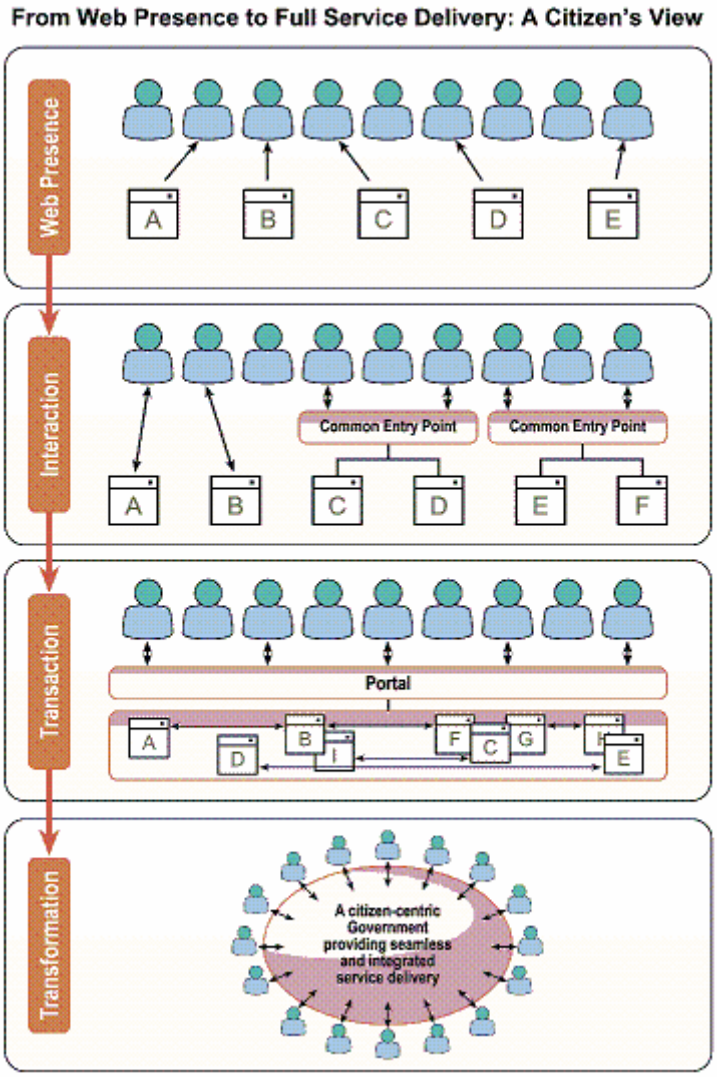


Figure 3: Web Presence Citizen View of eGovernment Services

3.6 Whole of Government Approach – Provision of Secure Communications within a Trusted Environment

One of the biggest challenges to e-government development in Iraq at present has been the security situation. eGovernment becomes possible when staff from government agencies have the opportunity to meet with each other and discuss areas of project commonality. Online and offline relationships are paramount to the success of eventual electronic relationships.

One of the dangers is 'silo' or agency-centric approach of government, where information sharing is limited. This extends from an organizational level down to the working patterns of individual government employees. For e-government transformation to succeed, a shift will need to take place at every level of government in Iraq.

The Value of Relationships

Online and offline relationships are paramount to the success of eventual electronic relationships

In 2007, Iraq is still at the first stage of development, as agencies begin to promote their services and highlights through a web presence. Some of the Ministry websites provide good information about the functioning of that Ministry, but need to reconstruct their presence with the aim to increase interaction with the Iraqi citizen seeking their service. The increase in Ministry high level domain registration is one of the key performance indicators for this stage of growth.

The GOI should pursue IT development in the public sector as a major enabler for a knowledge-based economy, believing that Iraqis will continue to increase their demand to achieve IT literacy. This will in turn lead them to determine how they wish to deal with government agencies and ministries, and begin to dictate how they will access services. With reference to the current security situation in Iraq, it is logical that more citizens will look to source government services and information from the safety of their home through an Internet connection if it is available.

At present, many Iraqi citizens have limited contact with government agencies. Due to this, the public sector needs to work on its image as being a unified and coordinated body, and not a collection of disparate agencies delivering different services. As the Iraqi public sector begins thinking of itself as one, agencies will open themselves to possibilities and opportunities for sharing. The benefit to them is being able to draw on the collective wealth of information, skills, knowledge and support they are beginning to build up. The citizens of Iraq will gladly participate in the development of a knowledge economy; one which understands their deep need to connect with others, locally and internationally.

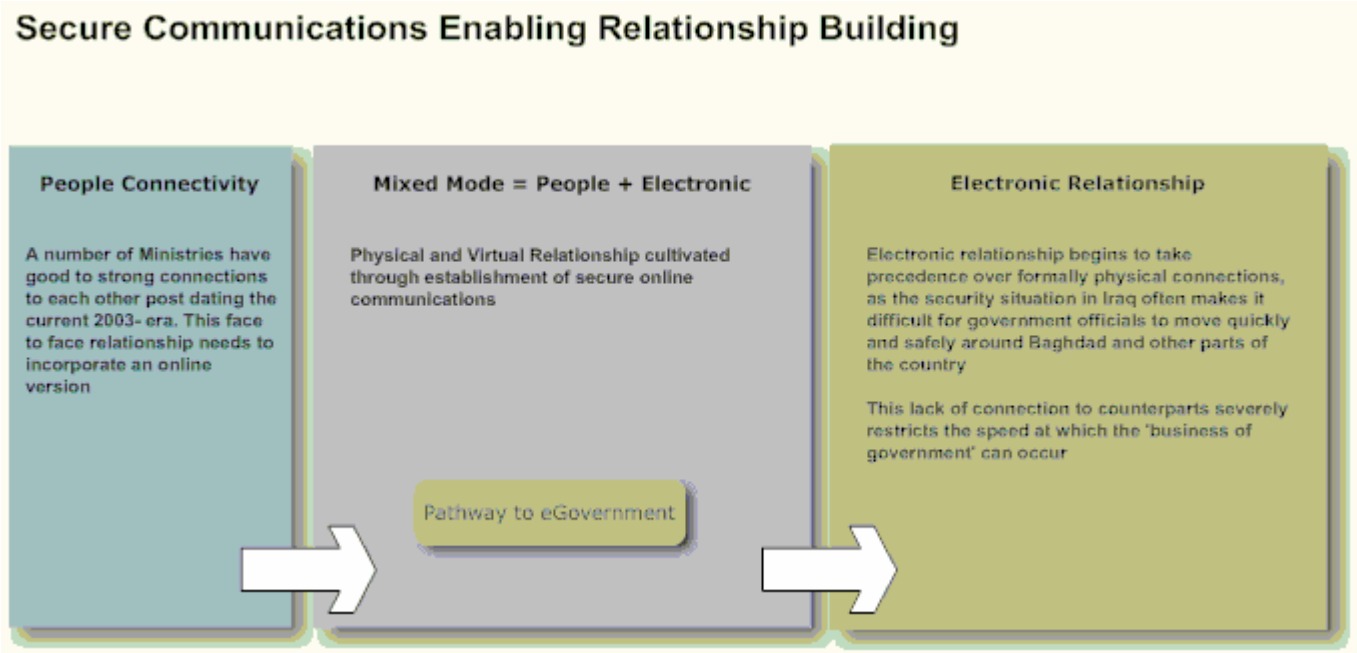


Figure 4: Pathway to eGovernment

3.7 National Steering Committee for eGovernment Iraq

For the Government of Iraq to be seen to be taking eGovernment initiatives seriously, a number of things need to occur:

- Establishment of an inclusive National Steering Committee eGovernment Iraq (NSCeGI)
- Develop a GOI eGovernment Administration Act
- Establishment of eGovernment Units within key ministries
- Establishment of inter-agency working groups to align and co-ordinate key cross governmental policies and initiatives
- Establishment of a regular reporting mechanism to the Office of the Prime Minister concerning milestones of the eGovernment program

To accelerate the process of establishing an eGovernment platform and mandate, the GOI should use the frameworks already in place through the office of the Acting National Chief Information Officer (NCIO) initiative to produce a definitive eGovernment Administration Act. This enactment will trigger vital law and progress the major eGovernment initiatives over the next 3 years (2007-2010). As long as there is a clear demarcation of responsibility for eGovernment planning, projects and cooperative ventures will have a greater chance of success.

The role of the National Steering Committee eGovernment Iraq (NSCeGI) has the major role of offering much needed support to the various levels of government. A strong leadership role will slowly encourage government departments to change the way they view their own service to the Iraqi citizen. The NSCeGov can champion collaboration mechanisms and help develop channels for cross-agency communication. As mentioned in the executive summary, the reasons for gathering data need to be determined well in advance in the design of systems aimed to deliver government services. If this is not adhered to, the probability of failure is high. Collaboration

between Ministries and agencies will be dependent on personalities. It is rare for this condition to have any positive outcome.

The NSCeGI will also identify and remove inhibitors to cross-government cultural change and will lead and facilitate whole-of-government initiatives to positively affect the change in culture.

As government begins to think and act differently, government workers will see the effects of their efforts through their participation in particular projects. The NSCeGI will continue to reinforce the need for the transition to a more corporate way of thinking for e-government to succeed.

National Steering Committee

Utilize the talent & experience of key ICT members of progressive Ministries to drive the agenda

3.7.1 The Role of NSCeGI

The National Steering Committee eGovernment will work to identify areas where the implementation of e-government initiatives would be impeded by a lack of adequate governance mechanisms and options for cross-government service delivery. Where possible, the National Steering Committee eGovernment will work with government agencies to develop flexible collaboration frameworks to deal with these issues.

Government transparency and accountability occurs when government reviews the way its internal processes are set up and managed.

The goal is for greater service orientation through a customer-centric focus. The National Steering Committee eGovernment could oversee projects such as:

- Government-Wide Strategic Intent
- Project Lifecycle Management
- Investment (Portfolio) Management
- Change Management
- Organizational Development
- Capacity Building
- Communications and Public Relations

The coordination of any e-government project is going to be a significant governance issue when trying to initiate, develop and maintain cross-agency initiatives. The National Steering Committee eGovernment will collaborate with the Ministry of Finance to address issues such as the initial point of funding for collaborative projects, joint Ministry funding bids and ongoing project responsibility.

3.7.2 The Role of Agencies

Partnering on eGovernment initiatives across agency or jurisdictional boundaries requires flexibility and accommodation on behalf of all agencies. In particular, government officers at the level of Director General IT (DG/IT) or equivalent need to take responsibility for reducing the systemic barriers existing within their organizations preventing them from participating in collaborative opportunities.

As governance frameworks for working collaboratively are developed, agencies should adopt the 10 Principles (outlined below in 3.8) and seek to utilize the common ground this offers as a starting point for investigating partnerships to grow their service delivery potential.

3.7.3 The Key Role of Ministries – A Change Management Perspective

At a national level, the role of Ministries in realizing this e-government enabler will be challenging. Currently, agency business is predicated on the specific mission of that particular agency, not the wider needs of the customers it serves, the potential of the information it may collect, the expertise it may harbor or the strategic direction of government as a whole.

As a starting point agencies need to introduce the notion of the Iraqi Public Sector as a business identity into their day-to-day and strategic decision-making processes. Agencies will also need to put in place workplace learning and knowledge sharing networks where staff can join together to solve problems and make decisions.

The e-government environment will also require public sector staff to be adaptive to change. The low levels of staff utilization needs to be addressed, as unproductive staff needs leadership to motivate them. The burden of reporting absorbs much of the time of the people in the positions of Director General.

The idea of having the Iraqi 'Chief Information Officer' considered an important member of the executive will help the 'new economy' projects. The ability to enthuse staff of the mission of the Ministry is a challenge across all Ministries.

Action Items

Establishing eGovernment Units within key ministries to co-ordinate key government wide projects

Produce and inclusive eGovernment Administration Act

3.8 National Steering Committee eGovernment – High Level Principles

These principles aim to provide a secure and trusted foundation for government-wide integrated service delivery projects for the Government of Iraq.

10 Key Principles for the National Steering Committee eGovernment Iraq
Principle 1: Integrated service delivery will have the end user of the service in mind; the Iraqi citizen. The aim is to include their views on the types of government services they require
Principle 2: Ministry participants must demonstrate a willingness to collaborate
Principle 3: Collaboration arrangements must encourage participation regardless of the size or historical significance of the representative's Ministry
Principle 4: Participants need to adopt a standards-based approach to collaboration. Initial meetings should include a list of the critical standards and guidelines to be developed and adopted by the Government of Iraq. This will guide a large part of the work over the next 3-5 years
Principle 5: The Steering Committee must agree to the production of a business case for any future government-wide service integration project. It is to include analysis of all costs and benefits underpinning the initial decision and the estimated operational costs to be incurred to sustain delivery
Principle 6: Governance arrangements in a collaborative environment must be sustainable, and include a clear definition of accountabilities
Principle 7: All parties to an integrated service delivery arrangement must agree to the vision of the National Steering Committee eGovernment and participate fully
Principle 8: Integration initiatives must be delivered in a secure environment with acceptable levels of privacy and confidentiality protection. Identity management and integrity must be a key variable within any government-wide project plan
Principle 9: An agreement between any Iraqi government agencies must support efforts to share information and integrate service delivery
Principle 10: The eGovernment Steering Committee must circulate all documents and policies to each Ministry in order to encourage transparent and open government

Table 2: 10 Principles for a National eGovernment Steering Committee

Email Reality Check!

The reality in some 'world's best practice' eGovernment countries involve workers spending about 30% of their work day sending or responding to emails

4.0 KEY ACTION ITEMS 2007-2010

Structural reform is a time intensive activity that can only occur if parties (namely Ministries and key government agencies) are willing to communicate with each other and within their own structures. The key action items in this section deal with two areas. The first is the legal framework needed to underpin a legitimate eGovernment foundation, and the second is the list of actionable government-wide projects which will impact a great number of Iraqi citizens while being a catalyst for greater transparency of government.

1. Draft Freedom of Information Act

2. Draft Privacy Act (Privacy of Personal Information Act)

3. Draft Data Protection Act

4. Draft eGovernment Administration Act

5. Draft Corporate Reporting of Financial Information

6. Draft Health Information Protection Act

7. Draft Electronic Record Keeping and Archiving Standard for Government Agencies

8. Digital Signature Law

9. Cybercrime & Cybersecurity Law

10. Mandate eGIF (government interoperability framework)

All of the above legislative actions fall under the category of protection of Iraqi citizen's civil rights, and rights to the privacy of their information.

4.1 Top 10 eGovernment Database Projects

After in depth consultation with a selected group of Government of Iraq Chief Information Officers (CIOs) regarding a 'Top 10' list of critical eGovernment projects, the following were agreed upon in order of relative priority:

1. Cabinet Ministry – Basic office automation and Internet systems (Estimated Time = 12 months). The ability to deliver this application would prove the concept of the value for provision of necessary eMinistry infrastructure in all Ministries. The higher level objective of transparency and integrity in government would be achieved.

2. Ministry of Interior – Civil Information System/National ID Cards/Civil Registry (Estimated Time = 24-30 months). Implementation of a single database to reduce forgery would allow the application to 'work across multiple Ministries'. The transparency of this solution would achieve high levels of integrity for the government.

3. Ministry of Interior – Government Employee ID System (Estimated Time = 12 months). According to the group, implementation of this solution would 'help us cut out multiple salaries. These are being received by ghost employees who plague current databases'.

4. Ministry of Labor and Social Affairs – Social Security System (Estimated Time = 36 months). The review chose this as a priority implementation as it is a 'gateway through which we look after the interests of the Iraqi citizen'.

5. Ministry of Labor and Social Affairs – Health Insurance System (Estimated Time = 24 months). The review chose this as a priority implementation as it is a 'gateway through which we look after the interests of the Iraqi citizen. This would be greatly strengthened by a law protecting health data gathered'.

6. Ministry of Finance – Budget Preparation System (Estimated Time = 16 months). According to the review team, this application will become a key piece in the efficient execution of ICT projects.

7. Ministry of Health – Medical Cards System & Medical Records System (Estimated Time = 18 months). The idea of these implementations is to take away as much burden from the Iraqi citizens as possible. This type of government wide initiative will have a direct impact on all Iraqi citizens.

8. Ministries of Education/Higher Education & Scientific Research – Student Enrolment System (Estimated Time = 18 months). This initiative will have an impact on every single family in Iraq. It will lift the burden from families as they have to labor through an 'old economy' process of two systems of enrolment for secondary school and for tertiary entrance. The introduction of automation will remove most of the burden from the current procedure, and will also help combat corruption. The transparency of the process will provide a fair and equitable system of entry into some of Iraq's best tertiary institutions. At present, it is plagued with methods favoring the wealthy and the connected.

9. Ministry of Housing and Construction – Housing & Property GIS Overlay (Estimated Time = 36 months). This is considered a vital application as a GIS Portal will greatly assist a number of Ministries in their quest to plan services based on population and other spatial data.

10. Ministry of Foreign Affairs – Diplomacy, Negotiation & Treaty Database (Estimated Time = 24 months). A successful implementation would show Iraq to be serious about interfacing with other nations through a sophisticated system. It would also compliment the current infrastructural plans to link all Iraq Embassies through a secure intranet system. Security risk assessments carried out in 2007 have highlighted the need for a secure system with access abilities by all satellite offices through a hub and spoke topology.

As is evidenced from the above, only a truly coordinated effort on the part of the Ministries involved will achieve the desired results of delivering at least 50% of these projects within their estimated time frames. This means that the pathway to success will need to include:

1. Confirmation by the National Steering Committee eGovernment Iraq that these projects are the priority in order to move forward with the eGovernment program. Endorsement and cooperation needs to come from the Office of the Prime Minister. This clears political roadblocks as they arise

2. Confirmation that inter-ministerial committees will be formed quickly given the nature of the interrelated projects. The value being provided across government, and in recognition of the value these will bring to the end user, the Iraqi citizen, have to be foremost in the minds of the strategic and technical teams

3. Confirmation that feasibility and business plans are completed which include detailed budget breakdowns and risk management strategies. Given the complex environment within Iraq at the present day, realistic allowances must be made for slippage potential as well as articulated countermeasures to avoid this

4. Confirmation that carry-forwards (from one financial year to the next) will be permitted to ensure completion of projects that overrun their initial projections be properly funded and resourced

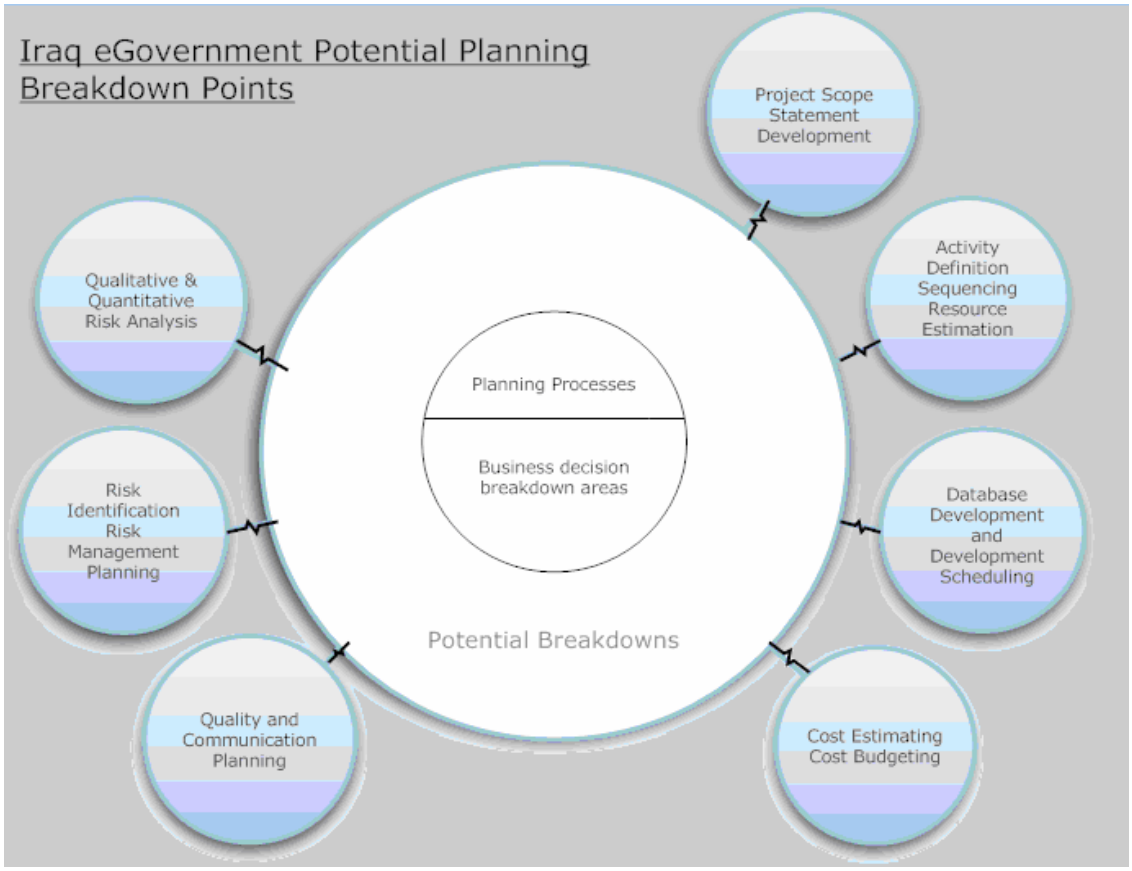


Figure 5: Iraq eGovernment Breakdown Points

The figure above was added to this section as a reminder of the many potential points of failure when collaborative occurs. The planning process is complicated, and needs to be documented. One of the standout factors directly impacting the success or failure of eGovernment projects large and small.

A couple of noteworthy business decision breakdown areas in Figure 5 include database development and risk identification as well as risk management planning. For example, some 'off the shelf' database products, when researched carefully, may contain overcomplicated and poorly constructed code. Programmers brought in to develop modules for a particular application may find it particularly troublesome to work with, or may find a disproportionate amount of bugs needing fixes. The amount of time spent on just these items will certainly affect 'Go Live' dates and have a cascade effect on all project deliverables. In some cases, all of the development work might be totally wasted if the first choice is found to be entirely unworkable; remembering the amount of time already spent to get to this conclusion.

4.2 Managing Expectations and Initiatives

There is no shortage of enterprise off-the-shelf solutions available in the market today aimed at eGovernment budgets. The problem is the one-size-fits-all functionality that has met with limited success in Iraq over the past three to four years. While all of the usual underlying objectives are sound, the current Iraqi environment is such that, there is even more reason to default to such things as portfolio management evaluations.

As with any country, the Government of Iraq has a finite amount of resources it can allocate to certain budget items each year. As the Iraqi people begin to demand a greater number of services from the government, it is easy to anticipate that there will be significant pressure placed prior to yearly budget allocations administered by the Ministry of Finance. A significant amount of these resources will be allocated to major infrastructure and services.

Realistic *e*Goals

The current Iraqi environment is such that, there is a strong case to default to such things as portfolio management evaluations

Good eGovernment information management practices enable the aggregation of data across agencies so as to facilitate a better whole-of-government understanding of how these resources are being procured and deployed, This increases the overall transparency and accountability of government.
Implementing collaborative multi-agency projects would deliver significant benefits to agencies and the community. However, in the present public sector environment there are many governance issues to consider:

- Which Ministries will pay the initial and ongoing charges to maintain the new eGovernment initiatives?
- Has the Ministry considered any cost recovery mechanisms associated with the eGovernment project?
- Who will have the responsibility for managing the infrastructure and services?
- Has any analysis being carried out regarding the impact of new initiatives as it relates to a change in duties for the government workers and their need for certain basic skills?
- How will intellectual property issues be managed?
- What affect will this have on suppliers to government?
- Where does accountability reside?
- Are post implementation reviews scheduled?
- If reviews are carried out, will the National Steering Committee eGovernment play a role?

4.3 Strategic Investment Approach to eGovernment – Quick Health Check

Senior Iraqi Ministry staff with the responsibility of implementing eGovernment projects needs to be aware of how project funding is funds are being allocated, spent and monitored. Their strategic management of these funds may be over the period of six months to six years depending on the size of the implementation. The eGovernment project has to demonstrate the ability to deliver value within the limitations of time and budget.

In the first instances, a simple budget planning and budget building structure can be set up. Due to it being an inexact science, the level of sophistication should develop over time. Officials implementing eGovernment projects should have an attitude of openness, and include 'feedback loops' for support staff, in order to improve the process through revision and refinement.

Strategic budgeting is different to 'operational budgeting' in that an operational budget allocates resources across the Ministry, and can often concentrate on budget increases or budget reductions through cost cutting. Often, value judgments about which project to choose are not considered. The Ministry may not ask itself which projects would be 'better' and more valuable for them to implement. An operational budget may also be built to reflect known changes within current operations.

Strategic budgeting, even at its most basic, seeks to integrate the budgeting/resource allocation (budget-building) process with strategic planning. Budgeting is a usually short-term, once a year process of tactical decisions about short-term resource allocations. Strategic planning, on the other hand, is a broader process of deciding how a Ministry intends to pursue its mission and vision.

One of the tough decisions forced by the strategic budgeting process is for a Ministry to prioritize its programs and projects. This will then force it to allocate resources in the most effective and efficient way. Resource limitations require that priorities be set and that choices be made.

Strategic budgeting and budget building can be used to develop an annual budget for the Ministry, taking into account that donor funding may also distort the planning process if it is received in an ad-hoc manner. The process can also help to:

- To encourage engagement and dialogue
- To increase the levels of information and knowledge upon which decisions are based
- To assure routine and systematic analysis of results to regularly measure against the strategic plan
- To ensure openness

If the Ministry views the strategic budgeting process as creating and then preserving assets as strategic investments, then it will be able to develop and utilize measures to its guide decision making. A strategic approach to budgeting can provide incentives for:

- Generating an understanding for potential shared use of resources (e.g. Ministry A may work with Ministry B to share a database because they have common platforms and input methods)
- Contributions toward collaborative efforts (e.g. through small work groups under the supervision of the National Steering Committee. There would be the opportunity in open forum for like Ministries to view and discuss common user platforms or other ICT needs due to the level of sharing that is encouraged)

4.3.1 A Strategic Investment Approach to eGovernment – Quick Health Check

Within the strategic budgeting thinking comes a reality check of the budget building processes outlined in the previous section. The quick health check gives a quick overview for project management staff to consider at scheduling issues, human resource issues and deliverables over the budget year. Timelines for smaller 'less strategic projects' (e.g. data entry into new software system or building an Arabic and Kurdish front end) might take more time and money than originally estimated due to a number of factors such as finding a person or team with the appropriate level of skill in that functional area.

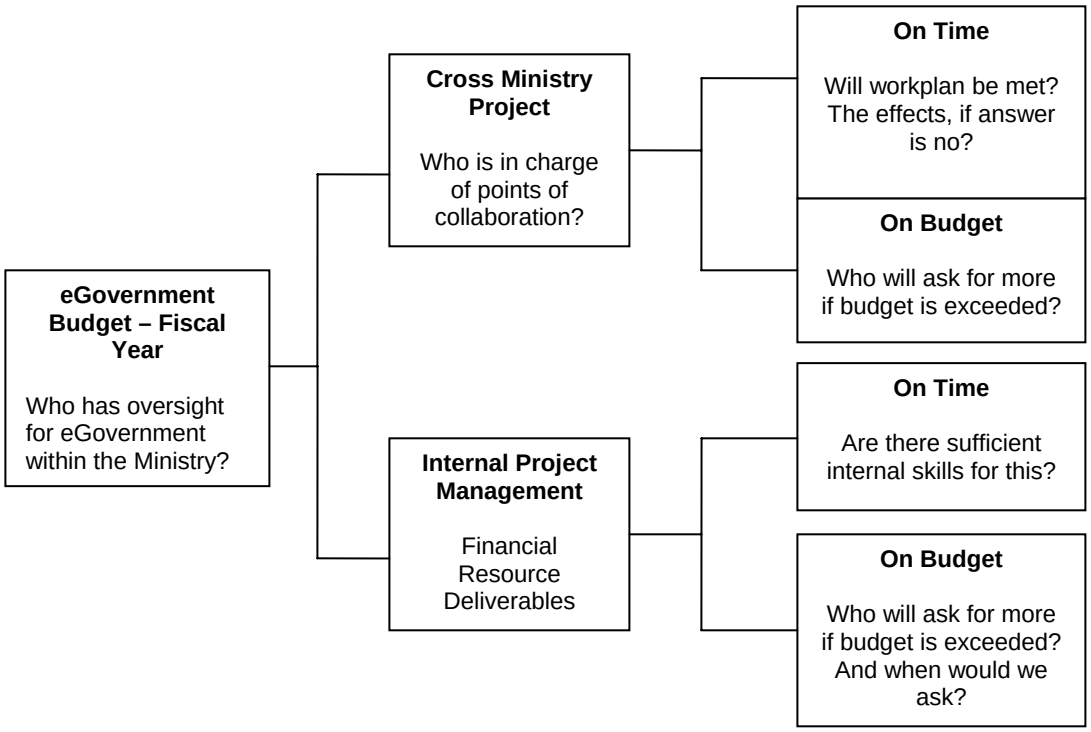


Figure 6: Reality Check for eGovernment Projects in Iraq 2007-2010

Questions arise once the responsible officer reviews the process flow above:

Of the approved IT projects that are mandatory,

a. they are large and significant
b. need to be priorities this budget year
c. must have adequate resourcing until the end of financial year
d. if (strategically critical) mandatory projects are not completed within a year, is the carry forward (accounting) option available

Of the Approved Discretionary:

a. These are absorbing a significant amount of the budget ($), and are also large
b. Project Manager's implementing these systems/enhanced applications (such as Oracle upgrades/payroll) need to be aware that timelines are reasonably accurate, though not as important as mission critical IT funding for financial year

Of the 'To Be Approved' – Mandatory

a. Depending on where in the year (which quarter) these projects are being reviewed, the projects will have to be monitored carefully as they tend to be involved in ambitious 'pilots' etc. (e.g. security/new encryption method) where monies will not be carried forward

Of the 'To Be Approved' – Discretionary

a. These projects may have been higher risk, and are not core to operations. In the above 'Health Check', it appears that the projects are 'too many' and monopolize far too much of the budget (30%).
b. This is an extremely high risk, given that, depending on which quarter we are in, a majority will not be actioned and resourced, and will not deliver core benefits
c. There is also a good chance that these will be higher risk ventures due to the intention to pursue, but with no formal approval received.

Control Objectives (IT Investment Mapping)

1. Plan and Organize
2. Acquire and Implement
3. Deliver and Support
4. Monitor and Evaluate

By following the stepped control objectives, the CIO can ensure an adequate control system is provided for the IT environment

4.3.2 eGovernment Management Questions for Ministries

How far should we go in controlling IT, and is the cost justified by the benefit?

What are the key performance indicators and performance metrics?

Who is responsible, accountable, consulted and informed?

What are the risks of not achieving out objectives?

What do others do in other regional governments? (Local Middle Eastern benchmarking)

How do we measure and compare the maturity of this project to others of similar size and scale implemented by other regional governments?

What is this strategy for organizational improvement?

5.0 THE CRITICAL NATURE OF LEADERSHIP IN EGOVERNMENT INITIATIVES

It is a fact that no government initiative will be successful if a strong and coordinated leadership is not present to drive desired outcomes. Leadership at the national level has to be consensual and inclusive. The success of any Government of Iraq eGovernment initiatives will only be possible when a core group of Ministries, through the formation of a National Steering Committee eGovernment Iraq (NSCeGI) decides to come together to collaborate. In the previous section, the action items for the duration of this plan were listed, with a strong emphasis on a number of 'collaborative' arrangements that need to be in place for success to occur.

In the spirit of collaboration, a series of leadership workshops were carried out in late 2006 with CIOs representing various Ministries within the Government of Iraq. Groups worked through a number of theoretical viewpoints in order to be able to articulate their own method of leadership. Transactional leadership styles were discussed which include command and control characteristics as well as having documented and clearly defined structures. The reward and punishment model showed participants that leaders who enjoy 'telling' functioned well within this paradigm. In contrast, the transformational leader allows others to 'follow' and be inspired by their message. The leader with 'vision' is the listener who soothes and 'sells' the message. The positive side of this style of leadership is that people follow this type of person as they are infused with enthusiasm and energy. Structural difficulties arise when structures are not always clear or enforced.

The first exercise included three components:

1. What the Minister or Director General thought of the CIO's leadership?

2. What the person thought of their style of leading?

3. What the staff thought of their leadership abilities?

The results were as follows:

Transformational leadership – results were split evenly between Ministerial participants. On the sliding scale of 0-100, all participants evaluated themselves in the upper quadrant. Roughly 50% of the participants thought of themselves as being transformational leaders, with the staff being less convinced and their Minister even less so. Discussion with the group concluded that, of the Ministries present, one of the main aims of the CIOs was to be visionary and accepting of new views, technologies and ways of conducting government business in the 21st Century (C21).

Transactional Leadership – clearly defined by having more structure than the transformational leader, the sliding scale yielded participant self-evaluations as tending less toward the 'harsher' end of the scale. Results varied between being slightly over the halfway point to around the 85% range, with 100% equaling dictatorial style. The conclusion here among participants was that staff members were more likely to feel that the CIO was transactional when they understood this is what the Minister was striving for.

The conclusion to this section is that eGovernment initiatives in Iraq will have a greater chance of success if the highest levels of leadership understand the way in which their individual styles directly impact the result of proposed eGovernment initiatives. Understanding the three levels of perception regarding leadership helps in a number of ways. Here are a few examples:

Other notable leadership drivers include:

- Staff will be affected by the message being delivered by the designated CIO or DG/IT and Minister in relation to the mission of the Ministry and the role it plays within the entire Government of Iraq structure
- Staff can either be encouraged or discouraged by the message being sent from above as to the value they add to project initiatives
- CIO can understand their own personal style of leading, and can adapt to suit the situation in order to successfully drive eGovernment initiatives
- By getting a better understanding of the styles of others, a CIO can change their mode of interaction with other Ministry CIOs to influence the desired outcome of a collaborative eGovernment initiative
- The Minister can realize their direct and immediate effect on project success and failure by understanding the perception of others of their 'style' of engagement. CIOs/DGs and staff quickly assess the speed and direction of strong, purposeful leadership
- All participants can become more astute at understanding the accumulation of limiting factors when leadership becomes overbalanced in transactional or transformational styles

As has been stated, leadership at all levels within government will play an important role over the life of this strategy (until 2010) as identified eGovernment projects enter their design and implementation phases. All of the factors of careful;

- Budgeting, Business Planning & Feasibilities (including pilot projects)
- Project selection
- Political Will
- Collaboration
- Tiers of leadership

will be vital to the success of at least 50% of the identified 'Top 10' eGovernment projects for the 2007-2010 period. This critical period will define Iraq for the following 2010-2020 period as a serious regional contributor to the regional economy.

5.1 Ten Step Approach to eGovernment Leadership

An outcome of the 2006 Leadership Series for Chief Information Officers (also Director General IT) was agreement concerning a '10 Step' approach to approaching government responsibility in the new economy. They are listed here.

1. The New CIO Leader – Has vision; excites and enthuses followers; has social awareness and is able to 'lead from the back'
2. Understanding & Commanding Your Environment – Knowing how your Ministry delivers its services; knowing its priorities and strategic objectives

3. The Future of Your Ministry as Truly IT-enabled – Looking for, and evaluating, IT opportunities (through partnerships) which will give greater citizen value and economic return. Staff knowing the CIO's vision

4. Shaping Expectations – Investing enough time in key staff so that they can spread the message of the Ministry. Identifying potential infrastructure and service strategies to create synergies and savings

5. Create Clear & Appropriate IT Governance – Knowing who has input into each IT decision and who owns the final decision being made

6. Business & IT Strategies Together – Making sure the planning process is flexible enough to allow the Ministry to shift with technology investments. Staff skill levels and receptiveness is critical here

7. Building a New IS Team – Having a sound understanding of where the Ministry needs to focus its attention over the next few years; and finding people with a similar mindset who are willing to achieve the goals set by the CIO

8. Building a High Performing Team – Recognizing the needs of staff members; giving them training opportunities; the CIO understanding own leadership style and implementing strategies for IS leadership team according to the critical competencies they require

9. IT Risks – Examine Ministry risks relative to key business processes; use of tools such as public/private partnership model, investment management toolkit; security governance and applying key standards; using risk management plan

10. Communicating Performance – Ministry IT-related projects create business value. Linking all IT investments to key drivers such as return on invested capital and efficiency of the Ministry. Trail of evidence between IT investments and Ministry impact

5.2 Analysis of Leadership Sessions 2006 – Chief Information Officers

The following analysis was conducted on responses of Chief Information Officer (CIO) workgroups. The 2006 series focused on what these officials viewed as their leadership challenges. The groups of eight (8) CIOs were asked to rate their thoughts regarding strategic components of their roles. They were asked to note the leadership implications for each area.

Areas of similarity and contrast within the response sets are highlighted:

- One of the biggest issues regarding leadership was the fact that a willingness to collaborate with other Ministries exists at the level of CIO. The other positive feature was that visibility of IT and its usefulness appear to be getting through to the Office of the Minister. This bodes well for ICT initiatives within key Ministries for the 2007-2010 time frame. Positive political influence is needed for Interministerial collaboration to occur

- The widest range was under 'new opportunities for IT projects within the Ministries – Group II felt that almost new projects were being budgeted for in the 2007-2008 budget; subsequently, Group II felt that business value was not being added at all

- Governance Models were considered to be poor, and internal processes fair to weak with respect to IT projects
- The Ministries appeared to have be flexible enough to accept change, but this did not appear to be supported by strong IT strategies
- Unfortunately, there is a big disparity between the satisfaction of the senior management levels and the career aspirations of line staff. A strong emphasis on skill development and training (generic and specific certifications) was apparent from both groups
- While information security awareness is emerging, it appears the need for a business case and methods of calculating the value of IT implementations is on the agenda of many CIO leaders; within the realm of considering IT as an investment, progress reporting and tracking scored highly

Business Objective	Group 1 Response (%)	Group 2 Response (%)
Business Plan	53	40
New Opportunities IT Projects	60	18
Business Value being added	53	15
Information flows (non IT)	58	53
Understanding Ministry Mission	54	60
Governance Model	34	35
Internal Processes	39	47
5 Domains of IT	60	47
Ministry Investment Decisions	64	43
No change likely until December 2008	55	46
Business & IT Strategies	56	50
Ministry Flexibility	60	65
Delivering Job Purpose	65	60
Review Strategy	63	58
Team Works Well With All	58	62
Interministerial Collaboration Occurs	64	60
Managing Full Sourcing Cycle	57	58
Type of Management Expected	60	60

Business Objective	Group 1 Response (%)	Group 2 Response (%)
Happy with Reporting	58	60
Service Cost Estimations & Human Resourcing	62	58
Career Goals Being Met	72	70
Adequate Staff Training	40	52
Adequate Staff Skills	43	52
Environmental Risks	100	85
Internal Risks Identified	60	60
Risk Management Strategy in Place	53	55
Risk Assessments Commenced	55	49
Security Policies (IT) in Place	56	55
IT Investments/Consideration of IT Value	55	58
Return on Investment Calculated	60	55
Minister's Comprehension Levels	68	68
Tracking/Assessing Progress of IT	61	65
Ready For Next Year	75	80

Table 3: Results of CIO Leadership Series 2006

6.0 CRITICAL ENABLING INFRASTRUCTURE FOR EGOVERNMENT

An accurate understanding of infrastructure availability is critical in determining content delivery. There appears to be sufficient telecommunications infrastructure within Iraq. The problem is not the quantity of infrastructure projects; it is their low level of connectivity and usage that is of concern.

Another concern expressed by the Ministry of Communications is that damage to Iraq's communications infrastructure was high in 2003, but progress in reconstruction since that time has been accelerating. The Ministry of Communications made a statement in 2007 (IDP Summit, UAE, February 2007) referring to its decision to deliver services through a fiber optic network on a national scale.

Iraq was effectively cut off from global IT developments during the 1990-2003 period. This has become a major institutional challenge for the GOI, including the need to update the skills of the workforce, which was set back a generation in terms of being versed in new technologies and applications.

Infrastructure Decision	Impact
National Fiber Optic Network	50% implemented by private sector partner. Designed on 7 Loops for central area, with plans to roll out to other regions. (Minister Communications announcement, February 2007).
Iraq has two current LAN Gateways	One located towards Jordan, and the other toward Kuwait. Others are planned for the area toward Turkey, Syria and Iran. Contract in place for Iraq connection to the Falcon submarine project, Iraq's pipe to the world wide web. Further plans for two other backup connections to international cables.
Microwave Connection	Internationally funded projects (Japan, World Bank)
Landlines	Decision to proceed with Fiber-to-the-Home (FTTH). Loan to be used to install fiber to 860,000 homes in the 'Baghdad Project' (Japanese funded). Plans for two other FTTH projects for other regions of Iraq currently in the design phase.
Wireless Broadband Options (WBB)	The government (2007) is still committed to exploring several WBB options. This will add 2 Million lines (using CDMA technology), with others planned for Baghdad, Mosul and other cities. A total 20% will be Evolution Data Only/Evolution Data Optimized (EV-DO) for mobile Internet connectivity. This work will allocate 500,000 lines to be managed and maintained by the private sector. EV-DO is a wireless broadband option that can provide download speeds of up to 2.4Mbps and will be available in many Iraqi cities. EV-DO evolved from a more established standard 1xRTT or single carrier Radio Transmission Technology. It is in a family of wireless data services for cellular phone systems called CDMA 2000– which is popular in the US. An already digital mobile phone service can deliver Internet services using the same transmitters and cell towers. This enables Internet service for cell phones and laptops.
GSM Mobile	Currently 8 Million subscribers in Iraq (2007) aggregated across 3 service providers: Iraqna, Atheer Telecom & AsiaCell. Subscriber rates have increased dramatically since 2005. Minister announcement for a period of consultation and investigation to present different options for dealing with mobile phones and delivering greater

	coverage. It is estimated that each mobile phone network operator has sunk about $300 Million (Capex) into their regional operations over the past few years. Under the latest license rules, they may be able to negotiate a separate sale of their infrastructures.
Automatic Teller Machines (ATMs)	Ministry of Communications has passed a resolution and funding to set up 500 ATMs at National Post Offices throughout Iraq (February 2007 announcement). An additional 280,000 dial up lines are being installed, and there will be another 500,000 DSL lines installed in 2007.
Telecommunications to assist eGovernment	The Ministry of Communications has announced that it has created a base for the development of eGovernment applications. MoC announced a project to install video conferencing facilities in all government ministries in 2007.
Iraqi Telephone and Posts Company	Transmission network – previously IP Routers co-located in central offices. Pre-2003, there were only about 4000 subscriber accounts. At the exchange level, users would access the IP Network via remote dial-up from private residences, government facilities or Internet Cafes. Post 2003 (CPA days) – Attempt to adhere to ITU Technical Standards and to apply commonly accepted industry management practices, including issuing licenses for use of the spectrum . Numerous small ISPs started business – VSAT uplink to connect to Internet. Limited content filtering and address blocking. Bechtel National awarded contract to repair the battle-damaged central offices in and around Baghdad and al Basra. Sections of the Fiber Network upgraded to OC-3 and stood up as an Earth Station as an International Gateway.
Legacy Versus IP Network	Exchanges restored to operational status by mid-February 2004 and Lucent 5ESS class 4 & class 5 switches. Decision had to be made between disposing of the legacy circuit-switched network and building as its replacement an all-IP network running over an OC-48 backbone. The decision was taken for specifications & build to be 'like-for-like'. Two options presented. 1. Architect and Build Data Networks & modern Operations Support Systems for the management of multiple interconnected networks and software defined VPNs. 2. Repair legacy network relying on switch technology.

Table 4: eGov – Available Infrastructure 'Old & New Economy' within Iraq 2007

6.1 Wireless Connection Options

The business of government is moving quickly toward a 'working without wires' environment. As wireless-enabled laptops and even smaller mobile devices are seen in business and government, fewer government workers will need to use the RJ-45 jack in the wall to connect to the government network. This will be true in Iraq in the near future, as workers are exposed to the benefits of a 'wire-free' environment. Exposure may come in the form of a 'pilot project', but once used, it is very difficult to deny the benefits of mobility. It makes good sense in a Ministry where workers are able to move from office to meeting room to data center without the need to disconnect and search for connection points.

Secure access will become an issue, with strategy and infrastructure changes needed to service this new environment. With a wide variety of access options (Wi-Fi, CDMA, GSM, WiMAX etc.), different types of devices

and operating systems, as well as interoperability challenges among networks, the Government of Iraq will need to consider its entire approach of information delivery and management.

The Government of Iraq has reviewed a number of presentations that include wireless connectivity options. WiMAX (Worldwide Interoperability for Microwave Access) solutions have been proposed as they are a standards based technology delivering 'last mile' wireless broadband access. A number of WiMAX solutions exist in the region, and provide Internet connectivity as part of a business continuity plan. If government can use both a fixed and wireless Internet connection from unrelated service providers, they will be immune from the effects of a same service outage.

Due to the inconsistency of telephone networks in Iraq, WiMAX is seen as a viable alternative for broadband access. Ministries (or clusters of) can evaluate the cost to install a WiMAX station in conjunction with existing cellular network towers and receivers. The security concern needs to be addressed however, as the use of the licensed and unlicensed spectrum within the 802.16 range has been known to be insecure. Within the range of communications options is the need for a 'standards based approach' complying with IEEE guidelines. The following section aims to show through the use of consistent data structures.

6.2 Service Oriented Architectural Approach to eGovernment

Service Oriented Architecture

The only way to build an enduring integration infrastructure is to base it on data structures

A common set of technology principles and architectural approach has guided many countries in their attempt to develop suitable underlying infrastructure. Together, they drive the eGovernment agenda based on open standards aimed at supporting interoperability. The GOI and the private sector need to collaborate closely to ensure this outcome.

Movement away from object oriented programming is being witnessed, as services need to be delivered within an interoperable environment. As opposed to binding data and its processes together, a service-oriented approach gives government Ministries the much needed flexibility of providing universally accepted interfaces for all users. Future eGovernment initiatives will cut across many Ministries and at a minimum involve several systems. All Ministries within the GOI will need an integration strategy and an integration infrastructure in order to link its systems together. This infrastructure needs to be planned as carefully as any other infrastructural investment such as public utilities including water, electricity and water services. It should be clearly thought out, and should have a project lifespan of several decades.

The incompatibility comes when the life spans of specific technologies are measured in years, not decades:

Computers	~3 years
Back-end Applications	~2-5 years
Programming Languages & System Architectures	~10 years

Upgrades to back-end applications such as databases often require costly upgrades. Systems architectures which may be based on the client/server or web browser environments may last about ten years. Added to this is the high probability of a wide range of systems, languages and applications within government agencies at any given point in time. This makes it impossible for any long-term integration infrastructure to be based on a specific application, language or system architecture.

eGovernment has a primary objective of making it easy to create, update and secure information so that public institutions can more effectively deliver the services that the citizens need throughout their lives. One constant is that despite what happens to technology, people will always require a range of critical services from government. Iraqis will:

- Be born
- Need birth certificates
- Request a passport
- Apply for a Driver's Licenses
- Enroll to vote
- Find work and expect to be paid
- Pay tax
- Expect and receive some form of assistance from government

The only way to build an enduring integration infrastructure is to base it on the one thing least likely to change – the data structures.

6.2.1 Using Data Structures

eGovernment infrastructure should be based on the data that it needs to store and process. Applications and specific technology implementations should be considered expendable, and should not determine the integration infrastructure. The goal should be to ensure that when they are replaced with something faster or more powerful, the replacement causes minimal disruption to the network of eGovernment systems. The key is to ensure that the data can flow between systems and government agencies in an easily understandable form.

The consensus is that XML is the best way to exchange information. It is readable by people, computer systems can be modified to understand it, which is unlike other formats. It can contain raw data, as well as information about the meaning of the data through embedded data description tags. The challenge is that different computer systems can use different XML tags to describe the same data. Translating the tags as a message passes from one system to another is a minor task compared to translating the internal data formats used by different systems.

The Power of XML

XML is an ideal way to model the data & allow communication between the numerous systems and agencies participating in eGovernment

Using XML representations of the data for the basis of eGovernment communications is becoming a standard approach. XML representations of processes, services and documents can become the major piece of an eGovernment integration strategy due to three main factors:

1. Open – No organization has ownership rights
2. Transparency – Can be read by any person or any computer
3. Responsive – New tags can be added as necessary to describe new types of data

6.3 Reducing Technology Lock-in

Government of Iraq decision-makers need to be mindful that XML is being used in an open way. It is in the interest of the government to work with solutions providers who use XML and other standards in an open manner. Minimizing lock-in can be practiced through elimination strategies.

Elimination strategies can include:

- Using open source
- Specifying industry standards
- Requiring compliance procedures and methodologies

Officials have to be mindful of standards compliance generating their own form of lock-in. It is possible for technology vendors who advocate web services and XML to re-brand existing proprietary API functions in a new and repackaged XML format. This does little to reduce vendor lock-in as internal processes are still tied to the internal application logic through a slightly different channel. Even if open source software is used, integration costs remain high because of API-driven complexity.

The most effective way to minimize vendor lock is to keep different systems loosely coupled. Instead of using many low-level types of interaction with each system such as the API of the vendor, a limited of high level ways should be developed. The objective of these more powerful applications allows systems to interact with each other and with the eGovernment backbone.

The GOI can pursue the strategy to carefully define high level interactions as XML representations of real documents through the various government Ministries and agencies. Modeling the integration strategy on real data and processes is vastly easier than modeling it on specific APIs. This also breaks the direct reliance on fragile volatile technology. The paradox should also be pointed out:

“The eGovernment struggle to provide a permanently open, transparent and responsive set of processes, with the often closed and proprietary supporting technologies.”

GOI purchasers can mandate compliance with existing processes as part of the functional specification if they make sure XML representations of the eGovernment business processes are the core of the integration infrastructure.

6.3.1 Government Department Boundaries

A key feature and benefit of a functioning eGovernment system is the presentation of complex inter-agency processes as a single integrated service. As a result of this, government will be able to offer many more services than it does at present. A simple work identification card (ID Card) example might include collaboration between a number of Ministries for data integration and verification:

Birth Certificate	Public Records
Work Permit	Ministry of Labor
Background Check	Ministry of Interior & Ministry of Justice
Health Records	Ministry of Health
Government Payroll	Ministry of Finance

The main barriers to enabling cross-agency processes and services are not technical. They are legal, political and procedural. Government Ministries and agencies have the history of clearly defined physical, organizational and cultural boundaries. Attempts to impose a uniform technology strategy for immediate implementation will result in guaranteed resistance at the departmental, regional and local levels. The idea of a single centralized eGovernment hub with all departments using identical XML data formats is difficult to envision or achieve. Effective eGovernment can still be achieved without facing the difficult task of breaking down ingrained organizational structures. A federated structure can achieve the desired effect. This is when autonomous groups join together for a common purpose. In this way, threats and anxiety are minimized as government entities remain in control of their

technology environments and data structures while supporting shared processes and services across a wider government network.

This can be achieved by having multiple rings of data and process flow, linked by bridges automatically converting XML data into the expected format as the messages move between networks. This approach enables the creation of government-wide processes and services without the need for every affected agency to replace their systems. It also reduces the requirement for all government workers to understand the bigger picture as they deliver new services. The federated information infrastructure enables this.

Beware The Paradox!

Government objective for a permanently open, transparent and responsive set of processes AND often closed proprietary supporting technologies

6.3.2 eGovernment Assisting Delivery Monitoring

A critical function of eGovernment is the support it can offer to policy creation and delivery monitoring and improvement. Basing the architecture on the flow of service requests between agencies makes it possible to create a view of how collections of services, agencies and functions are working together.

Even though Iraq is in the early stage of government-wide systems development, it is useful to look forward to how government services flow to the end-user, the Iraqi citizen.

Analyzed carefully, documents can represent time-stamps of passport applications, birth certificates, and medical records. They can contain invaluable information regarding service delivery and potential blockages. This can be concluded by the way documents pass through or wait for specific government services. Anti-corruptive practices are also encouraged by the transparency of accurate record entry and record keeping.

The investment management effect is also visible here as the dataflows become effective real-time diagnostic tools to incrementally improve overall delivery at all levels of government. At the most senior policy levels, they can provide timely and relevant information for policymakers seeking ways to maximize service efficiency and control costs. Delivery expectations can be mapped against actual service delivery, with the gap identified and then analyzed. Benchmarking can therefore lead to policy and program readjustment.

Within privacy and data protection constraints, eGovernment services should be offered widely to ensure reusability by other government agencies and third parties. The architecture should also allow the sharing of common services such as identity management with the need to centralize entire departmental systems. The owners of the process or service will not lose control, but duplication of effort across all agencies is understood, and minimized.

6.4 Case Study – Using Service Oriented Architecture

Flexible and reusable eGovernment services based on data and open standards and non-proprietary technologies are emerging. This is the Irish Government's example of the value of implementing a Public Services Broker (PSB).

In this example, the Public Services Broker is a Service Oriented Architecture (see Figure 8). It provides a common access point for eGovernment services, common interface standards, procedures and supporting services, together with the necessary infrastructure to make access to eGovernment services as straightforward and secure as possible. In addition to supporting customer interaction, the PSB will also provide the standard mechanism for supporting government inter-agency collaboration.

The PSB will allow individual users to submit service requests on their own behalf, and provide mechanisms and procedures to allow businesses or individual customers to authorize agents and intermediaries to submit service requests on their behalf. This will enable the PSB to provide support for call center and walk-in access channels, and allow business related transactions to be conducted by authorized persons. Three elements are highlighted:

- Human – portal made up of web-based information (HTML, PDF etc.) & interactive forms
- Integration – EAI integration framework based on XML, messaging & web services
- Service Fulfillment – PSB-enabled web services will receive and acknowledge the receipt of PSB service request messages and subsequently process them in the agency systems

The role of the PSB in customer interactions is to provide the customer-facing component of electronic services and to ensure that agencies receive service request messages reliably and securely in an electronically processible form (e.g. XML).

The human facing piece is delivered through the corresponding PSB Common Services, and results in the building of a PSB Service Request Message(s) passed to the PSB Integration Framework.

The integration piece will securely and reliably deliver the PSB Service Request Message(s) to the PSB/Agency Boundary where agencies expose the fulfillment processing as a PSB Enabled Web Service through providing a mechanism to receipt the message and pass it (manually or automatically) to fulfillment systems. Agencies provide the service fulfillment piece for existing services.

The role of the PSB in agency-to-agency interactions is to ensure that agencies can send or receive information and information requests to each other securely and reliably in an electronically processible form (e.g. XML).

6.5 Leadership Wheel

As connectivity and collaboration feature prominently within the case study in 6.4, the introduction of a connectivity tool is presented here. The Leadership Wheel shows the interconnection between the higher order outer rings of the wheel; eGovernance, Leadership, Networks and Partnerships and the inner 'spokes' of the wheel. These practical elements of enabling infrastructure, digitized Ministries, security issues and international standing of Iraq in the ICT community are held together through the ICT vision. This vision acts as the glue between Ministries and leads by decrying connectivity and open collaboration.

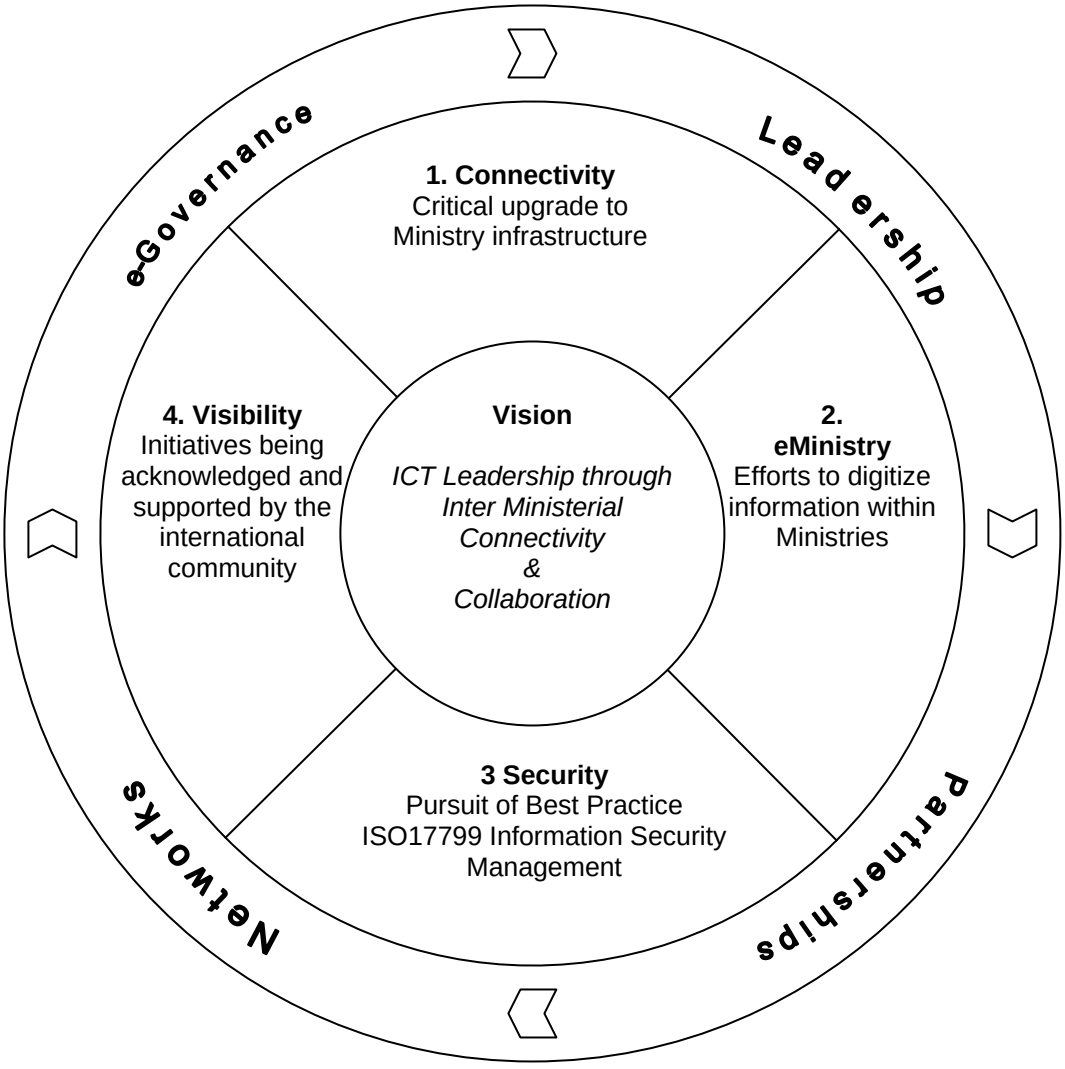


Figure 7: Government of Iraq eGovernment Leadership Wheel

7.0 EGOVERNMENT ARCHITECTURE

The high level design architecture for basic eGovernment solutions needs to focus on a few logical areas:

- Security
- Scalability & Performance
- Accessibility and Availability
- Manageability

As is demonstrated in Figure 7 below, the possibility of connections from the core network and government servers can support multiple infrastructure additions over time. This includes data centers (e.g. National Data Center) and government contact centers (e.g. Government IP Call Center). Disaster recovery features prominently in the overall design. This type of feature is a critical component of the design, and is particularly relevant when physical security is an ever present risk.

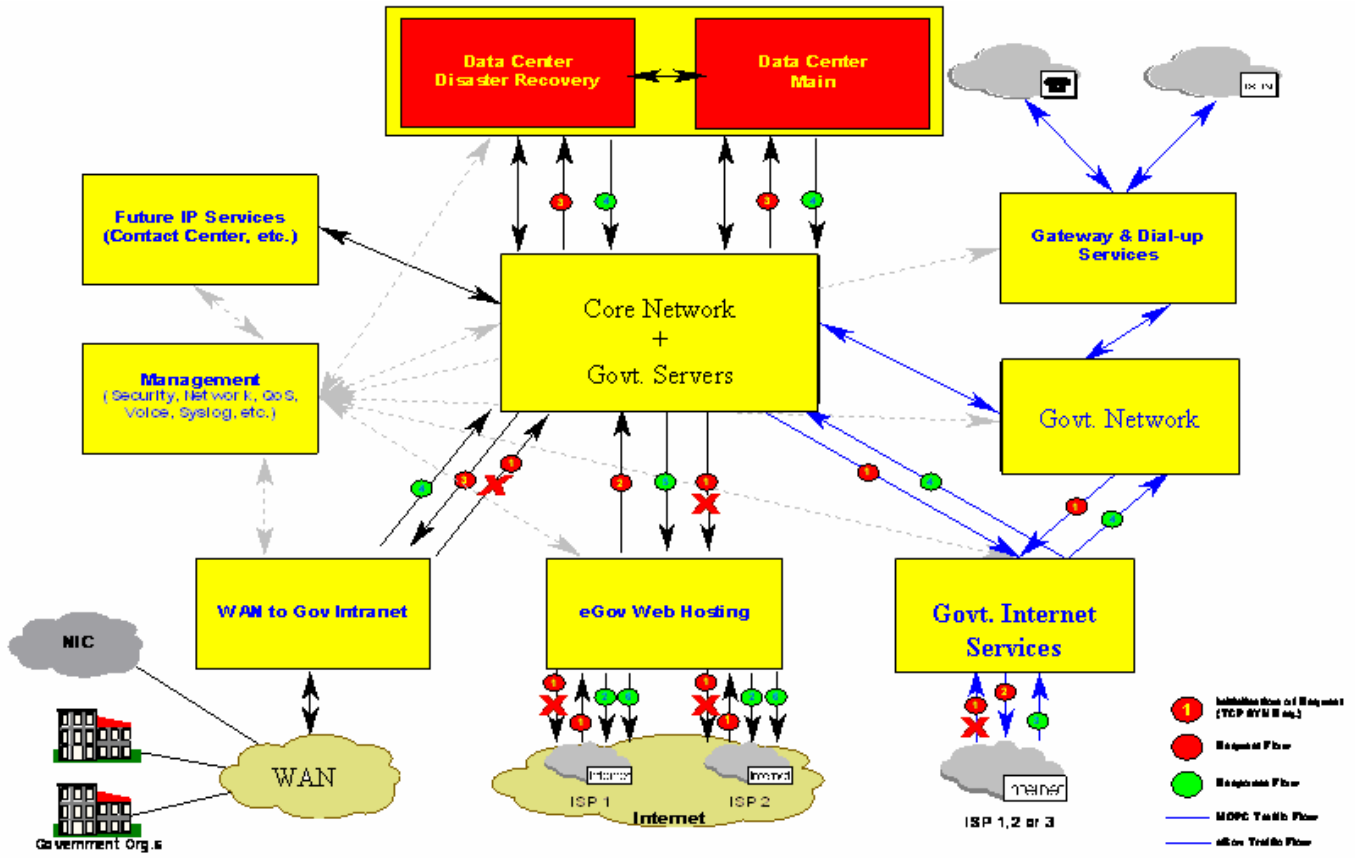


Figure 8: Sample eGovernment Architecture

7.1 Case Study: The Case for a Government of Iraq Data Center

As the needs of Iraqi citizens grow with respect to an increase in transactions with the government, new economy solutions are being required. This chapter overviews some of the high level technical and business concerns surrounding the Government of Iraq's requirement of offering eGovernment Services over the Internet from a single Point-of-Presence (POP).

A number of other government-wide approaches taken around the world have used the modular approach where each module is responsible for a specific task, to fit in with the overall solution. The modular approach aims to achieve the following:

- Scalability & Agility
- Availability
- Manageability
- Security
- Accessibility

The design architecture is based on the following design methodology:

- Mirror Design for redundancy and high availability
- Key platforms sensitive to the 24/7/365 operation of the network have redundant chasses, CPU and PSU.
- IP & Ethernet
- Hierarchal design.
- Security at every level
- Primary and Backup WAN links

The design architecture can be divided to the following modules:

- Web hosting and Internet Point of Presence (POP)
- Data Center and Data Center Disaster Recovery Site
- Government Intranet WAN Access
- Government Wide Internet Access
- Network Management
- Core that interconnects all of these modules

The Data Center module will host the application and database servers. With every GOI Ministry and agency owning and operating their own database systems, bringing them together requires a strategic plan to unify or integrate into one data center. The design element needs to allow for that and the coexistence of distributed databases and application servers and the provision of a WAN path. To reduce network traffic the application servers and the associated database should coexist on the same LAN to reduce traffic transaction.

A disaster recovery site is directly linked to the main data center using direct fiber (less than 70km if available) or an appropriate WAN link. Wireless options need to be explored within the business case.

All participating government organizations can be linked to the data center with a WAN link using a service provider (could be a dedicated service provider for Government or a third party). The available services today in

Iraq are Leased Lines, Frame Relay, and Wireless WAN among others. One connectivity option is to base the design on Leased Lines and using ISDN as a backup solution if the primary fails.

There will be one access gateway for the GOI for sites linked to the eGov WAN to the Internet. This is an independent connection and access point. The design provides controlled access to the Internet and prevents any security breaches of the government network. The process is transparent to the user as the network determines where to send the request.

This layer also provides VPN services to government officers to access the internal network globally by establishing a secure tunnel through the Internet using a VPN client. A centralized email system can be installed through this module; a mail relay server should be positioned in one of the DMZ zones to provide security checks against viruses and security threats.

The Core network interconnects all current and future modules together using Gigabit/10Gigabit technology, the Core layer does not enforce policies or checks for security. Its main aim is to switch traffic at high speeds between modules. Centralized Network Management applications reside in the core layer that manages the LAN, WAN, all connected modules, security management, policy management and QoS management.

7.1.1 eGovernment Web Hosting Service (POP)

This layer provides access to the services offered by the Government of Iraq to citizens over the Internet.

This layer is dependent on the following:

- Mirror design provides load sharing, redundancy, and high availability
- Two Internet connections from two different ISPs for high availability, load sharing and redundancy. The two connections should come physically from two different paths to provide true redundancy in cases of cable break due to construction or other miscellaneous causes.
- The routers connecting to the Internet should have enough memory to host the complete BGP4 Internet routing table
- BGP4 AS number from the Inter NIC
- Fully redundant routers (CPU, PSU)
- Gigabit speed, fully redundant, hardware Firewall service with PSU redundancy

Layer 2/3/4 switch with server load balancing, provides accessibility to:

- Web Servers
- Data Centre
- Backend applications
- Content Engines (Intelligent Cache Engines)
- Content Switches for Layer 5-7 services

To dedicate each web server to a particular content type (including redundant failover, backup or over-spill servers) and allow the switch to identify the appropriate server (or cache) to direct a URL request to, based on the content being demanded.

7.1.2 Scalability

The Web hosting module should be scalable in nature and should solve the following problems: Network link congestion—Data transmission delay associated with the capacity (bandwidth) of the telecommunication network. More users, richer media, and more complex applications consume more bandwidth, resulting in increased congestion.

Network equipment congestion—as network traffic increases, routers and switches must process more information packets. Packets collect in queues for processing. Overloaded network equipment discards queued data packets. They are then retransmitted which adds to traffic.

Web server congestion—the larger the traffic flow on a Web site, the more requests for data must be served and processed by the server. Until the data is served, the requests sit in a queue, resulting in delay and a slow Web experience.

Distance delay in the network—this is due to the time associated with data traveling over long distances.

To cater for the above, support the following in this module should be present:

- High density Server hosting
- Ability to provide high-speed flow setup, dynamic and intelligent server selection based on real server load and content availability, and URL and cookie-based policy and traffic prioritization.
- Non blocking firewall speeds
- Operating System independent
- Support more than 15 billion Web transactions per day
- Session distribution algorithm supports more than one-million simultaneous TCP sessions to accommodate rapid user population growth
- Simple addition and removal of servers allows for an easy upgrade of applications servers. The ability to scale a server farm and direct traffic based on application allows configuration flexibility
- Link to the Internet can always be scaled in future to cater for increased demands
- An increasing number of switches, firewalls, Content Engines, and Servers added to increase efficiency and capacity
- Using scalable protocols provides scalable content delivery
- Content Engines provide frequently accessed content storage and fast retrieval that will eventually offload Web servers

7.1.3 Security Features

Access between Web servers and Application Servers hosted in the Data Center is based on a one way approach; that is to say Web servers can initiate a session with Application Servers only through a certain port number other than that used over the Web. However, Application servers and any user inside the network cannot initiate a session to access the Web servers. In this configuration, expected threats are known to come only from the Internet and not from inside of the network.

- The Network Address Translation (NAT) function effectively prevents direct access to real servers through conservation of IP addresses and utilization with unregistered IP addresses. Content Switch offers traffic filtering based on source IP address or service
- The Content Switch provides integrated denial-of-service protection, eliminating incomplete or malformed TCP and HTTP connections

- Content Access Control Lists eliminate unwanted traffic based on network address or URL
- Firewall Load Balancing provides high performance firewall clusters and eliminates single points of failure
- Intrusion Detection System (IDS) provides intrusion detection of more than 300+ signatures and also monitors the operation of the firewalls and blocks the connection in case of a security breach
- Full security logging to the centralized logging server
- Integrates fully with any PKI infrastructure.

7.1.4 Accessibility

This layer is only accessed by users from the Internet and only the Internet using a web browser and valid URLs such as 'http://www.egov.gov.iq' or any sub URLs belonging to the eGovernment site.

If any of the government organizations need to access the site, they should access it from the Internet through a separate Internet access point dedicated for private use and email systems.

7.1.5 High Availability

The Web access layer is designed using the following design methodology:

- Mirror design, where dual physical equipment work in redundant, resilient, and load sharing configuration
- Resilient protocols to provide transparent router and L3 redundancy
- BGP4 AS, will provide multiple redundant, load sharing Internet presence
- Dual connected Web servers for high availability
- Mirrored server support to provide web site redundancy in cases of server failure

7.1.6 Manageability

The module is managed by the centralized management applications positioned in the Core module. This is because the Core module is the safest place to host sensitive management applications. For security purposes only specific ports are allowed to go through from the firewalls and IDS that the management requests can only be initiated from the Core towards the Web hosting module.

The management applications that are needed to manage the Web hosting module are:

- LAN/WAN management
- Security management
- Content management
- Security reporting
- LAN/WAN reporting
- Other Web management and uploading can also be enabled depending on the application characteristics

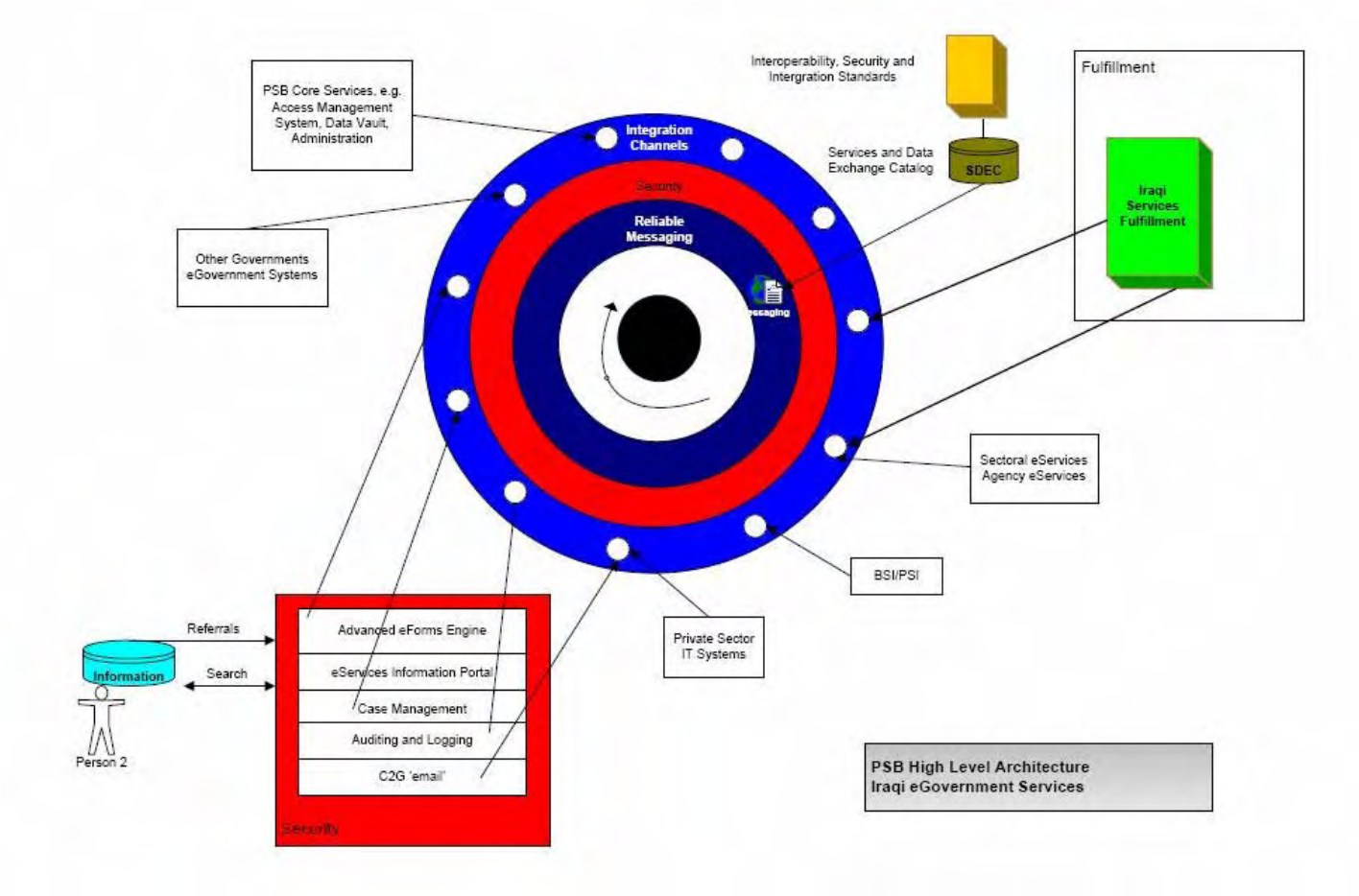


Figure 9: Sample eGovernment Architecture and Interoperability Framework (Public Services Broker = SOA)

7.2 Prospects for Customer Owned Fiber Networks – Case Study Canada's CANARIE Project

The Government or Iraq is evaluating the world's best examples of how to kick start economic development through infrastructure provision. There are some standout examples of alternate models which fill the gap when traditional approaches seem limited. One such example is referenced from the country of Canada.

CANARIE is Canada's advanced Internet organization, a not-for-profit corporation facilitating the development and use of next generation research networks and the applications and services that run on them. By promoting collaboration among key sectors and by partnering with similar initiatives around the world, CANARIE aims to stimulate innovation and growth to deliver social, cultural and economic benefits to all Canadians. The Government of Iraq should view elements of this model as transferable to the Iraqi situation. Certain well established and historical Ministries are leading the agenda to create a knowledge economy within Iraq through selected eGovernment project collaborations.

Under the leadership of CANARIE, the Advanced Internet Development Organization has built a nationally connected community owned infrastructure of dark fiber. The infrastructure has been 'lit' with Internet Protocol (IP) over gigabit Ethernet over glass.

As one of their presentations, they offer "a proposed strategy to make Canada the most networked country in the world and the first to have low cost Gigabit Ethernet infrastructure available to virtually all schools, hospitals, libraries and businesses.' Many of the school districts in Quebec have completed installation of their own dark fiber networks as part of Canada's national public grid. Telecommunications deregulation in Canada has assisted the ad-hoc establishment of public/private sector partly customer owned and operated IP over gigabit Ethernet fiber network linking schools and municipal governments to province-wide networks.

These all link to the CANARIE national trans-Canada optical backbone for research and education traffic. The result is the first large scale national infrastructure that operates completely independently of the global public switched telephone network. The only overlap is certain points of intersection for interconnection purposes. Note one of the items on the 'Top 10' list compiled by the review team for the Government of Iraq for the Ministries of Education and Higher Education and Scientific Research to build a student enrolment system within 18 months. This type of support infrastructure example is valid in the context of potentially powerful national eGovernment implementations.

'Lighting' Your Own Fiber

Ministries work together through MOUs to implement their bandwidth hungry projects through the 'community ownership' model of controlling

CANARIE has played a critical role in recent times in charting Canada's telecommunications future. The project adequately serves the Canadian research and education community by developing ways to make broadband Internet access cheap for clients. These 'customer-empowered' dark fiber networks have seen the shift away from carrier-owned infrastructure and the shift toward customer or municipally owned fiber. There are also innovative sharing arrangements such as fiber 'condominiums' where a consortium of customers owns the individual strands of fiber. This 'dark or unlit' fiber is installed by a private contractor on behalf of the consortium. Each customer 'lights' their own fibers using their own technology, therefore deploying a private network to wherever the fiber terminates. This arrangement may include carriers or Internet Service Providers (ISPs). The business arrangement is comparable to a condominium apartment building where tenants share common expenses such as management and maintenance fees.

The lesson learned here for the Government of Iraq is that consortiums of Ministries such as the Ministry of Education, Ministry of Higher Education and Scientific Research, Ministry of Science and Technology might be

able to work together under their existing Memorandum of Understanding. The collaborative work could be to establish a 'private network' between selected sites within their Ministries built on the model illustrated above.

The Canadian government has made a decision to use CANARIE to build a public sector national infrastructure that takes advantage of IP over Gigabit Ethernet over glass. This enables a national broadband infrastructure for education, government and research telecommunications.

One problem that Iraq may face as competition increases over the years to service the demand for a diverse range of broadband services will be the ability of the regulatory environment to deal equitably with service provision. In Canada in the second half of the 1990's, cable television operators fought for, and obtained, laws giving them open access to the poles and conduit owned by the incumbent local exchange carriers and provincial electric utilities. Any company could easily obtain a non dominant carrier license which gave them access to the poles and conduits owned by the incumbent local exchange carriers and provincial electric utilities. A similar situation occurred in Australia following deregulation of the Australian telecommunications industry in 1996.

In Canada, the non dominant carrier could demand, and gain access to the poles and conduits in order to lay new fiber. Payment to the pole owner is set at uniform inexpensive rates. The establishment of a national policy facilitated the ensuing boom in the construction of customer-owned dark fiber networks. The policy facilitated an easy and affordable right of way for the development of a 'community-based' model. The Government of Iraq has to carefully monitor the cost to its citizens to access the Internet if they are to actively participate in the new economy where government service provision is beginning to be online.

As evidenced by the number of young Iraqi's who are very adept at using modern techniques of instant messaging, chat rooms and blogs on the Internet as well as file transfers to peripheral devices, the commercial market space will soon become a crowded space full of potential service providers. As the Government of Iraq prepares its business case for service delivery to the 'Iraqi Cybercitizen', a myriad of vendors is also examining the vacant space looking at their own business case for entering the Iraqi market.

If the Government of Iraq looks at innovative business models aiming to service their citizens such as community-owned networks, the end user may have a greater chance of accessing affordable and reliable services.

As vendors view Iraq as a new business 'territory', there will be many opportunities for them struck through aggressive relationship building with decision makers within Ministries. It is the perfect opportunity for the Government of Iraq to work with the 'brand names' and others with strong references and recommendations to build Iraq ICT with sustainability and scalability in mind.

High Cost to Citizen

The Government of Iraq has to carefully monitor the cost to its citizens to access the Internet if they are to actively participate in the new economy where government service provision is provided online.

Convergence brings a unique opportunity to Iraq in that the market of voice, video and data provision has matured in other markets to a point where, with astute guidance, business case development and feasibilities, Ministries and government agencies can capitalize on these advances. Losing large percentages of budget as sunk cost does not need to occur. Technologically savvy Iraqi's are already beginning to demand media content through their mobile phones, with the reasons ranging from security to interest to a distraction factor. Either way, demand will likely continue to rise at a rapid rate as user sophistication and appetite mature further.

8.0 POWERING EGOVERNMENT APPLICATIONS – ELECTRICITY

Rebuilding vital infrastructure will be the foundation of growth of the ICT sector. The generation of eGovernment projects will also greatly increase as foundation infrastructure is available. This chapter provides some context for the interconnection of many sectors of the government in order to produce 'new economy' results. Reform in the area of electricity provision is occurring in Iraq under the heading of the following objectives:

- Oversight of planning and improving capital projects
- Setting tariff rates
- Establishing sector regulations
- Reforming metering
- Billing and collection function improvements

Following decades of sanctions, warfare and looting of equipment, Iraq's electricity sector is finding it hard to provide reliable power for essential services. Contained within the 2006 report "Summary of Electricity Project Deliverables", the following was noted:

"Protecting Iraq's infrastructure remains the primary challenge to the development of the energy sector, while the key secondary challenge includes a lack of ministerial coordination to form a cohesive energy policy and regulations. The current security situation combined with an absence of investor friendly regulations prevent the Electricity sector from generating sufficient revenue from its infrastructure in order to stabilize, support and upgrade its economic development prospects."

A number of points relating to eGovernment initiatives arise from the above. Private sector investment in Iraq's ICT relies on a strong investment climate (see Appendix C). In order to create a sector that would attract private investment, the Ministry of Electricity must first develop the capacity to implement reform and strengthen the electricity sector. The Government of Iraq needs to facilitate the implementation of the following:

Taking the 'e' out of eGovernment

It is extremely difficult to implement 'electronic' government initiatives without the 'e'

- Develop effective, open and transparent regulations and policies
- Implement best practices for managing the Ministry of Electricity
- Strengthen the Ministry's financial self-sufficiency by making the metering, billing and collections functions more efficient and tariffs based on cost of service
- Attract private investment in infrastructure and operations
- Adopt a financial system integrating all financial and budgeting activities
- Strengthen strategic planning of infrastructure

One of the common complaints from any number of Ministries within the GOI is the severe lack of a reliable power supply. This causes major disruptions to all aspects of government work, including critical applications within a Ministry's LAN or data center operations. Simple operations such as air-conditioning units installed to provide constant temperatures in server rooms suffer from the inconsistent power supply. It is perilous to rely on power supplies delivered through the national grid. The systemic issues of the past couple of decades are explored below.

8.1 Context for Current Electricity Infrastructure Issues

By 1990, Iraq had recovered significantly from the devastation of the Iraq-Iran War (1980-1988) and possessed a reasonably robust electricity infrastructure of 33 plants and 153 generating units with an installed capacity of 9,295 Megawatts' (MW). Iraq has never reached capacity production as the generation units were poorly maintained and operated with improper fuels. During the first Gulf War in 1991, bombing severely damaged the Iraqi electric system, which took twelve years to repair. By February 2003, prior to the commencement of the second Gulf War, the Iraqi electrical system was only generating 42% of its embedded capacity.

A key factor contributing to the erosion of production capacity was forced cannibalization (scavenging parts from one system/machine to service another) of its infrastructure leading to a steady decline of electricity generation by over 60%. Also, from 1991, the GOI had very little capital to invest in the electricity infrastructure's operations and maintenance, and it was unable to buy spare parts, replace parts at the end of their lifecycle or conduct routine maintenance. Iraq also lost access to natural gas, its most efficient and productive fuel, and resorted to more costly and maintenance intensive fuels such as crude and crude residual.

A lack of funds and spare parts also eradicated the normal habits and practices of running a power facility (daily running, apprenticeships, management development, and recordkeeping). Prior to 2003, much of the daily management and operations were performed by non-Iraqi contractors, leading to a deficit of experience among Iraqi Ministry of Electricity employees.

By March 2003, having lost its operations and maintenance (O&M) culture due to lack of funding for spare parts and an over-reliance on foreign contractors, the Ministry of Electricity has a poorly trained and under-motivated workforce. Iraq's electricity infrastructure is central to the economic foundation which the GOI needs to provide basic services to its citizens.

Recent capacity development projects include:

- Implementation of international accounting reforms
- Re-establishment of billing and collections after the end of the major conflict – and an advance in the collection rate from 25% to 80%
- A meter accuracy survey and meter assessment program
- A cost-of-service/tariff restructuring and increase proposal
- Electricity Law and regulatory framework proposals to establish an Iraqi Electricity Commission
- Development of a computerized planning model and a resulting 5-year Master Plan for expanding generation, transmission and distribution
- A fuel plan for converting power plant fuels to natural gas
- Adoption of computerized financial planning models

The growth of eGovernment projects rely heavily on a stable and uninterrupted power supply. Government services cannot be delivered through spotty power services. The crisis caused by poor power supply makes the citizens of Iraq skeptical that, despite all of the successes outlined above, that they will benefit from reliable power provided to them. As mentioned, the bigger the gap between service expectations and service delivery, the harder it is for eGovernment projects to succeed.

9.0 ELECTRONIC GOVERNMENT INTEROPERABILITY FRAMEWORK (EGIF)

Government should be required to comply with complex governance arrangements. Accountability and reporting demands can drive how decisions are made and how information and services are provided. The way government organizes itself to do work is often determined by these requirements rather than focusing on the big picture that encourages economic growth and sustainability.

Governments are increasingly required to operate in a larger international environment. The United Kingdom (UK) provided leadership by developing their e-GIF. There are a number of initiatives around the world to adopt consistent standards based on the UK model. When the Government of Iraq goes down the path of adopting technical standards, an information and communication environment supporting information sharing and integration will result.

An e-GIF of Technical Standards will help:

- Iraqi government agencies
- Iraqi government ministries
- Iraqi local government authorities
- Governments in this region as they all move toward consistent technical standards

9.1 The Scope of eGIF

In identifying e-GIF standards for the Government of Iraq, other international benchmarks need to be observed. The United Kingdom developed its first e-GIF in September 2000. This framework was referenced by the Australian and New Zealand versions.

The e-GIF of technical standards identifies the information and communication technology environment for:

- Interconnection (standards and protocols for managing connections)
- Data exchange (standards for discovery and exchange); and
- Accessibility (guidelines to making services accessible to as many people as possible).

It uses open standards that are well supported by the market as a means of communication. The identification of open standards removes the need to prescribe the use of the same hardware and software by all parties.

The e-GIF does not identify what applications to use when sharing, joining up or integrating information and services. It does not address specific legal, financial, business or governance frameworks required to enable integrated service delivery. It addresses relevant information and communications legal and regulatory issues.

Agencies that are currently using Electronic Data Interchange (EDI) will already be achieving the benefits of interoperable system adoption. A decision to move from EDI would need to be made in the context of achievable business benefits.

9.2 Principles of eGIF

Maintaining the trust of citizens in the business of government must be a fundamental principle underpinning integrated service delivery initiatives. The privacy of personal information and of ‘commercial-in-confidence’ information must be an essential consideration of all eGovernment projects.

The eGIF can be designed to support the following:

- Efforts to achieve whole-of-government solutions
- Integration of government information and services
- Openness and transparency across government
- Strategic focus on business outcomes
- Efficiency gains through reduced duplication of effort
- Improvements in providing information and services to citizens
- Economic growth through optimum use and reuse of information and resources

A number of principles underpin the development of eGIF:

- Internationally accepted standards should be adopted wherever available and appropriate
- The standards seek, wherever possible, to build on standards already being used by agencies to share, join up or integrate information and services
- Recommended standards will be scalable
- Iraqi standards should be open standards based
- Agencies will continue to choose their own applications (but in accordance with eGIF of Technical Standards)
- Agencies will make their own decisions about what information to share, join up or integrate in accordance with business-driven needs
- Agencies will continue to manage how they interact with citizens
- Any eGIF of Technical Standards Version 1 should be mandated

It is presumed that:

- Information may, at some time, be transferred across agency boundaries and underpin decisions when agencies are designing and investing in new ICT systems
- Decisions about ICT investment be made with a view to the return across government, not just to a single agency
- Decisions about ICT investments be consistent with the standards and policies identified in the eGIF Technical Standards V1.0
- Improvements in government services delivered via ICT infrastructure will not occur at the expense of current and more traditional forms of communication. Government acknowledges that a significant section of the Iraqi community has limited or no access to many information and communication tools

Mandate *e*GIF

The integration of government information and services should be mandated by the eGIF Technical Standards V1.0. If this does not occur, Ministries will not feel the need to comply

9.3 Legal & Regulatory Issues for eGIF

As Data Becomes Valuable Information…

Formal terms and conditions governing information validity, access to and use of, personal or sensitive information must be agreed to in all projects seeking to share, join up or integrate information across traditional boundaries

The capacity to use ICT to communicate and match data across traditional boundaries provides new opportunities for government wide approaches to the business of government. The desire to improve service delivery to citizens is the driver for greater integration of government information and services. It is recommended that the protection of personal and sensitive information be treated as a 'right' of the citizens of Iraq in any government initiative to share, join up or integrate information.

Legal and regulatory frameworks are evolving to support horizontal integration of information across traditional boundaries. An overview of legal and regulatory issues is provided here to help agencies comply with existing Iraqi legislation to manage some of the risks associated with joint GOI projects. It is recommended that legal advice be sought if clarification of a particular legal issue is required.

9.3.1 Government of Iraq Legislation

All government agencies need to comply with specific legislation before they participate in cross agency information sharing.

There are some legal and regulatory issues with which compliance is required. These are a high priority, and need to be coordinated by the National Steering Committee eGovernment Iraq.

Government of Iraq Records Act – refer to Official Gazette

Government Records Office – Policies & Standards

Privacy Legislation

Electronic Transactions Act

Freedom of Information Act

9.3.2 Regulatory Issues

When agencies join up or integrate information, they are creating a new set of information that will be subject to the Government of Iraq's intellectual property laws. Government agencies should ensure that the new information is managed in accordance with the requirements of these laws. The Iraq Intellectual Property Policy should be established in conjunction with the Government of Iraq Intellectual Property Policy and Best Practice Guidelines. Individual Iraqi Ministries and agencies need to determine and clearly state the terms and conditions on which the information can be used.

All reasonable effort needs to be taken to identify the original source of information and to ensure compliance with copyright procedures. When the original source of information cannot be determined, a disclaimer should be clearly displayed stating that all reasonable efforts have been made to identify the original source of the intellectual property.

9.4 Standards

The eGIF of Technical Standards are discussed under three categories:

Interconnection - These standards are for the mechanisms required for exchange of electronic information and protocols for managing the connection. It is based around the Internet, transport and application layers for the TCP/IP network model.

Data Discovery & Exchange - This category deals with the description and discovery of metadata and for the content, definition and exchange of data (web services, schemas and transformation).

Accessibility - This element is important to Iraq, as there are limited or no Internet services available to regional and remote areas.

9.5 Interconnection

This section deals with the accepted protocols for the Government of Iraq connecting using the universally accepted standards.

9.5.1 Networks

Internet Protocol Version 6 (IPv6) is the next generation protocol designed by the Internet Engineering Taskforce (IETF). IPv6 provides end-to-end transparency, auto configuration, global addressing and more.

The User Datagram Protocol (UDP) offers only a minimal transport service – non-guaranteed datagram delivery – and gives applications direct access to the datagram service of the IP layer. UDP is used by applications that do not require the level of service of Transmission Control Protocol (TCP) or that wish to use communication services (e.g. multicast or broadcast delivery) not available from TCP. Typical uses for UDP include name services (DNS), routing information (RIP) and network management (SNMP). Agencies should ensure that the UDP protocol is enabled with caution to reduce the potential for denial-of-service attacks, which could make systems inaccessible.

The Hypertext Transfer Protocol (HTTP) is an application-level protocol with the lightness and speed necessary for distributed, collaborative, hypermedia information systems. HTTP has been in use by the World Wide Web global information initiative since 1990. Now that both HTTP extensions and HTTP/1.1 are stable specifications, W3C has closed the HTTP activity.

9.5.2 Mail Transfer

The Simple Mail Transfer Protocol (SMTP) is a host-to-host protocol used to transfer mail reliably and efficiently between systems. SMTP is independent of the transmission subsystem and requires a reliable data stream channel. Iraqi Ministries and agencies should ensure that adequate controls are in place to prevent the spoofing of email addresses.

9.5.3 Directory Services

Lightweight Directory Access Protocol is designed to provide access to an X.500 Directory while not incurring the resource requirements of the Directory Access Protocol (DAP). The protocol is specifically targeted at management applications and browser applications that provide simple read/write interactive access to the X.500 Directory.

9.5.4 Name Services

Domain Name Services is the method used to convert Internet addresses in a mnemonic form to the equivalent numeric form. The DNS server that resolves the address may communicate with other DNS servers if it cannot translate the address itself.

Agency name servers exposed to the Internet may be subject to a wide variety of attacks. Appropriate steps should be taken to minimize the risk from such attacks. Iraqi Ministries and government agencies should ensure that only records designed and intended for public exchange are propagated to external systems.

9.5.5 Security

The use of Secure Sockets Layer is a common method of providing encrypted transmission of data between web browsers and web servers. Based on cryptography (public/private key encryption technology), SSL provides data encryption, server authentication, message integrity, and client authentication for any TCP/IP connection.

Another protocol for the transmission of data securely over the World Wide Web is Secure HTTP (S-HTTP). S-HTTP is a secure message-oriented communications protocol designed for use in conjunction with HTTP. Whereas SSL creates a secure connection between a client and a server, over which any amount of data can be sent securely, S-HTTP is designed to transmit individual messages securely. SSL and S-HTTP are complementary technologies and should be used in appropriate circumstances.

9.5.6 File Transfer

The Internet File Transfer Protocol (FTP) provides facilities for transferring files to and from remote computer systems. Usually the user /system transferring a file need the authority to login and access files on the remote system. The common facility known as anonymous FTP works via a special type of public guest account implemented on the remote system requiring minimal authentication to gain access to public files. The facility to receive files from remote systems should have adequate controls (viz. security and file size restrictions) in place.

Where FTP facilities are required, Iraqi Ministries and agencies should consider using services that have the ability to automatically reconnect and resume transmission for interrupted file transfers.

9.6 Data Exchange (Web Services)

Web services are self-contained business functions that can operate over any network. They are written to strict specifications to work together with other similar kinds of components. Some of the more established functions at this time are messaging, directories of business capabilities and descriptions of technical services. But other functions, such as security and transaction handling, are in the process of being specified. Web services are important to agencies because they enable systems in different agencies to interact with each other.

The World Wide Web Consortium (W3C) defines a Web service as "a software system identified by a URL whose public interfaces and bindings are defined and described using XML. Its definition can be discovered by other software systems. These systems may then interact with the Web service in a manner prescribed by its definition, using XML based messages conveyed by Internet protocols."

XML and the use of Web Services have been identified as primary technologies for integrated service delivery. By standardizing on XML, agencies will be able to exchange data with anyone, any time, without the need for the costly custom integration work that has been necessary in the past. XML can be used to create electronic catalogues, purchase orders, invoices, and other documents needed to conduct business. But XML by itself does not guarantee that these documents can be understood by any business other than the one that creates them. XML is only the foundation on which additional standards can be defined to achieve the goal of true interoperability.

Simple Object Access Protocol (SOAP 1.1) is a lightweight protocol intended for exchanging structured information in a decentralized distributed environment. It defines the use of XML and HTTP to access services, objects, and servers in a platform-independent manner. It uses XML technologies to define an extensible messaging framework providing a message construct that can be exchanged over a variety of underlying protocols. The framework has been designed to be independent of any particular programming model and other implementation specific semantics.

Web Services Description Language is an XML-formatted language used to describe a Web service's capabilities as collections of communication endpoints capable of exchanging messages. WSDL separates the description of the abstract functionality offered by a service from details of a service description such as "how" and "where" that functionality is offered.

Universal Description, Discovery and Integration (UDDI) is a Web-based distributed directory that enables agencies and applications to quickly, easily and dynamically find and use Web Services over the Internet. UDDI also allows operational registries to be maintained for different purposes in different contexts.

9.6.2 Schemas

Schemas express shared vocabularies and allow machines to carry out rules made by people. They provide a means for defining the structure, content and semantics of XML documents. The purpose of using such schemas is to minimise the divergence of descriptions and taxonomies between agencies across government.

XML Schema: Structures specify the XML Schema definition language, which offers facilities for describing the structure and constraining the contents of XML documents, including those exploiting the XML Namespace facility. The Schema Definition Language (XSD), which is represented in XML 1.0 and uses namespaces, substantially reconstructs and considerably extends the capabilities found in XML 1.0 document type definitions. This specification depends on XML Schema Part 2: Datatypes.

XML Schema: Datatypes is part 2 of the specification of the XML Schema language. It defines facilities for defining datatypes to be used in XML Schemas as well as other XML specifications. The datatype language, which

is represented in XML 1.0, provides a superset of the capabilities found in XML 1.0 Document Type Definitions (DTDs) for specifying datatypes on elements and attributes.

The W3C XML Schema Definition Language (XSD) is an XML language for describing and constraining the content of XML documents. It is recommended that the Government of Iraq base the use of XML on recommendations of the W3C to avoid the use of product-specific XML implementations.

9.6.3 Agreed Schemas

Electronic Business Extensible Markup Language (ebXML) is a modular suite of specifications for standardizing XML globally in order to facilitate trade over the Internet between organizations regardless of size.

The specification gives businesses a standard method to exchange XML-based business messages, conduct trading relationships, communicate data in common terms and define and register business processes.

9.6.4 Transformation

Extensible Stylesheet Language (XSL) is a language for expressing stylesheets. Given a class of arbitrarily structured XML documents or data files, designers use an XSL stylesheet to express their intentions about how that structured content should be presented; that is, how the source content should be styled, laid out, and paginated onto some presentation medium, such as a window in a web browser or a hand-held device, or a set of physical pages in a catalogue, report, pamphlet, or book.

XSL Transformations (XSLT) is designed for use as part of XSL, which is a stylesheet language for XML. In addition to XSLT, XSL includes an XML vocabulary for specifying formatting. XSL specifies the styling of an XML document by using XSLT to describe how the document is transformed into another XML document that uses the formatting vocabulary.

9.6.5 Metadata

Metadata is the data used to describe resources so that people searching for electronic information can find what they are looking for more efficiently. Metadata helps government search engines to accurately and efficiently identify and retrieve web-based resources in response to search requests. It is descriptive and targeted, and is used by search engines to locate relevant resources with greater precision and ease. To ensure usability, it is important that it is applied consistently by Ministries and agencies across the GOI. One of the main uses of metadata is to assist Internet users find resources based on its description.

The National Steering Committee eGovernment Iraq (NSCeGI) will require agencies to create descriptions of their key information resources and services in the form of web-based Metadata records complying with Iraqi Government Locator Service (IGLS) Metadata standard.

The IGLS will be issued as an Iraqi Standard, including an element set. This promotes consistency. IGLS Metadata, which is usually invisible to the end user, can be stored in HTML ‘metatags’ or in a Metadata repository or directory. These can be interrogated by external search engines. The use of TAGS supports consistency in subject entries across an agency and across government. It supports interoperability, saves time and effort in creating an agency specific thesaurus and improves the reliability and quality of automated metadata creation.

Metadata Records – Minimum Resource Set
Home pages – defined as the public entry point to each Ministry and agency
Topics/services – in high demand by the Iraqi citizen (this can be based on usage statistics but may include topical or publicized resources with potentially high public demand
Information Required by Ministry customers – Iraqis who want to understand their entitlements to government assistance (e.g. MoLSA Pension) and the requirements of government that apply to them
Pages – that provide an actual online service to the public (payments, application forms etc.)
Pages – required to meet a prescribed community/legal/service obligation
Entry points – to specific online services and indexes (e.g. entry point to a legal database)
Major formal publications – annual reports, corporate strategic plans, public policy and accountability documents
Media Releases (see Ministry of Foreign Affairs www.mofa.gov.iq for examples)
Major entry points – or indexes and menus to a range of closely related topics, programs or policies
Information – about Ministry and agency powers affecting the public, and manuals and other documents used in decision-making
Descriptive – or marketing information about Ministries and agencies, their services, activities and collections

Table 5: Metadata Records – Minimum Resource Set

It is important for Ministries and agencies to ensure that all the categories of resources have Metadata. Website construction plays a role in this as government agencies begin to build their interactive sites or overhaul old sites. As Metadata allows users to search accurately and quickly, any documents that will be of use to clients should be Metadata tagged.

The content of Metadata consists of a number of elements. A mandatory element set can include: creator, title, date, subject or function, and identifier or availability. Other elements include publisher, description and type, audience, language (for resources not in English) and coverage. See Appendix K for Metadata example.

9.6.6 Data Modelling

Data modelling is the act of exploring data-oriented structures and, from the point of view of an object-oriented developer; data modelling is conceptually similar to class modelling. With data modelling data entities are identified, while with class modelling, classes are identified. Data attributes are assigned to data entities just as attributes and operations are assigned to classes. There are associations between entities, similar to the associations between classes – relationships, inheritance, composition, and aggregation are all applicable concepts in data modelling. Data modelling focuses solely on data and only explores data issues.

Unified Modelling Language (UML) is a general-purpose notational language for specifying and visualizing complex software, especially large, object-oriented projects. Agencies are encouraged to use UML (XMI) for the modelling of inter-agency business processes, systems and applications.

9.6.7 Modelling Structured Data

Document Object Model (DOM) is the specification for how objects in a web page (text, images, headers, links, etc.) are represented. The DOM defines what attributes are associated with each object, and how the objects and

attributes can be manipulated. Dynamic HTML (DHTML) relies on the DOM to dynamically change the appearance of Web pages after they have been downloaded to a user's browser.

W3C's Document Object Model (DOM) is a standard Application Programming Interface (API) to the structure of documents; it aims to make it easy for programmers to access components and to delete, add, or edit their content, attributes and style. In essence, the DOM makes it possible for programmers to write applications that work properly on all browsers and servers and on all platforms. While programmers may need to use different programming languages, they do not need to change their programming model.

9.6.8 E-Mail

Multipurpose Internet Mail Extensions (MIME) is an extensible protocol for the format of messages so they can be exchanged between different e-mail systems. MIME is a very flexible format that allows the encapsulation of virtually any type of data format including text, images, video or any other application specific data type. In addition to e-mail systems, Web browsers also support various MIME types enabling them to display or output files that are not in HTML format.

Secure/MIME (S/MIME) is a version of the MIME protocol that supports encryption of messages. It is based on RSA's public-key encryption technology. S/MIME is supported by most e-mail systems currently available.

Government of Iraq agencies should use MIME for normal email messages where security is not a concern. For the exchange of secure email messages, agencies should be encouraged to use S/MIME. E-mail can contain different file formats including macros as part of a document, scripted and executable files. The receiving agency needs to make certain that proper policies and procedures are in place to ensure that the incoming mail does not pose a security risk.

9.6.9 Document File Types

Government of Iraq agencies will have the need to exchange documents in either editable or read only formats.

Recommended formats for editable documents are:

Plain Formatted text (.txt)

Rich Text Format (.rtf)

Hypertext documents (HTML 4.01)

Extensible Markup Language (XML)

Microsoft Word (.doc) '97 format

It is acknowledged that Microsoft Word is a proprietary document format. Consideration should be given to open standards based format (XML based) in future versions of the *eGIF*.

Recommended format for closed documents is:

Adobe Acrobat (.pdf) version 7.x

9.6.10 Image File Types

Images should be created in an appropriate format to minimize load time and maximize display quality. There are three formats for displaying images in web browsers – JPEG, GIF and PNG.

The Joint Photographics Experts Group (JPEG – ISO 10918) format is better for photographic images that contain many color variations, such as photographs. JPEG images can contain up to 16 million colors. JPEG does not work well on line drawings, lettering or simple graphics.

The Graphics Interchange Format (GIF) is most suitable for line-art images such as icons, graphs, line-art logos and flat areas of color. GIFs should be reduced to display a minimum number of colors as possible. GIF is better than JPEG for images with only a few distinct colors, such as line drawings, black and white images and small text that is only a few pixels high. With an animation editor, GIF images can be put together for animated images.

9.6.11 Accessibility

The objective of creating accessible web content is to reduce the barriers faced by a large and varied number of audiences trying to access information and services on the Internet. These groups include people with disabilities, Iraqis living outside of urban areas with slow Internet connections and people using alternative technologies to a computer, such as mobile phones, handheld devices (PDAs, etc.) to access web sites.

Reference to minimum website standards can be found at Appendix K.

The Government of Iraq needs to decree that all government web sites should:

"Have a simple and easy to use design. An official Government of Iraq website must obey basic standards and protocols with respect to form and function, and be mindful to current user computer capabilities and circumstances."

9.7 Next Steps for the Government of Iraq

The Government of Iraq understands the need for a standardized approach to ICT and is moving toward creating the standards in this eGIF.

The National Steering Committee eGovernment Iraq (NSCeGI) will play a key role to encourage the adoption of an interoperable environment beginning with the widespread acknowledgement and adoption of this eGovernment Strategy 2007-2010. This will be done by supporting the development of ICT skills of Iraqi government workers and by participating in projects to support the government-wide adoption of the standards.

As consistent standards are adopted and interoperability becomes a reality, agencies will become aware of opportunities to move from unilateral to multilateral approaches to policy development and service delivery. These endeavours need to be supported by new frameworks for operating outside out traditional bureaucratic boundaries.

A commitment by the Government of Iraq to adopt the *e-GIF* standards will demonstrate an understanding of the achievable benefits through e-government and a commitment to a whole of government approach.

The United Kingdom was the first electronic Government Interoperability Framework to be created. The United Kingdom continues to provide leadership in the identification of standards and policies to support interoperability. New Zealand has also mandated the use of their e-GIF for use by government agencies.

10.0 The Value of Securing Information – Applying World's Best Practice (ISO17799) in Iraq

The ability to secure information is paramount to the success of government operations in any country around the world. In recent times, the Government of Iraq has understood the importance of this, and work has begun to develop capabilities within Ministries at the national level. The use of specific remedial tools such as risk assessments is an example.

Information is an asset that, as with other important business assets, is essential to an organization's business within the contemporary interconnected business environment. Due to the growing interconnectivity, information is now exposed to a number and wide variety of threats and vulnerabilities.

Information security is the protection of information from a wide range of threats in order to ensure business continuity, minimize business risk, and maximize return on investments and business opportunities. Information security is achieved by implementing a suitable set of controls, including policies, processes, procedures, organizational structures and hardware/software functions. These controls need to be established, implemented, monitored, reviewed and improved. This is to ensure security objectives of the government agency are met. This should be done in conjunction with other business management processes.

10.1 Information Security – A Necessity

Information and the supporting processes, systems, and networks are important business assets. Defining, achieving, maintaining, and improving information security are essential to maintain up to date business procedures, even within government departments, as well as reduce exposure to potentially corruptive practices. Within Iraq over the next few years, legal compliance will begin to play a significant role, and information security procedures will be a major contributor to ensuring compliance.

Government Ministries are equally prone to security threats which can come in multiple forms. These include fire, flood, espionage, sabotage, acts of vandalism, computer-assisted fraud. Causes of such damage include computer hacking, malicious code, denial of service (DoS) attacks, which can be quite serious in nature. Another often overlooked cause is one of the lowest sophistication and that is leaving user names and passwords near a workstation. This, coupled with users creating simple and intuitive passwords allows many unauthorized account entries to be made.

Information security in Iraq is needed to protect newly built infrastructure. Information security functions as an enabler for both the public and private sectors, which, due to their increasing interconnection, are difficult to provide access control. Contemporary distributed computing has also weakened the effectiveness of central, specialist control.

Many information systems have not been designed to be secure. The security that can be achieved through technical means is limited, and should be supported by appropriate management and documented procedures. Iraqi Ministries need to work collaboratively and carefully plan the ISO17799 controls they will all agree to use. Information security management requires participation by all government employees with access to information, electronic or print. It may also require participation from shareholders, suppliers, third parties, customers or other external parties and groups.

10.2 Establishing Security Requirements

It is essential that Iraqi government agencies identify their security requirements. There are three main sources of security requirements.

One source is derived from assessing risks to the government agency, taking into account the elements of the agency's strategic plan (including mission, vision and action plans) and high level objectives. After a risk assessment is completed, threats to assets are identified, vulnerability to and likelihood of occurrence is evaluated and potential impact quantified.

Another source is the legal, statutory, regulatory, and contractual requirements that the government can use to define its relationship with private partners, contractors and service providers. The final source is the particular set of principles, objectives, and business requirements for information processing that government needs to develop to support its operations.

10.3 Security Risk Assessment

Security requirements are identified through an assessment of security risks. Expenditure on controls needs to be calculated against the potential damage and disruption caused to government services as a result of security failures. Certain vital functions are required within Iraq including work done by Ministries on finance, identification (e.g. passports and visas) and social safety services such as social benefits and medical.

The results of the risk assessment will help to guide and determine the appropriate management action and priorities for managing information security risks, and for implementing controls selected to protect against these risks. The management issue for the GOI is that risk assessments are not a one time investment. They should be repeated periodically, preferably annually to address any changes that might influence the risk assessment results.

This involves labor costs and budgetary implications. Repeat assessments are often done if there are major substantive changes to the infrastructure. This can include changing an ISP, changing network infrastructure, adding or removing any particular features, creating internal or external connection nodes.

10.4 Selecting Controls

Once security requirements and risks have been identified and decisions for the treatment of risks have been made, appropriate controls should be selected and implemented to ensure risks are minimized to an acceptable level. Controls can be selected from the ISO27001 Standard or from other control sets, or new controls can be designed to meet specific needs.

Ministries have the option to develop controls as they relate to their specific business objectives. An example of this might be the Ministry of Finance gathering data for input into monthly reports, where information is collected from a variety of sources, and stored in a shared database. Controls can be built specifically around this task as many people require access to the shared document.

The selection of security controls is dependent upon organizational decisions based on the criteria for risk acceptance, risk treatment options, and the general risk management approach applied to the specific Iraqi Ministry or agency. Ministries should also consider their controls with respect to all relevant national and international legislation and regulations. Cross-references to clauses in the ISO27001 code of practice should be made to facilitate compliance checking for auditing purposes.

10.5 Beginning the Information Security Journey

A number of controls can be considered a good starting point for implementing information security. They are either based on essential legislative requirements or considered to be common practice for information security. Some preliminary work has been done in 2007 in Iraqi Ministries, which follow the work plan for a more in-depth remediation plan to follow post-gap analysis.

Controls considered to be essential to an organization from a legislative point of view include, depending on applicable legislation:

Data protection and privacy of personal information

Protection of Organizational Records

Intellectual Property Rights

Standard practice information security controls include:

Information security policy document

Allocation of information security responsibilities

Information security awareness, education and training

Correct processing in applications

Technical vulnerability management

Business continuity management

Management of information security incidents and improvements

These generic controls are applicable to all government organizations and in most environments. Government officers have to note that all although controls in this standard are important and should be considered, the relevance of any control should be determined in light of the specific risks an organization is facing. The generic controls are considered a good starting point which will allow government officers to make sense of their individual risk assessment findings.

10.6 Critical Success Factors for Implementing Information Security

The following factors are often critical to the successful implementation of information security within government agencies:

- Information security policy, objectives, and activities that reflect business objectives
- An approach and framework to implementing, maintaining, monitoring; and improving information security consistent with the organizational culture
- Visible support and commitment from all levels of management
- A good understanding of the information security requirements, risk assessment, and risk management
- Effective marketing of information security to all managers, employees, and other parties to achieve awareness
- Distribution of guidance on information security policy and standards to all managers, employees and other relevant people
- Ability to financially support information security management undertakings
- The provision of appropriate awareness, training, and education
- Establishing an effective information security incident management process
- Implementation of a measurement system used to evaluate performance in information security management and feedback suggestions for improvement

10.7 Cross Functional Management Forum

Information security coordination can be made simpler for Iraqi Ministries if activity is coordinated across a number of them. The first step is to assign an IT/IS professional with information security responsibility, and create an information security management forum. ISO/IEC 17799 identifies a range of activities that might be carried out by this cross-functional forum:

- Agreeing, across a Ministry, specific roles and responsibilities in respect of information security
- Agreeing the specific methodologies and processes used in implementation of the information security policy
- Agreeing and supporting cross-organizational information security initiatives
- Ensuring that the corporate planning process includes information security considerations
- Assessing the adequacy and coordinating the implementation of specific controls for new systems and services
- Reviewing information security incidents
- Ensuring that the Ministry is aware of the way in which information security is being handled

10.8 Priorities and Action Statement – Information Security

There are a number of areas which need to be focused on for the next three years in most of the Iraqi Ministries. These include:

1. Policies – consistent, repeatable set of common criteria – acquisition. e.g. Data Protection Policy, Internet Use Policy, Business Continuity Plan, Disaster Recovery to implement global best practices into the GOI.

2. Procedures – Defining documents of policies
3. Security Awareness – Raising the knowledge level of GOI employees – and understanding how they directly or indirectly affect information

10.9 Cyberwarfare – National Security Issues

As the Government of Iraq enters the 'new economy' environment, information security issues emerge in the form of malicious electronic intrusions and attacks. All government officers need to be aware of the ways in which their valuable data can be corrupted or destroyed.

For most governments, defending their national security against Cyberwarfare means keeping intruders (hackers) away from important government information and communications systems. Little thought is given to the possibility of large scale disruption to government services when the Internet is used as a connectivity tool.

Electronic Attacks

For most governments, defending their national security against Cyberwarfare means keeping intruders (hackers) away from important government information and communications systems

As more Iraqis become dependent (at a rapidly increasing rate) on using the Internet for the functions of modern life, the Government of Iraq will have to invest heavily to protect this highly prized national asset, government information.

A country can face highly organized anonymous attacks that target national infrastructure:

- Ministries
- Banks
- Newspapers
- Media Outlets
- Telephone Exchanges

This type of premeditated series of attacks can cripple the entire structure of a community especially if they have poor information security in place. An event such as this occurred to Estonia in mid 2007.

In the Estonian example the following occurred:

- The attacks were highly sophisticated
- Tactics shifted as weaknesses emerged
- Particular 'ports' of specific mission-critical computer systems such as telephone exchanges were targeted
- Packet 'bombs' of hundreds of megabytes in size would be first sent to one address, then another

Clear Threat!

In the example: Distributed Denial of Service Attacks involved more than 1 million computers, creating traffic equivalent to 5,000 clicks per second on some targets

- Emergency number used to call ambulances and the fire service were out of action for more than 1 hour
- Botnets (swarms of computers hijacked by surreptitiously placed code, usually spread by spam) swamped sites by flooding them with false requests for information
- Distributed denial of service (DDOS) attack involved more than 1 million computers, creating traffic equivalent to 5,000 clicks per second on some targets
- Some attacks were viewed as highly coordinated, stopping precisely at midnight
- Small time hackers were also attracted by the incident, and followed the initial large scale assault
- Informal alliances with other countries were useful: Sweden assisted by stopping many malicious data packets before they reached Estonia

A spokesman from that country voiced the following:

"The efforts exceeded the skills of individual activists or even organized crime. They require the cooperation of a state and a large telecoms firm."

The example helps highlight the need to carefully construct enterprise architecture with built in flexibility and resilience. The service oriented architectural approach relying on cooperation between all levels of government through the introduction and use of standards is paramount. Discussion regarding international Cybercrime

conventions is being held. The aim is to oblige Internet Service Providers (ISPs) to cooperate in blocking DDOS attacks coming from their subscribers' computers. The underlying issue is trading the rights of individuals for security.

A major blockage facing countries trying to defend their critical infrastructure is working with the private sector who may actually own the telecommunications networks, electrical grids and transportation systems. This is a major issue in the United States, where the private sector owns more than 85% of the critical infrastructure. The conflict occurs when the government is interested in protection, with the owner focusing on expansion.

The Government of Iraq has noted some important lessons as it attempts to modernize its economic and social environment through the use of information and communications technology:

- The development of reliable architectural models able to withstand malicious attacks aiming to access or corrupt critical national data
- Sound investment decisions will need to be made to protect this highly prized national asset, government information.

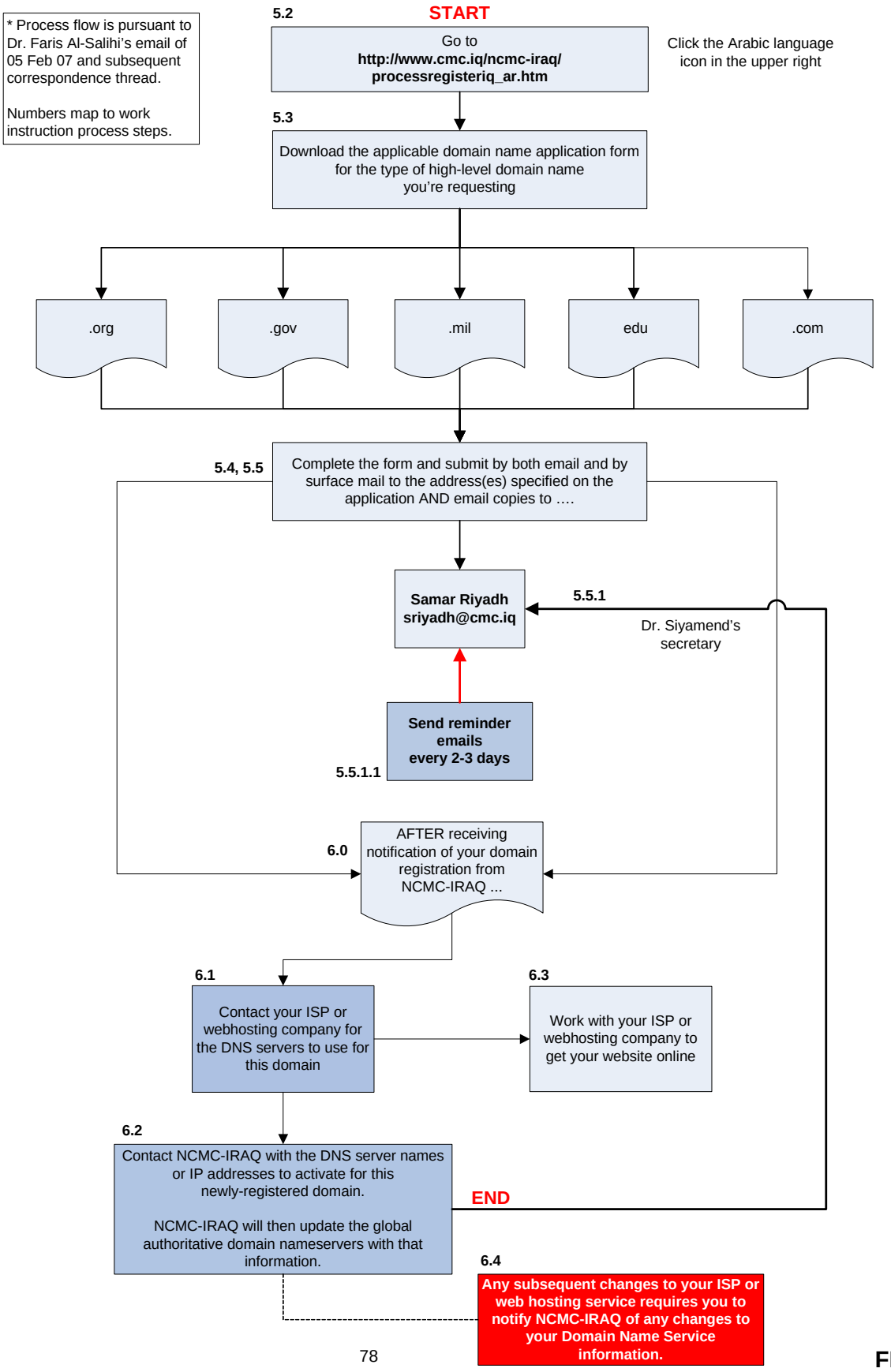
11.0 HOW TO OBTAIN AND IMPLEMENT A .IQ COUNTRY-LEVEL DOMAIN

Over the past few years, a number of government and non-government agencies have wished to register a high level domain within the Iraq for the purpose of communicating their good or service. In the case of government agencies including Ministries, this is to give Iraqi citizens and others access to the services they provide. For non-governmental agencies, the desire to make people aware of their service drives the demand. For businesses, the ability for customers to locate them or learn more about the types of goods and services they offer is the main driver.

Until recently, resolving the problem of registering high level domains had remained elusive within Iraq to date, with only a handful of government Ministries and agencies able to demystify the process. True eGovernment can only occur when connectivity issues in the public domain are resolved alongside the internal government-to-government challenges.

The inclusion of this chapter intends to show that the barrier of domain name registration and government website services will be broken down in the near future.

The flowchart on the following page identifies all of the necessary steps needed to register an official government domain. This process has been tried successfully for a small number of Ministries, with one of the main goals of the eGovernment Strategy to register all Ministries and government agencies by 2010.


* Process flow is pursuant to Dr. Faris Al-Salihi's email of 05 Feb 07 and subsequent correspondence thread.
Numbers map to work instruction process steps.
5.2
START
Go to http://www.cmc.iq/ncmc-iraq/processregisteriq_ar.htm
Click the Arabic language icon in the upper right
5.3
Download the applicable domain name application form for the type of high-level domain name you're requesting
.org
.gov
.mil
edu
.com
5.4, 5.5
Complete the form and submit by both email and by surface mail to the address(es) specified on the application AND email copies to ….
Samar Riyadh
sriyadh@cmc.iq
5.5.1
Dr. Siyamend's secretary
Send reminder emails every 2-3 days
5.5.1.1
6.0
AFTER receiving notification of your domain registration from NCMC-IRAQ ...
6.1
Contact your ISP or webhosting company for the DNS servers to use for this domain
6.3
Work with your ISP or webhosting company to get your website online
6.2
Contact NCMC-IRAQ with the DNS server names or IP addresses to activate for this newly-registered domain.
NCMC-IRAQ will then update the global authoritative domain nameservers with that information.
END
6.4
Any subsequent changes to your ISP or web hosting service requires you to notify NCMC-IRAQ of any changes to your Domain Name Service information.

12.0 THE VALUE OF BUSINESS CASE DEVELOPMENT – A QUESTION OF TRANSPARENCY

Spectacular success and spectacular failure are results stemming from the same starting point: the creation or absence of a business case. Government of Iraq officials will be better guided and informed as they develop and implement eGovernment projects with the aid of a business case. One of the main benefits is to customize the argument in favor of, or against, implementing a possible solution. Removing the highly unpredictable element of political influence, the business case should be defensible in its assumptions and conclusions.

Development of an adequate business case ties into the following assumptions of the higher order goals of eGovernment transformation:

High Level GOI Goal	Relevance to Business Case & Business Planning
Improving collaboration between government agencies	High
Being able to provide essential services to Iraqis	High
Improving Iraq's competitive advantage	Very High
Making connections between Iraqi Ministries	Very High
Reform old economy systems and methods of working	Very High
Reducing the cost of delivering government service	High
Assisting the development of the Iraqi ICT sector	High
Reducing corruptive and corrosive practices	High
Becoming a respected regional player in the ICT arena	High

Table 6: High Level Goals Mapping to Business Cases & Planning

12.1 Pursuing Business Cases for eGovernment Initiatives

All Iraqi government officers tasked with developing proposals to aid their service delivery need to be versed in the preparation of basic business cases. Having skills in this area will help them to define exactly their business objectives, as well as the size and complexity of the project. Directly linked to this are the financial and human resource impacts. The security situation in Iraq at present also adds another challenging, but not insurmountable variable. This may increase project timelines, systems integration needs and staff training requirements.

What a Good Business Case Tells You…

Fit with strategic IT plan

Acceptable level of risk

'GO' or 'NO GO'

Ministry ability to actually implement

The person or team involved in any eGovernment project need to be aware of why a business case is needed. This will help them clarify the 'strategic fit' of a particular project or planned implementation. Some of the key reasons for a business case include:

- It gives the decision maker a well-reasoned argument for the proposed eGovernment project
- It outlines any internal changes that may occur in the Ministry as well as highlight costs and associated risks
- It will inform decision-makers (at all levels) about the value it will bring to the Ministry
- It allows all to understand the problem and its context
- It allows the Ministry staff to clarify their vision for implementation opportunities and the development of service specializations
- It aims to prove value for leadership and hopefully gain 'buy-in'

The eGovernment business case should also contain elements of the following:

- Composition of a brief, compelling, service-oriented problem statement
- A mission statement or vision of the future addressing the problem
- A description of the objectives to be achieved
- A description and rationale for the preferred approach
- A statement of the benefits that address the concerns of all stakeholders
- Measures for gauging improved performance or progress toward each objective
- A statement of the likely risks of the initiative and how they will be addressed
- A basic plan of work with a timeline and key milestones
- Alternatives considered and how they would/would not work
- Cost estimates and budgeting provisions

The writing of a business case should give careful consideration to:

- Initial Investment Costs (start-up costs)

- Operational Costs
- Incoming Savings
- Ongoing benefits
- Technology assessments
- Technology upgrades (in-house skills or outsourced service)
- Ability to measure the benefits

As mentioned above, the decision to transform government services quickly becomes an investment decision that has immediate business case impacts. Decisions can only be made to invest when sound feasibility studies are carried out. These are only possible once a business case is prepared. Investment monitoring and benefits realization can be potentially problematic, but crucial to carry out. Qualitative or descriptive approaches can be balanced by some form of quantitative or financial approach to IT investments.

The information in Table 5 provides a quick reference guide for Iraqi government agencies as they co-ordinate components for the construction of their business case. It displays some key inputs when an IT solution is required to solve a Ministry customer service objective.

Once the decision is made, the governance component will often determine the success or failure of the project. As referenced earlier, the IT governance component can create or destroy value quickly through acts of diligence or tardiness in the area of project management.

Some other noteworthy points about the value of the investment highlighted by the business planning exercise:

- An increased understanding of the transparency of costs, risks and benefits
- A greater capacity to select those investments with the highest potential return for the Ministry, and ultimately the end user, the Iraqi citizen
- A strong analysis tool to effectively evaluate Ministry needs, and therefore have a predetermined understanding of need before going to the market and to vendors
- It is desirable to inform the project 'sponsor' or champion about the progress of a decision.

Research indicates that forty (40) percent of Chief Information Officers (CIOs) globally believe that there is insufficient co-ordination between IT Business Strategy and implementations. Business case development will identify potential risks and challenges, and be the bridge between the two.

Business drivers identify the business need, enhanced by quality evidence gathering. The objective is to strengthen the line items of the business case, including project purpose, dependencies, risks and milestones, organizational impacts and an action plan. The benchmarking component can assist in finding comparable cases from other Ministries or other regions. This step encourages knowledge transfer and knowledge exchanges.

There may be an opportunity to be exposed to 'lessons learned' through the successes and failures of other IT investment projects. Though not necessarily a sequential exercise, the business case developer can begin to outline potential benefits to be realized. Included here are business improvements at the Ministry level; increased efficiencies and change management impacts. The final stage works in tandem with Business Value. Performance evaluation is the monitor and control component of a system allowing enhancements to, and deductions from, the business case.

eGovernment Business Case Element	Data Sources and Descriptors
Problem Statement	Short description of problem – clear definition/ how and why the problem occurs
Mission or Vision Statement	Strategic framework visioning; Hopes and Fears included. Important to note high level GOI eGovernment expectations
Specific Objectives	Express specifically; Environmental scan; Strategic context framework; process analysis; self-assessment; stakeholder analysis
Preferred Approach	Cost-benefit analysis; Pilot testing; SWOT analysis; Data integration; Funds management; Training and development (skills)
Expected Benefits	Cost-benefit analysis; Stakeholder analysis; IT Benefits Realization
Performance or Progress Measures	Customer satisfaction; cost efficiency; time savings; dollar savings; improved accuracy measures; quicker case action; public confidence (customer survey)
Risks and Ways to Address them	Risk analysis; stakeholder analysis; technology awareness sessions; sensitivity analysis; risk profiling
Plan of work, timeline and key milestones	Co-ordination methodology; Account for existing infrastructure, funds, staff, time modeling; Resource Implication Management Model; Collaborative Management Model; Project Milestones; PERT chart
Project management and staffing	Mapping project activities; Dealing with skill sets and the potential shortage of IT professionals; Function identification and outsourcing; Internal project competition (staff and budget)
Cost estimates and funding sources	Cost-benefit analysis (human resources, technology, consulting, training, plant and equipment, maintenance); Cost-performance analysis; Stakeholder analysis; Multiple source funding model
Alternatives considered	Benchmarking; Best and Current Practice; Technology awareness sessions; Group decision-making; PERT Charts
Opposing arguments and responses	Best and Current Practice; Stakeholder Analysis
Table 7: eGovernment Business Case Builder	

13.0 GOVERNMENT PROCUREMENT – A QUESTION OF TRANSPARENCY

The road to electronic procurement (eProcurement) in developing countries can be problematic if the regulatory environment allows ambiguity. To this end, the Government of Iraq has commenced the journey of standardizing its procurement policies and procedures. One of the pillars of a transparent government can be seen through the way it chooses to conduct the business of government. The implementation of best practice procurement has measurable benchmarks and performance indicators. The Law of Public Contracts (2007) is the first step on that journey. Interpretation of the regulations (Order 87) will also be crucial as ambiguities can be exploited. Managing contracts is also a critical component of post-purchase transparency.

The success of planned eGovernment initiatives depends on the way in which public officers apply the new procurement regulations. Virtually everything is included in the procurement regulations (Article 2) including:

- State projects contracts
- Consultant contracts
- Supply of goods
- Supply of services

The guiding principles for procurement policy are laid out below.

1. Transparency – public bodies should ensure openness and clarity on procurement policy and its delivery.
2. Competitive Supply – procurement should be carried out by competition unless there are convincing and documented reasons to the contrary
3. Consistency – suppliers should, all other things being equal, be able to expect the same general procurement policy across the public sector
4. Effectiveness – public bodies should meet the commercial, regulatory and socio-economic goals of government in a balanced manner appropriate to the procurement requirement
5. Efficiency – procurement processes should be carried out as a cost, and as effectively as possible
6. Fair Dealing – suppliers should be treated fairly and without unfair discrimination, including protection of commercial confidentiality where required. Public bodies should not impose unnecessary burdens or constraints on suppliers or potential suppliers.
7. Integration – procurement policy should pay due regard to other economic and social policies, rather than cut across them
8. Integrity – there should be no corruption or collusion with suppliers or others
9. Informed decision-making – public bodies need to based decisions on accurate information and monitor requirements to ensure they are being met
10. Legality – public bodies must conform to all applicable legal requirements

11. Responsiveness – public bodies should endeavor to meet the aspirations, expectations and needs of the community served by the procurement

12. Accountability – effective mechanisms must be in place in order to enable public bodies to discharge their personal responsibility on issues of procurement risk and expenditure

Each Ministry, governate, region and non-ministerial agency is required to establish a Procurement Office, not a procurement committee of mere contracts office.

According to Article (9), "The offices of public procurement in all Ministries and public entities or agencies not related to any ministry as they are stipulated in section (2/1/A) of Order No. (87) – 2004 shall assume following up the implementation procedures of the public contracts that are being contracted with these entities.

The action item relating to the above paragraph is the immediate need for the establishment of procurement offices. These are different in function from the contracts offices which already exist. The establishment of procurement offices needs to be verified and actioned for the effective use of the Law of Public Contracts.

13.1 Applying the Procurement Regulations

This section is intended to highlight the need for careful procurement procedures as they apply to government purchases under the new law. These regulations provide procedures for and strengthen existing law (Order No. 87). These regulations are intended to be in force only until a new law on procurement is passed. The new law would succeed Order #87, but is time dependent.

The regulations cover all government bodies in accordance with Principle (3 – Consistency) represented by:

- Ministries
- Bodies not related to a Ministry
- Regions
- Governates
- State-owned enterprises (although not obvious from the text)

Linking new procurement practices to eGovernment outcomes occurs as the government attempts to bring an increasing number of their requests for quotes and tenders in an electronic format. The GOI will post an increasing number of these on the Internet, which will aim to greatly improve the efficiency of doing its business in a transparent manner.

1. Preparation of a draft budget: Article (3)

Firstly – The contracting entities should meet the following requirements before preparing tender documents.

(D) All terms, specifications, bills of quantities, maps and other aspects that are necessary for implementation shall be prepared in a specific way to avoid any changes during the implementation of projects as well as follow up the provisions stated in the state general budget and any related regulations concerning introduction on the basis of a completed project.

2. Verifying the availability of funds for a particular purpose: Article (3)

(B) The specialized offices confirm availability of allocated amounts within the state general budget for implementation of the contract.

3. Preparation of a feasibility study: Article (3)

An approval for the technical economic feasibility study regarding projects by the authorized parties, when discussing the project in order to enlist it within the plan in accordance with regulations No. (1) – 1984 and its amendments issued by the disbanded Planning Council.

Providing an accurate estimated cost study for the required work will be a measure for evaluating bids and awarding contracts.

13. 2 Determining the Method of Procurement

Application of the procurement regulations need to be conducted within the tenets of Principle (2), namely:

Competitive Supply: Procurement should be carried out by competition unless there are convincing reasons to the contrary;

Article (4): One of the following procedures shall be adopted when implementing all kinds of public contracts

a. Open Tendering

b. Restricted Tendering

c. Direct Invitation – when there are particular reasons such as secrecy in implementation requirements or speed of completion demands or security reasons

d. Single Source Method – for monopolized contracts or providing special maintenance after getting fundamental approvals

e. Purchasing Committees – values are less than fifty million Iraqi Dinars (approximately USD 40,000)

The procedure for government employees to follow is simple. A draft advertisement needs to be prepared (see a very detailed Article 5); approval from the agency head such as the Minister or Governor needs to be obtained; and the information of the procurement provided to the Office of Government Public Contract Policy (OGPCP). Referring to the OGPCP is not for approval, but for information purposes. The regulations do not require actual OGPCP approval to begin a procurement action, but the check and balance is implied.

13.3 Transparency of Procurement Selection Process

A transparent structure is facilitated by a system of three committees:

- A stand-alone ‘bids opening committee’
- Time and date of tender receipt formally recorded and the tender kept in a special locked box
- Tenders are opened publicly with bidder’s representatives present
- Separate tenders evaluation committee

- Separate committee looking at protests and complaints

The above enacts Principle (6) to do with fair dealing and integrity and Principle (12) regarding accountability.

To contextualize with an international example, the Australian Government Information Management Office (AGIMO) aims to progress toward the vision of connected and responsive government in that country. This national body oversees the Australian Procurement and Construction Council Government Framework for National Cooperation on Electronic Procurement. The Australian Government 'AusTender' system has been implemented to support complex procurement (purchase of complex or strategic requirements, usually via a tendering process). It is also government policy to pay suppliers electronically.

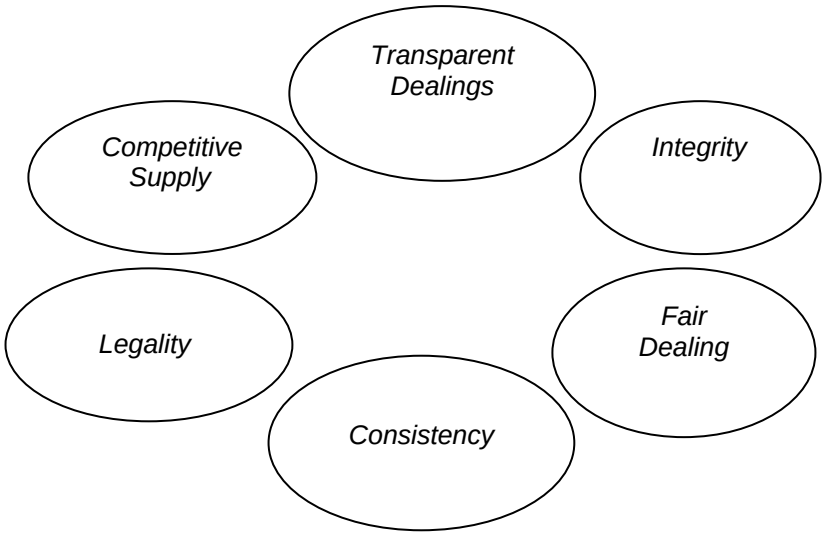


Figure 11: Transparency of eGovernment Projects

13.4 Managing eGovernment Contracts

Ministries need to consider, and be aware of, the ability to work with partners and IT vendors within a confidential environment. When a Ministry official is looking for a particular IT solution to solve a need, sensitive information may be shared with a private company or party representing the business interests of outside parties. When this occurs, the government needs to be comfortable that all material, written, spoken and observed is only shared between those parties. The use of a non-disclosure agreement (NDA) can protect the interests of both parties, and be used as a mechanism and the basis for the establishment of a trusted relationship.

A non-disclosure agreement (NDA), also called a confidential disclosure agreement (CDA), confidentiality agreement or secrecy agreement, is a legal contract between at least two parties. It can outline confidentiality materials the parties wish to share with one another for certain purposes, but wish to restrict from general use. It is a contract through which the parties agree not to disclose information covered by the agreement.

An NDA creates a confidential relationship between the parties to protect any type of trade secret and inside information. For government agencies and ministries, examples can vary widely between the network configuration to the computer security measures and software installed. As such, an NDA can protect non-public business information.

NDAs are commonly signed when two companies or individuals are considering doing business together and need to understand the processes used in one another's businesses solely for the purpose of evaluating the potential business relationship. NDAs can be "mutual", meaning both parties are restricted in their use of the materials provided, or they can only restrict a single party.

It is also possible for an employee to sign an NDA or NDA-like agreement with a company at the time of hiring; in fact some employment agreements will include a clause restricting "confidential information" in general.

Some common issues handled within an NDA include:

- Outlining the parties to the agreement;
- The definition of what is confidential, i.e. the information to be held confidential. Modern NDAs will typically include a laundry-list of types of items which are covered, including unpublished patent applications, know-how, schema, financial information, verbal representations, business strategies, etc;
- The exclusions from what must be kept confidential. Typically, the restrictions on use of the confidential data will be invalid if
    - The recipient had prior knowledge of the materials;
    - The recipient gained subsequent knowledge of the materials from another source;
    - The materials are generally available to the public;
    - The materials were obtained illegally; or
    - The materials are subject to a subpoena. In any case, a subpoena would more likely than not override a contract of any sort;
- Provisions restricting the transfer of data in violation of national security;
- The term (in years) of the confidentiality, i.e. the time period of confidentiality;
- The term (in years) the agreement is binding;
- The obligations of the recipient regarding the confidential information; and
- Types of permissible disclosure - such as those required by law or court order.

13.5 Common User Contracts

The government purchasing officer has to evaluate ‘best value’ when making a purchasing decision. Whether this is equipment supply, a software upgrade or professional services from a local Iraqi IT company, the decision has to be monitored and tracked once made.

The diligent use of some form of Common Use Contract (CUC) is encouraged, as it will manage the investment decision with the supplier or vendor as they deliver what has been promised.

A typical CUC will include such headings as:

1. An outline of the products or services offered

2. Official order detail.

Within (2), a number of sub items are essential. These can be broken down into a number of parts. For example:

a. General details

b. Hardware, Software or other services details

c. Installation details

d. Maintenance details

Some examples within the general details section include:

- Agreement number
- Customer details
- Payment terms and conditions (including any related financial undertakings)
- Performance guarantees
- Insurance requirements
- Confidentiality agreements (non-disclosure terms, secrecy and security)
- Contractor management services
- Staged implementation and termination clauses

Within the second section, the more specific IT solution being provided (hardware/software or services) is detailed. For example, if the solution is hardware related, then the CUC may typically include:

- Product being ordered
- Contractor's specifications
- Customer's functional specifications
- Warranty period
- Details of Acceptance Testing (user acceptance – including time periods, length of testing, level of testing)
- System configuration
- Training

Some examples within the installation details section include:

- Site details

- Delivery and installation
- Access date
- Site preparation

Some examples within the maintenance details section include:

- Hardware maintenance
- Maintenance Service (preventative and remedial)
- Service period
- Standard of maintenance services to be performed
- Response time
- Fault escalation procedures
- Hardware and system downtime
- Movement of Hardware
- Variation of Hardware

The purchasing officer needs to have a sound understanding of each component within a CUC to be in a position to properly evaluate the value of a contract with a third party vendor. This understanding will also allow them to manage staff in charge of the implementation process as well as to do a meaningful post implementation review.

14.0 IDENTITY MANAGEMENT – IRAQI CITIZEN SECURITY IN THE NEW ECONOMY

The increased incidence of identity theft around the world has caused IT and physical security technologies to converge in recent times. The establishment of accurate data gathering procedures is critical to the success of any system implementation. The case study examples illustrate the value of developing systems to verify user information, such as a government employee within a government payroll system or employee census. Balancing security, the rights of citizens to privacy and government needs through the transparency of data are highly valued.

The challenges ahead lie within:

- Passport and Visa: Immigration, ePassport, eID, eResidency Cards and national identity
- Law Enforcement: Evidence tracking, fingerprint and face identity, fraud and logistics
- Defense and Intelligence: Uniform identity, logistics, watch lists and threat database
- Border Control: Global trade management, port entry, aviation and shipping
- State and Municipal: Mass transit, medical, benefits and social safety net systems

Identity management solutions need to provide the following:

- Secure enrollment process for citizens depending on data integrity
- Strong verification methods – including end-to-end credentialing and identity proofing and vetting
- Enduring infrastructure able to minimize data contamination and tampering

Government of Iraq employees requiring access to government facilities containing highly sensitive citizen information must be authenticated by their levels of access. At present, this does not exist and is a critical priority. Some solutions provide added security through incorporating standardized vetting procedures, biometrics and a smart card to verify that individuals accessing secure areas within government Ministries and agencies are who they say they are and are authorized to do so.

Homeland security initiatives will need to create plans to identify and protect critical Government of Iraq infrastructure and key resources. As terrorism has escalated on a global scale and has begun to incorporate both physical and cyber-based components, safeguarding critical infrastructure has become an increasingly important priority for both government and private business. Iraq will not see an increase in private sector development and inward investment if the physical security issue exposes capital investments at risk.

The Government of Iraq needs to develop the Iraq National Infrastructure Protection Plan (INIPP) within the timeframe of this document. This step will assist the delivery of effective solutions aimed at safeguarding the development of effective programs supporting public-private initiatives. Government and business security issues can be addressed in the areas of:

- Education and Training
- Cyber-exercise development
- Control system cyber security
- Extended enterprise (Iraqi people relationship with processes, facilities and technology)

Case Study 1: Automated Passport System

A government passport office responsible for the processing of passport applications and issuance needed to upgrade existing production processes and supporting technology systems. A solution is needed to address the Department of Foreign Affairs requirement to take advantage of new identity management technologies to deploy:

- *A new automated passport system (APS), encompassing the latest data capture, workflow and passport personalization technologies*
- *A redesigned passport booklet incorporating advanced security document features*
- *An entirely new set of business processes that take advantage of the latest technologies*
- *A new organizational structure and change management program that meets the requirements of the new systems and business processes*
- *A maintenance and support structure for the APS that reflects the mission-critical nature of the passport office's ongoing operations*

What is needed is government oversight in the management, design, development and implementation of this complex technology and organizational change project. The scope of such a project requires mapping the complete business process within the passport office, including receipt of completed application forms, data capture, data verification, and the production and recorded dispatch of personalized passports.

- *A complete end-to-end solution for data capture, processing & production has to include:*
- *A biometric-ready contactless chip*
- *High-volume data capture from written applications*
- *Auxiliary functions for inventory control, payment processing, auditing and archiving*
- *A complete re-tooling of passport booklet construction & new facilities and equipment*

The ePassport solution within the case study highlights the need for a scalable, resilient architecture supporting eGovernment services such as: Online applications; Application status & tracking; and integrating with existing citizen databases. The solution also should be able to securely verify access for remote staff using industry-standard open technology large scale government projects. The implications often reach far wider than the sponsor Ministry or government agency workgroup; with the end result affecting the lives of Iraqi citizens.

This section gives practical government-wide database driven applications. The purpose is to show the importance of getting the technical and business case elements of a project plan worked out before implementation. There is a real risk of not achieving the stated objectives and goals of the original idea if all aspects are not carefully considered prior to commissioning.

Case Study 2: Identity Management - Census Database

Objective: To build a census database for all Government of Iraq employees to include no more than 5 million entries.

The Government of Iraq has to determine the best way to capture and enter data into a new system designed to provide government employee information.

Development of the Census Database will aid the objectives of the Government Payroll System. The aim of that project is to improve the management and payment of government employees in order to reduce corruption and introduce better control over the execution of the budget. Reports and statistics from the payroll system will support the formulation and execution of the annual budget and assist managers to better understand and control salary expenditure in their spending agencies.

Questions: The site is to be decided by the Ministry of Finance, with questions arising:

1. *Is there an existing network at the site?*
2. *Is there an existing power supply that can be utilized?*
3. *Is there an adequate electricity supply?*
4. *Is there a generator onsite?*
5. *Is there onsite technical IT support?*
6. *Is network cable installation available in Iraq?*

Technical Issues to be resolved:

A site survey is be required
Procurement of equipment can take an unexpectedly long amount of time, and needs to be managed and monitored

Formal terms and conditions governing information validity, access to and use of, personal or sensitive information must be agreed to in all projects seeking to share, join up or integrate information across traditional boundaries.

Case Study 3: Iraqi Financial Management Information System

A government wide approach is being adopted to improve budget execution for the Government of Iraq. With respect to budget execution, an automated web based accounting system will be rolled out to over 180 spending units throughout Iraq. A spending unit is defined as being able to make payments individually from budget allocations as well as operate a bank account opened for this purpose while submitting monthly trial balance reports to the Ministry of Finance. Connectivity for each of the spending units is via the Internet back to the Ministry.

Capacity building efforts involve external partners training three quarters of the spending units, with the GOI being responsible for the remaining 25%. The project is divided into two phases, with phase one completed in 2005. In depth technical training and capacity building for key GOI staff has assisted the progress of Phase II.

To achieve 100% coverage, it is imperative the GOI recognize Ministerial Orders covering the following: As of mid 2007, the IFMIS will be the primary 'official record' of the GOI; Full implementation is dependent on funding and technical support from the Ministry of Finance and the order signed; establishment of an inter-ministerial steering committee; ministry cooperation with the employee census.

Tax reform is also bundled within the scope of the IFMIS. The overall aim is to provide for increasing revenues for public sector expenditure and investment programs. It is critical to diversify the sources of public revenue beyond that generated by oil exports. The modernization effort involves the development of an integrated computer system that will provide tax-related data and activity management functions for the new organizational structure.

Conceptual agreement has also occurred for the development of comprehensive Customs Modernization Plan. The Ministries of Finance, Interior and Transportation are reviewing customs practices at all points of entry. This type of work ties in with identity management and national security issues, where border control issues are raised. A key project will be the uniform implementation of an automated nationwide customs information system.

All of these initiatives will play important roles in the development of eGovernment in Iraq over this initial period of government transition into the new economy.

15.0 GOVERNMENT OF IRAQ EGOVERNMENT PERFORMANCE INDICATORS

The Government of Iraq is committed to making progress within its eGovernment program. For this to be achieved at maximum efficiency and capacity, benchmarks are needed in order to measure the value of progress over time. This section introduces some high level eGovernment Performance Indicators, which can be broken down in further detail as required. Measurement instruments need to be developed with direction from the National Steering Committee eGovernment Iraq (NSCeGI), and delegated to competent business managers.

The list of performance indicators will evolve as projects are implemented, progress evaluated and improvements made. The combination of qualitative and quantitative evaluations will provide balance as assessments are made. It is envisaged that those responsible for eGovernment initiatives within various Ministries and government agencies will play a key role in this evaluation, with reporting filtering to Minister level and to the NSCeGI.

A level of collaboration and shared ownership is implied in the tables as being key to the success of policies and project implementations.

eGov Indicator	Description	Measurement
Accessbility of Government	Perception of Iraqi citizens regarding their access to government services	Short questionnaire rating citizen accessibility to government
eServices available and functioning	Reviewing the level of procedural automation. This assesses the progress of eGovernment service delivery	Number of eServices available and functioning
Ministries and agency activity in eGovernment	Determining how many GOI Ministries and agencies provide services electronically	Number of Ministries and agencies active in eGovernment. A survey would include a list of services delivered using ICT
Quantity and Type of eGovernment service offerings	Determining the quantity and type of eGovernment service offerings by Ministries and agencies	Number of services offered by type.
Quality of G2G Service	The perception of government-to-government service value	Agencies rate their use of own eGov services and those of other government agencies. Survey (preferably online) or Questionnaire
Quality of G2B Service	The perception of government-to-business service value	Businesses rate the benefits of interacting with government agencies electronically. Survey (preferably online) or Questionnaire
Quality of G2C Service	The perception of government-to-citizen service value	Iraqi citizens rate the benefits of interacting with government agencies electronically. Survey (preferably online) or Questionnaire
eGovernment Services Usage	Determining how many eGovernment services are used by businesses and citizens	Iraqis and others (e.g. regional governments and businesses) list the various GOI eGov services they use
eGovernment Services Quality	Determining the benefits due to accessing GOI eGovernment services	Iraqis and others (e.g. regional governments and businesses) list the benefits of using GOI eGov services
Service Delivery Time	Benchmark of the time it takes citizens to access and use traditional	Time difference between accessing traditional versus eServices

	versus eServices	
Public Document Postings	Determining the availability of government documents for public view and use	Number of postings by Ministry and agency – can be in the form of survey or review of Ministry and agency websites, or national government portal
Government Commitment	Determining the resource commitment by Ministry and agency.	Review of planned eServices through budget or strategic IT plan of Ministry and agency. Administered through survey

Table 8: eGovernment Performance Indicators

APPENDICIES

APPENDIX A: EGOVERNMENT READINESS CHECKLIST (GUIDE)

It is necessary to create a framework for assessing eGovernment projects covering all of the main input areas. The need for such a framework, in modest or comprehensive form allows the Government of Iraq to monitor its decision to pursue government-wide projects.

Subjective Assessments & Value Judgment

eGovernment-related projects implemented post-2003 have largely been based on subjective assessments and value judgments of a few groups within government and their partners. There is no authentic mechanism or institutional mechanism established to ensure a rational and subjective assessment of the projects. Such a situation can limit the healthy development and growth of the government sector as wastage can be high.

Significant Investment Made Into eGovernment Resources

Significant national resources are being spent annually on eGovernment projects in Iraq. Most of these projects are isolated attempts to exploit ICT for better service, efficiency and transparency. While the motivation is unquestionable, the lack of project scoping and planning is often poor. There is little evidence that much project feasibility is carried out prior to sanctioning projects, including the complilation of a business case and business plan. Many projects appear to have minimal oversight with respect to mapping intermediate outcomes to original objectives.

Public/Private Mapping

Despite some ambitious eGovernment projects being outlined for the 2007-2010 period, a National Action Plan is not in existence, which could guide scarce resources into much needed projects. A significant proportion of such a plan would involve replication of successful projects across different geographical regions within the country. The absence of a framework for knowing what denotes a successful project will limit replication efforts and also may result in misdirection of scarce resources. A National Action Plan can also assure funding agencies (banks, financial institutions, private equity, and multilateral funding agencies) that project resources are being channeled into projects as per a national framework and plan. The use of a widely accepted eGovernment assessment framework also gives confidence for appraisal within a widely accepted and used framework.

Monitoring Ongoing Efforts

As mentioned above, projects are always in different stages of implementation at any one time. It is desirable that a set of instruments be available to project administrators in order for them to apply midcourse corrections where needed, and maximize resource allocation and therefore results

In the context of the need for an eGovernment Assessment Framework, the following objectives are formulated for the proposed framework:

1. To assess whether and to what extent a given eGovernment project has the characteristics of a good eGovernment project delivering ‘maximum value’ to stakeholders (see relevant chapters within the Government of Iraq Investment Management Strategy)

2. To guide in funding of eGovernment projects in various stages of their life-cycle (newly starting, roll-out, scaling up, replication)

3. To provide guidelines for mid-term assessment of ongoing initiatives, so that mid-course corrections, if any, can be applied

4. To provide guidelines for shaping future eGovernment projects

5. To provide material for eGovernment training programs

6. To enhance the trust and confidence of stakeholders by enabling creation of a knowledge base of all eGovernment projects rated within a trusted framework

Project Categories

The variety, scope and size of eGovernment projects are large. It is impractical to attempt to build a 'one-size-fits-all' framework applicable to all categories. It is therefore proposed to confine evaluations into the following four (4) categories:

a. Government to Citizen (City)
b. Government to Citizen (Rural)
c. Government to Government
d. Government to Business

Projects can be further segmented on the basis of the investments made. The following table brings out the limits for categorization in respect of pilot projects and rolled-out projects separately.

Project Category (Size)	Pilot Project (USD)	Rolled-out Project
Small	<$1M	<$3M
Medium	$1-$5M	$3-$15M
Large	>$5M	>$15M

Assessing Attributes

It is desirable that the frameworks are comprehensive, holistic and above all meet the objectives for which they have been designed. As far as practicable, the framework aims to provide defensible and unambiguous answers to questions such as:

a. How far has the project succeeded in achieving its purpose and objectives?
b. Has the project been designed and developed with the technology application features conforming to widely accepted architectures and standards?
c. Is the project sustainable over at least 3-5 years, with or without the initial motivation which initiated the project?
d. Is the project cost-effective in terms of investment or in terms of cost per transaction?
e. Is the project replicable to other Ministries, between Ministries or to other geographies within Iraq?

The checklist was developed in continuance with the easy recallable 'Top 10' theme. The categories are as follows:

1. User Convenience
2. Citizen-Centric Service
3. Efficiency
4. Reliability & Scalability
5. Sustainable Organization
6. Cost Effectiveness
7. Commercial Sustainability (including Legal)
8. Technological Replicability
9. Architecture & Standards
10. Security

GOI moderators using the checklist approach to assess their levels of eGovernment readiness will customize the generic list to suit the objectives of their programs.

1.0 User Convenience

Attribute	Description	Assessment
Ease of Access to the Service	How convenient is the location to the nearest service delivery point	Good/Fair/Poor
User independence of time: (24x7 Availability)	How convenient is the time of service delivery expectations	
Single Window Access to Several Services	Extent to which the project offers all related services end-to-end	
Integrated Services Enabling Access to Several Agencies through one Request	Extent to which government services processing by several departments are offered in an integrated manner through delivery outlets	
Mechanisms for Problem Resolution and Exception Handling	Observe how smooth exceptions are handled and whether alternative processes exist in case of serious problems	
Suitability of Service Locations to Socially and Economically Low Level Users	Observe the degree of suitability of the location to socially and economically disadvantaged groups	

2.0 Citizen-Centric Service

Attribute	Description	Assessment
User interfaces in Arabic/Kurdish	Extent of use in Arabic/Kurdish as demanded by local population	
Grouping of Services around User Requirements and Behavioral Patterns	Observe the alignment of service offerings with user behavior patterns	
Alignment of Service Design with Citizen Requirements	Extent of user requirements covered in the service design	
Visits Reduced to Ministries and other Government Departments	Percentage reduction in user visits to government offices to receive required service	
New Service Offerings and their Relevance to Citizens	Extent of citizen-centric new services offered – and their perceived value to citizens	
Knowledge of Service Provider on the Services Offered	Extent to which the staff of service provider at government office is familiar with the new service they are responsible for delivering	

3.0 Efficiency

Attribute	Description	Assessment
Quality of Service	User perception of service quality based on location, staff knowledge, staff effectiveness, information display and follow-up until problem closure	
Speed of Service Delivery	Measurement of normal administrative task (duration) and the difference in speed before and after the implementation	
Compliance to Committed Service Time Frame	Measurement against agreed upon benchmarks established within Ministries	
Percentage of Users using e-Service compared to Traditional Channels	Measuring eService take-up	
Simplicity of User Actions Required to Obtain Service	Score based on differences in ease between the before and after improvements – forms (ease/difficulty), attachments, number of visits	
Compliance to Committed Service Time Frame	Check against project schedule and actual delivery dates. Review of post implementation review schedules	

4.0 Reliability & Scalability

Attribute	Description	Assessment
Availability of SLA (Service Level Agreement)	Are the operational contracts based on a system of SLA's?	
Degree of Availability	High degree of availability (99.99%) through disaster recovery systems & alternative channels	
Degree of Accuracy	Use of audits (third party) and error logs to assess assessment of system accuracy	
Response Time Consistency	The consistency with which system offers reasonable response times. Response to be assessed from the system logs	
Availability of Alternative Service Delivery Channels in case of system breakdowns	Extent to which users can rely on the system's response in case of breakdowns (power, connectivity, hardware, software).	
Extent to which design allows scalability	Based on the application programming interfaces (APIs) and their documentation	
Degree of Scalability of Project to Cover Target Users	Based on provisions to handle large numbers of users and transactions while maintaining response times	
Extent of Scope for Incorporating Enhanced Hardware Interfaces	Based on the extent to which both hardware and software designs permit integration of new devices	
Extent of Scope to Work with Alternate Power and Connectivity Solutions	Based on the design of systems which permits use of alternate energy and communication systems	

5.0 Sustainable Organization

Attribute	Description	Assessment
Degree of involvement of employees in project design, development and implementation	Degree of the sense of ownership of the project by the government employees	
Existence and functioning of an organizational structure for managing the project	Has the conventional operating structure been altered to accommodate new systems? Measure of effective functioning	
Extent and adequacy of training for employees	Rating the level of comfort of employees as they offer service through the new system	
Change Management – Role, clarity and degree of employee buy-in	Level of ambiguity existing on the roles of employees in the changed environment	
Championing the Project for up to 5 years	Level of continuity of highest level management support (greater number of	

	years scores higher)	
Existence and effectiveness of User Groups and Service Reviews	Review of the systems operations periodically & incorporating user feedback. Primary foci – system effectiveness	

6.0 Cost Effectiveness

Attribute	Description	Assessment
Reduced direct costs to user as a result of new system	Estimate % reduction in direct costs (noting sunk costs)	
Reduction of indirect costs involved in repeated visits	Estimate % reduction in indirect costs (such as repeat visits or calls made by customers)	
Extent of cost reduction to government	Based on a reduction of communication costs, staff costs etc.	
Capital Cost Recovery	Level of provision made for recovery of initial capital costs – or as percentage of lifetime costs	
Increased Revenue Benefits to Government	Estimate of increased revenue (collection) potential of government services	
Reduction in Corruptive Practices	Based on normal citizen (user) view of level of corruption due to new system	
Commercial Viability for Private Partner (if PPP)	Determination of value adds from private partnership (COTS versus Proprietary Solution etc.)	

7.0 Commercial Sustainability (including Legal)

Attribute	Description	Assessment
Effective Service Delivery through PPP	Degree to which private participation has enhanced project delivery	
Strength of Private Partnership	Based on the initial relationship (including sufficient contract documentation and role delineation) with the private provider	
Private Partner Delivery Capability	Based on the quality of service provided by the private partner including response times to issue reporting, ability to solve critical issues (time dependent), expertise, sensitivity to budget etc.	
System Reliability	Level to which user connectivity is available - especially during peak use times	
Private Partner Commitment	Based on negotiations and new contractual arrangements being entered into with supplier (evaluation of their level of corporate social responsibility) for system enhancements. Provider receptiveness to become 'true' partner	

Replication Arrangement with Application Developer	Extent to which commercial arrangement (contractual) with developer/PPP permits replication (decreasing costs for greater Ministry rollout)	
Commercial Viability	Extent to which transaction costs and other negotiated commercial terms are attractive enough to induce replication	
Period of continuous functioning of the project (post launch) including evaluation of system decline and ineffectiveness	Based on citizen evaluation over the first 3 years (post launch) up to a period of five years	
Degree of generic processes introduced compared to geography specific ones	Extent to which project extensions are replicable outside of Iraqi urban areas	
Economic Benefits to Rural and Remote Users	Extent to which services provide economic benefit to citizens in rural and remote areas of Iraq	
Compliance with Law of Public Contracts	Ability for government agencies to self regulate procurement (disciplined use of own procurement committee) to engage transparently with customers/vendors. (E.g. need for Ministry for increased functionality – use of electronic means to procure professional services)	
Extent of Business Process Re-engineering undertaken to comply with contractual obligations	Extent to which processes are altered to take advantage of the new systems delivered through enhanced ICT	
Extent of elimination of redundant and duplicated processes	Extent to which new ICT has reformed business practices (E.g. form filling, re-work)	

8.0 Technological Replicability

Attribute	Description	Assessment
Quality of Project Documentation	Extent of adequate documentation – including initial system requirements (scoping documentation), EOI/RFP/RFQ/SOW/Workplans and the ability to track these through personnel changes within knowledge management system	
Quality of Handover Materials from Vendor	Extent to which contract obligations are met such as user manuals, minimum levels of training, helpdesk availability, repair of systems failures, version control and contracted upgrades etc.	
Multiple Platform Feasibility	Extent of feasibility of deployment of application software on multiple platforms	

Ease of Installation of the Systems in New Locations	Extent of ease of installation and go-live (including disruption levels)	
Ability to Replicate Modules	Ability to integrate certain modules into existing systems (such as online payments)	

9.0 Architecture & Standards

Attribute	Description	Assessment
Comprehensiveness of Enterprise Architecture	Extent to which the architecture is robust enough to handle desired business processes. Assess based on adequacy of design	
Architecture Conformance to National/International Architectures	Extent to which architecture is in line with national and international architectures	
Mechanism in place for enforcing compliance to architecture	Review of systems (third party audit) to ensure conformance/continued conformance to originally designed architecture	
Provision for Inter-operability	Does the system interoperate with the systems of any other departments? If not, does the design support such inter-operability?	
Extent of Use of Open Source Software Systems	Based on the use of OSS: for OS, DBMS, Web Server etc.	
Extent of Compliance of the Project to Open Standards	Based on use of open standards like TCP/IP, HTTP, CORBA, DCOM, ODBC	
Mechanism in Place for Enforcing Compliance to Standards	System in place for conducting third party audit of the systems to elicit conformance/continued conformance to the standards. (E.g. Compliance with Iraqi LAN Standards 2006)	
Extent of Design & Adoption of Metadata Standards	Is the system based on the use of metadata standards such as XML?	

10.0 Security

Attribute	Description	Assessment
Design of Security Architecture & Policy	Does the system security design conform to ISO17799? Is there a security policy in place?	
Staff Development	Are dedicated staff members adequately trained to enforce security policies and make necessary changes to enhance security?	
Mechanism in Place for Enforcing Compliance to Security Policy	Is there a system in place for conducting third party audit of systems to ensure conformance to standards?	
Disaster Recovery	Process in place to restore operational infrastructure (within minimal time to restore critical services)	
Business Continuity	Plans in place for business operations to remain stable in the case of personnel or data issues. Sufficiently documented processes and procedures allow for minimal disruption	
Mechanisms in Place to Give Government Users Secure Access to Ministry Information (Intranets)	Extent to which government staff are able to securely access work information (e.g. email, databases etc.)	

APPENDIX B: OBTAINING & IMPLEMENTING A .IQ COUNTRY-LEVEL DOMAIN

This Appendix is supplementary to Chapter 6.0 'How to Obtain & Implement a .IQ Country-Level Domain.' The intention is to show that the barrier to domain name registration and government website services in Iraq can be made easier due to the procedural investigation that has been carried out.

1.0 PURPOSE

1.1 The purpose of this document is to define the responsibilities, resources, and processes required to apply for, register, implement and manage a .IQ-suffixed country-level domain name address.

2.0 SCOPE

2.1 The intended audience is all Government of Iraq Ministries' management and staff.

3.0 TERMS AND DEFINITIONS

ccTLD: Country Code Top Level Domain registry

CMC/NCMC-IRAQ: The Iraq Communications and Media Commission, which is the .IQ ccTLD for Iraq

DNS: Domain Name Service stores and associates many types of information with domain names; translates domain names (computer hostnames) to IP addresses

DNS Record: The DNS table that aliases a human-readable domain name to a unique numerical IP address, e.g. www.MinistryX-iraq.com resolves to 63.246.18.4

IP Address: A unique numerical address that electronic communications devices use to identify and communicate with each other on a computer network that utilizes the Internet Protocol (IP)

ISP: Internet Service Provider

4.0 REFERENCE DOCUMENTS

4.1 Attachment 1: Explanation of how Domain Name Space works.

4.2 Attachment 2: Flowchart of the .IQ domain registration and implementation process.

4.3 Attachment 3: Example of DNS Lookup record.

5.0 REGISTRATION APPLICATION PROCESS

5.1 If you already have a web presence and intend to continue using the same ISP and/or web hosting service for your .IQ domain addressing, contact your ISP and obtain the names of the primary and secondary DNS servers that are used and/or will be used to support your .IQ domain.

5.1.1 If you do not already have an ISP, skip this step until after receiving your domain name registration verification, and then follow the instruction in 6.1, below.

5.2 Go to http://www.cmc.iq/ncmc-iraq/processregisteriq_ar.htm, and then click the Arabic language icon in the upper right.

5.3 Download the applicable domain name registration application form for the type of high-level .IQ domain

name being requested (e.g. .com, .org, .gov, .mil, .edu).

5.4 Complete the form, make a file copy for your records, and then submit the original form by both email and by surface mail to the respective addresses specified on the form.

5.5 Email copies of the submitted form to the following CMC personnel:

5.5.1 Secretary to Director-General , xxx@cmc.iq

5.5.1.1 Send email reminders to the above every 2-3 days.

6.0 POST-REGISTRATION PROCESS

After receiving domain registration verification document from NCMC-IRAQ:

6.1 Contact your ISP and/or web hosting company for the names or IP addresses of the DNS servers that will be supporting your new .IQ domain name.

6.1.1 If you do not have an ISP, contact chosen host of your web presence; they will be able to provide you with the DNS information.

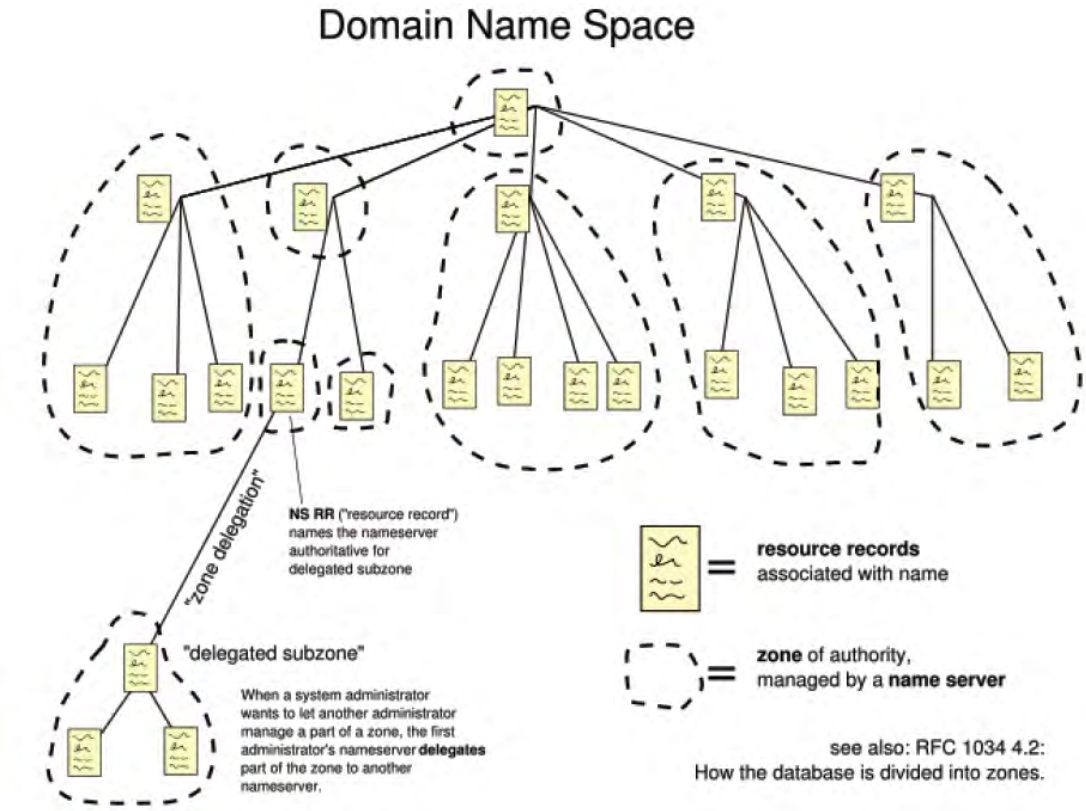
6.2 Upon receiving the DNS server information, send that information by email to:

6.2.1 Secretary to Director-General at CMC

6.2.2 NCMC-IRAQ will then update the global authoritative registry domain name servers with your DNS server information. Propagation to all global master name servers will take 48-96 hours. Your ISP will be able to tell you when the new domain addressing is publicly-accessible.

6.3 Continue to work with your ISP or web hosting company to get your website and/or other services completed and online.

6.4 **Important Note**: Any subsequent changes to your ISP or web hosting service will require you to obtain any new DNS information and communicate it to the NCMC, so that they can update the global authoritative registry domain name servers with your new information



On the Internet, the **Domain Name Service** (**DNS**) stores and associates many types of information with domain names; most importantly, it translates domain names (computer hostnames) to IP addresses. It also lists mail exchange servers accepting e-mail for each domain. In providing a worldwide keyword-based redirection service, DNS is an essential component of contemporary Internet use.

Pre-eminently, the DNS makes it possible to assign Internet destinations to the human organization or concern they represent, independently of the physical routing hierarchy represented by the numerical IP address. Because of this, hyperlinks and Internet contact information can remain the same, whatever the current IP routing arrangements may be, and can take a human-readable form (such as "`wikipedia.org`") which is rather easier to remember than an IP address (such as 66.230.200.100). People take advantage of this when they recite meaningful URLs and e-mail addresses without caring how the machine will actually locate them.

The DNS also distributes the responsibility for assigning domain names and mapping them to IP networks by allowing an authoritative server for each domain to keep track of its own changes, avoiding the need for a central registrar to be continually consulted and updated.

Example of DNS Hosting Record

name	class	Type
www.MinistryX-iraq.com	IN	ANY

Answer records

name	class	Type	data	time to live
www.MinistryX-iraq.com	IN	A	63.246.18.4	11126s (3h 5m 26s)

Authority records

[none]

Additional records

[none]

Example of Domain Name Servers *Lookup* Record

Retrieving DNS records for **www.MinistryX-iraq.com**...

DNS servers
ns4.ophosting.net [63.246.16.237] [primary DNS]
ns3.ophosting.net [63.246.16.236] [secondary DNS]

Answer records

www.xxx-iraq.com 1 A 63.246.18.4 14400s

APPENDIX C: IRAQ INVESTMENT CLIMATE 2007

The Izdihar Team (USAID funded private sector growth and employment generation project) provided this investment brief in early 2007.

Future eGovernment initiatives will rely heavily on inward investment, and the Government of Iraq is positioning the business environment to accommodate this national objective. This section overviews the current investment environment as strategic ICT investment is sought.

The Government of Iraq has made progress toward opening up the market and to create an investor-friendly business environment. Between 1980 and 2003, per capita GDP in Iraq fell from $3600 (USD) to around $700. Since 2003, GDP has risen to an estimated $1050 in 2005. Iraq is now on the path to establishing laws and regulations intended to attract foreign investment and rebuild the economy.

Efforts are underway to control inflation and the value of the currency has stabilized at less than 1300 Dinar to the Dollar (April 2007. Iraq is in the process of adopting an open trade and investment regime with a focus on strengthening the private sector. Rejoining the international community is a key part of its economic development strategy, and investment will play a vital role. Iraq's National Development Strategy for 2005-2007 articulates this new direction. Several goals include ensuring private sector growth by creating a favorable legal environment, fostering a transition to an open market economy, and integrating Iraq into the regional and global economies.

New Iraqi Investment Law

The Iraqi Investment Law was approved on October 22, 2006. It regulates the national and foreign investment process in Iraq. Some of the incentives for investors include:

- Taking out capital brought into Iraq with its revenues in hard currency
- Dealing with the Iraqi securities market
- Leasing land needed for the project or using it on condition that the term does not exceed a period of 50 years that can be renewed
- Insuring the investment project at any national or foreign insurance company
- Opening accounts in Iraqi Dinar or foreign currency or both at Iraqi banks or at banks outside Iraq
- Obtaining residency and facilitating investor's entry to Iraq and leaving Iraq
- Non-confiscation or nationalization of the investment project
- Non-Iraqi workers have the right to transfer their salaries and indemnities outside Iraq

There is an exemption from fees and taxes for ten years beginning with the commencement date of the investment project. The period is renewable and all furniture and assets needed for expansion and modernization requirements are also exempt.

Investor Commitments

1. Informing the commission of the date of starting work on the project
2. Maintaining accurate book-keeping checked by an authorized lawyer
3. Presenting economic and technical feasibility studies with all data related to the project
4. Keeping a record of imported materials, protecting the environment, and commitment to qualitative control systems
5. Complying with Iraqi laws and the action plan methodology presented by investors

Investment Commissions in Iraq

The law stipulates the formation of two kinds of investment commissions in Iraq:

The National Commission for Investment responsible for the formulation of the national policy for investment, the development of plans and controls, and monitors the application of controls. It is responsible for federal investment projects. The director will have the rank of Minister and the appointment requires confirmation by parliament. The board will include three representatives from the private sector chosen by the Prime Minister.

The Investment Law has also provided for the establishment of commissions at the regional and governate level. This is a result of the federal structure in Iraq being approved through the law on the formation of regions. The regional and governate commissions will have the power to grant investment licenses, encourage investment, and open local branches in areas under their jurisdiction in consultation with the national commission. The local investment plans are not to contradict the federal investment plans.

Evaluating the New Investment Law

The new Investment Law is expected to have a significant impact on the Iraqi economy by way of encouraging incoming capital and foreign expertise. By clarifying the investment situation for investors it will help pave the way toward renewing the infrastructure of the Iraqi economy and providing capital for reconstruction and development.

Approximately 93-95% of the Iraqi federal budget is derived from the proceeds of crude oil, and the state supports large programs for food rations, subsidized fuel prices, and the social welfare system. Iraq understands that the national needs cannot be met by raw petroleum revenues alone. Iraq, along with the rest of the world, must resort to investment to further its development objectives.

The damage to the Iraqi economic infrastructure since 1980 has been significant, and Iraq has a rapidly growing population. There are many potential profitable areas for investment, including financial services, ICT, housing, agriculture, and cement. An important step has been taken in that the Investment Law establishes the basic rules for the investor with guarantees and protection. Many parts of the country have a secure environment for investment. The growth and development of these governates will proceed, and improved security will begin to see investment throughout the entire country.

Currency Conversions & Transfer Policies

Iraq ranks favorably in comparison to its neighbors with regard to minimal capital requirements. Article 28 of Company Law No.21 specifies minimum capital requirements for various types of companies: Joint Stock Company – (US $1,362); Limited Company – (US $680); other types of companies – (US $340). Iraq ranks favorably compared to regional competitors, such as Egypt, Jordan, Kuwait, Saudi Arabia, Syria, and the UAE.

Foreign banks with a majority of foreign capital must obtain special permission from the Central Bank of Iraq to operate. Branches of foreign banks must maintain an unspecified positive balance of assets over liabilities and have $25 million in capital ($5 million for Iraqi banks).

The currency of Iraq is the Dinar (ID – also referred to as the Iraqi Dinar). The exchange system is managed, with some restrictions on the purchase or sale of foreign currencies. In addition, there is a free movement of capital without restrictions on capital inflows and outflows.

The exchange rate is generally determined on the basis of supply and demand conditions in the foreign exchange market. Daily auction prices are determined by the CBI. Banks may engage in spot transactions in any currency, but are not allowed to engage in forward transactions in Iraqi Dinar for speculative purposes. The Central Bank of Iraq (CBI) manages the auctions as necessary, in order to maintain stability in the foreign exchange market. In addition, there are nominal fees on purchases or sales of foreign exchange.

The Government of Iraq's monetary policy since 2003 has focused on maintaining price stability and a stable exchange rate. In addition, the CBI conducts daily foreign exchange auctions to limit the impact on base money growth of the sale of the government's oil export earnings.

Transparency of the Regulatory System

Potential investors in Iraq face certain complexities under various laws, regulations and administrative procedures. However, the government intends to begin a program to reduce such difficulties, and the new investment law is the first step in that direction. In addition, there is the intention to improve and simplify various procedures for obtaining project and investment licenses, and expect the new Investment Commission to lead the way. The relationship between regional laws such as the recently passed Kurdistan Investment Law and the federal law will also be clarified shortly.

There are still large areas of the Iraqi economy that are centralized and over time many of these functions will pass to the private sector. Already under the previous regime there were many joint ventures between the state and the private sector. In addition, there is a Commission on Public Integrity (CPI) tasked with investigating allegations of corruption and misconduct within government. It has the authority to refer cases to the judiciary, acts as an enforcement arm of Iraq's anti-corruption laws and performs its duties in conjunction with the Board of Supreme Audit (BSA) and the ministry Inspectors General (IGs).

Bilateral Investment Agreements & Regional Cooperation

Iraq is signatory to thirty-two (32) bilateral, and nine multilateral agreements within the Arab League, with respect to Investment Promotion & Protection (IPPA). There are also existing bilateral agreements with India, Iran, Japan, Jordan, Kuwait, Mauritania, Republic of Korea, Sri Lanka, Syria, Tunisia, Turkey, the United Kingdom, Vietnam and Yemen amongst others. In addition, Iraq has bilateral free trade area (FTA) agreements with UAE, Oman, Qatar, Algeria, Egypt, Jordan, Lebanon, Syria, Tunisia, Yemen, and Sudan. On July 11, 2005, Iraq and the U.S. signed a Trade & Investment Framework Agreement (TIFA) as a first step toward creating liberalized trade and increasing investment flows between the U.S. and Iraq.

Foreign Trade Zones & Ports

The Free Zone Authority Law No. 3/1998 (FZL) permits investment in Free Zones through industrial, commercial and service projects. This law operates under the Instructions for Free Zone Management and the Regulation of Investors' Business No. 4/1999, Under the Free Zone Authority Law, goods imported and exported from the FZ are exempt from all taxes and duties, unless imported into Iraq. However, this exemption does not apply to the Reconstruction Levy (CPA Order No. 54). Capital, profits, and investment income from projects in the FZ are

exempt from all taxes and fees throughout the life of the project, including in the foundation and construction phases. The application process for an investor involves submitting an application and a fee of US$100 to the Free Zone Authority. The investor must sign a lease within 30 days of lease approval.

Activities Permitted in Free Zones

Activities in free zones include:

- Industrial activities (both production and consumer), assembly, installation, sorting and refilling processes
- Storage, re-export and trading operations
- Service and storage projects and transport of all kinds
- Banking, insurance and reinsurance activities
- Supplementary and auxiliary professional and service activities.

Prohibited activities include actions disallowed by other laws in force, such as weapons manufacture, environmentally-polluting industries and those banned by the place of origin.

Current Free Zone Locations

There are a number of FZ locations that have been set up to allow investors to consider Iraq as a competitive investment destination. They are as follows:

1. Basra/Khor as-Zubair Free Zone – This one million square mile zone is located 40 miles southwest of Basra on the Arabian Gulf at the Khor al-Zubair seaport and has been in operation since June 2004
2. Ninewa/Falafel Free Zone – This 400,000 square mile zone is located in the north, near roads and railways that reach Turkey, Syria, Jordan and the Basra ports
3. Sulimaniyah Free Zone – This zone is located in northern Iraq
4. Al-Quaymen Free Zone – This zone has two phases located near the Iraqi-Syrian border. It is close to roads and railways that reach Turkey, Basra and Jordan. The zone's first phase is limited to commercial and service activities.

APPENDIX D: EGOVERNMENT PROJECT MANAGEMENT PHASES

Emphasizing good business practice, the project management framework greatly assists the 'Go' or 'No Go' business decision for the government agency as they consider eGovernment alternatives. The key here is evaluating resource bandwidth (i.e. availability of adequately skilled personnel to manage the project from start to finish).

eGovernment Project Management Phases	**Initiating Process Group**	**Planning Process Group**	**Executing Process Group**	**Monitoring and Controlling Process Group**	**Closing Process Group**
	Project Charter Development Preliminary project scope statement development	Project Management Development Plan	Project Execution direction and management	Project work monitoring and control Integrated change control	Project Closure
Project Scope Management		Scope Planning Scope Definition		Scope Verification Scope Change Control	
Project Time Management		Activity Definition Activity Sequencing Activity Resource Estimating Activity Duration Estimating Development Scheduling		Schedule Control	
Project Cost Management		Cost Estimating Cost Budgeting		Cost Control	
Project Quality Management		Quality Planning	Quality Assurance Performance	Quality Control Performance	
Project Human Resources Management		Human Resource Planning	Project Team Acquisition Team Development	Project Team Management	
Project Communication Management		Communication Planning	Information Distribution	Performance Reporting	
Project Risk Management		Risk Management Planning Risk Identification Qualitative Risk Analysis Quantitative Risk Analysis Risk Response Planning		Risk Monitoring and Control	
Project Procurement Management		Procurement and Acquisitions Planning Contract Planning	Seller Responses Request Seller Selection	Contract Administration	Contract Close Out

Table: Project Management principles useful for guiding eGovernment business decisions

Relationship of Processes within Knowledge Areas to Project Management Phases

Explanations for the major headings in the table above show the interdependency of the process for the eGovernment decision maker (e.g. DG/IT). No one area is more important than the other, with attention and care needed at every management phase. It should be noted that a large number of projects lose focus within the execution and control stage as the rationale behind the original authorization and planning stages is lost or forgotten. If the first two phases are ill-defined, then execution is also made more problematic. Problems may tend to compound down the line into phases three and four.

- Initiating – Defines and authorizes the project or a project phase
- Planning – Defines and refines objectives, and plans the course of action required to attain the objectives and scope that the project was undertaken to address
- Executing – Integrates people and other resources to carry out the project management plan for the project
- Controlling – Regularly measures and monitors progress to identify variances from the project management plan so corrective action can be taken when necessary to meet project objectives
- Closing – Formalizes acceptance of the product, service or result and brings the project or project phase to an orderly end.

Unfortunately, the project management component of each investment decision is embedded in the outcome of how 'poor' or 'successful' that implementation decision was.

For example, a Ministry wants to introduce a new automated payroll system. The decision maker follows the steps of defining the scope of what they require through an Expression of Interest (EOI). A few vendors respond and say that their system will give all the functionality required plus additional features. The Ministry proceeds to put out a Request for Quote (RFQ) on a system they believe they need. They also agree that the type of system they are asking for a quote on will serve their data and staff expansion needs for at least four (4) years.

They have enough money in the budget to cover the design, development, implementation and even staff training component of the system. The problem occurs when there are problems in the execution and controlling stages when they realize they have timeline/staff/functionality changes. It only takes a few difficulties with project execution, scope verification and performance reporting to stretch budgets, timelines, staff capacity and launch dates.

The decision is further complicated if the Ministry (assumed to have a limited budget) wishes to measure the value derived from such an implementation, and the opportunity costs of choosing one IT investment over another, and the impact that failure can have on all projects and future budgets.

APPENDIX E: BEST PRACTICE EXAMPLE OF EGOVERNMENT PORTAL - INFORMATION NETWORK OF KANSAS (KANSAS.GOV)

This example seeks to provide an example of a highly interactive/transaction government portal allowing citizens to complete their business with government online. The example gives a brief history of the fifteen years it took to evolve the user-centric portal into what we see today. The Government of Iraq should also consider what types of information it wishes to have available to its citizens, as well as being mindful of what the citizens themselves want. Kansas.gov also serves as a model for public access through workable public-private partnerships.

The Kansas legislature created the Information Network of Kansas (INK) in 1990 to provide online access to a wide variety of government information. A governor-appointed board of directors hired a private company, the Kansas Information Consortium (KIC), to build the network (with private funds, not state funds) and to integrate databases from a vast array of government entities into a single user-friendly service. INK went online in January 1992. It took only six months for it to be operating at a profit. Many business-to-government (B2G) portals worldwide operate at a loss, with many failing within their first year of operation.

The INK board performs three basic functions: regulating what services go on the network, regulating user fees, and administering the contract with KIC (including a yearly performance and financial audit by independent certified public accountants).

Resources

Users can either dial into INK using a toll-free number or access it through the Internet. The searchable network contains over 1,000 databases cover a vast array of relevant areas. Some examples include:

State statutes and administrative regulations

Pending legislation

Motor vehicle registration records & Database of unclaimed property

Statewide library catalog

The Federal Register

Information from the League of Municipalities

Directory of licensed and registered day care centers
An average of two new databases is added each week. Seventy-five percent of the network's information is available free of charge. Transaction charges apply only to searches or transactions that normally require a fee, such as incorporation documents or searching Kansas statute databases. This attracts a nominal transaction charge of 25c.

INK's expansion is market driven. The network surveys professional, government, and business groups to gauge which services to add. State agencies can contribute information to the system but are not required to do so.

Users

INK has more than 4,000 subscribers, including almost every city and bank, as well as most attorneys, in Kansas. INK is available on the Internet where most of its databases can be accessed free of charge. Access estimates are about one million transactions (including searches) per month.

Complete List of Online Services

The exhaustive list of services takes the user to links filled with relevant information and the ability to transact with that body. A couple of examples illustrate the depth and power of the single transaction-oriented portal structure.

Example A: Property Tax Payments section - A user can search and find limited information about a medical practitioner and their qualification status.

***Example B*:** Property Tax Payments section – The site was created to allow people the opportunity to pay their property tax online. The user receives sufficient help through a couple of areas on the site which includes: Frequently Asked Questions, Pay Your Property Tax, Protesting Property Tax, and a Privacy Statement. Accepted ePayment methods include electronic check or credit card.

The citizen is firmly in control of a whole range of things which directly affect their life in the State of Kansas. The comprehensive service list is derived from what the citizens are saying they want represented on the site. The directory covers every aspect of the citizen's life and is as follows:

Business Start Up	Professional Licensure
Consumer Protection	Property
Elections & Voting	Recreation & Tourism
Employment & Labor	Safety & Security
Environment & Natural Resources	State Employees
Finance & Legal Funding & Aid	State Government Listings State Records
Health & Medicine	Taxes
Insurance	Transportation
Legislature	

Revenues and Support

INK generates revenues by charging fees for access to about 25% of the computerized public documents that are collected, generated, and maintained by state and local governments. The contract between INK and KIC (the private provider) provides financial incentives to KIC as revenues expand. The contract also makes public service projects an integral element of network performance evaluations. One example of this is KidsNet, a constantly expanding database of day care providers searchable by city, county, ZIP code, ages of children accepted, or special needs. Access to KidsNet is free of charge because of subsidies provided by business and other users.

INK is supported wholly from user fees and has never received any state or federal assistance. Commercial INK subscribers pay $50 a year plus applicable transaction charges. Libraries are charged at a different rate to promote public access. Users who access the network through the Internet and who do not use the 25% of databases or transactions for which a fee is charged use are able to use the databases without charge.

Public Access

INK managers worked closely with public libraries to ensure that they had computers and access to the network. A flat-rate schedule allows library patrons full access to INK. Libraries pay $180 a year per computer terminal for unlimited dial-in INK access. Libraries must provide access to patrons free of charge, including transaction fees that would apply to searches performed from an office or home location. The only exception is services for which the state requires a separate, additional charge, such as filing statements and motor vehicle records. Large libraries often maintain several subscriptions to supply more terminals. Kansans can also use INK to obtain toll-free Internet access for ten cents a minute, plus any applicable transaction charges.

Conclusion

The Government of Iraq can note a couple of points about this example:

- The structure of a workable public private partnership model
- Fifteen year (15) development cycle which is a long time to be refining and investing in an evolving model
- Sustainability success
- The ‘demand-driven’ environment where the citizen is in control of what services they require to be online
- Protection of citizen privacy cleared outlined and present
- Simple and clear messages of what the user is able to/not able to do within most agency areas

Given careful specifications under an able leadership group, a project such as this has merit and can prove to be a great asset for the community. Government has a valuable role to play if it understands the limits of its services, as well as what the people expect. The opportunities for a positive public private partnership are wide as long as expectations regarding delivery and functionality are managed from the beginning.

APPENDIX F: OPEN SOURCE CASE STUDY - BRAZIL

The Government of Iraq should consider the adoption of open source technology for pilot projects within selected Ministries and government agencies. Groupware platforms based on the Linux operating system offer a free, enterprise ready solution offering a flexible PHP framework capable of hosting applications such as group calendar, address book, email, infolog (notes, to do lists, phone calls), knowledge management, trouble ticket system, project management among other functions.

In mid 2004, Parana, a state in Brazil adopted open source technology from eGroupWare as part of a government-wide groupware solution. The goal of Celepar, the organization in charge of technology in Parana, offered web-based groupware software to all 10,000 users in the Parana government. The Parana eGroupWare solution is built on the enterprise-class open source database by MaxDB by MySQL. It easily supports the heavy demands of the entire Parana government.

For special requirements from the government side, developers from Celepar and eGroupWare core team are extending the eGroupWare solution. eGroupWare runs in professional environments like governments, universities or companies around the world. It is developed by an international team of professionals. The requirements to install eGroupWare are a PHP in a version greater than 4.1 and a web server. Customers seem to appreciate provision of a database providing enterprise scale functionality in a high quality open source product. With MaxDB, a stable and reliable platform is offered, enabling the rollout of eGroupWare to very large user groups.

Linux Certified Open Source Database

MaxDB is an industrial strength, SAP certified open source database that offers high availability, scalability and a comprehensive feature set. MaxDB extends MySQL AB's database portfolio, targeting mySAP ERP environments and other applications that require maximum enterprise level database functionality, ease of use and strong operational reliability. The MaxDB technology is used in diverse SAP scenarios in over 6000 installations worldwide at customer sites including: Intel, DaimlerChrysler, Braun, Bayer, Colgate, Yamaha, Deutsche Post and Toyota South Africa. MySQL is a second generation open source company, with dual licensing that supports open source values and methodology.

The government of Brazil announced in 2004 that Linux would 'bridge a massive technology gap' in that country, and would save money by not paying software licensing fees. Brazil's Federal Data Processing Service (SERPRO) has developed software to translate text for visually impaired computer users. Called 'Open Screen', the project aimed to connect 6 million disabled Brazilians to the Internet by 2005.

In 2006, SERPRO chose an open source solution to build a nationwide border control solution. The solution included supplying identification and authentication for travel documents (e.g. passports) to be used at airports, harbors, and land borders. It was integrated with an International Traffic System, which is a border control system developed for the Brazilian federal police force. The automation project is part of the more extensive PROMASP (Program for modernization, improvement and security of international traffic inspection and Brazilian passport control) aimed at implementing up-to-date processes for managing and controlling, issuing, inspection and verification of travel documents in Brazil. The implementation of STI gives border patrol officers a powerful technological tool for:

- Identifying and authenticating travel documents
- Checking whether they are valid or have been faked or tampered with

- The place of issue and validity and confirmation that the person carrying it is the rightful owner (using biometric face and fingerprint comparison methods)

Throughout the lifecycle of the project, SERPRO will be provided specific hardware, installed at 50 sites around Brazil, as well as basic applications software, software customization, training and specific infrastructure projects during the first phase. The chosen vendor also provides hardware/software support and maintenance for 5 years post implementation at all service locations.

Sao Paolo University Brazil

Two of the university's computer servers run Linux operating systems. University administrators site the main reason behind the choice as feeling more comfortable with 'open source software' which allows University programmers to customize and adapt. The university wants to be in control of its own data, and further cites, "In a democracy it is important for source codes for computer software not to be hidden under patents and copyright." Open source systems are becoming popularly accepted in Latin America.

Total Cost of Ownership & Security – Questions for Linux Users

Linux users do not have to pay licensing fees, but installing and running the system is not completely 'free'. Adding up the costs of training, technical support, customizing new or specialized software, and the total cost of ownership looks less convincing. Small business systems installers in Brazil add, "It may be a little cheaper to install Linux if you look at the whole system cost, although you are better protected from viruses." There is a lively debate in computing circles as to whether Linux is genuinely more secure.

Analysts note that "Fans of Linux and the open source movement will say that by being publicly available, there are far more people who can work on it, more people who can detect problems, and provide quick fixes for them more quickly." On the other side of the argument, sellers of proprietary operating systems argue that "there is no way you can manage something like that using software programmers all around the world; you need to have it within a company that has all the expertise within it's own doors."

Whatever the reason, Linux continues to spread fast in Brazil. Certain Ministries and government agencies in Iraq should also consider the applicability of introducing Linux environments where applicable.

Government Sponsors Linux-powered desktops "Computers For All' Program

In early 2007, three Brazilian private sector firms began deploying Linux-powered desktop PCs for the Brazilian federal government's "Computers For All' program. The ready-to-use PCs include the "Linux XP Desktop" operating system, including support. Fifty thousand desktops were already delivered in early 2007 with an undisclosed amount yet to be delivered. This project is part of the Brazilian federal government's 2003 "Program of Digital Inclusion". The objective is to provide low-cost computers to the population to boost technological development. This type of grass roots program can enhance the citizen-to-government connection associated with developing countries eGovernment agenda.

Linux XP desktop is described as a user-friendly desktop operating system for home and office users. With a preinstalled version, a user gets an application set including: OpenOffice.org office suite; Evolution mail client; Firefox web browser; a multi-protocol instant messenger. Technical support is provided by phone and via web helpdesk.

The program is supported by the Ministries of: Cities, Science and Technology, Development of the Industry & Commerce, Communications, and Education among others. This is a typical assembly of the core groups of Ministries needed to give a government-wide venture such as this a strong chance of success.

Flow on Effect for Private Sector ICT Development in Brazil

Brazilian firms are beginning to develop their business base and expertise over the past four years as a result of the government open source initiatives. One of the integral components of a successful government wide ICT strategy is to encourage skill development and entrepreneurship within a domestic government service environment.

Within Brazil, firms experiencing growth through government contracts include:

- Development firms (software)
- IP Telephony
- OEM Solution Providers for PC Manufacturers
- PC Manufacturers
- Systems Integrators
- Language Interface Providers (Portugese-English-Portugese)

APPENDIX G: CORPORATE SOCIAL RESPONSIBILITY – NATIONAL EGOVERNMENT CONTACT CENTER

Citizen-centric government can only be achieved when citizens can easily determine where to go to obtain the government services they want.

The entire top tier IT multinational corporations have displayed a willingness to be involved in the growing IT sector within Iraq in recent times. To this end, future public-private possibilities emerge in an effort to integrate whole-of-government services.

One example is that of the eGovernment Contact Center (eGCC). A future solution might resolve some of the citizen management relationship issues we are witnessing at present. A couple of significant challenges for public sector contact centers include:

- Knowing what they want to offer the citizen
- Knowing the best way to deliver their services

Each department in each level of government needs to determine what works for them and how they can most effectively serve the citizens. Service can be through a number of channels:

- Live call agent on the phone
- A recorded messaging system
- Communication through the Internet (email, web chat and instant messaging options)
- Standard office environment

Vital Planning to Cater for and Anticipate Citizen Needs

Public Sector best practice has produced a number of key principles for effective delivery within Government Contact Centers.

- Meeting the expectations of the citizen as a measure of successful service delivery
- Attempting to deliver in a convenient, personalized, transparent and simplistic way
- Understanding that services need to be constantly reviewed and changed to suit conditions – therefore documented planning strategies need to be adopted
- Avoiding unnecessary duplication – establishing an oversight body made up of Ministries sharing the same need for ICT enhancements to their work practices (planning and forecasting)
- To utilize scarce resources (particularly acute in the current environment in Iraq) and manage demand – coupled with the crippling effects of high government employee turnover

The Government of Iraq could consider deploying an integrated government call center solution given a careful analysis of demonstrated demand from citizens. The end-user needs to be able to connect to the call agents through any of the mediums listed above. The difficulty with deployment would be due to a number of restrictive elements in the current Iraq context.

Challenges to Successful Implementation

Within a 'normal' operating environment, some of the challenges listed below can be severe inhibitors to deployment. These include:

- Management of citizen interactions across multiple channels (telephone/email/Internet & Wireless/Voice over IP/Chat)
- Ability of Staff (agents handling a variety of service types/basic training provision/call scripting and problem resolution tools/workflow automation/assignment and escalation)
- Minimizing total cost of ownership and delivering a sound investment return
- Alignment with the unique needs of the Iraqi citizen
- Sharing infrastructure – enable the sharing of physical resources and equipment across agencies to reduce costs from redundant systems
- Sharing information – improve operational efficiency by providing equal agency access to critical information (e.g. basic information needed to identify citizens)
- Develop communications to support delivery of citizen services, agency collaboration, and joint operations

Depending on the scope of the government's requirements, an enterprise solution can cost upward of USD$5M for a project enabling the services of core government agencies. A distributed model might group Ministries through their 'shared' objectives. This could be broken up into commonly shared service platform areas:

Commercially focused (e.g. Ministry of Trade and Industry, Ministry of Oil); versus

Social welfare focused (e.g. Ministry of Labor and Social Affairs, Ministry of Housing and Construction, Shia Endowment Council, Sunni Endowment Council) versus

Administrative function focused (e.g. Ministry of Finance, Ministry of Justice)

The investment in cash and human resources would be significant and, as stated throughout this eGovernment Strategy, would only be successful if held together by the glue of strong and definite project and program management.

eGovernment Contact Center Basic Building Blocks (Enterprise Hardware/Software)

An enterprise-wide implementation would involve:

Component	% of total (breakdown & estimation of cost)
Application Modules (CRM)	12
Administration Modules (Tools & Reports)	1
Intelligence Modules (Analytics)	16
Database & Application Server	2
Licenses	29
License Support	6.3
Implementation Costs	33.7
Grand Total	100%

This example can be scaled up or down to suit the size of the intended development. The user numbers for a medium scale implementation may be around 200 customer contact representatives (or call agents as they are referred to in private enterprise).

APPENDIX H: VENDOR MANAGEMENT – MAXIMIZING EGOVERNMENT INITIATIVES

As private sector interest in bidding for, and winning work to facilitate eGovernment initiatives in Iraq grows, it is vital for GOI decision makers to have an understanding of the type of relationship they would like with their private sector counterparts.

Establishing and maintaining public-private relationships requires the development of a structure and plan to support these relationships. Government stakeholders need to be comfortable with the terms of any new relationship, as well as build a 'success portfolio' with those private sector firms. The relationship can be measured simply; ability to deliver in accordance with the specifications of the contractual relationship.

The management of public-private relationships might include the definition of the processes and procedures by which the relationships would be managed. These processes could include an approach for determining which vendors in the marketplace would have the capability to support various aspects of a GOI National IT Strategy, a process for short-listing those vendors which would be appropriate for inclusion in a partnership program, and a process for selecting specific vendors for defined projects.

Traditional activities which support these processes would include primary and secondary market research, the issuance of documents such as Notices of Public Tender, Requests for Information (RFIs), Requests for Proposals (RFPs), the evaluation of responses to these documents, a vendor selection process and, finally, a contract administration process. These processes could be supported by technology with the capability to track contacts with vendors, record and share the substance of those contacts, support the dissemination of and responses to solicitations (i.e., RFIs, RFPs, etc.) facilitate contract administration, and monitor partnership progress along pre-defined metrics.

Building the Public-Private Partnership: A Foundation of Trust

The key to a collaborative partnership is trust in the relationship. Trust is built through dialogue allowing for the joint exploration of emerging technology trends, new ideas, promoting an improved understanding of the challenges faced by both private and public entities. GOI officials interested in utilizing private sector partners must develop effective working relationships that both produce the desired results while meeting public accountability standards. In establishing collaborative and effective relationships, both partners must define the behavior they desire from each other so that a collaborative environment exists for both parties.

Building blocks of a Successful Partnership

Successful partnerships between public and private sectors depend, ultimately, on relationships between people and institutions. Problematic public-private partnerships usually result from non-technical challenges arising in the working relationships between individuals. When relationships fail, technology is often used as a "scapegoat" for unsuccessful partnerships. Common barriers to successful collaboration include a lack of leadership, insurmountable communications issues, deficiencies in planning, and deficiencies in process.

Engaging with the Private Sector

The Iraqi public sector is on the verge of demanding a great deal more from the market in terms of internal Ministry connectivity as well as to the citizen base. A number of areas will see increasing activity including:

Government demand for voice and data applications
Video Teleconferencing (VTC) capability – much needed for inter-ministerial connections and collaboration

Due to this expected ramp up in demand, dealing with the private sector and its solutions and offerings requires a public official with a breadth of knowledge and experience in order to produce a satisfactory return on investment.

Certain rules of engagement should be noted by both sides of the relationship. For the private sector, some examples include:

- Ensuring that account managers and/or sales representatives articulate their business capabilities to state agencies in an informed manner. Understanding the intended strategic direction and service capabilities of the Ministry (or group of) will facilitate the relationship
- Complying with the new Iraq Procurement Law
- Building long term relationships through successful discovery projects or proof of concept work
- Analyzing legacy architectures and technical standards and working to transition to a web-based environment where appropriate

Some useful engagement examples for the GOI officials include:

- Working together to create an understanding of the private sector, its motivations and the way it operates
- Sharing strategic plans and missions, goals and objectives with the private sector
- Attending relevant public/private sector gatherings such as IT conferences and workshops. Attending with the motivation of completing 3 action items upon return should be a goal of the individual or group
- Commitment to educating procurement staff
- Educating eGovernment decision makers on the business drivers for the private sector
- Understanding all legislation impacting the Ministry's business strategy and short term goals
- Not placing unreasonable restrictions on vendors with regard to contract conditions
- Having realistic implementation expectations

Some useful engagement examples for the GOI officials include:

- Understand the ground rules before entering into a new relationship or contract
- Carefully scope the project and agree 'who will do what and by when'
- Start with a proof of concept or discovery project to allow groups to get to know each other
- Strive for "win/win" scenarios
- Separate procurement process from the business relationship
- Identify common interests (e.g., project failures or time and budget overruns, lessons learned)

Attending eGovernment Conferences

Attend with the motivation of completing 3 action items upon return. This should be the goal of the individual or group

- Take advantage of sponsored events and skill development opportunities

Building Blocks for a Successful Public Private eCollaboration

Following is a list of building blocks for successful collaboration between the public and private sectors. Managers of relationships between public and private sector entities should consider the extent to which these conditions exist, and manage towards the creation of these conditions where they are absent. The absence of one or more of these building blocks may result in a failed collaborative effort.

Executive Leadership: A commitment from the executive leadership of both the private and public sector organizations is a fundamental requirement for a successful relationship. The most senior public officials must be willing to be actively involved in building the relationship, and they must also be willing to take an active leadership role in the development of individual collaborative ventures. Well-informed political leaders can play a critical role in minimizing misperceptions about the value to the public of an effectively developed partnership with a private sector entity.

A Statutory Foundation for Partnering. Laws may limit or lack clarity regarding the formation and management of public and private sector partnerships. Without statutory clarity, leaders may view collaborative partnerships as risky ventures limiting ability to take advantage of creative solutions.

Direct Public Sector Involvement. Once a partnership is established, the public sector entity must remain actively involved in the project or program at all levels. This includes the definition of anticipated outcomes from the partnership and monitoring the performance of the partnership within a defined time-frame (weekly, monthly, quarterly, etc.).

A Well-Crafted Plan. Determine the expectations of partnership before entering into one, and develop a plan for meeting those expectations. A plan of this sort often takes the form of a contract describing the roles and responsibilities of both partners, and defines the method of dispute resolution.

Point of Failure

The absence of one or more of the partnership building blocks may result in a failed collaborative effort.

Well-informed political leaders can play a critical role in minimizing misperceptions

Effective Communication with Stakeholders. More people will be affected by a partnership arrangement than the public officials and private sector partners who are signatories to contracts or partnership agreements. Government employees, public labor unions, and the segment of the public receiving services also have an interest in these partnerships. Open communication is required to minimize resistance to the establishment of partnerships. Both parties need to develop an effective communication strategy to include the timely sharing of information, accurate and consistent messages conveyed to key audiences, and realistic messages from trusted sources that set realistic expectations.

The Right Opportunity. Partnership arrangements are not suited for all government business challenges. Both parties need to set and manage reasonable expectations.

The Right Partner. "Lowest Bid" vs. "Best Value." Private sector candidates' experience with partnership arrangements is an important factor in determining the right partner.

APPENDIX I: SKILL ASSESSMENT- COMPETENCY CHECKLIST FOR IRAQI MINISTRY STAFF

This skill development exercise is a modified version of a checklist used in 2006 for Iraqi Chief Information Officer (CIO) candidates to prepare for a customized CIO training course.

The ability to make informed ICT decisions requires a competency level across a number of areas. The self assessment included in this section allows Director General's IT (DG/IT) to evaluate their understanding of considerations before committing their Ministry to sponsorship of an eGovernment initiative. Self assessment includes a person's knowledge level and working experience for each item. Gap analysis of the results should identify areas of strength and weakness, signaling areas requiring further skill development.

The key areas included in the checklist include:

- Strategic Planning
- Performance Management
- Process Improvement
- Capital Planning & Investment Management
- Information Assurance & Security
- eGovernment
- Leadership
- Acquisition & Project Management

A key focus underlying the entire self assessment is the CIO's belief of their level of visibility within the Ministry. The ability of the individual to affect high level decisions is paramount. Their membership on an internal IT Steering Committee within the executive structure can support their efforts.

The diversity of the areas of responsibility underlines the necessity to position the right people in the position of CIO. An unsatisfactory level of competency within any of the 8 major focus areas will severely limit their ability to execute any eGovernment-related project.

Iraqi ICT Skills

An unsatisfactory level of competency within any of the 8 major focus areas will severely limit their ability to execute any eGovernment-related project.

Highlights from CIOs responses include:

- eGovernment Principles - Familiar with concepts & terminology – office has limited working experience; with most not working in the area of improving citizen services (but with the hope to)
- eGovernment Techniques – Familiar with concepts, but due to lack of knowledge, outsourcing of web-based services remains high
- Strong understanding of IT acquisition and IT capital planning
- Good understanding of the value of organizational performance management, but need assistance with baselines/benchmarks and targets
- Good understanding and practice with reporting systems and expectations

- Good understanding of business process re-engineering & benchmarks, but help is needed with formulating techniques
- Need assistance with governance structures and human resource management issues
- Poor understanding of enterprise level quality improvement
- Some working experience of investment management techniques including the select/control/evaluate process
- Have good knowledge, but need practical experience with building and certifying an information system to include confidentiality and data integrity
- Weak on continuity planning; disaster planning, recovery procedures, alternate sites, redundant systems & back-up
- Strong knowledge of leadership, with experience in managing smaller workgroups of around 200 people
- A majority have a good understanding of the value of maintaining political and social networks
- Good with refining and managing project requirements
- Good to very good experience for evaluating and selecting vendors to respond to program needs
- Good understanding of oversight and management of projects
- Regarding the question of the place of the CIO within the organizational structure, the overwhelming majority understood it to be a highly visible role that should report directly to the Minister; and be a part of the leadership team
- Strong support for the statement that senior leaders can effectively implement public policies and strategies into their own organizational reality
- Majority of respondents believe that an effective CIO's preferred order of business is: technology evaluation/policy formulation/architectural development/capital planning
- The overwhelming majority feel the success of the Ministry depends on the networks connecting computers within the Ministry

The results can be directly translated into practical training modules with the aim to enhance skill deficiencies of CIOs and senior IT management staff. The value of customizing programs to focus on areas of need makes exercises such as this survey extremely valuable to the future of ICT in Iraq.

I. Strategic Planning

1. LEGAL FOUNDATIONS OF IRM STRATEGIC PLANNING. The laws, statutes, and regulations that govern the development of an Information Resources Management (IRM) Strategic Plan.

Knowledge
- [ ] Extensive Knowledge
- [ ] Good Understanding
- [ ] Familiar with Concepts and Terminology
- [ ] Heard of Concepts and Terminology
- [ ] Never Heard of Concepts and Terminology

Working Experience
- [ ] Extensive Experience
- [ ] Some Working Experience
- [ ] Office has Working Experience
- [ ] Contract out this area
- [ ] My Office does not work in this Area

2. IRM STRATEGIC PLANNING PROCESSES. A formal IRM Strategic Planning Process.

Knowledge
- [ ] Extensive Knowledge
- [ ] Good Understanding
- [ ] Familiar with Concepts and Terminology
- [ ] Heard of Concepts and Terminology
- [ ] Never Heard of Concepts and Terminology

Working Experience
- [ ] Extensive Experience
- [ ] Some Working Experience
- [ ] Office has Working Experience
- [ ] Contract out this area
- [ ] My Office does not work in this Area

3. AGENCY AND IRM STRATEGIC PLANNING PRODUCTS. Agency and IRM Strategic Planning Products (e.g., Agency Strategic Plans, IRM Strategic Plans, etc.).

Knowledge
- [ ] Extensive Knowledge
- [ ] Good Understanding
- [ ] Familiar with Concepts and Terminology
- [ ] Heard of Concepts and Terminology
- [ ] Never Heard of Concepts and Terminology

Working Experience
- [ ] Extensive Experience
- [ ] Some Working Experience
- [ ] Office has Working Experience
- [ ] Contract out this area
- [ ] My Office does not work in this Area

4. AGENCY AND IRM STRATEGIC PLAN COMPONENTS. The IRM Strategic Plan (for example: mission, vision, goals, objectives, strategies, performance measures, etc.).

Knowledge
- [ ] Extensive Knowledge
- [ ] Good Understanding
- [ ] Familiar with Concepts and Terminology
- [ ] Heard of Concepts and Terminology
- [ ] Never Heard of Concepts and Terminology

Working Experience
- [ ] Extensive Experience
- [ ] Some Working Experience
- [ ] Office has Working Experience
- [ ] Contract out this area
- [ ] My Office does not work in this Area

5. INTEGRATION OF IRM STRATEGIC PLANNING PROCESS AND OTHER IRM BUSINESS PROCESSES. Integrating an IRM Strategic Planning Process with other IRM business processes (e.g., IT acquisition process, IT Capital Planning process, agency budgeting process, etc.).

Knowledge
- [ ] Extensive Knowledge
- [ ] Good Understanding
- [ ] Familiar with Concepts and Terminology

Working Experience
- [ ] Extensive Experience
- [ ] Some Working Experience
- [ ] Office has Working Experience

[ ] Heard of Concepts and Terminology
[ ] Never Heard of Concepts and Terminology
[ ] Contract out this area
[ ] My Office does not work in this Area

II. Performance Management

1. ESTABLISHING MEASURES. Establishing a system of organizational performance measurement and managing an organization on the basis of the measurement results.

Knowledge
[ ] Extensive Knowledge
[ ] Good Understanding
[ ] Familiar with Concepts and Terminology
[ ] Heard of Concepts and Terminology
[ ] Never Heard of Concepts and Terminology

Working Experience
[ ] Extensive Experience
[ ] Some Working Experience
[ ] Office has Working Experience
[ ] Contract out this area
[ ] My Office does not work in this Area

2. IMPLEMENTING A FRAMEWORK. Laying out and implementing a framework for organizational measurement, e.g., a *balanced* scorecard, as part of a system that can provide a clear, current, and complete picture of the status of the organization's performance (including early warnings signs of potential problems) that also enables one to track progress of the organization in attaining its strategic goals or objectives.

Knowledge
[ ] Extensive Knowledge
[ ] Good Understanding
[ ] Familiar with Concepts and Terminology
[ ] Heard of Concepts and Terminology
[ ] Never Heard of Concepts and Terminology

Working Experience
[ ] Extensive Experience
[ ] Some Working Experience
[ ] Office has Working Experience
[ ] Contract out this area
[ ] My Office does not work in this Area

3. DEFINING MEASUREMENT STANDARDS. Defining a formal set of standards (e.g., *baselines, benchmarks, targets*) to which numerical results of measurements can be compared in order to determine whether or not any corrective organizational actions are necessary.

Knowledge
[ ] Extensive Knowledge
[ ] Good Understanding
[ ] Familiar with Concepts and Terminology
[ ] Heard of Concepts and Terminology
[ ] Never Heard of Concepts and Terminology

Working Experience
[ ] Extensive Experience
[ ] Some Working Experience
[ ] Office has Working Experience
[ ] Contract out this area
[ ] My Office does not work in this Area

4. COLLECTING DATA. Managing the development and testing of quantitative measurement methodology (*rating forms, questionnaires,* and *performance indices*) for validity and reliability as well as collecting data on complex performance factors such as *product quality, user satisfaction,* and *organizational effectiveness.*

Knowledge
[ ] Extensive Knowledge
[ ] Good Understanding
[ ] Familiar with Concepts and Terminology

Working Experience
[ ] Extensive Experience
[ ] Some Working Experience
[ ] Office has Working Experience

[ ] Heard of Concepts and Terminology
[ ] Never Heard of Concepts and Terminology
[ ] Contract out this area
[ ] My Office does not work in this Area

5. REPORTING SYSTEM. Establishing a measurement reporting system so that shortfalls in performance expectations are made immediately explicit and that the appropriate staff can qualitatively diagnose the root causes of the problems and take corrective actions.

Knowledge
[ ] Extensive Knowledge
[ ] Good Understanding
[ ] Familiar with Concepts and Terminology
[ ] Heard of Concepts and Terminology
[ ] Never Heard of Concepts and Terminology

Working Experience
[ ] Extensive Experience
[ ] Some Working Experience
[ ] Office has Working Experience
[ ] Contract out this area
[ ] My Office does not work in this Area

III. Process Improvement

1. BUSINESS PROCESS IMPROVEMENT STRATEGIES. Business process improvement strategies of business process re-engineering, and benchmarking.

Knowledge
[ ] Extensive Knowledge
[ ] Good Understanding
[ ] Familiar with Concepts and Terminology
[ ] Heard of Concepts and Terminology
[ ] Never Heard of Concepts and Terminology

Working Experience
[ ] Extensive Experience
[ ] Some Working Experience
[ ] Office has Working Experience
[ ] Contract out this area
[ ] My Office does not work in this Area

2. TECHNIQUES FOR BUSINESS PROCESS REENGINEERING. Mapping, modeling and simulating current and alternative processes.

Knowledge
[ ] Extensive Knowledge
[ ] Good Understanding
[ ] Familiar with Concepts and Terminology
[ ] Heard of Concepts and Terminology
[ ] Never Heard of Concepts and Terminology

Working Experience
[ ] Extensive Experience
[ ] Some Working Experience
[ ] Office has Working Experience
[ ] Contract out this area
[ ] My Office does not work in this Area

3. PROCESS CENTERED ORGANIZATIONS. Concept of a process-centered organization and the process-centered alignment of an organization's governance, structures, human resources, enterprise architectures etc.

Knowledge
[ ] Extensive Knowledge
[ ] Good Understanding
[ ] Familiar with Concepts and Terminology
[ ] Heard of Concepts and Terminology
[ ] Never Heard of Concepts and Terminology

Working Experience
[ ] Extensive Experience
[ ] Some Working Experience
[ ] Office has Working Experience
[ ] Contract out this area
[ ] My Office does not work in this Area

4. ENTERPRISE LEVEL IMPROVEMENT PROGRAMS. Enterprise-level quality improvement programs such as Lean and Six Sigma.

Knowledge
- [ ] Extensive Knowledge
- [ ] Good Understanding
- [ ] Familiar with Concepts and Terminology
- [ ] Heard of Concepts and Terminology
- [ ] Never Heard of Concepts and Terminology

Working Experience
- [ ] Extensive Experience
- [ ] Some Working Experience
- [ ] Office has Working Experience
- [ ] Contract out this area
- [ ] My Office does not work in this Area

IV. Capital Planning and Investment Management

1. INVESTMENT CONTROL PROCESSES. Processes used to select, control, and evaluate IT investments and projects.

Knowledge
- [ ] Extensive Knowledge
- [ ] Good Understanding
- [ ] Familiar with Concepts and Terminology
- [ ] Heard of Concepts and Terminology
- [ ] Never Heard of Concepts and Terminology

Working Experience
- [ ] Extensive Experience
- [ ] Some Working Experience
- [ ] Office has Working Experience
- [ ] Contract out this area
- [ ] My Office does not work in this Area

2. PORTFOLIO MANAGEMENT. Processes used to manage a group of related IT projects to achieve an integrated solution and select projects most beneficial to the business unit.

Knowledge
- [ ] Extensive Knowledge
- [ ] Good Understanding
- [ ] Familiar with Concepts and Terminology
- [ ] Heard of Concepts and Terminology
- [ ] Never Heard of Concepts and Terminology

Working Experience
- [ ] Extensive Experience
- [ ] Some Working Experience
- [ ] Office has Working Experience
- [ ] Contract out this area
- [ ] My Office does not work in this Area

3. CROSS-ORGANIZATIONAL INVESTMENT CONTROL. Processes used to select, control and evaluate IT investments and projects that cross organizational boundaries (i.e., across business units or across ministries).

Knowledge
- [ ] Extensive Knowledge
- [ ] Good Understanding
- [ ] Familiar with Concepts and Terminology
- [ ] Heard of Concepts and Terminology
- [ ] Never Heard of Concepts and Terminology

Working Experience
- [ ] Extensive Experience
- [ ] Some Working Experience
- [ ] Office has Working Experience
- [ ] Contract out this area
- [ ] My Office does not work in this Area

V. Information Assurance and Security

1. ACCESS CONTROL. Methods of effective identification, authentication, authorization, audit and internal/external labeling)

Knowledge
- [ ] Extensive Knowledge
- [ ] Good Understanding

Working Experience
- [ ] Extensive Experience
- [ ] Some Working Experience

[ ] Familiar with Concepts and Terminology
[ ] Heard of Concepts and Terminology
[ ] Never Heard of Concepts and Terminology

[ ] Office has Working Experience
[ ] Contract out this area
[ ] My Office does not work in this Area

2. RISK MANAGEMENT. The interrelationships between Asset Value, Threat and Vulnerability Analysis, Safeguards, Impact, Risk, and allocating Business Resources to manage security in a given environment.

Knowledge
[ ] Extensive Knowledge
[ ] Good Understanding
[ ] Familiar with Concepts and Terminology
[ ] Heard of Concepts and Terminology
[ ] Never Heard of Concepts and Terminology

Working Experience
[ ] Extensive Experience
[ ] Some Working Experience
[ ] Office has Working Experience
[ ] Contract out this area
[ ] My Office does not work in this Area

3. SYSTEM CERTIFICATION. Building and certifying an information system to operate securely in a given environment, processing given information, so as to address confidentiality, integrity (including non-repudiation), and availability.

Knowledge
[ ] Extensive Knowledge
[ ] Good Understanding
[ ] Familiar with Concepts and Terminology
[ ] Heard of Concepts and Terminology
[ ] Never Heard of Concepts and Terminology

Working Experience
[ ] Extensive Experience
[ ] Some Working Experience
[ ] Office has Working Experience
[ ] Contract out this area
[ ] My Office does not work in this Area

4. CONTINUITY PLANNING. Business continuity planning, disaster planning, recovery procedures, including alternate sites, redundant systems, and backup.

Knowledge
[ ] Extensive Knowledge
[ ] Good Understanding
[ ] Familiar with Concepts and Terminology
[ ] Heard of Concepts and Terminology
[ ] Never Heard of Concepts and Terminology

Working Experience
[ ] Extensive Experience
[ ] Some Working Experience
[ ] Office has Working Experience
[ ] Contract out this area
[ ] My Office does not work in this Area

5. SECURITY MANAGEMENT. Information Security Management in the non-technical areas (e.g., personnel, physical, administrative, environmental, natural)

Knowledge
[ ] Extensive Knowledge
[ ] Good Understanding
[ ] Familiar with Concepts and Terminology
[ ] Heard of Concepts and Terminology
[ ] Never Heard of Concepts and Terminology

Working Experience
[ ] Extensive Experience
[ ] Some Working Experience
[ ] Office has Working Experience
[ ] Contract out this area
[ ] My Office does not work in this Area

VI. E-Government

1. PRINCIPLES OF E-GOVERNMENT. Legal and cultural requirements to successfully

implement electronic government (e-government) solutions for internal government operations for citizen services.

Knowledge
- [ ] Extensive Knowledge
- [ ] Good Understanding
- [ ] Familiar with Concepts and Terminology
- [ ] Heard of Concepts and Terminology
- [ ] Never Heard of Concepts and Terminology

Working Experience
- [ ] Extensive Experience
- [ ] Some Working Experience
- [ ] Office has Working Experience
- [ ] Contract out this area
- [ ] My Office does not work in this Area

2. TECHNIQUES FOR E-GOVERNMENT IMPLEMENTATION. Tools, techniques, and technologies that are used for implementing e-government services, especially web-based (Internet-based) services.

Knowledge
- [ ] Extensive Knowledge
- [ ] Good Understanding
- [ ] Familiar with Concepts and Terminology
- [ ] Heard of Concepts and Terminology
- [ ] Never Heard of Concepts and Terminology

Working Experience
- [ ] Extensive Experience
- [ ] Some Working Experience
- [ ] Office has Working Experience
- [ ] Contract out this area
- [ ] My Office does not work in this Area

VII. Leadership

1. MANAGING WORK GROUPS. Issues and approaches for managing groups or teams of people to achieve a purpose.

Knowledge
- [ ] Extensive Knowledge
- [ ] Good Understanding
- [ ] Familiar with Concepts and Terminology
- [ ] Heard of Concepts and Terminology
- [ ] Never Heard of Concepts and Terminology

Working Experience
- [ ] Extensive Experience
- [ ] Some Working Experience
- [ ] Office has Working Experience
- [ ] Contract out this area
- [ ] My Office does not work in this Area

2. LEADERSHIP. Issues and approaches for leaders in a government, military, or non-profit organization.

Knowledge
- [ ] Extensive Knowledge
- [ ] Good Understanding
- [ ] Familiar with Concepts and Terminology
- [ ] Heard of Concepts and Terminology
- [ ] Never Heard of Concepts and Terminology

Working Experience
- [ ] Extensive Experience
- [ ] Some Working Experience
- [ ] Office has Working Experience
- [ ] Contract out this area
- [ ] My Office does not work in this Area

3. LEADERSHIP IN LARGE ORGANIZATIONS. Issues and approaches for leading large groups (500 or more) of people.

Knowledge
- [ ] Extensive Knowledge
- [ ] Good Understanding
- [ ] Familiar with Concepts and Terminology

Working Experience
- [ ] Extensive Experience
- [ ] Some Working Experience
- [ ] Office has Working Experience

[ ] Heard of Concepts and Terminology
[ ] Never Heard of Concepts and Terminology
[ ] Contract out this area
[ ] My Office does not work in this Area

4. NETWORKING WITH PEERS. Establishing and maintaining political and social networks among professional peers.

Knowledge
[ ] Extensive Knowledge
[ ] Good Understanding
[ ] Familiar with Concepts and Terminology
[ ] Heard of Concepts and Terminology
[ ] Never Heard of Concepts and Terminology

Working Experience
[ ] Extensive Experience
[ ] Some Working Experience
[ ] Office has Working Experience
[ ] Contract out this area
[ ] My Office does not work in this Area

5. COMMAND AND CONTROL. Command and control within a flattened, networked organization, including decision making and communication flow.

Knowledge
[ ] Extensive Knowledge
[ ] Good Understanding
[ ] Familiar with Concepts and Terminology
[ ] Heard of Concepts and Terminology
[ ] Never Heard of Concepts and Terminology

Working Experience
[ ] Extensive Experience
[ ] Some Working Experience
[ ] Office has Working Experience
[ ] Contract out this area
[ ] My Office does not work in this Area

6. SYSTEMS THINKING. Role of mental models (which include experiences, values, beliefs, etc., of individuals) and framing in systems thinking.

Knowledge
[ ] Extensive Knowledge
[ ] Good Understanding
[ ] Familiar with Concepts and Terminology
[ ] Heard of Concepts and Terminology
[ ] Never Heard of Concepts and Terminology

Working Experience
[ ] Extensive Experience
[ ] Some Working Experience
[ ] Office has Working Experience
[ ] Contract out this area
[ ] My Office does not work in this Area

VIII. Acquisition and Project Management

1. REQUIREMENT AND CONFIGURATION MANAGEMENT PROCESSES. The processes of eliciting, refining and managing project requirements.

Knowledge
[ ] Extensive Knowledge
[ ] Good Understanding
[ ] Familiar with Concepts and Terminology
[ ] Heard of Concepts and Terminology
[ ] Never Heard of Concepts and Terminology

Working Experience
[ ] Extensive Experience
[ ] Some Working Experience
[ ] Office has Working Experience
[ ] Contract out this area
[ ] My Office does not work in this Area

2. SOLICITATION PROCESSES. Processes for soliciting, evaluating and selecting proposals from commercial firms that respond to IT program needs.

Knowledge

Working Experience

[ ] Extensive Knowledge
[ ] Good Understanding
[ ] Familiar with Concepts and Terminology
[ ] Heard of Concepts and Terminology
[ ] Never Heard of Concepts and Terminology

[ ] Extensive Experience
[ ] Some Working Experience
[ ] Office has Working Experience
[ ] Contract out this area
[ ] My Office does not work in this Area

3. LIFE CYCLE MANAGEMENT PROCESSES. Strategic and tactical processes used to structure the lifecycle of an IT project.

Knowledge
[ ] Extensive Knowledge
[ ] Good Understanding
[ ] Familiar with Concepts and Terminology
[ ] Heard of Concepts and Terminology
[ ] Never Heard of Concepts and Terminology

Working Experience
[ ] Extensive Experience
[ ] Some Working Experience
[ ] Office has Working Experience
[ ] Contract out this area
[ ] My Office does not work in this Area

4. THE ENVIRONMENT: LEGAL AND CULTURAL ISSUES. Legal and cultural requirements to successfully lead an IT project/program effort.

Knowledge
[ ] Extensive Knowledge
[ ] Good Understanding
[ ] Familiar with Concepts and Terminology
[ ] Heard of Concepts and Terminology
[ ] Never Heard of Concepts and Terminology

Working Experience
[ ] Extensive Experience
[ ] Some Working Experience
[ ] Office has Working Experience
[ ] Contract out this area
[ ] My Office does not work in this Area

5. PROJECT MANAGEMENT. Successful management of an IT project or program, including the oversight and management of projects being implemented by contractors.

Knowledge
[ ] Extensive Knowledge
[ ] Good Understanding
[ ] Familiar with Concepts and Terminology
[ ] Heard of Concepts and Terminology
[ ] Never Heard of Concepts and Terminology

Working Experience
[ ] Extensive Experience
[ ] Some Working Experience
[ ] Office has Working Experience
[ ] Contract out this area
[ ] My Office does not work in this Area

For the following questions please mark the ONE answer you believe to be MOST correct.

1. CIO Role: The appropriate role for the Chief Information Officer in your organization is:
[ ] The organization's chief technologist.
[ ] A technical advisor to the head of the organization.
[ ] An executive within a functional component of the organization
[ ] The organization's leader for information and technology matters.

2. Organizational Location: Where is the CIO located in your organization structure?
[ ] The CIO is located within the administrative bureau of the organization.
[ ] The CIO is located within the finance bureau of the organization.

[ ] The CIO is located within a functional division of the organization.
[ ] The CIO reports directly to the head of the organization.

3. Organizational Relationships: As the CIO, your relationship with the heads of functional elements in the organization is:
[ ] The CIO is the top technical expert.
[ ] The CIO manages the technical branch of the organization.
[ ] The CIO is a competitor for resources.
[ ] The CIO is part of the organization's leadership team.

4. Resource Responsibilities: As the CIO, your resource responsibilities are:
[ ] The CIO is responsible for only the resources of the technology branch.
[ ] The CIO is responsible for the organization's information technology.
[ ] The CIO is responsible for the organization's information and information infrastructure.
[ ] The CIO is a resource advisor for organizational planning and implementation.

5. CIO Portfolio: As the CIO, your leadership and decision-making responsibilities are:
[ ] The CIO is responsible for the technology branch.
[ ] The CIO is responsible for requested technology support to functional elements.
[ ] The CIO is responsible for technology support to the entire organization.
[ ] The CIO is responsible for organizational policies for information stewardship and assurance, and the organization's information technology and infrastructure.

6. How can senior leaders in the sphere of Information Resource Management (IRM) recognize the value of information as an organization's asset?
[ ] Talk frequently to other high-level Ministry Leaders
[ ] Stay current with the latest Professional and Technology Journals
[ ] Canvas IT (information technology) industry leaders, experts and consultants
[ ] Personally interact with a variety of "hands-on" systems users
[ ] Carefully evaluate the business decisions that the mission requires

7. Which of the following are key duties of a Chief Information Officer (CIO)?
[ ] Procuring and installing robust, secure networks
[ ] Personally lobbying financial officers for annual or additional funds
[ ] Proposing and defending technology solutions to Ministry leaders
[ ] Aligning technology solutions to mission requirements
[ ] Managing the development and acquisition of major IT systems

8. How do senior leaders effectively implement public policies?
[ ] Adapt and adopt best practices from other similar organizations
[ ] Ensure widespread compliance through management controls
[ ] Encourage desired organizational behaviors through a system of rewards and penalties
[ ] Diligently extend national policies to fit organizational realities
[ ] It is not the CIO's job to implement public policies per se

9. Which of the following constitute "critical success factors" for effective CIOs?
[ ] Obtaining a positive and stable Return on Investment (ROI)
[ ] Building a healthy, competent IT workforce
[ ] Developing a close, trusted relationship with the Minister

[ ] Demonstrating tangible results on mission accomplishment
[ ] All of the above

10. Which of the following fellow Chief Officers is MOST critical to a CIO's success?
[ ] Chief Executive Officer
[ ] Chief Financial Officer
[ ] Chief Operations Officer
[ ] Chief Human Capital Officer
[ ] Chief Information Assurance Officer
[ ] Chief Technology Officer

11. Please select an effective CIO's preferred order for the activities listed below.
[ ] Technology Evaluation; Architecture Development; Policy Formulation; Capital Planning
[ ] Policy Formulation; Capital Planning; Architecture Development; Technology Evaluation
[ ] Policy Formulation; Architecture Development; Technology Evaluation; Capital Planning
[ ] Technology Evaluation; Policy Formulation; Architecture Development; Capital Planning
[ ] Architecture Development; Policy Formulation; Technology Evaluation; Capital Planning
[ ] Do not know

12. Which information technology do you feel will be the most important to the success of your organization?
[ ] Networks connecting computers
[ ] Telephone service connecting people
[ ] Information technologies for public safety
[ ] Personal computers and handheld devices

13. What percentage of the information you expect to use in your job will come directly from a computer?
[ ] 50%
[ ] 25%
[ ] 10%
[ ] Less than 10%

14. Which of the following capabilities do you feel is most important to your organization?
[ ] Getting data and information from one part of the organization to another
[ ] Getting information to the citizens
[ ] Getting information from the citizens
[ ] Getting information to senior leadership

15. The benefit(s) of enterprise architecture are?
[ ] Aids in resolving IT issues
[ ] Supports Strategic Planning, Guides strategic decision-making, and Informs strategic implementation
[ ] Supports IT Planning
[ ] Provides few benefits and is of minimal value

APPENDIX J: GOI MINISTRY SPECIFIC ICT PROJECTS

Appendix J provides an overwhelming 'wish list' of database driven projects for Ministries that were previously referenced in the Government of Iraq ICT Strategy document (2006). As evidenced in column three of the table labeled 'eGovernment – Cross Cutting', exactly 50% of the applications designated by Ministries as desired would be affected by, or would have an impact upon, other Ministries. A certain level of collaboration needs to be achieved in and between Ministries for these cross-cutting eGovernment projects to be implemented successfully.

After in depth consultation with a selected group of Government of Iraq Chief Information Officers (CIOs) regarding a 'Top 10' list of critical eGovernment projects, the following were agreed upon in order of relative priority:

1. Cabinet Ministry – Basic office automation and Internet systems. The ability to deliver this application would prove the concept of the value for provision of necessary eMinistry infrastructure in all Ministries. The higher level objective of transparency and integrity in government would be achieved.

2. Ministry of Interior – Civil Information System/National ID Cards/Civil Registry. Implementation of a single database to reduce forgery would allow the application to 'work across multiple Ministries'. The transparency of this solution would achieve high levels of integrity for the government.

3. Ministry of Interior – Government Employee ID System. According to the group, implementation of this solution would 'help us cut out multiple salaries. These are being received by ghost employees who plague current databases'.

4. Ministry of Labor and Social Affairs – Social Security System. The review chose this as a priority implementation as it is a 'gateway through which we look after the interests of the Iraqi citizen'.

5. Ministry of Labor and Social Affairs – Health Insurance System. The review chose this as a priority implementation as it is a 'gateway through which we look after the interests of the Iraqi citizen. This would be greatly strengthened by a law protecting health data gathered'.

6. Ministry of Finance – Budget Preparation System. According to the review team, this application will become a key piece in the efficient execution of ICT projects.

7. Ministry of Health – Medical Cards System & Medical Records System. The idea of these implementations is to take away as much burden from the Iraqi citizens as possible. This type of government wide initiative will have a direct impact on all Iraqi citizens.

8. Ministries of Education/Higher Education & Scientific Research – Student Enrolment System. This initiative will have an impact on every single family in Iraq. It will lift the burden from families as they have to labor through an 'old economy' process of two systems of enrolment for secondary school and for tertiary entrance. The introduction of automation will remove most of the burden from the current procedure, and will also help combat corruption. The transparency of the process will provide a fair and equitable system of entry into some of Iraq's best tertiary institutions. At present, it is plagued with methods favoring the wealthy and the connected.

9. Ministry of Housing and Construction – Housing & Property GIS Overlay. This is considered a vital application as a GIS Portal will greatly assist a number of Ministries in their quest to plan services based on population and other spatial data.

10. Ministry of Foreign Affairs – Diplomacy, Negotiation & Treaty Database. A successful implementation would show Iraq to be serious about interfacing with other nations through a sophisticated system. It would also compliment the current infrastructural plans to link all Iraq Embassies through a secure intranet system. Security risk assessments carried out in 2007 have highlighted the need for a secure system able to accessed by all satellite offices through a hub and spoke topology.

Potential Point of Failure

…Exactly 50% of the applications designated by Ministries as desired would be affected by, or would have an impact upon, other Ministries.

If collaboration in and between Ministries is poor, failure is certain

Ministry	Applications	eGovernment (Cross Cutting)	Time Budget (Months)
Cabinet	1. Basic office automation and Internet systems	N	12
	2. Access to government DSS	Y	12
	3. "Meet Your Minister" portal project	N	24
	4. Government Intranet Project	Y	3
	5. Media Network Management System	N	24
	6. Civil Society Systems (NGO Register System)	N	12
Defence	1. Civil defence systems	Y	60
	2. C3 system	N	36
Office of the Prime Minister	1. Basic office automation and Internet systems	N	3
	2. Access to government DSS	Y	12
	3. "Meet Your Prime Minister" portal project	N	18
	4. Pre-DSS – Current Issues Document Archive	Y	18
	5. WBB Project	Y	3
Office of the President	1. Basic office automation and Internet systems	N	3
	2. Constitutional Development Database	Y	12
	3. Access to government DSS	Y	12
	4. "Meet Your President" portal project	N	18
	5. Pre-DSS – Current Issues	Y	18

	Document Archive		
National Assembly (State)	1. Basic office automation and internet systems 2. Access to government DSS 3. 'Meet Your Elected Member' Portal Project	N Y N	12 12 36
Shia Endowment Council	1. Registration and Management of Shrines and Properties 2. Pilgrimage Booking System 3. Religious Education 4. Contributions FMIS (same as MoF)	N N N N	N/A
Sunni Endowment Council	1. Registration and Management of Shrines and Properties 2. Pilgrimage Booking System 3. Religious Education 4. Contributions FMIS (same as MoF)	N N N N	N/A
Religious Affairs (Endowment of other specific religious groups)	1. Registration and Management of Shrines and Properties 2. Pilgrimage Booking System 3. Religious Education 4. Contributions FMIS (same as MoF)	N N N N	N/A
Electricity	1. Power Station Management 2. National Grid Management 3. Resources Conservation & Management 4. Fleet Management System 5. Emergency Restore Coordination System 6. GIS National Grid Overlay	N N N Y N Y	36 60 36 16 35 24
Science & Technology	1. Research & Technology Programs 2. eLibrary 3. GIS 4. Seismic Systems 5. Govt. DSS (Data Warehouse)	N Y Y N Y	 23 12 36 120
Transport	1. Transport Police 2. Traffic Police 3. Port Authority Administration 4. Airport Administration 5. Air Traffic Control Systems 6. Major Roads Centerline Overlay & Modeling System 7. Driving Test Administration System 8. Driving Instructor Register 9. Civil Aviation CFI & Pilot Licensing System 10. Master Mariners Certification System 11. Locomotive Drivers Licensing System 12. Railway Management	N N N N N Y N Y Y Y Y N	12 24 12 12 24 24 12 12 12 12 12 6

	System	N	12
	13. Railway Signaling Systems	N	12
	14. Railway Timetable Systems	Y	12
	15. Coast Guard Systems	Y	12
	16. Maritime Registry & Seaworthiness Certificates	Y	12
	17. Railway GIS Overlay	N	24
	18. Emergency Restore Coordination System	N	18
	19. Road Map Printing System	Y	12
	20. Aviation Chart Overlay & Printing System	Y	12
	21. Sea Chart Overlay & Printing System	Y	60
	22. Fleet Management System		
	23. eGate Access Control System		
Oil	1. Pipeline, Well & Refinery Surveillance	N	18
	2. Oil Infrastructure Fault Finding System	N	18
	3. Oil Industry Security Logistics	N	18
	4. Oil Infrastructure Geographical Overlay	Y	12
	5. Fleet Management System	Y	10
Health	1. Emergency Service Restoration	N	28
	2. Drugs & Cosmetics Administration & Register	Y	28
	3. Medical Cards System	Y	18
	4. Medical Records System	Y	16
	5. Register of Certified Medical & Dental Practitioners	Y	12
	6. Hospital Administration Systems	N	30
	7. Pathology Systems	N	24
	8. Medical & Surgical Practices Database	N	18
	9. Diagnostic Systems	N	24
	10. Public Medical & Health Advice Portal	N	26
	11. Immunization Management Systems	N	16
	12. Public Health Statistics & Monitoring System	Y	16
	13. Medical Institutions GIS Overlay	Y	12
	14. Fleet Management System	Y	12
	15. Remote Surgical Operations (Cyber Surgery)	N	60

Finance	1. Customs Administration	N	36
	2. Customs Consignment Tracking	N	16
	3. Macroeconomic Modeling	Y	12
	4. Budget Preparation System	Y	16
	5. FMIS Budget Execution	Y	18
	6. Tax Administration	Y	24
	7. Stock Market System	Y	24
Justice	1. Court Case Tracking System	N	24
	2. Legal Records System	N	36
	3. Arbitration Hearing Case Tracking System	N	24
	4. Cadastre	N	36
	5. GIS Access	Y	12
	6. Official Gazette	Y	12
	7. Real Estate Register	Y	12
	8. Notary Public Register	N	12
	9. Minors Care System	N	24
	10. Bailiff System		
Judicial Council	1. Bar Registration System	Y	24
	2. Database of Iraqi Law	Y	36
	3. Law Enactment Tracking System	Y	36
Municipality & Public Works	1. Emergency Restoration of Services	N	60
	2. Urban Planning System	Y	36
	3. Fleet Management	Y	12
	4. GIS Access	Y	12
Communication	1. Emergency Restoration of Services	N	60
	2. SCIS Project	Y	24
	3. Other Networking Projects	Y	60
	4. Internet Availability Project	Y	60
	5. Fleet Management	Y	12
	6. Spectrum Management System	Y	12
Agriculture	1. Land Management GIS Overlay	Y	18
	2. Land Usage & Monitoring after Reclamation System	N	24
	3. Buy, Sell & Exchange Farmers eMarket	N	22
	4. Farmers eAdvisory Service	N	22
	5. Fleet Management System	Y	18
Water Resources	1. Emergency Restoration of Services	N	28
	2. Water Resources GIS Overlay	Y	12
	3. Iraq Water Resources Management System	N	48
	4. Fleet Management System	Y	18
Youth & Sport	1. Iraqi Sporting Club Information Register	N	12
	2. Certified Coaches Register	N	12
Housing & Construction	1. Public Housing Scheme	Y	36

	Register		
	2. Emergency Restoration of Services	N	36
	3. Government Property Services Agency Register	Y	36
	4. Housing & Property GIS Overlay	Y	36
	5. Housing Subsidy System	N	12
	6. Loans Management System	N	6
Trade	1. Global & Regional Trade Organizations	Y	18
	2. Local & Global Trade & Development	Y	18
	3. Business Registry (Linked to Tax)	Y	6
	4. Secured Transactions Registry (Linked to Tax)	Y	8
	5. Register of Intellectual Property Rights	Y	24
	6. Subsidy Management System	N	22
	7. Foodstuffs Register	Y	18
	8. Food Basket Database	Y	18
	9. Business Register & Secured Transactions Rollout	Y	56
Education	1. Emergency Restoration of Services	N	28
	2. Education System GIS Overlay	Y	16
	3. Syllabus Management System	Y	18
	4. Curriculum Management System	Y	14
	5. Student Enrolment System	Y	18
	6. Educational Institution Administration System	Y	24
	7. Special Needs Education	N	24
Higher Education & Scientific Research	1. Emergency Restoration of Services	N	28
	2. Education System Geographical Overlay	Y	18
	3. Syllabus Management System	Y	18
	4. Curriculum Management System	Y	24
	5. Student Enrolment System	Y	18
	6. Educational Institution Administration System	Y	24
	7. Research Grant & Subsidy Management System	N	24
	8. Fully Integrated Education MIS	N	60
Culture	1. Register of Listed Artifacts & Cultural Sites	N	60
	2. Iraqi National Heritage & Recreational Resources System	Y	24

	3. Cultural & Tourism Promotion System	N	24
	4. Tourism Publications Inventory	N	24
	5. GIS Overlay	Y	24
Interior	1. Border Police Intelligence & Visa Resident System	N	18
	2. Iraqi Passport System & International Passport Database	Y	18
	3. Government Employee ID System	Y	12
	4. Weapons Permit Systems (linked to Criminal Intelligence	Y	12
	5. Interpol	Y	12
	6. Iraqi Police Department Management System	N	36
	7. Surveillance Systems	N	24
	8. Criminal Intelligence System	Y	24
	9. Detainee Records System (also border police)	Y	18
	10. Police Special Operations Systems	N	24
	11. Witness Protection	N	12
	12. Case-tracking System	N	24
	13. Emergency Service (Fire/Police/Ambulance)	Y	24
	14. Narcotics Bureau System	N	24
	15. Prison Administrations Systems	N	36
	16. Patrol, Retraining & Rehabilitation Systems	N	24
	17. Driver & Vehicle Licensing System	Y	24
	18. Fleet Management System	Y	24
	19. Civil Information System/National ID Cards/Civil Registry	Y	30
	20. GIS Overlay linked to Civil Information System	Y	24
	21. eMinistry, MoI Internal Enterprise Management System	N	12
	22. Integrated Justice Information Project (IJIP)	Y	24
	23. IP Station/ Police Station Register	N	6
	24. MoI GDN & Secure GDN	Y	24
	25. Memex Counter Insurgency	N	12
	26. MOI Databank	N	30
	27. MoI HR/Payroll Interim System in Access	N	6
	28. Stolen Vehicle Database	N	12
	29. Vehicle Asset DB	N	6
Central Bank of Iraq	1. Interbank Settlements & Clearing System		36
	2. Interbank FMIS		24
	3. CBI FMIS		24

	4. Foreign Exchange Auction System		36
	5. Treasury Bill Auction System		24
	6. Foreign Reserve Management System		24
	7. Foreign Exchange Control Operations System		36
	8. Anti-Money Laundering Systems	Y	24
	9. Interbank Intranet		12
	10. PKI		12
	11. Certification Authority		12
	12. Uniform Bank Performance Reporting System		24
Labor & Social Affairs	1. Job Vacancies & Placement System	Y	24
	2. CV Database	N	24
	3. Labor Rights Monitoring System	N	24
	4. Pensions Administration System	Y	48
	5. Unemployment Benefit System	Y	24
	6. Health Insurance System	Y	24
	7. Health & Safety Executive System	Y	24
	8. Allowances & Grant Management	Y	24
	9. Social Security System	Y	36
Foreign Affairs	1. Database of Embassies and Consulates (internal & abroad)	N	48
	2. Diplomacy, Negotiation & Treaty Database	Y	24
Environment	1. Monitoring System, Sea & Land Sustainable Natural Resources	Y	48
	2. Waste Classification, Waste Recycling & Disposal System	Y	36
	3. Land & Marine Usage Classification & Stewardship	Y	24
	4. Land & Marine Usage & Conservation GIS Overlay	Y	24
	5. Water & Air Monitoring System	Y	36
	6. Meteorological Forecasting System	Y	60
	7. Hazardous Substance Licensing System	Y	18
	8. Environmental Remediation Projects Database	Y	24
Planning and Development	2. Emergency Restoration of Services and Response Monitoring	Y	36
	3. Public Employees		

	Record System	Y	24
	4. Public Investment Project Approval & Management System	Y	18
	5. Project Planning System	Y	18
	6. Iraqi Standards Institute (Product Registers)	Y	36
	7. Administrative Development Systems	Y	30
	8. Ranking of Industrial Strength Iraqi Companies	Y	12
	9. Building Director Funding & Observation System	Y	18
	10. Transport Director Funding & Observation System	Y	18
	11. Industrial Project Funding & Observation System	Y	18
	12. Agricultural Project Funding & Observation System	Y	36
	13. Local Investment (Foxpro)	N	18
	14. International Investment (Foxpro)	Y	36
	15. Legal Department Companies (Foxpro – frozen 2005)	N	12
	16. Private Sector Development Grants & Loans	N	18
	17. Statistical Bureau – 2007 National Census System	N	18
	18. Statistical Bureau – Surveys Databank	N	18
	19. GIS Center	Y	18
Human Rights	Gender Affairs Database	N	24
	Minorities Database	N	24
	Anti-Child Exploitation Database	N	18
	Access to International Human Rights Law	N	12
Baghdad Mayoralty	Building Permits System	N	24
Displacement & Migration	Immigration/Emigration Records	Y	36
Provincial Affairs	Local Government Accounting System	Y	36
	Local Government HR	Y	24
	Local Government Statistics	Y	30
	Local Government GIS Overlay	Y	24
Country & National	Emergency Response Deployment System	Y	24

Security Affairs	Anti-Terrorism System Special Services Operations System Border & Transport Security System	 N N N	 36 12 12
Industry & Minerals	Web based central SOE database Donor Coordination Database Industry Promotion System Archival System	N Y Y N	60 12 36 48
Commission of Public Integrity (Office of the Prime Minister)	Financial Police Intelligence DB Government Data Warehouse Case Tracking System Computer Forensics Applications	Y Y N N	18 120 24 24
Supreme Audit	Auditor Register Auditor General's Systems – Program Monitoring & Control	Y N	12 24

APPENDIX K: INTRODUCTION TO GOVERNMENT OF IRAQ WEBSITE STANDARDS – MANAGEMENT OF INFORMATION

The purpose of this guide is to assist Government of Iraq Ministries and agencies implement minimum website standards.

The standards relate to minimum information provision, electronic publishing, Metadata, record keeping and archiving, accessibility, security, privacy and authentication. After the formation of the National Steering Committee eGovernment Iraq (NSCeGI) is formed, detailed documentation for each of these standards needs to be developed and implemented.

Website standards address common policy issues and practical challenges agencies face in providing services online. Some will assist agencies to overcome practical problems, while others provide guidance about the approach to adopt where no obvious choice currently exists. The standards will help to ensure user confidence in these services, and encourage further uptake of services.

For Government of Iraq Ministries and agencies to service the public better, there are categories of information that must be provided on websites to support the eGovernment mission.

1. Directories of services, including points of contact – Agencies need to consider how their customers will find information about what they do. In the current situation in Iraq, discretion regarding government employee direct contact information is advisable.

2. Information needed by citizens and organizations to facilitate their understanding of entitlements to government assistance and the requirements of Government affecting them

This information includes documentation such as:

Applications, enrolment and compliance-type forms

Explanatory notes and policies

Information about assistance

Service Charters

Links to other information, e.g. legal and legislative rulings specifically associated with an entitlement, benefit or policy, privacy statements etc

a. Legislative information, including bills, acts, treaties, subordinate information, legislative status information – GOI Ministries and agencies should not be required to duplicate information on their websites that is available elsewhere. In order to provide access to any legislative information, hypertext links to relevant resources should be provided.

b. Press releases, speeches and other public information released by Ministers, their officers and holders of statutory offices. Information included: media/press releases, Ministerial announcements, departmental/agency announcements, new government initiatives, speeches, public notices, warnings and advice.

c. Annual reports, corporate strategic plans and other documents concerning public accountability – basic documents aiding Iraqis in their understanding how government works such as annual reports; strategic plans (Ministry, departmental such as strategic IT plan); budget statements; speeches by the Minister or delegations hosted.

d. Reports submitted to Iraqi Parliament – to include Prime Ministerial statements, reports and government responses to parliament or cabinet of ministers. When documents are tabled in Parliament, they become part of the public record. Agencies are required to publish these documents online, preferably on the official government portal in the first instance.

e. Information about agency powers affecting the public, manuals and other documents used in decision-making affecting the public – it is important that there is a consistent set of information about agencies and their services available online. The information about agency powers and the documents used in decision-making should not only be comprehensive but also easy to search for, and access.

An example of a Metadata record for an Iraqi Ministry:

<link rel = “schema.IGLS”href=” //www.most.gov.iq/igls/1.2”>
<META NAME=”DC.Title” CONTENT=”Ministry of Science and Technology Website”>
<META NAME=”DC.Creator” SCHEME=”IglsAgent”CONTENT=”corporateName=Ministry of Science and Technology”>
<META NAME=”DC.Date.created”SCHEME=”ISO17799”CONTENT=”2007-05-21”>
<META NAME=”DC.Identifier”SCHEME=”URI”CONTENT=” //www.nai.gov.iq/”>
<META NAME=”IGLS.Function”SCHEME=”IGIF” CONTENT=”Reference services;Information Management Standards; Nuclear Science; Projects; Nuclear Research Funding”>
<META NAME=”DC.Description” CONTENT=”
Welcome to the Ministry of Science and Technology website. This website gives comprehensive information on the various departments including research history and announcements, proposed projects, and latest news and events including the ICDL program initiated for skills upgrade of employees. The Minister has a separate section that allows users to ask questions of the senior staff at the Ministry via email.”>

The government of Iraq needs to produce a concise Metadata Checklist for all Ministries and agencies to ensure website compliance with national metadata standards.

Electronic Publishing

Iraqi Ministries and government agencies of all types need to ensure that all new publications comply with guidelines. The Guidelines for Government of Iraq Information Published in Electronic Formats provide principles for language usage, information presentation, production and best practice conventions for electronic publications. By applying these guidelines, online information will improve in efficiency, quality and accessibility. Application will also assist in the preservation of GOI eGovernment publications and announcements for future access.

Publishing Guidelines

The guidelines cover a wide range of topics. They include information on the different dissemination formats for electronic publishing; Internet publishing, website structuring and issue consideration, writing for the Internet, contact points when needing to use the correct GOI flag and other symbols. The guidelines can cover:

Document Purpose

- Being clear on the nature of your audience and their skills, technological capabilities and interests
- Audience expectations of the website and their main reasons for accessing it
- Careful consideration of which documents to release (their appropriateness for public consumption and their use)

Design Elements

- Use clear navigation aids
- Keep design simple and consistent (this includes official government colors, shapes, logos, slogans etc.)
- Do not overuse graphics. Avoid a disjointed and chaotic layout. Remember the viewer is likely there to find a specific information source or service
- Direct the eye and attention of the viewer
- Understand the needs of Iraqis with impaired vision (some websites can be designed to speak to the visitor if they are unable to read)
- Use only the 256 Internet safe colors
- Do not have dead-end pages (avoiding pages with broken links)
- Provide information in fewest possible steps in shortest possible time (preferably with a download time of less than 10 seconds)
- All for feedback on your website. The objective should be to respond within a minimum amount of working days to any direct website enquiry

Information Organization

- Divide information into logical units
- Establish a hierarchy of importance
- Use this hierarchy to structure relationships between pages

Writing

- Provide information based on the four (4) principles of journalism: who, what, when, and where
- Always use version control
- Minimize punctuation: use single quotation marks and limit the use of prepositions and conjunctions
- Grammar: keep text clear and concise: include lists and dot points where possible and use qualifiers (almost, very, quite, often)
- Graphics: use simple graphics to assist the viewer. Poorly used, these can complicate the message

The guidelines also focus on the best ways of writing for the Internet. The main features to be aware of include:

- Establish a clear information structure
- Organize text into small blocks of related information with a hierarchy
- Limit each page to one concept – each page should be ‘stand-alone’

- Include author (if security permits) and date at the bottom of each page
- Have an approval system (without being overly bureaucratic) prior to publishing content
- Keep titles short and easily understandable
- Identify where the document comes from and note affiliations (if any)
- Incorporate the home URL on at least the main pages of the Ministry/agency site
- Provide at least one link to a local home page in every web page

Electronic Record Keeping & Archiving Government Information

The way in which information is stored and archived plays a vital role in any government's strategy of serving its constituents. The Government of Iraq needs to develop a standard for electronic record keeping and archiving according to best practice standards, policies and guidelines.

Implementation Requirements

All Government Ministries and agencies should be required to meet the guidelines for electronic publishing by January 1, 2009, including the conversion of existing website material.

All digital data created or received conducting business for the Government of Iraq need to be managed in accordance with the Electronic Record Keeping & Archiving Act. For this to occur, all agencies must keep full and accurate records of their decisions, transactions and activities in a form. This will ensure the reliability and accessibility of government records.

Government of Iraq agencies must create and manage electronic records with the same care as they manage paper records. Agencies must not dispose of electronic records unless permission is granted by the NSCeGI. To protect the interests of agencies and the citizens of Iraq, it is important for agencies to design and implement record keeping systems that can capture and retain full and accurate records of their activities, which can also operate as a source of national memory. The goal of open and transparent government is also achieved through this by meeting accountability requirements and to meet the expectations of the Iraqi community.

With Ministries and agencies conducting an increasing proportion of their business over the Internet, it is important to ensure that web publishing and online service delivery systems have good record keeping capabilities with links to internal record keeping systems. Failure to capture full and accurate records of web-based activity may leave Ministries and agencies exposed to legal, financial and political risk.

Authentication

In broad terms, authentication relies on one or more of the following:

- Something You Know – such as a password or Personal Identification Number (PIN)
- Something You Have – such as a smart card or identification card (e.g. Jinsia)
- Something You Are – such as fingerprint or retina scan

Authentication is the solution to the need for certainty in the identity of the other party to a transaction. Where services are provided via traditional, non-electronic systems, various authentication mechanisms are used. Customers are required to sign forms or letters or other types of correspondence as proof that they supplied the information contained in those documents. They may be required to supply an identification number. They may also be required to provide evidence they are who they say they are. This can be in the form of any Iraqi identification card (Jinsia), or driver's license, birth certificate, food-for-oil ID. In some cases, Iraqis need to

physically attend the relevant government office. Most of these methods will not work online. Where services are provided online, agencies will need to assess how they authenticate users.

Due to the current security situation in Iraq in certain urban areas, the development of online methods of user authentication might actually be accelerated. This is a potential growth area for private sector development in Iraq.

Failure to properly authenticate a transacting party may lead to situations such as:

- An illegal transfer of funds
- Unauthorized ordering of goods or services
- Illegal attempts to alter data (particularly that attached to a particular Iraqi citizen or ethnic groups of citizens)
- Identity Theft
- Creation of ghost employees/citizens within various government databases

Authentication is vital to eGovernment developments, and will underpin the confidence shown toward the systems by ordinary Iraqi citizens. It is also the bridge that will eventually see the development of eCommerce applications here in Iraq. Citizens and businesses will begin to accept transactions as valid and binding. It is important to note that authentication is not the same as security. Authentication must operate in conjunction with the Ministry or agency's overall security framework.

Senior Management Role to Play

An effective solution to authentication is to understand that technology should not drive the solutions. Authentication is as much about management and cultural issues as it is about technical solutions. Decision makers need to consider cost in relation to an identified level of risk associated with failure to properly authenticate a party to an online transaction.

The likelihood and consequences of such a failure, set against the cost of implementing authentication should be analyzed (see business case building Chapter 12). The consequences may be measured in a number of ways including financial, legal/liability and political outcomes. If managed as a business issue rather than a technical issue, agency authentication needs can be effectively addressed and implemented in a cost effective way as the benefits of transacting online are realized.

Ministries and agencies must consider whether or not their online services require authentication solutions. Some online services may only require simple authentication techniques such as the use of logins and passwords. For more complex online services involving data interchange, large databases or financial transactions, agencies may choose to use digital certificates. The authentication solution adopted should be determined by the outcome of a risk assessment (see chapter 10 on risk assessments) and subject to the preparation of a business case. Agencies should also consider the realistic needs and expectations of the Iraqi people as their customers.

APPENDIX L: ELECTRONIC RECORDKEEPING & ARCHIVING CHECKLIST

Ministries and agencies need to follow this checklist to ensure capture and retention of full and accurate records of web-based activity

- Identify and analyze agency functions, activities and transactions
- Determine agency recordkeeping requirements
- Conduct a web-based record keeping risk assessment
- Develop a business classification scheme
- Develop a functions-based thesaurus for records classification purposes
- Assign and document recordkeeping responsibility within the agency
- Design and implement recordkeeping systems that meet identified recordkeeping requirements
- Ensure that the recordkeeping systems support the creation and maintenance of adequate recordkeeping metadata
- Decide on object-driven or event-driven strategies (or a combination of both) to ensure creation and capture of records
- Train staff to use the recordkeeping systems
- Implement IT infrastructure for capture and retention of electronic records in a reliable, durable and accessible form
- Implement policies and procedures for managing hardware and software dependency and obsolescence
- Where possible, use open standards in preference over proprietary standards and platforms
- Conduct regular reviews and monitor developments

APPENDIX M: SAMPLE SECURITY CHECKLIST (WEB)

This objective of Appendix K is to alert all government officers the value of maintaining the integrity of all government systems and government data. One of the aims of providing information to the Iraqi public is to ensure the highest value of citizen service. One of the biggest dangers to this is unauthorized intrusion by a third party, particular with respect to malicious breaches.

1. The designated IT staff member within the Ministry or agency is responsible for the development and enforcement of an information security plan and risk treatment plan
2. A formal threat and risk assessment (in compliance with ISO17799) are performed against the government website
3. The site has a clearly visible privacy statement making clear what information is collected by the site and how it will be used, and indicating that any information collected will be securely protected from unauthorized disclosure
4. The site privacy statement complies with all the online Privacy Principles developed under relevant Government of Iraq privacy acts or laws
5. There is no National Security Classified information posted to the website or government portal
6. If or where the website makes use of a Public Key based encryption or authentication technology, that technology meets the mandated GOI Gatekeeper standards and is sourced Gatekeeper accredited suppliers
7. If or where the website makes use of authentication technology or digital certificates to identify or authenticate Iraqi citizen customers online, the system should use any established Iraqi Business Number as the identifier
8. All non-agency external third parties (e.g. web developers, web hosts, outsourcers, telecommunications providers, payment gateway providers) with a substantial role in the delivery of the government site, or the handling of sensitive site information, need to be accredited according to the appropriate ISO standards, or can demonstrate compliance to Government of Iraq security guidelines
9. Where non-agency external third parties play a role in directly managing or updating the site, systems are in place (e.g. Service Level Agreements with suppliers, stipulated contract conditions) to ensure effective protection of the confidentiality of site data, preservation of site security, and best practice site management
10. A detailed audit and activity log (e.g. web server, proxy, login attempts) collection and review system is in place on the website
11. Online system audit tools are used with activity logs scanned, analyzed and archived regularly
12. Incident analysis is performed and recorded where suspicious activity is evident
13. An incident reporting system is in place
14. Intrusion detection and/or network monitoring systems are in active operation
15. Where information about people or businesses (including email addresses) is collected by, or available from the website, measures are in place to securely store and protect the information
16. Systems are in place to detect unauthorized changes to website data and key system configuration files
17. Systems are in place to capture and report illegal, unusual and unexpected input to the web server or other online system elements
18. Regular backups of site content and key system data are performed and stored securely

19. A disaster recovery plan for the site has been prepared and tested, which includes planning for recovery from a serious website security break or attacks
20. A formal checking process is used when information is transferred from the internal network to the website in order to guard against leakage of sensitive information
21. Firewalls are in use to control access to the website and to block unauthorized transmissions from the site
22. Any firewall(s) for sensitive system elements need to be certified by an appropriately qualified organization
23. Firewalls in use are actively maintained and monitored, and the latest updates and patches are applied
24. If the website uses active server content or technologies (such as Java servlets, Cold Fusion, Common Gateway Interface (CGI) scripts, Active Server Page (ASP), Hypertext Preprocessor (PHP)), appropriate measures need to be in place to identify, and then remove or minimize vulnerabilities these technologies may introduce into the site
25. If the website provides an ability to query or display information from a database product (such as Structured Query Language (SQL) Server, Oracle, DB2, Access), appropriate measures need to be in place to identify, and then remove or minimize vulnerabilities these technologies may introduce into the site
26. Any additional online functionality or Internet services (such as Telnet, email, File Transfer Protocol (FTP), chat, Lightweight Directory Access Protocol (LDAP) directory services), offered by the website are identified, appropriately authorized, protected and managed, under the same security arrangements that apply to the core services of the site
27. No software or services other than those required to deliver the core functionality of the site are installed
28. Sample code normally installed as part of the default setup of the web server and/or operating system are removed from the website
29. Development tools are not installed, or if installed, are appropriately secured
30. Remote administration tools or web pages are not installed or active, or if installed or active, are appropriately protected, with IP addresses or domain name restrictions on their use, or access is only available via an authenticated encrypted session
31. There is a procedure in place to ensure that vendor security patches/updates for key system software components (the web server, operating system, database, middleware etc.) are regularly applied
32. Administrative access (physically and electronically) to the externally visible or key elements of the website is tightly restricted

APPENDIX N: LIST OF GOI MINISTRIES

- Office of the Prime Minister
- Ministry of Agriculture
- Ministry of Communications
- Ministry of Culture
- Ministry of Defence
- Ministry of Displacement & Migration
- Ministry of Education
- Ministry of Electricity
- Ministry of Environment
- Ministry of Finance
- Ministry of Foreign Affairs (www.mofa.gov.iq)
- Ministry of Health
- Ministry of Higher Education
- Ministry of Housing & Construction
- Ministry of Human Rights
- Ministry of Industry & Minerals (www.industry.gov.iq)
- Ministry of Interior
- Ministry of Justice
- Ministry of Labor & Social Affairs
- Ministry of Municipalities
- Ministry of Oil
- Ministry of Planning
- Ministry of Science & Technology (www.most.gov.iq)
- Ministry of Trade
- Ministry of Transport
- Ministry of Water Resources
- Ministry of Youth & Sports

Also

- Central Bank of Iraq (www.cbi.iq)

APPENDIX O: GLOSSARY OF EGOVERNMENT TERMS

Terminology	Definition. Description
Agency	Any Iraqi Government entity
API	Application Program Interface – set of routines, protocols and tools for building software applications
ASP	Active Server Page – Web scripting interface for dynamically generated web pages. Each object corresponds to a group of frequently used functionality
Authentication	Ways of making sure people are who they say they are, so that the right people get access to the right information or service.
BGPv4	Border Gateway Patrol – core routing protocol of the Internet. It works by maintaining a table of IP networks or prefixes which designate network reachability among anonymous systems
C21	21st Century (meaning: the current era)
CAPEX	Capital Expenditure
CDMA	Code Division Multiplexing – referring to wireless networks. Enables mobile/cellular phone operation
CGI	Common Gateway Interface scripts – Standard protocol for interfacing external application software with an information server, commonly a web server
CPU	Central Processing Unit – brain of the computer; most important element of the computer, where most calculations take place
DNS	Domain Name System allows naming and location of Internet sites.
DOM	Document Object Model, is the specification for how objects in a Web page (text, images, headers, links, etc.) are represented.
DSL	Digital Subscriber Line – associated with 'old economy' copper telecommunications network infrastructure. ADSL refers to reconfiguring telephone exchanges to provide higher data speeds over copper

Terminology	Definition. Description
DMZ	Demilitarized Zone – A computer or small subnetwork that sits between a trusted internal network, such as a corporate private LAN, and an untrusted external network, such as the public Internet
EAI	Enterprise Application Integration – unrestricted sharing of data and business processes throughout the networked applications or data sources in the organization
EbXML	e-business XML – a joint project of the UN and OASIS to bridge electronic document interchange (EDI) and XML
EDI	Electronic Data Interchange – the transfer of data between different companies using networks such as VANs (Value Added Network – private network provider leasing lines to subscribers) or the Internet
EV-DO	Evolution Data Optimized – referring to wireless broadband technology; download speeds of up to 2.4Mbps
eGovernment	Involves Iraqi government Ministries and agencies aiming to deliver their programs and services more effectively and efficiently, through the use of new information and communications technologies. eGovernment makes use of these technologies to improve government administration as well as enabling more effective engagement with Iraqi citizens.
Framework	A series of standards, guidelines, prompts, outlines and recommended steps that can be used to assist in the development of systems, processes and services. They help us to learn from other's experience, yet have the latitude to be able to modify the steps to suit a particular circumstance.
Frame Relay	Packet switching protocol for connecting devices to the WAN. Frame relay networks in the United States support data transfer rates at T-1 (1.544 Mbps) & T-3 (45Mbps) speeds.
FTP	File Transfer Protocol, allows transfer of files between computers over the Internet. FTP is an application protocol.

Terminology	Definition. Description
GIF	Government Interoperability Framework – technical standards that assist interconnection, data exchange & accessibility
GIS	Geographical Information Systems
GML	Geography Markup Language, based on XML.
GSM	Global System for Mobile Communications – digital cellular systems. First introduced in 1991
HTML	Hypertext Markup Language is the set of markup symbols or codes inserted in a file intended for display on a World Wide Web browser page.
HTTP	Hypertext Transfer Protocol (HTTP) is the set of rules for exchanging files on the World Wide Web. HTTP is an application protocol.
ICT	Information & Communications Technology
IETF	Internet Engineering Task Force (IETF) coordinates the specification development process and maintains the agreed technical specifications for the evolution of the Internet architecture and the smooth operation of the Internet.
Integrated service delivery	The ability to deliver information and services from a single point irrespective of its original source or of the client's access channel.
Interoperability	The ability to transfer and use information in a uniform and efficient manner across multiple organizations and information technology systems. It underpins the level of benefits accruing to enterprises, government and the wider economy through e-commerce.
IPv6	Internet Protocol (Version 6) – Network layer protocol for packet-switched Internet. Successor of IPv4, the current version of the Internet Protocol
IP	Internet Protocol
ISDN	Integrated Services Digital Network – International communication standard for sending voice/video/data over digital telephone lines. Transfer rates of 64Kbps

Terminology	Definition. Description
ISO 17799	Best Practice Information Security Controls – referred to within the complex of security risk assessments
ISO27001	Information Security Standard
ITU	International Telecommunications Union
JPEG	Image Type – format for photographic images
Layers	OSI (Open System Connection) model defining a networking framework for implementing protocols in 7 layers. Control is passed from one layer to the next; from the physical to the application layer
LDAP	Lightweight Directory Access Protocol.
Metadata	Metadata is structured information that describes and allows us to find, manage, control and understand other information. In a web environment metadata acts like a virtual library catalogue – it helps government search engines to accurately and efficiently identify and retrieve web-based resources in response to search requests. To ensure that metadata is as useful as possible, it is important that it is applied consistently by agencies across Iraq.
MIME & S/MIME	Multi-Purpose Internet Mail Extensions (MIME) and Secure Multi Purpose Internet Mail Extensions (S/MIME) is the exchange protocol for e-mail.
NAT	Network Address Translation – Internet standard enabling a LAN to use one set of IP addresses for internal traffic and another for external traffic. Provides a type of firewall hiding internal IP addresses
NDA	Non-Disclosure Agreement – Confidentiality agreement between two parties wishing to share information securely
OC-3/OC-48	Optical Network Carrier Level 3 = 155.52Mbps – carrying capacity of Internet backbone provider network. OC-48 = 2.38Bbps

Terminology	Definition. Description
ODBC	Open Database Connectivity – provides a standard software API method for using database management systems. The aim is to be independent of programming languages, database and operating systems
Online service	Online services are services delivered via the Internet. An online service can be simple, such as provision of information, or more complex such as determining entitlement to and applying for a benefit online.
PC	Personal Computer
PDA	Personal Digital Assistant
PDF	Portable Document Format – captures formatting information from a variety of desktop publishing applications; documents appear on the recipient's monitor and printer as intended
PKI	Public Key Infrastructure – a lock and key system allowing the owner of the data to scramble information before sending it in a way that can be unscrambled only by the person holding the appropriate key.
Policy	A formal statement of compulsory practice made by the Government.
POP	Point of Presence – access point to the Internet. Either part of the facilities of the telecommunications provider that the ISP rents or a separate location from the provider housing servers, routers and switches
PPP	Public Private Partnership(s)
Protocol	Protocol is used to mean agreed ways of working together, that is a common understanding of business rules required to operate a service or exchange data. It also has a specific meaning in IT circles of the special set of rules that end points in a telecommunication connection use when they communicate. Both end points must recognize and observe a protocol. Communications protocols are usually described in an industry or international standard.
PSB	Public Services Broker – form of Service Oriented Architecture

Terminology	Definition. Description
PSU	Power Supply Unit
RDF	The Resource Description Framework (RDF) is a general framework for semantic description of any Internet resource such as a Web site and its content.
RJ-45	Connector used to connect computers onto a local area network (LAN), especially Ethernet
RTT	Radio Transmission Technology
SMTP	Simple Mail Transfer Protocol (SMTP) is a TCP/IP protocol used in sending and receiving email.
SOAP	Simple Object Access Protocol (SOAP) uses web protocols to exchange from one computer to another. SOAP specifies how to encode an HTTP header and an XML file so that one computer program can call a program in another computer and pass it information. It also specifies how to return a response.
Spoofing	A program masquerades as another by falsifying data and identity & gaining the trust of the user for often illegal objectives
SSL	Secure Socket Layer – Cryptographic protocols providing secure communications on the Internet (more recently referred to Transport Layer Security)
Stakeholder	Any person or organization with an interest in a public resource or the public good. While each agency will have its own definition of stakeholders, they will generally include individual Ministers and their Ministries, Iraqi citizens, Iraqi businesses, or other government agencies.
Standard	This includes standards endorsed by a recognized standards setting authority; enacted in legislation; voluntary standards and agreed protocols. An example is ISO17799.

Terminology	Definition. Description
Structured Data	Information that has been organized to allow identification and separation of the context of the information from its content.
TCP/IP	Transmission Control Protocol/Internet Protocol (TCP/IP) is the basic communication protocol of the Internet. It can also be used as a communications protocol in a private network.
UDDI	Universal Description, Discovery and Integration (UDDI) provide directory services to discover Internet-based business resources within the "web services" model.
UML	Unified Modelling Language - General-purpose notational language for specifying and visualizing complex software, especially large, object-oriented projects.
URL	Universal Resource Locator – global address of documents and other resources on the World Wide Web
VPN	Virtual Private Network – referring to private communications network for confidential communication
VSAT	Satellite Communication Technology – (Very Small Aperture Terminal) – satellite Internet solution
W3C	World Wide Web Consortium, the governing body for web standards. (http://www.w3.org/)
WAN	Wide Area Network – a computer network that spans a relatively large geographical network. Typically consisting of 2 or more LANs. Usually connection is through public networks

Terminology	Definition. Description
Web services	Web services are simple, self-contained applications that perform functions, from simple requests to complicated business processes. The "web services" model uses WSDL, UDDI and SOAP. A WSDL description is retrieved from the UDDI directory. WSDL descriptions allow the software systems of one business to extend to use those of the other directly. The services are invoked using the SOAP protocol. Each of the components is XML based. Where two agencies know about each other's web services they can link their SOAP interfaces – provided all security concerns are managed appropriately. It is only where services are going to have unknown uses that they need to be formally described by a language such as WSDL and entered into a directory such as UDDI.
Wi-Fi	Wireless Fidelity – used generically when referring to any type of 802.11 network. Common use within close range of 300 feet.
WiMAX	Wireless fixed broadband based on the IEEE 802.16 Standard using a point to multipoint architecture. Published in 2002
WSDL	Web Services Definition Language (WSDL) describes how to use the software service interfaces of a registered business over the Internet within the "web services" model.
XML	Extensible Markup Language is a flexible way to create common information formats and share both the format and the data on the World Wide Web, Intranets, and elsewhere.
XSL	Extensible Stylesheet Language (XSL) is the language for defining how a browser will display XML content to the user.