

Citizens' Readiness for E-government in Developing Countries

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ABSTRACT

Electronic government (e-government) has become one of the most evolving and important applications of Information and Communication Technology (ICT) in recent years. Due to its positive impact on citizens, government and society alike, most developed and developing countries have attempted to apply e-government projects with mixed success. Many developing countries were facing difficulties in applying successful e-government projects due to different electronic readiness (e-readiness) problems, such as poor ICT infrastructure and a high percentage of digital illiteracy among citizens that have lead to e-government projects abandoned by users. Despite the various efforts by developing countries to overcome these problems, the factors that particularly affect citizens and their use of e-government have not been adequately identified and tested.

This research proposed a model based on e-readiness assessments and relevant literature that investigates the impact of citizens' readiness for e-government (CREG) on e-government success within developing countries. The CREG model explores a new vision for e-government success by introducing a combination of e-readiness and trust factors that together directly affect e-government projects in developing countries. The focus of the research is on government to citizen (G2C) services. Egypt was selected as an example of a developing country in which to conduct the study and three e-government services were selected for focused investigation.

The research confirmed the importance of the CREG model to achieve successful e-government projects in developing countries. The proposed CREG factors including e-readiness, trust and other factors were found to be crucial in citizens' use or non-use of e-government services. E-readiness factors showed a significant impact on increasing citizens' usage of e-government services as citizens who used online e-government services were more e-ready than non-users. The results also highlighted that e-readiness factors need to be combined with trust in both the technology and e-government in order to encourage more citizens to use e-government services. Adequate security and privacy measures that ensure information protection combined with providing a credible service that satisfies citizens' needs were shown to be important factors to encourage trust in technology and e-government.

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GLOSSARY

CREG	Citizens' readiness for e-government
E-government	Electronic government
E-readiness	Electronic readiness
EGP	Egyptian pounds
G2B	Government to business
G2C	Government to citizen
G2E	Government to employee
G2G	Government to government
GBP	British pounds
ICT	Information and communication technology
IDSC	Information and Decision Support Centre
IS	Information systems
IT	Information technology
MCIT	Ministry of Communications and Information Technology
MHE	Ministry of Higher Education
MI	Ministry of the Interior
MSAD	Ministry of States and Administrative Development
PC	Personal computer
UCAS	Universities and Colleges Admission Services
UNDESA	United Nations Department for Economic and Social Affairs
UNDP	United Nations Development Programme

KEY DEFINITIONS

E-government

E-government is the use of information and communication technologies (ICT) in improving the activities and services of government and delivering services over the internet (Adapted from Heeks, 2004).

Country e-readiness

A country e-readiness is the degree to which a country is prepared to participate in the networked world (Adapted from CID, 2003).

Government e-readiness

A government e-readiness is the degree to which a government is prepared to participate in the networked world (Adapted from CID, 2003).

Citizens' e-readiness

Citizens' e-readiness is the degree to which citizens are prepared to participate in the networked world (Adapted from CID, 2003).

E-ready citizen

The e-ready citizen is one who is able to use ICT and benefit from the internet.

Non-e-ready citizen

The non-e-ready citizen is one who is not able to use ICT and benefit from the internet.

Trust

"Trust is an expectancy of positive outcomes that can be received from another party" (Bhattacharya et al, 1998).

CHAPTER I

INTRODUCTION

1.1 Introducing the research

One of the most important developments in ICT in recent years is electronic government (e-government). It has the potential to make government operations and processes more transparent and more effective for citizens and businesses, and to provide a variety of benefits for the community at large such as reducing services' time and connecting businesses and citizens to government information at anytime (Liikanen, 2003).

Because of the remarkable potential benefits of e-government, most governments in both developed and developing countries have launched e-government projects. However, few of them have succeeded in achieving their set targets. In developing countries, Heeks (2003a) reports in his survey on 40 e-government projects that 35% totally failed as they were terminated or never used by users, 50% partially failed to achieve their goals and only 15% succeeded. Furthermore, the failure rate of e-government projects worldwide is identified by Gartner Group (2002) as 60%. The cost of failed e-government projects is high, including not only tangible costs such as wasted project expenditure and employee time, but also intangible costs such as loss of citizen trust (Heeks, 2003c).

In many cases, countries which achieved their set targets for e-government projects (Accenture, 2004; Blakemore and Lloyd, 2007) had high levels of e-readiness. Examples are Canada, USA and UK which got the highest ratings for e-readiness (DAI, 2003; EIU, 2006). Conversely, developing countries are typically reported as having low levels of success in e-government and low e-readiness ratings (DAI, 2003; UNDESA, 2005). This is because they were not electronically ready 'e-ready' in terms of ICT and had major problems with regard to their ICT fundamentals.

Many developing countries have accordingly launched strategic plans to enhance their e-readiness. These plans usually start with an essential step, undertaken in 188 countries (Bridges, 2005b), to measure their current e-readiness and decide how it could be improved. This was followed by developing action plans (Brown, 2002) to enhance their citizens' capabilities in ICT as well as enabling their businesses and governments to take the opportunities offered by ICT. Nevertheless, these plans did not lead to more

successful e-government projects used by citizens. That is because the available e-readiness assessments are designed to assess countries' e-readiness in general without a specific focus on the issues that affect e-government projects in particular (Ojo et al, 2007). Furthermore, these assessments do not identify how their factors affect citizens' usage of e-government services.

This research starts from two propositions.

- (1) The broad concept of *e-readiness* has a number of component concepts, one of which may be termed *readiness for e-government*. (Another component concept, for instance, would be readiness for e-business.)
- (2) In turn, the concept of readiness for e-government has a number of component concepts, one of which may be termed *citizens' readiness for e-government*. (Another component concept, for instance, would be government readiness for e-government.)

Citizens' readiness for e-government, subsequently abbreviated for convenience to **CREG**, the factors that influence it, and the extent to which it affects e-government success, form a primary focus of the research. It should be noted that citizens' readiness for e-government is distinct from citizens' usage of e-government. Roughly, citizens' readiness partially determines citizens' usage, which in turn partially determines e-government success.

The research specifically does not investigate other factors that may affect either citizens' usage or e-government success (such as reduced cost or improved quality of government services).

One contribution claimed for this research is to propose factors that influence CREG. The proposed factors are in three categories.

- The first category of factors is drawn from the many *e-readiness assessments* that attempt to rate or rank the e-readiness of sets of countries: some (but by no means all) of the factors that they believe influence e-readiness in general also influence CREG in particular.
- The second category is drawn from the published literature relating to *citizens' trust in e-government*, and to the broader issues of trust in government and trust in computer-related technology.

- The third category comprises *other factors* that fall into neither of the previous two categories.

The research question and the sub-questions that the research addresses are the following.

RQ: What are the factors that affect citizens' readiness for e-government (CREG) in developing countries?

SQ1: How do factors from e-readiness assessments affect citizens' usage of e-government?

SQ2: How do trust factors affect citizens' usage of e-government?

SQ3: How do other factors affect citizens' usage of e-government?

SQ4: How do e-readiness assessments affect e-government projects?

SQ1 was introduced as a result of reviewing the current e-readiness assessments (discussed in section 2.4) that show e-ready citizens who have appropriate ICT infrastructure and have computer and internet skills are using e-government services more than non e-ready citizens. Consequently, it becomes crucial to identify the e-readiness factors that citizens' in developing countries should have to be ready for e-government.

Identifying e-readiness factors was not sufficient to have successful e-government projects in developing countries. This is because there are some developing countries with reasonable levels of e-readiness but nevertheless with low levels of e-government success (Prattipati, 2003) which draws the attention to the existence of other factors. Reviewing the literature (discussed in section 2.5) showed that many researchers report that citizens' trust in e-government is important in encouraging their usage of e-government services (Al-adawi et al, 2005; Gefen et al, 2002; Otto, 2003). Identifying these factors, based on the discussion about them in the published literature, forms a second and crucial category of factors influencing CREG and is thus presented in **SQ2**.

Conducting a pilot study (discussed in section 3.2) with citizens showed the existence of other factors including awareness, perceptions of e-government services and non-resistance to use (or conversely resistance to use) that affect citizens' usage of e-

government. These formed the third group of factors affecting CREG and are investigated in SQ3.

The pilot study with managers, on the other hand, demonstrates the importance of understanding how e-readiness assessments, which e-readiness factors are drawn from, influence government strategy on e-government as appears in SQ4.

All the identified CREG factors from e-readiness assessments, literature review and citizens' and managers' experiences (in the pilot study) formulated the proposed CREG model which is tested in the main study. The results which formed the final model will lead to more successful e-government projects in developing countries.

1.2 Research scope

Section 1.1 specifies the questions that the research sets out to answer – what the research is about. For clarity, this section specifies what it is *not* about.

- It is about e-government, *not* e-governance. E-governance is generally regarded as including wider issues such as e-democracy and e-voting.
- It is about central e-government, *not* local e-government.
- It is about G2C, *not* government to business (G2B), government to government (G2G) or government to employee (G2E).
- It is about demand-side factors influencing CREG, *not* supply-side. For instance, one factor is “affordable internet prices”. That factor is considered only from the point of view of its demand-side influence on citizens, not from the point of view of the supply-side extent to which government is able or willing to influence those prices.
- It is about applications that deliver government services to citizens, *not* those that just provide information.

1.3 Research design

In order to answer the research question, a pilot study was carried out with citizens and government managers to test the significance of the proposed factors and where necessary to redefine the research question. The main empirical study was conducted using qualitative and quantitative research approaches. Egypt was selected as an example of a developing country: it has an ambitious e-government programme which began in 2001,

designed to improve the delivery of government services to citizens. Nevertheless, Egypt faces many ICT problems similar to those in many other developing countries (Sayed, 2004). At the time of conducting the research, there were eight services available online. Three of them were selected, according to the research scope criteria, for in-depth investigation. These are:

- reissue of birth certificates;
- renewal of vehicle licences;
- Universities and Colleges Admission Services (UCAS).

The study was structured into two main data collection phases conducted in 2005 and 2006 to test the proposed CREG model. Each phase consisted of three levels of data.

- The *first level* of data addresses issues of how policy makers, project managers and executive managers in the relevant government departments in Egypt consider e-readiness within the design and implementation of e-government projects and what measures exist to increase citizens' trust in e-government. Face-to-face interviews (Denscombe, 1999) were used at this level.
- The *second level* of data targets managers, technicians and other relevant stakeholders involved with the provision of each of the selected e-government services again using face-to-face interviews. This was important to have an in-depth understanding of the e-government project processes on the ground, to understand their experience and the lessons they have learned, and to understand how e-readiness and trust impact the services for which they are responsible.
- The *third level* of data addresses end-users (citizens) of the selected e-government services to evaluate the impact of the services offered to the community at large and to have a clear understanding of the impact of e-readiness within society on using e-government services. To achieve this, a survey of end-users (Weisberg et al, 1996) has been run twice (in two consecutive years: 2005 and 2006). Consequently, comparable results become available to show how progress in e-readiness and trust on the part of end-users affect e-government success and how policy makers and managers design their e-government plans to adjust to the changes in these factors.

1.4 Thesis structure

Chapter 2, "literature review", discusses: (a) the available literature on e-government in general (its characteristics, the types and levels of services offered, delivery channels); (b)

e-government in developing countries (opportunities, challenges, approaches); (c) e-readiness assessments (problems of assessments, list of assessments, factors used in assessments); and (d) trust in relation to e-government (available studies, achieving trust); (e) the initial theoretical framework for CREG.

Chapter 3 describes the pilot study conducted with managers and citizens. This is followed by the research design (data collection procedures and analysis framework) and the discussion of the methodological background of the design.

Chapter 4 gives the background of the Egyptian public administration sector and how e-government is applied, with special reference to the current situation of e-readiness plans and previous e-readiness assessments. The second part describes the three e-government services selected for investigation.

Chapter 5 provides a description of data findings and analysis. The analysis covers the collected data through interviews and questionnaires separately. Chapter 6 brings together the results of the data analysis from chapter 5, in order to answer the research questions as set out in section 1.1 and achieve the final CREG model.

Chapter 7 summarises the findings of the research, notes the implications of the findings for improving the success rates of e-government projects, details the contributions to knowledge resulting from the research and outlines possible future work.

1.5 Contribution of the research

The contribution to knowledge in the field of Information Systems, made by this research, comes from the provision of a model for citizens' readiness for e-government that includes e-readiness factors from assessments and literature as well as factors arising from this research. The research shows that readiness for e-government is not necessarily the same as e-readiness in general nor that e-readiness means citizens' use of e-government. All factors included in the model have been tested and confirmed by managers (policy-makers and project implementers) and citizens (end-users) as being significant to citizens' *use* of e-government. Consequently, the model bridges the gap between e-ready citizens and citizens who would make use of e-government services.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The chapter starts by discussing the available literature on e-government in general (section 2.2). It follows by discussing e-government in developing countries (section 2.3), e-readiness assessments (section 2.4), and trust in relation to e-government (section 2.5). The final section 2.6 explains the initial theoretical framework used in the research.

2.2 E-government in general

The concept of e-government was first introduced in 1979 by Simon Nora and Alain Minc when they provided a report to the French president about how to build the civil and political society using "telematique" or telematics (Nora and Minc, 1980). They define telematics as a combination of computers and telecommunications. In their report, they describe how most aspects of society, such as education, health and the activities of daily life, could benefit from telematics through a long term strategy between government and business (Cats-Baril and Jelassi, 1994).

Over subsequent years, various new definitions of e-government were proposed. However, the core part of each definition was based on the concept introduced by Simon Nora and Alain Minc. A recent more comprehensive definition (World Bank, 2007) is *"the use by government agencies of information technologies that have the ability to transform relations with citizens, businesses, and other arms of government. These technologies can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management"*.

Most definitions emphasise better delivery of government services to citizens and businesses using technology. This was summarised in Heeks (2004) definition of e-government as *"the use of information and communication technologies (ICT) in improving the activities and services of government"* which is the basis of the definition of e-government for this research with the addition of *"and delivering services over the internet"*.

E-government is not limited to providing government services to citizens or business but is part of a broader concept of e-governance as defined by Riley (2001); "*E-governance is the commitment to utilise appropriate technologies to enhance governmental relationships, both internal and external, in order to advance democratic expression, human dignity and autonomy, support economic development and encourage the fair and efficient delivery of services*". This concept considers e-government as one step towards reforming the shape of interaction between government and society through transparency of information and decision making by using ICT (Elmagarmid et al, 2001; Gisler et al, 2001). Consequently, society would be able to organise itself better to benefit from ICT (LaVigne, 2002; Sakowics, 2001; Wimmer and Bredow, 2002).

Determining e-governance, according to Saxena (2001) and UNDESA (2003b), could be achieved by having *e-democracy* that allows citizens to participate in their community in more efficient ways by having virtual meetings and cyber campaigns, public surveys and community forums, in addition to e-voting. Consequently, citizens will be participating more in the decision processes that affect the achievement of their social targets.

E-governance also includes *e-administration* – the improvement of government communication and information flows both within and between individual government departments, so as make government administrative processes more effective (Heeks, 2001). Although all aspects of e-governance are important, this research is limited to e-government as previously defined, and more specifically to the provision of e-government services to citizens in developing countries.

2.2.1 E-government characteristics

Although e-government projects follow similar steps as information system projects (Heeks, 2006) from initiation to deployment, Abdelghaffar et al (2005) claim that e-government projects have particular characteristics that influence their design and implementation.

- As e-government projects improve the delivery of services to citizens, they have a great attraction for policy makers. Therefore, politicians often make e-government decisions independently from experts, and subsequent success or failure may have a significant impact on their careers (Heeks, 2002).

- As for any project, an e-government project needs continued high-level (political) support for its progress, otherwise project management may be unable to sustain the project to achieve its targets (Heeks, 2003b; UNDESA, 2003b).
- As the main aim for e-government is to reform the public administration sector through enhancing its operations and providing new methods of service delivery, government employees may feel a loss of power in transferring the provision of services online. This might lead to a resistance to change on their behalf. Consequently, e-government managers have to clarify the main objectives and benefits of their projects in order to minimise the fears of their staff (InfoDev, 2002).
- Providing services online to the broad public requires dealing with a far more diverse group of users than in almost any other kind of application (Stamoulis, 2000; Wimmer and Bredow, 2002).
- E-government implementation may require a change in public culture to enable citizens to adapt to the new methods of providing services (Cohen and Eimicke, 2002).
- E-government objectives differ from those of private sector projects because of the existence of politics. Consequently, productivity and customer services are not the only issues that should be considered (Cohen and Eimicke, 2002). On the other hand, Csetenyi (2000) has argued that some experts believe e-government follows the same concepts as the private sector, but on a wider scale.
- E-governments can be described as the “*e-business of the state*” (Schubert and Hausler, 2001). This is because the tools of applying e-business are embedded within e-government. Consequently, e-commerce (Csetenyi, 2000) and e-business technologies (Nahon and Scholl, 2007) could be applied to e-government to increase the efficiency of providing services to citizens (Swedberg and Douglas, 2003). However, Sakowics (2001) argues that the concept of e-government is broader than e-business in that it covers rules and connections with government agencies. In addition to that, the main target of e-business is to increase profitability and market share for enterprises using web technologies while the aim of e-government is to provide services without profit (Liikanen, 2003).

2.2.2 E-government services and phases

E-government provides *different types of services* to society and their implementation depends on government's objectives (Pacific Council on International Policy, 2002; Starmoulis, 2000; UNDESA, 2003d).

- One type of service is government-to-citizen (G2C) which allows citizens to access information and receive government services such as submitting tax returns, or requesting identity cards, social security numbers or voter registration.
- Another type of e-government service is government-to-business (G2B) where government provides services to business such as launching new companies, taxation, inquiries and downloading forms online.
- Government-to-government (G2G) is the third type of e-government service. It is where a government department or agency supplies information or services to another.
- Ndou (2004) and AOEMA (2004) propose that e-government services could go even further to affect government employees (G2E) as the government can change the relationship with its employees by increasing their involvement for instance through knowledge management applications (Riley, 2001).

A country's development of e-government typically passes through a number of phases. Proposed phases vary between five (AOEMA, 2004), four (Gartner Group, 2000; Seifert, 2003) and three (InfoDev, 2002). The different number of phases can all be mapped onto the three defined by the InfoDev (2002), as shown in table 2-1.

E-government phases	InfoDev	Gartner Group; Seifert	AOEMA
1st phase	1 Publish government information	1 Publish government information	1(a) Establish website 1(b) Website contents updated regularly
2nd phase	2 Government interacts with citizens	2 Government interacts with citizens	2 Government interacts with citizens
3rd phase	3 Transactions conducted and completed by citizens online	3(a) Transactions conducted and completed by citizens online 3(b) Full integration of transactions	3(a) Transactions conducted and completed by citizens online 3(b) Full integration of transactions

Table 2-1: E-government phases

- The *first phase* is to publish government information such as laws and rules at a static website where the relationships between citizens and government are passive/passive (no interaction between the government and citizens). AOEMA (2004), on the other hand, argues that this phase should be divided into two small steps. An initial step for the government is to have a website which contains basic information about government organisations such as their working hours and phone numbers and then the website contents to be updated regularly with government documents and information.
- The *second phase* which all organisations agreed to it is where the government begins to interact with citizens and business. However, this interaction is mainly from the society side only (citizens and business), while the government is still passive. In this case, citizens can download forms and applications from the government website and use them in further transactions. In some cases, the government can be active through e-mails. Both of these two phases are important to get citizens used to using e-government websites and to gain their trust.
- When the government is ready to provide full services online, it moves to the *third phase* where transactions are conducted and completed by citizens and businesses online. So, both citizens and the government start to become active (there is interaction between the government and citizens online). This is the most important part for an e-government project when both government and citizens start to gain benefits from ICT to facilitate transactions and reduce time and effort. This aspect is the focus of this research. AOEMA (2004), Gartner Group (2000) and Seifert (2003) explain a sub-phase, 3(b), that is still more advanced, where full integration transaction takes place. In sub-phase 3(b), boundaries between government organisations have disappeared. Consequently, citizens can apply for services related to one government organization which will link them to any other part of other organisations to provide citizens with other services.

2.2.3 E-government delivery channels

As the main goal of e-government is to deliver better services for citizens, governments provide various types of delivery channels so that they can reach as many citizens as possible. In most cases, these channels depend on the direct use of the internet to access the e-government website to request the service.

Accessing services over the internet may happen in different ways to fit the national conditions within each country. It could be through using computers within government premises, public internet cafés, or at work in case there is a low penetration of personal computers for citizens at homes. In some developing countries and in rural areas another model can be provided in cooperation with the private sector by having an educated person request e-government services online on behalf of uneducated citizens (Bhatnagar, 2002). Moreover, in rural areas where there are no network connections, using wireless connections for kiosks would solve the problem. In Brazil, for instance, mobile units with wireless connection are used to visit rural areas regularly with government staff who are able to provide wireless services through the e-government website (InfoDev, 2002).

Alternative channels to request e-government services are the call centres that depend on phone calls and digital TVs. These delivery channels could be useful for some citizens who may not be educated about how to use a computer – such as elderly people (Cohen and Eimicke, 2002). In that case, telephones may be the most suitable method of requesting services.

Although different channels for delivering e-government services are important, providing services over the internet, which is the topic of this research, is seen as the most effective tool compared to other channels. This is because the internet provides the most effective means of interaction, enabling services to be provided continuously, 24-7 (InfoDev, 2002).

2.3 Issues of e-government in developing countries

2.3.1 E-government opportunities

The potential benefits of implementing e-government projects in developing countries are remarkable at all levels. Governments can use e-government application as a step for reforming the whole public sector process, which means that the process of each service has to be revised and changed to adapt to the new shape of service delivery (Liikanen, 2003). For example, in Chile a new process for tax return was established to reduce the time taken to respond to taxpayers to 12 hours only instead of 25 days for the traditional system (Heeks, 2001). Another benefit of e-government is to provide government services around the citizens' locations, meaning that citizens can access government services

either by using their home computers or they can find service centres around their living areas such as shopping malls and libraries. E-government is claimed to have tangible benefits on the economy in terms of cutting government costs. In Egypt, for instance, it has been estimated (Darwish, 2004) that e-government could increase government productivity to the extent of saving 900,000 working hours.

There are also seen to be indirect benefits of e-government, such as reducing the complexity of bureaucracy, simplifying the process of providing services and increasing transparency and accountability of the government to the public (UNDESA, 2003b). The democratic process is thus enhanced through increasing citizens' access to government information and services (Liikanen, 2003). This is as a result of the changing communication channels between the government and citizens from one-way to two-way.

2.3.2 E-government challenges

As a result of the importance of e-government, many developed and developing countries have attempted to apply e-government projects, but with mixed success. Of these countries, very few have succeeded in achieving their set targets whilst a larger number have arguably failed (Heeks and Bhatnagar, 1999; UNDESA, 2003c). In developing countries, based on a survey done on 40 e-government projects by Heeks (2003a), 35% of projects were considered as being total failures due to termination of the project, such as the electronic voter registration in Uganda and a land licensing and planning system for Beira city in Mozambique. 50% are considered being partial failures, where they only achieve part of their goals, such as the Cameroon's tax website. Only 15% succeeded.

The types and causes of failure in e-government projects have many similarities to those in information systems projects in general. These have been subject to well known analyses by (for instance) Lyytinen and Hirschheim (1987) and Sauer (1993). It is important to understand the types and causes of success and failure as set out in those and other published works, and to act on that understanding.

2.3.3 E-government success: previous approaches

A number of researchers have discussed factors that might help reducing failure rates and achieving higher success rates in e-government projects. Their focus is mainly related to how government could improve its own e-government processes (the supply side). In this

context, many researchers, such as Papantoniou, et al (2001), Cohen and Eimicke (2002), Burn and Robins (2003), Hackney and Jones (2002) and Reffat (2003) agree on the importance of change management as a success factor for e-government. Oberer (2002) adds that the changes in organisational conditions should include administrative measures for adapting to the new e-government process. This is because e-government projects require new technology, so organisations need to be able to change their business processes to adjust to it.

Heeks (2003b) agrees with the previous researchers on the importance of management for the success of e-government. However, he provides two further approaches for overcoming e-government failure. The first approach is to reduce the gap between current organisational realities (information, technology, processes, staff skills and management) and the future realities that will be necessary for e-government success. In his second approach Heeks (2001) defines lack of e-readiness for e-governance as a strategic challenge in Africa that might cause project failure. This includes the lack of adequate citizen data, and of legal and institutional infrastructure.

Although there are a number of approaches that focus on how government could improve its own e-government processes (the supply side) to achieve successful e-government projects, few researchers have studied the factors that affect citizens' usage of e-government (demand side). Bélanger and Carter (2006) conducted an empirical study to define the impact of the digital divide on e-government. Although their research does not directly address e-readiness, they consider some factors such as education and use of the internet as factors that affect e-government usage. However, this was a study conducted on a small scale and in a developed country (on 105 participants in one American state) which could be criticised as not being generalisable to other countries. Choudrie and Dwidedi (2005) conducted a study in the UK which correlated levels of education, together with possession of computers and broadband access, with awareness and use of e-government. This indicates the probable importance of citizens' e-readiness, in developing as well as developed countries, in influencing e-government success (Oll, 2007). Although the supply side clearly affects the demand side to the extent that citizens are influenced by government policies and projects, it is still important to have a better understanding of all the demand-side factors that influence e-government success.

From the government viewpoint (the viewpoint taken by most researchers), e-government success factors may be partitioned into internal (government-related) and external (for instance, society and the technology environment). Huijboom and Hoogwout (2004) emphasise the importance of taking external factors into account in the development of e-government projects. The main problem of external factors is that government has less control over them (Garner, 1986). Both society (citizens) and the technology environment need to be e-ready, otherwise there is a high risk of e-government failure.

The few studies that discuss the impact of e-readiness on citizens' usage of e-government take into account relatively few e-readiness factors, and omit consideration of other citizen-related factors found in the large number of assessments that attempt to rate or rank the e-readiness of sets of countries: section 2.4 reviews these e-readiness assessments. Further, these studies address developed rather than developing countries. This research aims to fill this gap by identifying the factors that may influence citizens to be ready for e-government (CREG) and to use it.

2.3.4 ICT challenges for e-government

In order to define the factors that affect citizens' readiness for e-government within developing countries and how they influence e-government success, it is crucial to understand the major problems of ICT in developing countries that might cause e-government failure. One reason that might contribute to the e-government failure is the lack of appropriate ICT infrastructure. This is because e-government, as defined previously in section 2.2, is based on the use of ICT to deliver government services for citizens.

ICT infrastructure includes basic access infrastructure (Ndou, 2004) which consists of, among other factors, telephone lines, personal computers, internet accessibility and penetration in rural areas, the speed available for the public to access the internet and the cost of the services provided in comparison to citizens' income. This problem of lack of infrastructure can be clearly demonstrated by comparing the situation of ICT infrastructure between developed and developing countries (Hui, 2006). In telephone penetration, at a time when there were 693 telephones per thousand citizens in the UK, there were only 66 per thousand in Egypt (UNDESA, 2004). In computer penetration, at a

time when there were 416 personal computers per thousand citizens in developed countries, there were only 6 per thousand in developing countries (World Bank, 2003).

ICT infrastructure also includes issues related to the reliability of networks and the availability of communications companies that support different services such as satellite communications in rural areas (Ndou, 2004). In India, for example, the government installs Kiosks in local rural areas to provide e-government services for citizens. However, because of the lack of leased lines and the dependence on telephone lines only at these areas, many reliability problems have occurred which decreases the use of these Kiosks (Bhatnagar and Vyas, 2001).

Developing countries face a high level of digital illiteracy which is a significant ICT problem that has left e-government projects abandoned without users and has contributed to e-government failure (InfoDev, 2002). The issue in some countries is even worse as rates of illiteracy (never mind digital illiteracy) are very high in both urban and rural areas. In Egypt, for example, 43% of the population is illiterate (InfoDev, 2004). Consequently, e-government projects end by having a limited number of digitally literate citizens (InfoDev, 2002). Ndou (2004) summarises the digital divide (Norris, 2001) in developing countries as the gap between citizens who are able to access information through the internet and those without access (InfoDev, 2002). The digital illiteracy problem goes beyond using computers only to how citizens are using technology in their daily life so that different electronic applications, such as e-commerce and e-government, can succeed.

The absence of legislation regulating the provision of online services may be another problem. An example of such legislation would be an electronic signature law, which is important in generating citizens' confidence (InfoDev, 2002; Ndou, 2004). ICT regulations should go further to include appropriate legislation leading to prosecution for illegal access to government and citizens' computers and provide more protection for citizens' data collected by the government.

Another issue is that some e-government projects in developing countries, use 'already designed' applications and plans that have been applied successfully in developed countries. These applications are mainly designed according to the needs of the developed countries – which do not necessarily suit the conditions in developing countries and might

lead to project failure. For example, credit cards are mainly used as a payment method for all e-government projects in developed countries while in most developing countries cash is still the major concept of payment and there is a major lack of credit cards (Bhatnagar, 2002, 2004).

2.4 E-readiness assessments

2.4.1 Problems of e-readiness assessments

As a result of the lack of basic ICT provision in developing countries, which might cause problems for e-government and other internet-based projects, many countries have launched e-strategy plans to enhance that provision. On the whole, these plans consist of many steps that *start* by defining the country's objectives. This is *followed* by an essential step (conducted by 188 countries around the world (Bridges, 2005b)) to measure their e-readiness situation to understand how it could be improved through an action plan (Bridges, 2002; Brown, 2002; UNDESA, 2003a). Measuring e-readiness is mainly done by using international e-readiness assessments that have predefined criteria. *Finally*, a detailed action plan is designed and followed to move the country towards its objectives. In later stages, an annual e-readiness assessment is conducted to assess the yearly changes and improvements within the country and how the country stands in regards to other countries (Bridges, 2005a; GeoSINC, 2002).

Although e-readiness assessments are important as an initial step towards having a more e-ready society that is able to benefit from e-government projects, these assessments present various problems that might have a negative effect on countries' plans. To identify those problems, it is important to establish what e-readiness means. Currently, there are various conflicting e-readiness definitions (Bridges, 2005a). According to the Centre of International Development at Harvard University (CID), which focuses on measuring the networked world, e-readiness is *"the degree to which a community is prepared to participate in the Networked World"* (CID, 2003). On the other hand, McConnell International (2000) defines e-readiness as *"the capacity of nations to participate in the digital economy"*. The CSPP (1998) defines an 'e-ready' community as *"the one that has high-speed access in a competitive market; with constant access and application of ICTs in schools, government offices, businesses, healthcare facilities and homes; user privacy and online security; and government policies which are favourable to promoting connectedness and use of the Network"*. Despite the importance of e-

readiness, there is no a single definition which is accepted universally for e-readiness, as each organisation works from its own perspective (Bridges, 2005a).

The problem of the diversity in e-readiness assessments is not limited to definitions. Currently, there are many organisations providing varied methods of assessment as listed in table 2-2 (Bridges, 2005a). These assessments have different objectives and goals for what they measure. McConnell International (2000), for instance, assesses the national economy's e-readiness to participate in the global digital economy. Asian Pacific Economic Cooperation (APEC), on the other hand, provides an assessment of e-commerce readiness and what should be focused on to improve it (APEC, 2000). International Telecommunications Union (ITU) has a different perspective that focuses on analysing the factors that affect a country's internet usage (ITU, 2001). Some assessments target enhancing business and the economy through improving ICT, while others might focus on enhancing society.

The following table shows the range of assessments conducted by various organisations.

Abbreviation of organisation undertaking assessment	Assessed countries	Organisation full name	Assessment title	Assessment description	Methodology
E-readiness assessments					
CID	15	Centre for International Development - Harvard University	Readiness for the networked world.	The assessment provides a report that defines the degree to which a community is prepared to participate in the networked world for each of the categories identified by the assessment.	Quantitative
APEC	10	Asia Pacific Economic Cooperation	E-commerce readiness assessment.	The assessment provides details on the areas that need to focus on within the criteria provided by the assessment.	
CSPP	1	Computer Systems Policy Project	Readiness guide for living in the networked world.	The assessment produces a rating that indicates which of four progressive stages of development the community is at for each of the five categories provided by the assessment.	
ITU-I	53	International Telecommunication Union	Internet country case study.	The assessment provides an analysis of the factors affecting internet use along with recommendations. This is done using mosaic methodology.	Case Study
USAID	24	US Agency for International Development	Information and communication technology (ICT) country assessment.	A set of detailed case studies, each describing an individual country's progress and giving an action plan for it to pursue in the future.	
InfoDev	13	Information for Development	Readiness for the networked world.	The study explores possible ways to move forward the e-readiness in the developing world. The assessment is using CID criteria	

SIDA	7	Swedish International Development Cooperation Agency	Country ICT survey.	A set of detailed case studies, each describing an individual country's ICT landscape and a basic analysis of factors of major interest for the promotion of use of ICT for development reasons.	Research Reports
ASEAN	10	Association of Southeast Asian Nations	E-commerce readiness assessment.	Evaluating countries according to four stages of development identified by IBM: emerging, evolving, embedding and extending.	
McConnell	42	McConnell International	Risk e-business: seizing the opportunity of global e-readiness.	Countries are examined according to their capacity to participate in the digital economy.	
WITSA	51	The World Information Technology and Services Alliance	International survey of e-commerce.	The survey focused on the direct experience of companies with e-commerce and their subjective views of what is needed to promote e-commerce.	
Crenshaw & Robinson	126	Crenshaw & Robinson	A cross-national analysis of internet development.	Statistical metrics stating the probable relationship between the variables and an explanation of how these factors are likely to shape the technology development.	
CIDCM	3	The Centre for International Development and Conflict Management	Negotiating the net model.	A report that comprises a detailed narrative description of the processes and outcomes of negotiations between key players over the phases of development and the issues likely to remain problematic in the future.	
EIU	69	Economist Intelligence Unit	E-readiness ranking.	The ranking covers the world's 60 largest economies and suggests areas to focus on government policy and funds.	
SIBIS	26	Statistical Indicators Benchmarking the Information Society	Matching up to the information society. An evaluation of the EU, the EU accession countries, Switzerland and the United States	The assessment measures and monitors the information society, for benchmarking and policy evaluation.	
MetricNet	43	MetricNet	Worldwide IT Benchmarking.	It measures IT performance and productivity by organisations worldwide and produces priorities for IT companies which help organisations to self assess their IT performance.	
K4D	98	Knowledge for Development Program (World Bank)	Knowledge Assessment Methodology (KAM) (interactive database)	A detailed, interactive statistical assessment of how 98 countries economies are prepared for an information economy and society.	
IDC-ISI	53	IDC Information Society Index	Information Society Index (ISI) 2005.	Ranks 53 countries according to their ability to access and absorb information and IT in the future.	
WEF	102	World Economic Forum	Networked Readiness Index (NRI).	NRI defines the degree of preparation of a nation or community to participate in and benefit from ICT developments.	
InfoDev and Pyramid Research	60	Pyramid Research, for the Information for Development Program	Information infrastructure index.	It has developed a set of indicators and defined empirical data to assess the information infrastructure worldwide.	

Kenny	191	Charles Kenny, for World Bank	Prioritising countries for assistance to overcome the digital divide.	It identifies countries that have both a lower than expected level of ICT provision given their GDP level and a quality and cost of services that is less than satisfactory.	
Kearney	62	A.T.Kearney Foreign Policy Magazine	Globalisation Index (GI).	The globalisation index tracks changes across 62 advanced markets and emerging markets.	
ITU-2	196	International Telecommunication Union	World Telecommunication Indicators (WTI).	A comprehensive set of tables including several types of indicators (for example population, GDP, telephone tariffs and traffic, ISDN, IT, network growth,...)	
ITU-3	178	International Telecommunication Union	Digital Access Index (DAI).	It points to barriers in ICT adoption and can be used to identify a country's strengths and weaknesses.	
Orbicom	192	Orbicom	Monitoring the digital divide.	The assessment considers the issue of ICT from the digital divide perspective.	
E-government assessments					
UNDESA	191	United Nations Department for Economic and Social Affairs	E-government readiness index.	It presents an assessment of the countries according to their state of e-government readiness. Consequently, it benchmarks countries based on their online presence, human capacity development and telecommunications infrastructure.	Quantitative
Brown	198	Brown University - Centre for Public Policy	Global e-government study.	It provides a ranking of e-government projects based on reviews of the official government websites across all countries for specific features and online services.	
Accenture	22	Accenture	E-government leadership.	It provides e-government ranking for 22 countries and recommend a course of actions that most likely to deliver high performance of e-government.	Quantitative and qualitative
Waseda	32	Waseda University Institute of E-government	E-government Ranking.	It provides e-government ranking for 32 countries around the world using a set of indicators and parameters	

Table 2-2: List of assessments

Source: Based on, and extended from Bridges (2005a)

Solutions are provided by different researchers and organisations for overcoming this problem by having a taxonomy for e-readiness assessments. This classification for assessments might assist policy makers to have a clearer vision of which assessment is appropriate to achieve a country's goals. Bridges (2005a) provides an approach for classifying e-readiness assessments according to the data collection and analysis techniques. These techniques include the following:

- Statistical techniques, to analyse data from different countries and to make links among factors collected from all studies;

- Best practice techniques, which provide comparisons between similar countries so that they can learn from other countries' experience;
- Historical analysis techniques, which focus on social, economical and political issues to forecast ICT of the country.

Another approach by Bridges (2005a) was to classify e-readiness assessments according to their outputs, whether they are descriptive, diagnostic of the problems within the country, or prescribing actions for specific problem.

GeoSINC (2002) suggests an alternative approach to the problem of assessment diversity, by using combinations of different assessments, because no single assessment covers all criteria. The difficulty remains, however, of the extent to which one assessment may fit with one or more others. Addressing that problem, Bakry (2004) proposes a single assessment applicable to all countries, rather than trying to classify or combine conflicting assessments. Bakry explains that the lack of agreement on standard e-readiness assessments may lead to inaccurate diagnoses for countries. His proposal for a standard assessment is based on five elements of development, which are given the acronym STOPE: strategy (for development), technology, organisation and people (for delivering the strategy), and environment (within which the strategy is to be delivered). Bakry's approach has not, however, been applied in practice.

A further problem arises from the existence of assessments for a single country by a number of different organisations. This problem leads to have conflicting figures for the same country. According to Bridges (2005b), 69 countries have been assessed more than ten times by different organisations (such as Egypt, South Africa and China). Another 68 countries have been assessed between five and ten times by different organisations. Other countries (such as North Korea and Nauru) have not been assessed at all. Accordingly, government policy makers would have to choose between conflicting figures to decide their action plan, which could give rise to problems (Abdelghaffar and Bakry, 2005; Bakry, 2003). A clear example of this confusion between e-readiness assessments figures occurred when McConnell ranking for e-readiness in 2001 concluded that India needed improvement in many areas of connectivity in contrast with the findings of MetricNet assessment (Budhiraja and Sachdeva, 2003).

Each assessment organisation uses its own set of assessment criteria, depending on its assessment objectives, and these criteria vary between assessment organisations (Bridges, 2005a). Furthermore, even where two or more organisations apparently use the same criterion, they may use different sets of variables to measure it. For example, the *access* criterion consists of bandwidth, industry diversity, export controls and credit card regulation in the APEC assessment (2000), while in the CID assessment (2003) it consists of information structure, internet availability, internet affordability, network speed and quality, hardware and software, and service and support.

Not only this, but also, defining parameters is static in terms of neglecting the current situation for each country (Mwangi, 2006). Further, the definition of parameters is static and may neglect important differences between countries or in a single country over time (Mwangi, 2006). For example, assessments may not consider the distribution of ages in a population. In Egypt, 33.4% of the population is under fifteen and are therefore not in the work force (Gronlund et al, 2005), so that it is misleading to compare the number of personal computers per thousand population in Egypt with the number per thousand in a country with a substantially older population.

The assessments discussed so far measure e-readiness in general but not the more specific readiness for e-government (Ojo et al, 2007). In this context, the United Nations has produced reports on e-government readiness (UNDESA, 2003d, 2004, 2005, 2008). The advantage of these assessments is that they focus on measuring both those e-readiness factors that specifically relate to e-government, such as human capacity and the telecommunication infrastructure index, and other factors that relate only to e-government readiness, such as the e-government web index. However, these assessments ignore other important e-government readiness factors such as ICT usage and legislation, in addition to not defining the impact of the measured factors on citizens' behaviour towards using e-government projects.

There are a small number of other assessments that specifically address e-government readiness, but again their different objectives and assessment criteria mean that there is no agreement between them on what should be measured.

- Accenture (2004) assesses e-government leadership, using service and delivery maturity as criteria. Service maturity is based on the number of services provided

online and on the phase achieved in e-government (see section 2.2.2). Service delivery focuses on customer (user) relationship management.

- Brown University - Center for Public Policy (2005) produces the Global E-Government Ranking based on reviewing e-government websites only, using the criteria of online information, electronic services, privacy and security, disability access, foreign language access, advertisement, user fees and public outreach.
- Waseda University Institute of E-Government produces a ranking using criteria relating to network preparedness, legal systems, e-government websites and government management (Waseda, 2006).

2.4.2 E-readiness factors in assessments

Reviewing all the above assessments for both e-readiness in general and e-government readiness in particular, despite the differences that have been discussed, it is possible to identify four major factors that occur pervasively. Appendix D-1 sets out the mapping between assessments and those major factors and appendix D-2 sets out a mapping between assessments and the sub-factors proposed within each of the major factors. The four group factors and their sub-factors that contribute to CREG are as follows (table 2-3).

- **ICT infrastructure** mainly relates to the elements of ICT infrastructure that need to be available to citizens if they are to use e-government services.
- **Human capital** relates to citizens' education and knowledge on how to use computers and the internet.
- **ICT usage** reflects how citizens use computers and the internet in their daily lives.
- **ICT regulations** relate to legislative provisions that affect the use of e-government services.

Factor group	Factor	Sub-factor	Source	
			Assessments	Literature
E-readiness	ICT infrastructure	Telephone at home	✓	
		Computer at home	✓	
		Computer and internet at work	✓	
		Internet speed	✓	
		Internet prices	✓	
	ICT usage	Regular use of internet	✓	
		Use of internet in public places	✓	
	Human capital	Computer knowledge	✓	
		Internet knowledge	✓	
Computer and internet education		✓		

		in schools		
ICT regulations		Telecommunication regulations	✓	
		E-signature law	✓	
		Information protection commitment	✓	✓

Table 2-3: E-readiness factors and sub-factors influencing CREG

Those four major e-readiness factors, therefore, become the *first group of factors* influencing citizens' readiness for e-government (CREG). The existence of these factors helps to move citizens from being non e-ready to be e-ready citizens and be able to use e-government services as shown in the initial theoretical framework in figure 2-1.

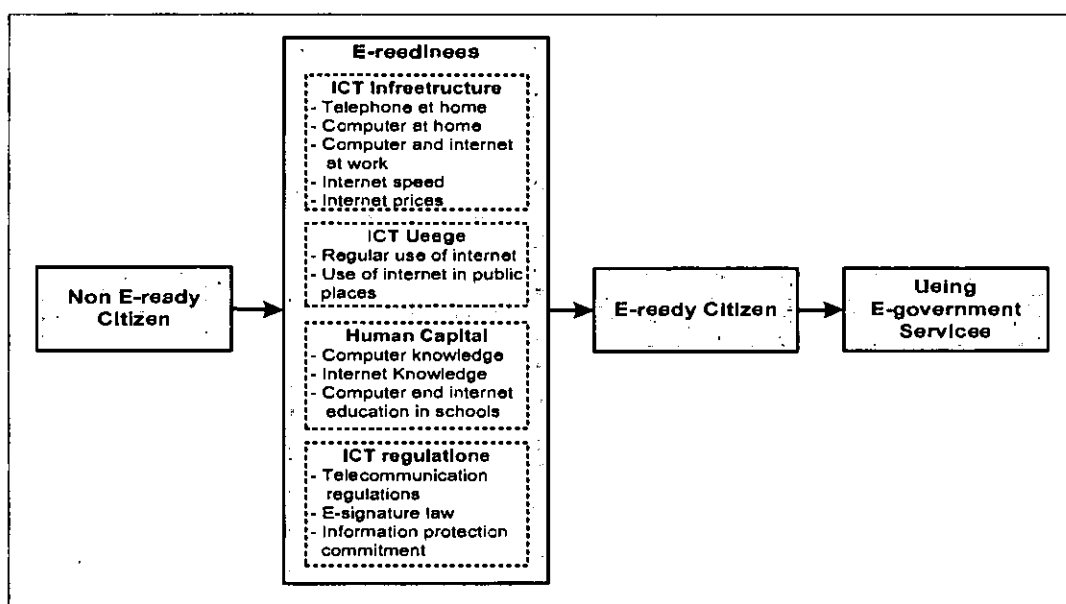


Figure 2-1: Theoretical framework-1

2.5 E-government and trust issues

Although the previous e-readiness factors are important for e-government success, are they enough? This question arose from reviewing the literature for developing countries where it seemed that although some of them achieved an adequate level of ICT infrastructure and had e-ready citizens who were able to get advantage from ICT, their e-government projects are still at a low level of usage. Although a high percentage of citizens are digitally illiterate, there remain many who are able to use computers and the internet but who nevertheless do not use e-government services. For example, Prattipati (2003) finds that only 23% of the Hungarian and 27% of the Polish citizens who used the

internet used e-government services online while the rest did not. So, even if citizens become e-ready, they still may not use e-government services.

It is therefore important to see whether there are other factors, additional to those derived from the e-readiness assessments reviewed in section 2.4, that may influence citizens' readiness for e-government and consequently their usage of e-government in developing countries. The following table (2-4) demonstrates the possible range of conditions that could occur in terms of e-readiness and e-government use.

	country has good e-readiness factors	country has poor e-readiness factors
citizens use e-government	<i>high e-readiness makes use probable but not inevitable</i>	<i>what citizen-specific factors are present that might lead to use?</i>
citizens do not use e-government	<i>what citizen-specific factors are absent that might lead to use?</i>	<i>low e-readiness makes non-use probable but not inevitable</i>

Table 2-4: Country's e-readiness versus citizens' use of e-government

The table indicates the possibility of there being other factors, in addition to those used in the e-readiness assessments, that might contribute to citizens' readiness for e-government and therefore increase the probability of citizens' use of e-government. In this context, a number of researchers have identified *citizens' trust* as a significant issue for e-government. They state that citizens' trust towards e-government is an essential factor in encouraging citizens to use e-government services (Al-adawi et al, 2005; Gefen et al, 2002; Otto, 2003).

Despite the recognition of trust in e-readiness assessments, only two of them include trust within their criteria (appendix D-1). The first is the World Information Technology and Services Alliance (WITSA) which only considers trust in e-commerce, which is the main objective of the assessment (WITSA, 2000). The second is The Statistical Indicators Benchmarking the Information Society (SIBIS) which considers the issue of trust for Switzerland, the USA and ten EU candidate countries (SIBIS, 2003). Although issues regarding security, privacy and legislation have an impact on trust, none of the e-readiness assessments consider how they affect citizens' usage of e-government in particular.

2.5.1 Defining trust

Trust can be generally defined as “*an expectancy of positive outcomes that can be received from another party*” (Bhattacharya et al, 1998). Trust has a major impact on relationships between transacting groups and may be achieved by documentation, statements or recommendations from others that could help to determine the credibility of the other party (Huff and Kelly, 1999). In the case of information systems, it is primarily citizens’ direct experience with the system itself which determines citizens’ trust or lack of trust in it (Schneider, 1999). Although trust in technology is different from the general concept of trust, human computer interaction researchers indicate that citizens deal with technology in the same way as they deal with social agents (Kiesler and Sproull, 1997; Wimmer and Bredow, 2002). Consequently, when the expectations of citizens are met with reliability, then trust exists (Sitkin and Roth, 1993).

2.5.2 E-government trust: previous approaches

Several researchers have identified some factors that might help to increase citizens’ trust in e-government. In this context, Thomas (1998) identified personal characteristic such as age and gender as a significant factor that affects trust in e-government. This is because elderly people, for instance, in many situations prefer paper-based services which they have used for many years rather than using an e-government website.

Parent et al (2004) consider that citizens’ past experience affects their trust in e-government. For example, if citizens’ experience of electronic transactions is negative, they would probably be less willing to use e-government to conduct transactions.

Lee and Rao (2005) discuss threats from the surrounding environment, such as wars, as factors that affect citizens’ usage intentions. They found that American citizens’ trust in the internet and e-government websites increased rapidly during the second Iraq war, while it became less after the end of the war. Their view is that citizens normally trust governments in these situations and become less concerned about internet risks. Further, trust in e-government may be related to trust in government generally, which is similarly affected by surrounding factors.

The previous factors identified by researchers as affecting citizens’ trust in e-government could be classified as an approach which is dependent on citizens’ personal characteristics.

Although this approach is useful, it neglects an important issue regarding the role of government in this two-way interaction. That is, what the government provides that might help to increase citizens' trust in e-government. In this context, some researchers offer another approach that considers trust in e-government occurring as result of the existence of external factors which encourage citizens to trust e-government. However, there is a lack of agreement between them on what it is that affects citizens' trust on e-government.

Srivastava and Teo (2005) who studied e-government in Singapore, confirmed that trust in both technology and government are major factors in citizens' adoption of e-government.

- On the one hand, they propose a set of factors that may influence citizens' trust in government, such as government's ability, motivation and commitment. To achieve trust, e-government projects should have top leadership support and provide appropriate measures such as security and privacy.
- On the other hand, citizens' trust in online technology is related to reducing risk and providing benefits. This could be influenced by providing a comprehensive legal system covering online services and by taking steps to improve citizens' e-readiness.

Using their model, they find that the higher the degree to which citizens trust government and technology, the more citizens will adopt e-government services. Nevertheless, the limitations of this research are that Singapore is a small country, its citizens mainly use the English language, and it has a high level of technology – which means that caution is necessary in generalising their findings to other countries.

Contrary to the findings of Srivastava and Teo (2005), Carter and Belanger (2004), through their study on 136 university students in the United States, conclude that trust in government is not a significant factor in determining trust in e-government. The basis for their argument is that, driving licences (the example they use) must be requested from government regardless of the degree of trust in it. The issue of internet trust was in any case largely insignificant for their research as their users were mainly university students using the internet regularly anyway.

Carter and Belanger (2004) go further to conclude that perceived usefulness, relative advantage and compatibility with users' life styles are significant indicators that affect users' usage of e-government. Consequently, governments should publicise to citizens the

benefits of using e-government services, and provide advantages for using them by reducing costs of using online services compared to traditional ones. Again, however, it should be noted that their results are limited to a specific group of 136 American students in this case, so that caution is again necessary in generalising their findings to other countries.

Bretschneider et al (2003) find through their study of e-government services in the United States that having an advantage for e-government services would not help to increase citizens' adoption of e-government – contradicting the findings of Carter and Belanger (2004). That might result from the existence of other factors affecting citizens' adoption of e-government.

Al-adawi et al (2005) adopt a model that differentiates between only viewing e-government information and conducting transactions online. This distinction matches the e-government phases (mentioned earlier in section 2.2.2) – the distinction between just obtaining information and carrying out transactions. According to their model, citizens' intentions to get information from an e-government website could be an important step towards conducting transactions in the future as a result of increased trust.

2.5.3 Trust factors in CREG

As there is a lack of agreement between researchers on what determines citizens' trust in e-government, it is important, at this stage, to decide what should be included as the most significant trust factors contributing to CREG. Looking to the e-government definition (discussed in section 2.2) might help to identify which factors are important for CREG. As e-government uses *ICT* to improve *government* services and deliver them over the internet, the two key components – *ICT* and *government* – provide the basis for factors affecting trust in e-government. If there is a lack of trust in either or both of these issues, it could negatively affect e-government usage (Abdelghaffar and Kamel, 2006).

The remainder of this subsection looks in turn at (1) technology trust, (2) government trust and finally at (3) e-government trust (the intersection of the two).

1) Technology trust

Security and privacy are identified by many researchers as issues influencing citizens' trust in technology (InfoDev, 2002; Lau, 2004; OECD, 2003; Wimmer and Bredow,

2002). If there is a perceived lack of either in the chain between citizens' points of access – which may be at home or work, or at third-party locations such as relatives, friends, private centres or kiosks (Baldwin et al, 2002) – citizens are less likely to use e-government to send private and financial information.

Security

E-government security is categorised at two different levels.

- *The first level* is regarding transmission of information between the end-user client and the e-government portal. This part is directly related to the internet communication process where security can be achieved by using a combination of various technologies such as digital certificate, secure Hypertext Transfer Protocol (HTTPS) and encryption (Regio, 2002). Consequently, the government would be able to provide maximum security features for e-government websites that enable citizens to send and receive data securely (NECCC, 2001).
- *The second level* is securing the information stored at government database servers. This could be achieved by using different measures such as having firewall technology that prevents unauthorised access from outside to the data of citizens stored by government servers. Unauthorised access to servers could even be by employees of government organisations which employ measures to control access to networks and define authentication levels for employees (Wimmer and Bredow, 2002; Yang et al, 2005). As citizens' data is exchanged between different governmental organisations, existence of an intranet would be useful to enable secure exchange of information between government departments rather than using the public internet (Wimmer and Bredow, 2002). Since e-government services carry many security threats, it is necessary to provide a range of security measures that cover as many angles as possible.

Research also suggests that it is important for technical measures to be backed up by legislation to protect citizens' information from falling into unauthorised hands (Jaeger, 2002; OECD, 2003), and against identity theft. Governments need the power to prosecute illegal access to citizens' data (Camp, 2000; Srivastava, and Teo 2005). In line with these observations the Egyptian government established a Digital Signature Act in 2005 (MCIT, 2005b). Legislation of this kind has the added benefit of providing an additional basis of trust for citizens who may already be e-ready.

As e-government services proliferate, provided by different government departments (whether through separate websites or through a single e-government portal), the existence of security safeguards that are unknown to citizens, whilst addressing the need for security, will not address the issue of citizens' trust in the technology. A security policy that announces the presence of the security measures is needed to reassure citizens and reduce the perceived risk of using e-government services (Tassabehji and Elliman, 2006). Providing a standard policy to all government organisations would help to sustain a standard level of security on all levels (Welch and Hinnant, 2002).

Privacy

Privacy, especially online privacy, has become a concern of many citizens in different countries (Irani et al, 2007). This is because of the amount of information collected about citizens, through surfing the internet or purchasing products online, without their permission or knowledge. In the United States, for example, 92% of citizens are very concerned about the privacy issue for online websites (NECCC, 2001).

In e-government, the privacy issue is more important than just in the context of surfing the internet or purchasing goods online because requesting e-government services online requires citizens to submit personal information. For example, citizens have to submit data including their incomes, bank accounts and family details when they fill in their tax forms online. This is in addition to other information collected about them without their knowledge such as browser type, internet protocol (IP) address and websites visited. The privacy issue relates to where the collected information will be stored, for what purpose and for how long, and who has access to it.

According to Lau (2004) in order to increase citizens' trust in e-government, government should make explicit privacy policy of what information will be collected and stored about them, for what purpose and for how long, and who will be authorised to access and use it. That should be supported by appropriate data protection legislation.

2) Government trust

Citizens' trust in their government is related to issues such as how far they are satisfied with government actions and their attitude to the political regime (Easton, 1965). Thomas (1998) states that citizens' attitude to government is that it should work on behalf of

citizens and should do its best to achieve a better life for them. Although some researchers agreed that citizens' trust in government is a significant factor influencing their attitude to e-government (Blakemore and Lloyd, 2007; Srivastava and Teo, 2005), in reality citizens use government services such as vehicle licensing (whether by traditional methods or through the internet) irrespectively of whether they trust their governments or not. This is because such services are often necessary if not essential (Carter and Belanger, 2004).

The problem for many developing countries is that there is a history of political instability and non-transparency, as discussed in a number of international reports (Transparency International, 2006; World Audit, 2006), which destroy the idea that governments work for their citizens' benefit. Therefore, if governments in developing countries waited until citizens trusted them, as a precondition for embarking on e-government, they might never get started. However, *building trust in e-government is a more limited task, and may be more feasible, easier and quicker* (Pacific Council on International Policy, 2002). Even more, building trust in e-government could increase trust in government as it shows that the government works for the citizens' benefits by facilitating receiving services in an better way (Parent et al, 2004; Tolbert and Mossberger, 2006; Welch and Hinnant, 2002).

3) E-government trust

To achieve citizens' trust in e-government, it is important to understand how using government services online differs from the traditional methods to which people will probably have become accustomed over many years. In the traditional methods, which depend on face-to-face transactions, trust mainly exists when citizens have the opportunity to observe the official's behaviour and understand the mechanisms of the process, achieved for instance by getting signed and stamped documentation (Dawes et al, 1999). In this way, the uncertainty or risk which might be associated with government transactions is reduced. However, in the e-government process, the aspect of observing services is missing and therefore minimising the risk that might be felt in using e-government services should be a central goal for governments in developing countries (Ba et al, 1999; Blakemore and Lloyd, 2007) to achieve citizens' trust in e-government.

In summary, the literature indicates that governments should pursue three approaches to achieve or increase the trust of their citizens in e-government.

- *The first* is by ensuring the existence of good security measures (Al-Sawafi, 2003) and providing a stringent and credible privacy policy (Welch and Hinnant, 2002), supported by appropriate legislation and regulations to increase trust in the technology (appendix D-2 and D-3).
- *The second* is increasing trust in the government by ensuring that the government motivation is to provide citizens with better services that are delivered with transparency (Srivastava and Teo, 2005; Thomas (1998).
- *The third* is increasing trust in e-government by ensuring that citizens are at least as satisfied with e-government services as they are with the traditional services – preferably more satisfied (Corritore, et al, 2003; NECCC, 2001; Rho and Hu, 2001) (appendix D-3).

The three approaches are grouped in factors and sub-factors which could contribute to CREG as in the following table (2-5).

Factor group	Factor	Sub-factor	Source	
			Assessments	Literature
Trust	Technology trust	Security	✓	✓
		Privacy	✓	✓
	Government trust	Motivation		✓
		Transparency		✓
	E-government trust	Credibility		✓
		Customer satisfaction		✓
		Response on time		✓

Table 2-5: Trust factors and sub-factors influencing CREG

2.6 Initial theoretical framework

Findings from the literature review and e-readiness assessments showed that both e-readiness and trust factors affect citizens' usage of e-government services.

- Section 2.4 (supported by appendices D-1 and D-2) described the derivation from the set of e-readiness assessments of a proposed set of factors and sub-factors that specifically appear to influence CREG and therefore relevant to this research. These have been grouped together as *e-readiness factors and become the first sub-question*.
- Section 2.5 (supported by appendices D-2 and D-3) similarly described the derivation, both from the assessments and the research literature, of a proposed set of factors and

sub-factors relating to issues of trust that also appear to influence CREG. These have been grouped together as *trust factors and become the second sub-question.*

Consequently, the initial theoretical framework (figure 2-1, p.33) changed to include trust factors (table 2-5 above) resulting in a second theoretical framework illustrated by figure 2-2 below.

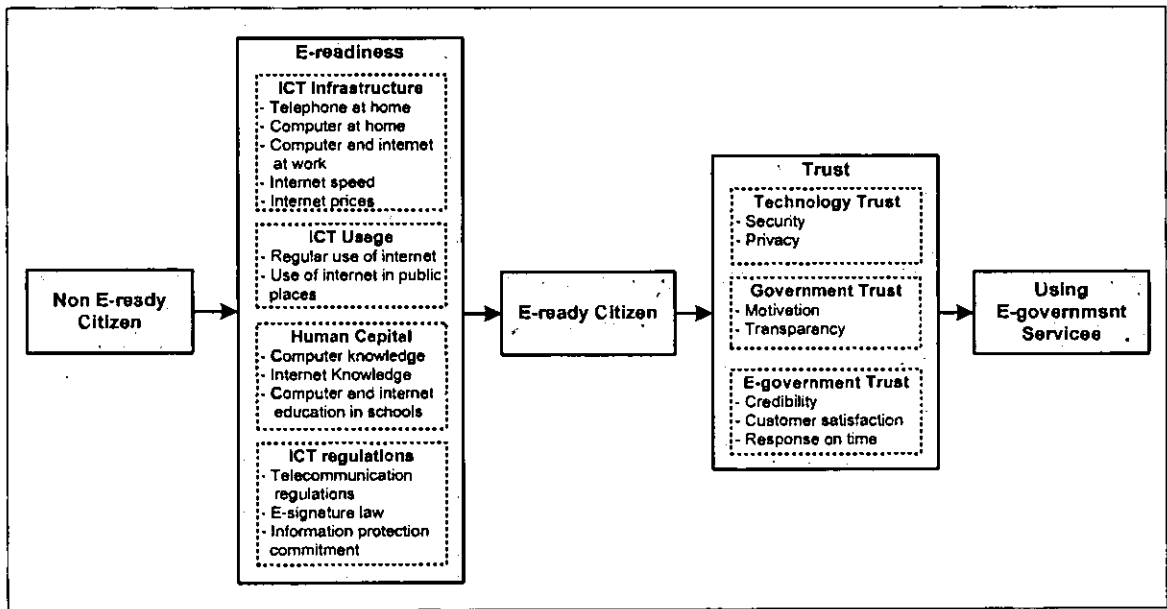


Figure 2-2: Theoretical framework-2

2.7 Conclusion

This chapter, through the literature review, explained how e-government, as an ICT project, is seen to provide several benefits for both governments and citizens which have encouraged several countries to implement e-government. However, in many cases, they were not able to achieve success due to several e-readiness obstacles. Reviewing the available e-readiness assessments identified that ICT infrastructure, ICT usage, human capital and ICT regulations are factors that have a direct effect on CREG in developing countries. As e-government is a new deployment of technology requiring citizens' use, a case has been made that there is a need to increase their trust towards it. Technology and e-government trust have been identified as major factors that would affect citizens' usage of e-government. By identifying e-readiness and trust factors as major factors for CREG and by testing them (in this research), it is argued that more successful e-government projects in developing countries can be achieved.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

In order to address the research question – What are the factors that affect citizens' readiness for e-government (CREG) in developing countries? – Egypt was selected as an example of a developing country with an ambitious e-government programme initiated several years ago. Three Egyptian e-government services were selected for detailed investigation.

The research can be characterised as being in the domain of information systems, specifically addressing e-government projects in developing countries. The research uses an interpretive/qualitative approach, augmented by quantitative data analysis. Both interviews and surveys were used as a method of primary data collection from managers and citizens and existing documentation was used for collecting secondary data. The collected data was analysed using an analysis strategy that classifies collected data from both citizens and government perspectives.

The chapter begins (section 3.2) with describing the pilot study and is followed by redefining the research question and factors used in the main study (section 3.3). Section 3.4 provides a detailed account of the research design, including data collection from interviews and surveys and an explanation of the data analysis strategy. That is followed (section 3.5) by a brief discussion placing the research design within the wider context of accepted research paradigms and methods.

3.2 Pilot Study

The pilot study was considered at early stage of designing the research. The aim of the pilot study was to achieve the following:

- Gain input from both *managers* and *citizens* to assess the appropriateness of the research question.
- Clarify the factors under investigation through testing the importance of the proposed factors (the outcomes of the literature review) on e-government success (figure 3-1).
- Test the wording of questions with interviewees and citizens for clarity.

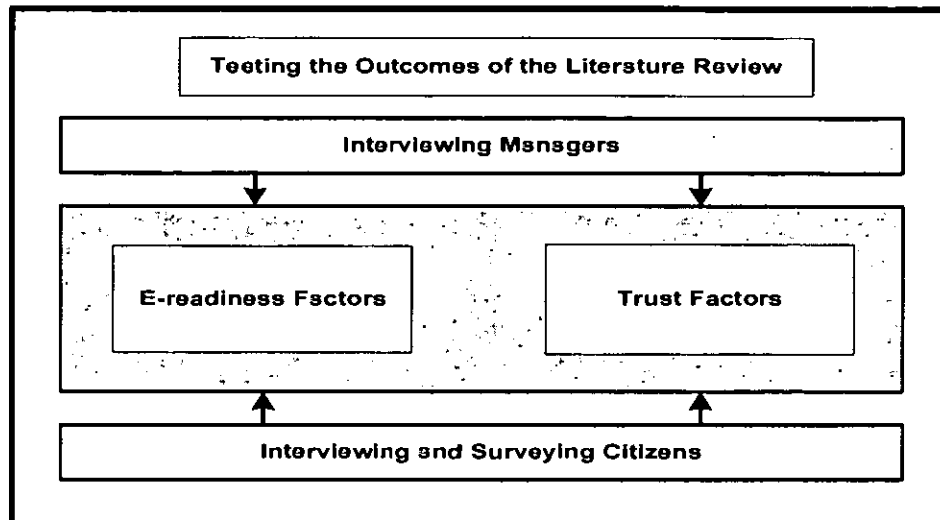


Figure 3-1: Testing the outcomes of the literature review

1) Initial visit

The pilot study started with an initial visit by the researcher in December 2004 to Egypt to meet directors in both MSAD and MCIT to obtain preliminary information that would help in (a) understanding the problems facing the e-government programme and clarifying factors that affect e-government success (discussed in section 2.4.2 and 2.5.3), (b) selecting the individual e-government services and individual interviewees (in line with the scope of the research set out in sections 1.2 and 1.3), (c) identifying the best methods that could be used in collecting data (discussed in section 3.4.2).

2) Managers' level

The pilot study continued in early 2005 with four managers at both MSAD and MCIT. Through the study, the researcher investigated how the e-readiness and trust factors determined in sections 2.4.2 and 2.5.3 affect e-government services from the policy maker and projects level. In general, MSAD and MCIT managers agreed to the significance of the proposed factors to both projects and citizens. However, from the interviews, two other issues were detected as important factors that could contribute to CREG.

- *The first issue* relates to citizens: the impact of citizens' awareness of e-government, their resistance to change to e-government services (having been used to receive services in the traditional way for many years), and their perceptions of using e-government services.

- *The second issue* relates to the impact of e-readiness assessments on e-government projects. There are several e-readiness assessments that measure the Egyptian e-readiness and contribute to CREG. Consequently, it becomes important to understand if managers consider e-readiness assessments in their projects and how this affects their strategies.

Also, through the pilot study, the researcher was able to determine the adjustments needed in the questions so that they would be clear for all interviewees, and to estimate the time needed for interviewees to answer the questions.

3) *Citizens' level*

At the citizens' level of the investigation, questionnaires were distributed to a hundred citizens in each of the selected services (birth certificate, vehicle licence and UCAS). This aspect of the pilot study took two forms: *surveys* and *interviews*.

Surveys

- To determine the number of questionnaires that should be distributed to reach the desired sample size (Fowler, 2002). The pilot response rate is used to calculate the number of questionnaires required, as follows.

Required number of questionnaires = required sample size / pilot response rate

The response rate in the birth certificate and vehicle licence pilots was 43%, and in the UCAS pilot was 66%. Accordingly, the numbers of questionnaires to be distributed were 2,325 and 1,515 respectively.

- To review the time needed to answer the questionnaires. Consequently, the questionnaires were designed to take less time to answer by reorganising the order of questions without affecting the expected output of the data.

Interviews

The pilot study included interviewing twenty citizens (ten in each study) within the selected e-government services.

- To test the wording of the questionnaires to ensure they would be understood clearly by citizens.
- To detect the importance of the selected factors and any other factors that could contribute to CREG. The findings from the interviews with citizens confirmed the importance of the proposed factors and the views from managers noted above

regarding the importance of including citizens' awareness, resistance to change and perception of e-government services. However, government trust did not show any impact on using e-government services.

3.3 Redefining the theoretical framework

From the pilot study conducted with managers and citizens, the research question was modified to include two additional sub-questions that were needed to answer the main research question.

- *Other factors* that affect citizens' usage of e-government including: awareness, non-resistance to change and citizens' perceptions of e-government (table 3-1). These have *formed the third category of factors that contribute to CREG* and become the **third sub-question** that helps to answer the research question (section 1.1).

Factor group	Factor	Sub-factor	Source
			Survey data
Others	Other factors	Awareness of e-government	✓
		Non-resistance to e-government	✓
		Perception of e-government	✓

Table 3-1: Other factors and sub-factors influencing CREG

- *The impact of e-readiness assessment* on e-government projects helps to understand how identified CREG factors affect e-government projects. So, it becomes the **fourth sub-question**.

On the other hand, both managers and citizens' interviews show that:

- *Trust in government* is not a significant factor that contributes to CREG. This is because citizens need to receive government services, such as vehicle licences, even if they do not trust their governments because they are essential. Consequently, this factor was omitted from trust group factor.

The theoretical framework introduced in section 2.6 was modified to include the new updates of the research question. This provides the base for the proposed CREG model (figure 3-2) which is tested in the *main study* to achieve the final model.

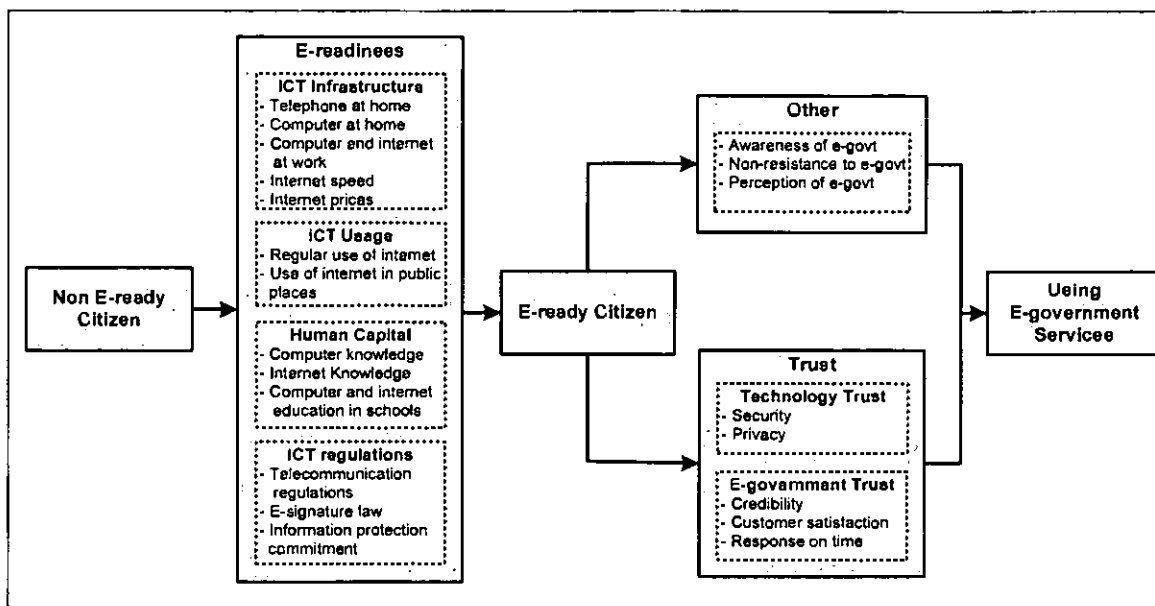


Figure 3-2: Proposed CREG model

3.4 Main study

3.4.1 Projects' selection

Egypt was selected for conducting the research as it has significant features similar to other developing countries (Denscombe, 1999). Egypt is a major country in the Middle East which has an ambitious programme to enhance community e-readiness in order to benefit from ICT. This is reflected on the establishment of a new Ministry of Communications and Information Technology (MCIT) in 1999. One of its major actions was to set up an e-government programme. That programme subsequently became the responsibility of the Ministry of States and Administrative Development (MSAD). Its main aim is to improve government services through e-government. However, Egypt has similar characteristics to other developing countries in terms of ICT problems as well as the low incomes of a major part of the population which negatively affect the success of e-government (Sayed, 2004).

To gain a close focus on the investigated issues, three e-government services were selected out of eight services that were available at the time of conducting the research:

- the reissue of birth certificates;
- the renewal of vehicle licences;
- the Universities and Colleges Admission Services (UCAS).

The selection was based on the criteria (a) the availability and accessibility of information which is required for conducting the research (Daymon and Holloway, 2003), (b) set out in section 1.2 – that the services studied should be the ones provided by central government and have been running for more than one year to be able to determine their impact on society.

3.4.2 Research methods

In order to answer the research question and sub-questions, interviews and surveys were used as a method of collecting primary data. Interviews were used for interviewing MSAD and MCIT managers while surveys were used for collecting data from citizens (figure 3-3). Documentation is used as a source of secondary data particularly with regard to previous e-readiness and government reports. On occasions when it was possible, direct observations were used to understand how the e-government services were operated by government employees.

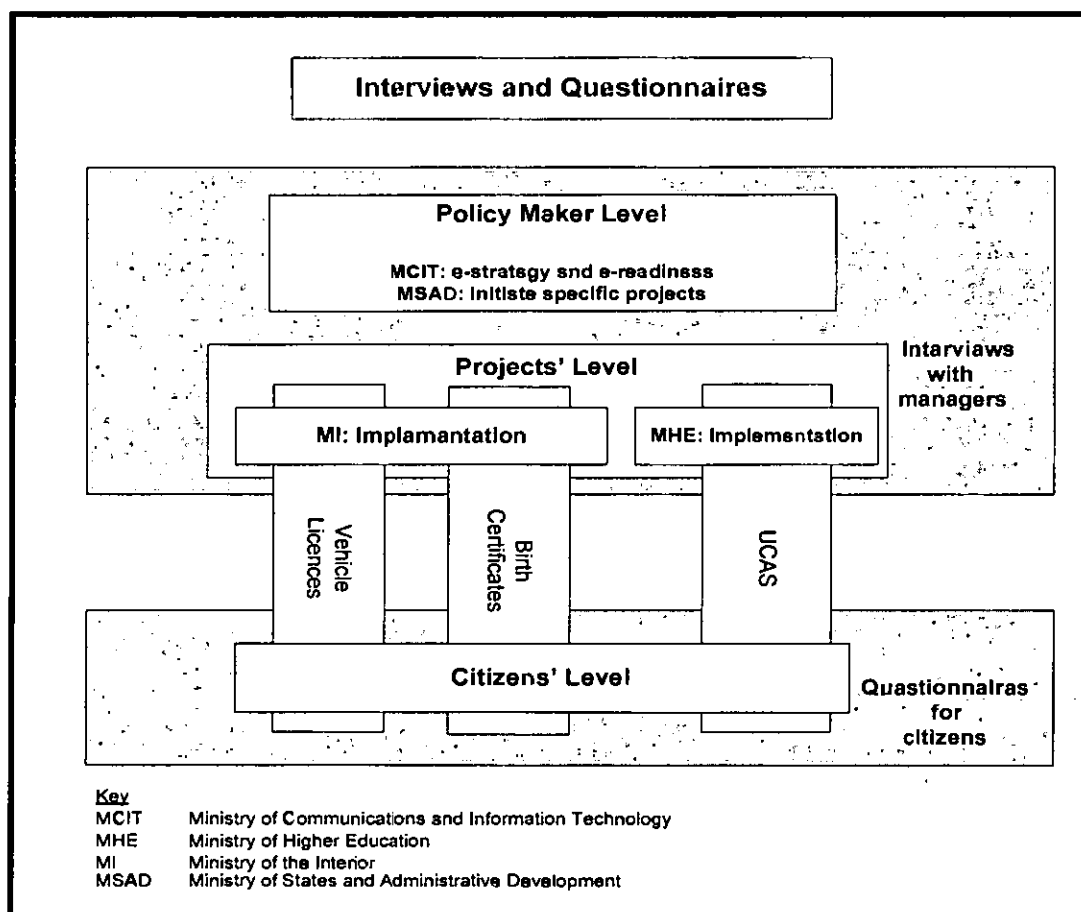


Figure 3-3: Interviews and questionnaires construction

Triangulating between the different data sources maximises the benefits of the collected data (Denscombe, 1999; Denzin, 1978) and helps to achieve validity of research as explained in section 3.4.4.

3.4.2.1 Interviews

One-to-one interviews were the chosen means of collecting data from policy makers and managers in the relevant ministries because of their flexibility and their ability to provide in-depth information and to collect sensitive data such as how political issues affect policies (Denscombe, 1999; Foddy, 1995; Hakim, 2000; Wengraf, 2001). Within the interviews, semi-structured questions were used to combine questions that require simple specific answers (e.g. multiple-choice) with the provision for interviewees additionally to make open-ended responses (Denscombe, 1999; May, 2001).

A letter was sent from Middlesex University to MSAD explaining the objectives of the research and requesting permission for conducting the research. The request was accepted and approval was given by the minister's senior advisor for conducting the research (appendix A).

The interviews in all ministries were conducted at the interviewees' premises. That was because interviewees had typically limited time for interviews. Time for the interviewees was about sixty minutes. However, in some cases interviews took longer. The interviews normally started with an introduction from the researcher about the research aims and followed by asking the questions. The interviewees, in most cases, were cooperative in providing sufficiently detailed answers to each question.

From the initial visit and the pilot study, four government departments were identified to sample interviewees from them (Sarantakos, 1998; Ritchie et al, 2003) as the following.

MCIT

The Ministry of Communications and Information Technology (MCIT) is responsible for strategy, decision making, developing of ICT plans that are related to e-readiness and conducting e-readiness assessments within Egypt. In the case of MCIT, there were at the time of the research eleven senior staff who between them were responsible for ICT infrastructure, ICT education, ICT policies and regulations, and e-readiness assessments.

All the eleven were selected and were allocated numbers 13 to 23 (appendix E). Two other specialist staff, numbered 42 and 43, were also selected.

MSAD

The Ministry of States and Administrative Development (MSAD) is responsible for the initiation of e-government services through proposing them to other ministries and followed by the development of these services to be ready for implementation. In the case of MSAD, there were at the time of the research twelve senior staff who were responsible for all e-government services. All the twelve were selected in order to understand the main trends in e-government. They were allocated numbers 1 to 12 (appendix E). Four other specialist staff, numbered 38 to 41, were also selected.

MI (birth certificates and vehicle licences) and MHE (UCAS)

In addition, there are two government departments that are specifically responsible for the e-government services and selected for study.

- Reissue of birth certificates and renewal of vehicle licences online is the responsibility of the Ministry of the Interior (MI).
- Online UCAS is the responsibility of the Ministry of Higher Education (MHE).

In MI, three staff responsible for birth certificates and five for vehicle licences were selected and allocated numbers 29-36 (appendix E). In MHE, five staff were selected and numbered 24-28. The staff selected had responsibilities at different levels of design, development and implementation.

3.4.2.2 Survey

The survey was used to gather information from end-users (citizens) because it is appropriate when data is collected from a large number of people spread over a large geographic area (Berdie et al, 1986; Denscombe, 1999). As there is a very low response rate for postal questionnaires in Egypt because citizens are not used to them, distribution was done face-to-face. To avoid the possible negative effects of researcher-responder interaction, a modification of the normal face-to-face method was adopted: self explanatory questionnaires using closed questions (Sapsford and Jupp, 1996; Vaus, 2004) were directly distributed to potential respondents, in appropriate public places, with the request that they would complete and return them in their own time (Abdelghaffar and Kamel, 2003; Cornford and Smithson, 1996; Kamel, 2005; Kamel and Hassan, 2003).

Designing the surveys for each of the birth certificate, vehicle licence and UCAS was carried out as described in following steps:

- *The first step* in the survey was to *identify the three populations* from which the samples were to be drawn. In the case of UCAS, the population was high school students who applied in 2004/2005 and 2005/2006 for the entrance to government universities in academic years 2005/2006 and 2006/2007. In the birth certificate case, the population was all citizens above 18 years who received reissued birth certificates since 2003. The vehicle licence population was limited to citizens above 18 years who own private cars, renewed their licences since 2004 and live in either Cairo or Giza (the only governorates where the service is available).
- *The second step* was to *select the sampling method*. The research used the probability sample technique that provides equal chance for each person in the population (Burns, 2000; Sapsford, 2001; Vaus, 1996, 2004; Weisbert et al, 1996). Probability sampling was used in each of the selected governorates. Following surveys done by IDSC (2005b; 2006), seven out of the twenty-seven Egyptian governorates were chosen as being representative of the whole country.

According to Stevens (1996), to perform a statistical analysis with rigour using the chi-square test (used in the research and explained at section 5.2.2), the *sample size* should be above 300 participants. However, because of the very large population of Egypt, previous surveys on Egyptian e-government awareness and usage, conducted by the Information and Decision Support Centre (IDSC), used a sample size of 1000 citizens (IDSC, 2005b). That sample size was accordingly adopted for this research, meaning that the error margin would be 3.2% (5% is the error margin for samples of 400) (Weisbert, et al, 1996).

Birth certificates survey

The questionnaires were distributed to citizens in seven governorates as explained earlier in this section. Due to the lack of awareness of citizens in Egypt regarding this type of research and surveys, and the low response to mail questionnaires, the questionnaires were distributed to citizens at the National Bank of Egypt branches. This is the largest bank in Egypt, which was established in 1898. Its customers are representative of the

whole society, including the different classes. The bank provides services which are used by all citizens even if they do not have a bank account. 2,325 questionnaires were distributed to citizens in the summer of 2005, and again in the summer of 2006. The valid responses represented a cross-section of the Egyptian society (appendix C-6).

In the 2005 survey, 1,101 questionnaires were returned resulting in a response rate of 47.5%. 154 were discarded because they were incomplete or they had been filled in incorrectly, leaving 947 valid responses. *In the 2006 survey*, 1,038 questionnaires were returned resulting in a response rate of 44.6%. 100 were discarded for the same reasons as in the 2005 survey, leaving 938 valid responses.

Vehicle licences survey

The vehicle licence survey was combined with the birth certificate survey. This is because the research was targeting the same citizens and combining the two was a more efficient use of time and resources. As the survey was combined with the birth certificate survey, three more questions were added: whether respondents own private cars or not, which traffic unit they are registered in and how they pay their car fines and renew their vehicle licences. This part of the survey was limited to citizens in Cairo and Giza.

In the 2005 survey, out of 947 respondents, 644 said they owned cars; out of those, 373 were from the Cairo and Giza governorates and were therefore relevant to the survey. *In the 2006 survey*, the figures were 938, 619 and 350 respectively.

UCAS survey

The survey was conducted for high school students who applied to universities in Egypt during the academic years 2005/2006 and 2006/2007. Questionnaires were distributed to students at seven of the twelve government universities – those that are located in the seven governorates that were selected for the birth certificate and vehicle licence surveys. As before, face-to-face distribution was used because of the low probability of responses for postal distribution. The questionnaires distributed (explained earlier in this section) were allocated among the seven universities pro rata to the number of students applying to each. The valid responses represented different classes and categories of students (appendix C-7).

In the 2005 survey, 1,219 questionnaires were returned, giving a response rate of 80.4%. 255 were discarded because they were incomplete or had been filled in incorrectly, leaving 964 valid responses. In the 2006 survey, the figures were 1,251, 82.5%, 197 and 1,054 respectively.

3.4.2.3 Documents

The secondary source of data used in this research is documentations, including for instance Egyptian e-government publications that explain e-government plans and strategies. Official government publications, from different Egyptian ministries, are also used as a source for statistics. Reports from the United Nations and other organisations and studies of e-government in many different countries also formed an essential part of the secondary data.

3.4.2.4 Direct observation

The use of direct observation was mainly limited to observing, when possible, how staff operated the e-government services that were under study. Also, in the case of UCAS project, the researcher was allowed to attend meetings for the design and implementation of online UCAS in 2005. Through these observations, the researcher could get a better understanding of how services are designed and run and what types of problems are faced by managers and staff.

3.4.3 Analysis strategy

Data analysis was designed at the following two stages.

- *Stage (1)* analyses interview and survey data for the two years separately. The interview data is from relevant government organisations (MCIT and MSAD at level 1, and MI and MHE at level 2), covering how government defines and implements its e-readiness, e-government and trust policies. The survey data is from citizen questionnaires (at level 3), covering how e-readiness and trust issues affect citizens' use of e-government services.
- *Stage (2)* analyses all the levels of data (government and citizens, both years) to investigate how government policies affect citizens and how citizens respond to e-government services, helping to identify the factors that affect CREG. This is followed by comparing the results with other studies to investigate their validity.

The analysis strategy is set out in figure 3-4, which is derived and refined from figure 3-3.

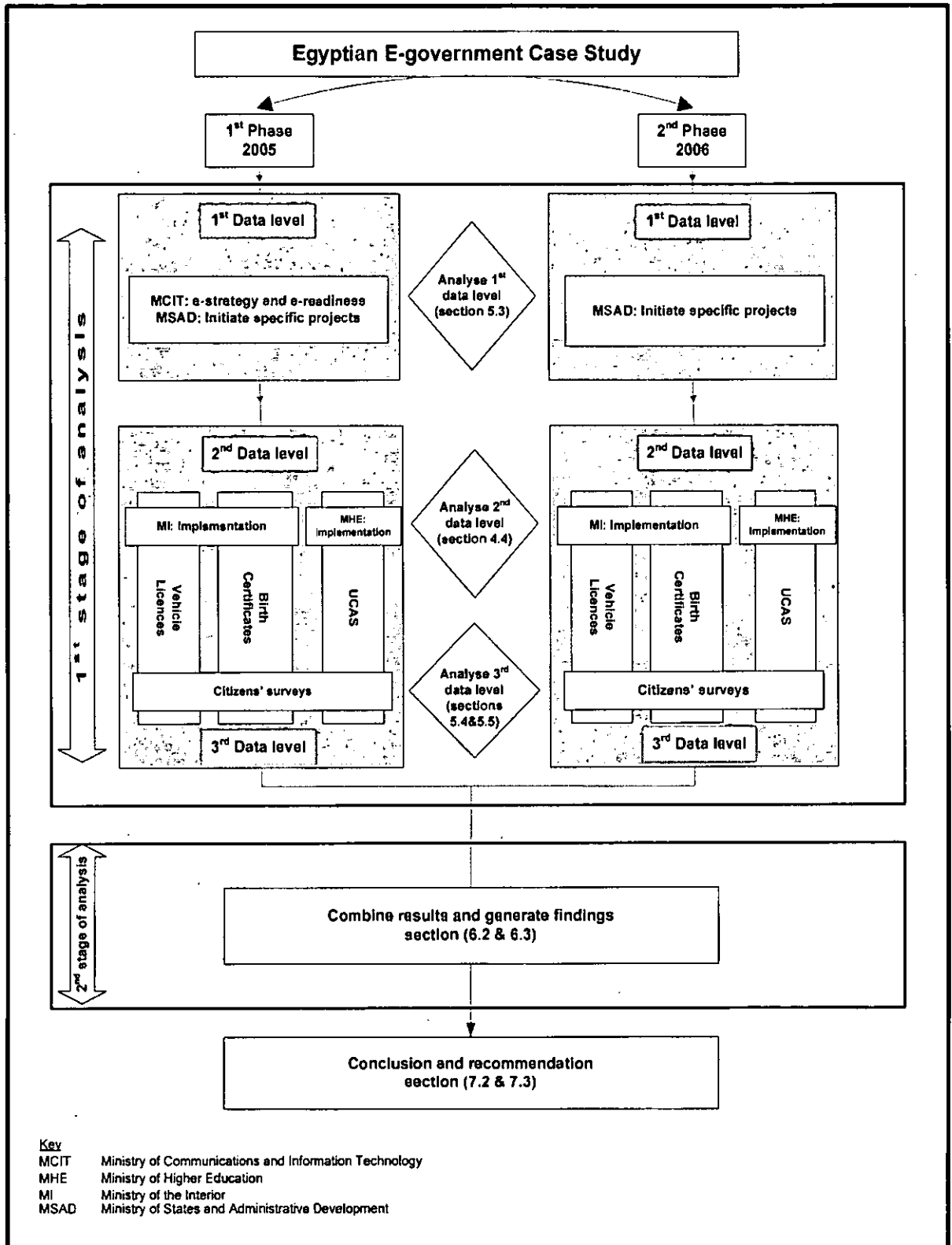


Figure 3-4: Research framework and analysis

3.4.4 Reliability and validity

Reliability

Reliability is demonstrated by ensuring the repeatability of the process in successive instances (Tashakkoria and Teddlie, 1998). In this research, four means were adopted to achieve reliability.

- The same protocol was used for each of the three investigated e-government services and for the two phases of data collection (phase 2 followed phase 1 after an interval of one year).
- Determining homogeneity of the two samples in the 2005 and 2006 surveys using a chi-square test (explained in section 5.2.2) (Burns, 2000; Puri, 2002). This was done by using the information collected from respondents, which in the case of birth certificates and vehicle licences was gender, age, education level, work and income, and in the UCAS case was gender, age, school type, study language and branch. The results showed no statistically significant difference between subjects in the two years. (See appendices C-6 and C-7)
- Data transcription was performed without interference of the researcher (Kirk and Miller, 1986; Silverman, 1993).
- A pilot study was carried out to test the acceptability of the interview scripts and questionnaires, and to adjust them, before their use in the data collection.

Validity

Validity is achieved when appropriate instruments are selected for collecting and analysing data. This can be done by collecting data from different sources and analysing them separately to reach initial findings and then triangulating those findings to show consistency of evidence (Burns, 2000; Silverman, 1993, 2001).

The research achieves validity through the following:

- By having a careful triangulation between interviews, questionnaires and document study. Interviews took place with e-government managers in both MCIT and MSAD to find out how much they take e-readiness and trust issues into account. Questionnaires, on the other hand, were used to investigate the impact of MCIT and MSAD policies on end-users. Document study was used to review government

statistics and compare them to the field results. On a limited number of occasions, observations were used to gain a better understanding of e-government processes.

- The survey sample is chosen to be as representative as possible of the population, and results should be tested statistically to ensure as far as possible that variances are again representative of the population and not resulting from error.
- Data analysis is done separately for each source of data and the results triangulated. That is followed by comparing the results of the two phases to be as sure as possible that the differences between the two years' results are statistically reasonable.
- The pilot study was used to make any necessary adjustments in the wording and ordering of questions ensuring as far as possible that questions are interpreted in the same way by respondents. This should minimise the risk that responses are influenced by the wording of questions rather than by respondents' genuine perceptions.

Thus, by having systematic procedures for data collection, and by comparing results from multiple sources within the research and from other previous studies, reliability and validity should be achieved.

3.5 Research design background

Theoretical background

This research adopts an *interpretive* approach, which sees knowledge as deriving from interpretations of (for instance) language, people's thoughts and feelings, and relationships between people. The interpretive approach is generally used in social science research. Since research in information systems involves (at least partially, and always critically) an understanding of human, organisational and social phenomena, Walsham and Chun-Kwong (1991) argue the importance of the interpretive approach in IS research. It can be used to explain how IS affect and are affected by their social contexts (Klein and Myers, 1999). It is therefore appropriate in understanding how citizens respond to e-government projects.

The interpretive approach is in contrast to positivist and critical approaches (Klein and Myers, 1999). The *positivist* approach assumes a reality consisting of what objectively exists (Hughes and Sharrock, 1997) and assumes that knowledge can be quantified and measured by numbers and figures (Seale, 2000). The *critical* approach focuses mainly on the contradictions and conflicts in social issues. It assumes that changes in the society

follow historical and constant “laws” and that actors cannot change their social or economic roles (Klein and Myers 1999).

On another dimension, research can be classified as either qualitative or quantitative (Silverman, 2001). *Quantitative* research deals with numbers, figures and statistics in data collection and analysis, and therefore has the potential to describe phenomena accurately and without ambiguity (Denscombe, 1999). However, as Silverman (2001) notes that it is limited in its ability to deal with cultural and social factors which may be more easily covered qualitatively.

Writers on *qualitative* research (Chua, 1986; Creswell, 2003; Walsham, 1993), emphasise its ability, for instance, to explore what is under the surface in organisations and to understand relationships among people.

This research primarily aims to understand the relation between e-government usage and citizens’ e-readiness in the context of the Egyptian community, and is therefore primarily qualitative (Hakim, 1994). However, a quantitative approach is additionally of value in allowing the collection and analysis of numeric data.

3.6 Conclusion

This chapter began by explaining the pilot study that confirmed the significance of the proposed factors and helped to redefine the research question. This was followed by describing the main research design and the methods used for investigating the selected e-government projects in order to answer the research question. The research adopts the interpretive approach, supplemented by quantitative analysis. Interviews were used as the method of data collection from the government departments while surveys were used to collect data from citizens. Analysing data is done through an analysis strategy that covers different levels of stakeholders. The following chapter (4) contains more detailed information about the Egyptian e-government programme.

CHAPTER 4

EGYPTIAN E-GOVERNMENT DESCRIPTION

4.1 Introduction

From the research question and the criteria identified in chapter 3, the individual e-government services selected for in-depth investigation were: reissue of birth certificates, renewal of vehicles licences and the Universities and Colleges Admission Services (UCAS). As these services are part of the e-government programme, this chapter begins (section 4.2) with a description of the Egyptian e-government strategy, phases and delivery channels. This is followed by understanding the current e-readiness situation in Egypt, which helps to understand how e-readiness affects e-government projects. The last part of the chapter (section 4.3) describes in details the traditional and online procedures in each of the investigated services.

4.2 Egyptian e-government programme description (www.egypt.gov.eg)

Egypt is one of the developing countries which is considered as a low middle-income country (World Bank, 2006) with 71.3 million population (CAPMAS, 2006). The public administration sector is operated by the Council of Ministers (responsible for ministers working groups). In order to overcome the problem of increasing bureaucracy, the government launched its administrative reform programme in 1997. The Ministry of States and Administrative Development (MSAD) became responsible for the programme and its major target was to improve public service and simplify administrative procedures (Sayed, 2004). In 1999, the government launched the Egyptian Information Society Initiative (EISI) to reduce the digital divide and convert Egypt to an information society. This initiative consisted of six parts: access, government, business, learning, health and culture (Sayed, 2004). The government part is relevant to this research.

ICT is seen as important for the Egyptian economy and the Egyptian government started planning for it in 1999. A conference was held by the Cabinet of Ministers, Information and Decision Support Centre (IDSC) to define the Egyptian ICT plan for the next five years. After this conference a new Ministry of Communications and Information Technology (MCIT) was established. The main objective of the new ministry is to encourage both public and private sectors to modernise Egyptian society. IDSC and

MCIT cooperated to launch the e-government programme. From 2001 to 2003, MCIT prepared for the e-government programme with some pilot projects, such as the reissue of birth certificates. By January 2004, MSAD had become responsible for the e-government programme in addition to its main goal of enhancing the efficiency of Egypt's administrative agencies (MSAD, 2006a).

Through the e-government programme, the Egyptian government expects to have several direct and indirect benefits. Direct benefits have been identified (Darwish, 2004) as the following.

- Economic benefits from saving (a) between 1% and 3% of government purchasing costs, (b) government working hours, estimated at 900,000 per year.
- Social benefits from increasing citizens' satisfaction through better delivery of government services.

Indirect benefits have been identified (EISI-G, 2005) as the following.

- Encouragement of investment, helping to reduce unemployment.
- Bringing the national database nearer to completion.

4.2.1 E-government strategy

The e-government strategy has three parts that are applied together (EISI-G, 2005).

- *The first part* of the strategy is to change both citizens' and business perceptions of government services changing from paper-based to electronic-based. This is followed by expanding service provision to include other parties such as the private sector and post offices rather than government only.
- *The second part* is to put in place the fundamentals of the legal framework that supports applying for services online, such as providing e-signature law. The government is also establishing a government gateway and communication network and providing standard specifications for networking and document classifications (see figure 4-1).
- *The final part* of the strategy is to automate all government ministries and organisations to provide electronically based services.

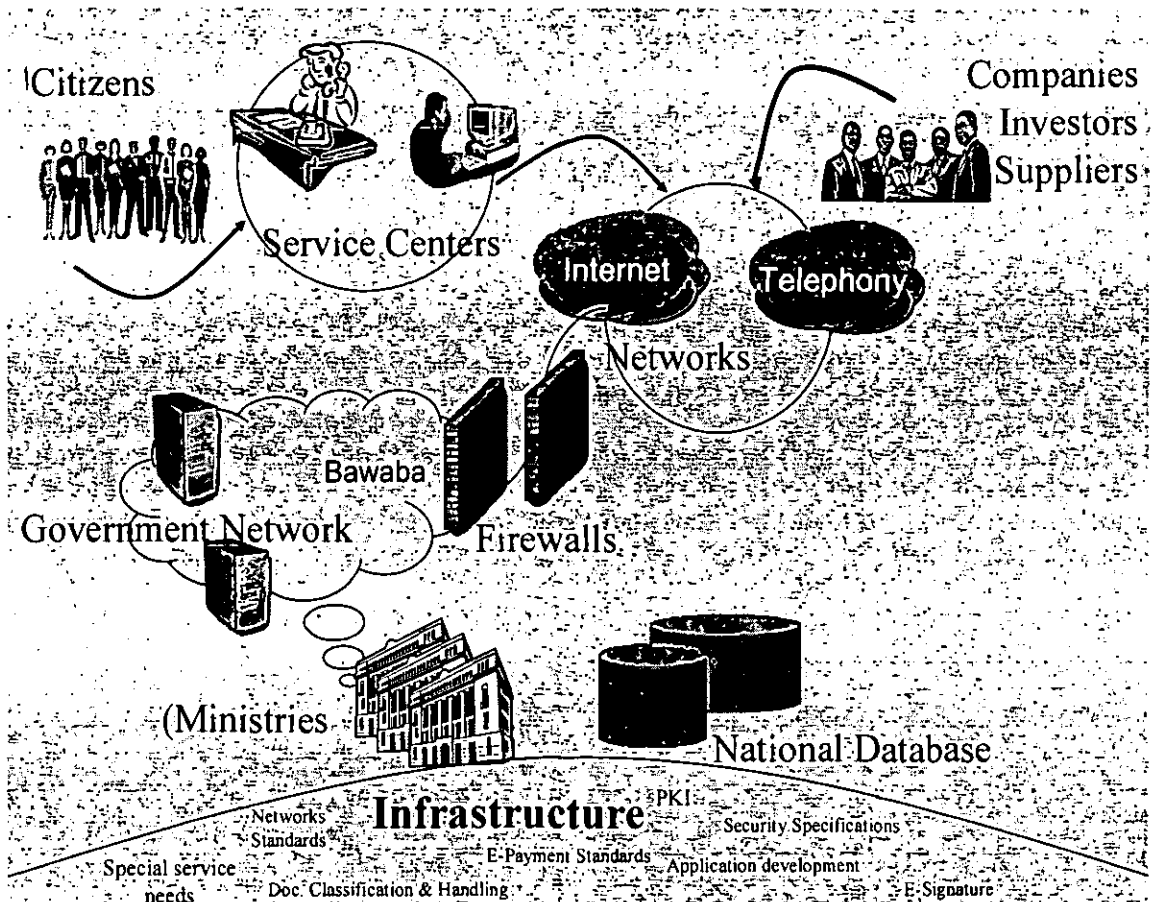


Figure 4-1: Egyptian e-government framework

Source: EISI-G (The Egyptian Information Society Initiative- Government), 2005

Note: "Bawaba" means portal

4.2.2 Egyptian e-government services and phases

The e-government programme was mainly focused on delivering G2C and G2B services – G2C first and G2B later on. G2G services are so far limited mainly to procurement, while no G2E services are yet being delivered (Riley, 2001).

In terms of the three main phases of implementing e-government services as presented in section 2.2.2, the Egyptian government is currently at the third phase where it is able to deliver full online service.

4.2.3 Egyptian e-government delivery channels

The government depends on various means by which citizens can connect to e-government websites: home computers, computers at work, kiosks and public internet places. Citizens might additionally connect, with the help of an intermediary, from

government premises, post offices and service centres. In that way, government could overcome the problem of the low penetration of telephone lines and personal computers and the high level of digital illiteracy. Nevertheless, that additional means of connecting is not currently available.

4.2.4 Current Egyptian e-readiness

Egypt's e-readiness, which has been assessed many times, is considered as being high among the developing countries and moderate overall (Gronlund et al, 2005). According to Bridges (2005b), Egypt has been assessed fifteen times out of the twenty-four e-readiness assessments and two times out of the other four e-government assessments and rankings (see appendix D-4).

Based on analysis of e-readiness assessment (see section 2.4), the following four e-readiness categories are identified as major factors affecting CREG:

- ICT infrastructure;
- ICT usage;
- human capital;
- ICT regulation.

These factors, and their component sub-factors, are discussed in section 5.1, with supporting material in appendix D. The following section describes the current situation in Egypt in respect of each.

1) ICT infrastructure

The main relevant elements of ICT infrastructure are: the existence of telephone lines, internet access and personal computers owned by citizens. As existence of telephone lines for citizens is an essential element for ICT infrastructure, MCIT had a target to provide most citizens with a telephone line. By 2006, Egypt was approaching 10.6 million telephone lines (14.8% penetration) distributed across both urban and rural areas (MCIT, 2006a). These lines include use by businesses, however, which means that penetration among citizens is substantially less.

The second part of the ICT infrastructure is related to internet access. Because of the increasing number of telephone lines, MCIT provided a free internet access initiative (a 56Kbps dial-up connection free of cost beyond the call charge) by 2002 to encourage

more citizens to gain benefits from accessing the internet. This initiative allowed 5.2 million users to be connected to the internet by 2006 (MCIT, 2006a). A contribution to that figure would have come from the existence of public internet places such as internet cafés and IT clubs and the figure might have taken account of more than one user per PC. 59% of the internet users are from Cairo while only 6% of them are from rural areas such as Upper Egypt. Most internet connections are dial-up, as the high-speed (256Kbps) internet was only introduced in 2004 and has so far only achieved about fifty thousand connections. That is because the monthly cost was EGP150 (GBP15) initially, reduced in 2006 to EGP95 (GBP9.5), both of which are high compared to Egyptian average incomes.

The final part of ICT infrastructure is related to the existence of personal computers. The density of personal computers per head of population is still at a low level because of their high price given Egyptian poverty levels (El-Laithy et al, 2003). By 2005, Egypt had 2 million PC (out of 69.9 million population in 2005 (CAPMAS, 2006)) equivalent to 2.85 per 100 citizens (MCIT, 2005b). As a result of this low percentage of PCs, the Egyptian government launched “a PC for every home” initiative in 2002 by providing loans for citizens to purchase computers: the amount made available was EGP1.63 billion (GBP163 million). In 2006, MCIT (2006a, 2006b) went further and launched the “Egypt PC 2010 – Nation Online” initiative offering PCs and notebooks at affordable prices.

In order to overcome the problems of affordability, availability and accessibility for computers, the Egyptian government has taken several steps including encouraging the private sector to establish public internet cafés, and establishing IT clubs which are run and funded with private and public sector cooperation. By 2006, 1,042 IT clubs existed, provided access to the internet and gave basic computer education to citizens (MCIT, 2006a). Furthermore, there is a government initiative to provide mobile units with computer and wireless connection to provide access in rural areas and places where there is a lack of internet connections. However, currently there is only one mobile unit, but the number is expected to increase later on (MCIT, 2006b).

2) *Human capital*

Human capital is related to citizens and their ICT capabilities. One of the problems in Egypt is the high percentage of illiteracy estimated by MCIT (2005a, 2005b) at 30% and by InfoDev (2004) at 43%, meaning that around one-third of the population are excluded

from participating in or benefiting from ICT technology. These percentages would be higher if digitally illiterate citizens were included. This would leave an even smaller number of citizens who could benefit from the technology. To overcome this problem, the Egyptian government has taken several steps to provide basic education skills for illiterate citizens and to reduce digital illiteracy amongst literate citizens.

One solution taken by the government to overcome the problem of digital illiteracy at its roots was providing students at schools and universities with ICT skills at different stages of the education system. As schools had been ineffective in reducing digital illiteracy because of a lack of computers and internet connections, the government started a project to provide them with labs and computers in order to increase the number of students who are able to use the technology. Currently, students at levels 7 to 9 in 2,500 secondary schools (about two-thirds of the total number) are provided with 2-megabit dial-up internet connections via the Central Education Office (MCIT, 2005b).

Furthermore, the government also launched a smart school project (funded from the United Nations Development Programme (UNDP)) that links students and schools in a cyber community. However, this project is still at its pilot stage with only 35 schools taking part. All the twelve universities in Egypt (MHE, 2005), on the other hand, have been connected to the internet since 1993 which helps the government by utilising their facilities to provide computer training for beginners and professionals (InfoDev, 2004).

3) ICT usage

The low percentage of ICT usage is another problem that faces the Egyptian e-government programme. Among the causes of the problem are the lack of an appropriate ICT infrastructure and the high percentage of digital illiteracy as explained earlier.

Furthermore, citizens' responses for the Egyptian government efforts regarding increasing the benefits from the internet, especially e-applications such as e-government, were disappointing. This is because their usage of the internet does not support the government ICT development plans in Egypt. In a survey conducted by IDSC (2005a), 52% of respondents who used the internet were mainly using it for chatting.

4) ICT regulations

Online services such as e-government should be protected with appropriate regulations. In Egypt, there is a lack of laws that deal with issues such as hacking, spam, network crimes, invasion of privacy and intellectual property rights which could negatively affect e-government usage (MCIT, 2005b). In this context, much effort has been put in by the government to provide security for information sent and received by government agencies.

- The Egyptian parliament, in 2005, approved the e-signature law. This law *“regulates and formalises the use of electronic transcriptions, guaranteeing that they are accorded the same legal merit as paper transactions”* (MCIT, 2005b). However, this law is only at a preparatory stage, awaiting decisions on how it will be implemented technically.
- This is followed by providing the public key infrastructure that allows secure exchange of information between citizens, banks and government agencies.
- This is further supported by providing a standard specification for security and authentication that will facilitate and promote e-transactions by MSAD.

Another side to the ICT regulations issue is related to privacy. Privacy is a major issue for e-government as much personal information is transmitted to government organisations and there is a need to define who has the right to view this information. However, this issue was not considered by MSAD. According to one of the global studies that ranks e-government projects, Egyptian e-government got a zero rating regarding the existence of a security and privacy policy or a statement about these issues on their website (Brown University- Center for Public Policy, 2005). This study measures different points, such as who has the right to view personal information, the use of cookies, prohibiting the use of personal information for commercial marketing, and disclosing citizens' information by law. Furthermore, there is no data protection act that covers privacy issues.

4.3 E-government services description

This section provides a detailed description of the traditional and online procedures for each of the investigated e-government services.

4.3.1 Reissue of birth certificates

Birth certificates are issued by the Ministry of the Interior. Requesting a reissue of birth certificates online was first introduced in 2003 in cooperation with MSAD (responsible

for the e-government programme). The main objective of the project is to provide a new channel for citizens so they can obtain the service with less effort. The birth certificate is an important document requested by many government agencies for example for first time admissions to schools (each year about 1.5 million children join schools for the first time), applying for new jobs, requesting a first ID card, issue of passports and many other governmental services.

Online reissue of a birth certificate starts with an application through the e-government portal that contains an external link to the Civil Status Organisation which is part of Ministry of the Interior. Citizens enter their personal data and choose the number of certificates they need and the payment method they prefer: either using credit/debit card or cash on delivery at citizens' homes. The fee when using a credit card is EGP18.5 (GBP1.85) and for cash on delivery EGP21.25 (GBP2.22). That compares with EGP5 (GBP0.5) for reissue by traditional means. When the head office receives an online request, the staff normally calls the person who has requested the certificate in order to verify that he or she is authorised to request it. Only relatives are allowed to make a request. The authorisation check is done by asking citizens for personal information. After verification the certificates are issued and sent by post. Customers receive online birth certificates forty eight hours from the time they requested the service. By comparison, the traditional way only takes about an hour as citizens go physically to the local office of the Civil Status Organisation. Requests for online birth certificates are still at a low level compared with the traditional way. While three million birth certificates are issued using the traditional way, more than 1,400 certificates were requested online in 2005 increased to about 2,800 in 2006 (MSAD, 2005b, 2006c).

The Ministry of the Interior does nothing to promote this online service other than simple posters in their local offices. Apart from data entry staff, a very small number of employees run the whole service. The Civil Status Organisation has plans in the future to reissue marriage, divorce and family statutes certificates online.

4.3.2 Renewal of vehicle licences

The issue of online vehicle licences is part of the responsibilities of the Ministry of the Interior. It was initiated at the beginning of 2004 with a pilot service for Giza city traffic units only. Traffic units have a range of duties including collecting car fines, registering

new cars, doing examinations of car status, issuing and renewing driving licences and conducting driving tests. At the beginning of 2005, the service was extended to Cairo traffic units. The service is limited to private cars and does not cover taxis and commercial cars.

The Egyptian traffic system requires car owners to pay their car insurance, tax and any outstanding fines before renewing their vehicle licences. Traditionally that required citizens to go physically to the traffic unit, often taking several hours because of long queues.

Renewing vehicle licences online was introduced to reduce the time and effort for citizens. It consists of two main steps. The first step is to pay any fines which have occurred since the last renewal of the licence. Citizens can find out about their fines online through the e-government website. If they are satisfied, they make the payment. Otherwise, they can appeal by sending an e-mail explaining their reasons. Applicants can view the results of appeals online, which normally take two days. They can make payments by debit/credit card or by cash on delivery.

The second step is online renewal of the licence, which can only be done after payment of any fines. Once payment has been confirmed, the new licence is sent by post within 48 hours. Although that compares adversely with the few hours that would be taken at the traffic unit, it does avoid the long queues. Use of online renewals is still very low. In Cairo, only 160 licences were issued since the service was launched, out of 729,928 private cars. In Giza the figures were about 3000 out of 260,558 (CAPMAS, 2006; MI, 2006b).

4.3.3 UCAS

UCAS (Universities and Colleges Admissions Services) is part of the Ministry of Higher Education (MHE). Its main responsibility is to organise students' admissions to government universities and other institutions. The admission process starts in July each year. Admission depends solely on students' high school grades.

The traditional process requires two visits by students to the UCAS offices. The first visit is to purchase the admission file, containing forms that they have to fill in with their admission choices. The fee for that is EGP35 (GBP3.5). The second visit is to submit the

completed forms, together with birth certificates and high school grade sheets. When the admission period finishes, the data for all applications is entered to the main computer for processing. When that process is finished, letters of acceptance are sent to students notifying them of the university to which they have gained entrance. Students use these letters when registering and paying the university fees.

The online service started as a pilot in 2004, when it was used by 3,476 applicants out of 376,861. In 2005, MSAD announced an ambitious plan to increase online applications to 40,000 through an advertising campaign to increase students' awareness. Nevertheless, in that year only 12,319 students out of 393,612 applied online. In 2006, the figures were 15,666 out of 374,950 (MOE 2004, 2005, 2006; MSAD, 2005a, 2006b).

There are advantages in applying online: for example, students do not need to pay fees, they can change their choices during the admission period, and they do not need to travel to the traditional UCAS office twice as in the traditional process. On the other hand, there have so far been a number of problems with the online service, which have contributed to its low take-up.

- There can be delays in accessing the admission website, because of the high volumes of traffic over a limited period.
- The process depends on applicants being issued with a personal identification number (PIN). Problems have arisen from PINs not being received, or received late, or not being clear. In those circumstances, students have to re-order it again.
- The system provides no hard-copy evidence of acceptance, such as a receipt or letter of acceptance, only an on-screen message. This may cause problems when students arrive to enrol, since administrative staff refuse to accept unfamiliar documentation.

4.4 Conclusion

This chapter has provided a detailed description of the Egyptian e-government programme including strategy, services and delivery channels. This was followed by describing the current situation of e-readiness and the obstacles that face it and affect e-government services. The second part of the chapter compared the traditional and online procedures for each of the services being investigated: the birth certificates, vehicles licences and UCAS services.

CHAPTER 5

DATA RESULTS AND ANALYSIS

5.1 Introduction

The chapter begins (section 5.2) by describing the process which the research uses for analysing the collected data from interviews and questionnaires. This is followed (section 5.3) by a detailed analysis of the data from interviews with MSAD and MCIT managers. The following sections (5.4 and 5.5) analyse the data collected from citizen surveys on birth certificate, vehicle licence and UCAS services. This helps to understand how e-readiness and trust factors affect citizens' usage of e-government services.

Table 5-1 shows factors, sub-factors and the source(s) from which each sub-factor has been derived. These factor groups form the basis of all the analysis in the remainder of this chapter, and are themselves submitted as a significant original research contribution.

Factor group	Factor	Sub-factor	Source		
			Assessments	Literature	Survey data
E-readiness	ICT infrastructure	Telephone at home	✓		
		Computer at home	✓		
		Computer and internet at work	✓		
		Internet speed	✓		
		Internet prices	✓		
	ICT usage	Regular use of internet	✓		
		Use of internet in public places	✓		
	Human capital	Computer knowledge	✓		
		Internet knowledge	✓		
		Computer and internet education in schools	✓		
	ICT regulations	Telecommunication regulations	✓		
		E-signature law	✓		
Information protection commitment		✓	✓		
Trust	Technology trust	Security	✓	✓	
		Privacy	✓	✓	
	E-government trust	Credibility		✓	
		Customer satisfaction		✓	
		Response on time		✓	
Others	Other factors	Awareness of e-government			✓
		Non-resistance to e-government			✓
		Perception of e-government			✓

Table 5-1: Factors and sub-factors influencing CREG

5.2 Data analysis strategy

The two stages analysis strategy, described in section 3.4.3 and represented in figure 3-4, was used. The analysis process, first for interview data and then for survey data, is now outlined.

5.2.1 Analysis of interview data

After transcription, the interview data was read several times, with special attention to comparing respondents' answers to individual questions, in order to understand how MCIT managers develop e-government and e-readiness plans, how MSAD managers respond to those plans, and the interaction between those planning activities and the three individual services selected as cases. Pre-defined themes during the research are used as a guideline in identifying categories while coding was capturing the issues arising recurrently in the interviews (Ritchie et al, 2003). The broad themes, the first three of which map onto the main factors in table 5-1, are used in the presentation of results in section 5.3: they are as follows.

- Government attitude to e-readiness factors.
- Government attitude to trust factors.
- Government attitude to other factors.
- Government attitude to e-readiness assessments.

5.2.2 Analysis of survey data

Since the three surveys described in section 3.4.2.2 were designed so that the data could be subjected to statistical analysis, four hypotheses were defined. These were to be tested in order to contribute to answering the research question. They are set out in table 5-2.

	Null hypothesis	Alternative hypothesis
H1	E-readiness has no significant impact on using e-government services.	E-readiness has a significant impact on using e-government services.
H2	E-readiness changes have no significant impact on using e-government services.	E-readiness changes have a significant impact on using e-government services.
H3	Trust has no significant impact on using e-government services.	Trust has a significant impact on using e-government services.
H4	Other factors have no significant impact on using e-government services.	Other factors have a significant impact on using e-government services.

Table 5-2: Null and alternative hypotheses

SPSS V12.0 was used to carry out the statistical analysis. The starting step for the analysis was to define frequencies and percentages for citizens who used or did not use e-government services by cross tabulation. The next step was to use chi-square to test whether it was possible to reject the null hypotheses, and accordingly to determine the significance of the alternative hypotheses as shown in table 5-2. The predetermined significance level was set to 0.05 (P-value \leq 0.05). The “P-value” measures statistical significance, and is the probability that 5% of the deviation from expected results is due to chance only. Consequently, results determined from the sample for (P-value \leq 0.05) could be generalised to the population (Puri, 2002; Sarantakos, 1998; Weisberg etc, 1996).

Using the chi-square test makes it possible to determine if there is an association between e-readiness factors within the Egyptian society (ICT infrastructure, ICT usage, human capital and ICT regulations – the independent variables) and citizens’ readiness for e-government (the dependent variable). The test was repeated for the trust factors (technology trust and e-government trust) and for the other factors (awareness, non-resistance and perception).

At a later stage (see Chapter 6) the analysis results from the interviews and the surveys were combined to generate the research findings. These findings would show how government policies consider e-readiness and trust factors within the e-government programme and how citizens respond to them, which leads to identification of the factors that affect citizens’ readiness for e-government (CREG).

5.3 Analysis of interviews with government managers

5.3.1 Government attitude to e-readiness factors

Government attitude to e-readiness factors is the first theme addressed in the data analysis. This would lead to identifying which e-readiness factors the government thought could affect CREG. In this context, interviews began with a question asking if the existence of e-readiness within the community is a major element for e-government success or not (appendix B-3 Q1; appendix B-5 Q1). This question was necessary to understand at an early stage the interviewees’ vision regarding this issue. Responses were

in total agreement on the importance of e-readiness for e-government projects. Although this agreement came from both MSAD and MCIT, participants in three cases added that whilst it is a major issue for e-government success it also needs to be combined with other factors such as increasing citizens' trust and overcoming their resistance to change. Respondent 5, from MSAD, said: *"Not only e-readiness, but also environmental issues, trust and confidence are also important factors for e-government."* Respondent 10, also from MSAD, added: *"...It is partially important but it should exist to adequate level"*. Everyone at MCIT agreed to the importance of e-readiness as a major factor for e-government success and that it has a great impact on end-users' ability to use e-government services.

MSAD and MCIT were asked in the interviews to judge the importance of the four e-readiness factors: ICT infrastructure, ICT usage, human capital and ICT regulations. They were given a five-point Likert scale of choices which varied from high significance to low significance in respect of e-government usage, and were asked to explain their choice (appendices B-3 & B-5 Q2, 2.1, 2.2, 2.3, 2.4). The percentages assessing significance of the factors as high or medium-high were as follows.

ICT infrastructure	91.3%
ICT usage	82.6%
Human capital	56.5%
ICT regulations	78.2%

Further detail on these responses is as follows.

Telephone at home, computer at home, computer and internet at work, public internet places

The percentages assessing significance of the sub-factors as high or medium-high were as follows.

Telephone at home	78.2%
Computer at home	86.9%
Computer and internet at work	82.6%
Public internet places	69.5%

Managers agreed that experience of computers and the internet at work would serve to encourage private use of e-government.

Managers who disagreed with the importance of the existence of telephone lines and computers in homes argued that this issue could be overcome by having public internet places such as internet cafés that citizens could use to access online e-government services. Their argument is based on the low income levels of significant sections of the population who cannot afford personal computers in their homes. Even so, public internet places are rated less important than computers in the home.

Internet speed, internet prices

The percentages assessing significance of the sub-factors as high or medium-high were as follows.

(At least reasonable) speed	69.5%
(Affordable) prices	73.9%

Managers agreed that high internet speeds were not important for the services currently being offered.

Regular use of internet

The percentage assessing significance of this sub-factor as high or medium-high was as follows.

Regular use of internet	91.3%
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There is thus very strong agreement on the importance of this factor. Respondent 14, from MCIT, said: *“It will be normal for them to get a service from the internet and they would not be afraid as they are now”*.

Computer and internet knowledge, computer and internet education in schools

The percentages assessing significance of the sub-factors as high or medium-high were as follows.

Computer knowledge	82.6%
Internet knowledge	82.6%
Computer and internet education in schools	100%

It is striking that none of the interviewees disagreed about the significance of schools in providing training in the use of computers and the internet, as the basis of achieving an e-ready community. Schools are especially important in a country like Egypt where a high proportion of the population is young. According to the Central Agency for Public

Mobilisation and Statistics (CAPMAS, 2006) in 2006, about 26 million citizens (equivalent to 37.7% of the population) were under the age of 15 years.

English language

The percentage assessing significance of this sub-factor as high or medium-high was as follows.

(Knowledge of) English language	8.6%
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Knowing English is not essential for using e-government services, as the portal mainly uses Arabic. In some situations, however, familiarity with English is helpful, for instance for typing the portal URL (www.egypt.gov.eg) or for using search engines such as Google. The interviewees' responses were accordingly mainly negative. Respondent 8, from MSAD, for instance, was unambiguous: "*Egyptian citizens do not need to be fluent in English*". In most cases, however, the reason for the negative view on this factor was that the education system in Egypt requires all school children to learn English for six years, so that adequate knowledge of the language is not a major factor contributing to citizens' readiness for e-government. However, respondent 5, from MSAD, said "*It is important for citizens to know the English language as in some cases they will need to make changes to their browser settings such as cookies Also, they will be able to understand the error messages that could appear on their computers*".

Telecommunication regulations, e-signature law and information protection

This topic has already been introduced and discussed (sections 2.3.4, 2.4.2, 4.2.4). The percentages assessing significance of the sub-factors as high or medium-high were as follows.

Telecommunication regulations	43.4%
E-signature law	69.5%
Information protection	86.9%

The low significance given to telecommunication regulation was because of the importance attached to competition in this field. On e-signature law respondent 8, from MSAD, said: "*how many citizens will apply for e-signature while more than 30% of the population are illiterate...? It is more important to provide more simple and secure service that does not ask people to do many steps to get the service*".

5.3.2 Government attitude to trust factors

The second theme identified within the analysis is the government attitude regarding trust issues. Trust is an important factor that affects citizens' usage of e-government services especially in a developing country like Egypt. This is because to the impact of the local culture which, for instance through attitudes to bureaucracy, could have a negative impact on e-government. In this context, trust in both technology and e-government were identified within the literature review as having a significant impact on citizens (as presented in section 2.5).

Technology trust is related to trust in receiving services over the internet, which includes existence of security and privacy for citizens' information. E-government trust, on the other hand, is related to the credibility of e-government services, and whether citizens expect they will be delivered on time and with satisfaction (appendix B-3 Q21; appendix B-5 Q22).

1) Technology trust

For e-government services, full details of a person's identity, credit cards numbers, bank accounts details and more sensitive details, need to be transmitted online. So issues such as information protection, security and privacy are important influences on citizens' trust in e-government services. Managers in both MSAD and MCIT were interviewed on this topic as MCIT is responsible for providing security and privacy procedures such as encryption and Public Key Infrastructure while MSAD initiate and manage e-government projects which are affected by MCIT plans. The percentages assessing significance of the sub-factors as high or medium-high were as follows.

Security policy	91.3%
Privacy policy	56.5%

Both MSAD and MCIT managers agreed that information protection (discussed earlier in section 5.3.1 under ICT regulations) and security policy have a great effect on e-government usage. This applies especially in the case of completing transactions conducted over the internet as citizens have to reveal personal data and financial details through the website, and any leakage of information might lead to the loss of citizens' trust which would take a long time to regain.

A number of security measures are employed. Servers are located at MCIT premises, with firewalls to obstruct hackers. Information transmitted from and to citizens is encrypted using 128-bit encryption. Databases holding citizens' information are mainly located at the premises of the ministries responsible for specific services, and each ministry is responsible for the protection of its own databases. Online requests to the e-government portal are routed not directly to the database servers but via the web servers: according to MCIT network manager and the MSAD network engineers, this provides greater protection.

Privacy policy was considered substantially less important than security policy. The explanations given were first that citizens in Egypt are not fully aware of the privacy issue and it is not a vital issue for them, and second that government does not reveal citizens' data to third parties. Respondent 10, from MSAD, said: *"If you look for facts, citizens' information, normally, are not revealed for third parties. They are mainly revealed for other government organisations which need the data to make processing for it"*.

2) E-government trust

The other trust factor is trust in specific e-government services, rather than in the generic technology that they use. There are three sub-factors: credibility, customer satisfaction, and response on time. The percentages assessing significance of the sub-factors as high or medium-high were as follows.

Credibility (of the service)	95.6%
Customer satisfaction	100%
Response on time	73.9%

The importance attached to response time was illustrated in the case of UCAS, where the high rate of student applications over a short period of time makes it a crucial issue. Server queues are monitored all the time, and there is a means of passing traffic from one server to another where overload occurs. Transactions are timed out if they are not completed within a specified time (MCIT network manager, MSAD network engineers) so as not to block queues. Techniques such as these, developed for UCAS, have been adopted in other services.

5.3.3 Government attitude to other factors

In addition to MSAD and MCIT attitudes to the sub-factors grouped under the headings of e-readiness and trust factors, discussed in sections 5.3.1 and 5.3.2 respectively, attitudes to two additional sub-factors (grouped under the heading of “other factors”) were investigated in the interviews with MSAD managers: awareness of e-government, and non-resistance to e-government.

1) Awareness of e-government

MSAD managers were asked whether or not they publicise their services (appendix B-3 Q18). The percentage who said ‘Yes’ were as follows.

Publicise e-government services	25%
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Their explanation for not publicising was that currently there is a lack of trust between citizens and government to some degree. Consequently, the e-government policy is to work quietly until the service runs and is used by some citizens. Then, when they find that the service is working properly and is better for them than the traditional way, they will publicise it to their friends and families. *“In time, e-government will get citizens’ trust”* (respondent 4).

Respondents who said that they publicise their e-government projects did not mean commercial advertisements. They thought that statements or reports on television, radio or in newspapers are the most efficient methods for advertising their projects in the future (appendix B-3 Q19).

2) Non-resistance to e-government

Resistance to change and mistrust of government are combined issues for a community that has a long and traditional history of bureaucracy especially in the delivery of government services. This was reflected in the way both government employees and citizens are used to providing and receiving government services (Sayed, 2004). Government employees are used to receiving papers with signatures and stamps to prove that they are original and properly authorised, and services are almost entirely paper-based. This bureaucracy has influenced citizens’ behaviour in the way that they expect to get their services face-to-face with a government employee, with the proof of a signed and stamped paper from the agency. Consequently, citizens expect to make personal visits

to the physical sites of government agencies. When e-government offers services online, a degree of mistrust or resistance is therefore often engendered.

All MSAD and MCIT managers were asked whether they thought citizens still preferred to receive paper-based rather than web-based services (appendix B-3 Q22; B-5 Q23). The percentages saying 'Yes' were as follows.

Citizens prefer paper-based services	100%
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All participants agreed that citizens in Egypt are used to paper-based services as a result of the bureaucratic system of government implemented more than fifty years ago: "*This is related to the government system which requires stamps and signatures on each paper otherwise employees they will not accept it as a valid document*" (respondent 2). Respondent 6 added: "*This is a heritage of fifty years of bureaucracy which we cannot change in a few years. We have to deal with this concept*". However, respondent 11 took the different view that resistance is mainly from those who are not educated enough. Furthermore, people who become used to receiving services over the internet and dealing with the internet would be more able and willing to receive online services; "... *or you can say it depends on the citizens' classes*".

5.3.4 Government attitude to e-readiness assessments

The final theme identified in reviewing the collected data is the attitude taken by MSAD and MCIT managers to the e-readiness assessments carried out on Egypt. The specific issues are (1) to what extent they take notice of those assessments, (2) how e-readiness levels (as assessed or perceived) affect e-government strategies and projects.

1) *How much notice is taken of e-readiness assessments*

Considering e-readiness assessments conducted on Egypt

The starting point was a question to MSAD and MCIT managers (appendix B-3 Q9; B-5 Q7) asking if they considered previous e-readiness assessments conducted on Egypt at the stage of design of their projects. The percentages saying 'Yes' were as follows.

Consider e-readiness assessments (MSAD)	58.3%
Consider e-readiness assessments (MCIT)	54.5%

MSAD managers who consider e-readiness assessments nevertheless had some concerns regarding what is actually measured and specifically how it is measured in Egypt. They

thought that the measurement criteria were neither correct nor fair for a country like Egypt. Three reasons were given. First, in Egypt a high percentage of the population are below working age but are nevertheless counted in the assessment; Egypt's ranking is consequently unfair compared to other countries. Second, if the e-readiness rating for Egypt is divided by the population figure of 71.3 million, it will inevitably fall below a country like Jordan with only 3 million. Third, there are criteria relating to infrastructural elements that do not exist at all in Egypt, such as digital TV: "...some figures that do not apply for Egypt such as digital TV indicators which do not exist in Egypt" (respondent 10).

MSAD managers who did not consider e-readiness assessments had various reasons. Some said they were not aware of them or that they were not available before 2004. Others said that the assessments were not directly relevant at that stage, because their main target was to put the basic technology for e-government in place first, as explained by respondent 7: "*The e-projects are not our objectives. Mainly, our objective is to have service provided on a computer base first then we can go online*". Respondent 11 added: "*What is important is to have a good automated base for government services first and then we can consider e-readiness assessments*". The difficulties they faced in transferring government services from paper-based to web-based made them focus first on delivering the service rather than on the level of e-readiness.

MCIT managers who did not consider e-readiness assessments gave the reasons that they were unaware of them or that they were not important for them since they had pre-defined plans that they needed to achieve.

MCIT managers were additionally asked who they thought benefited from e-readiness assessments. Respondent 18 said: "*Close stakeholders are who benefited from this assessment*". Respondent 21 added: "*The e-readiness report was read by people who had an interest in e-readiness*".

It should be noted that in answering these questions managers were generally only aware of the UN Global E-government Readiness Report (UNDESA, 2004), despite the fact that there have been fifteen e-readiness assessments conducted on Egypt (Bridges, 2005b).

Periodic project evaluations and annual e-readiness assessments

MSAD and MCIT managers were asked whether they evaluate the projects for which they are responsible and, if so, how often and against what criteria. MSAD managers who evaluate their projects do so either quarterly or annually, and either by comparing objectives with results or by measuring usage (appendix B-3 Q5, Q6 and Q7). MCIT managers also carry out evaluations either quarterly or annually, and do so by a combination of individual project evaluations and international e-readiness assessments (appendix B-5 Q5 and Q6).

MSAD and MCIT managers were asked whether they considered annual e-readiness assessments conducted on Egypt within their projects (appendix B-3 Q10; B-4 Q3; B-5 Q8). The percentages saying 'Yes' were as follows.

Consider annual e-readiness assessments (MSAD, 2005)	50%
Consider annual e-readiness assessments (MSAD, 2006)	75%
Consider annual e-readiness assessments (MCIT, 2005)	45.5%

As noted above, the e-readiness assessment to which respondents referred was again the UN Global E-government Readiness Report (UNDESA, 2005), this time because it is a report that appears annually. Respondent I said: *"We actually look for these assessments because we want to have a better e-readiness. So, we have to understand what we achieved and where are we from the world"*. The more Egypt moves up the ranking in both e-readiness and e-government, the more political support managers can get to continue implementing their projects. On the other hand, MSAD managers who use local evaluations do so because they see it is important to adjust e-readiness to the local conditions – not something that is taken into account by international assessments.

Managers who did not consider annual e-readiness assessments gave the same reasons as for not considering e-readiness assessments at all.

2) How much e-readiness levels affect e-government strategies and projects

The second part of this theme is related to how e-readiness affects e-government projects.

Perceived impact of e-readiness on e-government projects

MSAD and MCIT managers were asked whether they thought e-government could succeed in the absence of citizens' e-readiness (appendix B-3 Q3; B-5 Q3). The percentages who disagreed or totally disagreed were as follows.

Cannot succeed without e-readiness (MSAD)	58.3%
Cannot succeed without e-readiness (MCIT)	81.8%

MSAD managers who disagreed or totally disagreed were looking to e-readiness as the basic precondition, to avoid ending up with a service that is not used. Respondent 2 said: *"If we were selling citizens a system and they are not able to use it because they cannot use computers....we will not find customers for our project"*; respondents 6 and 7 agreed.

Of the other MSAD managers, some thought it would take too much time for society to become e-ready, so that implementation of e-government projects should start now in parallel with enhancing the e-readiness infrastructure and digital literacy. Further, some of them stated that the number of people who are currently e-ready is enough to start an e-government project and run it successfully: respondent 10 said: *"Percentages are not small and also not that big, but they can use any application which we provide and they could make it successful"*.

A higher percentage of MCIT managers thought that e-readiness is a major prerequisite for e-government success. However, some considered that ICT infrastructure is more important than human capital factors. Participant 13 said: *"We should have a good base for infrastructure and people who can use the technology"*. Participant 18 said: *"All countries with successful e-government have successful e-readiness scores"*.

Almost all managers, MSAD and MCIT, disagreed with waiting until the Egyptian community becomes e-ready, because that would mean waiting too long (appendix B-3 Q15; B-5 Q16). The percentages who said 'No' to waiting were as follows.

Should not wait (MSAD)	83.3%
Should not wait (MCIT)	100%

Actual impact of e-readiness on e-government projects

Both MSAD and MCIT managers were asked how significant e-readiness, and changes in e-readiness, are for their projects (appendix B-3 Q11 and Q12; B-5 Q12 and Q13). The percentages assessing the significance as high or medium-high were as follows.

E-readiness is significant (MSAD)	75%
E-readiness is significant (MCIT)	100%
E-readiness changes are significant (MSAD)	66.6%
E-readiness changes are significant (MCIT)	72.7%

MSAD managers stated that e-government plans are affected by e-readiness levels when they select new projects. That could lead to the early selection of G2C projects rather than G2B, if it appears that citizens are more e-ready than business. The strategy could go even further in project selection by identifying which service is likely to be well used by citizens. That happened, in the case of the birth certificate reissue and UCAS projects. The birth certificate project was selected because about three million citizens request birth certificate reissue every year (MSAD, 2006c) and a significant portion of them are e-ready (Birth Certificate Director). UCAS selection was based on students having had computer and internet education at school and being eager to use new technology.

E-readiness also had an influence in the following up of projects. In the case of birth certificate reissue, for example, the project was using debit or credit cards as the only payment method. However, because of low take-up caused by low percentages of card owners and lack of trust in using debit or credit cards over the internet, a further payment method that depends on ‘cash on delivery’ was introduced.

MCIT managers took the view regarding that MCIT is both a creator of and responder to community e-readiness. It helps to create e-readiness that affect e-government programme by establishing projects such as the free internet initiatives: respondent 15 said: *“When the community in a certain area has become e-ready through infrastructure we move to another area and so on”*. It also responds to e-readiness as, for example, when they found a need for higher internet speed and provided it: respondent 23 said: *“The broadband project was provided when we found that there are more people and business need for more speed of the internet”*. Similarly, when MCIT found areas with inadequate phone communications, they provided wireless networks. Most MCIT managers agreed that tracking and responding to changes in community e-readiness helps the e-government programme to achieve its target.

Impact of annual e-readiness assessments on e-government projects

MCIT undertakes its own periodic assessments of aspects of ICT fundamentals such as phone lines and internet connections (MCIT, 2005b, 2006b). It additionally takes note of the annual assessments carried out by the EIU on aspects of Egyptian e-readiness such as the connectivity and technology indicator (rising from 1.72 out of 10 in 2004 to 2.65 in 2006) and the legal environment indicator (rising from 4.74 in 2005 to 4.94 in 2006) (EIU, 2004, 2005, 2006).

Although all MCIT managers consider that annual e-readiness assessments are important for e-government projects (appendix B-5 Q14), MSAD managers have different perceptions (appendix B-4 Q4, Q5 and Q6). The percentages in MSAD who assessed the significance of annual assessments as high or medium-high were as follows.

Significant for e-government plans	50%
Significant for e-government implementation	33.3%
Significant for e-government follow-up	33.3%

MSAD considers that e-readiness statistics are important to support its selection of where to apply new e-government projects. Furthermore, understanding the trend of annual e-readiness in Egypt leads to more stable projects which have the appropriate infrastructure base and users. Those managers who rated the impact of e-readiness on e-government plans as being of lesser significance, however, said that e-readiness changes are quite slowly and therefore not significant for planning. Respondent 8 said that MSAD has its own plans regardless of the e-readiness level.

The impact of annual e-readiness assessments on e-government implementation and follow-up was intangible. According to respondent 6, implementation is mainly a matter of conducting specific steps according to plans and strategies already laid down. Respondent 13 agreed, noting that each project has its exact objectives that need to be met for evaluation, and by that stage there is consequently little focus on e-readiness. Follow-up focuses on the actual usage and number of hits on the website so as to compare project objectives with achievements, so that e-readiness assessments have almost no impact at that stage.

5.4 Analysis of survey responses: birth certificates and vehicle licences

These surveys were conducted in 2005 and 2006. They were conducted together as described earlier in section 3.4.2.2. In both surveys, respondents represented a cross-section of Egyptian society (see appendix C-6). The following table (5-3) summarises the responses.

	2005 (N=947)	2006 (N=938)
Valid responses for birth certificates and vehicle licences combined	947 (100%)	938 (100%)
Valid responses for vehicle licences	373 (39.4%)	350 (37.3%)
Did not order either online	894 (94.4%)	857 (91.3%)
Ordered birth certificate and/or vehicle licence online	53 (5.6%)	81 (8.6%)
Paid car fine as well as ordering vehicle licence	6 (0.6%)	15 (1.6%)
Previously knew about e-government services	333 (35.1%)	498 (53.1%)
Did not previously know about e-government services	614 (64.9%)	440 (46.9%)

Table 5-3: Respondent statistics: birth certificates and vehicle licences

5.4.1 Significance of e-readiness

This section analyses the survey results to investigate the impact of the e-readiness factors and sub-factors on citizens' usage of e-government services. Results (as shown in tables 5-4, 5-5 and 5-7) show rejection of the null hypothesis that e-readiness has no significant impact on using e-government services. Consequently, the alternative hypothesis that there is a significant impact of e-readiness on using e-government services can be accepted (see section 5.2.2). This is because, with respect to e-readiness, there are statistically significant differences between citizens who used e-government services and those who did not. The results present e-readiness factors and sub-factors regarding ICT infrastructure, ICT usage, human capital and ICT regulations.

NOTE: when referenced in the text, table entries are identified by row and column number.

1) ICT infrastructure

Factor	Sub-factor	C R	2005			2006		
			Did not use e-govt (N=894)	Used e-govt (N=53)	P-value	Did not use e-govt (N=857)	Used e-govt (N=81)	P-value
			1	2	3	4	5	6
ICT infrastructure	Telephone at home	1	747 (83.6%)	52 (98.1%)	0.005*	785 (91.6%)	80 (98.8%)	0.021*
	Computer at home	2	240 (26.8%)	49 (92.5%)	<0.001*	328 (38.3%)	74 (91.4%)	<0.001*
	Computer and internet at work	3	319 (35.7%)	41 (77.4%)	<0.001*	352 (41.1%)	72 (88.9%)	<0.001*
	Internet speed reasonable ¹	4	185 (61.5%)	39 (73.6%)	0.091	240 (59.4%)	51 (63%)	0.551
	Internet price affordable ¹	5	190 (63.1%)	40 (75.5%)	0.082	243 (60.1%)	53 (65.4%)	0.374

Table 5-4: ICT infrastructure sub-factors: birth certificates and vehicle licences

“**” Significant at $P \leq 0.05$; “1” Percentages are out of respondents who have internet knowledge

Table 5-4 shows that the existence of telephones at home, computers at home, and computers and internet access at work (R1, R2, R3), significantly affected the use of the online birth certificate and vehicle licence services, while internet speed and price (R4, R5) were not statistically significant.

Although the existence of telephones at home was statistically significant in differentiating between users and non-users of the services, both users and non-users had high levels of telephone penetration. However, the existence of computers at home, and of computers and internet access at work, varied greatly between users and non-users. For example, about 92% (R2-C2; R2-C5) of users had computers at home, compared to 26.8% in 2005 and 38.3% in 2006 of non-users (R2-C1; R2-C4). Among users, a very high percentage of those with computers at home also had telephones at home (for example, compare R1-C2 and R2-C2).

Around 60% or over of both users and non-users in both 2005 and 2006 considered internet speeds reasonable and internet prices affordable, so that the differences between the two groups are not significant (see P-values in R4-C3, R4-C6, R5-C3 and R5-C6).

2) ICT usage

Factor	Sub-factor	C/R	2005			2006			
			Did not use e-govt (N=894)	Used e-govt (N=53)	P-value	Did not use e-govt (N=857)	Used e-govt (N=81)	P-value	
			1	2	3	4	5	6	
ICT usage	Regular use of internet ¹	1	112 (37.2%)	33 (62.3%)	<0.001*	162 (40.1%)	57 (70.4%)	<0.001*	
	Use of internet in public places ¹	Regularly	2	62 (20.6%)	9 (16.9%)	0.823	32 (7.9%)	13 (16%)	0.071
		Sometimes	3	52 (17.3%)	10 (18.9%)		66 (16.3%)	12 (14.8%)	
		No	4	187 (62.1%)	34 (64.2%)		306 (75.7%)	56 (69.1%)	

Table 5-5: ICT usage sub-factors: birth certificates and vehicle licences

“**” Significant at $P \leq 0.05$; “1” Percentages are out of respondents who have internet knowledge

Table 5-5 shows that regular use of the internet was a significant factor distinguishing users and non-users. Those who used the birth certificate and vehicle licence services were also regular internet users, compared to other citizens (R1). However, from 2005 to 2006 there was a slight increase in regular internet use by both groups.

The use of public internet places such as internet cafés and IT clubs, however, was not a significant factor distinguishing users and non-users (see P-values in R2/3/4-C3 and R2/3/4-C6). That is because of the small numbers using public internet places either regularly or occasionally.

	C/R	2005		2006	
		Used e-govt (N=53)	P-value	Used e-govt (N=81)	P-value
		1	2	3	4
Computer at home	1	37 (69.8%)	<0.001*	65 (80.2%)	<0.001*
Computer at work	2	7 (13.2%)		8 (9.9%)	
Internet café	3	5 (9.4%)		5 (6.2%)	
IT club	4	1 (1.9%)		0 (0%)	
Other	5	3 (5.7%)		3 (3.7%)	

Table 5-6: Classification of computers used in online birth certificates and vehicle licences

“**” Significant at $P \leq 0.05$

Table 5-6 shows clearly the distribution of access points among users of the birth certificate and vehicle licence services. 69.8% (R1-C1) and 80.2% (R1-C3), in 2005 and 2006 respectively, used their home computers to request e-government services compared

with 9.4% (R3-C1) and 6.2% (R3-C3), respectively, who used public internet cafés.

3) Human capital

Factor	Sub-factor	C R	2005			2006			
			Did not use e-govt (N=894)	Used e-govt (N=53)	P-value	Did not use e-govt (N=857)	Used e-govt (N=81)	P-value	
			1	2	3	4	5	6	
Human capital	Computer knowledge	Excellent	1	164 (18.3%)	33 (62.3%)	<0.001*	224 (26.1%)	60 (74.1%)	<0.001*
		Good	2	182 (20.4%)	20 (37.7%)		206 (24%)	21 (25.9%)	
		No knowledge	3	548 (61.3%)	0 (0%)		427 (49.8%)	0 (0%)	
	Internet knowledge	Excellent	4	103 (11.5%)	30 (56.6%)	<0.001*	183 (21.4%)	60 (74.1%)	<0.001*
		Good	5	198 (22.2%)	23 (43.4%)		221 (25.8%)	21 (25.9%)	
		No knowledge	6	593 (66.3%)	0 (0%)		453 (52.9%)	0 (0%)	
	Computer and internet education ¹	School	7	96 (27.7%)	12 (22.6%)	0.728	69 (16.1%)	13 (16%)	0.032*
		Private computer centre	8	161 (46.6%)	27 (50.9%)		171 (39.8%)	44 (54.3%)	
		Other	9	90 (25.9%)	14 (26.4%)		190 (44.2%)	24 (29.6%)	

Table 5-7: Human capital sub-factors: birth certificates and vehicle licences

“*” Significant at $P \leq 0.05$; “1” Percentages are out of respondents who have computer knowledge

Table 5-7 shows that both computer and internet knowledge are significant in distinguishing between users and non-users. All users had either an excellent or good computer and internet knowledge (see the zero figures for “no knowledge” in R3-C2/5, and R6-C2/5) against under half of non-users (see the figures of over 50% for “no knowledge” in R3-C1/4, and R6-C1/4).

Computer and internet education was not a significant differentiator in the 2005 survey (see the P-value in R7/8/9-C3), though it had become significant in the 2006 survey R7/8/9-C6). The results show that private computer centres (R8) were the major source of computer and internet education in both years, compared to schools and other sources such as friends and family.

4) ICT regulations

This issue is discussed in section 5.4.2.

5.4.2 Significance of trust

To determine the impact of trust issues, questions were asked using a five-point Likert scale varying from “totally disagree” to “totally agree”. The chi-square test was used to investigate the relationship between the use of e-government services and degrees of trust. Responses rejected the null hypothesis, leading to acceptance of the alternative hypothesis that trust in technology and e-government have a significant impact on the use of e-government services (see section 5.2.2).

1) Technology trust

Factor	Sub-factor	C R	2005			2006		
			Did not use e-govt (N=894)	Used e-govt (N=53)	P-value	Did not use e-govt (N=857)	Used e-govt (N=81)	P-value
			1	2	3	4	5	6
Technology trust	Information protection	Totally disagree	179 (20%)	3 (5.7%)	<0.001*	246 (28.7%)	13 (16%)	<0.001*
		Disagree	366 (40.9%)	9 (17%)		200 (23.3%)	10 (12.3%)	
		Fair	150 (16.8%)	12 (22.6%)		169 (19.7%)	13 (16%)	
		Agree	109 (12.2%)	23 (43.4%)		164 (19.1%)	30 (37%)	
		Totally agree	90 (10.1%)	6 (11.3%)		78 (9.1%)	15 (18.5%)	
	Security	Totally disagree	148 (16.6%)	4 (7.5%)	<0.001*	256 (29.9%)	12 (14.8%)	<0.001*
		Disagree	396 (44.3%)	9 (17%)		225 (26.3%)	10 (12.3%)	
		Fair	147 (16.4%)	9 (17%)		144 (16.8%)	14 (17.3%)	
		Agree	135 (15.1%)	22 (41.5%)		152 (17.7%)	30 (37%)	
		Totally agree	68 (7.6%)	9 (17%)		80 (9.3%)	15 (18.5%)	
	Privacy	Totally disagree	172 (19.2%)	2 (3.8%)	<0.001*	279 (32.6%)	11 (13.6%)	<0.001*
		Disagree	344 (38.5%)	7 (13.2%)		211 (24.6%)	8 (9.9%)	
		Fair	155 (17.3%)	16 (30.2%)		151 (17.6%)	14 (17.3%)	
		Agree	139 (15.5%)	21 (39.6%)		148 (17.3%)	35 (43.2%)	
		Totally agree	84 (9.4%)	7 (13.2%)		68 (7.9%)	13 (16%)	

Table 5-8: Technology trust sub-factors: birth certificates and vehicle licences

“*” Significant at P≤0.05

Table 5-8 shows that 54.7% (R4/5-C2) and 55.5% (R4/5-C5) of users, in 2005 and 2006 respectively, agreed or totally agreed that information protection provisions were in place, compared to 22.3% (R4/5-C1) and 28.2% (R4/5-C4), respectively, of non-users.

The differences in perceptions between users and non-users were reflected in the responses on security and privacy. 58.5% (R9/10-C2) and 55.5% (R9/10-C5) of users, in 2005 and 2006, respectively agreed or totally agreed that security provisions were in place, compared to 22.7% (R9/10-C1) and 27% (R9/10-C4), respectively, of non-users.

On privacy, 52.8% (R14/15-C2) and 59.2% (R14/15-C5) of users, in 2005 and 2006 respectively, agreed or totally agreed that privacy provisions were in place, compared to about 25% of non-users (R14/15-C1; R14/15-C4).

2) E-government trust

Factor	Sub-factor	C R	2005			2006		
			Did not use e-govt (N=894)	Used e-govt (N=53)	P-value	Did not use e-govt (N=857)	Used e-govt (N=81)	P-value
			1	2	3	4	5	6
E-government trust	Credibility	Totally disagree	122 (13.6%)	2 (3.8%)	<0.001*	172 (20.1%)	9 (11.1%)	<0.001*
		Disagree	302 (33.8%)	2 (3.8%)		164 (19.1%)	3 (3.7%)	
		Fair	157 (17.6%)	10 (18.9%)		186 (21.7%)	20 (24.7%)	
		Agree	207 (23.2%)	28 (52.8%)		190 (22.2%)	35 (43.2%)	
		Totally agree	106 (11.9%)	11 (20.8%)		145 (16.9%)	14 (17.3%)	
	Customer satisfaction	Totally disagree	137 (15.3%)	1 (1.9%)	<0.001*	195 (22.8%)	10 (12.3%)	<0.001*
		Disagree	417 (46.6%)	1 (1.9%)		206 (24%)	2 (2.5%)	
		Fair	126 (14.1%)	9 (17%)		158 (18.4%)	7 (8.6%)	
		Agree	133 (14.9%)	32 (60.4%)		178 (20.8%)	37 (45.7%)	
		Totally agree	81 (9.1%)	10 (18.9%)		120 (14%)	25 (30.9%)	
	Response on time	Totally disagree	140 (15.7%)	1 (1.9%)	<0.001*	258 (30.1%)	10 (12.3%)	<0.001*
		Disagree	351 (39.3%)	1 (1.9%)		218 (25.4%)	4 (4.9%)	
		Fair	133 (14.9%)	9 (17%)		114 (13.3%)	12 (14.8%)	
		Agree	160 (17.9%)	31 (58.5%)		138 (16.1%)	32 (39.5%)	
		Totally agree	110 (12.3%)	11 (20.8%)		129 (15.1%)	23 (28.4%)	

Table 5-9: E-government trust sub-factors: birth certificates and vehicle licences

*** Significant at $P \leq 0.05$

Table 5-9 shows that 73.6% (R4/5-C2) and 60.5% (R4/5-C5) of users, in 2005 and 2006 respectively, agreed or totally agreed on the credibility of e-government services. The decrease between 2005 and 2006 is interesting and unaccounted for, but does not alter the predominance of users' views. Those figures compare with 35.1% (R4/5-C1) and 39.1% (R4/5-C4), respectively, of non-users.

79.3% (R9/10-C2) and 76.6% (R9/10-C5) of users, in 2005 and 2006 respectively, agreed or totally agreed that they were satisfied with the services. That compared with only 24% (R9/10-C1) and 34.8% (R9/10-C4), respectively, of non-users who had positive expectations of customer satisfaction.

Responses on customer satisfaction were confirmed by responses on receiving services on time. 79.3% (R14/15-C2) and 67.9% (R14/15-C5) of users, in 2005 and 2006 respectively, agreed or totally agreed that they received the services on time, while only 30.2% (R14/15-C1) and 31.2% (R14/15-C4), respectively, of non-users expected services would be received on time.

Negative expectations of non-users are clearly a major barrier to be overcome in increasing e-government use.

5.4.3 Significance of other factors

Three sub-factors under the "other" heading were detected in the surveys as having an impact on the use of e-government services: awareness, non-resistance and perceptions.

1) Awareness of e-government

Factor	Sub-factor	C R	2005			2006		
			Did not use e-govt (N=894)	Used e-govt (N=53)	P-value	Did not use e-govt (N=857)	Used e-govt (N=81)	P-value
			1	2	3	4	5	6
Other	Awareness of e-government	1	280 (31.3%)	53 (100%)	<0.001*	417 (48.7%)	81 (100%)	<0.001*

Table 5-10: Other sub-factors: awareness of e-government: birth certificates and vehicle licences

“*” Significant at P≤0.05

Table 5-10 shows statistically significant differences between users and non-users regarding awareness of e-government services. Users were by definition 100% aware of

them; but only 31.3% (R1-C1) and 48.7% (R1-C4) of non-users, in 2005 and 2006 respectively, were aware of the services. The increase between 2005 and 2006 might be due to coverage from MSAD in newspapers and on television: they were the main sources at that time for information on e-government services.

2) Non-resistance to e-government

Factor	Sub-factor	C/R	2005			2006		
			Did not use e-govt (N=894)	Used e-govt (N=53)	P-value	Did not use e-govt (N=857)	Used e-govt (N=81)	P-value
			1	2	3	4	5	6
Other	Non-resistance to e-government	1	346 (38.7%)	53 (100%)	<0.001*	351 (41%)	81 (100%)	<0.001*

Table 5-11: Other sub-factors: non-resistance to e-government: birth certificates and vehicle licences

“*” Significant at P≤0.05

Table 5-11 shows statistically significant differences between users and non-users regarding non-resistance to e-government services. Only 38.7% (R1-C1) and 41% (R1-C4) of non-users, in 2005 and 2006 respectively, were non-resistant; the remainder of non-users displayed some degree of resistance to the concept.

Other results from the two years' surveys show that 21.7% thought that services would be better, and 12.6% that the services will be provided in less time, than with traditional means. 30.6% expected that online services would both be better and take less time. On the other hand, 16.3% of citizens who refused to use e-government services did not trust the internet, and 33.9% of them preferred the traditional way of receiving services.

3) Perception of e-government

Table 5-12 shows that 83% (R4/5-C1) and 88.9% (R4/5-C3) of users, in 2005 and 2006 respectively, agreed or totally agreed that the web services are easier to use than the traditional ones; 79.3% (R9/10-C1) and 91.1% (R9/10-C3), respectively, agreed or totally agreed that the websites are easy to use; and 88.7% (R14/15-C1) and 86.4% (R14/15-C3) agreed or totally agreed that there is an improvement in the service than the traditional ones. It is interesting, though unexplained, that the first two measures improved between the two years while the third declined.

Factor	Sub-factor		2005		2006		
			Used e-govt (N=53)	P-value	Used e-govt (N=81)	P-value	
			C R	1	2	3	4
Others (perception of e-government)	Services easier than traditional services	Totally disagree	1	2 (3.8%)	<0.001*	4 (4.9%)	<0.001*
		Disagree	2	0 (0%)		2 (2.5%)	
		Fair	3	7 (13.2%)		3 (3.7%)	
		Agree	4	37 (69.8%)		17 (21%)	
		Totally agree	5	7 (13.2%)		55 (67.9%)	
	Website easy to use	Totally disagree	6	2 (3.8%)	<0.001*	3 (3.7%)	<0.001*
		Disagree	7	1 (1.9%)		2 (2.5%)	
		Fair	8	8 (15.1%)		3 (3.7%)	
		Agree	9	33 (62.3%)		12 (14.8%)	
		Totally agree	10	9 (17%)		61 (75.3%)	
	Improvement in services	Totally disagree	11	0 (0%)	<0.001*	5 (6.2%)	<0.001*
		Disagree	12	1 (1.9%)		1 (1.2%)	
		Fair	13	5 (9.4%)		5 (6.2%)	
		Agree	14	36 (67.9%)		11 (13.6%)	
		Totally agree	15	11 (20.8%)		59 (72.8%)	

Table 5-12: Other sub-factors: perception of e-government: birth certificates and vehicle licences

*** Significant at P≤0.05

Online problems		2005		2006		
		Used e-govt (N=53)	P-value	Used e-govt (N=81)	P-value	
		C R	1	2	3	4
Yes	Credit cards problems	1	5 (16.1%)	<0.001*	4 (13.3%)	<0.001*
	Delays in communications	2	23 (74.2%)		19 (63.3%)	
	Other problems	3	3 (9.7%)		5 (16.7%)	
	Credit cards problems + delays in communications	4	0 (0%)		2 (6.7%)	
No	No problems	5	22 (41.5%)		51 (63%)	

Table 5-13: Types of online problems: birth certificates and vehicle licences

*** Significant at P≤0.05

Table 5-13 shows that 58.5% of users in the 2005 survey faced problems using the services, though that percentage dropped to 37% in 2006. The majority of the problems were from delays in communications: 74.2% (R2 C1) in 2005 and 63.3% (R2 C3) in 2006. The next most frequent problems were related to payments using credit cards.

5.5 Analysis of survey responses: UCAS

These surveys were again conducted during 2005 and 2006 (section 3.4.2.2). In both surveys, respondents represented different classes and categories of students (appendix C-7). Table 5-14 summarises the data on respondents to these surveys.

	2005 (N=969)	2006 (N=1054)
Valid responses for UCAS	969 (100%)	1054 (100%)
Did not apply for online UCAS	933 (96.3%)	960 (91%)
Applied for online UCAS	36 (3.7%)	94 (9%)
Previously knew about e-government services	311 (32.1%)	805 (76.4%)
Did not previously know about e-government services	658 (67.9%)	249 (23.6%)

Table 5-14: Respondent statistics: UCAS

5.5.1 Significance of e-readiness

As shown in tables 5-15, 5-16 and 5-18, results of the two surveys indicate a rejection of the null hypothesis, leading to acceptance of the alternative hypothesis that e-readiness has a significant impact on using e-government services (see section 5.2.2). The results present e-readiness factors and sub-factors regarding ICT infrastructure, ICT usage, human capital and ICT regulations.

1) ICT infrastructure

The ICT infrastructure sub-factors were partially significant with respect to the use of e-government services (table 5-15). The existence of a telephone at home, computer at home, and computer and internet access at school (R1, R2 and R3), were shown to have a significant impact, while internet speed and prices did not.

Factor	Sub-factor	2005			2006			
		Did not use e-govt (N=933)	Used e-govt (N=36)	P-value	Did not use e-govt (N=960)	Used e-govt (N=94)	P-value	
		C1	C2	C3	C4	C5	C6	
ICT infrastructure	Telephone at home	1	783 (83.9%)	33 (91.7%)	0.211	818 (85.2%)	89 (94.7%)	0.011*
	Computer at home	2	329 (35.3%)	25 (69.4%)	<0.001*	437 (45.5%)	78 (83%)	<0.001*
	Computer and internet at school	3	444 (47.6%)	28 (77.8%)	<0.001*	541 (56.4%)	77 (81.9%)	<0.001*
	Internet speed reasonable ¹	4	224 (51.7%)	20 (60.6%)	0.325	284 (56.5%)	45 (57.7%)	0.838
	Internet price affordable ¹	5	237 (54.7%)	20 (60.6%)	0.325	299 (59.4%)	47 (60.3%)	0.892

Table 5-15: ICT infrastructure sub-factors: UCAS

“**” Significant at $P \leq 0.05$; “1” Percentages are out of respondents who have internet knowledge

Although having telephones at home was not a significant distinguishing factor between users and non-users in the 2005 survey (R1-C3), it had become significant by 2006. In each of the years, however, both users and non-users had high levels of phone penetration, varying from 83.9% (R1-C1) to 94.7% (R1-C5).

Percentages for having computers at home, and for having computers and internet access at school varied greatly between users and non-users. For example, in 2005 69.4% of users (R2-C2) had computers at homes compared to 35.3% of non-users (R2-C1), though both percentages had become considerably higher by 2006. As in the case of birth certificates and vehicle licences (section 5.4.1), having a computer at home tended to correlate with having the telephone at home.

Internet speed and prices, on the other hand, were not important influences on using UCAS (R4/5), and the P-values show that they are not significant distinguishing factors between users and non-users (R4/5-C3; R4/5C6).

2) ICT usage

Table 5-16 shows that regular use of the internet was a significant distinguishing factor between users and non-users of UCAS (R1). Using public internet places was not significant, as shown by the P-values (R2/3/4-C3; R2/3/4-C6).

Factor	Sub-factor	C R	2005			2006			
			Did not use e-govt (N=933)	Used e-govt (N=36)	P-value	Did not use e-govt (N=960)	Used e-govt (N=94)	P-value	
			1	2	3	4	5	6	
ICT usage	Regular use of internet ¹	1	165 (38.1%)	25 (75%)	<0.001*	220 (43.7%)	65 (83.3%)	<0.001*	
	Use of internet in public places ¹	Regularly	2	102 (23.6%)	7 (21.2%)	0.200	144 (28.6%)	15 (19.2%)	0.103
		Sometimes	3	198 (45.7%)	11 (33.3%)		159 (31.6%)	33 (42.3%)	
		No	4	133 (30.7%)	15 (45.5%)		200 (39.8%)	30 (38.5%)	

Table 5-16: ICT usage sub-factors: UCAS

“*” Significant at P≤0.05; “1” Percentages are out of respondents who have internet knowledge

	C R	2005		2006	
		Used e-govt (N=36)	P-value	Used e-govt (N=94)	P-value
		1	2	3	4
Computer at home	1	26 (72.2%)	<0.001*	61 (64.9%)	<0.001*
Computer at relatives' work	2	0 (0%)		2 (2.1%)	
Internet café	3	10 (27.8%)		27 (28.7%)	
IT clubs	4	0 (0%)		3 (3.2%)	
Other	5	0 (0%)		1 (1.1%)	

Table 5-17: Classification of computers used in online UCAS

“*” Significant at P≤0.05

Table 5-17 shows clearly the distribution of access points among UCAS users. 72.2% (R1-C1) and 64.9% (R1-C3), in 2005 and 2006 respectively, used their home computers, compared with 27.8% (R3-C1) and 28.7% (R3-C3), respectively, using public internet cafés – although interestingly those figures for internet cafés are substantially higher than for the wider range of citizens using the birth certificate and vehicle licence services.

3) Human capital

Table 5-18 shows that both computer and internet knowledge are significant in distinguishing between UCAS users and non-users. In contrast to the situation with citizens using the birth certificate and vehicle licence services, however, computer and internet education was also a significant distinguishing factor.

Factors	Sub-factors	C R	2005			2006		
			Did not use e-govt (N=933)	Used e-govt (N=36)	P-value	Did not use e-govt (N=960)	Used e-govt (N=94)	P-value
			1	2	3	4	5	6
Human capital	Computer knowledge	1	205 (22%)	12 (33.3%)	<0.001*	258 (26.9%)	40 (42.5%)	<0.001*
		2	313 (33.5%)	21 (58.3%)		332 (34.6%)	48 (51.1%)	
		3	415 (44.5%)	3 (8.3%)		370 (38.5%)	6 (6.4%)	
	Internet knowledge	4	180 (19.3%)	10 (27.8%)	<0.001*	227 (23.6%)	40 (42.6%)	<0.001*
		5	253 (27.1%)	23 (63.9%)		276 (28.8%)	38 (40.4%)	
		6	500 (53.6%)	3 (8.3%)		457 (47.6%)	16 (17%)	
	Computer and internet education ¹	7	167 (32.2%)	14 (42.4%)	<0.001*	173 (29.3%)	40 (45.5%)	<0.001*
		8	334 (64.5%)	11 (33.3%)		250 (42.4%)	34 (38.6%)	
		9	17 (3.3%)	8 (24.3%)		167 (28.3%)	14 (15.9%)	

Table 5-18: Human capital sub-factors: UCAS

“*” Significant at $P \leq 0.05$; “1” Percentages are out of respondents who have computer knowledge

There are interesting differences between users and non-users in terms of where they got their computer and internet education. In the case of users it was predominantly from schools – 42.4% in 2005 rising to 45.5% in 2006 (R7-C2; R7-C5). For non-users, however, it was predominantly from private centres – 64.5% in 2005, falling to 42.4% in 2006 (R8-C1; R8-C4). That reduced percentage was balanced by the notable increase, from 3.3% to 28.3%, in non-users who got their knowledge from families or friends (R9-C1; R9-C4).

4) ICT regulations

This issue is discussed in section 5.5.2.

5.5.2 Significance of trust

Determining students’ trust through the surveys followed the same method as described for the birth certificates and vehicle licences surveys. A chi-square test was used to investigate the relationship between the use of UCAS and degrees of trust. Responses rejected the null hypothesis, leading to acceptance of the alternative hypothesis that trust in technology and e-government have a significant impact on the use of e-government services (see section 5.2.2).

1) Technology trust

Factor	Sub-factor	C R	2005			2006			
			Did not use e-govt (N=933)	Used e-govt (N=36)	P-value	Did not use e-govt (N=960)	Used e-govt (N=94)	P-value	
			1	2	3	4	5	6	
Technology trust	Information protection	Totally disagree	1	218 (23.4%)	0 (0%)	<0.001*	371 (38.6%)	2 (2.1%)	<0.001*
		Disagree	2	250 (26.8%)	2 (5.5%)		145 (15.1%)	4 (4.3%)	
		Fair	3	222 (23.8%)	3 (8.3%)		167 (17.4%)	7 (7.4%)	
		Agree	4	166 (17.8%)	3 (8.3%)		153 (15.9%)	11 (11.7%)	
		Totally agree	5	77 (8.3%)	28 (77.8%)		124 (12.9%)	70 (74.5%)	
	Security	Totally disagree	6	301 (32.3%)	0 (0%)	<0.001*	355 (37%)	1 (1.1%)	<0.001*
		Disagree	7	209 (22.4%)	2 (5.6%)		170 (17.7%)	3 (3.2%)	
		Fair	8	203 (21.8%)	3 (8.3%)		168 (17.5%)	7 (7.4%)	
		Agree	9	133 (14.3%)	1 (2.8%)		163 (17%)	12 (12.8%)	
		Totally agree	10	87 (9.3%)	30 (83.3%)		104 (10.8%)	71 (75.5%)	
	Privacy	Totally disagree	11	300 (32.2%)	0 (0%)	<0.001*	338 (35.2%)	3 (3.2%)	<0.001*
		Disagree	12	191 (20.5%)	2 (5.6%)		145 (15.1%)	3 (3.2%)	
		Fair	13	211 (22.6%)	5 (13.9%)		173 (18%)	10 (10.6%)	
		Agree	14	141 (15.1%)	26 (72.2%)		185 (19.3%)	30 (31.9%)	
		Totally agree	15	90 (9.6%)	3 (8.3%)		119 (12.4%)	48 (51.1%)	

Table 5-19: Technology trust sub-factors: UCAS

*** Significant at P≤0.05

Table 5-19 shows the high levels of trust in the technology, across all three sub-factors, displayed by students who used online UCAS. Just over 86% (R4/5-C2; R4/5-C5) agreed or totally agreed that information protection provisions were in place, compared to under 30% of non-users (R4/5-C1; R4/5-C4). Over 85% of users (R9/10-C2; R9/10-C5) agreed or totally agreed that security provisions were in place, compared to around 25% of non-users (R9/10-C1; R9/10-C4). On privacy, the comparable figures were over 80% for users (R14/15-C2; R14/15-C5) – slightly lower than for the other two sub-factors – and around 30% for non-users (R14/15-C1; R14/15-C4).

2) E-government trust

Factor	Sub-factor	C R	2005			2006			
			Did not use e-govt (N=933)	Used e-govt (N=36)	P-value	Did not use e-govt (N=960)	Used e-govt (N=94)	P-value	
			1	2	3	4	5	6	
E-government trust	Credibility	Totally disagree	1	201 (21.5%)	1 (2.8%)	<0.001*	286 (29.8%)	2 (2.1%)	<0.001*
		Disagree	2	188 (20.2%)	1 (2.8%)		231 (24.1%)	0 (0%)	
		Fair	3	289 (31%)	2 (5.6%)		202 (21%)	5 (5.3%)	
		Agree	4	173 (18.5%)	4 (11.1%)		114 (11.9%)	17 (18.1%)	
		Totally agree	5	82 (8.8%)	28 (77.8%)		127 (13.2%)	70 (74.5%)	
	Customer satisfaction	Totally disagree	6	250 (26.8%)	2 (5.6%)	<0.001*	285 (29.7%)	3 (3.2%)	<0.001*
		Disagree	7	125 (13.4%)	3 (8.3%)		212 (22.1%)	2 (2.1%)	
		Fair	8	333 (35.7%)	0 (0%)		180 (18.7%)	6 (6.4%)	
		Agree	9	170 (18.2%)	5 (13.9%)		190 (19.8%)	5 (5.3%)	
		Totally agree	10	55 (5.9%)	26 (72.2%)		93 (9.7%)	78 (83%)	
	Response on time	Totally disagree	11	259 (27.8%)	2 (5.6%)	<0.001*	273 (28.4%)	2 (2.1%)	<0.001*
		Disagree	12	154 (16.5%)	4 (11.1%)		215 (22.4%)	1 (1.1%)	
		Fair	13	248 (26.6%)	5 (13.9%)		163 (17%)	20 (21.3%)	
		Agree	14	123 (13.2%)	16 (44.4%)		174 (18.1%)	21 (22.3%)	
		Totally agree	15	149 (16%)	9 (25%)		135 (14.1%)	50 (53.2%)	

Table 5-20: E-government trust sub-factors: UCAS

“*” Significant at P≤0.05

Table 5-20 again shows the high levels of trust in e-government, across all three sub-factors, displayed by students who used online UCAS. About 90% (R4/5-C2; R4/5-C5) agreed or totally agreed on the credibility of e-government services, compared with around 25% of non-users (R4/5-C1; R4/5-C4), respectively. Over 85% of users (R9/10-C2; R9/10-C5) agreed or totally agreed that they were satisfied with the services, compared to under 30% of non-users (R9/10-C1; R9/10-C4) with positive expectations of customer satisfaction. On receiving services on time, the comparable figures were around 70% for users (R14/15-C2; R14/15-C5) – notably lower than for the other two sub-factors – while again only around 30% of non-users (R14/15-C1; R14/15-C4) expected services would be received on time.

The results clearly indicate that, once students have made the decision to use UCAS, their levels of trust rises substantially.

5.5.3 Significance of other factors

As before, the three sub-factors under the “other” heading are awareness, non-resistance and perceptions.

1) Awareness of e-government

Factor	Sub-factor	C/R	2005			2006		
			Did not use e-govt (N=933)	Used e-govt (N=36)	P-value	Did not use e-govt (N=960)	Used e-govt (N=94)	P-value
			1	2	3	4	5	6
Other	Awareness of e-government	1	275 (29.5%)	36 (100%)	<0.001*	711 (74.1%)	94 (100%)	<0.001*

Table 5-21: Other sub-factors: awareness of e-government: UCAS

“*” Significant at P≤0.05

Table 5-21 provides interesting evidence about awareness of online UCAS. While by definition 100% of users were aware of it, the proportion of aware non-users rose dramatically from 29.5% in 2005 (R1-C1) to 74.1% in 2006 (R1-C4). That increase must be largely accounted for by the advertising campaign launched by MSAD.

2) Non-resistance to e-government

Factor	Sub-factor	C/R	2005			2006		
			Did not use e-govt (N=933)	Used e-govt (N=36)	P-value	Did not use e-govt (N=960)	Used e-govt (N=94)	P-value
			1	2	3	4	5	6
Other	Non-resistance to e-government	1	91 (9.8%)	36 (100%)	<0.001*	228 (23.8%)	94 (100%)	<0.001*

Table 5-22: Other sub-factors: non-resistance to e-government: UCAS

“*” Significant at P≤0.05

Table 5-22 shows statistically significant differences between users and non-users regarding non-resistance to e-government services. Only 9.8% (R1-C1) and 23.8% (R1-C4) of non-users, in 2005 and 2006 respectively, were non-resistant; the remainder of non-users displayed some degree of resistance to the concept. Those figures interestingly

show higher levels of resistance to e-government among UCAS applicants or potential applicants than among general citizens (see table 5-11).

Other results from the two years' surveys show that 32.3% of UCAS users generally thought internet services were trustworthy, (only) 17.1% thought that the online UCAS service is better than the paper-based service, and (only) 8.5% thought that the service is cheaper and quicker. 26.7% of non-users did not trust the online service, with 7.5% worried about lack of proof of online submission.

3) Perception of e-government

Factor	Sub-factor	C R	2005		2006	
			Used e-govt (N=36)	P-value	Used e-govt (N=94)	P-value
			1	2	3	4
Other (perception of e-government)	Reach the desired faculty	Totally disagree	1 (2.8%)	<0.001*	0 (0%)	<0.001*
		Disagree	3 (8.3%)		5 (5.3%)	
		Fair	0 (0%)		7 (7.4%)	
		Agree	6 (16.7%)		10 (10.6%)	
		Totally agree	26 (72.2%)		72 (76.6%)	
	Website easy to use	Totally disagree	1 (2.8%)	<0.001*	0 (%)	<0.001*
		Disagree	1 (2.8%)		15 (16%)	
		Fair	1 (2.8%)		7 (7.4%)	
		Agree	4 (11.1%)		9 (9.6%)	
		Totally agree	29 (80.6%)		63 (67%)	
	Improvement in the service	Totally disagree	1 (2.8%)	<0.001*	3 (3.2%)	<0.001*
		Disagree	2 (5.6%)		2 (2.1%)	
		Fair	1 (2.8%)		9 (9.6%)	
		Agree	5 (13.9%)		31 (33%)	
		Totally agree	27 (75%)		49 (52.1%)	
	Demographic distribution	Totally disagree	1 (2.8%)	<0.001*	5 (5.3%)	<0.001*
		Disagree	3 (8.3%)		6 (6.4%)	
		Fair	3 (8.3%)		10 (10.6%)	
		Agree	11 (30.6%)		21 (22.3%)	
		Totally agree	18 (50%)		52 (55.3%)	

Table 5-23: Other sub-factors: perception of e-government: UCAS

“*” Significant at P≤0.05

Table 5-23 shows that over 85% of UCAS users in both years (R4/5-C1; R4/5-C3) were able to join their preferred faculty; 91.7% in 2005 (R9/10-C1), declining to 76.6% in 2006 (R9/10-C3), agreed or totally agreed that the website is easy to use; 88.9% in 2005 (R14/15-C1), declining to only 85.1% in 2006 (R14/15-C3) agreed or totally agreed that the internet service is an improvement on the paper-based service; and over 75% in both years (R19/20-C1; R19/20-C3) agreed or totally agreed that using the service led to a good demographic distribution between universities. The distinct decline in two of those perceptions is unexplained.

Online problems		C R	2005		2006	
			Used e-govt (N=36)	P-value	Used e-govt (N=94)	P-value
		1	2	3	4	
Yes	PIN not received	1	1 (3.8%)	<0.001*	11 (28.2%)	<0.001*
	Faculty not presented	2	2 (7.7%)		1 (2.6%)	
	Delay in communications	3	7 (26.9%)		21 (53.8%)	
	Other reasons	4	0 (0%)		6 (15.4%)	
	PIN not received +delay	5	16 (61.5%)		0 (0%)	
No		6	10 (27.8%)		55 (58.5%)	

Table 5-24: Types of online problems: UCAS

“*” Significant at $P \leq 0.05$

Table 5-24 shows that 72.2% of users in the 2005 survey faced problems using the UCAS service, though that percentage dropped to 41.5% in 2006. The majority of the problems in 2005 related to PIN numbers not being received or received late (R5-C1); those problems dropped to zero in 2006 (R5-C3). However, in 2006 the predominant problems related to delays in communications (R3-C3). They occurred as a result of the short time, from 5 to 7 days, during which huge numbers of students have to apply. That suggests that the problem arises not from the usability of the website but from network capacity.

5.6 Conclusion

This chapter has defined the analysis guidelines for the data from both interviews and surveys. The analysis of interview data is based on four themes and shows that managers consider the existence of e-readiness and trust as major factors for e-government success. Results from the surveys show that citizens who used online e-government services were

more e-ready, and trust technology and e-government, more than non-users. Also, awareness of, and non-resistance to, online services has a positive impact on their use. The research results indicate that a combination of these factors should exist in order to encourage more citizens to use e-government services.

CHAPTER 6

COMBINED RESULTS AND FINDINGS

6.1 Introduction

This chapter continues the second part of the analysis strategy which is to analyse all the levels of data (government and citizens, both years) and compare the results with other studies to test their validity (as described in section 3.4.3).

The chapter starts (section 6.2) by explaining the findings from the managers' interviews and citizens' surveys given in the previous chapter in relation to the research sub-questions with the aim of identifying the significant CREG factors.

Answering the sub-questions will help to reach an answer to the main research question and achieving the final CREG model (section 6.3). The sub-questions are (section 1.1):

- How do factors from e-readiness assessments affect citizens' usage of e-government?
- How do trust factors affect citizens' usage of e-government?
- How do other factors affect citizens' usage of e-government?
- How do e-readiness assessments affect e-government projects?

The research validity is achieved by comparing the research findings from different resources (figure 6-1). Relevant sources are compared together to achieve the research validity as explained in section 3.4.4 using the triangulation method. Triangulation is also continued within each source (indicated below in parentheses):

- E-readiness assessments. (international and local assessments)
- Other literature sources.
- Government interviews on policy, strategy and programme. (MCIT, MSAD)
- Government interviews on implementing specific services. (MHE, MI)
- Citizens' surveys on specific services. (2005, 2006) (birth certificate and vehicle licence, UCAS).

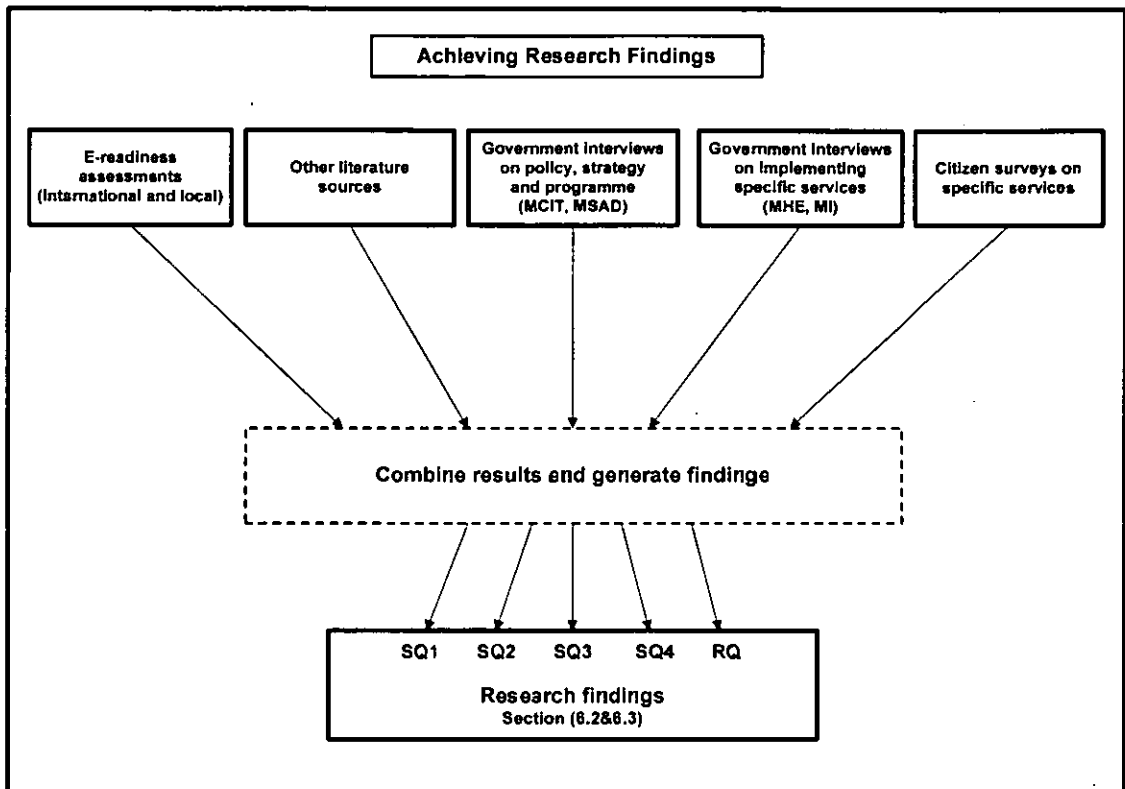


Figure 6-1: Achieving research findings

6.2 Answering the research sub-questions

6.2.1 SQ1: How do factors from e-readiness assessments affect citizens' usage of e-government?

1) Existence of citizens' e-readiness on e-government usage

The first part of the proposed CREG model (section 3.3) was to investigate the impact of e-readiness factors (detailed in table 5-1) on using e-government services in developing countries. The investigation considered the perspectives of both managers and citizens. Findings from managers' interviews and citizens' surveys show the significance of the first part of the proposed CREG model (section 3.3) that *e-readiness factors extracted from e-readiness assessments are essential for moving non e-ready citizens to be e-ready for using e-government services*. Therefore, the first hypothesis (section 5.2.2) that e-readiness has a significant impact on using e-government services is accepted (table 6-1 below).

	Hypothesis	Findings
H1	E-readiness has a significant impact on using e-government services.	Accepted

Table 6-1: Hypothesis (1) findings

Managers agreed that Egypt, as a developing country, should have proper ICT fundamentals in order to have a successful e-government programme. All the proposed e-readiness sub-factors were considered important and significant to the use of e-government services (see figure 6-2). This was reflected on the government policies in enhancing Egyptian e-readiness (MCIT, 2005b, 2006b) as explained in section (4.2.4)

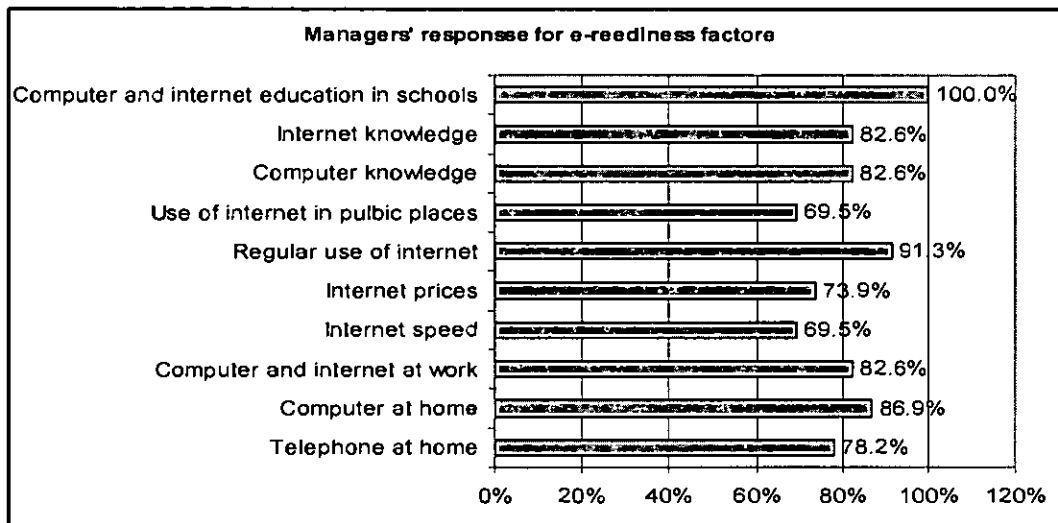


Figure 6-2: Managers' responses for e-readiness factors

Findings from citizens' surveys showed that there is a *partial match* between what government managers expect to be important e-readiness factors for e-government and those that actually affect citizens' usage of e-government. The following factors were significant and essential to move non e-ready citizens to be e-ready and they show a significant impact on citizens' use of e-government services comparing with non e-ready citizens (see figures 6-4 and 6-5). These results agreed with the views held by managers.

Significant factors

- Telephone at home
- Computer at home
- Computer and internet at work
- Regular use of internet
- Computer knowledge
- Internet knowledge
- E-signature law
- Information protection commitment

These factors form the first part of the final CREG model and are shown in figure 6-3 below (indicated by the boxes with white background).

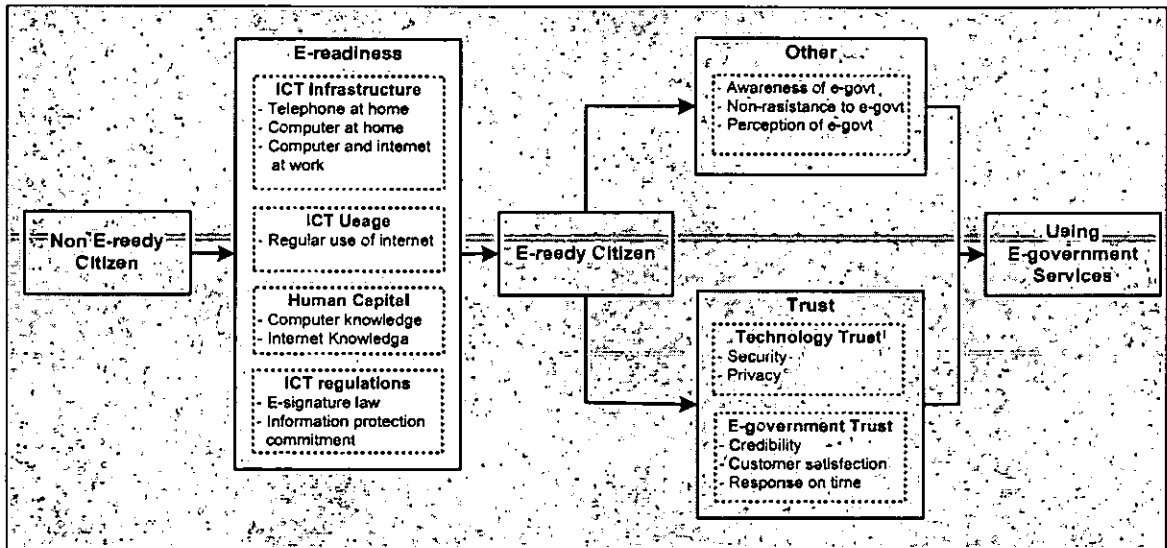


Figure 6-3: Significant e-readiness factors - CREG model

Having a telephone at home was a significant factor and an essential step for e-government usage. Although both users and non-users of e-government services had a high percentage of telephone lines in their homes, the provision of a telephone line at home was an essential step towards internet connections for citizens (see figures 6-4 and 6-5). However, the availability of telephone line needs to be combined with computer at home, computer and internet at work, and computer and internet knowledge in order to have an effective impact on using e-government services. In the 2006 surveys, for example, 91.4% of citizens who requested online birth certificates and vehicle licences (83% for online UCAS) have computers in their homes comparing to 38.3% of non-users in birth certificate (45.5% for online UCAS).

Using computers and the internet regularly was a common factor for most citizens who used online e-government services. Statistics of those who applied for online birth certificates and vehicle licences showed that 70.4% of them were using the internet regularly in their daily life compared with 40.1% who did not use the online service.

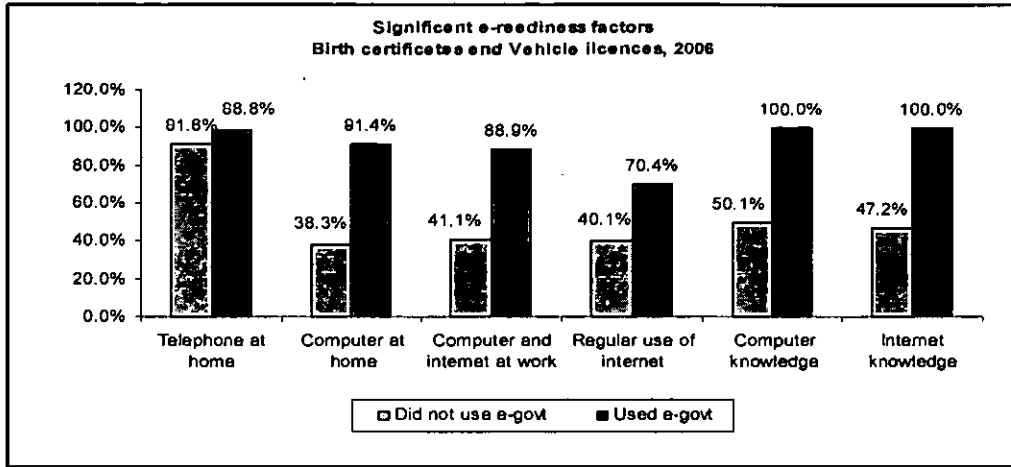


Figure 6-4: Citizens' responses for e-readiness factors: birth certificates and vehicle licences (significant factors)

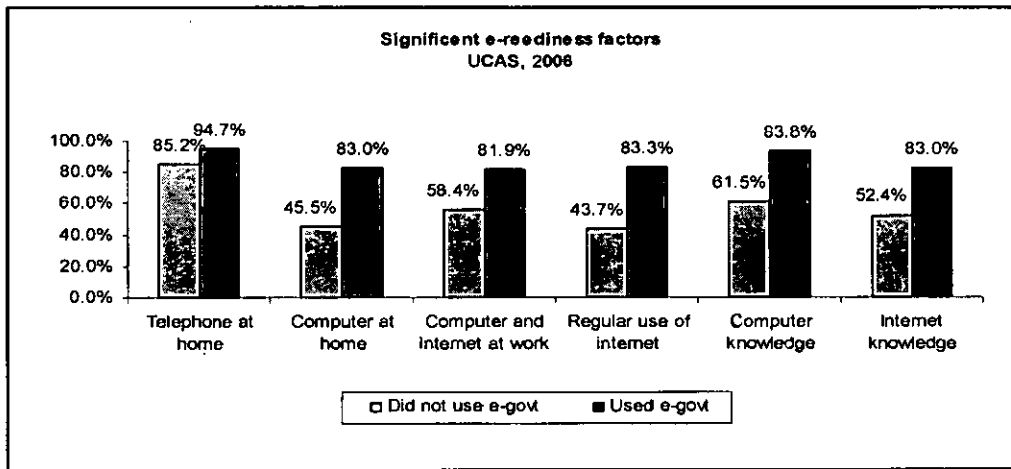


Figure 6-5: Citizens' responses for e-readiness factors: UCAS (significant factors)

The research findings coincide with Carter and Belager (2004) study that found citizens with high or medium computer and internet skills are using e-government services as opposed to citizens without these skills. However, in some cases, citizens' usage of the internet might not be in the direction intended by the government (that is to benefit the society). For example, in a survey carried out in Egypt by IDSC (2005a) regarding internet usage it was found that 52% of respondents were using the internet for chatting, 31% using it for downloading music and movies while only 1% of them were using it for education or receiving services online. Therefore, in developing countries it is not necessarily the case that increasing the number of internet users would have a positive impact on using e-government services as intended by the government.

Previous discussion demonstrates that most of the proposed e-readiness factors are an essential factor for citizens' readiness for e-government. Getting citizens in developing

countries from non-e-ready to e-ready is important as the evidence shows that e-readiness provides more potential users of e-government services. Citizens who have ICT skills and facilities mostly used e-government services because they are already familiar with the online virtual community. Therefore, applying e-government projects should not be postponed until all citizens become e-ready. Only, a mass level of distribution needs to reach different categories of citizens allowing e-government projects to have enough users of different services (Abdelghaffar and Kamel, 2008).

Non significant factors

On the other hand, few e-readiness factors did not have a significant impact on using e-government services and contradicted the managers' agreement regarding their impact.

- **Internet speed**
- **Internet prices**
- **Use of internet in public places**
- **Computer and internet education in schools**

Internet prices and internet speed did not have a significant impact on e-government usage as about 60% of users and non-users of e-government agreed that internet prices are affordable and speed is reasonable (figures 6-6 and 6-7). However, this does not neglect their impact on encouraging more citizens to use the internet and highlights that once a satisfactory level of internet prices and speed is achieved citizens become more saturated towards any improvement from the government. Consequently, more enhancement of internet speed, by providing broadband connectivity, would not affect citizens' usage of e-government services. As a result of that, telecommunication regulations sub-factor (related to ICT regulations factor) would not be a significant factor for citizens as long as they have affordable internet prices and reasonable speed. This was reflected in managers' responses as only 43.4% of them agreed to the significance of this factor on e-government usage.

Having internet in public places such as internet cafés was significant from managers' vision to overcome the lack of personal computers at home and the digital illiteracy problem in developing countries (MCIT, 2005b). However, this concept was not reflected in citizens' surveys as only 6.2% of citizens used internet cafés and IT clubs to request online birth certificate and vehicle licence services (31.9% for online UCAS) in 2006 surveys.

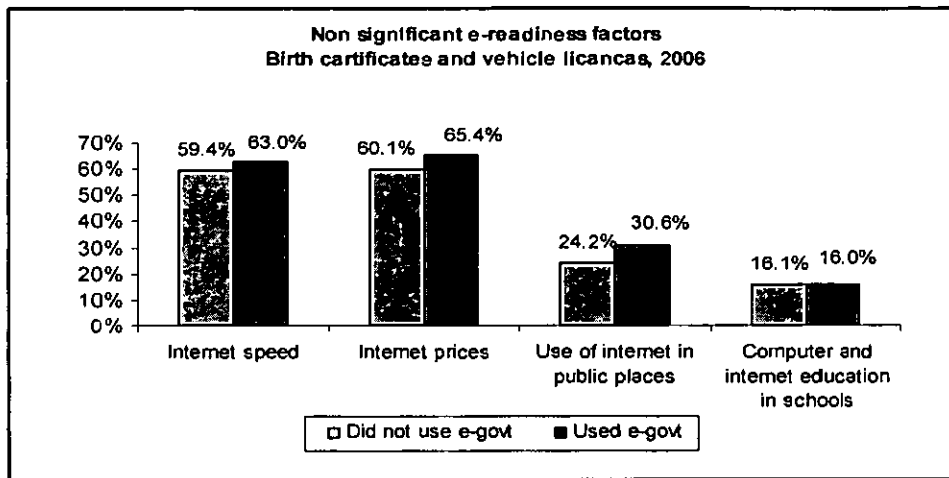


Figure 6-6: Citizens' responses for e-readiness factors: birth certificates and vehicle licences (non significant factors)

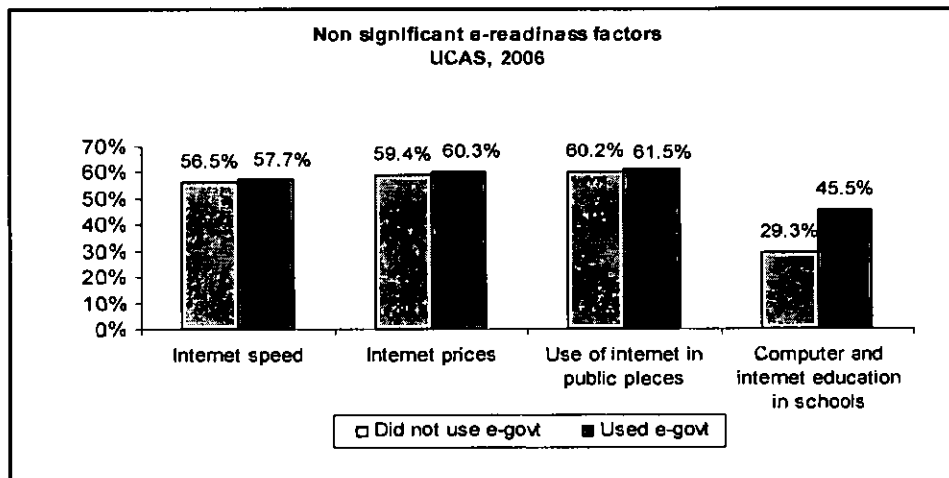


Figure 6-7: Citizens' responses for e-readiness factors: UCAS (non significant factors)

Computer and internet education in schools was not a significant factor in the case of the birth certificate and vehicle licence. Most users and non-users of e-government got their computer and internet education at private computer centres or from other sources while a small percentage got their education in schools. Although there was a slight increase in the percentage of students who got their computer and internet education in schools, it was still lower than the total number of students who got their computer and internet education at private computer centres and other sources.

Although the previous factors are not significant, none of the proposed e-readiness factors should be excluded from government policies because of their impact on e-government

projects. E-readiness factors have different impacts on e-government. While a telephone at home, computer at home or at work and computer and internet knowledge were more important for citizens to access the internet and online government services, reasonable internet speed and affordable prices were less important. Therefore, each government should prioritise its focus on the factors that are important, depending on its objectives, rather than trying to put in place all factors with equal weight (Abdelghaffar and Kamel, 2008).

2) The impact of changes in citizens' e-readiness on e-government usage

The second part of e-readiness factors investigation was identifying how the changes in e-readiness factors within the society affect the e-government take-up. 66.7% of **managers** believed that increasing the e-readiness level has a significant impact on increasing citizens' usage of e-government services as there will be more e-ready users who are able to use the online technology. Other managers considered e-readiness improvements not significant either because they are not tangible or because of other problems such as lack of citizens' trust and resistance to change in receiving online services.

Citizens' surveys conducted in 2005 and 2006 (including birth certificate, vehicle licence and UCAS) indicate that improvements in citizens' e-readiness level have a significant impact on using e-government services. Consequently the second hypothesis that e-readiness changes have a significant impact on using e-government services is accepted (table 6-2).

	Hypothesis	Findings
H2	E-readiness changes have a significant impact on using e-government services.	Accepted

Table 6-2: Hypothesis (2) findings

This was confirmed through comparing and testing two groups' data between 2005 and 2006 regarding e-readiness factors (see appendices C-4 and C-5). Results show that there was a *significant increase* in the percentage of citizens who used e-government services and improvements regarding the following e-readiness factors: telephone at home, computer at home, computer and internet at work, computer knowledge, internet knowledge and regular use of internet (see figures 6-8 and 6-9). On the other hand,

internet speed, internet prices, use of internet in public places and computer and internet education in schools were *not significant*.

Improvements in e-readiness level were combined with an increase in e-government usage. In surveys, 53 citizens used online birth certificates and vehicle licences in 2005 (36 in the UCAS survey) increased to 81 in 2006 (94 in the UCAS survey). On the project level, for instance, 15,666 students applied for online UCAS in 2006 comparing to 12,319 in 2005 (MSAD, 2005a, 2006b).

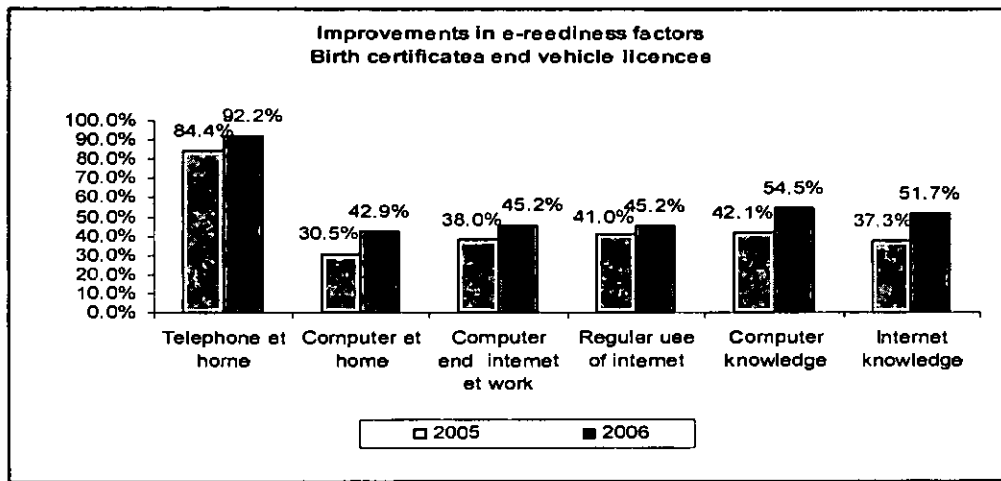


Figure 6-8: Improvements in e-readiness factors from citizens' surveys 2005-2006: birth certificates and vehicle licences (significant factors)

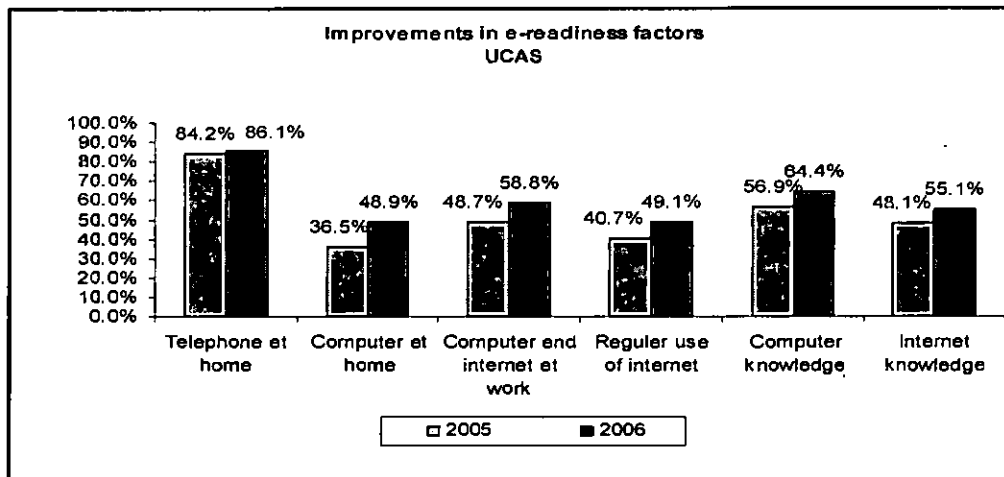


Figure 6-9: Improvements in e-readiness factors from citizens' surveys 2005-2006: UCAS (significant factors)

The improvement in e-readiness level within citizens' surveys was a result of the MCIT efforts (MCIT, 2005a, 2006a) as explained in section 4.2.4. This was confirmed in The UN Global E-government Readiness Report as Egypt's rank improved from 136 (in 2004)

to 79 (in 2008) (UNDESA, 2004, 2005, 2008) and in The Economist Intelligence Unit e-readiness reports (EIU, 2005, 2006, 2007).

Previous discussion shows that the improvement of e-readiness factors from one year to another has a significant impact on citizens' usage of the investigated services. Although the increase of the online usage could be a result of increasing citizens' awareness or other undetected factors, the fact is that almost all citizens who used online services were e-ready in terms of ICT. In addition, there was an improvement in the e-readiness level between 2005 and 2006 for citizens who used online services.

6.2.2 SQ2: How do trust factors affect citizens' usage of e-government?

Although e-readiness factors were important for using e-government services, there were a number of citizens in the surveys who were e-ready and able to use a computer and internet but did not use e-government services. This highlighted the existence of other factors that contribute to e-government usage. In this context, trust factors were detected from the literature review as important factors affecting citizens' usage of e-government services and forming the second part of the proposed CREG model (section 3.3). Findings from managers' interviews and citizens' surveys showed that it is crucial for citizens to trust the technology and e-government in order to use e-government services. Consequently, the third hypothesis is accepted (table 6-3) and **trust factors become the second part of the final CREG model** as appear in figure 6-10.

	Hypothesis	Findings
H3	Trust has a significant impact on using e-government services.	Accepted

Table 6-3: Hypothesis (3) findings

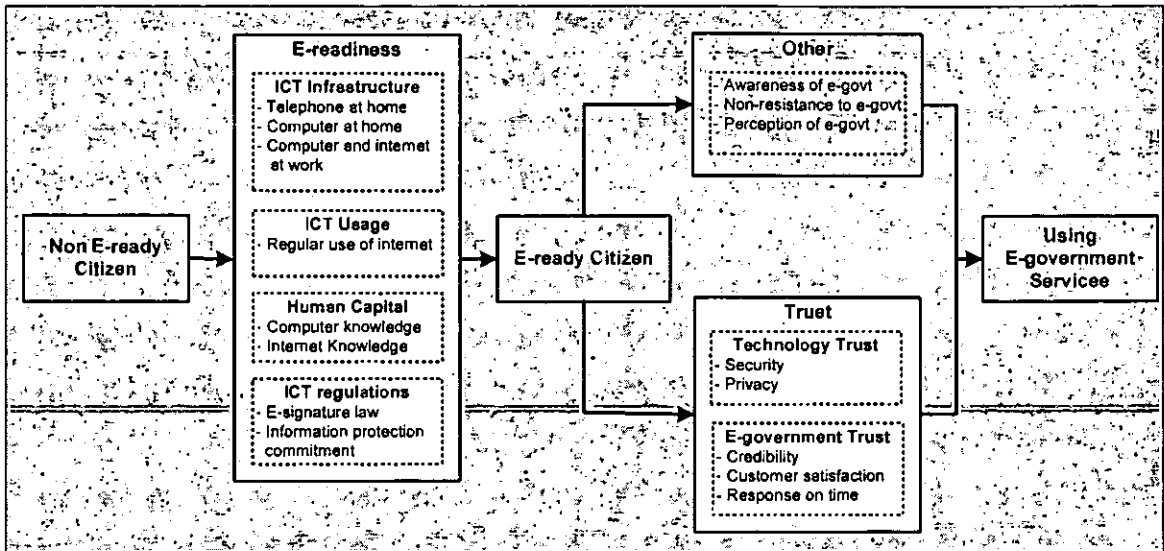


Figure 6-10: significant trust factors - CREG model

All managers agreed on the significance of *technology* and *e-government trust* factors for using e-government services (see figure 6-11). However, the privacy issue was less important for managers as they thought that citizens were not concerned about the privacy of information. This is because information is normally exchanged between government organisations only.

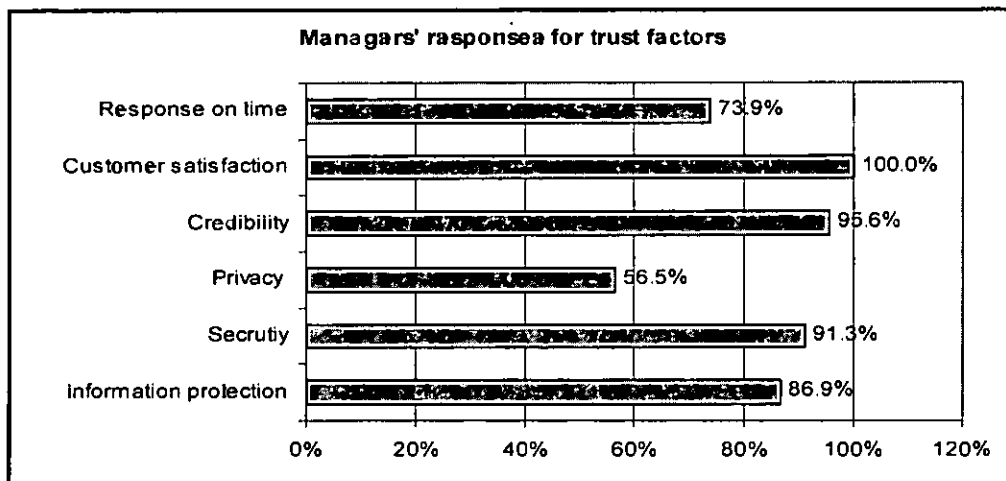


Figure 6-11: Managers' responses for technology and e-government trust factors

1) Technology trust

Significant factors

- Information protection
- Security
- Privacy

The above technology trust sub-factors were confirmed by **managers** and **citizens** as significant factors for using e-government services. Citizens who used e-government services believed that there was enough privacy, security and protection regarding their information. Their belief was confirmed through receiving e-government services without experiencing any problems regarding their personal information. On the other hand, citizens who did not use e-government services thought that there was a lack of information protection, security and privacy with regard to receiving services over the internet (see figure 6-12). The root of this problem is that e-government is using the internet which is a public network. Consequently, citizens feel that the risk is very high due to the lack of security and privacy for their information (as explained in section 2.5.3).

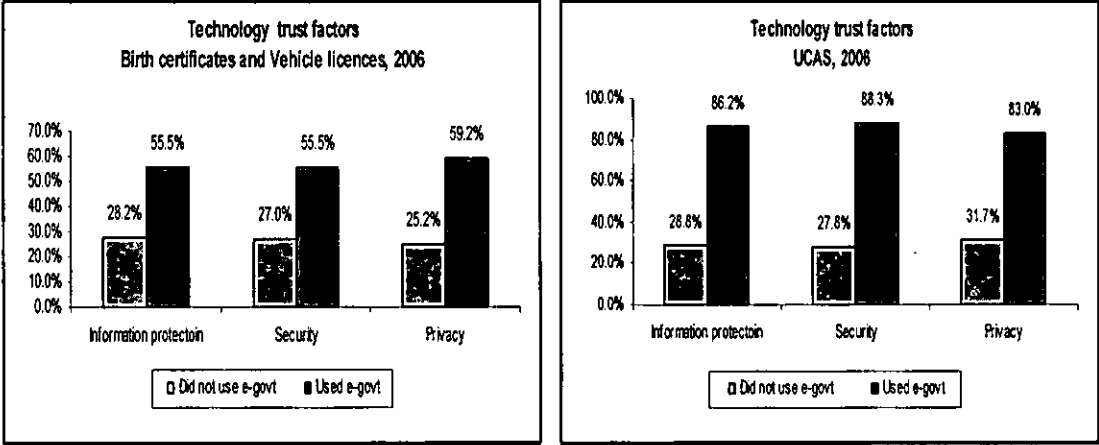


Figure 6-12: Citizens’ responses for technology trust factors (significant factors)

The lack of citizens’ trust in technology is a problem in both developed and developing countries (Srivastava and Teo, 2005). For example, 60% of citizens in the European Union would not use e-government services because of security fears for their transactions (RAND Europe, 2003). Although these findings contradict the Carter and Belager (2004) study conducted in the United States, this research confirms the importance of having technology trust between citizens to increase their use of e-government services.

As in many e-government programmes, the Egyptian e-government considered the security and privacy in its strategy (EISI-G, 2005) as presented in section 4.2.1 to increase citizens’ trust in their projects. This was reflected within the investigated e-government

services (birth certificate, vehicle licence and UCAS) on two levels: (1) securing citizens' information transmitted to the e-government portal using 128-bit encryption and Secure Hypertext Transfer Protocol and (2) securing information stored on e-government and government servers against unauthorised access using firewall and different access levels.

However, the technical measures are not fully supported by legislation that prosecutes illegal activities for services provided online except an e-signature law - part of ICT regulations - (approved but not yet implemented) which was seen by 69.5% of managers as a significant factor for increasing e-government usage.

Although appropriate security and protection measures are in place for online e-government transactions, the government does not explain its security or privacy policy for citizens. Consequently, citizens are unaware of the existence of these measures. To reassure that citizens are aware of these aspects, governments need to publicise the measures taken to secure their personal information both on the e-government website and by advertising them to the public (RAND Europe, 2003) using appropriate language understood by citizens (Hackney et al, 2005; Tassabehji and Elliman, 2006). A strong legal system that has a practical impact in supporting the technical measures would also help to convince more citizens to trust the technology.

2) E-government trust

The second part of the trust factors included within the proposed CREG model is to trust e-government as a new method of delivering e-government services.

Significant factors

- **Credibility**
- **Customer satisfaction**
- **Response on time**

E-government trust sub-factors were confirmed by **managers** and **citizens** as having a significant impact on citizens' usage of e-government and included in the final CREG model (see figure 6-10). In citizens' surveys, most of citizens who used e-government services were satisfied with receiving the service on time and agreed to the credibility of the service. On the other hand, citizens who did not use e-government services were less confident that receiving government services online would enhance the service and reduce time and effort (figures 6-11 and 6-13).

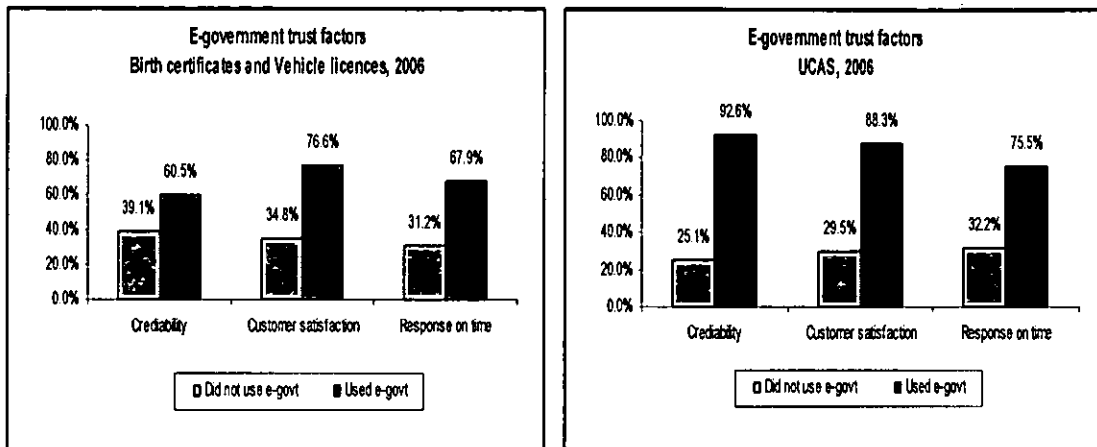


Figure 6-13: Citizens' responses for e-government trust factors (significant factors)

The research findings match the results found by different studies conducted in developed and developing countries. For example, 60% of citizens in the European Union can not rely on the information provided through e-government websites which affects their usage negatively (RAND Europe, 2003). In developing countries, Kamel and Hassan (2003) in their survey of citizens' usage of online banking system in Egypt found that citizens' usage of online banking was affected by customer satisfaction.

Looking at the investigated e-government services might help to understand the reasons behind the lack of e-government trust between citizens. The e-government services are lacking the *ability* and *motivation* to provide citizens with better services that help to achieve *credibility* and *customers' satisfaction* (Corritore, et al, 2003; Oll 2007; Rho and Hu, 2001; Srivastava and Teo, 2005).

- The e-government services are more *expensive* and *take a longer time* to complete than traditional methods. For example, to reissue a birth certificate using the traditional method costs only EGP5 (GBP0.5) and it can be obtained at the same day, whereas the online birth certificate costs EGP18.25 (GBP1.82) and takes 2 days to be delivered. There is, then, an increase in cost and time for using the online service. Furthermore, in the case of renewing the vehicle licence online, if citizens attend personally in respect of their car fines, they have a chance of being exempted from a high percentage of their fines as they can declare their reasons clearly and easily show any relevant evidence. This would not be the case if they only send an e-mail.

- Furthermore, e-government services contain a *higher risk* comparing to the traditional services. For example, students who applied using online UCAS did not receive any confirmation of their online admission, such as a letter, within the following few days of their application. The best they can do is to 'print screen' their receipt, and in many cases they do not have printers. Therefore, *more risk exists* as students do not have a proof of admission as in the traditional way (Dawes et al, 1999) and some of the students who applied online also applied using the traditional way to confirm their admission. (Ba et al, 1999).

These differences between online and traditional government services such as the increased cost for a birth certificate or the lack of admission proof in the UCAS case reduce the credibility of e-government services. Consequently, e-government services do not have an advantage compared to the traditional methods in respect of citizens' satisfaction of e-government; as well as losing a major element of trust that governments work for citizens' benefits (Thomas, 1998).

Overcoming the problem of trusting the technology is essential but not sufficient for using e-government services. This is because lack of credibility and customer satisfaction could be a barrier for citizens to use e-government services (Oll, 2007). Therefore, a government would also need to review the procedures of providing services online with relevant ministries in order to provide citizens with good reasons for credibility and to show that there is some advantage to be gained by using e-government services (Oll, 2007). However, as noted previously, the citizens must also be reassured on issues of security and privacy, for example by an advertising campaign, in order to encourage citizens' trust and increase citizens' acceptance of online government services.

6.2.3 SQ3: How do other factors affect citizens' usage of e-government?

The third part of the proposed CREG model (section 3.3) is related to testing the impact of the other factors detected within the pilot study on using e-government services. As both e-readiness and trust factors show a significant impact on using e-government services, it becomes important to understand how *citizens' awareness* of e-government, their *willing to use* it and *perception* of the service affect their usage. All the proposed sub-factors were showing a significant impact in citizens' surveys on using e-government

services. Consequently, the fourth hypothesis is accepted (table 6-4) and its factors were considered in the final CREG model (figure 6-14).

	Hypothesis	Findings
H4	Other factors have a significant impact on using e-government services.	Accepted

Table 6-4: Hypothesis (4) findings

Significant factors

- Awareness of e-government
- Non-resistance to e-government
- Perception of e-government

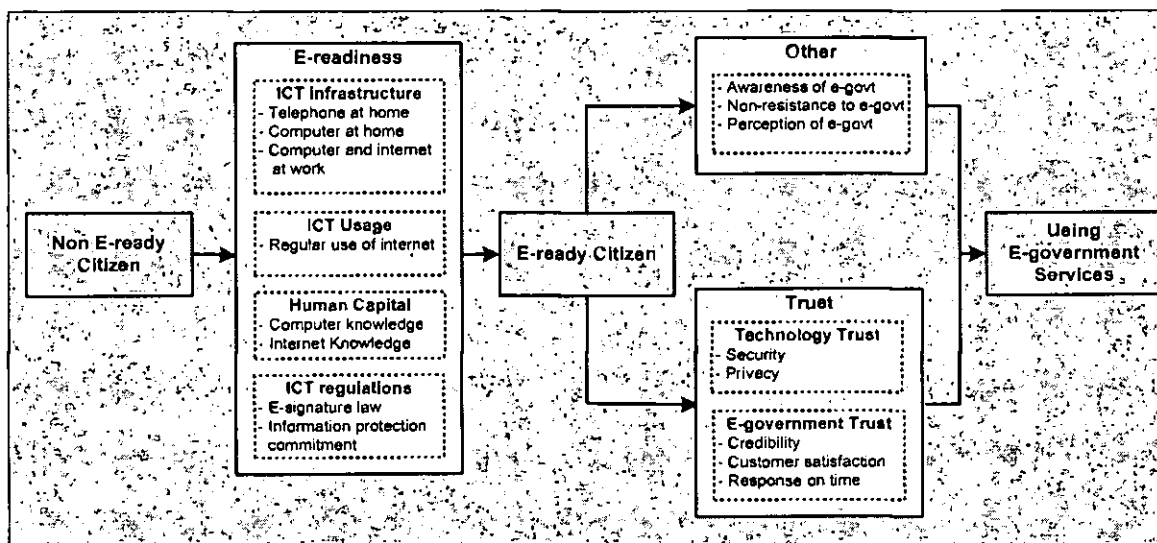


Figure 6-14: Other significant factors - CREG model

1) Awareness of e-government

An essential step to understand the lack of using e-government services between citizens was to determine the level of citizens' awareness of e-government services. This is due to the low level of take-up of e-government services although the existence of adequate number of citizens who are e-ready and trust receiving services online. For example, the actual take-up of the UCAS service from 2005 to 2006 was only 3,347 students out of 374,950 (MOE, 2006; MSAD, 2006b).

MSAD has no general advertising policy to increase citizens' awareness of e-government apart from the UCAS service. This is because students are young and getting computer education at school so they could be potential users of the online UCAS rather than other

e-government services. In UCAS surveys, **students' awareness** rose from 32.1% in 2005 to 76.4% in 2006 (see figure 6-15). The increase of awareness could be explained by the advertising campaign carried out by MSAD.

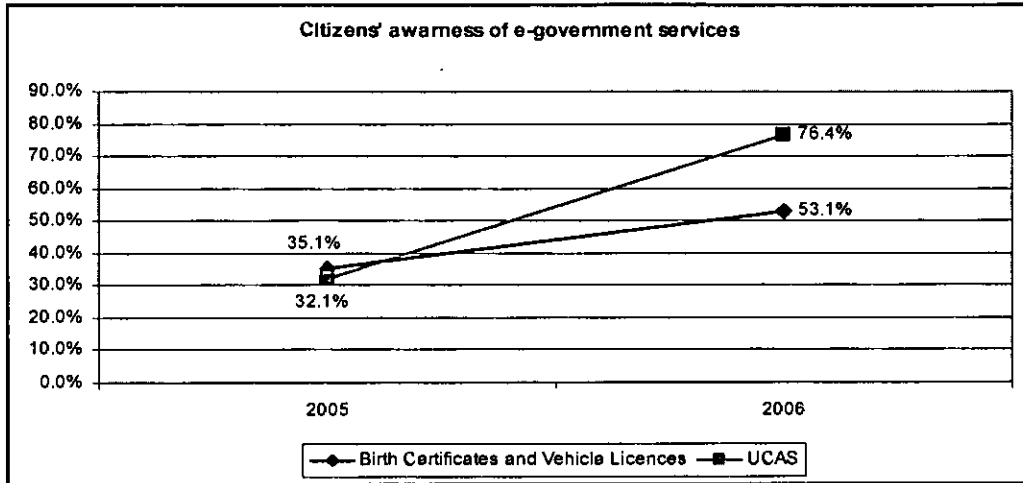


Figure 6-15: Citizens' awareness of e-government services (significant factor)

Citizens' awareness of the existence of online birth certificate and vehicle licence services were low. Only 35.1% of citizens had heard about these services, rising to 53.1% in 2006 either from managers' speeches in television or newspapers (see figure 6-12). These results coincide with a previous survey done on 1000 Egyptian citizens by IDSC (2005b) where only 27% of respondents had heard about e-government services which increased to 47% in a second survey in 2006 (IDSC, 2006).

Increasing citizens' awareness of e-government services needs to be combined with citizens' trust (explained in section 6.2.2) and willingness to use the service (explained in the following point) in order to have an effective impact on e-government usage. For example, in 2005 and 2006, MSAD conducted a comprehensive advertising campaign using television, satellite TV channels, radio and newspapers to increase students' awareness of online UCAS and encourage them to use it. However, only 12,319 applied online in 2005 increased to 15,666 in 2006 (MSAD, 2005a, 2006b). This could be a result of the lack of trust between students towards the e-government.

2) Non-resistance to e-government

Even when **citizens** become aware of e-government services, statistics from surveys show they were less willing to use online e-government services. For example, in the birth

certificate and vehicle licence surveys, only 38.7% of citizens in 2005 were willing (non-resistance) to use the online service increased to 41% in 2006. In the UCAS survey, only 9.8% of students in 2005 were willing to use online UCAS increased to 23.8% in 2006 (see figure 6-16). All managers agreed that a long history of bureaucracy (Sayed, 2004) contributes to the resistance to change attitude amongst Egyptian citizens to use e-government services.

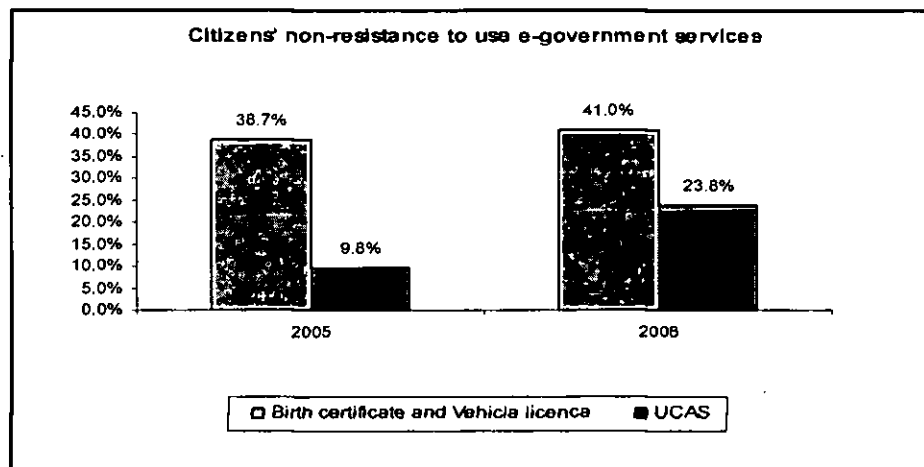


Figure 6-16: Citizens' non-resistance to use e-government services (significant factor)

The reasons behind citizens' resistance to use online services varied. In the UCAS surveys, 26.7% of students who refused to use e-government services did not trust receiving services over the internet and 15.6% thought that traditional UCAS is better. In birth certificate and vehicle licence surveys, 33.9% of citizens who refused to use e-government services preferred the traditional way and 16.3% did not trust receiving services over the internet. The results confirm that more effort is needed by governments to change the public culture to enable citizens to adapt the new methods of providing services, as suggested by Cohen and Eimicke (2002).

3) Perception of e-government

Findings from citizens who used online birth certificate and vehicle licence show a positive perception of e-government. They requested the online service easier than the traditional way and agreed that the service improved. These findings were confirmed by students who used online UCAS. This positive experience would encourage them to use e-government services in the future (Palmer, 2002). However, most of them faced a delay in communications when they requested the services online.

Most of the citizens who requested online birth certificate and vehicle licence services were from governorates of Cairo, Giza and Assyout with average income of EGP1000-2000 (GBP100-200) per month. 43.4% of them in 2005 (50.6% in 2006) were at age of 40-49 and university graduates. Online UCAS users were mainly from governorates of Cairo and Giza at age of 15-20.

Looking to the findings of other factors investigated within the study, awareness could be considered as a significant factor when it is combined with willingness to use online e-government services. Providing an easy website with improved services would help citizens to be satisfied with using the online services in the future. All of these sub-factors if combined with e-readiness and trust factors would provide a base that encourages more citizens to use e-government services.

6.2.4 SQ4: How do e-readiness assessments affect e-government projects?

As e-readiness factors (which are a major part of CREG factors) extracted from e-readiness assessments, it becomes important to understand how managers consider e-readiness assessments within their e-government projects and how they affect their strategy.

1) How much notice is taken of e-readiness assessments?

Results from MSAD managers show that 58.3% of them considered e-readiness assessments conducted on Egypt in designing their projects. 50% of the managers continued considering e-readiness assessments annually; this figure rose to 75% in 2006 (see figure 6-17).

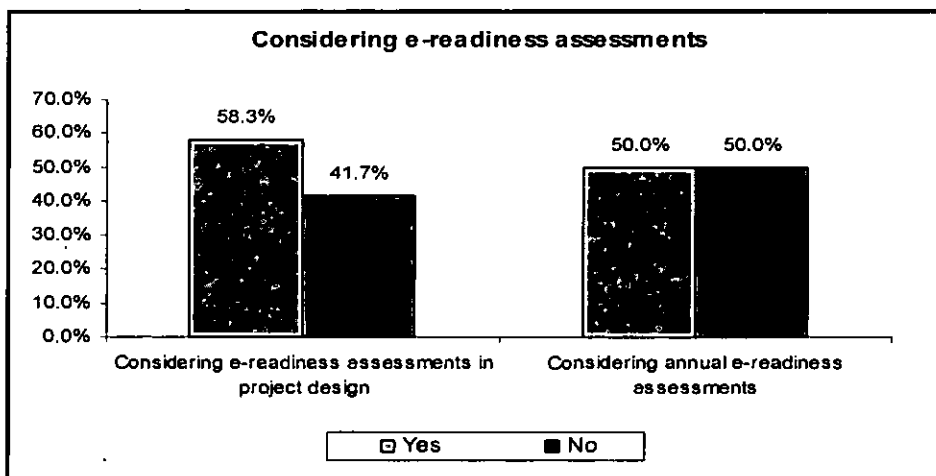


Figure 6-17: Considering e-readiness assessments: MSAD

Considering e-readiness assessments was done without any specific guide of how to benefit from them. Managers who considered international e-readiness assessments focused on identifying where Egypt stands comparing to other countries while managers who relied on local MCIT reports used them to understand the current e-readiness situation in Egypt in general. Managers who did not consider e-readiness assessments within their projects were not aware of them or they did not find them useful for their projects as they were focussing on implementing projects only.

2) How much e-readiness levels affect e-government strategies and projects

Although an adequate percentage of managers considered e-readiness assessments reports, some of the e-readiness factors presented in CREG had an impact on the macro level of e-government strategy resulting in a special focus on project selection. Project's selection was based on two factors: *existence of e-ready citizens* and *service popularity*.

- The *first factor* concerns choosing projects that already had a significant number of e-ready citizens capable of using the internet. These factors were in most cases related to the proposed e-readiness factors that affect CREG such as computer and internet knowledge. For example, the UCAS project was selected as it targets students who are, in many cases, interested in using the internet and who had some computer and internet education at schools. Consequently, there would be more potential users of the online UCAS service.

The vehicle licences project selection depended on the large number of car owners in both governorates of Cairo and Giza rather than other cities in Egypt with a lower level of car ownership. This is in addition to the existence of more e-ready citizens in these two governorates compared to other governorates. The selection goes further, in focussing on private car owners rather than taxi or commercial owners. This is because many private car owners are literate and e-ready whereas many taxi and commercial owners are not.

- The *second factor* affecting e-government strategy is the popularity of the service and citizens' demand of the service. This is because the e-government strategy, as described in section 4.2.1, is to facilitate citizens receiving services (EISI-G, 2005). For example, providing the reissue of birth certificate online facilitates the service

which is requested by 3 million citizens annually (MI, 2006a). The same case is for the UCAS and vehicle licence. Where there are mass numbers of citizens requesting the service, there are more likely e-ready citizens who are capable of using the technology.

Apart from the previous two factors, MSAD managers ignored other factors that could contribute to projects' success. Managers did not consider which areas or governorates have higher e-readiness level than others or which category of citizens according to age, education or income could be potential users of the service.

Although e-readiness improvements show a significant impact on increasing citizens' usage of e-government services (section 6.2.1), only 50% of MSAD managers thought that *e-readiness changes* has no effect on e-government strategy. This is because managers had to follow certain steps for each project to put basic e-government technology in place first (MCIT, 2005b, 2006b). Consequently, the improvements in the Egyptian e-readiness level have almost no impact on the later stages of projects which negatively affects e-government projects' success. That might explain why MSAD did not request improvements from MCIT to enhance certain e-readiness factors or areas that could affect their projects positively.

Findings of this question show that the government needs to have a clear guide for managers of which e-readiness factors (including CREG factors) need to be considered within their projects to achieve more successful projects. Also, the e-readiness improvements within the community need to be considered in the government plans. Considering both e-readiness factors and any improvements helps to close the cycle between policy maker and citizens levels regarding CREG factors. So, the CREG factors that affect citizens should be considered within managers decisions to achieve more successful e-government projects. An annual survey is also needed to get feedback from citizens (Elliman and Irani, 2007; Hackney et al, 2005) on how projects are running and which areas need improvement.

6.3 Final CREG model

RQ: What are the factors that affect citizens' readiness for e-government (CREG) in developing countries?

Answering the research sub-questions helps to achieve an answer to the main research question and achieve the final model for citizens' readiness for e-government (CREG). Interviews with government managers conducted in 2005 and 2006 confirm the significance of all the proposed factors for using e-government services – findings which were also confirmed by the citizens' surveys. The findings from citizens' surveys (sections 5.4 and 5.5) which were conducted for three e-government services in 2005 and repeated in 2006, show that all the hypotheses (in section 5.2.2) could be accepted as given in the following table (6-5).

	Hypothesis	Findings
H1	E-readiness has a significant impact on using e-government services.	Accepted
H2	E-readiness changes have a significant impact on using e-government services.	Accepted
H3	Trust has a significant impact on using e-government services.	Accepted
H4	Other factors have a significant impact on using e-government services.	Accepted

Table 6-5: Hypotheses findings

The initial model which was developed through the e-readiness assessments and literature review (section 2.6) and modified as a result of pilot study with citizens and managers (section 3.3) established a foundation for the proposed CREG model which was tested in the main study. Factors identified in the model considered a combination of e-readiness assessments, literature review and citizens' and managers' experiences.

The research confirmed the significant CREG factors through conducting interviews with government managers and surveys with citizens for three e-government services (birth certificate, vehicle licence and UCAS) in 2005 and repeated again in 2006. The replication of the study over two years (2005 and 2006) helps to confirm the findings and achieve the final model that provides a foundation of a community that is ready for using e-government services. Findings of the significant CREG factors form the final CREG model as presented in figure 6-18.

This final CREG model (figure 6-18) consists of *three steps*.

- The *first step* consists of the essential e-readiness factors (including ICT infrastructure, ICT usage, human capital and ICT regulations) that show a significant impact on moving non e-ready citizens to be e-ready for using the internet technology.
- The *second step* takes place by increasing citizens' awareness of the service existence and followed by encouraging citizens' willingness (or reducing their resistance) to use the e-government service.
- Willingness to use the service is an important step towards using e-government services. However, it should be combined with the *third step* which is encouraging trust in both the technology and e-government. Trusting the technology is achieved by providing adequate security and privacy measures. Trusting e-government is achieved by providing credibility of e-government services as in the traditional way combined with customer satisfaction of the online service.

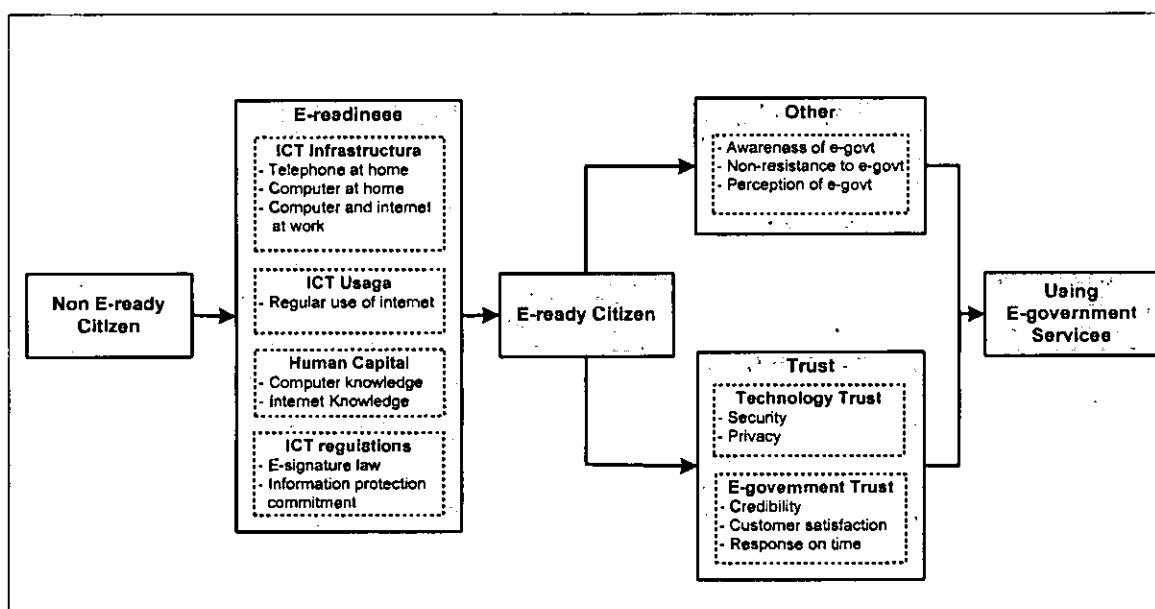


Figure 6-18: Final CREG model

Following these steps would help to reach the goal of having citizens who are ready to use e-government services in developing countries. It also helps to bridge the gap between the impact of e-readiness and trust factors together on citizens' usage of e-government services in developing countries.

The final CREG model consists of *most of the proposed e-readiness factors* which is the first step to move non e-ready citizens to be e-ready and able to use e-government services. Furthermore, *all trust factors* were essential for e-ready and non e-ready citizens. Existence of trust in technology and e-government minimises the risk of requesting government services over the internet and provides credibility for e-government services that encourages e-ready citizens to use online services. The other proposed factors including *awareness, non-resistance and perception* help to increase citizens' awareness of the existence and benefits of services that will reduce citizens' resistance to use new services. Both trust and other factors help to overcome the barrier for citizens to use e-government services.

The following table (6-6) presents the CREG factors and sub-factors originally presented in Table 5-1 (derived from assessments, literature and survey data) showing their significance or non-significance. *Significant* CREG factors are indicated by “✓” and *non significant* factors by “x”.

Group factor	Factor	Sub-factor	CREG
E-readiness	ICT infrastructure	Telephone at home	✓
		Computer at home	✓
		Computer and internet at work	✓
		Internet speed	x
		Internet prices	x
	ICT usage	Regular use of internet	✓
		Using of internet in public places	x
	Human capital	Computer knowledge	✓
		Internet knowledge	✓
		Computer and internet education in schools	x
	ICT Regulations	Telecommunication regulations	x
		E-signature law	✓
Information protection commitment		✓	
Trust	Technology trust	Security	✓
		Privacy	✓
	E-government trust	Credibility	✓
		Customer satisfaction	✓
		Response on Time	✓
Others	Other factors	Awareness of e-government	✓
		Non-resistance to e-government	✓
		Perception of e-government	✓

Table 6-6: Significant and non significant CREG factors

6.4 Conclusion

This chapter has combined the results from different sources to validate the findings and achieve answers to the research sub-questions. The findings show that most of the e-readiness factors were important for citizens to use e-government services. However, the findings also show that e-readiness factors should be combined with trust in technology and e-government in order to encourage citizens to use e-government. All the other proposed factors (awareness, non-resistance, perception) detected in the pilot study prove their significant impact on using e-government services.

From the research sub-questions an answer to the main research question has been achieved and significant CREG factors identified which have formed the final CREG model illustrated by the figure 6-18.

CHAPTER 7

CONCLUSION AND RECOMMENDATIONS

7.1 Introduction

This research was motivated by reports of failing e-government projects, particularly in developing countries apparently due to a lack of 'e-readiness' in ICT infrastructure. However, despite the e-readiness assessments and action plans to enhance citizens' capabilities, citizens were not using e-government. This prompted the question: "What are the factors that affect citizens' readiness for e-government (CREG) in developing countries"? Further sub-questions asked how these factors affected citizens' use of e-government.

In broad terms, the research was an investigation into the impact of CREG factors on e-government in developing countries and focussed on the Egyptian e-government programme as an example of e-government in developing countries. In line with the scope set out in section 1.2 and for the reasons given in section 1.3, three e-government services were selected to study.

Data was collected by conducting interviews with government managers and surveys with citizens. Obtaining managers' and citizens' opinions was vital to see how they matched in order to bridge the gap between the *provision* of e-government services and the *use* of e-government services. The research validity was achieved by triangulating the findings from different sources (primary and secondary) together.

The remainder of this chapter provides a summary of the research findings (section 7.2) leading to the CREG model (section 7.3) and recommendations (section 7.4). The chapter concludes by highlighting the contribution of the research to knowledge (section 7.5) and gives recommendations for future work (section 7.6).

7.2 Summary of findings

This section summarises the key findings from the analysed data collected from interviews with government managers (section 7.2.1) and from citizens' surveys (section 7.2.2). The findings answer the main research question and sub-questions that identify the

significant citizens' readiness for e-government (CREG) factors which help to achieve the final CREG model.

7.2.1 Findings from interviews with government managers

Findings from managers' interviews show an agreement between them on the importance of having an adequate level of e-readiness within the Egyptian community in order to achieve a successful e-government programme. Managers agreed to the significance of all the proposed e-readiness factors on increasing citizens' usage of e-government services.

The study shows that e-readiness levels affect e-government strategy. This impact was seen to be on the macro level by the selection of e-government projects to be implemented. However, e-readiness changes were less important for managers and did not affect e-government projects.

There was an agreement between managers on the importance of technology and e-government trust factors on citizens' use of e-government services. This is due to the fact that there is a lack of trust from citizens towards government projects. Although the government provided appropriate security measures to protect citizens' information and increase citizens' trust in technology, there was less concern regarding service credibility and customer satisfaction.

Managers agreed on the importance of increasing citizens' awareness and reducing citizens' resistance to use e-government services. However, few efforts were taken by the government regarding improving these factors.

7.2.2 Findings from citizens' surveys

Findings from citizens' surveys identified significant CREG factors as described in section 6.3 (and listed in Table 6-6). The study found that there are matches, to a certain extent, between what government managers consider to be significant factors for e-government usage and what really affects citizens.

The results from the surveys showed agreement with government managers that having a telephone at home, computer at home and at work, computer and internet knowledge and regular use of internet factors had a significant impact on citizens' use of e-government services. However, internet speed and prices, use of internet in public places and

computer and internet education in schools were not significant factors. Furthermore, the investigation of e-readiness changes over two years showed a positive improvement in levels of citizens' e-readiness and an increase in e-government usage.

Both technology and e-government trust factors showed a significant impact on the use of e-government services by citizens. Users of e-government services believed that appropriate security and privacy measures were in place to protect their information while non-users were less confident. Although different measures that protect citizens' information were in place, they were not visible to citizens. Services' credibility, customer satisfaction and delivering services on time show a significant impact on increasing citizens' usage of e-government services.

Finally, citizens' awareness, non-resistance and perception of e-government services significantly affected the use of e-government services.

The significant factors detected in the interviews and surveys were used in forming the final CREG model (discussed in the following section 7.3).

7.3 The final CREG model derived from the research results

The steps taken in this research have resulted in the development of a citizens' readiness for e-government model. The preliminary model was adapted by following indicators from the pilot study and the factors were tested in the interviews and surveys. The factors listed in this model have all been verified as significant in achieving successful e-government projects. In particular, the factors of technology trust, e-government trust, awareness, non-resistance and perception of e-government are vitally important in bringing the e-ready citizen to the stage of *using* e-government services. The final CREG model, achieved in section (6.3), appears in figure 7-1 below (as a reminder).

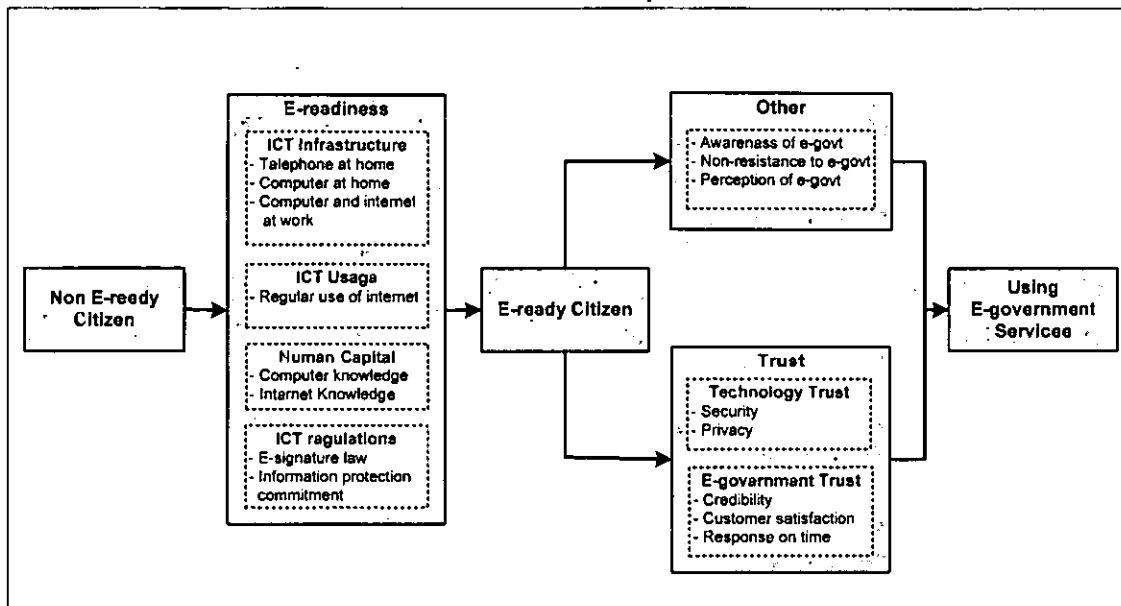


Figure 7-1: The final CREG model

The model shows the three steps needed to be taken from the stage of non e-ready citizen to e-ready citizen and finally to use government services.

The *first step* in the model consists of the essential e-readiness factors that developing countries should focus on within their action plans to move non e-ready citizens to be e-ready for using the technology. The *second step* is to increase citizens' awareness of the existence of e-government services through an advertising campaign and reduce their non-resistance for using e-government services by explaining the benefits of receiving services over the internet. Although the second step is important, it has to be combined with citizens' trust in technology and e-government that formed the *third step* in the CREG model. Governments could achieve citizens' trust in technology by providing them with enough security and privacy measures that protect citizens' information, and citizens' trust in e-government by providing them with credible services that achieve citizens' satisfaction.

Following the steps provided in the final CREG model would help to have citizens who are ready for using e-government services in developing countries.

7.4 Implications for improving the success levels of e-government projects

Governments, in developing countries, have the opportunity to benefit from e-government projects to enhance service delivery to citizens. However, applying e-government projects

should be combined with certain procedures that encourage more citizens to use e-government services. The findings of the research recommend that governments in developing countries, with similar characteristics to Egypt, need to take into account the following key points.

7.4.1 To benefit from e-readiness for e-government projects success

1) E-readiness factors are essential for e-government usage

Moving non e-ready citizens to become e-ready helps to have more potential users of e-government projects. This is due to the fact that citizens having high ICT skills and facilities, on the whole, use e-government services more than other citizens.

2) No e-readiness factor could be excluded from government policies

This is due to their impact on e-government projects. However, e-readiness factors have different impacts on e-government projects. Consequently, each government should prioritise, depending on its objectives, the factors that they consider are more important and focus on them rather than attempting to cover all factors.

3) Increasing e-readiness needs to be done with width plans

Expanding e-readiness (width) plans rather than improving the current e-readiness factors (depth plans) would help to include more e-ready citizens. This should be combined with evaluating citizens' usage of the internet to identify whether the e-readiness factors affect citizens' usage in the way the government has planned for (section 6.2.1).

4) Applying e-government projects should not be postponed

E-government projects should not be postponed until the whole society becomes e-ready as in developed countries but only until a mass level of distribution of e-ready citizens is reached. This distribution should reach different categories of the society that allow e-government projects to have enough users of different services.

5) Increasing citizens' awareness of the existence of e-government services is not a sufficient factor for e-government success

Increasing citizens' awareness should be combined with citizens' willingness to use online services and trust receiving e-government services online.

7.4.2 To gain citizens' trust for e-government projects

1) The provision of enough privacy and security measures at both e-government and government levels

This would help to increase citizens' trust in e-government. However, it is important that these measures are also made visible to citizens via the e-government website and through an advertising campaign.

2) Governments need to provide credibility for e-government services

This could be achieved by having online services offering preferences regarding cost and time that are equivalent to traditional services, or even better. Furthermore, this should be applied to all e-government services equally.

7.4.3 To gain more benefits from e-readiness assessments for e-government projects

1) E-government managers need to change their views regarding e-readiness assessments

They should have a wider vision that includes e-readiness assessments at different levels of decision making within projects rather than focusing only on the design level.

2) The government should have a clear guide for managers

This concerns which e-readiness assessments need to be considered at which stage of the project and which factors should be focused on. This could be a combination of international and local assessments.

3) Reviewing e-readiness assessments needs to be done annually

This should be a core part of high level policy with a predefined plan regarding the specific areas that should be focused on. Consequently, IT managers would be able to define what needs to be improved or adjusted within their projects.

4) Relevant government departments have to improve communication on reviewing e-readiness plans

This could be done in terms of providing feedback between the e-government and e-readiness ministries on which areas need more effort than others and which e-readiness factors need to be improved.

5) A citizens' survey should be conducted annually

Conducting an annual survey would help to identify the impact of e-readiness and trust factors on citizens. Citizens' feedback provides an important evaluation on the project's success and enables an appropriate readjustment to e-government plans.

In conclusion, having appropriate e-readiness levels within a community is an essential step for citizens to use e-government services but is not sufficient unless it is combined with citizens' trust of receiving services online. Achieving citizens' trust in e-government is a complicated process and requires governments to provide protection for citizens' information and to convince citizens of e-government credibility by providing services that have at least as good, or better, conditions than the traditional ways. By announcing these procedures to citizens, governments would be able to overcome the problem of invisibility and minimise the risk of requesting government services online.

7.5 Contribution

The work carried out and presented in this thesis makes a contribution to the e-government field by introducing a formalised concept of citizens' readiness for e-government (CREG) which includes e-readiness, trust and other factors that contribute to citizens' usage of e-government in developing countries (summarised in Table 5-1). The CREG factors were identified by considering e-readiness assessments, literature review and survey data. Table 5-1 in combining these sources of secondary and primary data is considered as a significant contribution to the field. It adds to the body of knowledge not only in the synthesis of factors from assessments and literature but also by introducing three new factors discovered and tested in this research. These new factors are: awareness, non-resistance and perception.

The CREG model that has been derived from this research contributes to the information systems field by providing a model that bridges the gap between the impact of e-readiness factors and trust factors on citizens' usage of e-government services in developing countries. Closing the gap between e-readiness and trust factors widens the scope of e-readiness assessments to include other trust factors that are related to *e-government trust* rather than technology trust only. A secondary contribution from this model is in providing a foundation for other researchers to build on by considering both trust and e-readiness together when investigating e-government projects in developing countries.

The research also provides a contribution to the debate of the impact of e-readiness assessments on e-government projects by building on existing work and presenting summaries, analyses and key factors in accessible formats as outlined below:

1. A comprehensive summary of available e-readiness assessments that describes content and methodological approach (section 2.4.1): **Table 2-2**.
2. An analysis of the e-readiness assessments with regard to CREG factors: **Appendices D-1 and D-2**.
3. Factors for inclusion in all e-readiness assessments conducted in developing countries which could have a massive impact on citizens' usage of e-government services (the CREG factors): **Table 6-6**.
4. The implications of the research given as key points for consideration in e-government projects: **Section 7.4**.

Finally, the research approach serves as a template for e-government research conducted in other developing countries with similar conditions to Egypt. Bringing together stakeholders' opinions from top-down (managers) and bottom-up (citizens) allows the researcher to obtain a complete picture of the factors relevant to project designers and users of e-government programmes and to compare the different positions. The approach taken in this research provides the general and detailed guidelines of how to benefit from e-readiness assessments for e-government success and how to increase citizens' trust in e-government. The design for surveys and interviews can also be used in future e-government research conducted for other developing countries, either as they stand or as a basis for development.

7.6 Future work

This research is an exploratory research which focused on identifying the impact of citizens' readiness for e-government factors in developing countries. The findings have proven the importance of certain e-readiness and trust factors on e-government usage.

The work presented here has been limited to three e-government services and to central government projects only. Future work investigating the significant factors on a large scale to include more selected e-government services would further add to the understanding of e-government projects in developing countries. Similar research

covering local e-government projects at local council level would also be valuable in extending the scope of citizens' use.

Furthermore, as the improvement of e-readiness and trust factors helps to increase usage of e-government services, there will be a need to understand their impact on society from the social, economic and governance perspectives.

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APPENDIX A APPROVAL LETTERS



His Excellency Dr Ahmed Darwish
Minister of Administration Development

12 May 2005

Dear Dr Darwish

Hany Ahmed Abdelghaffar Ismail, a second-year PhD student in the School of Computing Science at Middlesex University, London, is investigating e-government projects in both Egypt and the United Kingdom. His research focuses on comparable e-government initiatives (government to citizen) that are in operation in the two countries. It is planned that the outcome of the research will include recommendations for successful future e-government projects.


A key part of his research is to study e-readiness as an important factor in such projects. It would be immensely helpful for him to have the opportunity to talk informally to appropriate people within the e-government domain in Egypt, so as to understand how e-readiness issues are identified and dealt with in setting up and running this type of project.

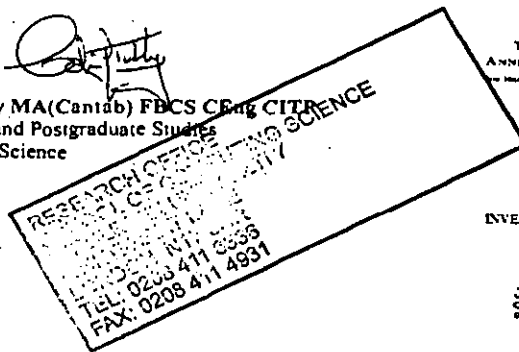
May I seek your permission for him to conduct three case studies within the e-government domain, and to collect data that would contribute to his research? The initial research period in Egypt is scheduled between 21 May and the end of September this year. The research plan is to follow through the case studies during the PhD period, covering three years, and it is therefore requested that your permission extend throughout that period.

His supervisors, who support this request and can provide references or further information if required, are (in addition to myself) Dr Penny Duquenoy (p.duquenoy@mdx.ac.uk) and Walaa-Eldeen Mohamed Bakry (w.bakry@mdx.ac.uk).

May I express my appreciation and gratitude in anticipation of your cooperation.

Yours


Professor Colin Tully MA(Cantab) FBCS CEng CITR
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Ministry of state for
Administrative Development
Senior Advisor's office

September 1st 2005

Dear Prof. Colin Tully

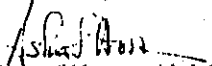
Director of Research and Postgraduate Studies

Regarding your letter sent on August 12th 2005, requesting our approval on helping Mr. Hany Ahmed Abdelghaffar Ismail to complete his case study on e-readiness for the e-government.

First of all it is my pleasure to inform you that our policy is to help and support researchers. Our consultants already have met with Mr. Abdelghaffar supplying him with the necessary information and statistics. Also, please note that Mr. Hany Abdelghaffar has full permission to contact the programs managers for any additional information needed for his research.

Best regards.

Yours sincerely,


Dr. Ashraf Hassan Abdelwahab
Senior Advisor to the Minister

APPENDIX B QUESTIONNAIRES AND QUESTIONS

Appendix B-1: Requesting a Reissue of Birth Certificate and Renewing of Vehicle Licence Questionnaires

This study identifies the impact of electronic readiness within the society on using government services over the internet (e-government). This questionnaire is only for citizens who reissued birth certificates since 2003. Also, it is only for citizens who renewed vehicle licences or paid car fines since 2004 in Giza or 2005 in Cairo.

1- Did you hear about requesting a reissue of birth certificate, renewing a vehicle licence or paying a car fine over the internet?

- Yes No (Move to question 3)

2- How did you hear about them?

- News papers TV Radio Government offices Other, please specify _____

3- Did you request a reissue of birth certificate for yourself, your children or your relatives since 2003?

- Yes No (Move to question 5)

4-How did you request it? (Please select all that apply)

- From Civil Status Organisation (central office) From Civil Status Organisation (local office) From the e-government website over the internet

5- Do you own a private car?	<input type="radio"/> Yes Which traffic unit is your car registered in? _____	<input type="radio"/> No (Move to question 7)	
6- How did you renew your vehicle licence since 2004 (in Giza traffic) or 2005 (in Cairo traffic)? (Please select all that apply)	<input type="checkbox"/> From the local traffic unit	<input type="checkbox"/> From the e-government website over the internet	<input type="checkbox"/> Other, please specify _____
- And how did you pay your vehicle fines? (Please select all that apply)	<input type="checkbox"/> From the local traffic unit	<input type="checkbox"/> From the e-government website over the internet	<input type="checkbox"/> Other, please specify _____

7- Are you willing to request a reissue of birth certificate, renew a vehicle licence or pay a car fine over the internet?

<input type="radio"/> Yes Why? (Please select all that apply) <input type="checkbox"/> I trust receiving services over the internet. <input type="checkbox"/> Services received over the internet are improved. <input type="checkbox"/> Services received over the internet are cheaper than the traditional way. <input type="checkbox"/> Services received over the internet take less time than the traditional way. <input type="checkbox"/> Other, please specify _____	<input type="radio"/> No Why? (Please select all that apply) <input type="checkbox"/> I do not trust receiving services over the internet. <input type="checkbox"/> I get used to the traditional way of receiving services. <input type="checkbox"/> Services received by the traditional way are cheaper than services received over the internet. <input type="checkbox"/> Services received by the traditional way take less time than services received over the internet. <input type="checkbox"/> Other, please specify _____
--	---

8-Do you believe in the existence of these features in case of requesting a reissue of birth certificate, renewing a vehicle licence or paying a car fine over the internet?

	Totally disagree	Disagree	Fair	Agree	Totally agree
Information protection commitment	<input type="radio"/> 01	<input type="radio"/> 02	<input type="radio"/> 03	<input type="radio"/> 04	<input type="radio"/> 05
Security	<input type="radio"/> 01	<input type="radio"/> 02	<input type="radio"/> 03	<input type="radio"/> 04	<input type="radio"/> 05
Privacy	<input type="radio"/> 01	<input type="radio"/> 02	<input type="radio"/> 03	<input type="radio"/> 04	<input type="radio"/> 05
Credibility of the service	<input type="radio"/> 01	<input type="radio"/> 02	<input type="radio"/> 03	<input type="radio"/> 04	<input type="radio"/> 05
Customer satisfaction	<input type="radio"/> 01	<input type="radio"/> 02	<input type="radio"/> 03	<input type="radio"/> 04	<input type="radio"/> 05
Response on time	<input type="radio"/> 01	<input type="radio"/> 02	<input type="radio"/> 03	<input type="radio"/> 04	<input type="radio"/> 05

9- Do you have a telephone line at home? Yes No

10- Do you have a computer at home? Yes No

11- Do you have a computer and internet at work? Yes No

12- Do you know bow to use the computer? Excellent Good I don't know how to use it (Move to question 20)

13- Do you know how to use the internet? Excellent Good I don't know how to use it (Move to question 19)

14-Where did you learn how to use the computer and the internet? School Private computer centres Other, please specify _____

15- Do you think that internet speed is reasoable? Yes No

16- Do you think that internet prices are affordable? Yes No

17- Do you use the internet regularly? (one time or more per week) Yes No

18- Do you use the internet at public places? (such as internet cafes, IT clubs ...) Regularly (one time or more per week) Sometimes No

19- What kind of applications do you use computers for? (Please select all that apply)
 Basic computer applications (e.g. word, excel, ...) Internet Random search Catalogue looking for products Receiving services over the internet Other, please specify__ E-mail Programming Other, please specify__

20- Do you have a credit or debit card? Yes No

Fill this part only if you requested a reissue of birth certificate, renewed a vehicle licence or paid a car fine over the internet, otherwise move to the Personal Information Section

21- Which computer did you use to request a reissue of birth certificate, renew a vehicle licence or pay a car fine over the internet?

- A computer at home
 A computer at work
 A computer at an internet café
 A computer at an IT club
 Other, please specify _____
 Modem
 ADSL

22- Which payment method did you use to pay fees for requesting a reissue of birth certificate, renewing a vehicle licence or paying a car fine over the internet?

- Credit card
 Debit card
 Cash on delivery

23- When you requested a reissue of birth certificate, renewed a vehicle licence or paid a car fine over the internet:

	Totally disagree	Disagree	Fair	Agree	Totally agree
The online service was easier than the traditional way.	<input type="radio"/> 01	<input type="radio"/> 02	<input type="radio"/> 03	<input type="radio"/> 04	<input type="radio"/> 05
There was an improvement in the service.	<input type="radio"/> 01	<input type="radio"/> 02	<input type="radio"/> 03	<input type="radio"/> 04	<input type="radio"/> 05
The online service website was easy to use.	<input type="radio"/> 01	<input type="radio"/> 02	<input type="radio"/> 03	<input type="radio"/> 04	<input type="radio"/> 05

24- What type of problems did you face when you requested a reissue of birth certificate, renewed a vehicle licence or paid a car fine over the internet? (Please select all that apply)

- Payment problems of using credit/debit cards
 Delay in internet communications
 Other, please specify _____
 No problems

Personal Information

1- Gender

- Male
 Female

2- Range of age

- Less than 18
 18 – 29
 30 – 39
 40 – 49
 50 – 59
 60+

3- Education level

- Below primary
 Primary-elementary
 Secondary
 College degree
 University degree
 Postgraduate degree

4- Employment status

- Employed
 Unemployed

5- Do you have?

- Mobile phone
 - Satellite TV
- Yes
 Yes
 No
 No

6- What is the range of the monthly income in Egyptian pounds?

- Less than 500 501-1000 1001-2000 More than 2000 Refuse to answer

Governorate _____ **City** _____ **District (Village)** _____

Notes _____

Appendix B-2: Universities and Colleges Admission Services (UCAS) Questionnaires

This study identifies the impact of electronic readiness within the society on using government services over the internet (e-government). This questionnaire is only for students who used UCAS to apply for universities this year.

1- Did you hear about applying for UCAS over the internet?

- Yes No (Move to question 5)

2- How did you hear about it?

- News papers TV Radio School From receiving the PIN Other, please specify _____

3- Did you use the UCAS over the internet to inquire about information?

- Yes No (Move to question 5)

4- What type of information did you inquire about? (Please select all that apply)

- Inquiry about high school grades
 Inquiry about guidelines for past years acceptance
 Other, please specify _____

5- How did you apply for the university?

- Using the traditional UCAS
 Using the UCAS over the internet
 Other, please specify _____

6- Are you willing to apply for UCAS over the internet?

<input type="radio"/> Yes Why? (Please select all that apply) <input type="checkbox"/> I trust applying for the UCAS over the internet. <input type="checkbox"/> The UCAS over the internet is improved. <input type="checkbox"/> I can change my choices more than one time. <input type="checkbox"/> Applying for the UCAS over the internet is cheaper than the traditional UCAS. <input type="checkbox"/> Applying for the UCAS over the internet takes less time than the traditional UCAS. <input type="checkbox"/> Other, please specify _____	<input type="radio"/> No Why? (Please select all that apply) <input type="checkbox"/> I do not trust applying for the UCAS over the internet. <input type="checkbox"/> I get used to the traditional UCAS. <input type="checkbox"/> Nothing to prove that I applied over the internet. <input type="checkbox"/> I have to submit my file to the university by myself. <input type="checkbox"/> Applying for the traditional UCAS is cheaper than the UCAS over the internet. <input type="checkbox"/> Applying for the traditional UCAS takes less time than the UCAS over the internet. <input type="checkbox"/> Other, please specify _____
---	--

7- Do you believe in the existence of these features in case of applying for UCAS over the internet?

	Totally disagree	Disagree	Fair	Agree	Totally agree
Information protection commitment	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Security	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Privacy	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Credibility of the service	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Customer satisfaction	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Response on time	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5

- 8- Do you have a telephone line at home? Yes No
- 9- Do you have a computer at home? Yes No
- 10- Do you have a printer at home? Yes No
- 11- Did you have a computer and internet at school? Yes No
- 12- Do you know how to use the computer? Excellent Good I don't know how to use it (Move to question 20)
- 13- Do you know how to use the internet? Excellent Good I don't know how to use it (Move to question 19)
- 14- Where did you learn how to use the computer and the internet? School Private computer centres Other, please specify _____
- 15- Do you think that internet speed is reasonable? Yes No
- 16- Do you think that internet prices are affordable? Yes No
- 17- Do you use the internet regularly? (one time or more per week) Yes No
- 18- Do you use the internet at public places? (such as internet cafes, IT clubs ...) Regularly (one time or more per week) Sometimes No
- 19- What kind of applications do you use computers for? (Please select all that apply)
- Basic computer applications (e.g. word, excel, ...)
- Internet
- E-mail
- Programming
- Other, please specify _____
- Random search
- Catalogue looking for products
- Receiving services over the internet
- Other, please specify _____

Fill this part only if you applied for UCAS over the internet, otherwise move to the Personal Information Section

20- Which computer did you use to apply for UCAS over the internet?

- A computer at home
- A computer at relatives' work
- A computer at an internet café
- A computer at an IT club
- Other, please specify _____
- Modem
- ADSL

21- When you applied for UCAS over the internet:

	Totally disagree	Disagree	Fair	Agree	Totally agree
It helped you to join the selected faculty.	<input type="radio"/> 01	<input type="radio"/> 02	<input type="radio"/> 03	<input type="radio"/> 04	<input type="radio"/> 05
It helped you in the demographic distribution.	<input type="radio"/> 01	<input type="radio"/> 02	<input type="radio"/> 03	<input type="radio"/> 04	<input type="radio"/> 05
There was an improvement in the service.	<input type="radio"/> 01	<input type="radio"/> 02	<input type="radio"/> 03	<input type="radio"/> 04	<input type="radio"/> 05
The online UCAS website was easy to use.	<input type="radio"/> 01	<input type="radio"/> 02	<input type="radio"/> 03	<input type="radio"/> 04	<input type="radio"/> 05

22- Did you face any problems when you applied for UCAS over the internet?

- Yes No (Move to the personal information section)

23- What type of problems did you face when you applied for UCAS over the internet?

(Please select all that apply)

- Did not receive the PIN code
 Did not find the faculty I want to join listed online
 Delay in internet communications
 Other, please specify _____

Personal information

1- Gender

- Male Female

2- Range of age

- 15 – 20 21 – 25 Above 25

3- School

- Owned by the government Private

4- Language of study

- Arabic Foreign languages

5- Branch

- Scientific Arts

6- Which stage did you apply for?

- First stage Second stage Third stage Other, _____

7- Do you have?

- Mobile phone Yes No
 - Satellite TV Yes No
 - Car within the family Yes No

Governorate _____ City _____ District (Village) _____

Notes _____

Appendix B-3: Interview Questions- Policy Maker Level (MSAD)

The interview investigates the impact of electronic readiness (e-readiness) within the community and trust issues on the success of the electronic government (e-government) programme.

Existence of e-readiness

1- Do you think that the existence of the community e-readiness is a major element for the success of the e-government programme?

- Yes
 No

Please specify:

2- How far is the existence of the following e-readiness factors and their sub-factors significant for citizens' usage of e-government services? Explain why?

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
ICT infrastructure	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Human capital	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
ICT usage	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
ICT regulations	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5

2.1 ICT Infrastructure

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
1. Telephone line at home	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
2. Computer at home	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
3. Computer and internet at work	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
4. Computer and internet at schools	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
5. Public internet places (e.g. Internet café, IT clubs....)	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
6. Reasonable internet speed	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
7. Affordable internet prices	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5

2.2 Human Capital

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
1. Knowledge of using the computer	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
2. Knowledge of using the internet	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
3. Computer and internet education at schools	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
4. Knowing English language	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5

2.3 ICT Usage

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
1. Using the internet regularly	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5

2.4 ICT Regulations

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
1. Telecommunication regulations	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
2. E-signature law	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5

3- With the lack of e-readiness between citizens, do you think the e-government programme could achieve its target?

- Totally disagree
- Disagree
- Fair
- Agree
- Totally agree

Please specify:

4- How far was Egypt e-ready when the e-government programme initiated in 2001?

	E-ready	Partially e-ready	Not e-ready
ICT infrastructure	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3
Human capital	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3
ICT usage	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3
ICT regulations	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3

Please specify:

Project evaluation

5- Do you evaluate the e-government project?

- Yes
- No

6- At which stage do you evaluate the e-government project? (Please select all that apply)

- Quarterly
- Every 6 months
- Yearly
- More than one year
- Other, please specify _____

Please Specify:

7- Which criteria do you use to evaluate the success or failure of the e-government project? (Please select all that apply)

- Comparing the project objectives with the results
- The project is heavily used by end-users
- The project meets stakeholders' expectations
- Other, please specify _____

Please Specify:

8- What type of problems did you face through the implementation of the e-government project? (Please select all that apply)

- Technical problems
- Human resources problems
- Political support problems
- Financial problems
- Other, please specify _____

Please specify:

E-readiness assessments

9-Did you take into consideration e-readiness assessments conducted on Egypt at the design of the e-government project?

- Yes
- No

- If Yes, please specify which e-readiness assessment did you consider and how it affected the e-government project?

- If No, why did not you consider it? (Please select all that apply)

- Not aware of it
- Not important for the e-government project
- Unable to link it to the e-government project
- Other, please specify _____

Please specify:

10- Do you consider annual e-readiness assessments conducted on Egypt within the e-government project?

- Yes
- No

- If Yes, please specify which e-readiness assessment did you consider and how it affects the e-government project?

- If No, why did not you consider it? (Please select all that apply)

- Not aware of it
- Not important for the e-government project
- Unable to link it to the e-government project
- Other, please specify _____

Please specify:

E-government, e-readiness and the community

11- How far is the community e-readiness significant for the e-government project?

- Low significance
- Medium-low significance
- Medium significance
- Medium-high significance
- High significance

Please Specify:

12- How far are the annual changes of the community e-readiness significant for the e-government project?

- Low significance
- Medium-low significance
- Medium significance
- Medium-high significance
- High significance

Please specify:

13- Are there communications between the e-readiness and the e-government managers?

Yes

No

Please specify:

14- Do you think if the Egyptian community was e-ready, the problems related to citizens' usage of e-government services could be avoided?

Totally disagree

Disagree

Fair

Agree

Totally agree

Please specify:

15- In your opinion, is it preferable for the government to wait until the community becomes e-ready to a certain level before implementing the e-government programme?

Yes

No

Please specify:

16- By looking for the e-readiness rank, Egypt is still far away from being e-ready. What are the most important factors that should be changed to become an e-ready society for the e-government programme?

Please Specify:

17- At which stage, do you think, the community will be e-ready to apply the e-government programme successfully?

Please Specify:

Trust and other issues

18-Do you publicise for the e-government project to be known for citizens?

Yes

No

Please specify:

19 - What are the most significant ways in which you make individuals or groups aware of your services? (Please select all that apply)

- Newspapers
- Magazines
- Utility bills
- Letters
- Television
- Radio
- Direct mail
- E-mail
- Other (specify) _____

20- How far is the existence of the following factors significant for citizens' usage of e-government services? Explain why?

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
Awareness	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Resistance to change	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Trust in e-government projects	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5

21- How far is the existence of the following trust factors significant for citizens' usage of e-government services? Explain why?

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
Information protection commitment	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Security policy	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Privacy policy	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Credibility of the service	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Customer satisfaction	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Response on time	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5

22- Do you think that the Egyptian community prefers to receive paper based service rather than web based service?

- Yes
- No

Please specify:

**Appendix B-4: Follow up Interview Questions Policy Maker Level
(MSAD)**

This is a following up interview to investigate the impact of electronic readiness (e-readiness) changes within the community and trust issues from 2005 to 2006 on the success of the electronic government (e-government) programme.

E-readiness changes

1- According to the recent UN Global E-government Readiness Report, Egypt has been ranked 99 rather than rank 136. How far is the improvement significant for the e-government project?

- Low significance
- Medium-low significance
- Medium significance
- Medium-high significance
- High significance

Please specify:

2- How far is the improvement from 2005 to 2006 in each of the following e-readiness factors and their sub-factors significant for citizens' usage of e-government services? Explain why?

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
ICT infrastructure	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Human capital	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
ICT usage	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
ICT regulations	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5

2.1 ICT Infrastructure

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
1. Telephone line at home	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
2. Computer at home	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
3. Computer and internet at work	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
4. Computer and internet at schools	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
5. Public internet places (e.g. Internet café, IT clubs....)	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
6. Reasonable internet speed	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
7. Affordable internet prices	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
2.2 Human Capital					
1. Knowledge of using the computer	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
2. Knowledge of using the internet	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
3. Computer and internet education at schools	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
2.3 ICT Usage					
1. Using the internet regularly	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
2.4 ICT Regulations					
1. Telecommunication regulations	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
2. E-signature law	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5

E-readiness assessments

3- In 2006, did you consider annual e-readiness assessments conducted on Egypt within the e-government project?

- Yes
 No

- If Yes, please specify which e-readiness assessment did you consider? (Please select all that apply)

- An international e-readiness assessment
 A local e-readiness assessment
 A local evaluation report
 Other, please specify _____

Please specify:

- If No, why did not you consider it? (Please select all that apply)

- Not aware of it
 Not important for the e-government project
 Unable to link it to the e-government project
 Other, please specify _____

Please specify:

4- In 2006, what is the impact of annual e-readiness assessments conducted on Egypt on the plans of the e-government project?

- Low significance
- Medium-low significance
- Medium significance
- Medium-high significance
- High significance

Please specify:

5- In 2006, what is the impact of annual e-readiness assessments conducted on Egypt on the implementation of the e-government project?

- Low significance
- Medium-low significance
- Medium significance
- Medium-high significance
- High significance

Please specify:

6- In 2006, what is the impact of annual e-readiness assessments conducted on Egypt on the follow up of the e-government project?

- Low significance
- Medium-low significance
- Medium significance
- Medium-high significance
- High significance

Please specify:

7- In 2006, do you request from the Ministry of Communications and Information Technology (MCIT) any changes of e-readiness plans that could positively affect the e-government project?

- Yes
- No

Please specify:

8- What type of problems are you still facing through the implementation of the e-government project in 2006? (Please select all that apply)

- Technical problems
- Human resources problems
- Political support problems
- Financial problems
- Other, please specify _____

Please specify:

Trust changes

9- How far are the changes from 2005 to 2006 in the following trust factors significant for citizens' usage of e-government services? Explain why?

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
Information protection commitment	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Security policy	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Privacy policy	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Credibility of the service	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Customer satisfaction	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Response on time	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5

Please specify:

Appendix B-5: Interview Questions- Policy Maker Level (MCIT)

The interview investigates the impact of electronic readiness (e-readiness) within the community and trust issues on the success of the electronic government (e-government) programme.

Existence of e-readiness

1- Do you think that the existence of the community e-readiness is a major element for the success of the e-government programme?

- Yes
 No

Please specify:

2- How far is the existence of the following e-readiness factors and their sub-factors significant for citizens' usage of e-government services? Explain why?

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
ICT infrastructure	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Human capital	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
ICT usage	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
ICT regulations	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5

2.1 ICT Infrastructure

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
1. Telephone line at home	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
2. Computer at home	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
3. Computer and internet at work	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
4. Computer and internet at schools	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
5. Public internet places (e.g. Internet café, IT clubs....)	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
6. Reasonable internet speed	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
7. Affordable internet prices	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5

2.2 Human Capital

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
1. Knowledge of using the computer	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
2. Knowledge of using the internet	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
3. Computer and internet education at schools	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
4. Knowing English language	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5

2.3 ICT Usage

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
1. Using the internet regularly	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5

2.4 ICT Regulations

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
1. Telecommunication regulations	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
2. E-signature law	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5

3- With the lack of e-readiness between citizens, do you think the e-government programme could achieve its target?

- Totally disagree
- Disagree
- Fair
- Agree
- Totally agree

Please specify:

4- How far was Egypt e-ready when the e-government programme initiated in 2001?

	E-ready	Partially e-ready	Not e-ready
ICT infrastructure	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3
Human capital	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3
ICT usage	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3
ICT regulations	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3

Please specify:

Project evaluation

5- Which method do you use to measure the impact of the e-readiness project on the community? (Please select all that apply)

- Using an international e-readiness assessment
- Using a local e-readiness assessment
- A local evaluation report
- Other, please specify _____

Please specify:

6- When do you measure the impact of the e-readiness project on the community? (Please select all that apply)

- Quarterly
- Every 6 months
- Yearly
- More than one year
- Other, please specify _____

Please specify:

E-readiness assessments

7-Did you take into consideration e-readiness assessments conducted on Egypt at the design of the e-readiness project?

- Yes
- No

- If Yes, please specify which e-readiness assessment did you consider and how it affected the e-readiness project?

- If No, why did not you consider it? (Please select all that apply)

- Not aware of it
- Not important for the e-readiness project
- Unable to link it to the e-readiness project
- Other, please specify _____

Please specify:

8- Do you consider annual e-readiness assessments conducted on Egypt within the e-readiness project?

- Yes
- No

- If Yes, please specify which e-readiness assessment did you consider and how it affects the e-readiness project?

- If No, why did not you consider it? (Please select all that apply)

- Not aware of it
- Not important for the e-readiness project
- Unable to link it to the e-readiness project
- Other, please specify _____

Please specify:

E-readiness and the community

9- How far is the community e-readiness significant for the e-readiness project?

- Low significance
- Medium-low significance
- Medium significance
- Medium-high significance
- High significance

Please specify:

10- How far are the annual changes of the community e-readiness significant for the e-readiness project?

- Low significance
- Medium-low significance
- Medium significance
- Medium-high significance
- High significance

Please specify:

11- What is the impact of the e-readiness project on the e-readiness of the Egyptian community?

- Low significance
- Medium-low significance
- Medium significance
- Medium-high significance
- High significance

Please specify:

E-government, e-readiness and the community

12- How far is the community e-readiness significant for the e-government programme?

- Low significance
- Medium-low significance
- Medium significance
- Medium-high significance
- High significance

Please specify:

13- How far are the annual changes of the community e-readiness significant for the e-government programme?

- Low significance
- Medium-low significance
- Medium significance
- Medium-high significance
- High significance

Please specify:

14- Do you think that annual e-readiness assessments conducted on Egypt are important for the e-government programme success?

- Yes
- No

Please specify:

15- Do you think if the Egyptian community was e-ready, the problems related to citizens' usage of e-government services could be avoided?

- Totally disagree
- Disagree
- Fair
- Agree
- Totally agree

Please specify:

16- In your opinion, is it preferable for the government to wait until the community becomes e-ready to a certain level before implementing the e-government programme?

- Yes
- No

Please specify:

17- By looking for the e-readiness rank, Egypt is still far away from being e-ready. What are the most important factors that should be changed to become an e-ready society for the e-government programme?

Please Specify:

18- At which stage, do you think, the community will be e-ready to apply the e-government programme successfully?

Please Specify:

19- Are there communications between the e-readiness and the e-government managers?

Yes

No

Please specify:

20- Do you think that government managers were aware of e-readiness assessment conducted on Egypt before designing their projects?

Yes

No

Please specify:

Trust and other issues

21- How far is the existence of the following factors significant for citizens' usage of e-government services? Explain why?

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
Awareness	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Resistance to change	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Trust in e-government projects	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5

22- How far is the existence of the following trust factors significant for citizens' usage of e-government services? Explain why?

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
Information protection commitment	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Security policy	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Privacy policy	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Credibility of the service	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Customer satisfaction	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5
Response on time	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3	<input type="radio"/> 4	<input type="radio"/> 5

23 - Do you think that the Egyptian community prefers to receive paper based service rather than web based service?

- Yes
- No

Please specify:

Appendix B-6: Project Level Questions
(Reissue of Birth Certificate/ Renewal of Vehicle Licence/ UCAS Projects)

Project Director

Project objectives and design

1. When was the online project designed and implemented?
2. Why was the online project introduced at this stage of the e-government programme?
3. What are the objectives of the online project?
4. What is the classification of citizens targeted by the online project?
5. At which phase is the online project now?

6. Who was involved in designing the online project?
7. Who is responsible for the implementation and operation of the online project?
8. How the process for the service provided online differs from the traditional way?
9. Do you plan to have the service provided online completely for all citizens?

10. How is the online project funded?
11. Do citizens have to pay fees?
12. What is the payment method used for requesting the online service?

Project evaluation

13. At which stage do you evaluate the online project?
14. Which criteria do you use to evaluate the success or failure of the online project?
15. What type of problems did you face during the implementation and operation?

E-readiness assessments

16. Did you consider e-readiness assessments conducted on Egypt at the design of the online project?
17. Did the online project design change as a result of the e-readiness assessments findings?
18. Do you follow annual e-readiness assessments conducted on Egypt?
19. How annual e-readiness assessments affect the online project plans, implementation and following up?

Community e-readiness

20. How the community e-readiness affects the online project?
21. How the annual changes of the community e-readiness affect the online project?
22. How the lack of e-readiness factors including (ICT infrastructure, ICT usage, human capital and ICT regulations) affects the online project progress?
23. How the previous e-readiness factors affect the usage of the online service?
24. Do you request changes in the community e-readiness from MCIT?
25. Do you think it is better to wait until the community becomes e-ready before implementing the online project?

Citizens' awareness

26. Do you publicise for the online project?
27. Does an advertising budget exist for raising public awareness of the service?
28. What are the most significant ways for advertising the online project?
29. How citizens' awareness of e-government affects the usage of online service?

Trust issues

30. Do you think that citizens trust receiving services from the e-government website?
31. What the government did to increase citizens' trust in e-government?
32. How far are the following factors existing within the online project:
Information protection commitment, security policy, privacy policy, credibility of the service, customer satisfaction and response on time?
33. How the previous factors affect the usage of the online service?
34. What is the security and privacy policy of the online service?
35. Do you think that citizens resist using the online service?
36. How can the government change citizens' resistance for the online project?

Project Manager

The online service process

1. What is the cycle of the online service?
2. Which delivery channels are used to provide the service?
3. How e-payment methods affect citizens' usage of the online service?
4. What is the most common method used for the payment?

Project operation

5. What is the online system infrastructure?
6. Who is responsible for operating the online project?
7. How many employees are operating the online project?
8. Do you need to process information from or to other government organisations?
9. How do you communicate with other government organisations?
10. What types of problems are facing the operation of the online project?

11. At which government organisation is the database located?
12. What type of information citizens need to enter for requesting the online service?
13. For how long is citizens' information kept?
14. Who has the authority to access the database?
15. Who has the authority to view citizens' information?
16. What are the security measures for securing the database?
17. What type of measures is taken to ensure citizens' information privacy?

Usage of the online service

18. What is the number of citizens applying for online and offline services every year?
19. What is the classification of citizens who used the online service?
20. What types of problems are facing citizens when they request the online service?
21. How citizens' awareness of e-government affects the usage of online service?
22. How would you encourage more citizens to use the online service?

E-readiness assessments

23. Did you consider e-readiness assessments conducted on Egypt at the design of the online project?
24. Did the online project design change as a result of the e-readiness assessments findings?
25. Do you follow annual e-readiness assessments conducted on Egypt?

26. How annual e-readiness assessments affect the online project plans, implementation and following up?

Community e-readiness

27. How the community e-readiness affects the online project?
28. How the annual changes of the community e-readiness affect the online project?
29. How the lack of e-readiness factors including (ICT infrastructure, ICT usage, human capital and ICT regulations) affects the online project progress?
30. How the previous e-readiness factors affect the usage of the online service?
31. Do you request changes in the community e-readiness from MCIT?
32. Do you think it is better to wait until the community becomes e-ready before implementing the online project?

Trust issues

33. Do you think that citizens trust receiving services from the e-government website?
34. What the government did to increase citizens' trust in e-government?
35. How far are the following factors existing within the online project:
Information protection commitment, security policy, privacy policy, credibility of the service, customer satisfaction and response on time?
36. How the previous factors affect the usage of the online service?
37. Do you think that citizens resist using the online service?
38. How can the government change citizens' resistance for the online project?

Website Manager

1. What type of hardware specification the end-user should have to use the online service?
2. What type of software the end-user should have to use the online service?
3. What type of internet settings the end-user should prepare to use the online service?
4. What are the common problems that face citizens during requesting the online service?
5. How could the online service be improved?

6. Who is responsible for operating the online website?
7. At which government organisation is the web server located?
8. Who is responsible for operating the web server?
9. What type of information is collected about citizens and how?
10. For how long is citizens' information kept?
11. Who has the authority to access the web server?
12. Who has the authority to view citizens' information?
13. What are the security measures for securing the web server?
14. What are the security measures for securing online transactions?
15. What type of measures is taken to ensure citizens' information privacy?
16. Do you have a privacy and security statement on the website?

17. What is the number of hits for the online service?
18. What is the demographic distribution of the online user?

Web designer/ developer

1. How did you design the online service website?

2. Did you take into consideration any special issues of the online service when you design the website?
3. What types of problems did you face at the design of the website?
4. When do you update the website information?
5. Did you test the usability of the website?
6. Does the website provide accessibility features for citizens?
7. How much time does the online transaction take?

Networks Manager

1. Do you need to exchange information between different government organisations?
2. How government organisations exchange citizens' information between each others?
3. What type of security measures is used for securing transactions between government organisations?

4. At which government organisation are the servers located?
5. Who is responsible for operating the servers?
6. Who has the authority to access the servers?
7. Who has the authority to view citizens' information?
8. What are the security measures for securing the servers?
9. What type of measures is taken to ensure citizens' information privacy?.

10. What is the capacity/bandwidth of the servers?
11. What do you do if the hits exceeded the available bandwidth?
12. How do you ensure that online transaction will not fail?
13. How many failed online transactions occurred?
14. How many successful transactions occurred?

APPENDIX C DATA RESULTS

Appendix C-1: Data Results from Interview Questions (MSAD)

The interview investigates the impact of electronic readiness (e-readiness) within the community and trust issues on the success of the electronic government (e-government) programme.

Existence of e-readiness

1- Do you think that the existence of the community e-readiness is a major element for the success of the e-government programme?

- Yes 11(91.7%)
- No 1(8.3%)

2- How far is the existence of the following e-readiness factors and their sub-factors significant for citizens' usage of e-government services? Explain why?

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
ICT infrastructure	0 (0%)	1 (8.3%)	0 (0%)	3 (25%)	8 (66.7%)
Human capital	0 (0%)	0 (0%)	5 (41.7%)	1 (8.3%)	6 (50%)
ICT usage	1 (8.3%)	0 (0%)	1 (8.3%)	2 (16.7%)	8 (66.7%)
ICT regulations	0 (0%)	2 (16.7%)	1 (8.3%)	5 (41.7%)	4 (33.3%)

2.1 ICT Infrastructure

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
1. Telephone line at home	1 (8.3%)	0 (0%)	1 (8.3%)	4 (33.3%)	6 (50%)
2. Computer at home	0 (0%)	0 (0%)	0 (0%)	9 (75%)	3 (25%)
3. Computer and internet at work	0 (0%)	0 (0%)	2 (16.7%)	9 (75%)	1 (8.3%)
4. Computer and internet at schools	0 (0%)	0 (0%)	0 (0%)	3 (25%)	9 (75%)
5. Public internet places (e.g. Internet café, IT clubs....)	0 (0%)	0 (0%)	4 (33.3%)	3 (25%)	5 (41.7%)
6. Reasonable internet speed	0 (0%)	0 (0%)	4 (33.3%)	6 (50%)	2 (16.7%)
7. Affordable internet prices	0 (0%)	1 (8.3%)	3 (25%)	4 (33.3%)	4 (33.3%)

2.2 Human Capital

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
1. Knowledge of using the computer	0 (0%)	0 (0%)	2 (16.7%)	5 (41.7%)	5 (41.7%)
2. Knowledge of using the internet	0 (0%)	0 (0%)	2 (16.7%)	5 (41.7%)	5 (41.7%)
3. Computer and internet education at schools	0 (0%)	0 (0%)	0 (0%)	2 (16.7%)	10 (83.3%)
4. Knowing English language	0 (0%)	3 (25%)	7 (58.3%)	1 (8.3%)	1 (8.3%)

2.3 ICT Usage

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
1. Using the internet regularly	0 (0%)	0 (0%)	2 (16.7%)	9 (75%)	1 (8.3%)

2.4 ICT Regulations

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
1. Telecommunication regulations	1 (8.3%)	1 (8.3%)	4 (33.3%)	1 (8.3%)	5 (41.7%)
2. E-signature law	0 (0%)	0 (0%)	4 (33.3%)	6 (50%)	2 (16.7%)

3- With the lack of e-readiness between citizens, do you think the e-government programme could achieve its target?

- Totally disagree 7(58.3%)
- Disagree 0(0%)
- Fair 2(16.7%)
- Agree 2(16.7%)
- Totally agree 1(8.3%)

4- How far was Egypt e-ready when the e-government programme initiated in 2001?

	E-ready	Partially e-ready	Not e-ready
ICT infrastructure	1 (8.3%)	8 (66.7%)	3 (25%)
Human capital	1 (8.3%)	6 (50%)	5 (41.7%)
ICT usage	1 (8.3%)	6 (50%)	5 (41.7%)
ICT regulations	1 (8.3%)	7 (58.3%)	4 (33.3%)

Project evaluation

5- Do you evaluate the e-government project?

- Yes 12(100%)
- No 0(0%)

6- At which stage do you evaluate the e-government project? (Please select all that apply)

Choices	Answers	
<input type="checkbox"/> Quarterly <input type="checkbox"/> Every 6 months <input type="checkbox"/> Yearly <input type="checkbox"/> More than one year <input type="checkbox"/> Other, please specify _____	Quarterly	3 (25%)
	Every 6 months	3 (25%)
	Other (monthly)	1 (8.3%)
	Quarterly + Other (weekly; monthly)	2 (16.7%)
	Quarterly + Yearly + Other (weekly; monthly)	3 (25%)

7- Which criteria do you use to evaluate the success or failure of the e-government project? (Please select all that apply)

Choices	Answers	
<input type="checkbox"/> Comparing the project objectives with the results <input type="checkbox"/> The project is heavily used by end-users <input type="checkbox"/> The project meets stakeholders' expectations. <input type="checkbox"/> Other, please specify _____	Comparing the project objectives with the results	6 (50%)
	Project is heavily used by end-users	3 (25%)
	The project meets stakeholders' expectations	1 (8.3%)
	Comparing the projects objectives with the results + Project is heavily used by end-users	1 (8.3%)
	Project is heavily used by end-users + The project meets stakeholders' expectations	1 (8.3%)

8- What type of problems did you face through the implementation of the e-government project? (Please select all that apply)

Choices	Answers	
<input type="checkbox"/> Technical problems <input type="checkbox"/> Human resources problems <input type="checkbox"/> Political support problems <input type="checkbox"/> Financial problems <input type="checkbox"/> Other, please specify _____	Human resources problems	2 (16.7%)
	Other problems	4 (33.3%)
	Technical problems + Human problems	1 (8.3%)
	Technical problems + Political problems	1 (8.3%)
	Technical problems + Financial problems	1 (8.3%)
	Financial problems + Political problems	1 (8.3%)
	Technical problems + Human problems + Other problems	1 (8.3%)
	Technical problems + Human problems + Political problems + Financial problems + Other problems	1 (8.3%)

E-readiness assessments

9- Did you take into consideration e-readiness assessments conducted on Egypt at the design of the e-government project?

Yes 7(58.3%)

No 5(41.7%)

e - If No, why did not you consider it? (Please select all that apply)

Choices	Answers	
<input type="checkbox"/> Not aware of it <input type="checkbox"/> Not important for the e-government project <input type="checkbox"/> Unable to link it to the e-government project <input type="checkbox"/> Other, please specify _____	Not aware of it	3 (60%)
	Other	2 (40%)

10- Do you consider annual e-readiness assessments conducted on Egypt within the e-government project?

Yes 6(50%)

No 6(50%)

- If No, why did not you consider it? (Please select all that apply)

Choices	Answers	
<input type="checkbox"/> Not aware of it <input type="checkbox"/> Not important for the e-government project <input type="checkbox"/> Unable to link it to the e-government project <input type="checkbox"/> Other, please specify _____	Not aware of it	3 (50%)
	Other	3 (50%)

E-government, e-readiness and the community

11- How far is the community e-readiness significant for the e-government project?

Low significance 0(0%)

Medium-low significance 0(0%)

Medium significance 3(25%)

Medium-high significance 5(41.7%)

High significance 4(33.3%)

12- How far are the annual changes of the community e-readiness significant for the e-government project?

Low significance 1(8.3%)

Medium-low significance 0(0%)

Medium significance 3(25%)

Medium-high significance 4(33.3%)

High significance 4(33.3%)

13- Are there communications between the e-readiness and the e-government managers?

Yes 7(58.3%)

No 5(41.7%)

14- Do you think if the Egyptian community was e-ready, the problems related to citizens' usage of e-government services could be avoided?

- Totally disagree 0(0%)
- Disagree 0(0%)
- Fair 2(16.7%)
- Agree 2(16.7%)
- Totally agree 8(66.7%)

15- In your opinion, is it preferable for the government to wait until the community becomes e-ready to a certain level before implementing the e-government programme?

- Yes 2(16.7%)
- No 10(83.3%)

16- By looking for the e-readiness rank, Egypt is still far away from being e-ready. What are the most important factors that should be changed to become an e-ready society for the e-government programme?

Answer: qualitative data only

17- At which stage, do you think, the community will be e-ready to apply the e-government programme successfully?

Answer: qualitative data only

Trust and other issues

18-Do you publicise for the e-government project to be known for citizens?

- Yes 3(25%)
- No 9(75%)

19 - What are the most significant ways in which you make individuals or groups aware of your services? (Please select all that apply)

Choices	Answers	
<input type="checkbox"/> Newspapers <input type="checkbox"/> Magazines <input type="checkbox"/> Utility bills <input type="checkbox"/> Letters <input type="checkbox"/> Television <input type="checkbox"/> Radio <input type="checkbox"/> Direct mail <input type="checkbox"/> E-mail <input type="checkbox"/> Other (specify)_____	TV + Radio	1 (8.3%)
	Newspapers + TV	6 (50%)
	Newspapers + TV + Radio	3 (25%)
	Newspapers + TV+ Other	1 (8.3%)
	Newspapers + Magazines + Utility bills+ Letters	1 (8.3%)

20- How far is the existence of the following factors significant for citizens' usage of e-government services? Explain why?

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
Awareness	0 (0%)	0 (0%)	1 (8.3%)	1 (8.3%)	10 (83.3%)
Resistance to change	0 (0%)	0 (0%)	2 (16.7%)	6 (50%)	4 (33.3%)
Trust in e-government projects	0 (0%)	0 (0%)	1 (8.3%)	2 (16.7%)	9 (75%)

21- How far is the existence of the following trust factors significant for citizens' usage of e-government services? Explain why?

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
Information protection commitment	0 (0%)	0 (0%)	2 (16.7%)	5 (41.7%)	5 (41.7%)
Security policy	0 (0%)	0 (0%)	1 (8.3%)	4 (33.3%)	7 (58.3%)
Privacy policy	0 (0%)	2 (16.7%)	1 (8.3%)	4 (33.3%)	5 (41.7%)
Credibility of the service	0 (0%)	0 (0%)	1 (8.3%)	0 (0%)	11 (91.7%)
Customer satisfaction	0 (0%)	0 (0%)	0 (0%)	1 (8.3%)	11 (91.7%)
Response on time	0 (0%)	0 (0%)	3 (25%)	8 (66.7%)	1 (8.3%)

22- Do you think that the Egyptian community prefers to receive paper based service rather than web based service?

- Yes 12(100%)
- No 0(0%)

Appendix C-2: Data Results- Follow up Interview Questions (MSAD)

This is a following up interview to investigate the impact of electronic readiness (e-readiness) changes within the community and trust issues from 2005 to 2006 on the success of the electronic government (e-government) programme.

E-readiness changes

1- According to the recent UN Global E-government Readiness Report, Egypt has been ranked 99 rather than rank 136. How far is the improvement significant for the e-government project?

- Low significance 0(0%)
- Medium-low significance 1(8.3%)
- Medium significance 3(25%)
- Medium-high significance 3(25%)
- High significance 5(41.7%)

2- How far is the improvement from 2005 to 2006 in each of the following e-readiness factors and their sub-factors significant for citizens' usage of e-government services? Explain why?

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
ICT infrastructure	0 (0%)	0 (0%)	3 (25%)	6 (50%)	3 (25%)
Human capital	0 (0%)	0 (0%)	3 (25%)	4 (33.3%)	5 (41.7%)
ICT usage	0 (0%)	0 (0%)	2 (16.7%)	5 (41.7%)	5 (41.7%)
ICT regulations	2 (16.7%)	0 (0%)	6 (50%)	2 (16.7%)	2 (16.7%)

2.1 ICT Infrastructure

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
1. Telephone line at home	2 (16.7%)	1 (8.3%)	3 (25%)	2 (16.7%)	4 (33.3%)
2. Computer at home	1 (8.3%)	0 (0%)	1 (8.3%)	3 (25%)	7 (58.3%)
3. Computer and internet at work	0 (0%)	0 (0%)	1 (8.3%)	8 (66.7%)	3 (25%)
4. Computer and internet at schools	0 (0%)	3 (25%)	5 (41.7%)	2 (16.7%)	2 (16.7%)
5. Public internet places (e.g. Internet café, IT clubs...)	2 (16.7%)	0 (0%)	1 (8.3%)	5 (41.7%)	4 (33.3%)
6. Reasonable internet speed	1 (8.3%)	0 (0%)	5 (41.7%)	3 (25%)	3 (25%)
7. Affordable internet prices	1 (8.3%)	1 (8.3%)	1 (8.3%)	3 (25%)	6 (50%)

2.2 Human Capital

1. Knowledge of using the computer	0 (0%)	0 (0%)	4 (33.3%)	3 (25%)	5 (41.7%)
2. Knowledge of using the internet	0 (0%)	0 (0%)	4 (33.3%)	3 (25%)	5 (41.7%)
3. Computer and internet education at schools	0 (0%)	2 (16.7%)	4 (33.3%)	3 (25%)	3 (25%)

2.3 ICT Usage

1. Using the internet regularly	0 (0%)	2 (16.7%)	3 (25%)	5 (41.7%)	2 (16.7%)
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2.4 ICT Regulations

1. Telecommunication regulations	1 (8.3%)	2 (16.7%)	4 (33.3%)	3 (25%)	2 (16.7%)
2. E-signature law	4 (33.3%)	2 (16.7%)	2 (16.7%)	1 (8.3%)	3 (25%)

E-readiness assessments

3- In 2006, did you consider annual e-readiness assessments conducted on Egypt within the e-government project?

Yes 9(75%)

No 3(25%)

- If Yes, please specify which e-readiness assessment did you consider? (Please select all that apply)

Choices	Answers	
<input type="checkbox"/> An international e-readiness assessment <input type="checkbox"/> A local e-readiness assessment <input type="checkbox"/> A local evaluation report <input type="checkbox"/> Other, please specify _____	An international e-readiness assessment	3 (33.3%)
	A local e-readiness assessment	1 (11.1%)
	Others	1 (11.1%)
	An international e-readiness assessment + A local evaluation report	2 (22.2%)
	An international e-readiness assessment+ A local e-readiness assessment + A local evaluation report	2 (22.2%)

- If No, why did not you consider it? (Please select all that apply)

Choices	Answers	
<input type="checkbox"/> Not aware of it <input type="checkbox"/> Not important for the e-government project <input type="checkbox"/> Unable to link it to the e-government project <input type="checkbox"/> Other, please specify _____	Not aware of it	2 (66.6%)
	Not important for the e-government project	1 (33.3%)

4- In 2006, what is the impact of annual e-readiness assessments conducted on Egypt on the plans of the e-government project?

- Low significance 1(8.3%)
- Medium-low significance 3(25%)
- Medium significance 2(16.7%)
- Medium-high significance 3(25%)
- High significance 3(25%)

5- In 2006, what is the impact of annual e-readiness assessments conducted on Egypt on the implementation of the e-government project?

- Low significance 0(0%)
- Medium-low significance 5(41.7%)
- Medium significance 3(25%)
- Medium-high significance 1(8.3%)
- High significance 3(25%)

6- In 2006, what is the impact of annual e-readiness assessments conducted on Egypt on the follow up of the e-government project?

- Low significance 1(8.3%)
- Medium-low significance 5(41.7%)
- Medium significance 2(16.7%)
- Medium-high significance 3(25%)
- High significance 1(8.3%)

7- In 2006, do you request from the Ministry of Communications and Information Technology (MCIT) any changes of e-readiness plans that could positively affect the e-government project?

- Yes 10(83.3%)
- No 2(16.7%)

8 What type of problems are you still facing through the implementation of the e-government project in 2006? (Please select all that apply)

Choices	Answers	
<input type="checkbox"/> Technical problems <input type="checkbox"/> Human resources problems <input type="checkbox"/> Political support problems <input type="checkbox"/> Financial problems <input type="checkbox"/> Other, please specify _____	Other problems	1 (8.3%)
	Human resources problems + Political problems	1 (8.3%)
	Human resources problems + Financial problems	2 (16.7%)
	Human resources problems + Technical problems	2 (16.7%)
	Human resources problems + Other	3 (25%)
	Political problems + Financial problems	1 (8.3%)
	Human resources problems + Technical problems + Financial problems	1 (8.3%)
	Human resources problems + Political problems + Financial problems	1 (8.3%)

Trust changes

9- How far are the changes from 2005 to 2006 in the following trust factors significant for citizens' usage of e-government services? Explain why?

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
Information protection commitment	0 (0%)	0 (0%)	4 (33.3%)	2 (16.7%)	6 (50%)
Security policy	0 (0%)	0 (0%)	5 (41.7%)	1 (8.3%)	6 (50%)
Privacy policy	0 (0%)	0 (0%)	5 (41.7%)	0 (0%)	7 (58.3%)
Credibility of the service	0 (0%)	1 (8.3%)	2 (16.7%)	1 (8.3%)	8 (66.7%)
Customer satisfaction	0 (0%)	2 (16.7%)	1 (8.3%)	2 (16.7%)	7 (58.3%)
Response on time	0 (0%)	0 (0%)	4 (33.3%)	0 (0%)	8 (66.7%)

Appendix C-3: Data Results Interview Questions (MCIT)

The interview investigates the impact of electronic readiness (e-readiness) within the community and trust issues on the success of the electronic government (e-government) programme.

Existence of e-readiness

1- Do you think that the existence of the community e-readiness is a major element for the success of the e-government programme?

Yes 11(100%)

No 0(0%)

2- How far is the existence of the following e-readiness factors and their sub-factors significant for citizens' usage of e-government services? Explain why?

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
ICT infrastructure	0 (0%)	0 (0%)	1 (9.1%)	3 (27.3%)	7 (63.6%)
Human capital	0 (0%)	0 (0%)	5 (45.5%)	1 (9.1%)	5 (45.5%)
ICT usage	0 (0%)	0 (0%)	2 (18.2%)	3 (27.3%)	6 (54.5%)
ICT regulations	0 (0%)	1 (9.1%)	1 (9.1%)	6 (54.5%)	3 (27.3%)

2.1 ICT Infrastructure

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
1. Telephone line at home	0 (0%)	0 (0%)	3 (27.3%)	1 (9.1%)	7 (63.6%)
2. Computer at home	0 (0%)	0 (0%)	3 (27.3%)	4 (36.4%)	4 (36.4%)
3. Computer and internet at work	0 (0%)	0 (0%)	2 (18.2%)	7 (63.6%)	2 (18.2%)
4. Computer and internet at schools	0 (0%)	0 (0%)	0 (0%)	3 (27.3%)	8 (72.7%)
5. Public internet places (e.g. Internet café, IT clubs....)	0 (0%)	0 (0%)	3 (27.3%)	0 (0%)	8 (72.7%)
6. Reasonable internet speed	0 (0%)	1 (9.1%)	2 (18.2%)	7 (63.6%)	1 (9.1%)
7. Affordable internet prices	0 (0%)	0 (0%)	2 (18.2%)	2 (18.2%)	7 (63.6%)

2.2 Human Capital

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
1. Knowledge of using the computer	0 (0%)	0 (0%)	2 (18.2%)	4 (36.4%)	5 (45.5%)
2. Knowledge of using the internet	0 (0%)	0 (0%)	2 (18.2%)	4 (36.4%)	5 (45.5%)

3. Computer and internet education at schools	0 (0%)	0 (0%)	0 (0%)	4 (36.4%)	7 (63.6%)
4. Knowing English language	2 (18.2%)	3 (27.3%)	6 (54.5%)	0 (0%)	0 (0%)

2.3 ICT Usage

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
1. Using the internet regularly	0 (0%)	0 (0%)	0 (0%)	8 (72.7%)	3 (27.3%)

2.4 ICT Regulations

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
1. Telecommunication regulations	0 (0%)	1 (9.1%)	6 (54.5%)	0 (0%)	4 (36.4%)
2. E-signature law	0 (0%)	0 (0%)	3 (27.3%)	6 (54.5%)	2 (18.2%)

3- With the lack of e-readiness between citizens, do you think e-government programme could achieve its target?

- Totally disagree 7(63.6%)
- Disagree 2(18.2%)
- Fair 0(0%)
- Agree 0(0%)
- Totally agree 2(18.2%)

4- How far was Egypt e-ready when the e-government programme initiated in 2001?

	E-ready	Partially e-ready	Not e-ready
ICT infrastructure	0 (0%)	7 (63.6%)	4 (36.4%)
Human capital	0 (0%)	6 (54.5%)	5 (45.5%)
ICT usage	0 (0%)	5 (45.5%)	6 (54.5%)
ICT regulations	0 (0%)	4 (36.4%)	7 (63.6%)

Project evaluation

5- Which method do you use to measure the impact of the e-readiness project on the community? (Please select all that apply)

Choices	Answers	
<input type="checkbox"/> Using an international e-readiness assessment	Using an international e-readiness assessment	3 (27.3%)
<input type="checkbox"/> Using a local e-readiness assessment	Using a local e-readiness assessment	5 (45.5%)
<input type="checkbox"/> A local evaluation report	A local evaluation report	3 (27.3%)
<input type="checkbox"/> Other, please specify _____		

6- When do you measure the impact of the e-readiness project on the community? (Please select all that apply)

Choices	Answers	
<input type="checkbox"/> Quarterly <input type="checkbox"/> Every 6 months <input type="checkbox"/> Yearly <input type="checkbox"/> More than one year <input type="checkbox"/> Other, please specify _____	Quarterly	2 (18.2%)
	Yearly	3 (27.3%)
	Other	3 (27.3%)
	Quarterly + Yearly	2 (18.2%)
	Quarterly + Other	1 (9.1%)

E-readiness assessments

7- Did you take into consideration e-readiness assessments conducted on Egypt at the design of the e-readiness project?

- Yes 6(54.5%)
- No 5(45.5%)

- If No, why did not you consider it? (Please select all that apply)

Choices	Answers	
<input type="checkbox"/> Not aware of it <input type="checkbox"/> Not important for the e-readiness project <input type="checkbox"/> Unable to link it to the e-readiness project <input type="checkbox"/> Other, please specify _____	Not aware of it	2 (40%)
	Not important for the e-readiness project	3 (60%)

8- Do you consider annual e-readiness assessments conducted on Egypt within the e-readiness project?

- Yes 5(45.5%)
- No 6(54.5%)

- If No, why did not you consider it? (Please select all that apply)

Choices	Answers	
<input type="checkbox"/> Not aware of it <input type="checkbox"/> Not important for the e-readiness project <input type="checkbox"/> Unable to link it to the e-readiness project <input type="checkbox"/> Other, please specify _____	Not aware of it	2 (33.3%)
	Not important for the e-readiness project	4 (66.6%)

E-readiness and the community

9- How far is the community e-readiness significant for the e-readiness project?

- Low significance 0(0%)
- Medium-low significance 0(0%)
- Medium significance 3(27.3%)
- Medium-high significance 5(45.5%)
- High significance 3(27.3%)

10- How far are the annual changes of the community e-readiness significant for the e-readiness project?

- Low significance 0(0%)
- Medium-low significance 1(9.1%)
- Medium significance 0(0%)
- Medium-high significance 3(27.3%)
- High significance 7(63.6%)

11- What is the impact of the e-readiness project on the e-readiness of the Egyptian community?

- Low significance 0(0%)
- Medium-low significance 0(0%)
- Medium significance 0(0%)
- Medium-high significance 6(54.5%)
- High significance 5(45.5%)

E-government, e-readiness and the community

12- How far is the community e-readiness significant for the e-government programme?

- Low significance 0(0%)
- Medium-low significance 0(0%)
- Medium significance 0(0%)
- Medium-high significance 2(18.2%)
- High significance 9(81.8%)

13- How far are the annual changes of the community e-readiness significant for the e-government programme?

- Low significance 0(0%)
- Medium-low significance 0(0%)
- Medium significance 3(27.3%)
- Medium-high significance 6(54.5%)
- High significance 2(18.2%)

14- Do you think that annual e-readiness assessments conducted on Egypt are important for the e-government programme success?

- Yes 11(100%)
- No 0(0%)

15- Do you think if the Egyptian community was e-ready, the problems related to citizens' usage of e-government services could be avoided?

- Totally disagree 1(9.1%)
- Disagree 0(0%)
- Fair 1(9.1%)
- Agree 1(9.1%)
- Totally agree 8(72.7%)

16- In your opinion, is it preferable for the government to wait until the community becomes e-ready to a certain level before implementing the e-government programme?

- Yes 0(0%)
- No 11(100%)

17- By looking for the e-readiness rank, Egypt is still far away from being e-ready. What are the most important factors that should be changed to become an e-ready society for the e-government programme?

Answer: qualitative data only

18- At which stage, do you think, the community will be e-ready to apply the e-government programme successfully?

Answer: qualitative data only

19- Are there communications between the e-readiness and the e-government managers?

Yes 5(45.5%)

No 6(54.5%)

20- Do you think that government managers were aware of e-readiness assessment conducted on Egypt before designing their projects?

Yes 3(27.3%)

No 8(72.7%)

Trust and other issues

21- How far is the existence of the following factors significant for citizens' usage of e-government services? Explain why?

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
Awareness	0 (0%)	0 (0%)	1 (9.1%)	0 (0%)	10 (90.9%)
Resistance to change	0 (0%)	1 (9.1%)	1 (9.1%)	7 (63.6%)	2 (18.2%)
Trust in e-government projects	0 (0%)	0 (0%)	1 (9.1%)	1 (9.1%)	9 (81.8%)

22- How far is the existence of the following trust factors significant for citizens' usage of e-government services? Explain why?

	Low significance	Medium-low significance	Medium significance	Medium-high significance	High significance
Information protection commitment	0 (0%)	0 (0%)	1 (9.1%)	2 (18.2%)	8 (72.7%)
Security policy	0 (0%)	0 (0%)	1 (9.1%)	4 (36.4%)	6 (54.5%)
Privacy policy	0 (0%)	3 (27.3%)	4 (36.4%)	0 (0%)	4 (36.4%)
Credibility of the service	0 (0%)	0 (0%)	0 (0%)	1 (9.1%)	10 (90.9%)
Customer satisfaction	0 (0%)	0 (0%)	0 (0%)	0 (0%)	11 (100%)
Response on time	0 (0%)	1 (9.1%)	2 (18.2%)	5 (45.5%)	3 (27.3%)

23 - Do you think that the Egyptian community prefers to receive paper based service rather than web based service?

Yes 11(100%)

No 0(0%)

**Appendix C-4: Data Results - Birth Certificate and Vehicle Licence
2005-2006 E-readiness Comparison**

Factor	Sub-factor	2005 (N=947)	2006 (N=938)	P-value	
ICT infrastructure	Telephone at home	799 (84.4%)	865 (92.2%)	<0.001*	
	Computer at home	289 (30.5%)	402 (42.9%)	<0.001*	
	Computer and internet at work	360 (38%)	424 (45.2%)	0.002*	
	Internet speed reasonable¹	224 (63.3%)	291 (60%)	0.336	
	Internet price affordable¹	230 (65%)	296 (61%)	0.224	
ICT usage	Regular use of internet¹	145 (41%)	219 (45.2%)	0.226	
	Use of internet in public places¹	Regularly	71 (20.1%)	45 (9.3%)	<0.001*
		Sometimes	62 (17.5%)	78 (16.1%)	
		No	221 (62.4%)	362 (74.6%)	
Human capital	Computer knowledge	Excellent	197 (20.8%)	284 (30.3%)	<0.001*
		Good	202 (21.3%)	227 (24.2%)	
		No knowledge	548 (57.9%)	427 (45.5%)	
	Internet knowledge	Excellent	133 (14%)	243 (25.9%)	<0.001*
		Good	221 (23.3%)	242 (25.8%)	
		No knowledge	593 (62.6%)	453 (48.3%)	
	Computer and internet education²	School	108 (27%)	82 (16%)	<0.001*
		Private computer centre	188 (47%)	215 (42.1%)	
		Other	104 (26%)	214 (41.9%)	

Table (appendix C-4) 2005-2006 e-readiness comparison: birth certificates and vehicle licences

“*” Significant at P≤0.05; “1” Percentages are out of respondents who have internet knowledge

“2” Percentages are out of respondents who have computer knowledge

**Appendix C-5: Data Results - UCAS
2005-2006 E-readiness Comparison**

Factor	Sub-factor	2005 (N=969)	2006 (N=1054)	P-value	
ICT infrastructure	Telephone at home	816 (84.2%)	907 (86.1%)	0.244	
	Computer at home	354 (36.5%)	515 (48.9%)	<0.001*	
	Computer and internet at school	472 (48.7%)	618 (58.6%)	<0.001*	
	Internet speed reasonable¹	244 (52.4%)	329 (56.6%)	0.168	
	Internet price affordable¹	257 (55.2%)	346 (59.6%)	0.152	
ICT usage	Regular use of internet¹	190 (40.7%)	285 (49.1%)	<0.001*	
	Use of internet in public places¹	Regularly	109 (23.4%)	159 (27.4%)	<0.001*
		Sometimes	209 (44.8%)	192 (33%)	
		No	148 (31.8%)	230 (39.6%)	
Human capital	Computer knowledge	Excellent	217 (22.4%)	298 (28.3%)	<0.001*
		Good	334 (34.5%)	380 (36.1%)	
		No knowledge	418 (43.1%)	376 (35.7%)	
	Internet knowledge	Excellent	190 (19.6%)	267 (25.3%)	0.002*
		Good	276 (28.5%)	314 (29.8%)	
		No knowledge	503 (51.9%)	473 (44.9%)	
	Computer and internet education²	School	181 (32.8%)	213 (31.4%)	<0.001*
		Private computer centre	345 (62.6%)	284 (41.9%)	
		Other	25 (4.5%)	181 (26.7%)	

Table (appendix C-5) 2005-2006 e-readiness comparison: UCAS

“**” Significant at $P \leq 0.05$; “1” Percentages are out of respondents who have internet knowledge

“2” Percentages are out of respondents who have computer knowledge

**Appendix C-6: Data Results - Birth Certificate and Vehicle Licence
General Data**

		2005 (N= 947)	2006 (N= 938)	P-value
Gender	Male	527 (55.6%)	505 (53.8%)	0.430
	Female	420 (44.4%)	433 (46.2%)	
Age	Less than 18	0 (0%)	0 (0%)	0.072
	18 - 29	239 (25.2%)	253 (27%)	
	30 - 39	268 (28.3%)	245 (26.1%)	
	40 - 49	289 (30.5%)	324 (34.5%)	
	50 - 59	102 (10.8%)	73 (7.8%)	
	60 +	49 (5.2%)	43 (4.6%)	
Education level	Below primary	0 (0%)	0 (0%)	0.246
	Primary - elementary	71 (7.5%)	62 (6.6%)	
	Secondary	65 (6.9%)	81 (8.6%)	
	College degree	187 (19.8%)	168 (17.9%)	
	University degree	503 (53.1%)	525 (56.0%)	
	Postgraduate degree	121 (12.8%)	102 (10.9%)	
Work	Employed	801 (84.6%)	809 (86.3%)	0.306
	Unemployed	146 (15.4%)	129 (13.8%)	
Ownership	Mobile phone	706 (74.6%)	776 (82.7%)	<0.001*
	Satellite TV	551 (58.2%)	564 (60.1%)	0.391
	Car	644 (68%)	619 (66%)	0.353
Income	Less than 500	112 (11.8%)	97 (10.3%)	0.089
	501 - 1000	249 (26.3%)	235 (25.1%)	
	1001 - 2000	202 (21.3%)	228 (24.3%)	
	More than 2000	163 (17.2%)	191 (20.4%)	
	Refuse to answer	221 (23.3%)	187 (19.9%)	
Governorates	Alexandria	135 (14.3%)	124 (13.2%)	0.805
	Assyout	86 (9.1%)	93 (9.9%)	
	Cairo	247 (26.1%)	238 (25.4%)	
	Gharbia	143 (15.1%)	144 (15.4%)	
	Giza	189 (20%)	183 (19.5%)	
	Ismailia	42 (4.4%)	41 (4.3%)	
	Sohag	105 (11.1%)	115 (12.3%)	

Table (appendix C-6) General data: birth certificate and vehicle licence

*** Significant at P≤0.05

**Appendix C-7: Data Results - UCAS
General Data**

		2005 (N= 969)	2006 (N= 1054)	P-value
Gender	Male	502 (51.8%)	555 (52.7%)	0.702
	Female	467 (48.2%)	499 (47.3%)	
Age	15-20	946 (97.6%)	1030 (97.7%)	0.363
	21-25	23 (2.4%)	22 (2.1%)	
	Above 25	0 (0%)	2 (0.2%)	
School	Governmental	587 (60.6%)	609 (57.8%)	0.201
	Private	382 (39.4%)	445 (42.2%)	
language	Arabic	493 (50.9%)	567 (53.8%)	0.189
	Foreign languages	476 (49.1%)	487 (46.2%)	
Branch	Scientific	497 (51.3%)	516 (49%)	0.294
	Arts	472 (48.7%)	538 (51%)	
Stage	First stage	352 (36.3%)	363 (34.4%)	0.081
	Second stage	228 (23.5%)	294 (27.9%)	
	Third stage	389 (40.1%)	397 (37.7%)	
	Other	0 (0%)	0 (0%)	
Ownership	Mobile phone	585 (60.4%)	546 (51.8%)	0.672
	Satellite TV	430 (44.4%)	497 (47.2%)	0.210
	Car within the family	212 (21.9%)	197 (18.7%)	0.075
Governorates	Alexandria	178 (18.4%)	176 (16.7%)	0.166
	Assyout	38 (3.9%)	61 (5.8%)	
	Cairo	397 (41%)	394 (37.4%)	
	Gharbia	73 (7.5%)	84 (8%)	
	Giza	150 (15.5%)	195 (18.5%)	
	Ismailia	76 (7.8%)	78 (7.4%)	
	Sohag	57 (5.9%)	66 (6.3%)	

Table (appendix C-7) General data: UCAS

APPENDIX D
ASSESSMENTS FACTORS
Appendix D-1: List of Assessments Factors

Assessment	Organisation Full Name	ICT Infrastructure	ICT Usage	Human Capital	ICT Regulations	Other
E-readiness Assessments						
CID	Centre for International Development - Harvard University	<ul style="list-style-type: none"> • Networked access 	<ul style="list-style-type: none"> • Network society 	<ul style="list-style-type: none"> • Network learning 	<ul style="list-style-type: none"> • Network policy 	<ul style="list-style-type: none"> • Network economy
APEC	Asia Pacific Economic Cooperation	<ul style="list-style-type: none"> • Basic infrastructure and Technology 	<ul style="list-style-type: none"> • Current level and type of internet use 	<ul style="list-style-type: none"> • Skills and human resources 	<ul style="list-style-type: none"> • Access to necessary network services 	<ul style="list-style-type: none"> • Positioning for the digital economy • Promotion and facilitation activities
CSPP	Computer Systems Policy Project	<ul style="list-style-type: none"> • Network infrastructure 	<ul style="list-style-type: none"> • Networked places (access) 	-	<ul style="list-style-type: none"> • Networked world enablers 	<ul style="list-style-type: none"> • Networked economy • Networked applications and services
ITU-I	International Telecommunication Union	<ul style="list-style-type: none"> • Connectivity infrastructure • Geographic dispersion 	<ul style="list-style-type: none"> • Pervasiveness 	-	-	<ul style="list-style-type: none"> • Sectoral absorption • Organisational infrastructure • Sophistication of use
USAID	US Agency for International Development	<ul style="list-style-type: none"> • Pipes (access) 	-	<ul style="list-style-type: none"> • People (training) 	<ul style="list-style-type: none"> • Public sector 	<ul style="list-style-type: none"> • Private sector
InfoDev	Information for Development	<ul style="list-style-type: none"> • Networked access 	<ul style="list-style-type: none"> • Network society 	<ul style="list-style-type: none"> • Network learning 	<ul style="list-style-type: none"> • Network policy 	<ul style="list-style-type: none"> • Network economy
SIDA	Swedish International Development Cooperation Agency	<ul style="list-style-type: none"> • Connectivity and access 	-	<ul style="list-style-type: none"> • Human resources 	<ul style="list-style-type: none"> • Policy and regulatory framework 	<ul style="list-style-type: none"> • Key institution
ASEAN	The Association of Southeast Asian Nations	<ul style="list-style-type: none"> • Infrastructure 	<ul style="list-style-type: none"> • E-society 	<ul style="list-style-type: none"> • E-society 	<ul style="list-style-type: none"> • E-commerce 	<ul style="list-style-type: none"> • Liberalizing trade in ICT goods and services • E-government
McCoaell	McConnell International	<ul style="list-style-type: none"> • Connectivity 	-	<ul style="list-style-type: none"> • Human capital 	<ul style="list-style-type: none"> • Information security 	<ul style="list-style-type: none"> • E-business climate • E-leadership
WITSA	The World Information Technology and Services Alliance	<ul style="list-style-type: none"> • Technology 	-	-	<ul style="list-style-type: none"> • Trust • Public policy 	<ul style="list-style-type: none"> • Workforce issues • Taxation

						<ul style="list-style-type: none"> • Business Processes • Costs • Consumer attitudes
Crenshaw& Robinson*	Crenshaw& Robinson	<ul style="list-style-type: none"> • Level of existing technological development 	-	<ul style="list-style-type: none"> • Mass education 	-	<ul style="list-style-type: none"> • Political openness/democracy • Presence of a sizable services sector • Foreign investment • Ethnic homogeneity • Sectoral inequality • Population density • Quantity of experts • Individual property rights
CIDCM	The Centre for International Development and Conflict Management	<ul style="list-style-type: none"> • Internet development 	-	-	<ul style="list-style-type: none"> • ICT policy 	<ul style="list-style-type: none"> • Background and history • Key players in internet development/ responsibilities and objectives • Negotiations between players in developing the country's internet • Political structure and culture
EIU	Economist Intelligence Unit	<ul style="list-style-type: none"> • Connectivity and technology infrastructure 	-	<ul style="list-style-type: none"> • Social and cultural environment 	<ul style="list-style-type: none"> • Legal environment 	<ul style="list-style-type: none"> • Business Environment • Government policy and vision • Consumer and business adoption
SIBIS	Statistical Indicators Benchmarking the Information Society	<ul style="list-style-type: none"> • Internet readiness 	<ul style="list-style-type: none"> • Digital divide 	<ul style="list-style-type: none"> • Digital literacy, learning and training 	<ul style="list-style-type: none"> • Information security 	<ul style="list-style-type: none"> • Perceptions of possible barriers • Online applications
MetricNet*	MetricNet	-	-	-	-	<ul style="list-style-type: none"> • Measuring IT performance and productivity by organisations. • Measuring IT spending by industry
K4D	Knowledge for Development Program (World Bank)	<ul style="list-style-type: none"> • Information and Communication Technology 	-	<ul style="list-style-type: none"> • Education 	-	<ul style="list-style-type: none"> • Economic performance • Economic regime Governance • Innovation system • Gender
IDC-ISI	IDC Information Society Index	<ul style="list-style-type: none"> • Computer • Telecommunications 	<ul style="list-style-type: none"> • Internet 	-	-	<ul style="list-style-type: none"> • Social
WEF	World Economic Forum	<ul style="list-style-type: none"> • Network access 	<ul style="list-style-type: none"> • Network use 	<ul style="list-style-type: none"> • Network society 	<ul style="list-style-type: none"> • Network policy 	<ul style="list-style-type: none"> • Network economy
InfoDev and Pyramid Research *	Pyramid Research, for the Information for Development	<ul style="list-style-type: none"> • The communication infrastructure level 	-	-	-	<ul style="list-style-type: none"> • Investments • Revenues

Kenoy	Charles Kenny, for World Bank	<ul style="list-style-type: none"> • ICT access, cost and quality 	-	-	-	-
Kearoey	A.T. Kearney Foreign Policy Magazine	<ul style="list-style-type: none"> • Technological connectivity 	-	<ul style="list-style-type: none"> • Technological connectivity 	-	<ul style="list-style-type: none"> • Economic integration • Political engagement • Personal contact (eg: international travel and international telephone traffic)
ITU-2	International Telecommunication Union	<ul style="list-style-type: none"> • Basic indicators 	<ul style="list-style-type: none"> • Basic indicators 	-	-	-
ITU-3	International Telecommunication Union	<ul style="list-style-type: none"> • Infrastructure • Affordability 	<ul style="list-style-type: none"> • Usage 	<ul style="list-style-type: none"> • Knowledge 	-	<ul style="list-style-type: none"> • Quality
Orbicom	Orbicom	<ul style="list-style-type: none"> • Networks • Uptake 	<ul style="list-style-type: none"> • Uptake 	-	-	<ul style="list-style-type: none"> • Skills • Intensity
E-government Assessments						
UNDESA	United Nations Department for Economic and Social Affairs	<ul style="list-style-type: none"> • Telecommunication infrastructure index 	<ul style="list-style-type: none"> • Telecommunication infrastructure index 	<ul style="list-style-type: none"> • Human capital index 	-	<ul style="list-style-type: none"> • Web measure survey • E-participation
Browo	Brown University - Centre for Public Policy	-	-	-	<ul style="list-style-type: none"> • Privacy and security • Electronic services 	<ul style="list-style-type: none"> • Online information • Disability access • Foreign language access • Advertisement, user fees and premium fees • Public outreach
Accenture	Accenture	<ul style="list-style-type: none"> • Internet users 	<ul style="list-style-type: none"> • Internet users 	-	-	<ul style="list-style-type: none"> • Service maturity • Customer relationship management
Waseda	Waseda University Institute of E-government	<ul style="list-style-type: none"> • Network preparedness 	-	<ul style="list-style-type: none"> • Network preparedness 	<ul style="list-style-type: none"> • Promotion of e-government (e.g. legal system) 	<ul style="list-style-type: none"> • Required interface functioning applications (e-applications) • Management optimization • Homepage/ portal situation • Gap between management and technology

Table (appendix D-1): List of e-readiness and e-government assessments factors
Source: See assessments references; Based on, and extended from Bridges (2005a)

“*” Limited amount of information available

Appendix D-2: List of Assessments Sub-Factors

Sub-factors Assessment	Factors														
	ICT Infrastructure					ICT Usage		Human Capital			ICT Regulations			Trust	
	Telephone at home	Computer at home	Computer and internet at work	Internet speed	Internet prices	Regular use of internet	Use of internet in public places	Computer knowledge	Internet knowledge	Computer and internet education in schools	Telecommunication regulations	E-signature law	Information protection commitment	Security	Privacy
E-readiness Assessments															
C1D	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
APEC	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓		✓	✓
CSPP	✓	✓	✓	✓	✓	✓				✓	✓	✓	✓	✓	✓
ITU-1	✓			✓	✓	✓									
USAID	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
InfoDev	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓
SIDA	✓			✓	✓	✓	✓	✓		✓	✓				
ASEAN	✓	✓			✓	✓	✓	✓	✓	✓			✓		
McConnell	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓
WITSA	✓	✓	✓					✓	✓			✓	✓	✓	✓
Crenshaw & Robinson*	✓														
CIDCM	✓	✓			✓						✓			✓	
EIU	✓	✓	✓	✓	✓	✓		✓	✓	✓			✓	✓	
SIBIS	✓	✓		✓	✓	✓	✓	✓	✓					✓	✓
MetricNet*															
K4D	✓	✓	✓	✓	✓	✓		✓	✓	✓					
IDC-ISI	✓	✓		✓		✓		✓	✓						
WEF	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		
InfoDev and Pyramid Research *											✓			✓	✓
Kenny	✓	✓		✓	✓	✓		✓	✓						
Kearney	✓	✓	✓			✓		✓	✓					✓	
ITU-2	✓	✓		✓		✓		✓	✓						
ITU-3	✓	✓		✓	✓	✓	✓	✓	✓						
Orbicom	✓	✓		✓		✓		✓	✓					✓	
E-government Assessments															
UNDESA	✓	✓	✓			✓		✓	✓						
Brown												✓		✓	✓
Accenture	✓	✓	✓			✓	✓	✓	✓						
Waseda	✓	✓	✓	✓		✓		✓	✓			✓		✓	

Table (appendix D-2): List of e-readiness sub-factors

Source: See assessments references; Based on, and extended from Bridges (2005a)

“**” Limited amount of information available

Appendix D-3: List of Trust Sub-Factors

Author Name	ICT Reg-ulations	Technology Trust		E-government Trust		
	Information protection commitment	Security	Privacy	Credibility	Customer satisfaction	Response on time
Al-dawi et al (2005)		✓	✓	✓		
Al-Sawafi (2003)		✓				
Bretschneider et al (2003)					✓	
Camp (2000)	✓					
Carter and Belanger (2004)		✓				
Corritore, et al (2003)				✓		
Finger and Pecoud (2003)					✓	
Gilbert et al (2004)		✓		✓		
InfoDev (2002)		✓	✓			
Jaeger (2002)	✓					
Lau (2004)		✓	✓			
NECCC (2001)		✓	✓	✓		
Otto (2003)		✓				
Palmer (2002)				✓		
Parent et al (2004)					✓	✓
RAND Europe (2003)	✓			✓	✓	✓
Regio (2002)		✓				
Rho and Hu (2001)					✓	✓
Riedl (2004)		✓	✓			
Srivastava and Teo (2005)	✓	✓	✓			
Welch and Hinnani (2002)			✓			
Wimmer and Bredow (2002)		✓	✓			
Yang et al (2005)		✓				

Table (appendix D-3): List of trust sub-factors

Source: See references

Appendix D- 4: List of Assessments Conducted on Egypt

Assessment	Organisation Full Name	Year
E-readiness Assessments		
CID	Centre for International Development - Harvard University	2004
ITU-1	International Telecommunication Union	2000
USAID	US Agency for International Development	2004
InfoDev	Information for Development	2004
McConnell	McConnell International	2001
WITSA	The World Information Technology and Services Alliance	2000
Crenshaw & Robinson	Crenshaw & Robinson	N/A
EIU	Economist Intelligence Unit	2001 to 2007
K4D	Knowledge for Development Program (World Bank)	N/A
IDC-ISI	IDC Information Society Index	N/A
WEF	World Economic Forum	2003 & 2004
InfoDev and Pyramid Research	Pyramid Research, for the Information for Development Program	2004
Kenny	Charles Kenny, for World Bank	2001
Kearney	A.T.Kearney Foreign Policy Magazine	2004
ITU-2	International Telecommunication Union	2007
ITU-3	International Telecommunication Union	2003
E-government Assessments		
UNDESA	United Nations Department for Economic and Social Affairs	2003 & 2004 & 2005 & 2008
Brown	Brown University - Centre for Public Policy	2004 & 2005

Table (Appendix D-4): E-readiness assessments conducted in Egypt

Source: See assessments references; Based on, and extended from Bridges (2005b)

APPENDIX E LIST OF INTERVIEWEES

Policy Maker and Project Managers – MSAD and MCIT Interviewees		
No.	Position	Organisation
1	Project manager	MSAD
2	Project manager	MSAD
3	Minister assistant	MSAD
4	Senior advisor to the minister	MSAD
5	Operation manager	MSAD
6	Project manager	MSAD
7	Project manager	MSAD
8	Project manager	MSAD
9	Executive project manager	MSAD
10	Programme director	MSAD
11	Project manager	MSAD
12	Project manager	MSAD
13	Network engineer manager	MCIT
14	Project manager	MCIT
15	Project manager	MCIT
16	Senior analyst	MCIT
17	Project director	MCIT
18	Executive project manager	MCIT
19	Project manager	MCIT
20	Project manager	MCIT
21	General director	MCIT
22	Project manager	MCIT
23	Project director	MCIT
Relevant Stakeholders – Selected E-government Services		
No.	Position	Organisation
24	Project manager- UCAS	MHE
25	Senior employee- UCAS	MHE
26	Senior employee- UCAS	MHE
27	Web designer and developer- UCAS	MHE
28	Officer- UCAS	MHE
29	Project manager- birth certificate	MI
30	Senior officer- birth certificate	MI
31	Officer- birth certificate	MI
32	Project manager- vehicle licence- Giza	MI
33	Project manager- vehicle licence- Giza	MI
34	Officer- vehicle licence- Giza	MI
35	Project manager- vehicle licence- Cairo	MI
36	Officer- vehicle licence- Cairo	MI

Other Relevant Stakeholders		
	Position	Organisation
37	Credit cards manager	National Bank of Egypt
38	Call centre manager	MSAD
39	Statistics specialists	MSAD
40	Website engineer	MSAD
41	Network engineer	MSAD
42	Network manager	MCIT
43	MCIT employee	MCIT

Table (Appendix E): List of interviewees

APPENDIX F

ABSTRACTS OF PUBLISHED PAPAERS

Abdelghaffar, H. and Kamel, S. (2008). "The Impact of E-readiness on E-government in Developing Nations: Case of Universities and Colleges Admission Services", Proceedings of the 9th International Business Information Management Association (IBIMA), Morocco.

The Impact of E-readiness on E-government in Developing Nations **Case of Universities and Colleges Admission Services**

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Sherif Kamel
The American University in Cairo, Egypt

Abstract

Electronic government (e-government) has become one of the most evolving and important applications of information and communication technology (ICT) in recent years due to its positive impact on citizens, government and the society alike. However, due to lack of appropriate e-readiness levels in many developing nations, e-government failure rates are still relatively high with a lot that needs to be done that relates to awareness, restructuring and ICT completion and deployment. This paper demonstrates the findings of a study investigating the impact of e-readiness within the society on the success of universities and colleges admission services in Egypt as a model example of e-government design and delivery in developing nations. The study findings indicate the importance of e-readiness as an invaluable element for e-government successful introduction, diffusion and implementation in the developing nations context.

Abdelghaffar, H. and Kamel, S. (2006). "The Impact of E-readiness on E-government in Developing Countries: The Case of Egypt", Proceedings of the Information Resources Management Association (IRMA), Washington, USA.

The Impact of E-readiness on E-government in Developing Nations **Case Study of Egypt**

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Abstract

Electronic government (e-government) is one of the growing applications of information and communication technology. It has several advantages for both citizens and government as well as macro implications on overall socioeconomic and business development. Respectively, governments around the world have thought the design and implementation of their e-government projects. However, there are only a handful of nations that have managed to achieve their desired targets while others failed or were less fortunate to realize an impact from the deployment of information and communication technology when it comes to government services. One major reason for that is the role of citizens who represent the main stakeholder of the e-government framework and at the same time the primary target and beneficiary for e-government projects. Citizens were mostly not electronically ready (e-ready) to participate and actively contributing to this evolving and maturing model. Furthermore, e-government policy makers did not consider a number of related issues beyond technology from the start. This paper reports on a research conducted in Egypt that explores how citizens' e-readiness could affect e-government success and what are

the other factors at the local level such as culture that could affect successful implementation of e-government in the context of developing nations.

Abdelghaffar, H., Bakry, W. and Duqueno, P. (2005). "E-government: a New Vision for Success", Proceeding of the European and Mediterranean Conference on Information Systems (EMCIS), Cairo, Egypt.

E-government: A New Vision for Success

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Abstract

One of the most important emerging applications of Information and Communication Technology (ICT) is e-government. Perceived as providing benefits to the community by overcoming the complexity of bureaucracy, increasing the efficiency of the economy, reducing services' time, and permitting businesses and citizens to connect to government information, it is likely to become a part of life for citizens and businesses. However, the initial push to implement e-government projects resulted in a number of projects that failed, either partially or completely. A major reason offered for these failures is that governments were applying the conventional ICT project formula to e-government without consideration of other features that are particular to e-government. E-government has its unique combination of features and characteristics that should be taken into consideration at design and implementation stages to determine its success.

The primary aim of this paper is to identify the main characteristics of e-government in order to assess the range of aspects that are likely to affect the success or failure of an e-government project. We begin by setting out the concept of e-government and its importance in an e-society. Noting the failure rate of e-government projects, we follow with a discussion of Critical Success Factors (CSF's) – i.e. aspects that must be taken into account to ensure the success of a project. We identify the range of aspects of e-government, and align these to CSF's. Finally, we argue that current CSF's in e-government do not take into account the full range of characteristics that apply to this sector, and that new e-government CSF's are needed in order to improve the success rate of e-government projects.

Abdelghaffar, H. and Bakry, W. (2005). "Defining E-government and E-readiness", Proceedings of the Information Resources Management Association (IRMA), San Diego, USA.

Defining E-government and E-readiness

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Abstract

Currently, many governments are implementing e-government projects in order to gain the benefits of the digital revolution. However, the success rate is still low. As the first step for implementing e-government projects is to conduct an e-readiness assessment, this paper proposes a definition of e-government and how e-readiness can fit within this definition.