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An e-readiness assessment tool for local authorities: a pilot application to Iraq

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An e-readiness Assessment Tool for Local Authorities: A Pilot Application to Iraq

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Abstract

Measuring e-readiness is vital to embrace e-government successfully. Sophistication of available tools and lack of capacity at municipal level makes it important to consider e-readiness assessment tools for municipalities. This study proposes a tool for measuring e-readiness in municipalities and it was conducted in two Iraqi governorates. Data was collected, for this studay, quantitatively and qualitatively relying on questionnaires for public internet users and government employees, and IDIs. Several aspects were investigated and then used in the tool that was designed to qualify for the use of local officials in Iraq as a pilot case for developing countries. Indicators were categorized into three groups, infrastructure, human resources, and government and management. Measuring e-readiness in municipalities is a trade off between simplicity with acceptable level of information and sophistication with accurate information. The proposed tool relies on collecting data easy to find and access to meet the condition of simple and reliable use by officials in local governments. This is expected to help these officials to identify issues to focus in development of community aspects to raise e-readiness and reap the benefits of e-government.

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1 Introduction

1.1 Introduction and Background

The great potential e-government has gained as an essential program that supports administrative, social, and economic reform has directed considerable attention to facilitating all factors of success to maximize the benefits the community can obtain by moving to e-government. This is urging organizations and governments to measure how ready their communities are to embrace e-government. For that reason, several e-readiness assessment tools have been developed to help assess the opportunities and challenges facing e-government programs and to help guide the efforts to successful implementation and development.

In Iraq, the subject of this study, some municipalities have recently turned their attention to e-government and have actually initiated programs in many government agencies. For example, Thi-Qar governorate, in the south, has started such program with the help of Italian governmental agencies and other NGOs.

This research aims to develop an e-readiness assessment tool to be used by the municipal authorities or local governments in governorates of Iraq and potentially on a broader basis in developing countries. This tool must be simple, easy to use, and consistent with the reality of these governorates' environments. It should measure several aspects that are expected to be crucial to e-government in municipalities where various conditions are necessarily the same as those on the national level.

The argument that such tools are needed can be based on several grounds. Municipalities in developing countries are known to lack high level competencies in different fields of technology and management as most of the highly qualified scholars

and technicians are concentrated in the capital and other large cities (in this case Baghdad and perhaps Mosul and Basrah to a lesser extent). These competencies are vital to address crucial issues for e-government. In addition, e-readiness assessment as currently practiced is not straightforward and indeed may be rather complicated. Most of these tools employ a long list of indicators, of which some might not be appropriate for municipalities of small size of population and area and low levels of economic activity, with similar constraints applying at the governorate level. Moreover, different assessment tools use different weighting for similar indicators, which creates confusion and adds more complications to the task of selecting the proper tool for assessment. Finally, most e-readiness studies and therefore assessment tools focus on the national level and not the municipal level, which adds to the difficulty of addressing the exact issues at the local level, where expertise and data may not be available to answer the questions of local decision makers and executives in this matter.

A primary task of this study is thus to consider which subset of indicators is of most direct importance to the programs of e-government in governorates. The set of indicators to be used as the framework of assessment was chosen from the literature in this field based on a judgment as to what represents a prerequisite for e-government and applies the most to the conditions of these governorates. After that, these indicators were tested and verified to determine how successful and reliable they are in providing an assessment of e-readiness of that community. This test was conducted in two governorates in the south of Iraq. Information was collected from the field and then analyzed and used to form a simple tool that describes the aspects of e-readiness and helps the decision makers by pointing to where enhancements are needed, how

policies may best be drawn up to promote e-government, and what other issues to consider.

In sum, this research is an attempt to provide an assessment tool targeting local authorities in municipalities using a pilot case of the southern governorates in Iraq.

1.2 Statement of the problem

The rush to e-government systems has dominated a lot of development programs in developed and developing countries as well as, in their different levels, central or local. However, there are enormous differences among and within these countries in terms of how capable they are to embrace and benefit from e-government, which is termed e-readiness. For that reason, a lot of assessment tools have been developed to measure how ready a community is; however, these tools bear some differences themselves in how they approach e-readiness and for what purposes, which make it difficult to pick one tool to assess local conditions. In addition, differences between central and local governments make it more difficult to carry out these assessments. Hence, local governments in municipalities need urgently to assess their e-readiness but should, at the same time, overcome the deficiencies of e-readiness tools by adoption of e-readiness assessment tools adapted to their local realities.

Policy makers have realized the great potential of e-government to contribute to reform of administrative systems of the government and provide better services to the community. More benefits are anticipated as new technologies revolutionize the methods of reaching out to citizens and the whole community at large, including business and civic society. Technology has changed the shape of relationships between those stakeholders of a nation or any community inside nations. This has generated a necessity to address all aspects of the relationships and factors of success and failure to enforce whatever promotes successful implementation and overcome

whatever might hinder benefiting from e-government programs. "The success of e-government implementation has positive correlation with e-readiness. e-readiness is a precondition of e-government implementation" (Stevanus, p. 1) Readiness Assessment is on important phase of e-government planning methodology. (Al-Omary, 2006, p. 1) Several factors such as infrastructure and technology, the human factor, and culture should be studied and evaluated in order for the government to decide the best way of planning and implementing and then administering new systems of technology and concepts of managing country resources and relationships among all stakeholders in the community (nation). Key factors amongst e-readiness assessment are human, technological, regulatory and organizational factors. (Estevez, 2005, p 5) These issues should be addressed properly to avoid failure and, thus, preserve precious resources. So, they should try to measure how capable they are to implement these projects and then develop them, and how the public is going to benefit from the services provided by its government and attempt to maximize the benefit. For this purpose, several tools and models have been designed to measure the electronic readiness of countries, cities, or organizations to engage the new era in which the advancements in ICT as a tool of radical changes for the best of the community.

It may not be that difficult for governments at the center to measure how e-ready they are, but local governments at municipalities find it a lot more difficult to find out about this. This is mainly because in developing countries, such as Iraq, these localities have low capacities in general, and the situation is even worse when it is touches on new fields like e-government. It is rationally accepted as a fact that in most developing countries most of high qualified people in all fields are concentrated at the capital and some of the main cities. The rest of the country is left with just very few competencies. So, municipalities will be left without skills or expertise needed in

advanced and sophisticated technologies and for management of such reform. Since e-readiness consists of a consideration of a variety of issues to deeply understand and consider when carrying out assessment, difficulties will rise from the very beginning and may lead to faulty results if assessments are not conducted at all or worse if conducted with incorrect results. The literature shows that a lot of municipal governments worldwide have not adopted strategic plans for e-government program until recently. (Lighthouses, 2007, p6) This could indicate lack of experienced staff in planning. Gusen M. (2004, p10) points to very low computer skills among elected members of city councils in his study conducted in Macedonia and Moon (2002) points to low technical skills in municipalities in the United States of America.

There are several models of e-readiness assessment and tools that can be used for assessment by anyone. Some of these tools have been developed by international organizations and they are applied annually in global ranking exercises. Reports of the results are published every year to show the ranking of the countries according to criteria set by that organization. Two examples are the United Nations e-government survey and the e-readiness rankings by the Economist Intelligence Unit. Other examples include the guide developed by Harvard University's Center for International Development (CID) to assess readiness for developing countries, the Asia Pacific Economic Cooperation forum (APEC) readiness initiative guide, which was the result of contribution of private sector and the governments in the Asia Pacific region on the best way to develop electronic commerce.

Despite the availability of several tools of assessment, it is still not that easy to assess how a city or a municipality is ready to embrace e-government. Several potential reasons explain this gap. First, there is some diversity in the purposes for which these tools are used. They serve different objectives to be pursued by the

government. For example, some tools are used to assess business environment and its preparedness to embrace e-government. This is of course part of the whole scope, but misses the rest of the broader picture. Second, different models give different weights for the same measures, which causes confusion when attempting to find out how to use these measures or to decide what model to use. Third, some models comprise measures that make it irrelevant to use or unreliable for assessing e-readiness in municipalities. This might be originated from the differences of the socio-economic considerations between municipalities, as individual cases, and large cities or even the whole country. An example of that is the AT Kearney/ Foreign Policy Magazine Globalization Index (GI), which uses the foreign embassies and number of memberships in international organizations as measures in its assessment. (Bridges, 2005, p. 16)

According to the e-readiness index of the states in India, (p 3) scores or weights are given to measures depending on subjective judgments about the attributes being studied based on some statistical or econometric techniques or they are determined through preferences of stakeholders.

Additionally, e-readiness assessments usually provide a snapshot of the reality at one place and thus may have a "brief shelf life in a rapidly changing environment". (UNDESA e-gov survey, p3) So, it will always be a difficult, costly, and time consuming process to conduct large and comprehensive assessments in short periods.

Moreover, there are very few specific studies on e-readiness in municipalities. "Most of the e-readiness studies in developing countries focus on macro-level indicators". (Kamel S. 2006, p. 217) which is confirmed by (Flak, L.S., Olsen, D.H. and Wolcott, P , 2005, p1) in that "the majority of efforts to benchmark e-government have had central government as the unit of analysis".

All the previous reasons make it difficult for local governments to assess their local e-readiness in order to launch their initiatives and implement the projects of e-government taking into consideration the implications of the results of the assessment. e-government readiness assessment is a very difficult job where each government has its own objectives and priorities. (Al-Omari, 2006, p6) Therefore, "Despite the continuing move toward e-government, the development, implementation, and effectiveness of e-government at the local level are not well understood". (Moon, 2002, p3) and that is why (Flak, L.S., Olsen, D.H. and Wolcott, P , 2005, p 28) state that "e-government assessment tools will have to be tailored to the country-specific contexts".

In Iraq, a few projects are being implemented at the moment in some governorates by the local councils of these governorates. Although these projects are still in the first stages (information dissemination) and simple in their nature, they have not been preceded by serious assessment of e-readiness in these governorates. Actually most of the projects that lie under the term e-government are funded and supported by the Italian government in addition to some funding for e-government infrastructure in Baghdad and other areas by the American government.

This shows how urgent is the need for a tool of assessment of e-readiness to be used by these municipalities. This tool must be adequate for the level of people at the governmental offices of local governorates; therefore it should solve all the previously mentioned problems and difficulties and at the same time still provide the most proper information through assessment.

So, the objective here is to provide a model that comprises a set of measures that describe the various factors needed by a local government in order to decide when and how and why e-government services should be launched to pursue their objectives.

This model must be simple, clear, easy to use, and well suited for the objectives and goals of the projects at that level, based on a pragmatic need to identify e-government issues rather than theoretical considerations. This will lead, if the tool is properly applied and interpreted, to successfully taking into consideration all the factors in the right way. This is part of the requirements for the success of these projects in addition to other aspects such as usage, continuous evaluation, and monitoring to further development.

1.3 Research Questions

Main Research objective is:

Developing and testing an e-readiness assessment tool for Iraqi governorates and cities

The investigative research questions are:

- What measures should be used to best describe and assess e-readiness of the governorates by local authorities to help them decide upon launching local e-government initiatives?
- How valid and effective are these measures in providing a realistic and clear e-readiness assessment?
- How can these measures be incorporated into one model to provide a tool for assessment?

2 Literature Review

2.1 Scope of the literature reviewed

This chapter is presents a basic review of the literature about e-government in the context of this research, focusing on e-readiness assessment tools. After that
it will delve a bit deeper into e-readiness and some of the tools used to assess e-readiness and differences among these tools related to the aims and objectives they were designed to pursue. However, the reviewed literature was found to be weak with respect to analysis or applicability to local government conditions in developing countries, which is the area covered by this research. Stephen Holden states that the literature on e-government in general can be characterized as recent and scant (2002, p. 329). Therefore, it is rationally accepted and technically found that literature on e-readiness is also scant and could be even considered rare with respect to e-readiness in municipalities in developing countries.

2.2 E-government

The massive and fast advancement and growth of the internet in the past two decades has led to the adoption of electronic online provision of services by the private and public organizations. "[F]rom 1995 to 2000, the number of websites increased form 20000 to approximately 10 million, and the it is estimated that approximately two million web pages of content are added each day" (Scott, 2005, p1). This has stimulated a transformation in the philosophy and organization of government (Alfred, 2002, p. 1).

Governments in the developed and developing countries have started to include ICT in their plans of national development and administrative reform. "The strategic

and well conceived use of ICTs in government can result in a more inclusive, effective, efficient, transparent, accountable and people-centered public administration" (UNDESA-e-government survey, p1). So, this stems from the belief that e-government is a great potential to achieve a lot on the way to successful development. Some cases and experiences show this high potential of achievement when utilizing ICTs in government initiatives as the "implementation of the e-government and the common government wide solutions has delivered significant results to the taxpayer and federal employees alike with $508 million of actual saving being reported in 2007" (OMB, 2008, p 2).

"In Singapore, the government spends approximately US$100 million per year on ICTs for the civil services. Studies have found that every dollar spent on the program has generated US$ 2.7 in returns due to expanded productivity and reduced operational costs" (Saidi N., Yared H., 2003, p. 10)

This presents e-government as a solution to a lot of problems and a good option for enhancing and promoting available systems, but still by no means the perfect or the only solution or option of change. It is not a panacea (Saidi N., Yared H., 2003, p. 1) that could cure all defects and problems of the interacting community. It should be seen in its processes and means as "complementary to the traditional ways of interaction with the government and within its offices and should not be seen as the alternative as some technology enthusiasts see" (ESCWA, 2003, p 2)

However, e-government programs may fail to achieve what they were intended or planned to achieve. Some assert that it has not revolutionized the way governments function and the benefits anticipated were not realized and e-government has not lived up to its promise. (Flak, L.S., Olsen, D.H. and Wolcott, P., 2005, p. 3). The view of failure to revolutionize the government performance appears to be somewhat

supported by the high rate of e-government projects failure which is estimated somewhere between 60-80 %. This has made the benefits of e-government theoretical and in reality they are elusive (UNDESA e-government survey, p2).

Despite the high failure rate, governments still opt for implementing their own systems of online services with great hopes to realize and harvest the fruitful results held out by such systems. However, this does not seem to be the only motive or driving force to implement such systems. In some cases, governments in developing countries may choose to initiate e-government programs just to respond to external political pressures.

"A complementary explanation of the current rush to promoting and building e-government plans in less developed countries focuses on the emerging, intimate link between aid and security" (Ciborra, 2003, p1)

International agencies and donors are linking aid to development of e-government programs in countries receiving aid (World Bank, 2001). This is intended to be part of the reform agenda in these countries. However, although this seems to hold a potential for failure as the administration will only prioritize aid receiving no matter what the systems, resulted from conditional aid, end up in. an example for that, the project of e-government in Nasiriah was pushed by the Italians and they funded the provision of all equipment and provided training outside Iraq. After the Italians stopped funding the project, it was left with no local support and it is not functioning at the moment. There is no clear evidence in the literature supporting this argument and it is worth of study. The field of e-government is still new and the "literature on e-government is scant" as Stephen Holden (2002) asserts.

2.2.1 E-government in Municipalities

Municipal governments are the closest level of governance to citizens in decentralized systems. 'Local Government is often portrayed as representing the highest form of decentralization" (Miller K., 2002, p 4)

This depends on the level of autonomy these governments have and the authorities they can practice in their localities. Yet, these local authorities will supposedly be capable of effectively responding to local issues and interests of the local citizens. "Local governments facilitate the tailoring of solutions for local problems to local conditions. They will be able to tailor programs or solutions to local problems to reflect the special circumstances or preferences of their respective localities." (Miller K., 2002, p. 9)

"In Norway, the municipality is the government level that has the most direct contact with the citizen and businesses and is responsible for providing an array of basic services" (Flak, L.S., Olsen, D.H. and Wolcott, P , 2005, p3). Although this applies mostly to developed countries, it is still valid in developing countries where local authorities have such power or autonomy.

Municipal governments in developing countries have been launching local e-government programs since the very beginning of the wide adoption of ICTs by higher levels of governments. It started with the basic websites. "Website adoption by local governments had dramatically increased from 8.7 % in 1995 to 83.6 in 2000" (Holden S,, 2002, P. 55).

Local governments in municipalities have their own motives to initiate e-government programs and this might differ across different municipalities according to socioeconomic differences. They may even have different sets of objectives from a state or federal government (Koh, 2002, p. 1).

"In a period of devolution and decentralization, municipalities are expected to expand the scope and quality of services under very tight fiscal constraints. One way to accomplish these sometimes conflicting objectives is to rely more on web based services. in fact in order to cut red tape and provide one stop, round the clock services, cities increasingly are facing what has been called the e-government imperative" (Scott, 2005, p1).

However, as Moon (2002, p. 3 and 5) states, "despite the continuing move toward e-government, the development, implementation, and effectiveness of e-government at the local level are not well understood" and "only a small portion of municipal governments makes a proactive and strategic move toward e-government. Maybe that is why these governments still provide unsophisticated websites. Many municipal government websites are at either stage 1 or stage 2 of the Layne and Lee model and a relatively small portion has moved to stage 2. Fewer than that have entered stage 3 (Moon, 2002 , p6). Scott (2005) confirms this as he states that "two extensive surveys of local governments found that a very low percentage of cities in the United States and regional authorities in Europe offer electronic transactions". Another study states that in 1997 "the primary purposes of local governments' websites were information dissemination (85%) and citizen education (72%)" (Holden S., 2003, p. 7)

A notable issue is that, until recently, local governments in municipalities have not considered a strategy for e-government which, according to a study by Lighthouses (e-readiness survey for municipalities 2007, p 6), has proved the existence of a deeper relationship with business performance indicators in these municipalities. That relationship did not exist in the survey of 2005 because municipal governments reported that they had no ICT strategy and later started to develop their

own strategies as they believe in its role as a success factor for ICT business development, beside other factors, of course.

A lot of the Arab countries have realized how useful e-government is and launched some programs, though mostly still in the first stage. Some had 100 percent of their national ministries online at the beginning of 2001 and others are working on it, but this is not the situation in regional and local authorities where presence on the web is still quite low and these localities are systematically under-equipped and under-represented in the centralized government structures in many of the MENA countries. (Saidi N., Yared H., 2003, p. 3 and 10)

2.2.2 Barriers to e-government in Municipalities

The way to e-government is not paved and not straight. The case is more difficult in developing countries and for municipalities in particular. Huge and numerous obstacles face programs aiming at fundamental change and reform in the administration and structure of relationships in communities, which is what e-government expected to offer.

Although these barriers and obstacles all impede e-government to some degree, perhaps "lack of sufficient financial resources" (Moon, 2002, p6) is factor number one that hinders almost all efforts to remove and overcome other obstacles. It is a major challenge for MENA governments to generate financial resources for human capacity building. In addition, e-government programs require substantial investments and innovation as direct costs of these programs. (Saidi N., Yared H., 2003, p. 5 and 6). In Iraq, although e-government programs are still new and have not gained high capacity as yet, insufficient government funding has contributed to lack of progress in many ICT related areas. (ESCWA Iraq report, 2007, p 3)

Another crucial factor is lack of human capital and expertise in municipalities. This has always influenced the ability of municipalities to plan and then implement and deploy reforms such as e-government programs and then run the systems under these programs administratively and technically. (Moon, 2002, p. 6; Holden S., 2002, p. 12)

Gusev's. study in Macedonia (2004, p 6 and 10) shows that the quality of IT skills of elected officials and members of municipality councils is very low, although most of them were of good educational background. He asserts that "Persons that have a decision making role must learn and foresee the future of these technologies".

Another important barrier is limited support and misconception by citizens represented by low participation (Holden S., 2002, p 13). It is also stated as lack of motivation for those who doesn't use online services which hurdles taking training to improve their skills or getting informed about existing online services and "the lack of understanding about usefulness of provided services for private life arrangements" (Toots, 2007, p. 11). An additional reason for low usage is the digital divide and exclusion of huge sectors of communities for several reasons (ePractice workshop Municipal e-government, 2008, p 8). In addition, there are problems of trust and security for citizens and businesses (Saidi N., Yared H., 2003, p. 8), difficulties in back-office organization and procedures such as old prevailing business processes and mentalities of user employees (ePractice workshop Municipal e-government, 2008, p 6). Most organizations in developing countries regularly face "organizational inertia" that deters their innovativeness. (Kamel S., 2006, p. 229)

All of these drive governments to be realistic and not to expect big and quick success, and at the same time expect failure and work to avoid it. "Transforming an organization into a fully integrated, automated digital establishment is a much more difficult task than many believed in early days of the internet." (Koh, 2002, p 2)

2.3 E-readiness

From the importance of e-government arose the importance of e-readiness. This simply implies to measure how ready is a community to adopt and benefit from up-to-date technologies and new systems applied under e-government programs to achieve the optimum expected outcome of these programs. it is a combination of several indicators under some categories defining aspects of the community. These indicators are measured individually and the levels representing each indicator provide information about what indicators needing improvement or development and to what extent these levels should be raised to improve the opportunities of successful e-government projects. So, e-readiness is measured through measuring individual aspects and accordingly it can be changed by changing these individual aspects.

Several tools have been designed to assess readiness of a community to adopt e-government. These tools, however, differ in some aspects of how to measure and what to measure in a way that reflects different views and perspectives of looking at e-government, what it requires, and how it affects the community.

2.3.1 What is e-readiness about?

There is no one exact definition to be used wherever the term e-readiness appears; there have been more than one attempt to define what is meant by e-readiness.

The definition provided by the United Nations University is:

"e-readiness measures how well a society is positioned to utilize the opportunities provided by information and communication technology (ICT). ICT infrastructure, human capital, regulations, policies and internet penetration are all crucial components of eReadiness." (Adegboyega Ojo, Tomasz Janowski and Elsa Estevez, 2007, p. 1)

The APEC e-commerce Readiness Assessment Guide provides another definition from a somewhat different persective:

"Readiness is the degree to which an economy or community is prepared to participate in the digital economy" (APEC, 2000, p. 2)

A third definition is offered by Rahman: "e-readiness refers to a country's ability to take advantage of the Internet as an engine of economic growth and human development." (Rahman, 2007, p1)

It can also be defined, according to the Harvard readiness guide (www.readinessguide.org), as follows:

"Readiness is the degree to which a community is prepared to participate in the Networked World. It is gauged by assessing a community's relative advancement in the areas that are most critical for ICT adoption and the most important applications of ICTs."

One more definition can be offered to illustrate the different views on what constitutes e-readiness:

"e-readiness is the "state of play" of a country's information and communication technology (ICT) infrastructure and the ability of its consumer, businesses and governments to use ICT to their benefit." (Economist Intelligence Unit, 2006, P. 1)

All the above mentioned definitions of e-readiness define one composite group as the primary stakeholder that uses the same system. Stakeholders in this regard are Government, citizens, business (private sector), and non-governmental organizations and all entities part of the community. As for the system these entities are sharing, it

includes for example all services, infrastructure, policies, standards, and regulations and laws.

However, there are some slight differences in addressing what exact purposes these systems serve and what goals to pursue. For example, some of these definitions address economic growth and human development as the goal to be pursued. Other definitions focus on the internet economy, using "participation in the Digital Economy" to imply all activities and transactions that shape the new form of economic reality over the internet. Other views of definitions target society by emphasizing participation of the community in the networked world and this participation is expected to generate and add value to the society through this participation. "e-government should provide services that add more value than traditional ones" (Kunstelj, M., Jukic, T., and Vintar M., 2009, P. 118)

The above definitions provide a sample of the definitions used for e-readiness, but cannot be considered exhaustive. They provide some idea about the diversity of e-readiness definitions and their emphasis. Moreover, there are other definitions that address specific programs such as e-learning, e-Health and hence they cover different aspects of using technology. This is an evolving field, and new definitions that have new orientations may emerge in the future. It is not possible at this time to determine a single or exact global definition for e-readiness as "No standard definition of e-readiness is perfect". (Bridges, 2005, p. 7) However, we can rely on a comprehensive understanding of the idea behind the term. This implies measuring how ready we are to embrace ICT widely in different aspects and how to enhance this preparedness depending on the disaggregated measured levels of each aspect.

2.3.2 Importance of e-readiness Assessment

E-readiness, as applied to introduction of e-government in Iraq, falls within the broader field of project/program feasibility analysis. Before launching any project, there must be some information available for those responsible for that project indicating whether they have the needed capabilities and resources necessary to start the project and then sustain the effort successfully. In addition, project implementers need information about different stakeholders and elements of the environment in which the project is to be launched and then run. This will help vastly in proper planning and implementation of that project.

E-government is not different from other projects except to the extent that it may have a larger pool of stakeholders and elements of the environment in which it operates, as it often targets services directed to the entire population or to a large segment of it. Another difference is that this environment and its elements are rapidly and fundamentally changing. So, assessment in this case is of serious and crucial importance for the project to be planned, implemented and then sustained to bring its anticipated outcomes.

"It is frequently claimed that the availability of an effective assessment framework is a necessary condition for advancing e-government's proper implementation". (Azab N., Kamel S., Dafoulas G., 2009, p. 1)

These assessments and their results should be the starting point on which decision makers build to map out an action plan based on sound "e-strategy" for improving e-readiness. (World Bank group, 2001, p.7)

Sound e-readiness assessment is not only useful in implementing e-government in the right way, but also keeping it on track and pushing it further ahead. "An effective e-government readiness assessment framework is a necessary condition for advancing

e-government". (Adegboyega Ojo, Tomasz Janowski and Elsa Estevez, 2007, p.1) These assessments are used as guidance for development efforts through benchmarks for comparison and gauging progress. (Ghavamifar, A., Beig, L., Montazar, G.A., 2008, p. 3)

Although e-readiness improvement is crucial for almost all countries, developing countries' decision makers find themselves motivated to improve e-readiness and promote the adoption of ICT in their countries for three reasons: first, benefits of ICT are seen as part of the solution to their problem; second, these countries may be left further behind if they fail to address the digital divides between and within countries; and third, ICT is integrated into development and aid programs by international leaders and donors. (World Bank group, 2001, P. 2)

For this reason these countries need urgently to know where they are and how to reach where they want to be, according to their desires as drawn by their motivations. Hence, they should assess their e-readiness in a way that helps them to achieve their goals and satisfy others at the same time.

So, it can be seen that e-readiness assessment is one important milestone in the road to building and establishing e-government system and it also helps in guiding it on the right course by continuously assessing the changing variables of the environment. This assessment is achieved through some e-readiness assessment tools designed for this purpose.

2.3.3 E-readiness Assessment Tools

In order to assess how ready a community is to embrace e-government, several e-readiness assessment tools have been developed by international organizations and other institutions. These tools measure specific aspects of the community and several features of services and technologies that should be available to facilitate the transfer into the digital era of e-government. These tools are meant to provide the best possible indication about measurable variables affecting e-government so as to help decision makers in deciding what to focus on and to what extent improvements should be made to the different aspects measured to enhance the overall e-readiness of the country (or part of it or just an organization).

2.3.4 What is measured by the Tools?

These tools are outlined by general indicators as constructs formed and defined by specific indicators for each. These indicators describe the availability of certain features and the levels of availability of some other features required to provide results about how ready an organization or a community is to apply and use e-government technology. The World Bank lists some of these features in an e-Ready society, for example. "To put ICT to effective use, a country must be e-ready in terms of infrastructure, the accessibility of ICT to the population at large and the effect of the legal and regulatory framework on ICT use." (World Bank, 2001, p. 1) This list can be expanded by incorporating other aspects included by various authors on e-government. "An e-Ready society is one that has the necessary physical infrastructure (high bandwidth, reliability, and affordable prices), has integrated current ICTs throughout businesses (e-commerce, local ICT sector), communities (local content, organizations online, ICTs used in everyday life, ICTs taught in schools), and the government (e-government) (Nonchev A, 2002, p. 2)

Table 1 lists the main variables identified through a review of what various assessments tools measure, highlighting where the categorizations differ in the indicators included or how they are measured.

Table 1 some of the most important indicators and their categorizations.

	Categorization	Indicators
1	Infrastructure, technology, quality of ICT services, connectivity, internet development	Speed, availability, access, pricing, bandwidth, electronic signature, financial infrastructure, teledensity, telecommunication and access, hosts and secure servers, international telephone traffic and cross border transfers, cellular subscribers, information security, ISDN
2	Use of ICT, Use of internet, prevalence and integration of ICT	Use in homes, schools, workplace, economy, government, everyday life, number of internet users, cellulare users
3	Legal and regulatory framework, access to network services, promotion and facilitation, position for the digital economy	ICT policy, industry standards, credit card regulation, industry led standards, government regulations, intellectual property, privacy, information security, individual property rights, taxes and tariffs
4	Skills, human resources, people	ICT education, training, development programs, available skilled workforce, mass education, employment and skills,
5	Others	Diversity of organizations, relevant content online, market competition, FDI, consumer trust, liberalizing trade in ICT goods and services and I/S, political and financial stability, democracy, ethnic homogeneity, population density, quantity of exports, global urbanization, type of government, religion, universities, NGOs, research groups, social inclusion, IT spending by Industry, international travel and tourism, GDP

Different e-readiness assessment tools use different terms to describe some features. For example, speed and bandwidth are used by different tools to denote the same concept of the speed of the connection, also itself used as a measure by another tool. for further detailed list of e-readiness assessment tools refer to appendix A.

It is worth noting the overlap between the categorizations. Some indicators are found under two or more of these categories. This is because these indicators have many implications and underlie various conditions that are different in the mechanisms through which they affect outcomes. For instance, information security can be seen under infrastructure (category 1) and legal and regulatory framework (category 3). This reflects the understanding of information security as part of the systems and technologies facilitating security procedures to protect what is desired to be protected according to the classification of importance of information. At the same time, information security has another application within the regulatory category. In this use, it represents all security regulations, laws, and processes that identify what to protect and to what extent and purpose security should be applied in different systems and for different levels of authority. This example shows that e-readiness is not merely one dimensional measurement of some aspects and features. "E-readiness is a complex and multi-faceted phenomenon, and an accessible and manageable set of indicators is useful for at least partial explanation". (Bridges, 2005, p. 7)

In fact it could go even beyond the listed features to be measured to include other dimensions of life, such as cultural effects and global interrelationships. Kovacic asserts that, among the group of national cultural indicators he studied, there are at least two significant variables that could be used to explain differences in level of e-government readiness. (2005, p. 14) these two dimensions are Individualism and

Power Distance. The individualism dimension describes the relationship between individuals and the group in a society. Individualistic culture considers the performance of the individual rather than the group as the main source of identity in collectivism. The Power Distance factor describes the unequal distribution of power in organizations and institutions. According to the author, countries with low power distance and high individualism have positive attitude towards implementing and using ICTs. (Kovacic, 2005, p. 5)

A framework for assessing e-readiness was proposed in the methodology of this research. This framework consists of several indicators to measure certain aspects expected to influence e-readiness in Iraqi municipalities.

2.3.5 Classification of e-readiness assessment tools

E-readiness tools have been designed to serve different purposes in different ways. These tools can be defined in terms of how they present the assessed data and describe the results to be used by countries or communities within countries. They can also be defined and classified according to their perspective, whether economic or societal. "e-readiness assessments are, in fact, very diverse in their goals, strategies and results" (Bridges, 2005, p. 7)

- **e-economy vs. e-society**

  The tools use widely varying definitions for e-readiness and different methods of measurement and the assessments vary considerably in their goals and results. (World Bank Group, 2001, p. 1) so it is incumbent on the user to select the best tool depending on the goals to be achieved and the aspects to be considered. Some of these tools focus on societal aspects and other tools focus on economic aspects. (Azab N., Kamel S., Dafoulas G., 2009, p. 2).

In the e-society perspective, the tools assess the readiness of the society to benefit from ICT by measuring the same categories mentioned in Table 1 but the focus is on those related to the societal aspects. Examples of this type of tools: CID's e-readiness Assessment Guide and CSPP's e-readiness Assessment Guide. These tools measure aspects such as social inclusion, individual property rights, and population density

In the e-economy perspective, the tools assess the readiness of the economy and in specific business potential to benefit from integrating ICT in its environment. Examples are: WITSA e-commerce survey, APEC's e-commerce assessment, Mosaic's Global diffusion of the internet framework. Examples of economic aspects measured: taxes and tariffs, quantity of exports, and IT spending by industry.

However, both society and economy should be assessed and combined to look comprehensively at e-readiness (World Bank Group, 2001, p. 5) because "if socio-economic issues are not studied and addressed, then practical use of ICT will remain the province of a privileged few". (Bridges, 2005, p. 7).

- **Indices vs. Analyses**

The tools may also be classified as either analytical or indexing. Analytical tools were designed to help decision makers to focus on some critical issues in strategic planning and system implementation. (Koh, C., and Prybutok, V.R., 2002, p. 6). An example of this is the APEC e-readiness assessment for e-commerce. This tool's results can be used to develop the most suitable strategies to overcome the impediments to deployment of e-commerce. The aim of this assessment tool is not comparison between economies, but to be of use to analysis within them. (APEC, 2000, p. 5) It is preferable and

recommended by some studies that the results of the assessment surveys should be presented in an analytical report that contains an overview of strengths, weaknesses, opportunities and threats, as well as recommendations on policy actions and possible next steps. (UNDESA, 2003, p. 5)

Other assessments provide rankings of e-government e-readiness facts according to the criteria of each one of these assessments or surveys.

The UN global e-government readiness index presents an assessment of the countries according to their state of e- government readiness and the extent of e-participation worldwide and hence ranks the 191 member states of the UN according to a quantitative composite index of e- readiness based on website assessment, telecommunication infrastructure and human resource endowment. (UNDESA, 2005, p. 4) The survey offers insights into different strategies and common themes in e-government development among regions and across them. (UNDESA, 2005, p. 29)

Another example of indices of e-readiness is the ranking of the Economist Intelligence Unit which "evaluates the technological, economic, political and social assets of 68 countries and their cumulative impact on their respective information economies". Through this ranking, governments can gauge the success of technology initiatives against those of other countries. (Economist Intelligence Unit, 2006, p. 3)

Companies willing to invest in online operations can use this ranking to get an overview of the best locations to put their money and expand their investments.

However, these assessments can provide different results, to varying degrees, because of different interpretations and different sets of indicators to measure. For

instance, when comparing the top twenty-five countries in the list of e-government readiness index of the United Nations and that in the Economist Intelligence Unit we find 22 different positions for countries. The average of shift in countries' positions is 3-4 places up or down. Some countries' ranks showed big differences between the two assessments, however. For example, South Korea ranks 5 in the UN index (2005), but ranks 18 in the Economist ranking (2006), while Switzerland ranks 17 in the UN index (2005), but 4 in the Economist (2006). This big difference in ranking of both countries comes from the difference in the assessment criteria used by the two indices.

2.3.6 Limitations and obscurities in e-readiness Assessment Tools

Despite the crucial importance of e-readiness assessment tools there are some limitations to consider. First, as noted earlier, most e-readiness tools are meant to measure factors at the higher level of the whole nation and do not consider the different conditions in lower levels such as municipalities. "Most of the e-readiness studies in developing countries focus on macro-level indicators" (Kamel S., 2006, p. 217). An example of this is the UNDESA e-government assessment survey is addressed to national level, and specifically central unit of the government responsible for e-government development (UNDESA e-gov survey, P4).

Second, these tools have a brief shelf life in a rapidly changing environment (UNDESA e-gov survey, P3) which makes it necessary to conduct these assessments regularly to catch up with the changes.

Third, different weights are given to the same indicators in different assessment tools, which makes it difficult to decide which to rely on. This problem rises from the way these weights are assigned. "Researchers assign scores depending on subjective judgments about the attributes that are being studied or in other models weight given

to the indicators is determined through preferences of the stakeholders which are identified as Government, business, citizens" (e-readiness index of the states in India, p. 3)

Al-Omari (2006, p. 6) states that "e-government readiness assessment is a very difficult job where each government has its own objectives and priorities". This might lead governments to consider adopting a tool with some adaptation according to the objectives and priorities in the local reality.

A list of some e-readiness assessment tools is presented in Appenix C with the indicators used by each tool and their categorization in the tool.

2.4 What makes a good assessment tool?

Instruments designed by studies should comply with rules that prove their properness and suitability to conduct the desired measurements. These tools of measurement should be validated to bring values and confidence to researches results. Straub and Carlson state that "confirmatory research calls for rigorous instrument validation as well as quantitative analysis to establish greater confidence in its findings". He further states that "Attention to instrumentation issues also brings greater clarity to the formulation and interpretation of research question" (p.148)

In this regard, "measurement tools can be judged on a variety of merits that include practical as well as technical issues" (Indiana university, P.1)

Practical issues to consider are: (Indiana University, P1)

- Cost
- Availability
- Training required
- Ease of Administration, scoring, analysis
- Time and effort required for respondent to complete measure

There are two technical issues to consider when evaluating measurement tools. These are:

- **Reliability**

  Straub and Carlson (1989, p. 160) state that "reliability is a statement about the stability of individual measures across replications from the same source of information". Reliability implies the replicability of the results when using the instrument more than once. It simply means the success of the tool to measure the same variables in the same way and give consistent results. "It has to do with the quality of measurement and in its everyday sense; it is the consistency or repeatability of the measures" (knowledge base website)

  Reliability is estimated in one of four ways: (http://faculty.chass.ncsu.edu/garson/PA765/reliab.htm)

  1. Internal consistency
  2. Split-half reliability
  3. Test-retest reliability
  4. Inter-rater reliability

- **Validity**

  According to Garson (http://faculty.chass.ncsu.edu/garson/PA765/validity.htm) "A study is valid if its measures actually what they claim to, and if there are no logical errors in drawing conclusions from the data". The validity of a measure is how good it is in measuring what it meant to measure in the way it measures it. Three main classes of validity are:

  a) Construct validity: "It has to do with the logic of items which comprise measures of social concepts. A good construct has a theoretical basis which

is translated through clear operational definitions involving measurable indicators." (Garson)

b) Content validity: "The instrument should include items that comprise the relevant content domain" (Indiana university, p2)

c) Criterion-related validity: This implies that the instrument should behave as it was designed and expected to in terms of measuring what it does measure.

Accordingly, a tool must comply with the following conditions, in order to consider as a good one. These conditions are:

1. The cost should be considerably low
2. Measured information should be highly available
3. It should be simple and easy to use and train on
4. It should provide clear information, hence; facilitate administration and ease and clarity of analysis.
5. It should not take a long time to conduct
6. It should be reliable in providing the same results when used again and again in the same environment.
7. It should be valid to provide measurement to what it was supposed to measure.

While data collection restrictions in Iraq made it impractical to apply the above tests to validate the local government e-readiness tool in a rigorous manner, these criteria were applied to assess the preliminary tool in a judgmental manner and to develop the improved assessment tool presented at the end of this study.

2.5 How the topic fits with the current literature

This research falls within the scope of e-readiness assessment by providing a tool for the same purpose but with the focus on facilitating simple usage, clear and direct insight to local authorities in municipalities for short term e-readiness projects and considering only the first two stages of e-government evolution (information dissemination and interaction). The measures used in the tool to be developed are used by other tools of assessment. However, the set of measures used in this research are descriptive to conditions of direct and short-term impact on e-government projects in the environments where these projects are implemented and within the current timeframe where Iraq is still transitioning to a new era. The current environment in the Iraqi municipalities assumes the provision of the services with the least available resources from the government, lack of sufficient infrastructure, weak public sector competencies, weak private sector activities, and very low expectation of usage due to high rates of illiteracy in general and computer illiteracy in specific. These conditions are the most crucial in the case of Iraqi municipalities and hence there is no need to consider other conditions, illustrated previously in this chapter and used in some other assessment tools, as this would be unrealistic and might cause confusion in the assessment. The well-known assessment tools consider the long-term perspective of e-readiness. For instance, the United Nations assessment model includes the enrollment rates in schools as one measure. This is valid and crucially important for a nationwide assessment for policy purposes, but assessment of currently existing factors that affect the projects launched by the municipalities is of higher importance as it takes into consideration the current conditions in these municipalities and the first two phases in developing e-government.

In fact the tool to be developed here could be seen as the entry point for later broad and comprehensive assessments. So, this tool might serve as a base for other tools to be used as the program progresses or when assessing the broader capacity of a community to realize the potentials for economic and social benefits from the larger initiative of e-government.

3 Methodology

3. 1 Basic Aim of the Research:

E-government development is generally divided into three main stages: information dissemination, interaction, and transaction. Only the first two stages in the evolution of e-government have been considered in this research. The third stage, transaction, is not within the scope of this research because preliminary evidence indicates most Iraqi communities are not yet able to implement e-government transactions. As these require different and higher-order measures to assess readiness, development of a tool in this area could be a potential future study.

The study presents several measures to be used as indicators of e-readiness for these two early stages of online services. In order to prove the validity of this assessment tool, these measures will be tested empirically to find out how relevant and effective they are in assessing e-readiness. These measures, according to this study, are the minimum objective conditions to be available so that provision of some e-government services is achievable and feasible.

3.2 E-readiness for Iraqi Municipalities Framework

3.2.1 E-readiness

In this research, e-readiness is presented as the level of availability of factors of certain aspects describing conditions of provision of basic physical infrastructure, community characteristics, work environment characteristics, and set of rules in the form of policies and laws in the community and work environment. The availability of

these factors in certain levels helps measure how ready this community is to employ and benefit from ICT in e-government programs.

3.2.2 Why this Assessment tool?

This tool is designed to help management staff in the Iraqi municipalities measure how ready their communities are to employ ICT by defining levels of readiness for each of the factors identified proper and crucial by this research. It is supposed to help these people find the weaknesses they need to focus on, and then enhance, to reach better levels of e-readiness and then increase the chance of successful launching of e-government services. In some points, it helps to decide whether it is the time to launch a project or not depending on some of these aspects measured such as sufficient funding and willingness of higher management.

It is meant for this tool to be simple and easy to use as it incorporates only few factors from the very long list of factors usually used by other sophisticated tools. This is mainly because the conditions in Iraqi municipalities are different in the availability of infrastructure and other aspects than the levels expected by sophisticated tools and because of weak capacity of these municipalities.

3.2.3 E-readiness framework in Iraqi municipalities

In order to form a basis of measurement of e-readiness in Iraqi municipalities, a set of indicators are to be chosen to reflect how e-ready these municipalities are. The selection of the indicators is based on what are the basic and proper prerequisites for the first two phases of e-government (Layne and Lee Model), information dissemination and interactions, in Iraqi municipalities considering several conditions in these municipalities such as weak capacity, weak infrastructure, and low local financial resources in most governorates.

The indicators, used in this framework, come from the set of indictors that have been used to assess e-readiness in different e-readiness assessment tools developed by several organizations worldwide.

The framework in this research comprises the following categories, with a set of indicators under each one, to address phases 1 and 2 of online services evolution.

A. Infrastructure
    1. Speed or Bandwidth (accepted speed of the internet)
    2. Availability or access (availability of access to the internet)
    3. Reliability (quality of access to the internet, period and repetition of internet disconnection)
    4. Pricing (cost)
    5. Mobile penetration

B. People (citizens)
    1. Education
    2. Usage (hours of use)
    3. Trust in government
    4. Trust in technology
    5. Skills relevant to use (browsing, email, general computer skills)
    6. Training programs

C. People (government)
    1. Skills for developing, maintaining websites and running systems.
    2. Availability (access of government employees to the internet)
    3. Information computerization (computerization of data or availability of already computerized databases that can be transferred to the web)
    4. Willingness of leaders

5. Funding for ICT and e-government projects

D. Legal framework and policies

1. Legislation for security, privacy and within-government service documents.
2. Policies supporting ICT literacy, education, and training and supporting ICT dissemination.

Figure 1 provides insight on these indicators and how are they related to each other and then result in affecting e-readiness. However, due time constraints and limited collected data, deep analysis of the relational model is left for future studies.

This research tests how valid these indicators are when used in assessment by finding out how crucial they are in setting the environment ready to embrace e-government in municipalities. Some of these indicators are expected to be of high importance whereas other indicators aren't expected to be as important. However, this must be tested and verified through out the process of the research.

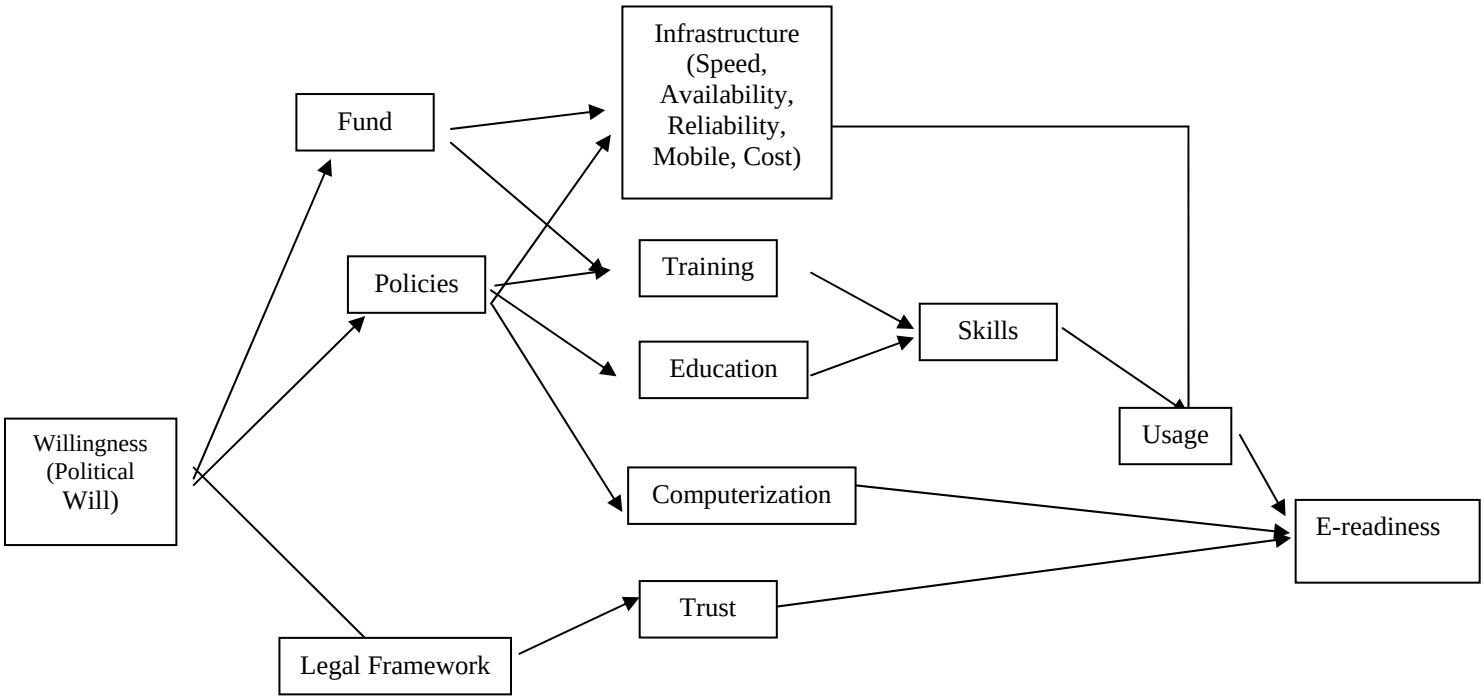


Figure 1. A Preliminary relational model for e-readiness variables.

3.3 Validity of measures

The measures in this research have been selected from a long list of measures used by e-readiness assessment tools designed and used by international organizations (mentioned in the literature review) for this purpose. The methodology of this research explores how available the information of these measures is by collecting data from potential sources of such information. Information collected has then been processed and analyzed to test how successful it is in measuring the aspects they are meant to measure by providing weight or value to these aspects according to the responses of participants.

The highest response in one direction, positive or negative, presents the highest influence of this factor. Hence, the measure is valid and verified as successful measure of e-readiness. For example, it is expected that the speed of the connection affects people usage of internet. When people show clear orientation of affection by speed variation, high or low, then they do care about this factor and the factor is of influence on the general readiness. Conversely, if responses weren't clear to identify orientation of people need or preference regarding a certain factor, and no good explanation for that is available, then this factor is not expected to be of real value in deciding e-readiness in this aspect.

Furthermore, the sample taken from two cities is considered to provide confirmation for the validity of these measures when comparison is held between the two sets of data and both sets gave consistent results.

In addition, the collected data will be further analyzed using factor analysis to extract the factors most appropriate for use in e-readiness assessment tools. Both sets of data, from the two cities and three government offices, Post and Communication, Governorate Council, and Roads and Bridges directorate, will be compared against

each other to further confirm the set of measures should be used in the proposed assessment tool.

Finally, proposed factors and the whole set of factors is going to be discussed with specialists to verify these factors as valid measures.

3.4 The Sample

3.4.1 Population

This research targets Iraqi governorates other than Baghdad, the capital. So, the presumed population of the research is the citizens and government offices in these governorates. Each of these governorates includes a large city as the center of the governorate and some other cities with smaller population.

Part of the information to be collected comes from citizens of these cities who are expected to be the beneficiaries from e-government services. The research has targeted people in the main city of each governorate in addition to another small city in the same governorate. This approach takes into consideration the different availability of facilities providing internet access in different areas and the fact that government offices in smaller cities have fewer employees. Rural areas and smaller cities have been excluded for the reason of unavailability of access to the internet and mainly for the absence of direct government services in these areas. People of rural areas have to travel to neighboring cities, though not necessarily to the center of the governorate, to conduct any processes such as issuing documents.

The study has been conducted in two governorates in the south in part for security reasons. These cities have no major security problems and people there have only very minor objections to activities such as researches conducted by American universities. However, this is not expected to affect generalization of the results because the factors under research are believed to be essentially the same across all of the Iraqi

governorates and the capacities of Governorates' Councils (local governments) are believed to be generally similar.

Information collected from the government was taken from three offices belonging to the main city of the governorate because most e-government initiatives are launched, or expected to be launched, in these main cities and not smaller cities, given that these programs need funds and capacities that are almost completely unavailable in smaller municipalities. Another reason is that the number of workers at smaller cities is sometimes too small to make it possible to collect information effectively as the number doesn't fit the sample needed and this implies the need to travel to a lot of small cities which is costly and time consuming process. Besides, these offices work under the main offices at the central cities and therefore they work under the same systems and do not have their own independent systems. The three government agencies, under study, were the Post and Communication directorate, Governorate Council of Nasiriah, and Roads and Bridges directorate, as some help was provided by contacts in Nasiriah to reach these agencies. It was difficult to get contacts in Kerbala to reach the same government agencies in that governorate or even other ones.

Officials were interviewed at different levels of the government. Some officials were interviewed in Baghdad and others in the governorate where the research is going to be conducted. Interviewees in Baghdad provided general insights on e-readiness and answers to some points of consideration in the framework of the assessment tool proposed by this study, as they have higher experience in this field as they are already involved in some projects of e-government. However, interviewing officials at the governorate level provided more specific information about the conditions of their environment, government offices, and their city as they are more aware of their local issues.

3.4.2 Method of sample selection:

In the research, information was collected through in depth interviews with officials and through questionnaires distributed to citizens and government employees.

Some interviews were planned in Baghdad with officials in the central Ministry of Science and Technology (MOST), and the Ministry of Communication (MOC) because these people are responsible for the large-scale projects of e-government in Iraq and all issues related to this field. These officials were chosen as a non-probability sample because the researcher targeted those who have the experience and knowledge to provide good information.

Other interviews were planned in the governorates with officials in government agencies. Non-probability sampling was also used here because, as in the first case, the researcher was looking for people acquainted with the subject and involved in it, so as to get factual responses and opinions.

3.4.3 Size of the Sample:

The size of the sample was as follows:

- Two officials were interviewed at MOST to provide general insights about e-readiness issues, how the center is planning to help the governorates to assess their e-readiness, what tools are being used, and how this is going to affect the executives at the governorates in using these tools, taking into consideration the differences between the central (Baghdad) and the rest of the country. The interviewees also helped to validate and give weight to the measures of the proposed model of assessment according to their experience. However, no interviews were managed with the Ministry of Communication as it was difficult to arrange for interviews as officials were always busy. The same happened with the head of Iraqi Commission for Computers.

- At Nasiriah governorate, there were interviews at offices where questionnaires were distributed. Four officials were interviewed to investigate their views on the use of e-government, concerns with its application, expected benefits, and related issues.
- Two sets of questionnaires were distributed in each one of the governorates in the research. One questionnaire was distributed in internet cafes available at these cities. It targeted people who are familiar with and use the internet. As few Iraqis have internet in their homes or places of work, users of internet cafes are believed to be more representative of the overall internet-using population than may be the case in other countries. Conducting interviews in these facilities also makes it feasible to identify and survey a comparatively large number of users with limited resources. The target for completed questionnaires from this group was two hundred; in fact, only 74 completed questionnaires were collected in Nasiriah of which 70 were usable. In Kerbala, the target was the same number, two hundred, but only 47 questionnaires were collected and used.

  In addition, another questionnaire was distributed in government offices in Nasiriah to assess government official e-readiness. The target was one hundred, but only 75 completed questionnaires were collected from three agencies, mentioned earlier. About 25 questionnaires were collected from each of these three agencies.

3.5 Data Collection Plan

Date to be collected and method of conducting the interviews:

The interviews collected information as follows:

- Interviews with officials of MOST and MOC
    - Discussing and specifying as precisely as possible the opinions of these officials on the proposed model for implementing e-government in Iraq as a whole and the individual measures.
    - The potential for information availability in governorates and how this affects e-readiness assessment and its implications for e-government success.
    - The assessment tools used, if any, and the adequacy of the available tools to the objectives of e-government projects in general in the country, and specifically on those launched by the local governments in the governorates, as objectives may differ at the local level.
    - Government funding allocated to e-government projects in general and for supporting initiatives and projects of e-government in governorates.
- **Interviews with officials at local governments in governorates.**
    - Information about policies and regulations adopted based on national policies, and local policies and regulations.
    - The availability of funds to initiate e-government projects and funds allocated to promote public use e-government services**.**
    - The availability of each element of information being considered for inclusion in the assessment tool.
    - The extent to which information is available and ready to be put online.

- The extent to which the proposed tool is aligned with the objectives of the e-government projects launched in these governorates.

These interviews were semi-structured and conducted face-to-face in order to get the maximum active interaction; in some cases, additional issues were raised not mentioned in the points above in order to get insightful comments from the interviewee by leading the discussion to the focus of the research.

The Questionnaires explored information relevant to the measures related to the use of IT.

- General personal information (e.g. age, gender, education level)
- Skills of computer software usage.
- Speed and reliability of internet connection.
- Connectivity and access.
- Types of services used on the internet.

The questionnaires in the government offices was conducted by filling out the information on a face-to-face basis to guarantee full understanding, accuracy, and high response rates to the questions.

The questionnaires for the public were distributed to the internet cafes where people access the internet. These internet cafes were chosen by the assistants by going to different locations and asking for an internet café. Then the assistants asked the owners of the internet cafes to help distribute the questionnaires to their customers (users). In Nasiriah, four internet cafés' owners agreed to participate and twenty five questionnaires were given for each. In Kerbala, it was more difficult to convince the owners of internet cafes and their participation was lower.

3.6 Description of the Data collected

E-readiness is defined in terms of few categories of several indicators that describe some aspects related directly or indirectly to the concept of e-government. These indicators could be denoted as factors of how successful e-government is going to be in achieving the anticipated goals. Most of these factors measure how satisfied users are with the current availability of services and ICT facilities and what their preferences are for gaining access to services through different means of ICT, such as WebPages on the internet, mobile phones, or even regular phones. In addition, some specialized variables are also used to measure certain e-readiness aspects. A limited set of social properties that describe aspects of important relation to e-readiness of the community are also included in the tool developed.

The specific data collected from government officials and citizen-users included both qualitative and quantitative data, relying respectively on interviews and questionnaires.

A definition of the broad categories used for the data collection will clarify the nature of these measures and demonstrate their usage in constructing the assessment tool. Five broad categories were used, as follows:

User needs: in this study, the user need is the lowest acceptable availability of certain conditions that meet the demand (or most urgent demands) of the users. For example, if the available speed offered in internet cafes is too slow, the user is not expected to spend more time than it takes to send an email or download a specific file or document, etc. This implies that the user is not going to be willing to spend enough time to explore other available services and benefit from them.

User preferences: in this research, user preference is the level of availability of the aspect that not only satisfies the demand and the basic need of the user but encourages him to go beyond the basic use level and thus to benefit more from other information and types of services.

The goal and the measure of e-readiness should be the levels estimated by user preferences and not only the lowest level of user need. If the reference point is the minimal level of availability, then people will revert to the old system and all we have is failure. If the user is satisfied with the available conditions, then there is a great possibility that he will ask for more benefits (online services or information) by attempting to explore and search for more of the same type or even different types. This implies higher use and therefore efficient and effective usage of services over time. At the same time it allows the number of users (of online services) to increase and gradually to achieve the coverage goals of these systems and services. This is simply success.

Several service-related aspects underlie this category:

- Infrastructure aspects (speed, availability, reliability).
- Pricing of the service that represents the channel (telephones and internet).
- Privacy and security issues or trust in technology.
- Trust in government.
- Training.

Environment conditions and descriptive information (social properties): These factors are affecting readiness and could be related to the users but not specifically to their needs or preferences. They are characteristics of either the community in general or the environment of the work in government agencies. These measured factors

provide insight about some aspects and how they might influence e-readiness. Under this category of data types:

- Gender of users. \ General
- The level of education of users.\ General
- Computer Skills, such as computer software that users are familiar with or skills needed for development and management of the systems and services.\ General
- Computer and internet penetration, and landline and mobile telephone penetration. \ General
- Frequent access to data stored in paper form. \ Government
- Time consumed in accessing or searching for information in paper files. \ Government
- Estimated current usage. \ General
- Training. \ General

User opinion: in this category, some data were collected to express what potential users of e-services (current internet users) think about some issues related to their anticipated usage of the services.

Measured aspects are:

- Data computerization
- Trust in government
- Trust in technology
- Willingness and determination of the government in general and the organization in specific to use e-government.
- Policies of education and training.

The output of this category is not always highly indicative of the value of the measures, but they could be used as supportive evidence to other aspects measured in other categories or compared to opinion of specialists. For example, government employees give their own perception of how well the data of their organization are computerized. This could indicate indirectly how insistent is the administration of this organization on supporting the efforts of engaging ICT. Another example, when the users answer the question asking about how is the government is going to respond to requests sent online, the trust in government factor may underlie the response and thus indirect confirmation of its level is provided.

These types of collected data (user preferences, needs and opinion and social properties) can be all measured and verified and analyzed statistically.. Moreover, they consider issues related directly or indirectly to the user or the community side, but with very little consideration of the provider of the service (Government) side and some aspects of this provision. So, another way should be used to approach this kind of information. This is done through interviewing some people with knowledge and experience and had real participation in this field.

Specialists' opinion: As was just mentioned above, interviewing some key personnel in the context of this research provided insights about aspects that cannot be measured by simply asking people for their preferences and opinions in a standardized format. At the same time some of these aspects cannot be easily represented statistically as they represent qualitative data and can not be represented in definite and clear levels. Some of these aspects

can have two levels as existing or non-existing. Some might be presented as existent in certain levels that could be later developed and raised to enhance this aspect. These levels may help to decide whether it is the time to launch a project or not.

Measured aspects examples are:

- Trust in government
- Trust in technology
- Willingness and determination of the government in general and the organization in specific to use e-government.
- Higher level skills.
- Policies and Legal framework.
- Fund issues

In addition, it is difficult to measure these aspects statistically in this research as this would require extensive governmental data to be accessed, which goes beyond the scope of this research and would not be, in any case, easily facilitated by government offices and agencies working in this field in Iraq. For instance, legislation for ICT and e-government is an issue that relies on deep investigation of opinions of specialized intellectuals and specialists in academia and professionals in the work environment. Another example is the funding of such programs. It is difficult to access governmental data about funding for the projects with sufficient details to try to analyze how these funds have affected these projects or might affect them in the future.

The above mentioned categories describe how data were collected to validate the factors used as e-readiness measures, and indeed give a preliminary view of the current level of e-readiness in the municipalities and agencies examined.

Overall, the study categorized the collected data according to the standard categories used in many e-readiness assessment tools: infrastructure, people, legislation, and policies. Under each of these categories there are several indicators of e-readiness and these are all defined in the e-readiness assessment framework for this research in the methodology section.

In sum, data collected in this research are of quantitative and qualitative characteristics. Data are also classified into groups of detailed factors under general aspects that include infrastructure and people.

While the limitations are discussed more fully in the section on the findings, it should be noted that the local conditions in Iraqi governorates are not supportive of field research. Despite these difficulties, the research was able to collect sufficient data for the exploratory purposes of this research.

4 Data Analysis

This section reports the results of analyzing the collected data to draw the implications for designing an e-readiness tool for municipalities in developing countries. The data are analyzed primarily using descriptive analysis, such as the frequency distribution of the answered questions in the questionnaires distributed to users in Nasiriah and Kerbala and the questionnaire distributed in government offices in Nasiriah government. Factor analysis is then used to provide information about the measures used to further clarify the most appropriate variables for e-readiness assessment.

Qualitative data are analyzed in light of these quantitative data to draw out the findings of the overall research.

4.1 Response

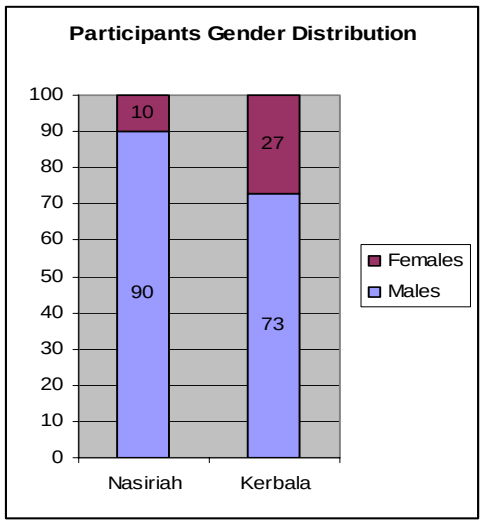
- Internet Cafes respondents in both cities

  The participation of internet users in both cities was unexpectedly low. The number of respondents in Nasiriah was 70 and represented about 40% of the distributed questionnaires to internet cafes in Nasiriah and Shatra, a nearby community. In Kerbala, the number was below that of Nasiriah, with 47 respondents (31% of the total questionnaires completed), although 150 questionnaires were distributed..

  Thus, participation in both cities did not reach expectations and took more time than anticipated, as mentioned earlier. These low percentages and slow response might be an indication of low willingness of the community to participate in this kind of research, which could slow or deflect the plans of

the government to assess community characteristics and then diagnose the problems and critical issues to consider in developing e-government programs. This is, in itself, an issue to consider.

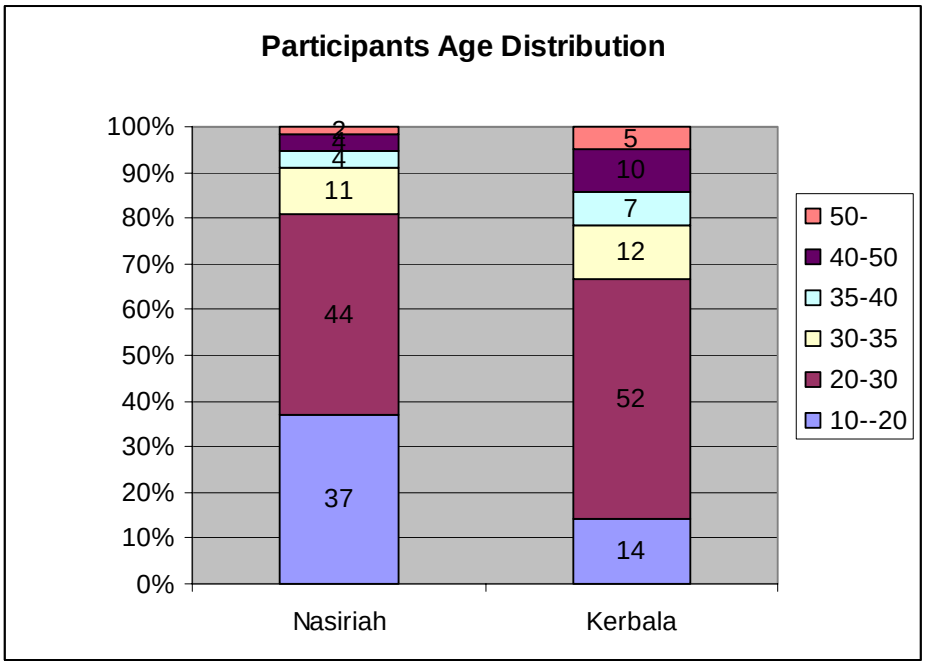
Another important issue highlighted by the questionnaires, although not planned initially for the model of assessment, is participation according to gender. The numbers show that 90% of participants in internet cafes in Nasiriah were males and that the percentage in Kerbala was 73% males. This observation is so important and signifies the importance of considering gender equality of access to the internet and services available online. The reason behind that might be the traditional nature of the cities in Iraq's south where women are not allowed into places where men gather. In fact, no women can be found in other places in the city like cafes and other socialization places. Even in restaurants women are mostly accompanied by male family members and an almost isolated space is allocated to families and women.



So, this signals the danger of the exclusion of more than half of the society. This half is denied the right to access the internet and other available services and this means the loss of great potential of usage of services and information

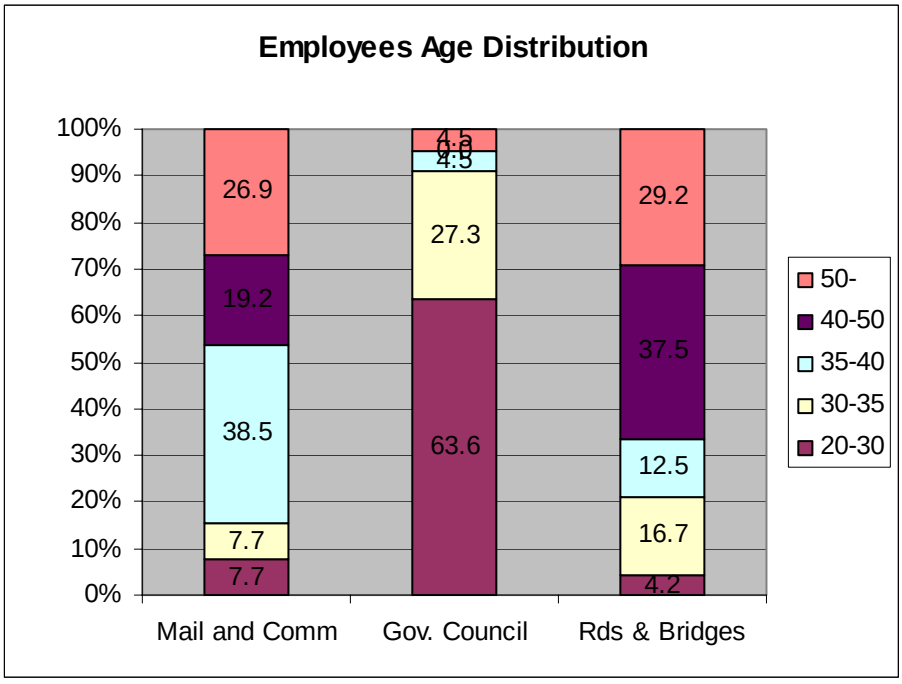
available on the internet and this will most probably contribute in the failure of e-government unless it is addressed.

The average age of users is 24 in Nasiriah and 27 in Kerbala. In Nasiriah, about 90% of users in internet cafes fall in the range of 16 - 35 years old, compared to 80% in Kerbala. This implies that users in internet cafes are mostly young and therefore this range of age could be seriously considered as the target of the initiatives and programs relying on the use of ICT for development. However, this does not necessarily mean that governments should neglect people above and under this range. In fact, these ranges, above and under youth should be targeted with special consideration as they are unlikely to participate in the movement of ICT4D because of difficulties in deeply engaging old generations, in the Iraqi localities, in the era of ICT because of their weak education and traditional backgrounds. In addition, the younger generations, below 10 or so, should also be considered with special care as these will possibly be the base for development and success in the future.



- Government offices respondents in Nasiriah city.

  Age distribution of Government Employees shows that longstanding government agencies, such as Post and Communication and Roads and Bridges, have broadly distributed age ranges for their employees while Governorate Councils have almost all young employees. This may be because the Governorate Council was established after 2003 and people there are newly employed.



4.2 Descriptive analysis using frequency distribution

This part of the analysis is going to present data collected and then attempt explaining the trend of the results and how would they contribute in assessing e-readiness as individual factors.

Under this section, if a response to a factor shows high and clear recognized value and that response was consistent in both cities and all offices, then this factor is expected to have impact on e-readiness and should be included in the

assessment tool. If results show low value as when the response is distributed in away that show no clear pattern of tendency toward one direction, or when responses from both cities were not consistent, then this factor is not expected to be impacting e-readiness and shouldn't be included in the assessment tool. However, when factors used and verified according to the questionnaires were discussed with specialists, some of them were included as their importance was confirmed by those specialists even if collected response shows different tendency.

Note: All figures are shown in appendix B.

Infrastructure Aspects

- **Speed of Internet (Bandwidth)**

  The distribution of responses to the questions, meant to measure how internet users respond to the speed of the link they are using, shows that about 52% of users in Nasiriah find speed below acceptable (low & very low) and 43 find it acceptable. In Kerbala, 45 % find it below acceptable and 36 % said it was acceptable. Figure 1 presents the distribution of responses. This highlights the importance of the speed of the internet to users and how this could influence their usage of e-services when launched. Figure 2 confirms that speed is important for users and shows that higher speed pushes usage levels up. However, the relationship found was lower than expected. Expectations were that a high percentage of the respondents would perceive speed of internet (Bandwidth) as low or very low, reducing their willingness to use online services, but high number of respondents answered that the speed is acceptable. That might reflect the fact that internet users have not used internet with higher speed in other places and the available

speed was what they have used to since they were introduced to the internet. That was an explanation given by more than one of the interviewees in this research. However, responses still imply the importance of speed as a factor of measuring readiness of community. Indeed, speed influences current and future use of internet and e-services.

- **Availability (Access):**

Availability for the public

Although availability of internet and computers should be measured in ways that reflect all forms of access, in this research it was only possible to assess the availability of access to the internet in cafes, 86% of respondents in Nasiriah and 83% in Kerbala reported that they have computers in their houses and internet availability at home is about 58% in Nasiriah and 68% in Kerbala (see Figure 3 and Figure 4). However, people still come to internet cafes to access internet, perhaps because of the very low speed of the internet at homes compared to internet cafes. Available internet speed at houses is about 10 Kbps from local wireless providers, as measured by the researcher, and still a lot of the households do not have working landline telephones or no landlines at all (only 44% and 36% of the sample in Nasiriah and Kerbala, respectively, had landlines in their households as shown in Figure 5). Another reason for young people to come to the internet cafe is that they can come in groups and socialize with others while in cafes in addition to playing networked games.

When asked about how far the cafes are, respondents answered that it was neither far away nor very close to their houses. The most common response in each location described the cafes as close, at 52% and 45% in Nasiriah

and Kerbala respectively as shown in Figure 6. This might have encouraged people to go to internet cafes even if they have internet at home, making a choice that it is better to go to the café than to stay home and suffer the unavailability of electricity and low speed of connection.

In addition, in Nasiriah respondents think that internet cafes in their cities are moderately available with some responding availability is low, but in Kerbala it tends to be low and very low as Figure 7 shows. So, according to both groups of respondents, both of the cities lack sufficient number of internet cafes and therefore provide low overall access to the internet.

Availability in the government offices

A high percentage of employees own computers at home, more than 73% in all three agencies (Figure 26). However, the situation at work differs, particularly in the directorate of Roads and Bridges where only 29% have computers. In the other two agencies, it is higher than 80%, (Figure 27). It was astonishing when the head of IT department in Roads and Bridges said that there are only four computers in their directorate. He also stated that every now and then he had to fight to keep the three computers in his department as accounting and design and other departments ask him to give them his computers to do some tasks. The 29% availability of computers in the survey came from the number of engineers who bring their own laptops and use them at their offices.

It seems that the availability of computers is related to the opinion of employees on the need to use computers. None of the respondents in Post and Communication and Governorate Council said "I don't need a computer at work" and about 90% of them feel that they need computer highly or very

highly. At the Roads and Bridges only 65% reported that a computer is needed highly or very highly, and about 17% said that they do not need computers in their work.

The need for internet was similar to that for computers. In Roads and Bridges, there is only one computer connected to the internet and the head of the IT department pays the cost of that line by himself (about 20 USD per month), although he uses the internet for communicating with the ministry in Baghdad.

Internet availability at the other two agencies was much better and about 50% of the computers in the Governorate Council are connected to the internet, but the number is lower in Post and Communication.

To sum up, people in internet cafes and employees in government offices indicated the need to higher availability of computers and internet. That need was demand driven as presented by all interviewees and most of participants in the survey.

- **Reliability (continuity of service)**

Reliability in this research is verified in two questions, one that measures how effective and reliable the connection is for people to sustain usage of tehe internet and another question to test how reliable people find current connections. The percentages show that in both cities, more than 60% of users wait for a connection for only 10 minutes or less when the line is disconnected, before they leave the internet café, (Figure 8). This show how important this aspect is and how usage depends greatly on continuous availability of internet connection. Furthermore, as Figure 9 shows, only 11% of respondents in Nasiriah and 6.4% in Kerbala say that the internet

rarely disconnects or it is always connected (never disconnects), which leaves the rest suffering disconnections. Some of the alleged disconnections might be felt when the speed goes so low that the user finds himself unable to access the page he wants. This again indicates people's desire to have good connection to the internet.

- **Pricing (cost of internet access)**

Internet is a service and is expected to be influenced by cost, just like other services and commodities in the market. Unexpectedly, about 74% of respondents in both cities (Nasiriah and Kerbala) find the current cost of the internet as acceptable and only 3% and 6.5% in both cities find the cost very high. However, less than 5% in both cities found the cost low, Figure 11.

The cost of one hour of accessing the internet in Iraq is 2000 IDs which is about 1.7 $. The cost of internet is the highest in Iraq and Mauritania when compared to 19 Arab countries in a study conducted by the Arab Advisors Group. (http://www.arabadvisors.com/arabic/Pressers/presser-080109.htm) In addition, it is higher than all neighboring countries like Iran and Turkey as the cost there is around 1$USD.

Some interviewees, when asked about this issue, explained that people have no idea about the prices of the internet service in other countries and for Iraqis internet is a service that was not available before 2003 and was considered a luxury for some elite, although in 2001 internet was made available in some government controlled centers under difficult conditions. So, it is expected that people will soon complain about the prices of the internet and ask for better but also less expensive service, an issue that may influence the usage of the internet considerably in the future. The low usage

(number of weekly hours of internet usage) of the sample of this research might give evidence on the influence of cost and other aspects on the usage of internet, Figure 12.

- **Mobile penetration**

The study shows that 97% in Nasiriah and 100% in Kerbala own mobile phones, among the population sampled. It also shows that the majority of the respondents (65% in Nasiriah and 70% in Kerbala) think they would use the internet from their mobiles, if it was offered with acceptable cost. The responses range from little usage to high to very high usage, but it still represents a great potential for taking advantage of mobiles as a channel to for offer internet services and it is a good indicator for mobile internet usage if the government was willing to use this channel.

- **People Aspect (Public and Government)**

  - **Education**

According to the survey, more than 80% of respondents in both cities have either a bachelor degree or diploma (high school graduates). Fewer than 10% in both cities had lower levels of education. Almost the same applies to the government offices were most of employees have degrees and capable of using computers to an extent.

So, it could be inferred that most internet users are expected to be of moderate to high education levels as using the internet and computers in general requires some skills. This highlights this factor as a measure of e-readiness of the community to benefit from e-services.

  - **Usage**

The number of weekly hours of internet access shows that most of the users (slightly below 50%) get online for 7 hours or less which is considered low. Lower proportions use the internet for longer periods, as shown in Figure 14. The usage factor is naturally expected to depend on other factors present in the framework set by this research, such as cost of internet, speed of link, and reliability. Some questions in the survey ask about the effect of these factors on usage. It was found that cost and speed have high influence on usage. About 68% and 62% of respondents in both cities have shown high and very high influence by speed and 69% and 71% has confirmed an influence (low or high) of cost on usage. The results regarding reliability (perception of disconnections and the time users wait before leaving the internet after being disconnected) also show high influence on usage. See Figures 8 & 9.

In addition, the pattern of usage by purpose, shown in Figure 15, shows that a high proportion of users (66% in Kerbala and 59% in Nasiriah) report using the internet for learning. In Kerbala 66% use it for business, but this percentage is only 35% in Nasiriah. This difference may be due to the fact that Kerbala is a city where business is more active than Nasiriah as Kerbala is known for its, relatively, active economy, based on a high level of religious tourism (every year it witnesses millions of visitors, both local and international, to the shrines of Imam Hussain and Abbass in the center of the city). The rest of the usage purposes were reported at only low levels in both cities. The higher people use the internet, the higher expectations of the same people, and maybe more, use services provided online. That was confirmed by the interviewees, but this factor can not stand alone as it depends on other

factors in the same framework, and, in fact, most of other factors work as causes of fostering or degrading usage. However, measuring current usage gives an indication to anticipate the future usage of e-services as this might form a great motivation to access internet and at the same time regular access (usage) of internet drives people to know about provided services and try them.

- **Trust**

People in both governorates and Iraqis in general are new to using internet and have very little exposure to communicating with the government through the internet. So, their perception regarding this little exposure and future use can be measured with regard to trusting the government in running their processes online. Their idea about security of internet as a channel of communication is not that clear and they seem to be uncaring about this issue.

Trusting technology (the internet)

People feel unsafe when using the internet as they fear providing their full and accurate personal information when they register for any activity on the internet. See Figure 15. It seems that people in Kerbala fear the internet more than Nasirians do. About 30% of respondents in Nasiriah said that they feel that the internet is a little safe while in Kerbala only 13% answered in the same way. This maybe caused again by the, relatively, higher business activity in Kerbala which concludes that serious use might raise the awareness or care of people when using the internet.

In general, usage is not very high and the purposes for which it is used do not seem to pose a security issue (as shown by the pattern of use in Figure

14). As for current business-related uses, people may not look very concerned with security because current business activities do not include financial transactions, for example, information of high value or even personal information.

However, in both cities 43% and 39% answered “Don't know” when asked how safe do you think the internet is? See Figure 17.

The inconsistency between the results of the two cities and the high percentage of don't know suggests that people have no clear opinion on this issue and this degrades the value of this factor in this regard.

The case might get so different when more sophisticated services are provided by the government. Services including transaction of high value information, such as personal information financial transactions, could change the way people look to the safety of the internet and change the way government deals with this issue as this is expected to become a crucial factor to consider.

However, and no matter what level of e-government is under study, specialists confirm, security should always be a concern as it involves protecting existence, continuity, and accuracy of online content, and at the same time people should be protected against dangers of the internet.

- **Trusting the government**

Figure 17 shows great desire to choose the internet as a way of handling processes with the government, if it was available. In another question, less than 10% think the government's response to their online processes will be high or guaranteed as Figure 18 shows.

When respondents were asked, what are your reasons for preferring direct, face-to-face interaction with the government agencies instead of using the services provided online or on the telephone, the responses confirmed that citizens do not feel confident of the government's response in online interactions. The percentages giving this as their reason to prefer direct interaction were the highest among the many suggested reasons (see Figure 20). The second most important reason, in this regard, was that face-to-face interaction allows for pressuring government employees and even paying some tips, and this is a severe manifestation of distrusting the government to provide services in an impersonal format.

Both cities show highly similar responses to issues regarding general trust in the system of government online services. The interviewed specialists state that this low trust factor is a combination of long history of bureaucracy and corruption of public sector and a technical factor which is the difficulty of getting acknowledgment for requests sent online. So, trust should be included as one general factor from the view point of citizens and should be seen as a security concern when viewed from the government.

The system of receiving and delivering people's processes should be always improved and then opinion of people should be tested against these improvements to measure the general trust factor which indicates how people are ready to use services provided online.

- **Skills**

This section considers computer and internet skills for the public and government employees and higher level skills needed for government offices to develop programs and services of e-government.

- **Usage Skills**

The skills of using computer and accessing the internet were difficult to assess by questioning the users. However, respondents to the questionnaires reported some knowledge of basic to moderate usage skills when accessing the internet for different purposes. The question about the purpose of using the internet provides some information about how people use the internet and it shows that people do some browsing regularly and use search engines when looking for specific websites that offer products or services they are willing to use. They use messengers such msn messenger, skype, etc., facebook and some forums to communicate with people of similar interests. This was directly observed in some internet cafes by the researcher and the assistants.

For government offices, responses to the question how well they use computers show above moderate skills in two of the agencies and low Roads and Bridges' employees low skill levels, figure 23. That weakness is also observed in other aspects such as availability and may be the reason behind the weakness of usage skills for employees in this agency.

The question of programs that participants can use shows the significance of high knowledge of basic programs in the Governorate Council as 100% of respondents know how to use Windows and about 96% use Microsoft Word while the numbers for the same programs in other offices are 77% and 79%. Other percentages show various levels of usage of other programs, but in general they are all below 50%. However, databases showed the lowest level of familiarity in all agencies. (See Figure 24).

Government offices with employees with higher skills show better overall levels in most of other indicators. This could indicate the importance of the role of skills in advancing other aspects and then raising the level of e-readiness. Indeed, skills of using computers and internet are important factor that indicate high readiness to enter and benefit from the world of ICT.

Interviewees asserted that public users are expected to have skills higher than government employees do as the motivation for the first group differs a lot, in general. So, skills of government employees might be used as the bottom line level of skills to measure general skills level.

- **Higher level skills**

The three agencies, where the study was conducted, suffer from a lack of specialized IT staff. Although observation gives the indication that the offices of these governmental agencies are overstaffed and crowded with desks of employees, interviews with the heads of IT departments show that there is a great shortage in this field. When asked about what are the three most important needs for them to develop ICT in their agencies all of them answered that skilled staff is one of the greatest needs and some times it was the highest critical issue. The director of Post and Communication directorate confirmed that shortage of skilled staff in IT is one of the two most important issues. Post and Communication department have only one engineer, one programmer, and one technician in the IT department. Roads and Bridges have only one programmer in the IT department in addition to two typists. The typists are both women and on maternal leave for several months. So, the head of the department is working alone and at the same time he is responsible for the store of the directorate. In the Governorate

Council, IT staff numbered only seven in a workplace where more than 300 employees work. The head of IT department added, "We are depending almost completely on ourselves to develop our skills."

- **Training**

The Public

In both cities, only about 13% show no interest in any training on computers. For the rest, willing and the undecided citizens, facilitation of training with encouraging conditions will satisfy their needs and aspirations (Figure 22). Figure 23 shows a great desire to get training in Kerbala and Nasiriah.

Those who stated they were unwilling to set aside some money for training themselves and their families were only 11% in Nasiriah and 4 % in Kerbala. The difference between the decided and the undecided in both cities may be attributed to the difference in education levels among internet café users in the two cities (according to the survey), or to the difference in economic activities, as discussed earlier in this chapter. However, the great desire to acquire training indicates the importance of training in making people able to use computer and internet services as interested people are motivated to develop their skills of using computers and internet.

The Government

The government does not seem to provide sufficient training as 91%, 80%, and 58% of respondents in the three agencies said that they have not gotten any training by the government (Figure 28). Although one question demonstrated moderate skills in computer usage, more than one interviewee confirmed that these are the result of their own efforts in developing

themselves. For all of the interviewees, and as mentioned before, training is one of the three most important issues to consider when thinking of developing the work environment.

There were two questions assessing the desire for training by respondents. Both questions provide evidence that government employees are willing to get training. About 57%, 55%, and 70% of respondents in Post, Governorate Council, and Roads and Bridges respectively are ready to spend one hour after their work time to get training, and 69%, 69%, and 91% answered "agree" or "strongly agree" to allocate a small amount of money for training as Figures 29 and 30 show. The higher percentages are those of Roads and Bridges, showing that employees realize their weakness and are willing to develop through training. At least two senior interviewees confirmed the desire of the employees to get training.

According to the interviewees in MoST (Ministry of Science and Technolgoy), training should be embedded in the plan of the government to develop general capacity of the government and some initiatives should be arranged to provide encouragement for training the public.

- **Government and Management**

Although the government is mainly involved, beside people and private sector, in most of what was mentioned earlier, it is the only responsible for several issues regarding the environment of the office and provision of resources and institutional aspects.

  - **Information computerization**

In the field research, time limitation and difficulty of access to government information severely limited observations of how government

agencies are progressing in transferring their documents and records to computerized systems. Studying this aspect relies only on interviews and perception of these agencies' employees on information computerization.

The director of Post and Communication stated that 25% or less of the data are computerized in his directorate while it was about 40% in the Governorate Council as the head of IT stated. That percentage was about only 10% at the Roads and Bridges as stated by the head of IT department who added that if he had excluded keeping some documents in a digital form, using email to communicate with the ministry in Baghdad (semi-officially), and managing a small database for the employees and retirees, this percentage would have dropped to zero.

They all stated that there is no clear policy or tendency to shift to computerization of their data from higher levels at the ministries or even lower than the ministry level.

The survey shows that 83%, 65%, 67% of respondents in Post and Communication, Governorate Council, and Roads and Bridges respectively have high or very high need to use paper records and files. For the Post and Communication directorate the remaining respondents reported moderate need to use paper files, but the remaining respondents in both other agencies selected other options like less need or even much less. Another question gives a similar but somewhat more useful response. About 100%, 83%, and 80% said that time spent in accessing or using paper records and files is moderate, long, or very long. Figures 30 and 31 show these figures. This implies high access rate to paper files and long hours spent in that process.

This really needs to be considered as an issue, and signals the importance of shifting to computerized systems to enhance efficiency.

The perception of the employees on the degree to which data of their agency were computerized was difficult to interpret and gives no clear indication, although more than 30% in two agencies answered that it is moderate. The Roads and Bridges response was that about 37% said it is good, but this is inconsistent with the estimation of the head of the IT department, who said it is only about 10%. See Figure 33. this point makes employees unable to measure how well their office is doing in digitization and computerization.

- **High-level Support (Political Will)**

About 66%, 74%, and 71% of responses in the three agencies were that government's efforts are weak or very weak in employing ICT for developing work environment (see Figure 34). Responding to a question about the motives for shifting to computers, less than 16% in all agencies thought this move was due to pressures from higher management in their ministries or agencies. This indicates that they are not feeling any pressure on their offices, from above, to develop their work using computers.

The interviews gave the same result and interviewees stated that if support was available from their superiors, they would have better resources available and advanced work environment. One of the interviewees sees this issue as one of the main obstacles to development and reported that bureaucracy is hindering their attempts. Others confirmed this in that there is no support from higher levels for training or computerization or even updating basic databases, such as that for retirees.

However, negative intervention or influence is taking place and causing problems. One example of that is shutting down what is known as the e-government project in the governorate. Conflict of interests between two local officials from two different political parties caused that project to stop and the argument put forward to justify this decision was the absence of legislation. No one could say what the legislation they were looking for was! There were only some smiles.

Specialists and officials in Baghdad see political will as one vital factor as without it no real or serious efforts are paid in any direction. Another important point to mention is that political will and persistence will most probably lead to institutionalization of the programs or projects, hence resulting in a stable and sustainable system of support that is very unlikely to fall even if the administration was changed.

However, it is still difficult to measure political will and then attempt to put a scale of measurement of political will. Even specialists weren't so sure about how to measure this aspect. Some went with the option of relying on how people feel the pressure from higher officials, but this option depends on perception of people which is not very accurate in this regard. Others stated that the assessor should be the one who estimates that depending on his own judgment and this is not reliable in cases when the assessment is meant to provide information to higher officials which is the way how most government assessment are directed.

- **Funding**

Funding levels also proved to be difficult to measure based on the perceptions of employees, so the findings are based on interviews with more

senior officials and how they address this issue. The three agencies suffer from lack of sufficient funds and all the interviewees confirmed this factor as one of the three most crucial barriers to successful development of their work in general and employing ICT especially. In fact, there is no specific fund for ICT and what is allocated to these agencies does not cover or include expenses of ICT needs.

Funding is highly influenced by political will positively and negatively. The central ministry of communication provides some funding for projects of communication in the governorate but sometimes it reallocates amounts budgeted for IT projects to other projects. For instance, there was an allocation of five billion Iraqi Dinars for an infrastructure project in Nasiriah. That fund was then reduced to 1.7 billion and then it was reduced again and finally the project was canceled.

Specialists in this regard and officials believe that sufficient and efficient funding can lead to success of e-government programs and conversely lack of fund is a great danger of failure. They also find it difficult to set scales to measure the level of availability of fund and its effect on deciding to launch or implement initiatives or programs of all types and e-government's ones in specific.

- **Legal Framework**

Considering that the scope of this research is only the first two stages of e-government (information dissemination, and interaction), there might not be legislations necessary to bring about the conditions needed for success. The head of Roads and Bridges brought to light one issue to consider in this regard. This agency relies highly on sending emails that carry official

documents to the central ministry in Baghdad, although they send some other documents regularly with their representative. They do not send copies of documents emailed to the ministry. So, they need a way to authenticate and ensure legal acceptance of documents sent through this system. This suggests a need for legislation to authenticate the new digital form of documents and communication.

Although collected data provide no clear evidence on the need to legislations in the field of ICT, interviewed specialists stated the need to a form of acknowledgment law as a response to the users' perception of low government response to their online submitted requests.

Furthermore, specialists confirm the need for legislations that not only serve citizens and government offices, but also hold government offices responsible against issues of privacy, security of people records and accuracy and credibility of information they provide.

However, for the current stage, as interviewees assert, the absence of such laws might not highly affect people's access and use of online services, but a great need for such laws will appear when the situation develops and use increases. So, a list of some possibly needed laws is incorporated in the assessment of the public, but for the assessment of government offices it is only mentioned in terms of how these offices define their legal needs and how would these needed laws affect their work environment.

- **Policies**

The interviews and the surveys have shown the need for some actions to be taken to achieve successful ICT use for the development of public sector and successful implementation of e-government programs. Interviewees

believe these actions should be planned and implemented by the government. As it was the case for the availability of laws, the availability of these policies is not a prerequisite for current e-readiness measurement, but they are near future indicators of how e-readiness is rising. The focus should be on the following:

- **Computer and internet penetration**: the survey shows the need to provide services such as landline telephones that could be used to increase access to internet. There might also be an opportunity for the government to lead initiatives to support computer penetration in the communities within the governorates. In addition, it could prove useful if the government plans to provide services through mobiles.
- **Training and Education**: the survey shows that people think that providing IT education should start in primary schools and that people have the desire to pursue training if it were made available under acceptable conditions (e.g., inexpensive). In addition, government agencies and their employees would appear to have the desire and need to develop their skills in using computers.
- **Information Computerization**: both survey and interviews have shown the need to shift their records to computerized systems to facilitate fast and accurate access to data. A national or local plan to support this direction might increase the opportunity of quick and correct launch of programs. Officials in MoST assert that some directorates in the central ministries in Baghdad are heading this way. The National ID registry has started digitizing their records since the

nineties and the Ministry of Interior is pushing hard for digitization, mainly for security reasons.

- **Employment standards**: all surveyed agencies complained of the lack of specialized technical staff. Although it is clear that these offices are overstaffed, it is also very clear that these agencies lack highly qualified personnel. This point is highly related to training, but it represents a basic step to start with when hiring new employees.
- **Funding**

  Apparently there is a great need for sufficient fund allocation in all agencies. Lack of funds has caused a lot of projects to stop and has hindered developing these offices by keeping their IT capacity low, limiting access to computers and keeping employees untrained. A clear fund policy is expected to foster the use of ICT in government offices and then enable these offices to effectively implement e-government programs.

4.3 Using Factor Analysis

Using SPSS, factor analysis was used to analyze the responses of users in internet cafes and employees in three government offices. Before running the analysis, data were cleaned by assigning a neutral value to questions left without answers to minimize the distortion of the data if left without answers.

The samples, and hence the response size were appropriate to be used for factor analysis. The minimum number of responses to be analyzed should be higher than the number of variables to investigate as a condition for factor analysis. The numbers of usable questionnaires (responses) for both governorates (70 and 47) were higher than the number of investigated variables in this case which was eleven. In the case of

government offices, 24-26 usable questionnaires were collected in each ministry, while there were only six variables to investigate. So, the condition of the sample is met properly.

As stated in the methodology, the variables (indicators) were chosen from a set of indicators used in e-readiness assessment tools according to their convenience with the environment of Iraqi municipalities. These variables were tested and confirmed to have influence on readiness.

The variables were chosen according to the saturation value and chosen to be of an absolute values greater than or equal to 0.3, a threshold often used in this type of analysis. The factors are presented with their percentage of variance of squared loadings, which reflects the extent to which a factor affects the result.

Users in Internet Cafes

Tables a, and b in appendix F, show the result of factor analysis in both cities and the values of variables are highlighted. Table 1 (below) shows categories with their variables and variables' highest loading from the analysis in both cities, Nasiriah and Kerbala.

Table 1. Variables and their highest loadings for both cities

		The Public	
Category	Variable	Nasiriah	Kerbala
Infrastructure	Reliability	.837	.817
	Cost	.413	.587
	Speed	.479	.650
	Availability	.393	.445
	Mobile	.594	.505
Human Resources	Trust	.316	.658
	Education	.391	.840
	Usage	.413	-.649
	Training	.535	.505

The variables (indicators) shown in Table 1 are those measured by questionnaires distributed in internet cafes. Variables are listed with their loadings to indicate how effective each one of these variables in contributing to e-readiness.

The variable of usage appears with a negative sign in the table. This can be interpreted within the set of indicators in the factor containing this variable along with other variables in the same factor. The absolute value of the loading indicates the significance of this variable

For Nasiriah, the cumulative percentage of loadings for the factors, and hence all variables, is 62% and for Kerbala it is 70%. This means that the current proposed set of variables (measures) represent 62% and 70% of the total influence on e-readiness. The remaining influence may be attributed to other variables that were not considered in this model and to interactions among the variables themselves, which was not explicitly taken into consideration, as noted above. The difference between the loadings for the two cities may be interpreted as being due to unmeasured differences between the two environments. However, since both percentages were above 50% then this set of variables provides significant individual variables. Appendix E shows the tables of percentage of variance and cumulative (loading) represented by each factor with its significant variables for both cases of Nasiriah and Kerbala.

Government Employees

The results of factor analysis for Government employees' surveys are shown in Tables c, d, e in appendix F, and same previous considerations were applied here.

Table 2 (below) shows categories with their variables and variables' highest loading from the analysis in the three organizations, Mail and Communication, Governorate Council, and Roads and Bridges. These loadings show how effective these variables in e-readiness of government organizations.

Table 2. Variables and their highest loadings for the three organizations

		Government		
Category	Variable	Comm Mail and	Council .Gov	and Roads Brdgs
Inftrastructure	Availability	.811	.757	.873
Human Resouces	Education	.494	.658	.769
	Training	.597	.859	.587
	Skills	.640	.394	.584
Government and Management	Computerization	.511	.687	.740
	(Willingness (Political Will	.563	.704	.634

The cumulative percentages of loadings for the factors are 74%, 61%, and 61% in the three agencies which reflects the percentage of influence of the variables counted in this model, the remainder being attributable to other unaccounted-for variables or the influence of variables on each other. This shows the extent to which these variables are affecting e-readiness. Appendix E shows the tables of percentage of variance and cumulative (loading) represented by each factor with its significant variables for the three cases of government offices.

In addition, factor analysis provides information on how well it worked to measure variables through measuring the percent of variance in a variable explained by all factors. Appendix D provides tables of communalities for all factor analyses of all cases. The percentages shown in the tables tend to be moderate to high which suggests that the analysis is measuring these variables moderately to highly well. However, interpretability of the factors is a critical issue here because communalities must be interpreted in relation to the interpretability of the factors and values of communalities could be "meaningless unless the factor on which the variable is loaded is interpretable" which is the case in this study as factors are difficult to interpret. (http://faculty.chass.ncsu.edu/garson/PA765/factor.htm)

4.4 Variables (indicators) of the Tool

The list of indicators, verified by the factor analysis, is in Table 3. These factors came from comparing the two tables of factor analysis of both Nasiriah and Kerbala and from comparing the tables of government offices in Nasiriah.

Table 3. Factor Analysis Indicators

	Indicator
1	**Speed of Internet**
2	**Availability**
3	**Cost of Internet**
4	**Reliability**
5	**Mobile internet**
6	**Skills**
7	**Government Trust**
8	**Education**
9	**Usage**
10	**Training**
11	**Computerization**
12	**Willingness (political will)**

As for the indicators confirmed by specialists in interviews they are shown in Table 9.

Table 4. Specialists' Indicators

	Indicator
1	**Skills**
2	**Willingness (political will)**
3	**Trust**
4	**Fund**
5	**Policies**
6	**Legal Framework**

It is evident that some factors exist in both lists. This was because these factors were investigated and rated through interviews, although some of them were

considered in the factor analysis. The factors investigated through both factor analysis and interviews were Skill, Political Will and Trust. The specialists consulted confirmed the results of factor analysis for all factors. However, their opinion was of great importance in identifying the importance of professional skills within the whole concept of skills and then rating it as of high importance. Willingness or political will as most of them named it, is of great importance and is related closely to funding, policies, and legal framework as political will provides the motivation to foster all these aspects, which in return support all other aspects of infrastructure and human resources.

Trust factor was verified by the specialists as a factor combining technological and societal aspects. The current system does not provide acknowledgement to the user, which makes trusting online processing difficult, but at the same time there is the other face of not trusting the government in general due to its bureaucracy and corruption.

5 Findings

The research reported in this thesis has provided a set of variables that can be used as indicators to measure E-Readiness in Iraqi municipalities. These variables were identified from the literature on e-readiness and tested for application to developing country localities through analysis of data collected from surveys and interviews in Iraq. This section reviews the resulting set of variables and ranks them according to their values in the analysis.

5.1 Valid Measures

According to the analysis, the set of measures that could be used in assessing E-readiness in municipalities in Iraq, and potentially more broadly in developing countries, is shown in Table 5.1. They are ranked in each category according to their appearance in the factors resulting from the factor analysis and the rating of interviewees.

Table 5.1 Indicators deduced from factor analysis and interviews

	Infrastructure	Human Resources (Users and Government employees)	Government & Management
1	Speed of Internet	Government Trust	Computerization
2	Availability	Skills	Willingness (Political will)
3	Cost of Internet	Education	Fund
4	Reliability	Usage	Policies
5	Mobile internet	Training	Legal Framework

Indicators were categorized in three categories, that is, infrastructure, human resources, and government and management.

5.1.1 Infrastructure category

The infrastructure category captures all of the main technical aspects of the internet usage environment for users and government employees. The internet provision for the government uses the same underlying network as that of internet cafes and sometimes it is even slower and less reliable, perhaps due to inferior hardware. The cost is not different except that the government pays for internet links, rather than the users (at least in principle), and the Iraqi government also considers cost of service when making decisions at the local level. Availability is an issue in both cases and weak availability is a common point brought up by interviewees. Of course, some government agencies are an exception, such as the governorate council in Nasiriah and some important and powerful agencies in Baghdad, which enjoy high availability of computer and internet access (notably the General Secretariat of the Council of Ministers, which has much better access compared to other ministries, even the Ministry of Science and Technology).

The teledensity indicator was omitted because it has shown low influence. That may be due to the fact that internet access through landlines is so slow that it is not widely used and because the sample covered only users in internet cafes and not users of internet in households.

Results have shown a real potential for mobile internet to contribute as a channel of providing government services. This appears to be a good option for raising the level of E-readiness and should be considered in provision of services.

5.1.2 Human Resources Category

Aspects related to human resources were found to be very similar among private users of the internet and employees in government, so these two groups were combined into a “human resource” category.

Trust in technology was omitted because the questionnaire data showed inconsistency in response to the questions investigating this aspect. In addition, it may be that services provided in the first two stages of E-government (information dissemination and interaction) do not generate as much concern over security levels from the user perspective, compared to higher levels that require more input of personal data. However, this issue is of real importance when considering the availability and continuity of services, the security of information provided online in websites, and protection privacy of customers. This is the responsibility of the provider, although customers themselves should also be encouraged to behave responsibly by being aware of dangers and by taking necessary precautions.

Skills of computer and internet use and higher professional skills were grouped under a general indicator of skills considering their nature of acquired capabilities and the way these skills are acquired, primarily through training.

5.1.3 Government and Management Category

All aspects related to line management and higher levels of management in government were placed under this category as these factors directly impact E-readiness but cannot be attributed to any of the previous categories. They are generally related to management at a higher level than the municipality or governorate. The indicators in this category are significantly different in that they are difficult to measure quantitatively or with certainty, while many of the aspects making up the infrastructure and people factors can be measured more accurately.

The legal framework for the current stages under study is weak and not very effective, as many of the responses have shown and, most importantly, as the interviewees stated.

Although it has proven useful to isolate and study these various indicators individually and each contributes to assessing E-readiness, the three categories overlap and influence on each other. Within categories as well, indicators may affect each other.

5.2 Toward an E-Readiness Assessment Tool

The set of investigated indicators and the means of measuring them through questionnaires and interviews form the proposed E-readiness assessment tool. The method of assessing the level of each indicator relies on the answers to the questions posed in both formats. These questions can be answered through a comparatively low-resource analysis by those responsible for considering the E-readiness level to decide whether to launch programs or to identify which aspects to focus on, according to the purposes and results of the assessment.

The tool covers assessment of public e-readiness and government organizations' e-readiness. The first one, public assessment, comprises two questionnaires to be distributed via internet café owners for internet users in internet cafes and for households internet users, if accessible. In addition, the assessor should be able to gather some information from some government organizations where some information is found such as the tax authority. Then the data collected from both questionnaires can be put into the form that the assessor uses to come out with the final result of the assessment.

There are two approaches to collect data. First, after deciding the sample of cafes in the research, the questionnaires are handed to the owners of internet cafes asking them

to ask people for help in answering the questions. A condition should be pursued to achieve randomness of the sampled users. For example, they should choose the first user to enter the café every one hour of time. Then usable questionnaires are collected on a weekly basis until the designed sample is reached from every café. The second approach is to assign a facilitator who collects a group of people in the café and asks them to answer the questions, which take only a very few minutes of their time. This is a focus-group like practice. The selection of the best approach is the choice of the assessor and is expected to be affected by available resources.

The second, government assessment, includes only one questionnaire to distribute for government office employees. The questionnaires can be distributed to all employees in the organization or to a sample if the organization is large. The sample should be random to prevent bias and an option for that is to rely on selecting the first one third (or so) according the number of staff, of the employees in each room starting from the right. This method was used in this study. The focus group technique can also be used here with the same mentioned conditions. The assessor should also collect some information from the management of the organization concerning levels of some aspects, such as training programs and computer availability, and information not measured in the questionnaire.

The measures developed using the assessment tool can be presented in a bar chart summarizing each measured variable and thus the whole level of E-readiness.

There are two possible approaches to interpreting the values derived by applying the tool for each indicator. First, one could assess them relative to target levels derived by benchmarking performance in other geographic locations as reported in e-readiness assessments for those locations. However, this approach is difficult to apply to the case of Iraq, where the availability of comparable data are very limited. Comparable

data implies a level of data availability for analysis in Iraq, in reference to which comparison can then be made. A good example to clarify this is the speed factor. Speed of connection is generally very low in Iraq if compared to speed of connection in Jordan, for example. What is considered high speed in Iraq may seem low in Jordan, especially when considering cost, but Iraqi users have accustomed themselves to this low level of performance. So, readiness of Iraq in terms of speed cannot be compared to benchmarks in other countries. Second, a survey may be conducted using an e-readiness tool developed for low-resource assessments, such as that developed through this research. A proposed tool, based on the tool used in this research modified on the basis of the field research, is presented in appendix C. This tool includes a questionnaire for surveying citizens and line employees and an interview guide for more senior officials.

In this tool, certain aspects' levels have been deduced from the experience of interviewees to facilitate and simplify use of the tool, such as the speed and cost of internet. However, these assessments may also rely on how people perceive their speed of connection and cost, particularly when more detailed information about speed and cost are unavailable. Furthermore, some information is needed to identify the technologies used to access the internet. This type of information can be interpreted, with the help of relatively unspecialized staff, to clarify how aspects of speed, cost, and reliability can be changed either by the same technology or by upgrading to better technologies.

There are other types of data to be measured by users' perceptions. Aspects of trust in government and the desire to use mobile internet are of such type. These can be measured by other means as it is difficult to operationalize the aspects they represent. For the usage factor, it is measured through regular access to the internet

(daily, weekly, monthly) as it was found that about 50% of access was less than or equal to seven hours a week which means that some are presumably accessing the internet less than daily depending on the purpose of access.

The unavailability of proper local benchmarks, as mentioned earlier, makes it difficult to set the levels of some aspects such as internet penetration, training, professional skills, and security. Although international benchmarks can be found, still these are both directly applicable to Iraqi municipalities. In addition, for government offices, these aspects, for practical considerations, differ in the level each government organization needs. So, they are left to the judgment of the evaluator assessing e-readiness of the organization, who is expected to have at least a moderate knowledge of IT and the need of the organization.

For the assessment of the public, and for the same aspects of training, education, and internet penetration, the assessor should consult the Ministry of Planning for such percentages and then decide the level of the governorate. However, until now such information is not published by the organization responsible for such statistics, which is CoSIT (Center of Statistics and Information Technology).

Appendix C presents the assessment tool for both government organizations and the public. Guidelines are also presented to help guide the process, as well as score calculation methods to explain how scores are to be calculated and then added to form the final score of each assessment. Most of the measures are scored on a scale of five.

Scores for each aspect individually help to identify the level of improvement that each aspect needs. Although improvement should be continuous, high scores imply no urgent or current need of improvement.

Legislation and policies are measured based on the availability of these items, but cannot be assessed by considering them individually because, although there is clearly

a need for facilitating legislation and policies, it is difficult to define a master list of the requirements in this area. It is left to the assessor to identify the legislations and policies required to foster ICT in the environment of the country or the community. Action to be taken in this case depends on the item and the level of availability (available, under development, or unavailable). If it is available, then it should only be listed as such, but in case of under-development pressure should be exerted to give more power to the process. In case of unavailability, pressure should be placed on local Governorate Councils to attempt legislate such issue or turn this to the central legislative body. The same is valid for policies, although these involve primarily the executive branch, not the legislative.

The total score for the government offices can be combined to produce a score for all government offices in a governorate for purposes of national benchmarking. The score of the public in each governorate can also be used in benchmarking the governorates nationally. However, the main purpose of such ranking remains the identification of issues of importance concerning e-readiness, so as to lead e-government projects to success.

5.3 Assessing the Tool

Using the criteria explained previously in the literature review for assessing the tool of measurement, the proposed tool should in principle be assessed with respect to several issues in order to confirm its validity for assessing e-readiness. However, in this preliminary study, the research has not been able to conduct such a comprehensive review due to lack of resources. The overall approach of developing a simple and readily applicable tools has been preferred, enabling the users to achieve an acceptable level of accuracy in the data generated, rather than developing a potentially more accurate tool but one more difficult to apply in the field. Interviewees

were consulted to collect their opinions on the issues to consider in assessing the e-readiness measurement tool.

These issues to consider are:

- **Cost**

Cost is reduced by developing a tool that does not require facilitators and that relies on questionnaires that can be easily completed by the sample members.. In this case, it is only the cost of paper used for the process, and the cost of moving to internet cafes to distribute questionnaires. The same applies to government assessment. If the assessment was for one government organization, then it is only the paper that costs.

- **Availability of data**

The sources of data for assessment comes from sources such as internet café administrators, internet café users, government employees, IT staff in government offices, and some government offices such as the tax office in the governorate. All of these sources are expected to be moderately easy to access and get data from, although it might takes some time to collect data from the public. Ifthe assessment is conducted by a government office, then some of the relevant offices, such as the tax authority, should not be difficult to access, but in case of a non-government conductor of the assessment, then help from a government office will be needed to arrange for such access.

- **Training on using the tool**

The tool is easy to use and quite straightforward with clear guidance for implementation provided. Some limited explanation is required for internet café owners to enable them to answer the users' questions, if any. In government offices, the same level of explanation should be provided to ensure clear understanding of the questions.

- **Ease of administration, scoring, and analysis**

The tool, being divided into questionnaires for each source of data, makes it easy to decide who is responsible for the process and to carry out what is needed. The scoring for each aspect is clear and describes levels clearly, with the documentation providing help in analyzing the aspects individually. The total score of each assessment provides clear bases for comparing different government organizations when intending to benchmark these organizations in the governorate. An exception to that is the scaling of some aspects where there is no clear reference available to measure against. . An example of that is the availability of training centers and how to decide whether these are low, moderate, or high if compared to the population of the governorate.

- **Time and effort required for respondents to complete measure**

A preliminary test was conducted to measure how long each questionnaire takes to be filled out completely. The questionnaire for internet users takes less than five minutes to be answered by each participant and for employees it takes much less than five minutes. However, the assessment form to be filled out by the one who carries out the field work may take an hour, considering the need to calculate some data taken from users' or employees' questionnaires or even preparing some data from other organizations. The latter may require calling them or asking for information officially by corresponding with these offices. In the latter case, this generally implies waiting for several days before getting the information needed.

- **Reliability**

The tool is simple and measures most individual aspects directly. Most of the questions ask for characteristics that are likely to generate the same answers if a given

participant is asked again about the same issue, although this was not tested directly. This provides replicability of the same results when the assessment is used again and again. However, there remain certain aspects that rely on the perceptions and feelings of the respondent. In this case, unless the same conditions hold, the responses might differ. In general, the variations in responses to such aspects is not expected to have a great affect on the final result as these aspects are originated from the same conditions that lay the same shadow on the local public of the same culture and then generate similar response when collecting data from different participants. When changes take place, over time, responses are expected to be consistent from different participants considering the variations in their individual characteristics.

Most of the aspects were checked for internal consistency by providing more than one question in different forms to verify reliability of response.

However, the tool, as a whole, should be tested for reliability using test-pretest technique or/and using inter-rater consistency check to further check reliability. These practices were difficult to apply during the study period due to limited time and resources..

- **Validity**

  The assessment tool is valid when the data collected accurately reflects what the tool seeks to measure. The tool developed includes items that comprise the relevant content domain based on discussions with specialists. Through “face” validity, the tool would appear to measure what it is meant to measure. However, this is a subjective judgment and the tool needs to be tested for construct validity and criterion-related validity. For construct validity, it would appear that using factor analysis is a useful way of describing the factor structure, determining factors based on which items correlate highly to each other and at the same time

have low correlation to items that measure different concepts. The criterion-related validity requires the availability of another tool for the same purpose to prove concurrent and predictive validity of the tool. It was difficult to find such a tool to run comparison with, and it was also difficult to conduct the type of analysis needed using factor analysis to prove validity of these last two types.

5.4 Limitations of the Study

During the period of the research some obstacles arose for several reasons. The methodology of this research imposes a lot of difficulties itself as it is based on interacting with people to extract data, an unfamiliar process to most Iraqis. The place where the research was conducted also imposed some limitations and added to the difficulties of getting primary data. Some of these limitations were:

- Weak response: Some internet café owners refused to participate in the survey and those who accepted to distribute the questionnaire in their cafes did not take it seriously. They were not very active in distributing the questionnaires to their customers and moreover reported that a lot of internet users refused to answer the questions, seeing it as a waste of time. Moreover, the research assistants found it improper to ask owners to allow them to stay at their cafes and try to interview their customers directly as individuals or in groups. This was inferred from some indirect hints of the owners. So, it took much longer than planned and expected to collect the data, more than eight weeks to get 70 responses in Nasiriah and 47 in Kerbala.
- Weak assistance: As the research had to be conducted remotely with the assistance of friends and relatives, who were not necessarily acquainted with the topic, there were problems of weak coordination to reach interviewees and this wasted time and resulted in weak documentation of the research process

and some loss of detail. For example, the number of computers in each of the cafés was not recorded accurately and internet speed at some internet cafes was not recorded.

- It was difficult to distribute questionnaires to the government employees in Kerbala governorate as it was difficult to access government agencies without having contacts in the city to facilitate such access.

6 Implications

This research covers only the first two stages in the evolution of e-government, information dissemination and interaction. Although these first two stages have the simplest needs and requirement to fulfill, it is still complicated to exactly identify all aspects defining e-readiness of a community, to measure them precisely and accurately, and then to control these aspects to increase the chances of successful e-government systems. Throughout this study several experiences and lessons were learnt which should be considered in studying the issues facing e-readiness in Iraqi municipalities and attempting to measure this e-readiness.

6.1 Data availability and appropriateness

The first impression is the difficulty of collecting data from the community. There were technical difficulties such as the low participation of internet users which extended the time needed for reaching the designed sample. In addition, it was also difficult to arrange for meeting specialists or appropriate officials.. These two, users and specialists, are both primary sources of data without which it is almost impossible to find usable data, as secondary data are not available in almost all cases.

Practical difficulties were present whenever it comes to measuring issues abstract in nature such as trust or political will. These factors are intangible and difficult to represent on a scale of discrete levels. However, operationalization of such factors can be done to approximate a measurement of people's perceptions on these issues. This would provide an indication of the level of these issues at the moment and in the environment of the assessment.

Another practical issue is the lack of proper benchmarks or references to decide the right levels on the scale of measurement that reflect the uniqueness of the situation

of Iraqi municipalities. As mentioned before, there is a lack of measurements for levels of services applicable to municipalities in developing countries. A further reason for the absence of references is that no clear studies are available in Iraq showing the link between, for example, the number of training centers in a governorate and the population. Officials can only say that such percentage is very low in Baghdad, therefore it is very much lower in governorates. There is no clear basis for determining what constitutes low, acceptable or high for this issue. The same applies for the education factor and for internet penetration. Although some of these can be compared to international figures, the situation of Iraq as a country cannot be compared to the municipality level. Announced national levels in international assessments are inaccurate and very low (0.14% for internet penetration according to UN report 2008) as Iraqi officials claim, and the levels provided by Iraqis are only estimates and vary widely in range (20% to 40% in Baghdad as stated by the SCIS interviewee, for example). This signals the need to identify the actual national levels and to link these levels to the scale of the target community.

Legislation and policy information is available but in a somewhat puzzling manner. When some officials responded to a question asking about legislation, the first answer would be that, "We are working now on the law of cyber crimes and the law of E-signature". This response seems out of balance with the overall state of internet use. Some urgent laws are left behind and the focus is on e-signature. Thus information on the regulatory environment is available, but confusing.

Data availability is an issue that should decide what assessment tools should be used and how to approach finding the required data. Until real and reliable data become available, some of the collected data will rely on the perceptions of people, whether users, employees, or the one who is responsible for the assessment.

This would make it difficult for the assessor to provide a definitive result, but with the help of people of some knowledge this can be solved by providing relatively acceptable information until accurate data and references are made available. In fact, this process could lead to establishment of good references after experience accumulates over several repeated assessments over time.

6.2 Improvements to the tool

The option chosen for the currently proposed assessment tool is to go with simplicity rather than sophistication. This is due to basic levels of provision and considerations mentioned above. However, the situation is changing rapidly. Internet penetrations is increasing notably at households through wireless connections by local providers, and the State Company for Internet Service is offering some services at the moment and promising better services in the future. So, continuous developments and enhancements should be incorporated in the assessment. New levels should be identified and new aspects should be added. For example, levels of speed and availability should be raised in the future and security consideration should be added thoroughly to the investigation. New and higher professional skills should also be incorporated in detail for government offices. The government is employing new and more sophisticated systems in central ministries and planning to extend these services to the governorates. Central ministries are planning to connect their offices in the governorates in unified systems and databases. All these updates should be considered when further developing the assessment tool.

The sample used in this research proved to provide limited insights on the users of the internet. Some aspects such as privacy and security concerns were not entirely clear. This may be due to the size of the current sample and the places targeted for data collection. A better sample would include users in households as their number is

increasing. Other potential users of the internet in other places should also be included. Students and staff of universities and schools, people in the private sector and non-government organizations might provide a better and more holistic picture of internet use and potential use of e-services.

For government offices, it is not necessary to rely on a sample of several government offices. Rather, the assessment can be conducted in every government organization in the governorate as has been done many times for other purposes.

Improving the tool means also improving the collection of data to provide accurate and faster response. Meeting users in groups with the help of a facilitator will improve the response. Gathering officials of relevance and specialists might also provide better and insightful notes and even integrate more useful information.

In addition, organizational culture should be studied in a very detailed way to understand what obstacles face change brought by the new system and how change should be managed. Resistance inside government organizations can be a stick in the wheel for e-government programs, and unless it is addressed very well and solutions are suited to the reality of this environment this wheel is not expected to move.

There are more additional issues to consider in this regard such as the structure of offices, the position and role of ICT units inside them, and business processes and how suitable they are to be moved to the new system. It is a huge process of reform, and in order to control it we should measure it and decide where everything stands at the moment to plan well for its development.

Finally, incorporating all the above-mentioned considerations would most probably imply high cost, much greater need for information availability, a lot of training, difficulty of administration, and overall much greater efforts to be paid. However, if this was planned and implemented in the right way, it would most probably lead to a

more reliable and valid tool and then to credible results which would form a concrete base for a reform through ICT.

7 Conclusion

Concluding Remarks

In order to lead e-government programs to success, and then generate the desired value of such programs, e-readiness of a community should be measured to identify how ready it is to embrace this shift and make the best of it. Local governments in developing countries need this kind of measurement seriously as they have limited resources to employ in e-government programs.

This study was conducted in two governorates in south of Iraq, Thi-Qar and Kerbala, and it proposes a tool to measure e-readiness in municipalities. The argument for developing such a tool is the lack of local capacity at local levels and the sophistication of current e-readiness assessment tools which makes it even more difficult for municipal officials to measure local e-readiness. For these reasons, this tool was meant to be simple, easy to conduct, and provides good amount of information about several aspects of direct impact on e-readiness in these localities. Therefore, a framework of set of indicators is formed to use for assessing e-readiness in municipalities.

The data were collected from both users in internet cafes and from governmental offices and then analyzed statistically in addition to qualitative data collected from several interviews with specialists in the field of ICT. The result was a set of indicators that are expected to identify the most crucial aspects related to e-readiness in municipalities. The proposed indicators were categorized into three categories. These categories are: infrastructure, human resources, and government and management. According to the objectives of this study these indicators should

measure availability levels of e-readiness aspects only for the first two stages of e-government, information dissemination and interaction. This implies lower levels of availability for most of the indicators as it involves no higher level processes such as transaction which needs different levels of most of the aspects measured which can be developed in a later step in the future. However, rapid changes in the use of technology, even in Iraq, push to develop a tool for the purpose of measuring e-readiness for higher stages of e-government evolution.

Throughout the process of conducting the methodology, some difficulties appeared in collecting data using questionnaires from the public. That was much easier in government offices as the approval of directors was obtained. However, this hasn't provided a great opportunity to collect data as much as such study requires. So, availability and ease of access to data was, and will always be, a crucial point in conducting such assessments. This implies the importance of this factor, data availability, which should always be considered when designing and even using e-readiness assessment tools.

Findings from interviewing specialists confirm the need to a simplified and easy to use tool providing sufficient level of information rather than a sophisticated one with huge amount of data with high accuracy. This is the core argument of this study. It is enabling officials at the local governments to assess e-readiness without needing high expertise in this field. For that reason, the tool was designed to collect basic and important data that impact e-readiness directly and at the same time is available, accessible, and collectable by a tool that meets the conditions of low cost, ease of use and administration, and almost no training needed to facilitate the assessment. However, there are aspects that were found to be difficult to measure. Trust, willingness (political will) are such aspects as they are difficult to operationalize and

then measure. So, measurement of these aspects relies on the perceptions of users, employees or the one who conducts the assessment. Relying on judgment or perception may sometimes provide delusional results, but it can also provide some useful impressions to use in assessment.

Finally, the tool was designed in a way that provides scores for each of the aspects to identify the level of availability of that aspect and then assessor can identify what needs improvement and to what level he desires. In addition, a total score can be obtained from summing up all scores of all aspects and then can be used for the purpose of benchmarking by comparing different governorates scores or even different government agencies inside the governorate.

Just as was stated in the literature, throughout this study, e-readiness has proven to be a complex and multi faceted concept as it involves, in most of its parts, issues related to communities and their different entities which means a whole life should be defined and measured using sets of numbers and tables, and what a difficult task is this. However, efforts should always persist on attempting to simplify these life aspects to make it easier to measure and then build upon to provide tools that aim development of life itself.

Future inspirations

In order to further develop the field of e-readiness assessment in municipalities, future studies can add to this field through the following considerations:

- Studies should look to include other aspects related to e-readiness and may improve the way e-readiness is measured.
- Studying the relationships between aspects to include that effect in a comprehensive model of e-readiness for municipalities.

- Consider new changes and updates that are taking place rapidly in municipalities, and covering higher stages of e-government (transaction and integration)
- Dedicated studies should focus on issues of trust and political will for their relative ambiguity, and policies and legal framework for their huge impact on e-readiness when moving forward in provision of services and when transferring to transactional services and when starting to integrate e-government within the system.

Appendix A.

A list of international e-readiness assessment tools and indicators.

NO.	Model	INDICATOR	Category according to the model
1	**CID**	Availability	
2	**CID**	speed	
3	**CID**	quality of network access	
4	**CID**	use of ICT in schools, workplace, economy, government, and everyday life	
5	**CID**	ICT policy	
6	**CID**	ICT training programs	
7	**CID**	diversity of organizations	
8	**CID**	relevant content online	
9	**APEC**	speed	Infrastructure
10	**APEC**	pricing	Infrastructure
11	**APEC**	access	Infrastructure
12	**APEC**	market competition	Infrastructure
13	**APEC**	industry standards	Infrastructure
14	**APEC**	foreign investment	Infrastructure
15	**APEC**	bandwidth	Access to network services
16	**APEC**	industry diversity	Access to network services
17	**APEC**	export controls	Access to network services
18	**APEC**	credit card regulation	Access to network services
19	**APEC**	internet use in business	Internet use
20	**APEC**	internet use in government	Internet use
21	**APEC**	internet use in homes	Internet use
22	**APEC**	industry led standards	promotion and facilitation
23	**APEC**	ICT education	skills and human resources

24	**APEC**	Workforce	skills and human resources
25	**APEC**	taxes and tariffs	position for the digital economy
26	**APEC**	industry self-regulation	position for the digital economy
27	**APEC**	government regulations	position for the digital economy
28	**APEC**	consumer trust	position for the digital economy
29	**CSPP**	prevalence and integration of ICT in homes	
30	**CSPP**	prevalence and integration of ICT in schools	
31	**CSPP**	prevalence and integration of ICT in businesses	
32	**CSPP**	prevalence and integration of ICT in health care facilities	
33	**CSPP**	prevalence and integration of ICT in government offices	
34	**CSPP**	competition among access providers	
35	**CSPP**	speed of access	
36	**CSPP**	government policy	
37	**ITU Mosaic**	ICT infrastructure	
38	**ITU**	use of ICT	
39	**ITU**	legal and regulaatory framework	
40	**ITU**	macroeconomic and local business environment	
41	**USAID**	Pipes (Access)	
42	**USAID**	public sector (gov policies,eGov)	
43	**USAID**	Private sector (usage)	
44	**USAID**	People (training)	
45	**USAID**	existing development programs	
46	**InfoDev**	uses CID	uses CID
47	**SIDA**	ICT infrastructure	uses CID
48	**SIDA**	use	
49	**SIDA**	human resources	

50	**SIDA**	legal and regulaatory framework	
51	**Asean**	e-society	
52	**Asean**	e-commerce	
53	**Asean**	e-government	
54	**Asean**	liberalizing trade in ICT goods and services and I/S	
55	**MI**	infrastructure	connectivity
56	**MI**	access	connectivity
57	**MI**	pricing	connectivity
58	**MI**	gov. policies and regulations	e-leadership
59	**MI**	intellectual property	information security
60	**MI**	privacy	information security
61	**MI**	electronic signatures	information security
62	**MI**	ICT education	Human capital
63	**MI**	available skilled workforce	Human capital
64	**MI**	competition	e-business climate
65	**MI**	political and financial stability	e-business climate
66	**MI**	foreign investment	e-business climate
67	**MI**	financial infrastructure	e-business climate
68	**WITSA**	barriers to technology industry	
69	**WITSA**	role of consumer trust	
70	**WITSA**	problems with e-commerce tech	
71	**WITSA**	internal business practices that support e-commerce	
72	**WITSA**	workforce problmes	
73	**WITSA**	taxes	
74	**WITSA**	public policy issues	
75	**WITSA**	resistance from consumers	

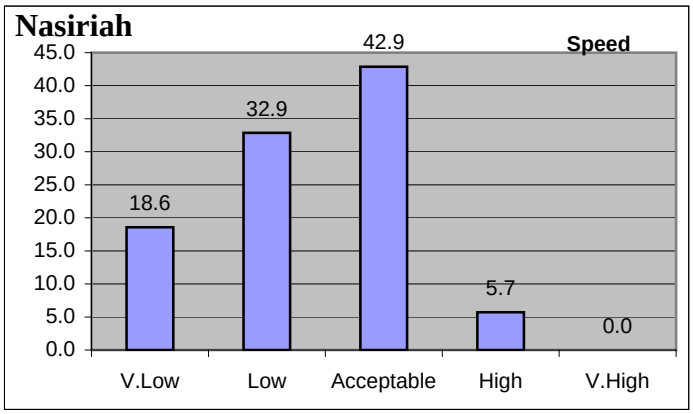
76	**C&R**	level of existing tech dev	Factors in ICT development
77	**C&R**	political openness	
78	**C&R**	democracy	
79	**C&R**	mass education	
80	**C&R**	presence of sizeable services sector	
81	**C&R**	teledensity	
82	**C&R**	foreign investment	
83	**C&R**	ethnic homogeneity	
84	**C&R**	sectoral inequality	
85	**C&R**	population density	
86	**C&R**	quantity of exports	
87	**C&R**	individual property rights	
88	**C&R**	local phone call costs	
89	**C&R**	global unrbanization	
90	**CIDCM**	economy	structural context
91	**CIDCM**	education levels	structural context
92	**CIDCM**	existing infrastructure	structural context
93	**CIDCM**	type of government	political structure and culture
94	**CIDCM**	policy making style	political structure and culture
95	**CIDCM**	relegion, etc	culturale norms
96	**CIDCM**	government	key player in internet development-responsibilites and objectives of relevant players
97	**CIDCM**	local and foreign business	key player in internet development-responsibilites and objectives of relevant players
98	**CIDCM**	universities	key player in internet development-responsibilites and objectives of relevant players

99	**CIDCM**	NGOs	key player in internet development-responsibilites and objectives of relevant players
100	**CIDCM**	international financial institutions	key player in internet development-responsibilites and objectives of relevant players
101	**CIDCM**	research groups	key player in internet development-responsibilites and objectives of relevant players
102	**CIDCM**	access	internet dev and ICT policy over time
103	**CIDCM**	regulation	internet dev and ICT policy over time
104	**CIDCM**	competition	internet dev and ICT policy over time
105	**CIDCM**	Negotiations between players in developing the country's internet	
106	**EIU**	connectivity	
107	**EIU**	business environment	
108	**EIU**	e-commerce consumerand business adoption	
109	**EIU**	legal and regulaatory framework	
110	**EIU**	supporting e-service	
111	**EIU**	social and cultural infrastructure	
112	**SIBIS**	telecommunication and access	areas of measurement of benchmarking
113	**SIBIS**	internet for research	
114	**SIBIS**	security and trust	
115	**SIBIS**	education	
116	**SIBIS**	work	
117	**SIBIS**	employment and skills	
118	**SIBIS**	social inclusion	
119	**SIBIS**	e-commerce	
120	**SIBIS**	e-government	

121	**SIBIS**	health and transport	
122	**Metric-Net**	it measures IT performance and productivity by organizations	
123	**Metric-Net**	IT spending by industry	
124	**KAM**		economic and institutional regime
125	**KAM**		educated and skilled population
126	**KAM**		dynamic information I/S
127	**KAM**		efficiend innovation system of firms, research centers, univs
128	**ISI**	There are 23 indicators under these categories	computer use
129	**ISI**		internet and e-commerce
130	**ISI**		telecommunication
131	**ISI**		social factors
132	**NRI**	1/3 market+1/3 political/regulatory factors + 1/3 I/S	environment for ICT
133	**NRI**	1/3 individual rdns + 1/3 bsns rdns +1/3 gvrmnt rdns	readiness of key stakeholders
134	**NRI**	1/3 individual use + 1/3 bsns use +1/3 gvrmnt use	actual use of ICT by stakeholders
135	**NRI**	total investment, infrastructure and traffic	
136	**World Bank**	competition	access and quality that allows for the GDP per capita
137	**World Bank**	rural needs	access and quality that allows for the GDP per capita
138	**World Bank**	small economies	access and quality that allows for the GDP per capita
139	**World Bank**	insititutional investor	access and quality that allows for the GDP per capita
140	**GI**	number of memeberships in international organizations	political engagment
141	**GI**	foreign embassies	political engagment
142	**GI**	hosted and instances of UN council mission participation	political engagment
143	**GI**	number of internet users	technology

144	**GI**	hosts and secure servers	technology
145	**GI**	international travel and tourism	personal contact
146	**GI**	international telephone traffic and cross border transfers	personal contact
147	**GI**	trade	economic integration
148	**GI**	FDI	economic integration
149	**GI**	portfolio capital flows	economic integration
150	**GI**	income payments and receipts	economic integration
151	**WTI**	population	
152	**WTI**	GDP	
153	**WTI**	total telephone subscribers	
154	**WTI**	telephone tarrifs	
155	**WTI**	cellular subscribers	
156	**WTI**	ISDN	
157	**WTI**	International telephone traffic	
158	**WTI**	telecommunication revenue	
159	**WTI**	equipment trade	
160	**WTI**	IT	
161	**WTI**	network growth	
162	**DAI**	there are 8 indicators under these 5 categories	availability of infrastructure
163	**DAI**		affordability of access
164	**DAI**		educational level
165	**DAI**		quality of ICT services
166	**DAI**		internet usage

Figure (1) Response to Speed of Internet



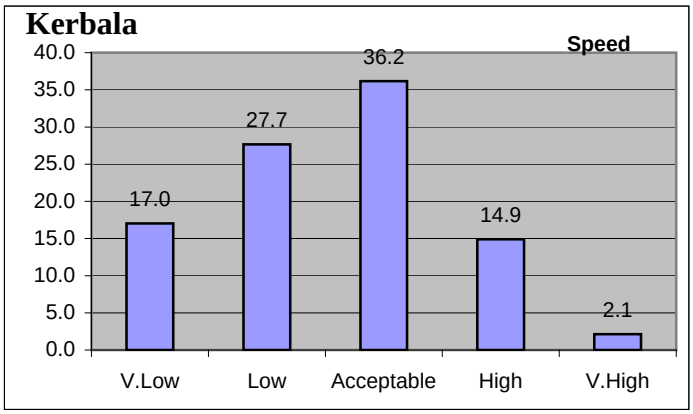
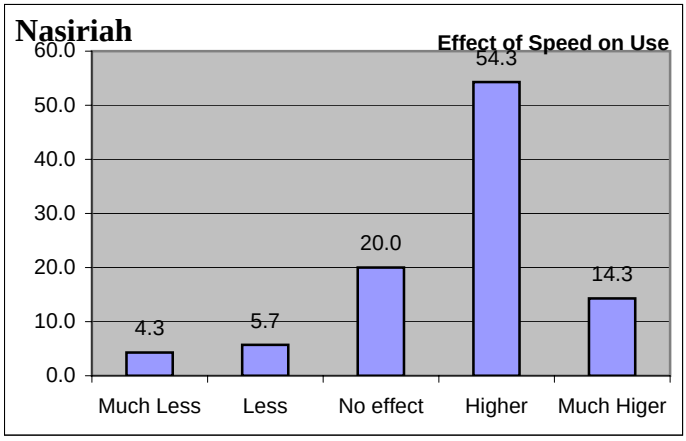


Figure (2) Effect of speed on use



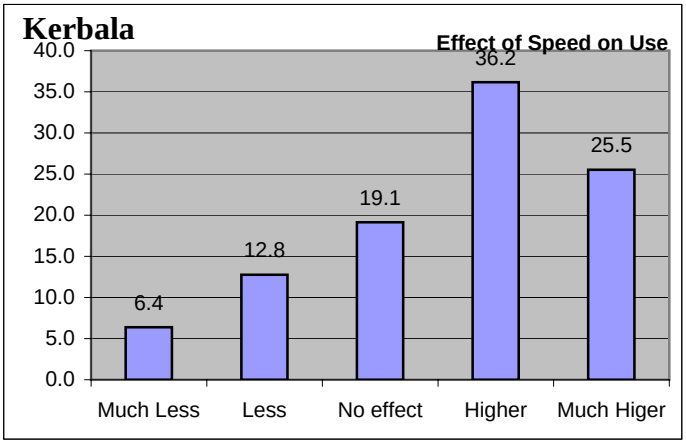
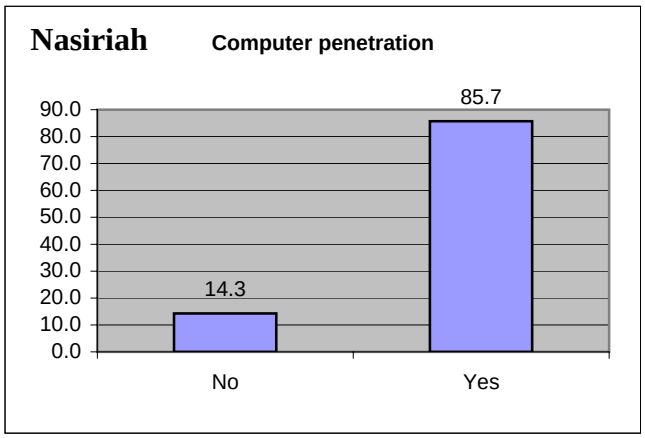


Figure (3) Computer at households



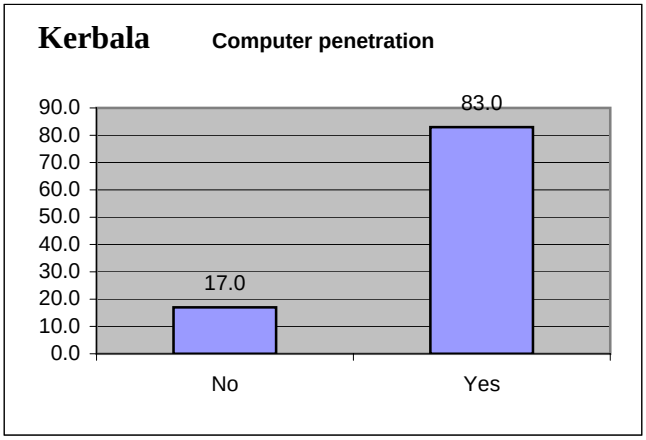
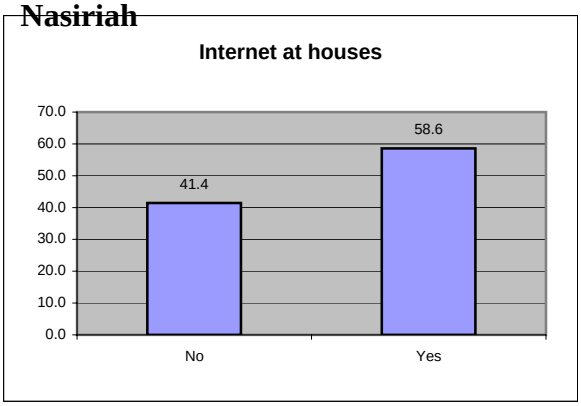


Figure (4) Internet at households

Nasiriah



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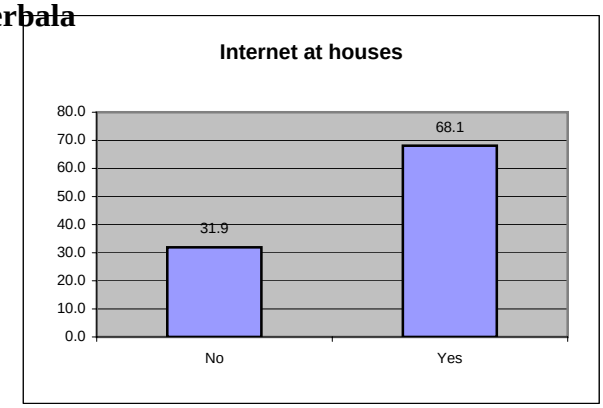
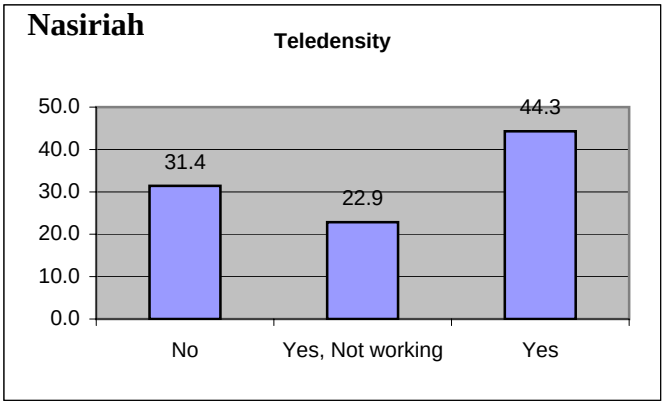


Figure (5) Land lines at householdes

Nasiriah



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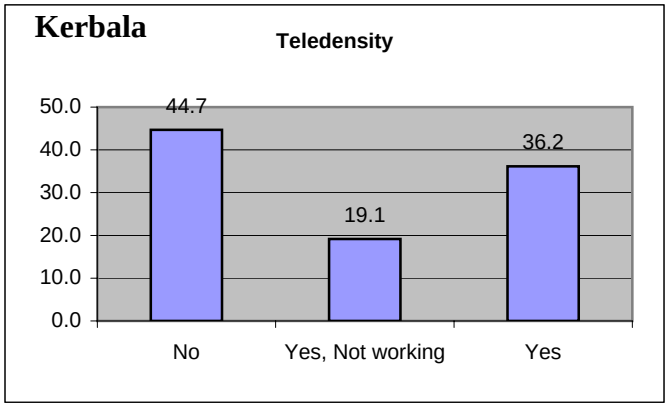
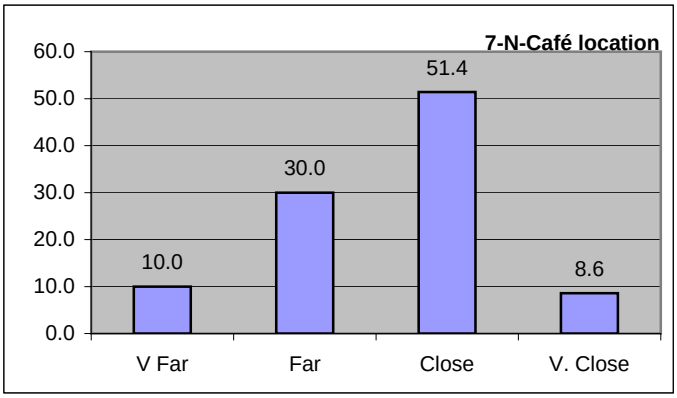


Figure (6) Internet Café location

Nasiriah



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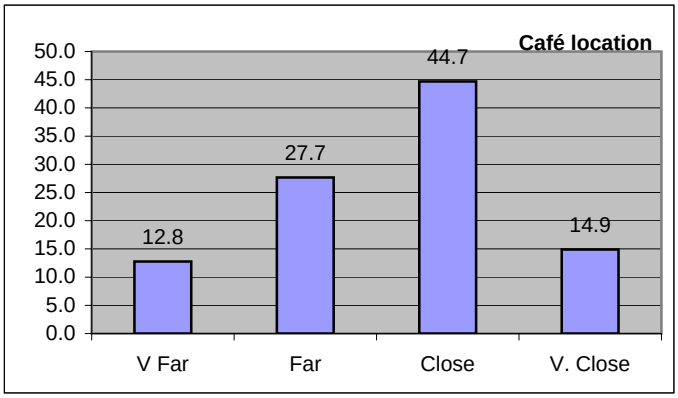
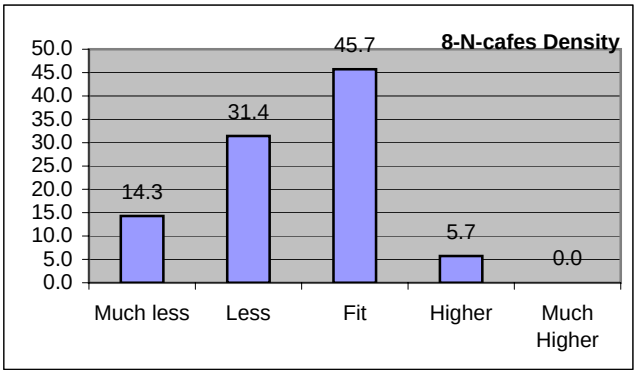


Figure (7) Internet café density

Nasiriah



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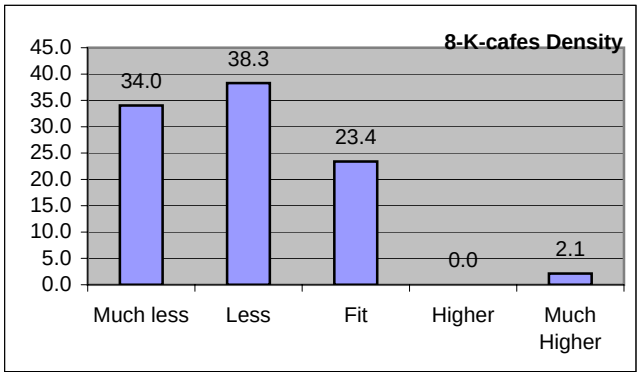
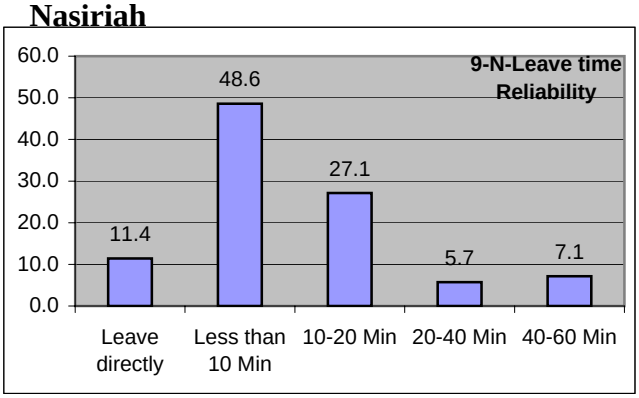


Figure (8)Time to wait before leaving after disconnection

Nasiriah



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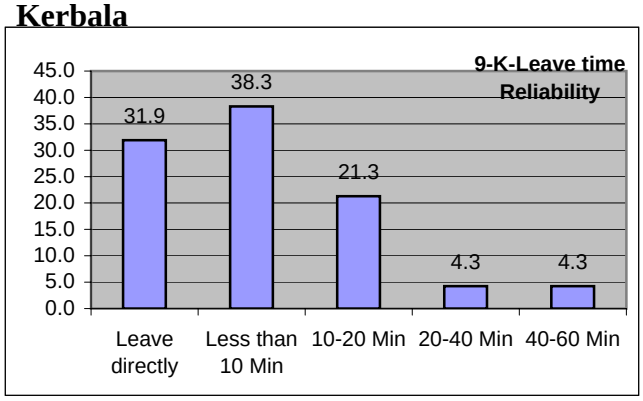

Figure (9) Number of disconnections

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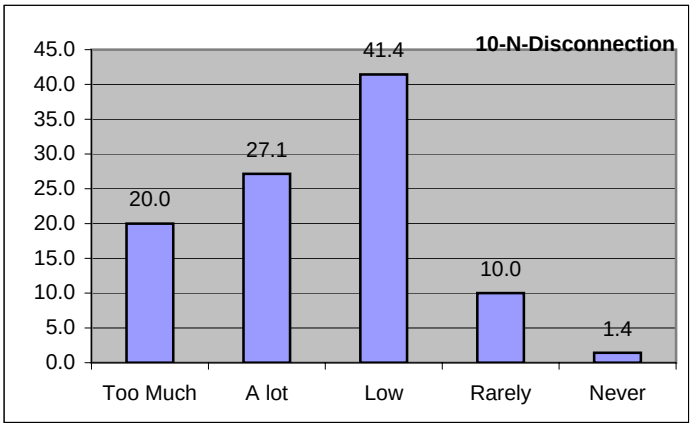

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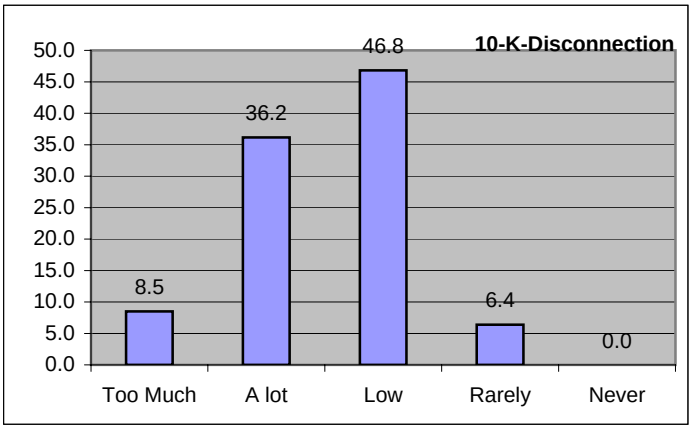

Figure (10) Cost of Internet

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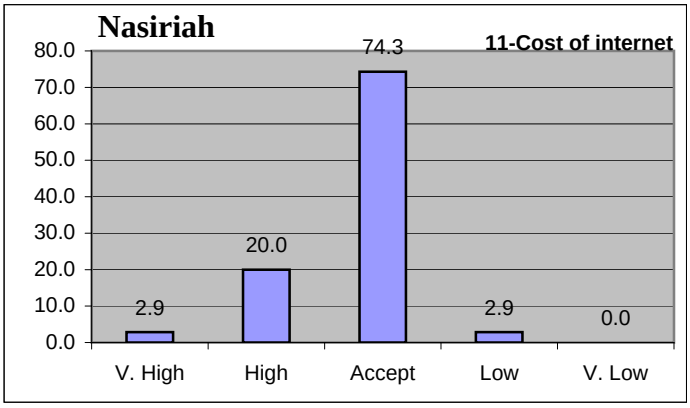

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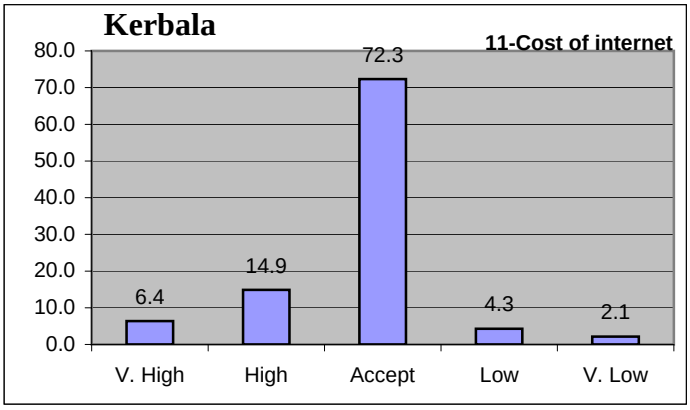
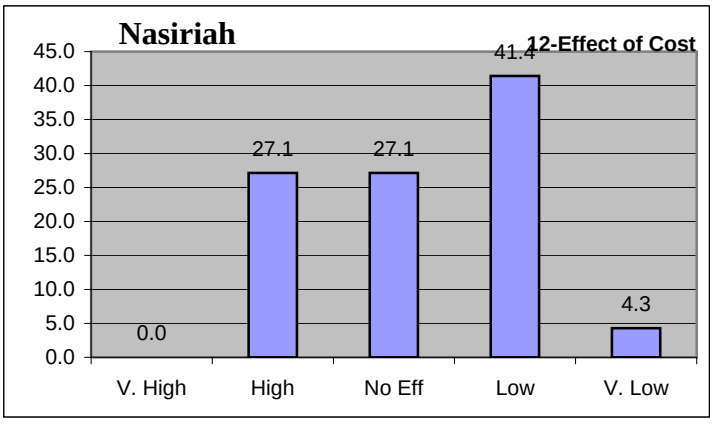


Figure (11) effect of cost on usage

Nasiriah



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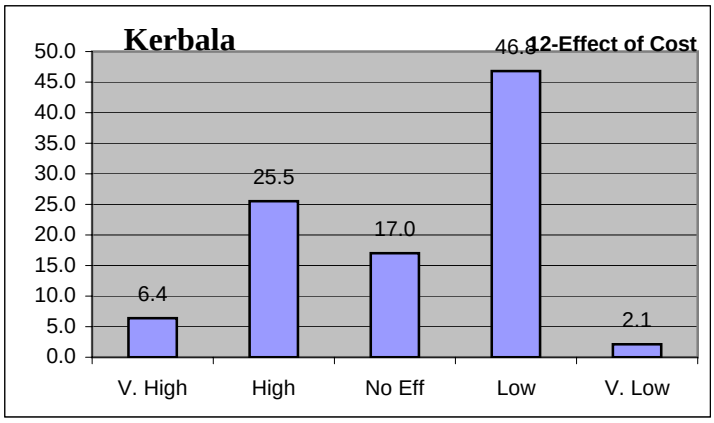
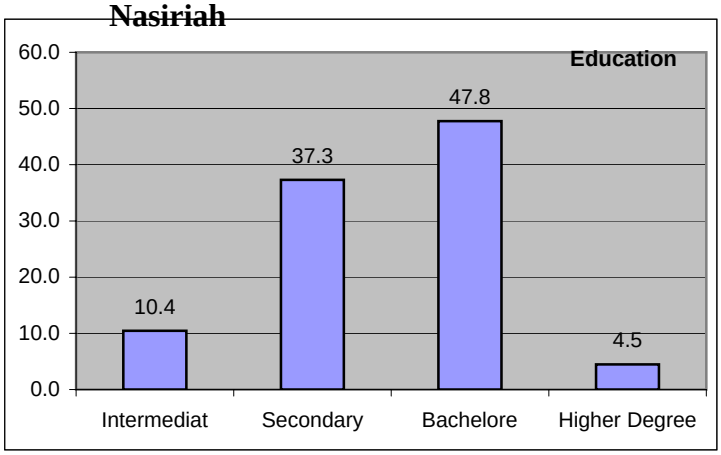


Figure (12) Education levels of users

Nasiriah



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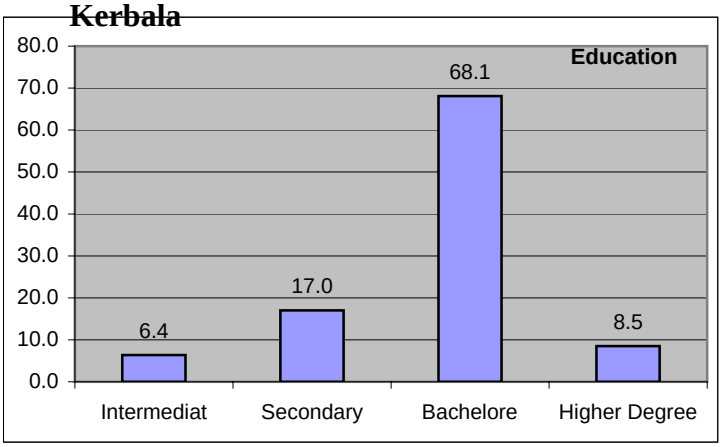
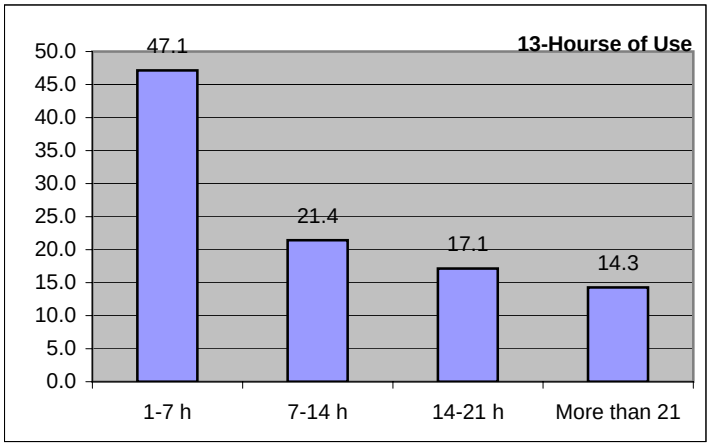


Figure (13) Weekly hours of use

Nasiriah



Kerbala

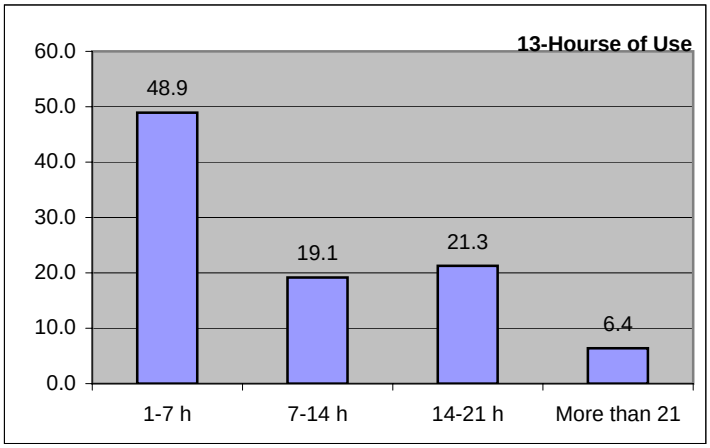
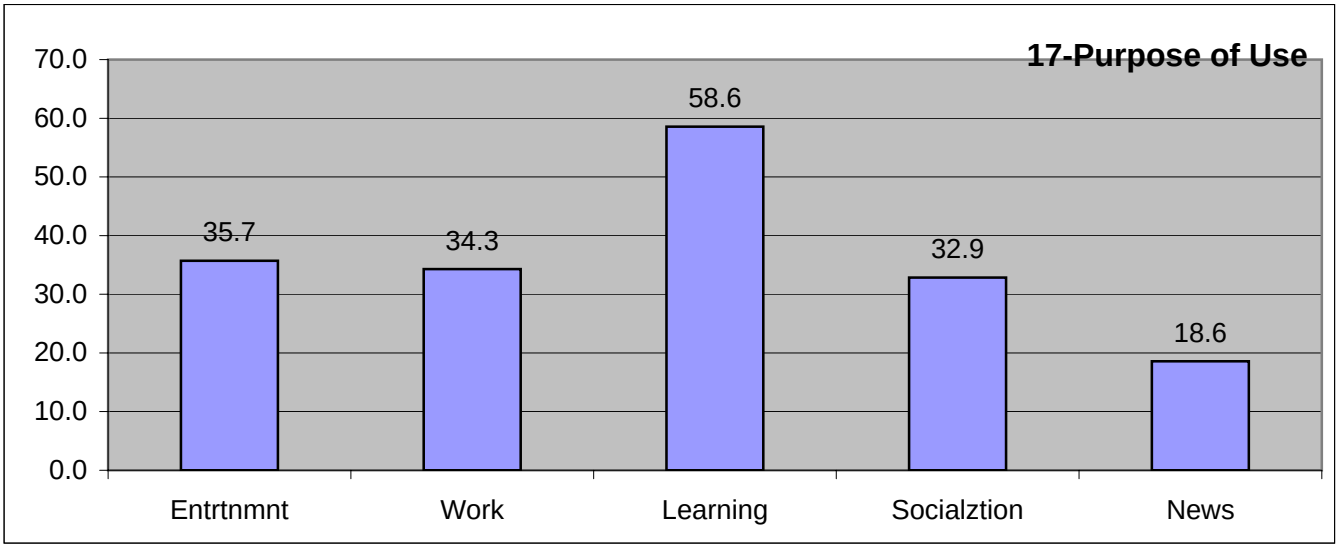


Figure (4) Purpose of Use

Nasiriah



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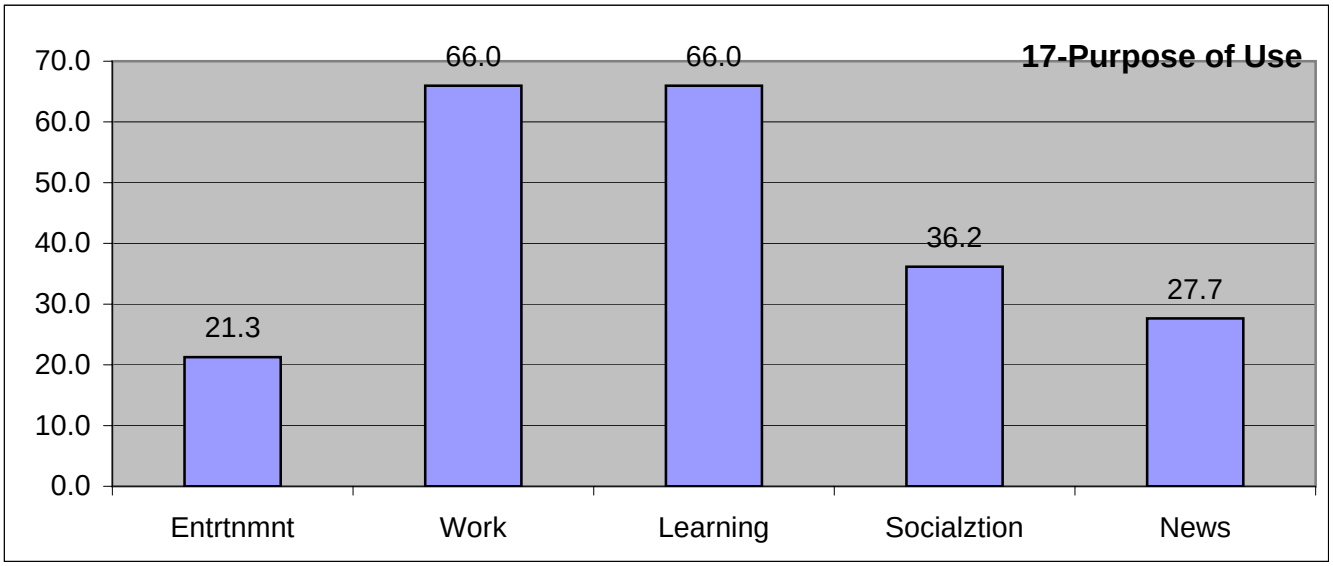
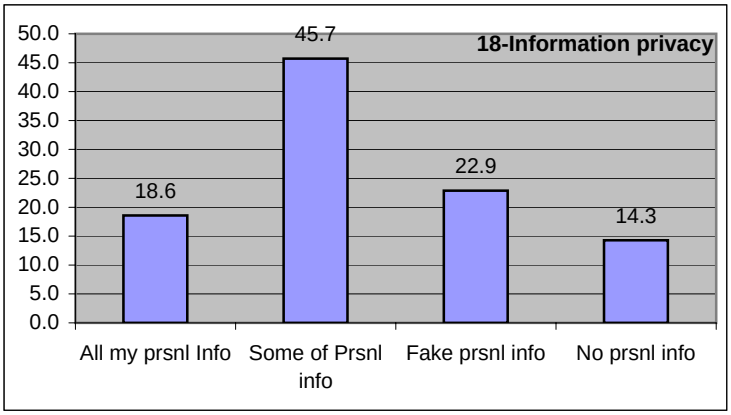


Figure (15) Information Privacy

Nasiriah



Kerbala

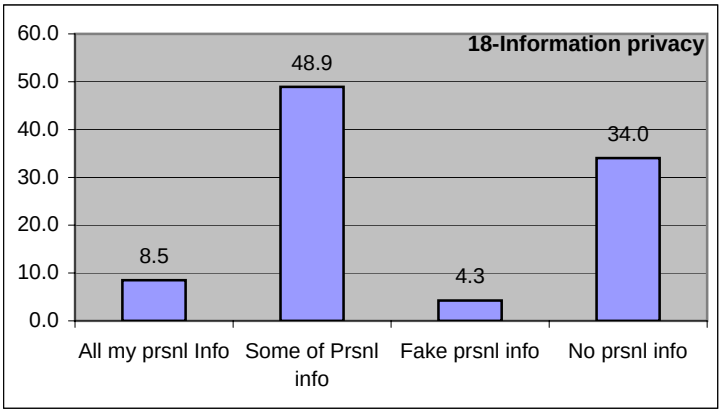
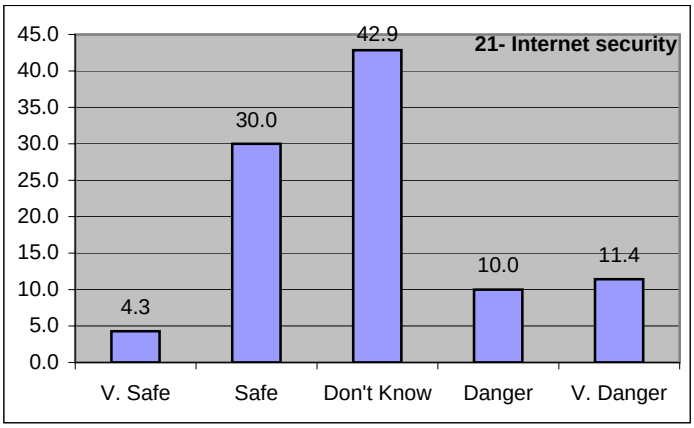


Figure (16) Internet safety

Nasiriah



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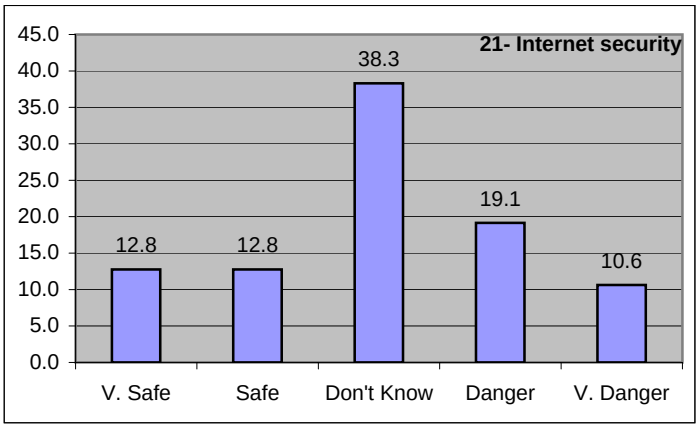
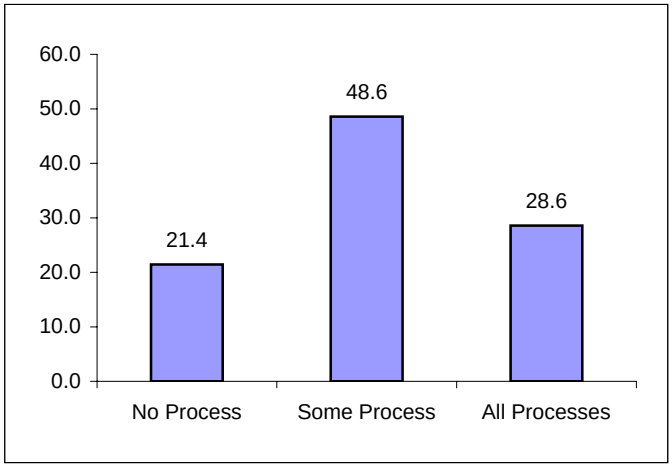


Figure (17) Processing online preference

Nasiriah



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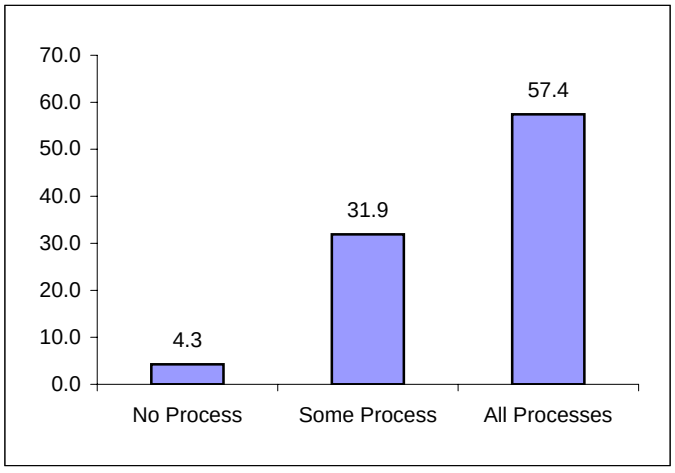
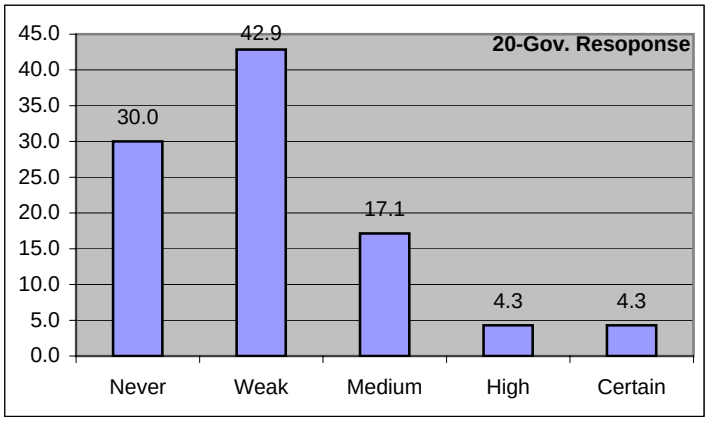


Figure (18) Government response to online requests

Nasiriah



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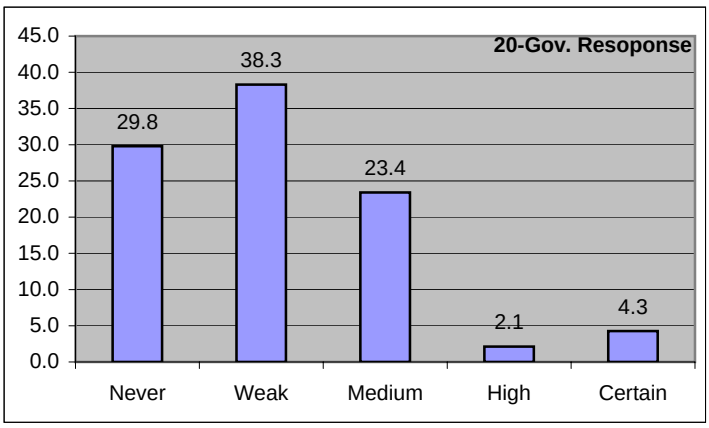
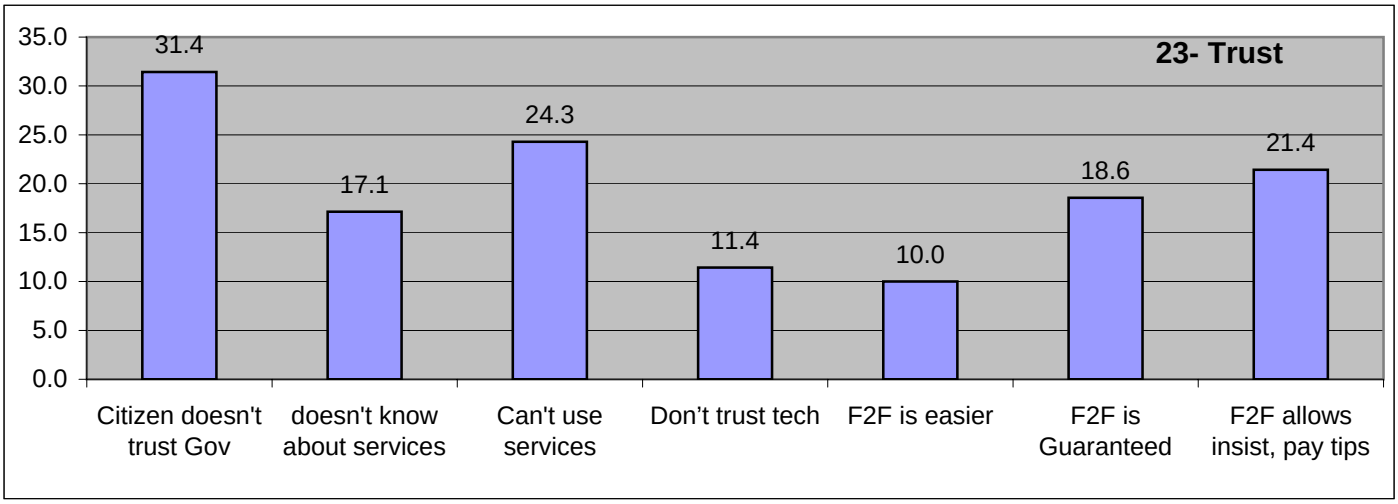


Figure (19) Causes of preference of Face to Face interaction with the government

Nasiriah



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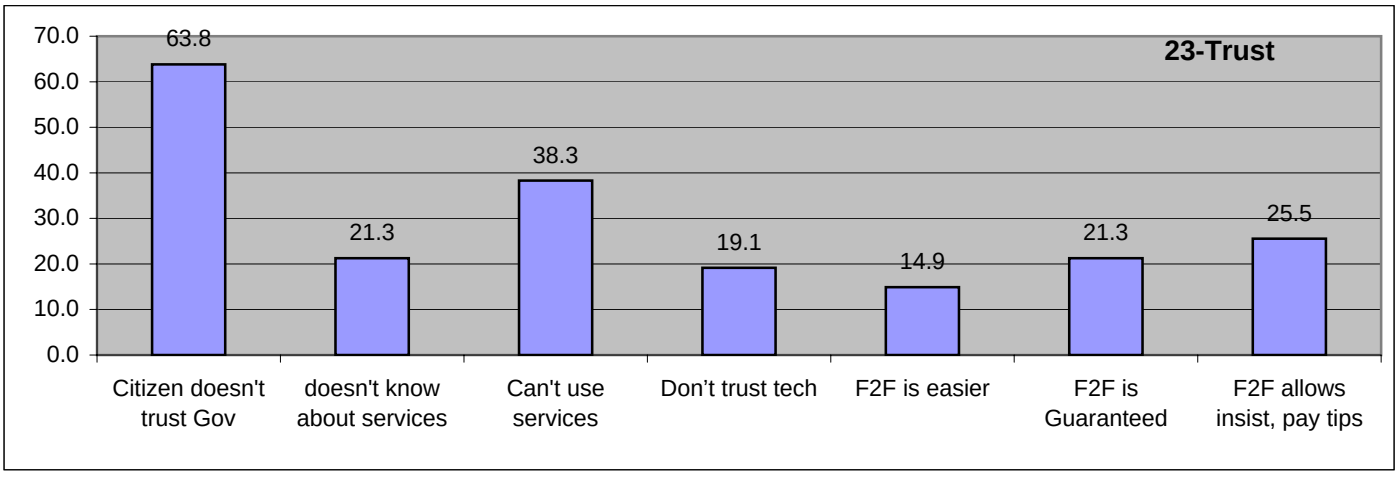
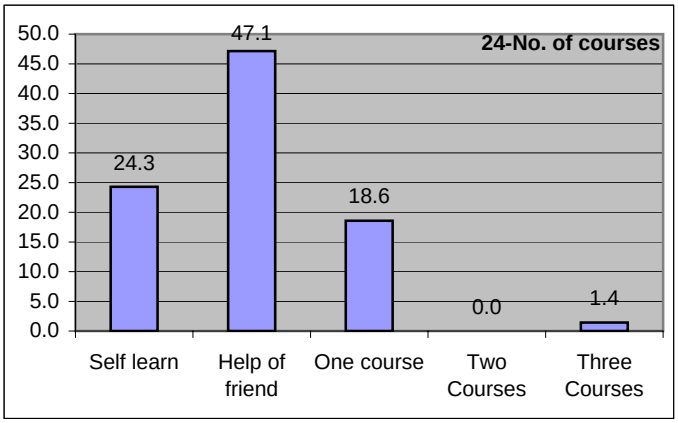


Figure (20) Source of user's skills

Nasiriah



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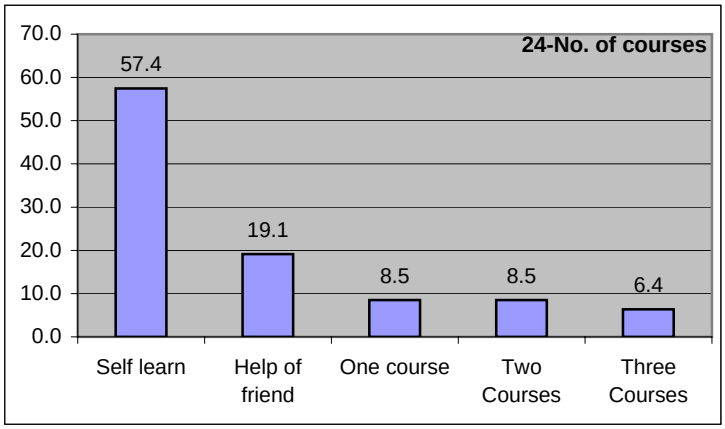
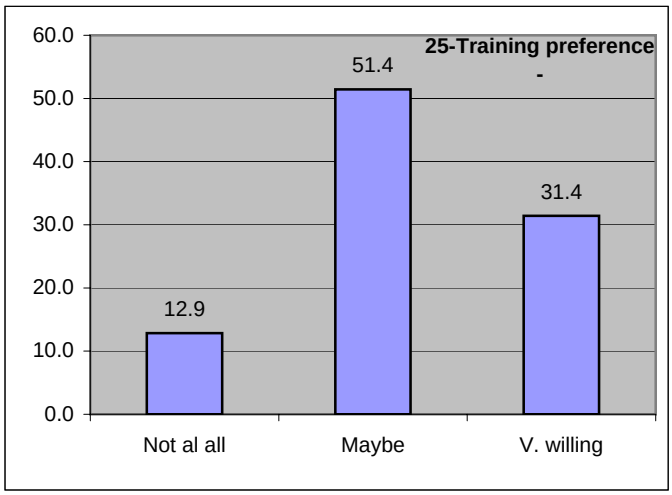


Figure (21) Desire to attend training

Nasiriah



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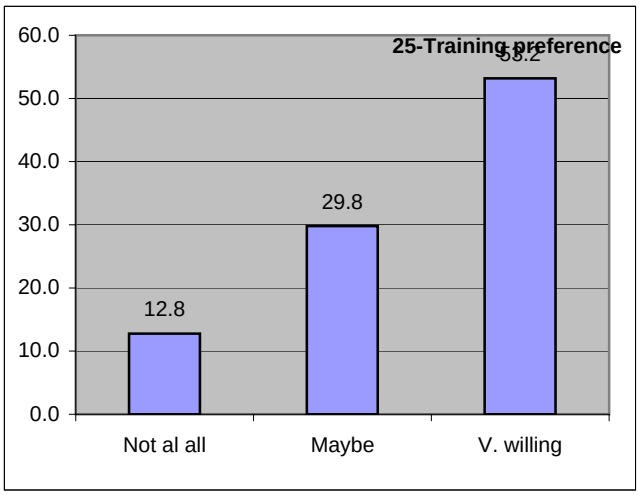
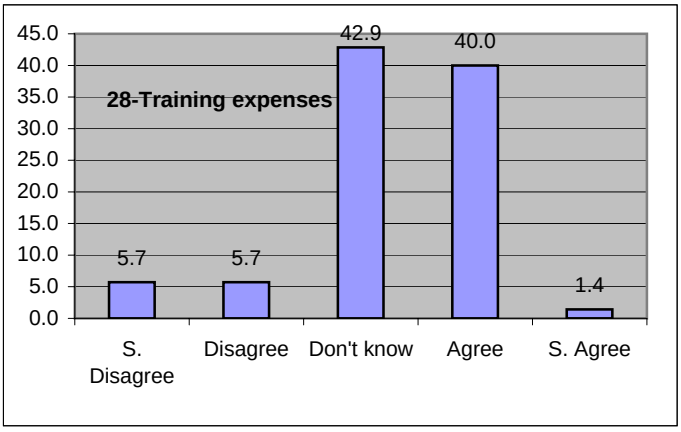


Figure (22) Allocating money for training

Nasiriah



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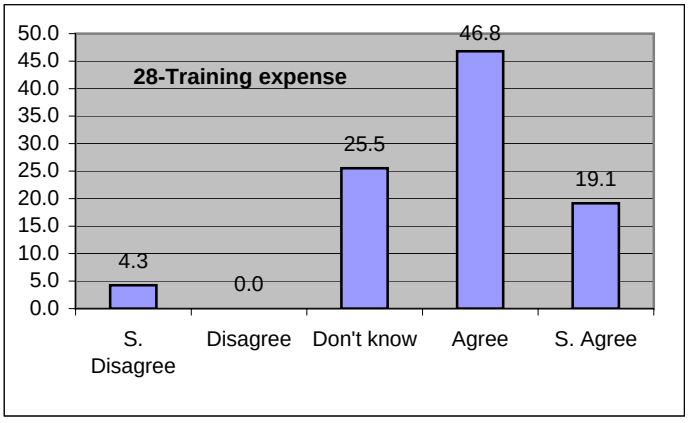
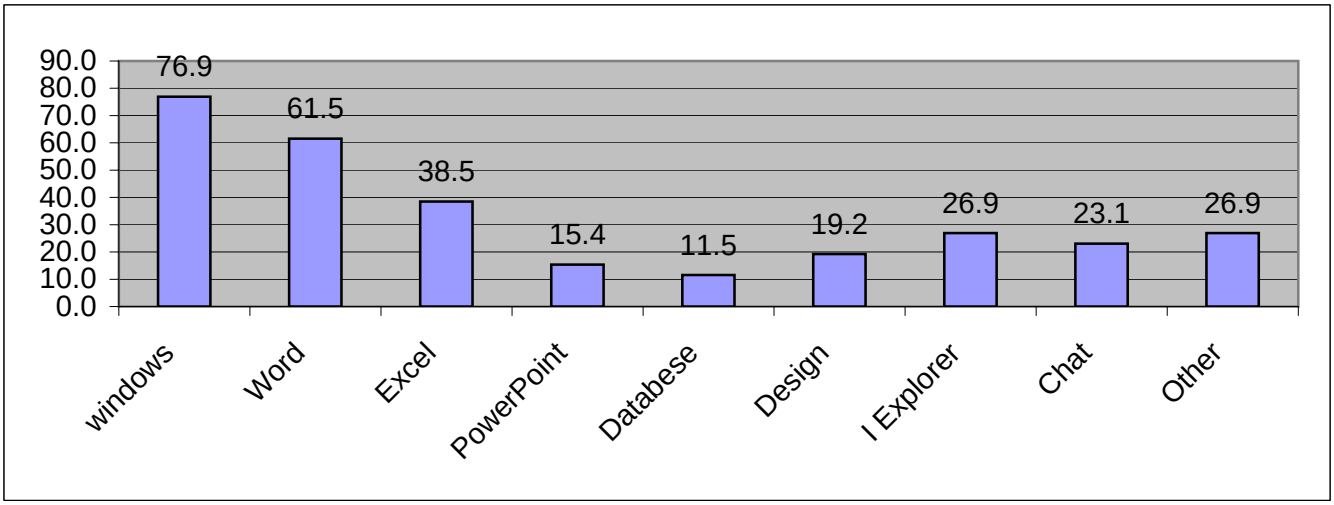
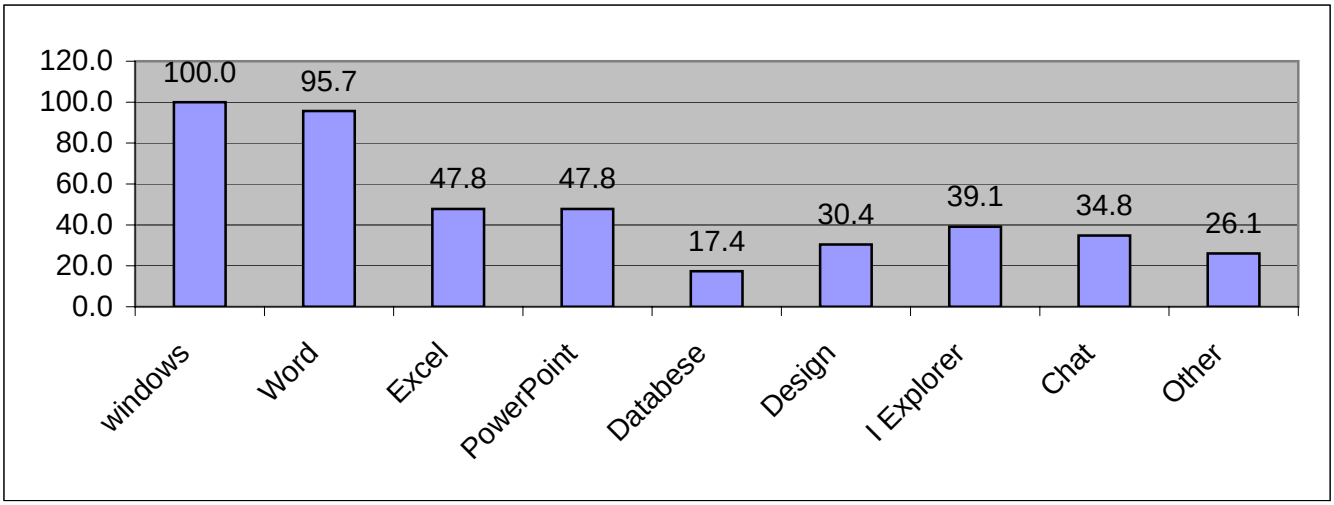


Figure (24) Softwares users know

Mail and Communication



Governorate Council



Roads and Bridges

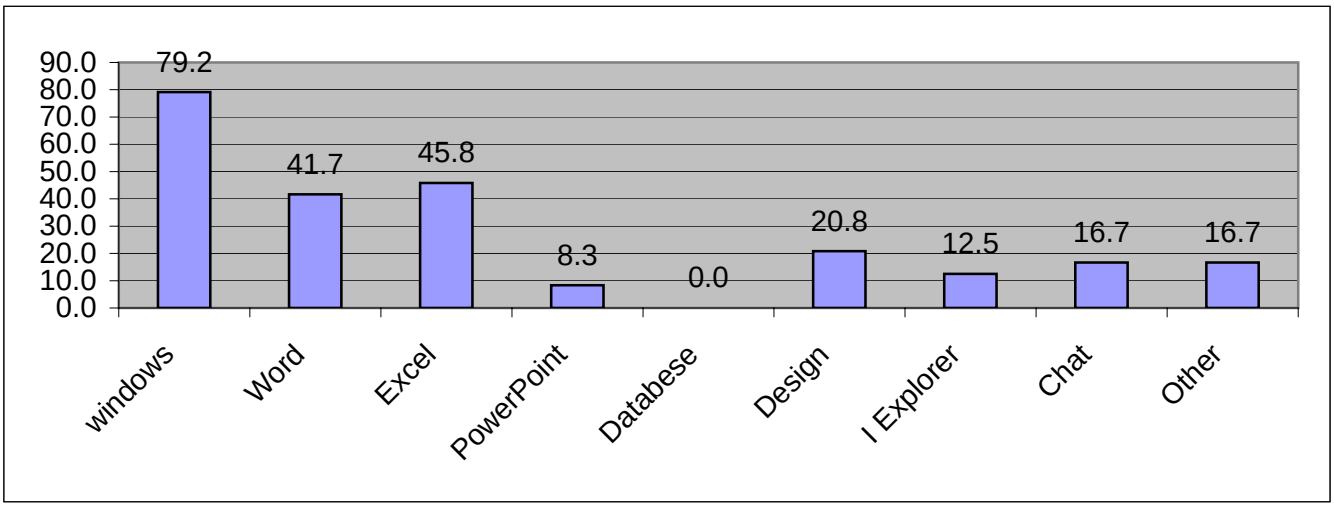
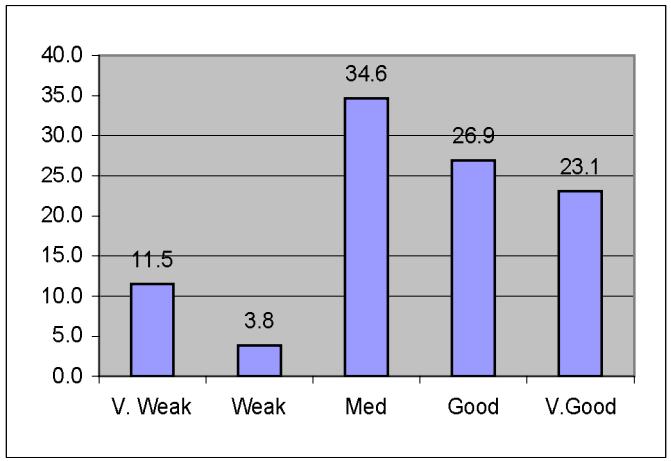
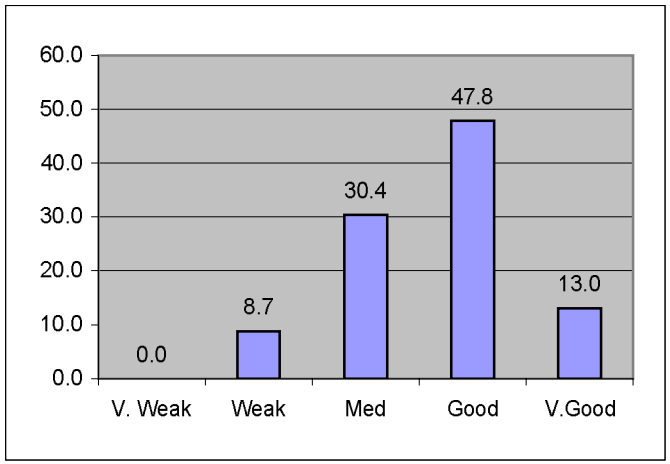


Figure (23) Computer Skills

Mail and Communication



Governorate Council



Roads and Bridges

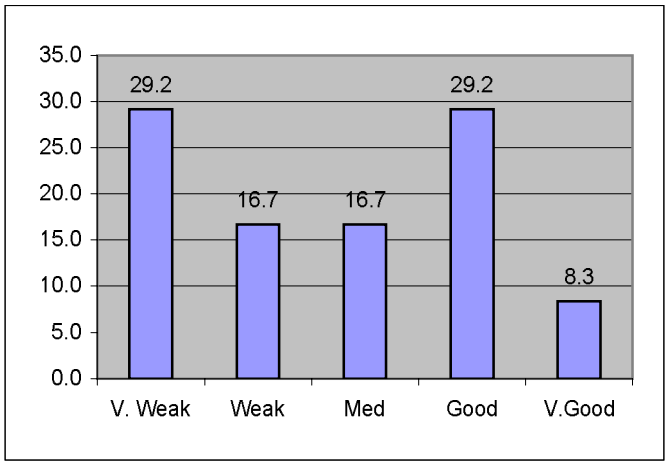
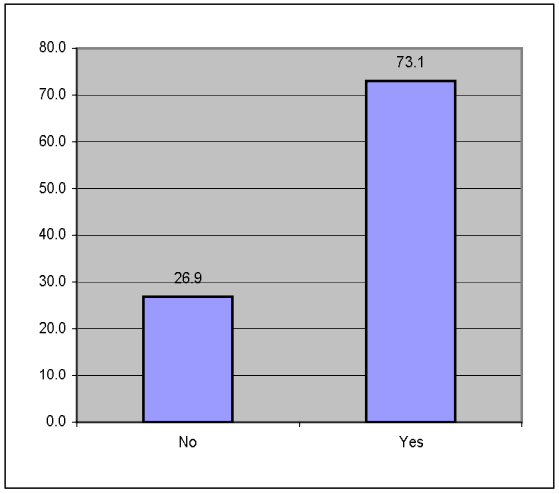
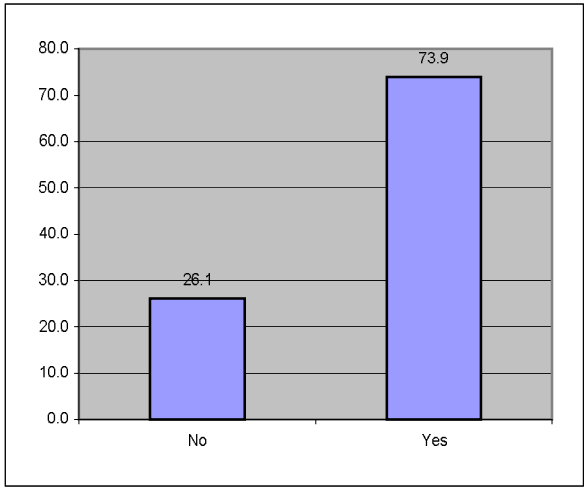


Figure (25) Computers at households

Mail and Communication



Governorate Council



Roads and Bridges

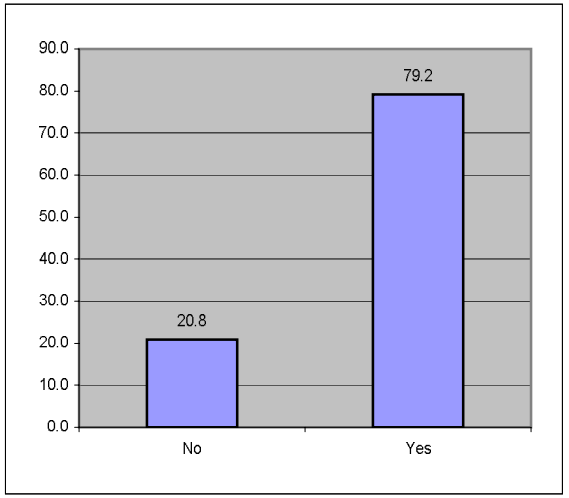
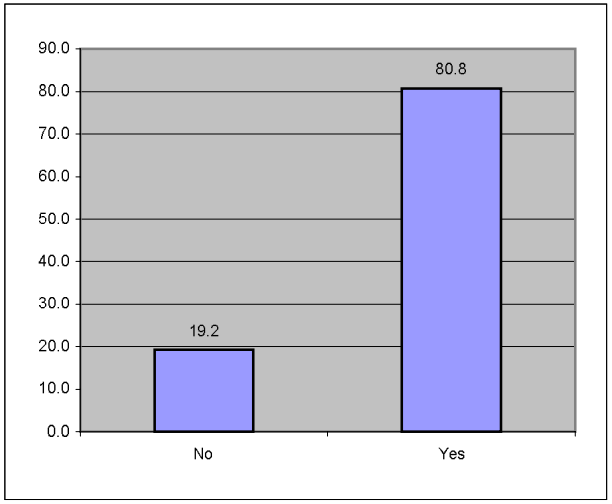


Figure (26) Computers at work

Mail and Communication



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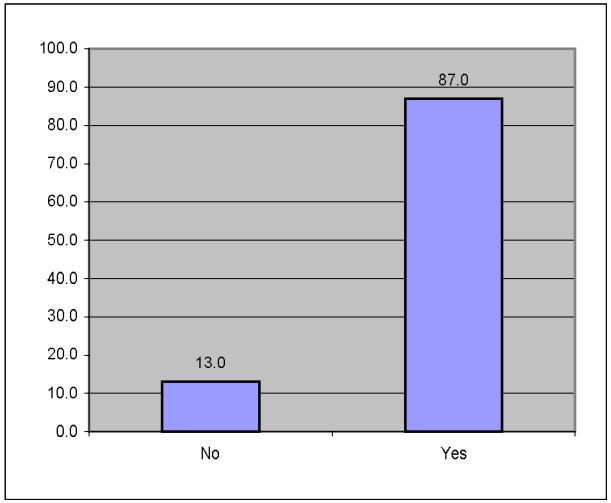


Roads and Bridges

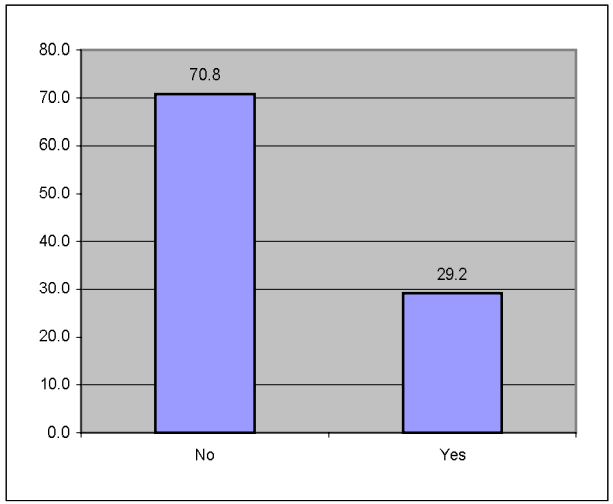
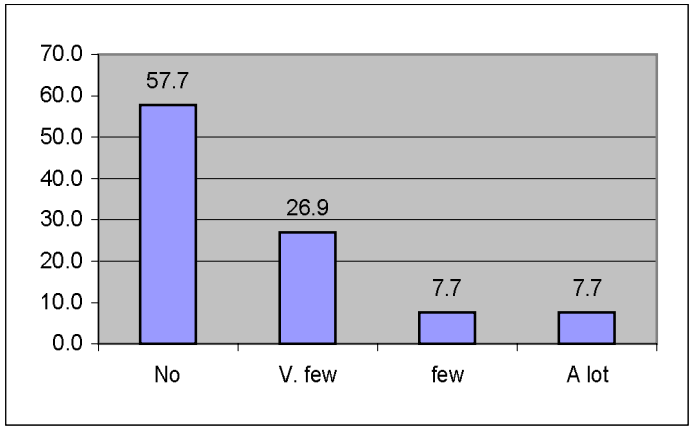
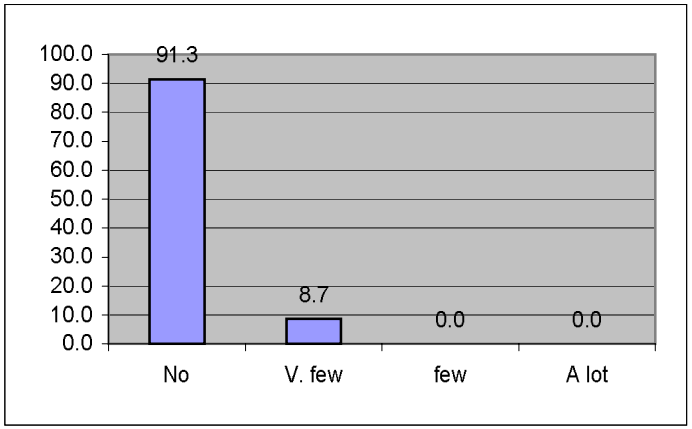


Figure (27) Training by Government

Mail and Communication



Governorate Council



Roads and Bridges

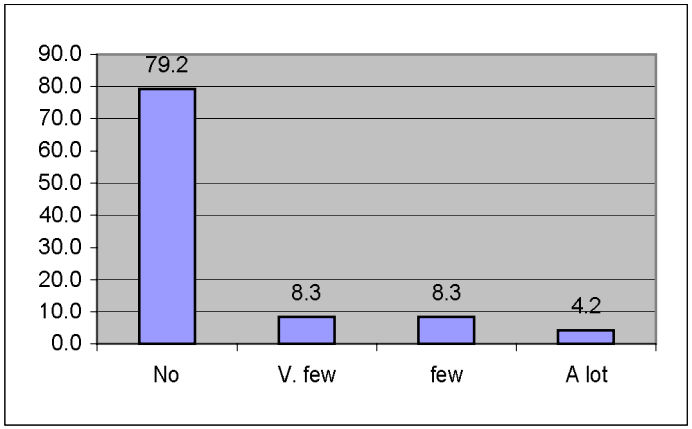
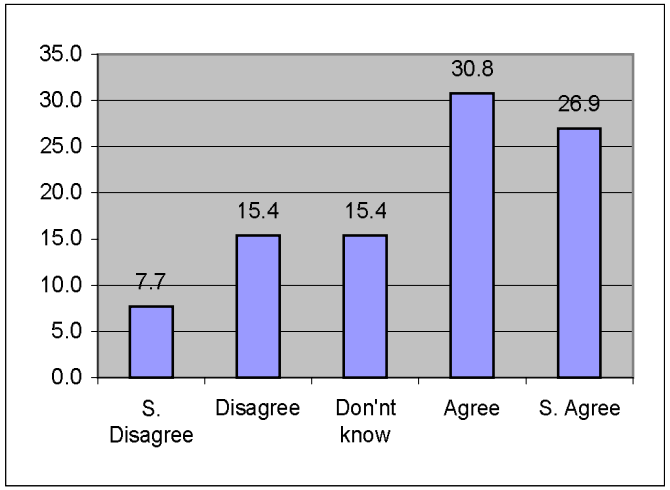
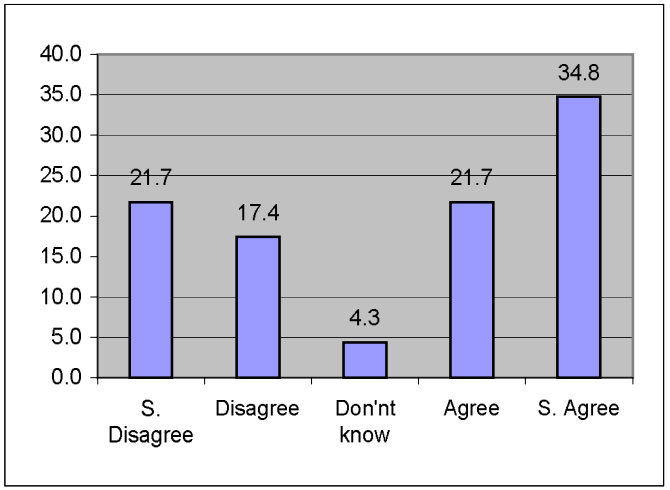


Figure (28) Training desire (Hour for training

Mail and Communication



Governorate Council



Roads and Bridges

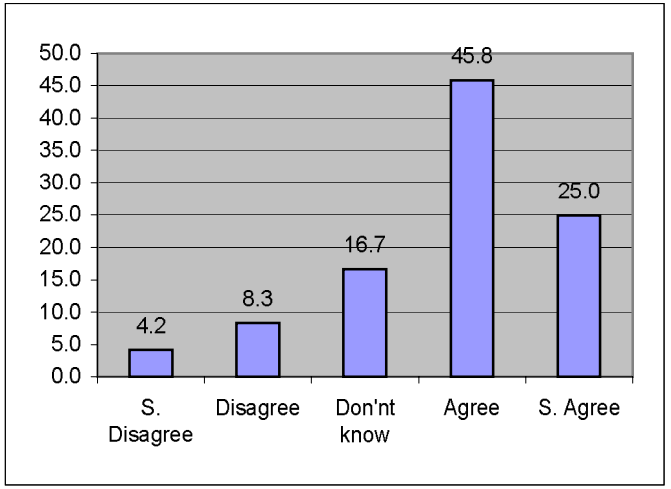
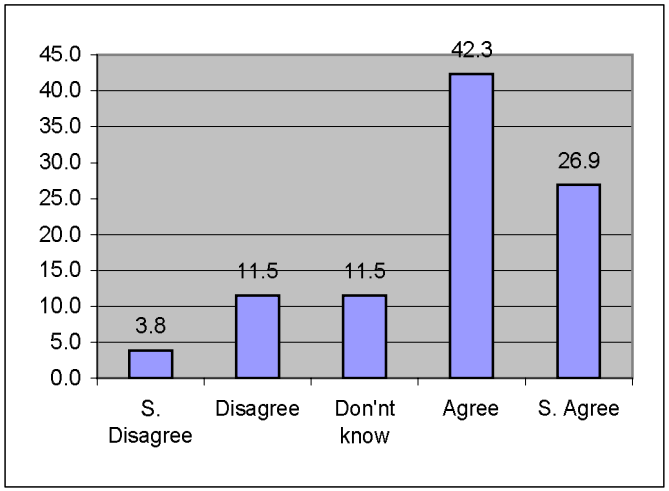
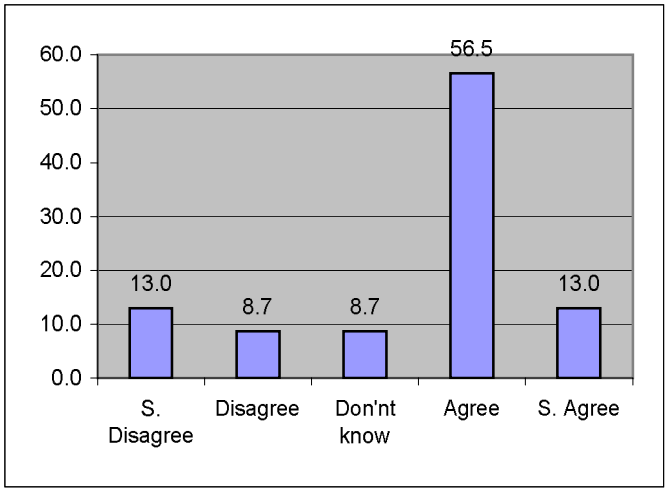


Figure (29) Training Desire (allocating Money)

Mail and Communication



Governorate Council



Roads and Bridges

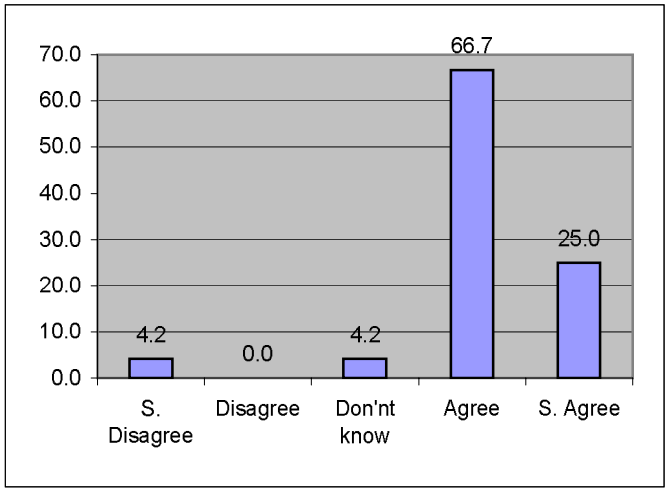
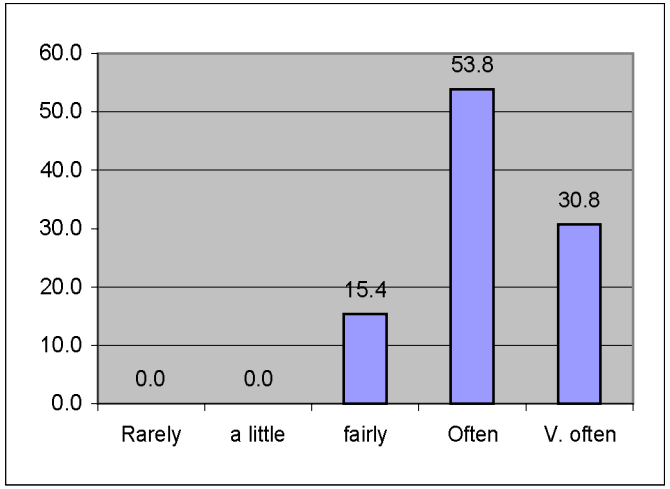
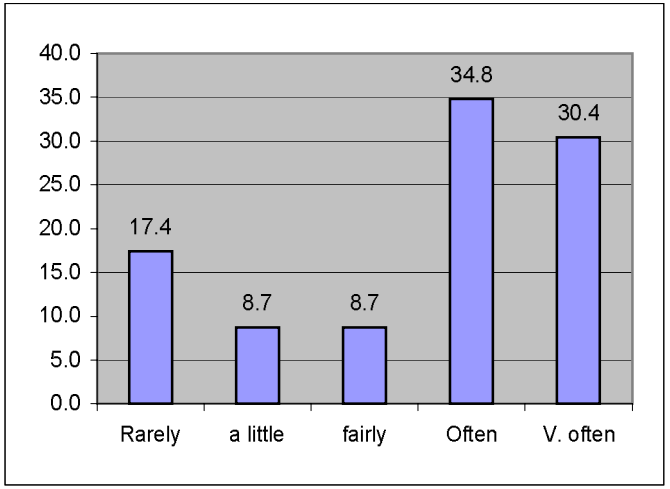


Figure (30) Frequent access to paper files

Mail and Communication



Governorate Council



Roads and Bridges

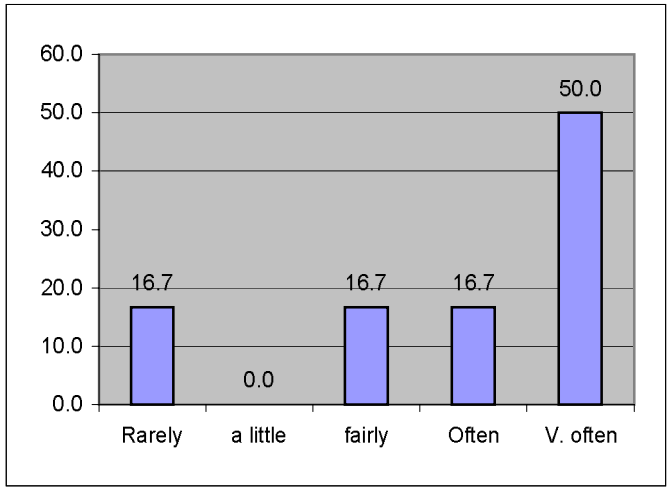
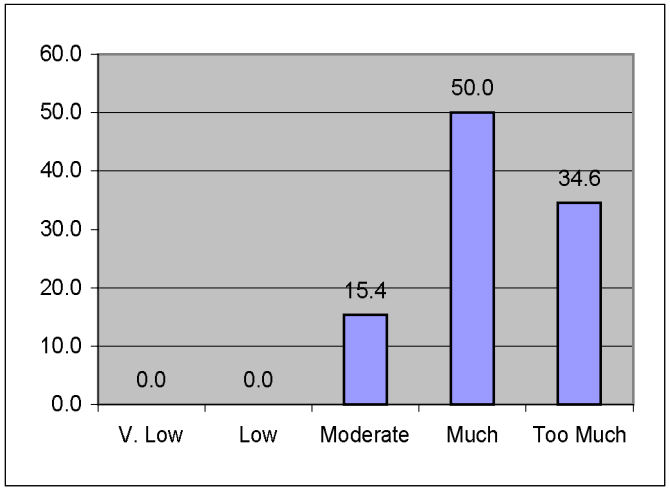
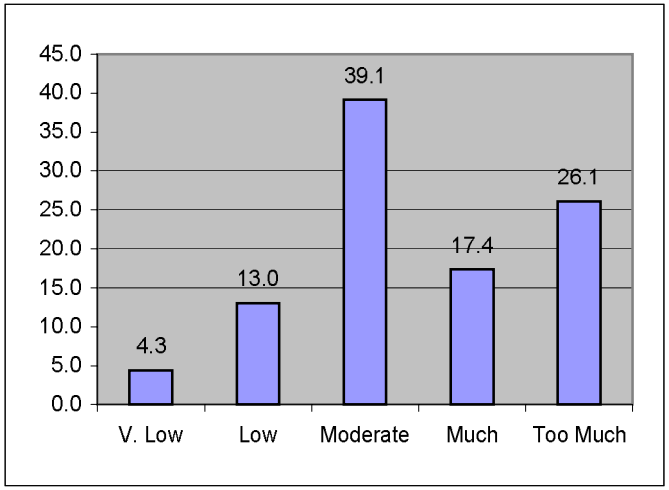


Figure (31) Time Lost in accessing Paper files

Mail and Communication



Governorate Council



Roads and Bridges

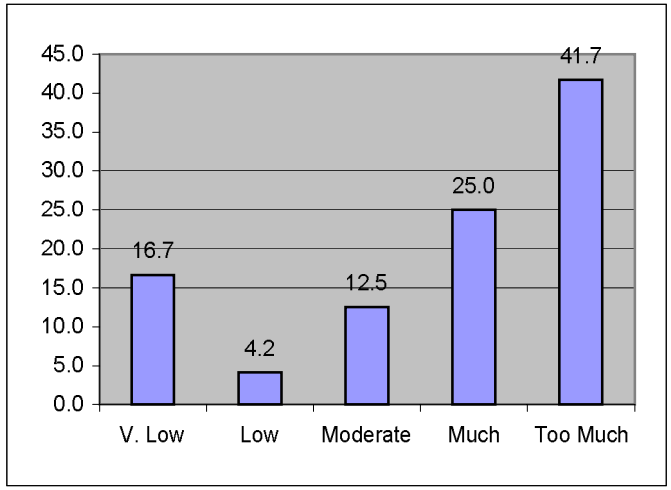
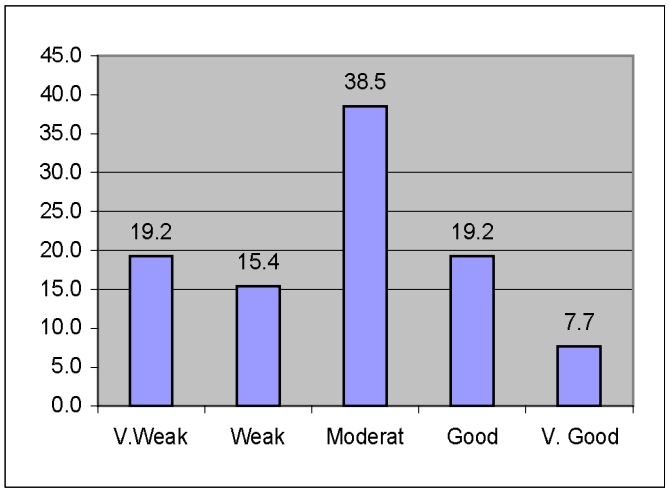
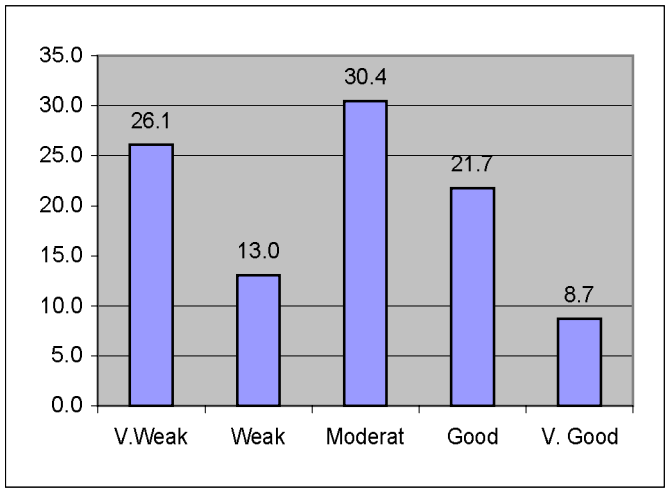


Figure (32) Efforts of government to computerize

Mail and Communication



Governorate Council



Roads and Bridges

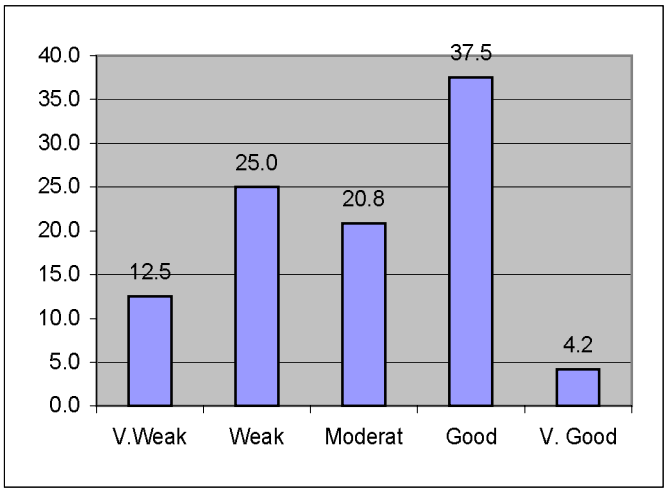
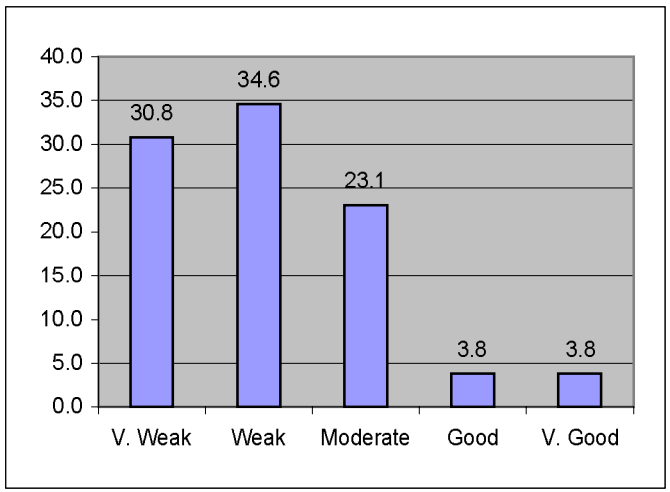
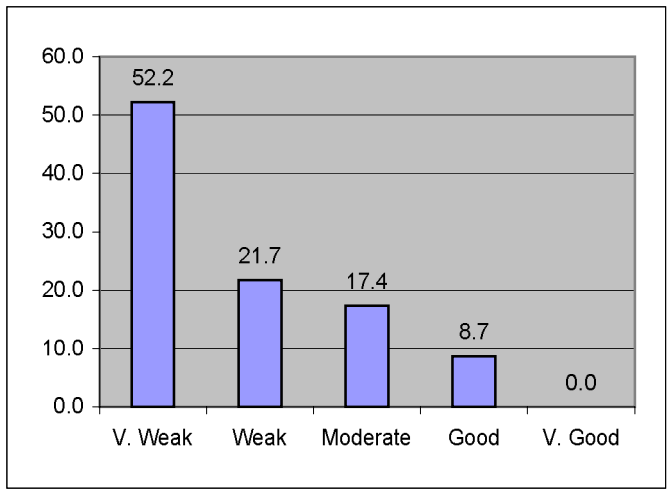


Figure (33) Efforts of government to support ICT

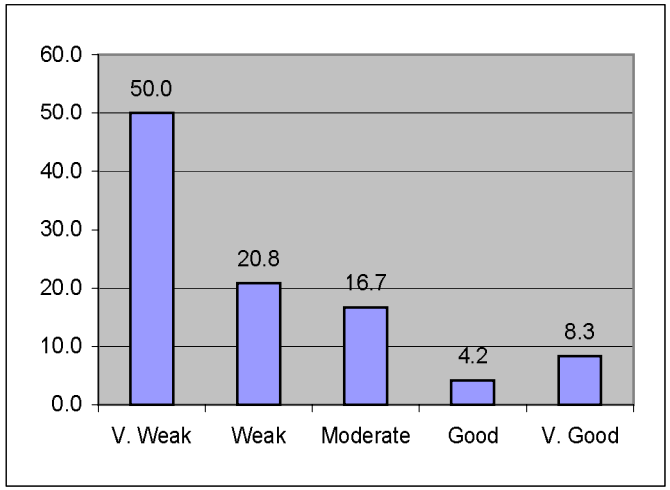
Mail and Communication



Governorate Council



Roads and Bridges



Appendix C Proposed assessment tool

E-Readiness assessment tool for government agencies in Iraqi municipalities.

Q1. Measurement form (to be filled by the government office assessor)

1. Speed				
What is the speed of internet at your organization?				
What technology you are using to access the internet? For scoring, please refer to point 2 in counting the scores.				
				Speed upgradeability - Score is (out of five)
				Cost Reducibility - Score is (out of five)
How would you describe speed of internet at your office?				
V. Low	Low	Moderate	High	V. High
				Score is (out of five)
2. Availability				
What is the percentage of computers to employees in your organization?				
V. Low (0-20)%	Low (20-40)%	Moderate (40-60)%	High (60-80)%	V. High (80-100)%
				Score is (out of five)
What percentage of your computers connected to the internet?				
V. Low (0-20)%	Low (20-40)%	Moderate (40-60)%	High (60-80)%	V. High (80-100)%
				Score is (out of five)
3. Reliability				
How would you describe the disconnections and speed variation in your organizations?				
V. Often / V.High	Often / High	Few / Moderate	Rare / Low	Never / V. low
				Score is (out of five)
4. Professional Skills				
How would you describe the level of high (professional) skills availability in your organizations?				
V. Low	Low	Moderate	High	V. High
				Score is (out of five)
5. General skills of use				
From question 1 in the users' questionnaire, how do you describe the general skills of users?				
V. Low (0-20)%	Low (20-40)%	Moderate (40-60)%	High (60-80)%	V. High (80-100)%
				Score is (out of five)
6. Education				
What is the percentage of number of high school graduates, university degree and above, to the total number of employees (other than workmen, if exists)?				
V. Low (0-20)%	Low (20-40)%	Moderate (40-60)%	High (60-80)%	V. High (80-100)%
				Score is (out of five)

7. Training Availability				
How would you describe the availability of training at your organization?				
V. Low (0-20)%	Low (20-40)%	Moderate (40-60)%	High (60-80)%	V. High (80-100)%
			Score is (out of five)	
Do you have a training unit in your organization, or you do training outside?				
			Score is (out of five)	
8. Computerization				
What percentage of your data is digitized?				
V. Low (0-20)%	Low (20-40)%	Moderate (40-60)%	High (60-80)%	V. High (80-100)%
			Score is (out of five)	
9. Willingness (Political will)				
How would you describe the persistence of the government to deploy ICT for the development of your work environment or the project you intend to launch on scale of five?				
V. Low	Low	Moderate	High	V. High
			Score is (out of five)	
			Total Score (out of 65)	
10. Fund				
How do you describe your funding for ICT or the project you're intending to launch? • Not available • Partly available and not possible to increase • Partly available and possible to increase • completely available				
If fund is partly available and possible to increase, what percentage of it is available?				
11. Legal Framework				
What are the legislations you need for your ICT work or providing services?				
Are these needed legislations available?				
Not available under development Available				
12. Policies				
For each of the following, mark as Available, Underdevelopment, Unavailable • Policy of increasing computer and internet penetration in government offices. • Policy for developing and training ICT capacity in government offices • Policy for employing ICT staff in government. (IT unit, number of staff, qualifications) • Policy of digitizing offices records and files • Policy for funding ICT in government offices and ICT projects				

Q2. Questionnaire for collecting information from employees

1. How confident would you feel if you had to carry out the following tasks? Please tell on a scale from 1 to 5 where 1 means "I am not at all confident" and 5 means "I

am very confident". By the values in between you may grade your opinion. How about…

- Using Microsoft windows and handling files
- Using Microsoft word to write and process documents
- using a search engine to find information on the Internet
- using e-mail to communicate with others
- downloading and installing software onto a computer
- identifying the cause for computer problems

2. How would you assess the willingness and support of high management in developing ICT in your office?				
V. Low	Low	Moderate	High	V. High

3. What is the level of your education?		
Primary or Intermediate	High school or Diploma	Bachelor or High degree

4. How would you describe training availability at your office?				
V. Low	Low	Moderate	High	V. High

Guidelines:

1. The assessor should be of the management level and aware of what is he doing in general. Head of IT department working with an executive is a good combination of assessment committee.
2. The assessor will have to distribute a questionnaire to the organization employees to investigate some aspects. The questions investigating skills might be modified according to the levels of skills needed in the office to provide better impression about skills for the purpose of self assessment over time.
3. The question of measuring the higher level (professional) skills could be further detailed to ask about the numbers of system programmers, database programmers, system administrators, network engineers etc. for further detailed information if needed.
4. Measuring skills of use is done by calculating the average of items in the result of responses to the question on this aspect.
5. Computerization aspect is not easy to measure, but can be estimated. It implies the number of processes that are computerized and the percentage of records saved digitally to all records on paper.
6. Measuring the persistence of the management to deploy ICT is not easy, but it should be scaled in order to comprehend how the whole transition is going to be and how support is going to be provided by the upper levels of management. Measuring this relies on how the assessor feels that upper management is persistent on deploying ICT for the development of work environment. Another way of approaching that is to ask employees for their perception in this regard. Although this might be influenced by the inaccuracy of respondents (employees) fearing to state their opinions sharply, it could help if it shows clear negative perception.
7. If fund was completely available or unavailable, then it is clear and no further action would be taken. However, if it was partly available with a chance to

increase, then it would be rationally acceptable to expect raising more fund be exerting more pressure upward.

8. For security, it depends largely of the services provided internally and services provided for outer use. Since most local organizations host web services on external providers then measures for internal security and IT departments should be able to describe the level of security applied at that office.
9. The assessor should attempt to list all legislations needed for his work environment and the services intended to launch. After that, every legislation should be marked as available, under development, or unavailable and then actions should be taken according to this. The list of legislation needed differ from place to place (office) depending on the nature of work for that office and the services it intends to start.

Counting the Scores

1. For each scale of five, the scores are calculated as follows:

Level	**V. Low**	**Low**	**Moderate**	**High**	**V. High**
Score	**1**	**2**	**3**	**4**	**5**

2. For the technology used to access the internet in the government office the following issue are to be considered and scored.

		Feature	
		Speed	**Cost**
Scores	**1**	Non-expandable	Fixed
	5	Expandable	Reducible

3. If the organization holds its training outside then no score is given, but if it has its own training unit and the unit is operating then a score of (**5**) is added.
4. For the aspects of fund, policies, and legal framework, there are no scores counted, but it should be comprehended how ready an office is by looking at how available these aspects are and how difficult or easy it is to work without them at a specific stage.
5. For the purpose of deciding to initiate a project a minimum score for some factors should be identified and set in order to describe readiness for a specific project. This level (score) may be set with the help of some specialists and depending on the project requirements.
6. For the purpose of comparing government organizations, all scores should be counted to their real levels and then a total score is calculated with the condition of a minimum of 1 for the infrastructure indicators. These are, speed, availability, and reliability. The importance of minimum level or availability is to provide a base of comparison between government organizations.

E-Readiness assessment tool for the public in Iraqi municipalities

Q1. Information form for data collected by the assessor.

1. What is the average speed of connections available for users? How would you describe it on a scale of five?				
- 56 Kbps / V. Low	56- 128 Kbps / Low	128- 256 Kbps / Moderate	256–512 Kbps / High	512 – Kbps / V. High
			Score is (out of five)	
2. What are the technologies of accessing the internet? Are they expandable? Is cost reducible? For scoring, please refer to point 6 in counting the scores.				
			Expandability - Score is (out of five)	
			Cost reducibility - Score is (out of five)	
3. What is the internet penetration at your city? (estimated by : no. of internet cafes in the city multiplied by the average number of computers at cafes + number of households connections-if available)				
V. Low	Low	Moderate	High	V. High
			Score is (out of five)	
4. What is the average cost of one hour of internet access? (From both cafes and households). How would you describe it on a scale of five levels?				
500-750 ID / V. Low	750-1000 ID / Low	1000-1500 ID / Moderate	1500-2000 ID / High	2000-3000 ID / V. High
			Score is (out of five)	
5. How would you describe the reliability of users' internet connection on a scale of five?				
V. Unreliable / V. Low	Unreliable / Low	Moderately Reliable / Moderate	Reliable / High	V. Reliable / V. High
			Score is (out of five)	
6. What is the percentage of Mobile users in your governorate? How would you describe their desire to use internet through mobile?				
V. Low (0-20)%	Low (20-40)%	Moderate (40-60)%	High (60-80)%	V. High (80-100)%
			Score is (out of five)	
7. For a specific online service (Online Passport, for example) what is the percentage of processes run online to those run on face-to-face bases?				
8. What do people think of government responsiveness to their online processes?				
V. Low (0-20)%	Low (20-40)%	Moderate (40-60)%	High (60-80)%	V. High (80-100)%
			Score is (out of five)	
9. From question 6 in the users' questionnaire, how do you describe the general skills of users?				
V. Low (0-20)%	Low (20-40)%	Moderate (40-60)%	High (60-80)%	V. High (80-100)%
			Score is (out of five)	

10. What is the percentage of the number of high school graduates, university degree and above to the total population of the governorate? how would you describe this percentage?				
Low		Moderate		High
			Score is (out of five)	
11. How would you describe regular access of people to the internet?				
Monthly / Low		Weekly / Moderate		Daily / High
			Score is (out of five)	
12. How many training facilities are available in the governorate? What is the percentage of this number to the population? How would you describe the availability of Training Centers in the governorate?				
V. Low	Low	Moderate	High	V. High
			Score is (out of five)	
			Total Score (out of 60)	
13. For the following legislations, mark each one as available, under development, unavailable. • Confidentiality and Privacy law • Cyber crimes law • Acknowledgment of receipt law				
14. For each of the following, Mark as Unavailable, Underdevelopment, Available • Policy of increasing computer and internet penetration for the public • Policy of supporting training provision for the public • Policy of incorporating ICT in schools as means of education and providing ICT education in schools. • Policy of provision of services through mobiles				

Q 2. Questionnaire for internet cafés

1. What is the speed of your link to the internet?
2. What technology you are using to access the internet?
3. How many computers do you have, in your café, connected to the internet?
4. What is the cost of one hour of internet access for users?

Q 3. Questionnaire for internet users in internet cafes or home users, if accessible.

1. What is the speed of your internet link?..... I don't know …….				
How would you describe the speed?				
V. Low	Low	Moderate	High	V. High
3. What is the cost of your internet link?				
How would you describe the cost of internet?				
V. Low	Low	Moderate	High	V. High
5. How would you describe the disconnections and speed variation in your organization?				
A lot	Few	V. Few	Rarely	Never

/ V. High	/ High	/ Moerate	/ Low	/ V. Low
5. How often do you access the internet?				
Monthly		Weekly		Daily

6. How confident would you feel if you had to carry out the following tasks? Please tell on a scale from 1 to 5 where 1 means "I am not at all confident" and 5 means "I am very confident". By the values in between you may grade your opinion. How about…

- Using Microsoft windows and handling files
- Using Microsoft word to write and process documents
- using a search engine to find information on the Internet
- using e-mail to communicate with others
- downloading and installing software onto a computer
- identifying the cause for computer problems

7. Do you think government offices respond effectively to requests sent through emails or using websites if that was made available?

Never / V. low	Low / Low	Medium / Moderate	High / High	Sure of that / V. High

8. Do you think you are going to use the internet if it was available from your mobile?

Rarely / V. Low	Not often / Low	Often / High	Very often / V. High

Guidelines:

1. The assessor should be of management level in the executive authority and should be at least aware of aspects in general. In addition, some specialists should provide help in interpreting technological aspects. These specialists can be engineers from the local directorate of Post and Communication.
2. The assessor will have to distribute two questionnaires. One questionnaire for administrators (owners) of internet cafes (Q2) and another for users in internet cafes or at households. Furthermore, the assessor will have to access information at tax authority and other local agencies to acquire information regarding some aspects to measure.
3. Speed is calculated from the average of speed on internet connections at internet cafes and speed of internet connections at households. Households' speed on internet could be measured from internet providers as an average. When internet penetration at households becomes much greater than that at internet cafes then it might be used alone without referring to internet cafes' speed.
4. Another related point is the technology used to access the internet. This aspect defines to what extent speed is expandable and to what extent these technologies are reliable and how cost effective they are.
5. Availability: (penetration) is measured as the number of computers accessing the internet. This can be measured using the number of computers available at internet cafes plus number of internet connections provided to households by

contacting the providers in the city to count the number of customers accessing the internet as individuals as it is the condition of provision by these providers. The number of internet cafes in the governorate can be obtained from the tax authority of the city as it is the only place where such information is guaranteed to be available. Then the percentage representing penetration in the city could be measured to international or national benchmarks to verify how far the community is from internationally accepted levels.

6. Cost: information about the cost of the internet could be collected from internet cafes and from household internet users, after accessing these users as mentioned previously. Cost should be compared to regional values of cost and from the perspective of what technologies provide better and less expensive access. However, the current used cost levels are identified by the Iraqi State Company for Internet Service (SCIS).
7. Reliability: this point is a combination of what people feel and technologies used to access the internet. However, scoring is based on people perception, but technologies used can be interpreted by engineers to help decide reliability and how can this be improved.
8. Mobile internet: Mobile internet is measured by measuring penetration of mobile from mobile service providers and by measuring how people are willing to use internet through mobile.
9. For the above mentioned points, a specialist from communication directorate should assist to interpret information and comment on technologies used as it is not possible to list here all types and differences of specifications of technologies used or going to be.
10. Trust: measuring trust implies how people trust responsiveness of the government to online services. This is done by sensing this perception and by observing the percentage of requests sent online to face-to-face requests for some services already provided such as online passport application. The scores for this aspect are taken from inspecting how people percept this issue.
11. Measuring skills of users is estimated statistically from their answers to question 6 in the questionnaire. Average of all responses is used to estimate the level of general skills and then benchmarked to local levels in other governorates or international levels. If not available, it should be as a reference for development over time.
12. Information about education level can be gathered from the directorate of education at the governorate. University graduates can be different here as this involves universities inside and outside the governorate. However, this can be collected from the directorate of the governorate were statistics of all employees exist and from unions and other organizations or from the central ministry of planning. A better approach would be conducting a generic survey in the governorate which is useful for a lot of other aspects of e-readiness and general considerations, but this is an expensive and harder choice if it was only for e-readiness measurement. In the same way, national statistics and benchmarks could be used as references in this case when comparing education levels.
13. The regular access to internet indicates the desire of people to access the internet for various reasons and in the current conditions. Besides, this measure can be a measure of progress when enhancing other aspects.

14. Again, information on training facilities can be found in tax authorities as they are not granted permission to start business without tax clearance.
15. Legislations and policies: assessor has to verify whether the listed legislations or policies are available, underdevelopment, unavailable. In case of unavailability, pressure should be exerted for legislation. In case of underdevelopment, checking and pressing on this issue should persist to encourage serious efforts of legislation or policy setting.
16. Interpretation of the results is based on the levels of the scale developed. Levels of measures will indicate what aspects to focus on and how much work is needed for each one. Low levels should be raised to higher ones and low percentages should also be raised to higher percentages to enhance the total e-readiness through the enhancement of individual measures. The type of effort needed to enhance a certain aspect is defined clearly from the operationalization of each measure as numbers, levels, percentages, or even existence and non-existence of these measures.

Counting the Scores

1. For each scale of five, the scores are calculated as follows:

Level	**V. Low**	**Low**	**Moderate**	**High**	**V. High**
Score	**1**	**2**	**3**	**4**	**5**

2. for each scale of three, the scores are counted as follows:

Level	**Low**	**Moderate**	**High**
Score	**1**	**3**	**5**

3. Questions (1 and 4) are given scores after calculating the average of responses collected from internet cafes owners and household internet users.
Questions (5, 6, 8, and 11) are given scores according to the average calculated from the responses of users and internet café's owners. This average is calculated as follows: the number of responses at every scale are multiplied by the weight given for that scale (V. low = 0.2, Low = 0.4, Moderate=0.6, High=0.8, V. High=1) and then all values are summed up to form a level that when applied to the scale of the assessment question gives the level of that indicator.

4. Questions (3, 10, 12) needs references to compare to. These references can be obtained from the central ministry of planning. If not available these can be estimated by consulting a specialists who is a ware of the local conditions of the place where the assessment is to be conducted.

5. Question 9 is scored in the same way as in point 3 for each of the questions answered by users. After applying step 3, the average of the percentages obtained is calculated to provide a level of skills.

6. For the technology used to access the internet in the internet cafes and households, question two, the following issues are to be considered and scored.

		Feature	
		Speed	**Cost**
Scores	**1**	limited	Fixed
	5	Expandable	Reducible

7. For the aspects of policies, and legal framework, there are no scores counted, but it should be comprehended how ready these aspects are by looking at how available these aspects are and how difficult or easy it is to work without them at a specific stage.
8. Question 7 is intended to be used as a reference for the purpose of comparison as this service is provided and people are hearing about it and using it increasingly. This is because no other available reference can be used to compare people's perception to realize the trust factor using these services if the levels were moderate or high, then this can give an acceptable indication on trust.

Appendix D

Table of Communalities for factor analyses in all cases.

Communalities for Nasiriah Users Analysis		
	Initial	Extraction
Education	1.000	.642
Usage	1.000	.462
Teledensity	1.000	.758
Reliability	1.000	.773
Cost of Internet	1.000	.561
Speed	1.000	.634
Internet Cafes	1.000	.533
Mobile Internet	1.000	.682
Trust in Gov	1.000	.596
Trust in Tech	1.000	.550
Training Cost	1.000	.562

Communalities for Kerbala Users Analysis		
	Initial	Extraction
Education	1.000	.835
Usage	1.000	.720
Teledensity	1.000	.532
Reliability	1.000	.680
Cost of Internet	1.000	.644
Speed	1.000	.798
Internet Cafes	1.000	.754
Mobile Internet	1.000	.788
Trust in Gov	1.000	.648
Trust in Tech	1.000	.591
Training Cost	1.000	.707

Communalities for Mail and Communication Analysis		
	Initial	Extraction
Skills	1.000	.674
Education	1.000	.729
Availability	1.000	.725
Computerization	1.000	.758
Training	1.000	.827
Willingness	1.000	.728

Communalities for Governorate Council Analysis		
	Initial	Extraction
Skills	1.000	.499
Education	1.000	.422
Availability	1.000	.689
Computerization	1.000	.642
Training	1.000	.746
Willingness	1.000	.643

Communalities for Roads and Bridges Analysis		
	Initial	Extraction
Skills	1.000	.637
Education	1.000	.611
Availability	1.000	.784
Computerization	1.000	.571
Training	1.000	.346
Willingness	1.000	.728

Appendix E Total Variance Explained Tables of factor analysis

Loadings of Factors in Nasiriah

Factors	Variables						% of Variance
1	Reliability	Cost	Speed	Availability	Trust in Gov		22.557
2	Education	Usage	Speed	Availability	Trust in Gov	Trust in tech	15.284
3	Speed	Availability	training				12.078
4	Availability	Mobile					11.471
						Cumulative %	61.390

Loadings of Factors in Kerbala

Factors	Variables					% of Variance
1	Speed	Availability	Trust in Gov	Mobile		19.007
2	Reliability	Cost	Speed			16.630
3	Cost	Mobile	Tech trust			13.659
4	Education					10.599
5	Speed	Mobile	Trust in Gov	Training		10.077
					Cumulative %	69.973

Loadings of Factors in Mail and Comm.

Factors	Variables					% of Variance
1	Education	Skills	Availability	Computerization	Training	34.582
2	Training	Willingess				21.049
3	Skills	Willingess				18.362
					Cumulative %	73.992

Loadings of Factors in Gov. Council

Factors	Variables				% of Variance
1	Skills	Availability	Computerization	Training	35.872
2	Education	Skills	Availability	Willingness	24.821
				Cumulative %	60.694

Loadings of Factors in Roads and Bridges

Factors	Variables				% of Variance
1	Education	Skills	Availability	Computerization	42.823
2	Skills	Training	Willingness		18.466
				Cumulative %	61.289

Appendix F Factors Tables

Table a. Components extracted for Nasiriah Users

	Component			
	1	2	3	4
Education	-.662	.391	-.094	-.203
Usage	.176	.413	-.502	.096
Teledensity	-.252	-.014	.277	.786
Reliability	.837	.010	.261	.057
Cost of Internet	.413	-.452	-.388	.189
Speed	.479	.447	.439	-.110
Internet Cafes	.393	.343	.371	.353
Mobile Internet	-.508	.223	-.145	.594
Trust in Gov	.316	.663	-.235	-.031
Trust in Tech	-.460	.461	.283	-.212
Training	-.350	-.366	.535	-.138

Extraction Method: Principal Component Analysis.

Table b. Components extracted for Kerbala Users

	Component				
	1	2	3	4	5
Education	-.189	-.064	.249	.840	.167
Usage	-.649	.275	-.360	.296	.080
Teledensity	.064	-.526	-.418	.233	-.148
Reliability	-.026	.817	-.028	.079	-.070
Cost of Internet	-.096	.587	.508	-.165	.062
Speed	.650	.444	-.138	.245	.317
Internet Cafes	.445	.296	-.043	.028	-.682
Mobile Internet	.505	-.369	.516	-.137	.335
Trust in Gov	.658	.121	-.224	.203	.329
Trust in Tech	-.405	-.053	.635	.145	-.009
Training	-.383	.150	-.369	-.379	.507

Extraction Method: Principal Component Analysis.

Table c. Components extracted for Mail and Communication agency

	Component		
	1	2	3
Education	**.494**	**-.629**	**.184**
Skills	**.640**	**-.166**	**.540**
Availability	**.811**	**.193**	**.170**
Computerization	**.511**	**.129**	**-.693**
Training	**.597**	**.684**	**-.041**
Willingness	**-.381**	**.563**	**.515**

Extraction Method: Principal Component Analysis.

Table d. Components extracted for Governorate Council agency

	Component	
	1	2
Education	**.259**	**.658**
Skills	**.394**	**.517**
Availability	**.757**	**.340**
Computerization	**.687**	**-.413**
Training	**.859**	**-.090**
Willingness	**-.384**	**.704**

Table e. Components extracted for Roads and Bridges agency

	Component	
	1	2
Education	**.769**	**-.215**
Skills	**.584**	**.520**
Availability	**.873**	**.148**
Computerization	**.740**	**.156**
Training	**-.034**	**.587**
Willingness	**-.572**	**.634**

References

Al-Diwachi, A., (2003). Behavioral considerations in the application of E-Government. ESCWA/TCU/2003, In Arabic

Al-Omari, A., Al-Omari, H., (2006). E-Government Readiness Assessment Model. Journal of Computer Science, 2(11):841-845. Retrieved April 10, 2009, http://www.scipub.org/fulltext/jcs/jcs211841-845.pdffrom:

APEC, (2000). E-Commerce Readiness Assessment Guide, APEC Readiness Initiative, Version 5.0, 2000.

Azab, N. A., Kamel, S. and Dafoulas, G., (2009) " A suggested framework for assessing electronic government readiness in Egypt" Electronic Journal of e-Governmet Volume 7 Issue 1 2009, pp. 11-28, Retrieved April 14, 2009, from www.ejeg.com

Bridges.org (2005), E-Readiness Assessment Tools Comparison, retrieved 14 April, 2009 from:
www.bridges.org/files/active/0/ereadiness_tools_bridges_10Mar05.pdf

Ciborra, C. U., (2003). Unveiling E-Government and Development: Governing at a distance in the new war. Retrieved April 15, 2009, from:
http://www.lse.ac.uk/collections/informationSystems/pdf
/events/2002/Ciborra_Inaugral.pdf

DIT, NCAER (2007), India: E-Readiness Assessment Report 2005 for states/Union Territories, Delhi, DIT. Retrieved April 15, 2009, From http://www.mit.gov.in/download/e-ready/Chap2.PDF

EIU, (2006). The 2006 e-readiness rankings, A white paper from the Economist Intelligence Unit. Economist Intelligence Unit Written in co-operation with The IBM Institute for Business Value; London, Retrieved April 16, 2009, from http://graphics.eiu.com/files/ad_pdfs/2006Ereadiness_Ranking_WP.pdf

ESCWA, (2007). NATIONAL PROFILE OF THE INFORMATIN SOCIETY IN IRAQ.

Estevez, E., Janowski, T., Ojo, A., (2005). PLANNING FOR E-GOVERNMENT-A SERVICE ORIENTED AGENCY SURVEY.

Flak, L. S., Olsen, D. H., Wolcott, P. (2005). Local E-Government in Norway.

Scandinavian Journal of Information Systems, 17(2):41-84. Retrieved April 15, http://www.e-sjis.org/journal/volumes/volume17/no2/05flaketal.pdf2009, from

Ghavamifar, A., Beig, L., Montazar, G.A. (2008), The comparison of different E-Readiness Assessment Tools, Information and Communication technologies: From Theory to Application, 2008, ICTTA 2008, Vol. 7, Issue 11 retrieved from: //ieeexplore.ieee.org/Xplore/login.jsp?url=http:// ieeexplore.ieee.org/iel5/4520396/4529902/04529945.pdf

Gusev, M., (2004). Local e-Governance in FYR Macedonia 2004 Recommendations and e-Model of Municipalities. Retrieved April 15, 2009, http://www.undp.org.mk/e-governance/pdf-en/introduction.pdffrom

Holden, S. H., Norris, D. F., Fletcher, P. D., (2003). Electronic government at the local level: Progress to date and future issues. Public performance and management review, vol. 26, No. 4, June 2003, pp. 325-344. Retrieved April 12, 2009, from JSTOR

Indiana University (University Indianapolis Center for Service and Learning), Characteristics of Good Measurement Instruments.
From http://csl.iupui.edu/assessment/characteristicsofGoodInstruments.cfm

Kamel H. S. (2006). Electronic business in Developing countries: opportunities and challenges. Hershey: Idea Group Publishing.

Keith, M. M. (2002). Advantages and disadvantages of local Government Decentralization. Paper presented at the Caribbean conference on local government and Decentralization, Ocean View international Hotel Georgetown, Guyana, 25 June 2002.

Koh, C., and Prybutok, V.R., (2002). E-Government Readiness: A Research Framework and an Action Research Case of a Municipal Government, Proceedings of the Decision Sciences Institute, pp 1168-1173, November 2002

Kovacic, Z. J., (2005). " The impact of national culture on worldwide eGovernment readiness", Informing Science Journal, vol. 8, pp. 143-158 http://inform.nu/Articles/Vol8/v8p143-158Kova.pdfretrieved from:

Lighthouses, (2007). E-Readiness survey for municipalities 2007. retrieved April 17, 2009, from
http://unpan1.un.org/intradoc/groups/public/documents/unpan/unpan026739.pdf

Kunstelj, M., Jukic, T., Vintar, M., (2009). How to fully exploit the results of e-

government user surveys: the case of Slovenia, International Review of Administrative Sciences, March 1, 2009; 75(1): 117 – 149

Moon, M. J., (2002). The Evolution of E-Government Among Municipalities: Rhetoric or Reality. Public Administration Review, 62(4), 2002, 424--433. Retrieved April 12, 2009, from JSTOR

Municipal eGovernment, ePractice workshop (2008). Brussels March 6, http://www.epractice.eu/Retrieved April 15, 2009, from

Nonchev A., (2002). Bulgarian E-Readiness Assessment Model and Methodology for Quantitative Assessment, Third Regional Information Society www.csd.bg/fileSrc.php?id=80Forum (RISF) retrieved 12 May 2009 from:

Ojo, A., Janowski, T., & Estevez, E. (2007). Determining progress towards e-government - what are the core indicators? Retrieved april 19, 2009, from http://www.iist.unu.edu/newrh/III/1/docs/techreports/report360.pdf

OMB, (2008). Expanding E-Government Achieving Results for the American People. WASHINGTON, D.C. 20503

Rahman, H., (2007). Egovernment readiness: from the design table to the grass http://portal.acm.org/citation.cfm?id=1146598.1146658roots from:

Saidi, N., Yared, H., (2006). E-Government: Technology for good governance, development and democracy in the MENA countries.

Scott, James K. (2005). E- Services: Assessing the Quality of Municipal Government Web Sites. State and Local Government Review 37(2): 151- 165. Retrieved April 12, 2009, from JSTOR

Straub W. Detmar, Carlson L. Curtis, (1989), Validating Instruments in MIS Research. MIS Quarterly, Vol. 13, No. 2 (Jun., 1989)

Alfred, T. H., (2002). Reinventing local governments and the e-government initiative. Public Administration Review, 62(4), 434—444. Retrieved April 12, 2009, from JSTOR

Toots, A., (2007). Take-up of municipality e-services: Some findings from citizens' survey in Tallinn. Retrieved April 14, 2009, from http://www.nispa.sk/_portal/files/conferences/2007/papers/200704231034430.Toots_fulltext_Kyiv_WG_egovmnt.pdf

UNDESA, (2003). e-Government Readiness Assessment Survey, unpan011509 Retrieved 10 May 2009 from: http://unpan1.un.org/intradoc/groups/public/documents/un/unpan011509.pdf

UNDESA, (2005). Global E-government Readiness Report 2005 – From E-government to E-inclusion, United Nations Department of Economic and Social Affairs, New York, NY

UNDESA. (2008). Un global e-government readiness report 2008. *From E-Government to E-Inclusion, UN Department of Public Administration, New York*, 270.

Wijaya, S. W., Surendo, K., (2006). STRATEGIC PLANNING FOR E-GOVERNMENT IMPLEMENTATION OF KABUPATEN/KOTA AT : 351-356. Retrieved April 15, 2009, from iiWAS 2006INDONESIA, http://repository.gunadarma.ac.id:8000/iiWAS2006_369-374_518.pdf

, (2001). E-Readiness as a tool for ICT development, World Bank Group http://www.infodev.org/library/WorkingPapers/AReready.pdfretrieved from