Studying eGovernment Trust in Developing Nations
Case of University and Colleges Admissions and Services in Egypt

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ABSTRACT

eGovernment is one of the most important ICT projects in providing opportunities for citizens to engage with their communities and engage with government. Many nations have introduced eGovernment projects, which have been implemented with mixed success. This paper reports on a study concerning the impact of citizens' trust on using eGovernment services in developing nations. In this context, trust in the technology and eGovernment are identified as essential factors to citizen uptake. The findings of the research show that Internet security and credibility of eGovernment services are significant factors that contribute to citizens' trust towards eGovernment projects, and in consequence their use of them.

INTRODUCTION

In the last decade, eGovernment has become one of the most important emerging applications of Information and Communication Technology (ICT). It has the potential of making government more transparent and effective which helps to overcoming the complexity of bureaucracy, increasing the efficiency of the economy, reducing the time taken to receive services and permitting businesses and citizens to connect directly to government information.

As a result of the perceived importance of eGovernment many developed and developing nations have attempted to initiate and implement eGovernment projects with mixed success. Among these nations very few have succeeded in achieving their set targets, whilst a larger number have arguably failed (Heeks and Bhatnagar, 2001); United Nations Department for Economic and Social Affairs-UNDESA (2003c). According to the United Nations Department for Economic and Social Affairs-UNDESA (2003b) the percentage of failure amongst eGovernment projects worldwide varies from 60% to 80%. A survey conducted on 40 eGovernment projects in developing nations found that 35% of projects were considered as being total failures, 50% were considered of being partial failures and only 15% of the projects could be classed as a success (Heeks , 2003a).

The problem of failures with eGovernment IT projects - as with any IT project - failure, whatever the type of it, is that it is very costly (Khasawneh and Ibrahim, 2008). As well as the costs incurred from the direct loss of funding (i.e. funds spent without achieving any improvement in the public sector), there are indirect costs such as the loss of time and effort of public sector employees. There is also an unseen cost

that can have implications beyond the project itself, which is the loss of trust towards the government itself (Heeks, 2003b). As noted above, one of the key aspects arising from failing projects is the loss of trust towards governments – particularly in respect of IT projects. The result is that eGovernment projects are in danger of losing their customer base (citizens), and will consequently join the list of 'failed government IT projects'. The research presented in this paper investigates the issue of trust and eGovernment projects in a developing nation (Egypt) from the point of view of the citizen, with the aim of understanding the impact of trust on their take-up of eGovernment services, and the ultimate objective of improving the success rate of eGovernment projects. The hypotheses set out below have underpinned the research presented

> H1: Trust has a significant effect on using eGovernment services.
> H2: Technology trust has a significant effect on using eGovernment services.
> H3: eGovernment trust has a significant effect on using eGovernment services.

The following sections begin with outlining the context of trust and eGovernment, and proceed to discuss two types of trust that are relevant in the context of eGovernment: *trust in technology*, and *trust in eGovernment*. These issues also fall within the scope of eGovernment implemented within a developing nation (Egypt). Having set the background the authors introduce the research conducted by describing the method used, the findings from the data and the conclusion drawn from those results.

EGOVERNMENT AND TRUST

Defining eGovernment Trust

Trust as a general concept can be defined as "a set of expectations shared by all those in an exchange" (Zucker, 1986). However, defining eGovernment trust is a more complicated issue because of the different factors that can affect citizens' trust, as well as the broad range of stakeholders who contribute (to varying extents) to a 'trusted eGovernment'. In many cases, personal characteristics, such as age and gender, have a significant effect on determining trust for eGovernment. For example, elderly people in many situations prefer paper-based services which they have used for many years, rather than using an eGovernment website (Thomas, 1998). A citizen's past experience will affect their trust towards eGovernment (Pang et al., 2007). Thus, if a citizen's experience of electronic transactions is negative, they would not be willing to use eGovernment to conduct transactions (Parent et al., 2004). If one accepts the above positions then people can see why degrees of trust vary from one person to another.

eGovernment Trust: Previous Approaches

Trusting eGovernment does not depend only on personal characteristics (such as age) but goes beyond this to incorporate the whole process regarding the adoption of eGovernment services (Hui and Wan, (2007); Schwester, (2009)). Some researchers agree on certain factors while many contradict each other in many cases (Al-Adawi, et al. (2005); Carter and Belanger (2004); Bélanger and Carter (2006); Srivastava and Teo (2005)).

Carter and Belanger (2004) define citizens' trust through an adoption model of eGovernment that measures citizens' intentions to use eGovernment services. They do this by measuring citizens' trust towards the Internet and towards government. Their results show that the perceived usefulness and relative advantage and compatibility with a users' life style are significant indicators that affect usage of eGovernment, and that the Internet and government trust are not significant factors for using and trusting eGovernment services (Al-Shafi, and Weerakkody, 2009). This is because government services, for example the issue of a driving license, are requested by citizens regardless of their degree of trust towards

government. The question of Internet trust was not significant in their research as their users were mainly college students who regularly use the Internet (and are therefore familiar with it). Despite their efforts in adapting eCommerce trust factors to the eGovernment context, it should be said that their results are limited to a specific group of citizens – students in this case – and applied to the United States. It is not clear that their results can be generalized to all users and all nations.

References to Al-Adawi, et al. (2005) adopt a model that considers the same factors identified by Carter and Belanger (2004). However, their model classifies citizens' intentions to *view* eGovernment information only or to *conduct transactions* online using an eGovernment website. This type of classification matches identified eGovernment phases, that is, the distinction between obtaining information and downloading forms, and applications for a complete transaction. According to their model, a citizens' intention to get information from an eGovernment website could be an important initial step towards having citizens who conduct transactions in the future as a result of increased trust.

Contrary to the findings by Carter and Belanger (2004) that government and Internet trust do not affect citizens' trust towards eGovernment, Srivastava and Teo (2005) argue that trusting both *technology* and *government* are major factors in a citizen's adoption of eGovernment. They take different levels of trust: government's ability to provide the service, motivation and commitment. Using their model they find that the higher the degree of citizens' trust towards government and technology the more likely it is that citizens will adopt eGovernment services. However, this research was conducted in Singapore, which is relatively a small nation where citizens largely use the English language. Generalizations from their findings to other nations are not then necessarily applicable.

How Can Egovernment Trust be Achieved?

As there is a lack of agreement between researchers about how to determine citizens' trust for eGovernment (Al-Adawi, et al., 2005; Colesca, 2009), it was important in the initial stages of this research to identify which trust issues were relevant to eGovernment. Electronic government is defined as the use of ICT to provide government services to citizens in a better way than previous traditional ways (United Nations Department for Economic and Social Affairs-UNDESA, 2003a). Consequently, in order for citizens to be able to request eGovernment services it is important for them to be able to (a) use technology, and (b) trust *both the government* (with regard to its capability of providing online services) and *the technology*. If there is a lack of trust in either or both of these issues this could negatively affect eGovernment usage (Abdelghaffar and Kamel, 2006).

Technology Trust

To understand the factors influencing technology trust, it is important to understand how the technology affects citizens when they use eGovernment services. Citizens, normally, use the Internet (i.e. is a public network) to communicate with an eGovernment website. They might also use a third party who delivers eGovernment services for citizens (such as private centers and kiosks (Baldwin, et al., 2002). If there is a lack of security at any stage in the process, the citizen would be unlikely to use eGovernment as their private and financial information has to be transmitted in order to complete a transaction online. In this respect, the issues of security and privacy are identified by many researchers as technical measures that a government needs to provide to increase citizens' trust towards the technology (Information Development Program-InfoDev (2002); Lau (2004); Wimmer and Bredow (2002).

Security
Determining eGovernment security is characterized at two different levels. *The first level* is regarding the transmission of information between the end user terminal (whether PC or Kiosks) and the eGovernment

portal. This level is directly related to the Internet communication process. Providing security within eGovernment projects require hardware technology to increase security, such as firewalls and intranet (National Electronic Commerce Coordinating Council, 2001). *The second level* of security is related to the security of information stored at the main database server. As citizens' data is transmitted online and exchanged between different ministries, there should be clear guidelines for citizens, employees or other agencies involved in processing, of the security measures that exist and the legislation that is in place to protect that information (Wimmer and Bredow, 2002). It is also seen as important, in addressing a negative perspective on Internet security that technical measures should be backed up by legislation that gives government the power to prosecute cases of illegal access to citizens' data (Camp, 2000; Srivastava and Teo (2005). These two measures will provide a further basis for eReady citizens who are using the Internet to trust using eGovernment services online.

Privacy

Another aspect of technology trust is related to the issue of privacy. Citizens in many nations have become more concerned about privacy in general, and privacy in relation to government (Bart et al., 2005). Figures show that 92% of United States citizens are very concerned about the privacy issue in respect of online websites, such as the existence of a privacy policy (National Electronic Commerce Coordinating Council, 2001). Secondly, when citizens use the Internet they browse and link to websites anonymously (although they can be traced through an IP address and the use of cookies). However, in eGovernment the problem of privacy increases for citizens who are completing a transaction over the Internet and sending full details of their lives. This is in addition to other types of collected data necessary for the process, such as browser type and the type of websites visited (that is, the ability to track the user's online progress). Consequently, it needs to be made clear to citizens what the government intends to do with this type of data (Lau, 2004). This should be explicit at the start of the transaction, and separate to any privacy policy that refers to information collected.

Government Trust

A trust of government is identified by how far citizens are satisfied with government output and their attitude to the political regime (Easton, 1965). Reference Thomas (1998) explains that the citizens' point of view towards government is that government works on behalf of citizens and they expect it would do its best to achieve a better life for them. There is, then, a type of trust towards government by citizens which would not affect eGovernment. However, the reality is that citizens request government services, such as a vehicle license, using a traditional paper-based method although they might not trust their governments. Why? This is because some government services are necessary, if not essential, for citizens. Consequently, the demand side by citizens usually exists regardless of their attitude towards their governments (Carter and Belanger (2004). Therefore, if the government provides citizens with a quality service via eGovernment, the demand would exist regardless of their degree of trust for the government itself.

It is important to understand how citizens' trust towards government in general differs from a citizens' trust for eGovernment. This difference is explained by understanding how the process of requesting government services online differs from more traditional methods. In face to face transactions trust mainly exists when citizens have the opportunity to observe provider behaviour and understand the mechanisms of the process over many years (Dawes et al., 1999). In this way, the risk which exists for uncertain situations is reduced (Deutsch, 1960). However, in the eGovernment process the aspect of observing services is missing and, therefore, risk exists. According to Ba, et al. (1999), minimizing the risk process-based factors should be the core concept for trust, which is achieved by more secure, reliable and credible services.

EGOVERNMENT TRUST IN DEVELOPING NATIONS

The problem for many developing nations is that there is a history of political instability and non-transparency that destroy the concept that the government works for the citizens' benefit (Al Sukkar and Hasan, 2005). In this situation, the government has to rebuild trust for its eGovernment project rather than building a general government trust that might take long time to be established (Pacific Council on International Policy, 2002). As the relationship between eGovernment and trust is sparse, the issue of eGovernment trust is even more complicated as the service is generally provided via the Internet which is open to the public globally, making the risk higher than in traditional transactions. Therefore, in order to trust eGovernment services, governments need to take several steps to reduce risk. Two major approaches are used:

(1) *The first approach* to minimise the risk in eGovernment is achieved by increasing the trust in technology. This is done by assuring the existence of *enough protection of citizens' information* and enough *security* and *privacy* measures (Thomas (1998); Welch and Hinnant, 2002)).

(2) *Secondly*, as the issue of citizens' trust towards eGovernment is more than just a technical or a process issue, it should be combined with other factors that influence the trust of an eGovernment service. Other factors that could be considered to increase trust in eGovernment include providing *credibility* for the online process so that citizens feel that the online services are believable (Corritore, et al., 2003). Another factor is to gain *citizens' satisfaction* with the whole process of providing services online. So, they can feel that it is better than the traditional method (Rho and Hu, 2001). *Receiving online services on time* and in a better way than traditional service is an essential factor for gaining citizens' trust. This is because eGovernment response time is crucial to provide more positive experience for citizens in using online transactions (Pang et al., 2007). Consequently, citizens' adoption of eGovernment becomes less risky. The previous two approaches (technology and eGovernment trust) and their factors are tested in this research to measure their impact on citizens' use of eGovernment.

RESEARCH METHODS

Egypt was selected as a model of developing nations to be used in the research as it has an ambitious eGovernment program that started in 2001 (Eid and El-Razek, 2009). Such a program was put on the priority list of the government agenda and implemented by the Ministry of State for Administrative Development (MSAD). Among the several projects undertaken by the eGovernment program, the universities and colleges' admission and services (UCAS) was selected as an example of an eGovernment project to be covered in this in-depth investigation. It is important to note that different techniques were used for data collection including questionnaires for citizens, interviews for project staff and documentations.

In order to have a clear understanding of the impact of trust within society, a survey of end-users was conducted twice in two consecutive years: 2005 and 2006. Responding to the research questions was done through analyzing collected data and comparing results to determine how trust affects eGovernment success. The case study was conducted mainly for high school students who applied for universities and institutions in Egypt at the academic years 2005/2006 and 2006/2007. The survey was distributed to students at seven large state universities located in seven provinces covering major geographic areas in Egypt. Chi Square test is used to determine if there is an association between trust variables as an independent variable and using eGovernment services as dependent variable.

In each study, 1525 questionnaires were distributed for students using face-to-face interactions during the summer of 2005 and 2006. Using such technique was selected due to the very low response rate for mail

questionnaires in Egypt. In the 2005 study, 1219 surveys were collected resulting in a response rate of 79.9%. Among the 1219 surveys submitted, 250 were discarded because they were incomplete partially or were filled wrongly. This has resulted in having 969 valid responses. In the 2006 study, 1251 surveys were collected resulting in a response rate of 82 %; of which 197 (12.9%) were discarded for incompleteness or for other errors in filling the survey leaving 1054 valid responses.

RESEARCH RESULTS

In 2005, out of the 969 valid responses received, 36 subjects (3.7%) had applied online while 933 subjects (96.3%) had applied offline. 29.5% of respondents had heard about the online UCAS service before, while 70.5 % had not. Among the sample, 51.8% were male and 48.2% were female. More than 97% of the respondents were within the 15-20 years age range (the normal age for high school students). 60.6% of them were from government schools and 51.3% were coming from scientific background.

In the 2006 survey, 1054 valid responses were received. Among them, 94 (8.9%) applied through the online UCAS system, while 960 (91.1%) applied offline. 74.1% of the respondents had heard about the online UCAS service, while 25.9% had not. From the sample, 52.7% were male and 47.3% were female. 97.7% were within the age range of 15 to 20 years, and 57.8% had studied at government schools. 49% of the respondents were from a science background. Both the 2005 and 2006 surveys included students from different classes of the Egyptian society.

Determining the level of students' trust from the survey followed several steps. The first was to find out whether students were aware of the online UCAS facility. This was followed by asking students' opinions of using the online UCAS service. Finally, there were a group of questions (following the Likert scale format) which asked for students' perceptions in respect of trusting technology and trusting eGovernment.

UCAS		2005		2006	
		Did not use eGovernment services (n=933)	Used eGovernment services (n=36)	Did not use eGovernment services (n=960)	Used eGovernment services (n=94)
Willing to use online UCAS?	Yes	91 (9.4)	36 (100)	228 (23.8)	94 (100)
	No	878 (90.6)	0 (0)	732 (76.3)	0 (0)
P-value		<0.001*		<0.001*	

*Values between parentheses are the percentages, *: Significant at P≤0.05*

TABLE 1: Students' expectations regarding the use of eGovernment services

Awareness and Usage

In 2005, 29.5% of the students who responded to the survey were aware of the existence of this service online while 70.5% of them were not. In the following year, the percentage of students who were aware of the service increased to 74.1%. This was due to an advertising campaign carried out by the Ministry of States and Administrative Development (MSAD), the ministry responsible for eGovernment in Egypt, specifically aimed at increasing students' awareness. This raise in the level of awareness helped students to become more confident regarding the services and encouraged them to use the website to view

information. In 2005, less than 1% of students had used the website to view information regarding the previous year's acceptance guidelines. This percentage increased dramatically to 29.7% in 2006.

The next question asked the students whether, if they are willing to apply online. The results showed that there was a statistically significant difference between respondents who used or did not use the eGovernment service. Also, there was a significant increase in students willing to apply online from 9.4% in 2005 to 23.8% in 2006. However, this was clearly because of the increasing diffusion of Internet connectivity among students.

Technology and eGovernment Trust

This part of the survey aimed to measure students' perceptions of trust regarding the online UCAS service as an eGovernment service, and how it affects their usage of services. Looking at the statistical results, 77.8% of students who applied online totally agreed that information protection commitment were in place by the government comparing with 28.6% of students who applied offline. Regarding existence of security for applying online, 83.3% (in 2005) and 75.5% (in 2006) of students who applied online agreed to the existence of security measures when they send their information online while this percentage were hardly approaching 27% in the both surveys (2005 and 2006) for students who applied offline. This is in addition to 80% of respondents in both surveys who used online UCAS agreed to the existence of privacy policies compared to about 30% of students who did not use online service in the 2006 survey.

As discussed earlier at sections, another side of the trust issue is to do with trusting eGovernment services, particularly where the Internet is part of the process. Results from the 2005 and 2006 surveys show that there is a statistically significant difference between respondents who applied to UCAS online and those who applied offline. The three criteria: customer satisfaction, receiving the service on time and credibility of the service, were statistically significant. In the 2005 survey, 72.2 % (83% in 2006 survey) of students who applied to UCAS online were totally satisfied with the service received online, and 77.8% (74.5% in 2006 survey) agreed that the service had credibility. Both students who applied online and offline for UCAS thought that services might not be delivered on time. This might be as a result of the general perception regarding government services, that is, that these services normally take some time.

The results from these two students' surveys show that the more students trust the Internet and eGovernment services, the more they will use the service. This would explain why non-eReady (students who illiterates in information technology) students would not request government services over the Internet even if they become eReady and even when there is a benefit for doing so – for example, an exemption from the university admission fees (6 US dollars in 2005 and 7 US dollars in 2006). In this case, and because applying for universities is a serious matter for Egyptian students, they would not take any risk over their application (and applying online from their perspective involves some risk) even if it means paying fees and spending two days going through the traditional manual admission process.

RESEARCH FINDINGS

Although the results from the two surveys show that students who did use the online admission service were previously aware of the services, increasing students' awareness among those who are aware of the service, either by MSAD or not, does not achieve a significant impact on increasing eGovernment usage. In 2005 and 2006, MSAD conducted a comprehensive advertising campaign using television, satellite channels, newspapers and radio for the online UCAS service to increase students' awareness in general of the online admission service and encourage them to use it. Nevertheless, students' awareness of the services did not encourage them to use it. In 2005, only 12,319 students applied online and increased to 15,666 in 2006.

Understanding the students' refusal to apply using the online service even though they knew about it, and were capable of using it (in terms of electronic readiness), is important in explaining factors that contribute to a successful eGovernment project. Statistical results from the surveys show that in 2005, 9.4% of the students were willing to use the online service while this percentage rose to 23.8% in 2006. However, it is important to see how many of these students would actually use the UCAS in the future and how the increasing percentage of students using it would represent a role model for others.

Looking at the results for students' who used the online eGovernment application service indicates that these students were more trusting of the process than the other students. Offline users did not trust the eGovernment services as they thought that there was a lack of security and that there were privacy issues with the Internet. Although proper security measures and information protection are important issues, there are no clear information policies for citizens on the eGovernment website (Colesca, 2009). In reality, the government does have its own procedures to protect customers' information at the level of operation and usage. Citizens' information is protected by using encryption methods (offering protection for the Internet transfer) and the servers on which the information is stored are protected against unauthorized access.
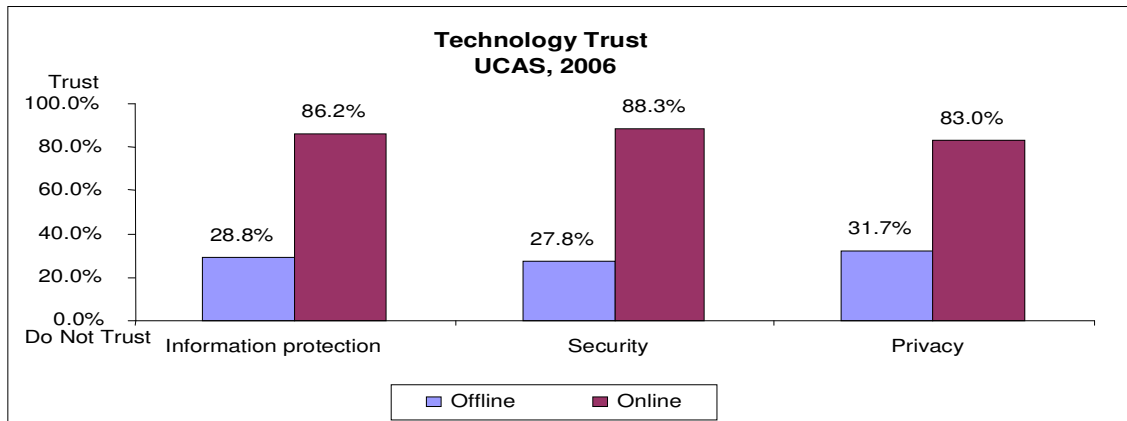

Figure 1. Student responses to the questions relating to technology trust, 2006

Consequently, a lack of trust towards the Internet had a negative effect on student use of the eGovernment UCAS service in Egypt. This issue was also noted as a problem in developed nations as well as developing nations. Carter and Belager (2000) in their study in the United States confirmed the research findings as citizens' usage of eGovernment would not increase with citizens' perception of trusting the Internet. Consequently, increasing the security and publicizing it with an explanation of the benefits of using eGovernment would not necessarily lead to more usage of eGovernment services as confirmed in the UCAS example. This is in addition to provide more privilege for eGovernment services which would increase citizens' acceptance of online government services.

Encouraging citizens to use eGovernment services via the Internet needs more than attention to security and privacy issues. Customer satisfaction gained from receiving government services easily and on time is also important, particularly bearing in mind the legacy of bureaucracy that is associated with government services. From the students' point of view, the surveys indicated high levels of perceived advantages regarding credibility, response time and customer satisfaction which were common to most users of eGovernment. Conversely, students who did not use online services were had less belief that receiving government services online would enhance the service and reduce time and effort.

These findings are in line with the results of another survey conducted in Egypt concerning citizens' use of online banks (Kamel and Assem, 2003) where it was found that citizens' uptake of online banking was affected by perceived ease of use. Their findings coincide with those of the Deloitte and Touche Study, which notes "*citizens want the same one stop shopping and service in an instant options from their government as they do from private business*" and for the most part, eGovernment is meeting these expectations.
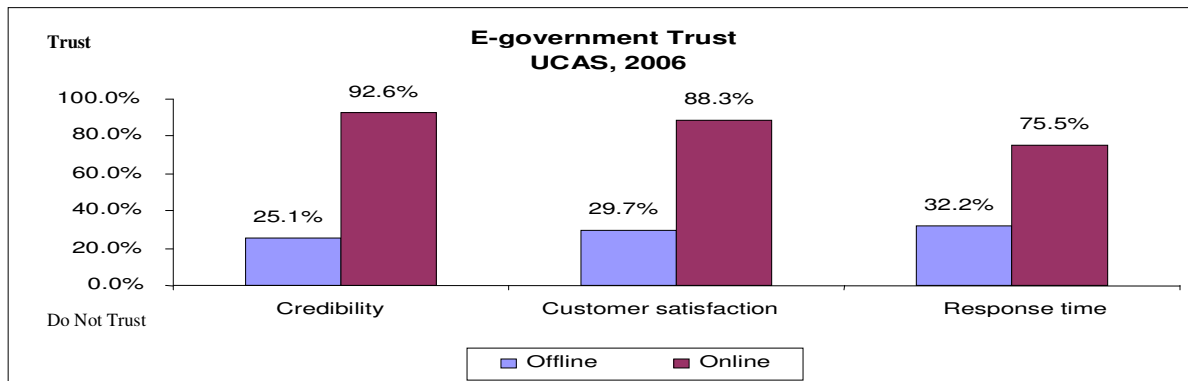

Figure 2. Students' agreement of existence of technology trust, 2006

Furthermore, the online UCAS admission system does not address the issue of 'minimizing the risk for citizens' which is an important aspect relating to the uptake of eGovernment services discussed earlier under sections (Ba et al., 1999). In the online admissions service, students do not get any letter to confirm that the admission process was successful. The best they can do is to use the "print screen" facility to print their receipt, and in many cases they do not have a printer. Even if they get a printed receipt it does not carry the stamp of the UCAS organization (which traditionally validates their transaction). As a result, some students who apply online also make an application using the offline, traditional, method to confirm their admission. In addition the next stages of the admission process are completely different from the traditional method, as students are required to submit their official papers themselves to universities - which involve more procedures than if they had used the traditional method. Therefore, the online system appears to carry more risk as students cannot observe the process as they could when using the traditional way (Dawes et al., 1999). Consequently, if the UCAS admission service would immediately send students a suitably authorized letter that provides evidence of a successful admission, they would increase trust in the system.

CONCLUSION AND RECOMMENDATIONS

Trust is a significant factor for the uptake of eGovernment services. The findings of the research presented here show that trust towards technology, especially Internet security, is a major concern of many citizens - outweighing concerns of privacy. Citizens (in this case, students) who did use eGovernment services trusted the technology more than those who did not use the

eGovernment services. Although eGovernment does use a variety of measures to enhance online security, these were not visible to citizens who need to be reassured on this issue. Trust in eGovernment affects all citizens. A lack of trust has a negative affect for both eReady and non- eReady users when it comes to using online government services. This research indicates that based on one segment of the population (students) and one of the eGovernment services (UCAS), the credibility of eGovernment has not yet matured nor diffused within the community, which is probably due to the heritage of bureaucracy and

administration systems within the government that required services to be provided face to face. Citizens (in this case students using UCAS) who did not use the eGovernment service had less trust in the credibility of eGovernment, expecting they would not receive a satisfactory service by using UCAS and that delays could occur for receiving the service.

The differences between the online and offline government services, such as lack of admission proof discussed above, reduce the credibility of online government services. As a result, eGovernment is not seen to have an advantage over traditional methods and loses the opportunity of improving the level of citizens' satisfaction in eGovernment, as well as impacting on the belief that governments work in favour of citizens (Thomas, 1998). Therefore, eGovernment needs to review its procedures in providing services online to convince citizens that the services offered can be trusted. This should be in combination with an advertising campaign which focuses on increasing citizens' trust by addressing the issues of technology and eGovernment that have been discussed above.

The research findings have indicated that the three hypotheses have been proven. The first hypothesis was proven since increasing trust and credibility in government in general can lead to a significant effect on diffusing the use of eGovernment services. With respect to the second hypothesis, it was proven since increasing information technology awareness and literacy among the community leads to increasing trust in information technology usage and respectively the use of eGovernment services. Finally, the third hypothesis was proven where with the increase of information technology trust, citizens would start trusting eGovernment services and that could lead to a gradual increase in the usage of such eGovernment services.

The research has demonstrated that each hypothesis is true, and in so doing has highlighted issues that are pertinent to improving successful uptake of eGovernment services. Addressing the concerns of citizens in some cases could easily be carried out (for example, making security practices more visible, validating on-line applications with credible confirmation documents, etc.), and in more general terms familiarizing citizens with the Internet and computer technology in different and accessible ways.

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