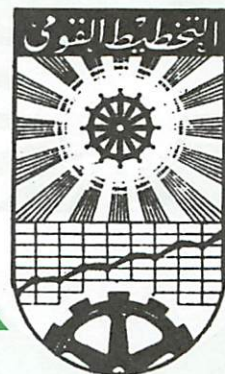


ARAB REPUBLIC OF EGYPT

**THE INSTITUTE OF
NATIONAL PLANNING**



Memo No (1652)

**Towards Developing an Assessment
Metric for
E- services: case study Egypt**

**Main Research: Dr Ann Nosseir
Research Assistant: Muhammad Fathi Afifi**

APRIL 2012

**CAIRO
SALAH SALEM St-NASR CITY**

Towards Developing an Assessment Metric for E-services: case study Egypt

Dr. Ann Nosseir

Main Researcher: Dr. Ann Nosseir

Research Assistant: Muhammad Fathi Afifi

Table of Contents

Abstract.....3

Introduction5

Related work10

Conceptual Framework14

Research Method17

 Measurement.....17

 Data Collection19

Data Analysis and Results.....20

Discussions and Conclusions26

References (Endnote).....29

Abstract

Since the mid 1980s, Egypt has realized significant growth in information and communication technology (ICT) usage across different sectors in the economy. In order to generate economic development and growth, ICT need to be transformed into economic activities offering services, applications and content that create new markets, reduce costs and increase productivity.

In October 1999, a new Ministry of Communications and Information Technology (MCIT) was formed to facilitate Egypt's transition into the global Information Society. The goal of the MCIT is to develop and expand the telecommunications infrastructure, expand the pool of IT skilled labor and create national information systems and databases. Successfully, the Ministry managed to achieve a lot of its goals and provide the context to move on and develop several e-services such as e-learning, e-government, e-commerce, and e-health.

The nature and the characteristics of these services have made them difficult to study. Furthermore, since several developers are involved, this allows a heterogeneous offering of e-applications approaches and makes a delivery of uniform service quality quite difficulty. E-Services, as well, are not easy to communicate because they are intangible. The key factor to encourage and maintain users' interaction and usage is users' perception to the e-services quality. Research in this domain has recommended a wide range of quality dimensions to assess the e-services quality. This research is fragmented and focuses mainly on e-commerce applications' quality. The goal is to investigate the factors determining

the users' perception while using different e- services applications. In other words; the objective of this research is to develop a comprehensive metric to assess users' perception of e-services quality. Having this metric will enable a deep investigation to the current Egyptian e-services.

Introduction

Information and Communication Technology (ICT) is the main pillar to circulate knowledge and information that allow flourishing the economy by creating more business opportunities and improve government and educational services. “Information and communication technology ICT is not a panacea, but a technology that can be made to enhance business performance” (OECD, 2003) ⁱ. A proper utilization to the information and communication technologies (ICTs) in their socio-economic development can function as a significant productive economic force. ICT has the potential to create job opportunities, improve delivery and access to health and education, facilitate information sharing and knowledge creation, and increase the transparency, accountability and effectiveness of government, business and non-profit organization; all of which contributing to an enabling environment for socioeconomic development (Morawczynski, and Ngwenyama, 2007) ⁱⁱ

In this context, the more people and firms use the IT and network, the higher the benefit becomes. Adopting ICT, however, takes time in order to set the infrastructure and train people to acquire IT skills.

In 1999, Egypt has created a Ministry for Communication and Information Technology. Its mission is to coordinate among government agencies and private sector institutions to expand telecommunications infrastructure, develop the IT skilled labour and create national database (Mahboub and Salman , 2007) ⁱⁱⁱ. This

has been translated into a comprehensive national program that includes a number of projects and initiatives namely Egypt Information Society Initiative (EISI). Egypt initial has devoted 2.2% of GDP to expenditure on ICT during the period 1993-2001^{iv}. The economic indicators of the second quarter of 2009/2010 show a good performance. The real growth rate of ICT sector is 12.8%; ICT sector contributes 4.24%to real GDP. ICT sector revenues are EGP 10.37 billion and during the fourth quarter in 2009, the ICT gross domestic product at fixed prices has reached EGP 8.74 billion (ICT, March 2010)^v.

As a start, the focus was on allowing the diffusion of ICT and equal access for all, in other words, e-Readiness, successfully: Internet usage has noticeably proliferated in the last five years. The Internet access costs in Egypt are the lowest among Arab countries, and lower even than those prevailing in the advanced nations. The Word bank ICT indicators show that Egypt's Internet usage per 100 people increased from 0.6 in 2000 to 16.6 in 2008. Generally, gauging the networked readiness of Egypt's position in the world, Egypt's position improves continuously from 99 in 2005 to 76th 2009 and to 70th 2010; meanwhile all other countries in the region either remain rather stable or drop in the rankings year 2009-2010(ICT,2010).^{vi}

Besides the e- readiness, the EISI projects' objectives were in developing socio-economic development applications in tracks like e-government, e-businesses, e-learning and many others to help bridge the digital divide and facilitate Egypt's integration into the global information society (UNCTAD,2006)^{vii}.

E-government applications are of a significant importance as they are a means to reengineer the operation of government, and they are usually designed with the purpose of integrating and managing information in the best fashion. These applications improve government processes by cutting process cost and managing process performance, allowing connecting to citizens, offering citizens the opportunity to share in the decision making process, and greatly improving efficiency and quality. Moving toward this goal effectively, in years 2008–2009, Egypt scored 4.23 to the extent ICTs has been used by the government agencies and to the extent of ICTs used by the government to improve the efficiency of government services, it scored 4.61. These scores are a weighted average between 1 = not used at all to 7 = highly. Looking into the government online service index to assess the quality of government's delivery of online services, Egypt scored 0.53 out of 1 and ranked the 23rd out of 130 countries (ICT, 2010)^{viii}.

E-businesses foster the economy as “transitioning from commodity-based approaches to value added manufacturing and information economies is vital for sustainable development. Appropriate use of high technology products is a gateway for successful economic transition”^{ix}. E-businesses allow a new way of doing business and require creating new technology-based firms, improving workforce skills, using electronic documents, and developing e-payment infrastructure. The Egyptian government has established the Information Technology Industry Development Authority (ITIDA) to enhance the e-businesses infrastructure and ensure implementation of e-signature law. During 2008–2009, the weighted average for the extent Egyptian companies used the Internet for their business activities such as buying and selling goods. Egypt has scored 4.86. This weight is ranging from value 1 for never to 7 for extensively (ICT, 2010)^x.

Deploying and developing eLearning applications are particularly challenging for Egypt given the region's comparatively low literacy rates. Approximately 57.9% are illiterate. To nurture human capital, Egyptian government is exerting a great effort to improve the educational systems quality. One focus is to teach computer skills at elementary, secondary and university levels in addition to training within the vocational and traditional educational system. The aim is to create a new generation of citizens who understand and are comfortable with the use of ICT in their daily lives. The ministry of higher education is in the process of building a national e-Learning centre for higher education. The centre aims at introducing courseware development and delivery among Egyptian universities as well as other higher education institutions. Statistical data in June 2009 on ICT use by the higher education sector show that the proportion of faculties with e-labs of the total number of faculties is 8.3%; the proportion of faculties connected to the Internet of the total number of faculties with computers is 8.8%; and the proportion of faculties with computers of the total number of faculties is 100%(ICT, March 2010)^{xi}.

The Egyptian government also has realized the importance of developing these applications, i.e. e- government, e-business, and e-learning applications, in Arabic to enable access by the majority of the citizens and to protect Egyptian cultural identity. In May 2005, Egypt has started an initiative for digital Arabic content and the Egyptian government represented by MCIT signed a protocol with the Publishers Union and the e-learning and e-business Solutions Union. In this protocol, *(the MCIT finances a project of 13 million US dollars for three years to*

digitize and create an Arabic portal for a number of the available Arabic books in different disciplines.) (ESCWA,2007)^{xii}

With this in mind, evidently Egypt is making clear and successful steps to develop the ICT sector. Now, the Web has rich Egyptian e-government and e-business applications. At least each government agency, private or public, has a Website that provides information or services. Small businesses as well are flourishing. Websites like e.g., <http://www.yallabina.com/> and <http://www.Nefsak.com> are becoming commonly used. To keep this momentum and to allow equal access for all, a deep assessment to the current e-government and e-business applications would help identifying the gaps and areas that require enhancements.

The previous work assessing the Egyptian e-services focused on issues like the critical challenges facing the diffusion of the Internet (Aladwani, 2003)^{xiii}, the e-readiness of the Egyptian government (Azad et.al., 2009)^{xiv} and the public acceptance of this service(Elbeltagi,2007)^{xv}. Little has been done to assess users' perception of applications recently developed. These applications are establishing new concepts for human communication and interaction that affect economies and societies worldwide. Hence, focusing on users' perception in the assessment will allow spotting the strengths and the weaknesses to improve the efficiency and effectiveness of these applications.^{xvi} That triggers the following questions: "how can we assess users' perception? Is there a single instrument that measures users' perception? What are the factors influencing users' perception. How do they influence?"

To answer these questions, this work will combine and synthesize the literature and develop a comprehensive metric to assess users' perception to e-services quality e.g., e-government and e-business. Next, it will investigate the impact of factors like demographic parameters e.g., age, gender, educational back ground, occupation, and internet usage on users' perceptions.

Related work

The choice of individuals to use any system depends on the value perceived of this system to them. The Technology Acceptance Model (TAM) (Davis, et.al., 1989)^{xvii} models how users come to accept and use a technology. The model suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it, particularly, perceived usefulness (PU), which is *"the degree to which a person believes that using a particular system would enhance his or her job performance"* and perceived ease-of-use (PEOU), which is *"the degree to which a person believes that using a particular system would be free from effort"* (Davis, et.al., 1989).^{xviii} Shewhart (Shewhart, 1980)^{xix} differentiates between objective and subjective quality emphasizing that the subjective quality, which is *"the level of perceived value reported by the benefited user,"* has a stronger influence on the application usage than objective quality, which is *"the degree of compliance of a process or its outcome with a predetermined set of criteria that are assumed essential to the ultimate value it provides"* (Magoutas et.al.,2007)^{xx}.

Though studies on e-service perceived quality have been conducted and different scales have already been developed for measuring e-service quality, the existing research on e-service quality has been described as fragmented (Christy,2003)^{xxi} (Costantinides,2004)^{xxii}. Furthermore, the majority of the quality dimensions are

developed for e-commerce applications, which are used to evaluate any e-application, and fewer have targeted e-government applications. This work will survey the current perceived quality dimensions and provide a metric that groups these dimensions into general and application specific.

The set of dimensions of e-business differs from one research to another. Dabholkar (Dabholkar ,1996)^{xxiii} suggested website design, reliability, delivery, ease of use, enjoyment, and control are the main dimensions. Yoo and Donthu(Yoo and Donthu,2001) proposed four dimensions scale called SITEQUAL; ease of use, aesthetic design, processing speed, and interactive responsiveness^{xxiv}. Cox and Dale (Cox and Dale, 2001)used the six dimensions: website appearance, communication, accessibility, credibility, understanding and availability^{xxv}. Wolfinbarger and Gilly (Wolfinbarger and Gilly, 2003) put forward their eTailQ scale includes website design, reliability, security and customer service^{xxvi}. Lociacono et.al.(Lociacono et. al.,2002) set the WEBQUAL scale, which is composed of 12 dimensions informational fit-to-task; tailored communications; trust; response time; ease of understanding; intuitive operations; visual appeal; innovativeness; emotional appeal; consistent image; on-line completeness; and relative advantage^{xxvii}.Parasuraman et. al. (Parasuraman et. al.,1988)recommended the five dimensions of SERVQUAL which are tangibles, the appearance of physical facilities, equipment, personnel and communication materials, reliability, the ability to perform the promised service dependably and accurately, responsiveness, the willingness to help customer and provide prompt services, assurance, the knowledge and courtesy of employees and their ability to convey trust and confidence, empathy, care and individualized attention provided to customers.^{xxviii} Li et. al. (Li et. al.,2009)concentrated on nine dimensions: ease of use, website design, reliability, system availability, privacy, responsiveness and

empathy from the perspective of online companies, and experience and trust from the perspective of customers^{xxix} Chang and Chin(Chang and Chin,2009) presented different dimensions: customer interface quality, perceived security, customer satisfaction, switching costs, and customer loyalty^{xxx}. Cheung et al.(Cheung et al,2003) grouped the medium characteristics of e-commerce into Website design that is considered with social presence, navigation, ease of use, and interface, accessibility , compatibility , functionality , privacy, reliability, security, network speed , network externalities, usefulness, information quality which includes information complexity, information novelty, information architecture, information content, and information accuracy, dynamic pricy strategy, and search attribute. ^{xxxi}

In the area of perception of e-government applications, Alshawwi and Alalwany (Alshawwi and Alalwany,2009) established a set of dimensions for e-government assessment conveying the Citizen's perception there are as follows: performance that includes efficiency, personalized information and services, accessibility which is about efficient user interface, disability access language translation, cost saving that has money saving, time saving, openness, trust which is about trust in the internet, trust in the government, and perccived ease of use and usefulness.^{xxxii} Grimsley and Maahan (Grimsley and Maahan, 2006)^{xxxiii} suggested three main dimensions public value, dissatisfaction, and trust. Public value is about citizen satisfaction, sense of alternativeness, friendliness, commitment, aesthetics, and security. Dissatisfaction is focusing on integrity, functionality, flexibility. Finally trust includes sense of being well informed about initial availability, consistency, and timely feedback, sense of personal control of one's life/ autonomy, and sense of influence according to their time, work, family care, and social life (Grimsley and Maahan, 2006).^{xxxiv}

Faced with a lot of dimensions, research recognized the need to group these dimensions. First, Barnes and Vidgen (Barnes and Vidgen,2002)and categorized these dimensions into eQual metric that have three main classifications to assess e-government service. *Information quality* focused on information, data and system quality. *Interaction and service quality* are about marketing, e-commerce, and IS service quality. *Usability* is about human computer interaction and Web usability.^{xxxv} Second, Constantinides(Constantinides,2004) as well grouped these dimensions factors into functionality, psychological, and content factors. Functionality factors include “Usability” and “Interactivity” elements. Psychological factors are about whether the website and vendor are trustworthiness. Content factors are referring to creative and marketing mix related elements of the Web site which are “Aesthetics” and “Marketing mix”^{xxxvi}. Although the work Alshawwi et al and ^{xxxvii} Grimsley and Maahan ^{xxxviii} showed extra dimensions about e-government quality, clearly none of the previously presented classifications consider these dimensions.

The following sections will investigate two main questions: Are the general dimensions to assess e-services equally important for e-commerce and e-government? What is the impact of factors like demographic parameters e.g., age, gender, educational back ground, and internet usage on users’ perceptions?

Conceptual Framework

We have used the eQual 22 dimensions because it is comprehensive and considers most of the dimensions discussed. These dimensions are grouped into usability, information content, and interaction categories (Barnes and Vidgen, 2002)^{xxxix}. We have added dimensions that affects citizens' trust discussed by Grimsley and Maahan (Grimsley and Maahan, 2006)^{xl} and Alshawwi and Alalwany (Alshawwi and Alalwany, 2009) and elaborated by Pearson et. al. (Pearson et. al, 2007)^{xli} like creating a sense of personal control of one's life, creating a sense of being well informed, creating a sense of influence (ability to comment on the service and give feedback), and conveying a sense of commitment (receiving the services) under category of interaction and dimensions such as providing structured and organized information and conveying appropriate and effective information under the information content category. Our framework model posits that these perceived quality dimensions are affected by variables such as age, gender, educational background, and internet usage (Figure 1).

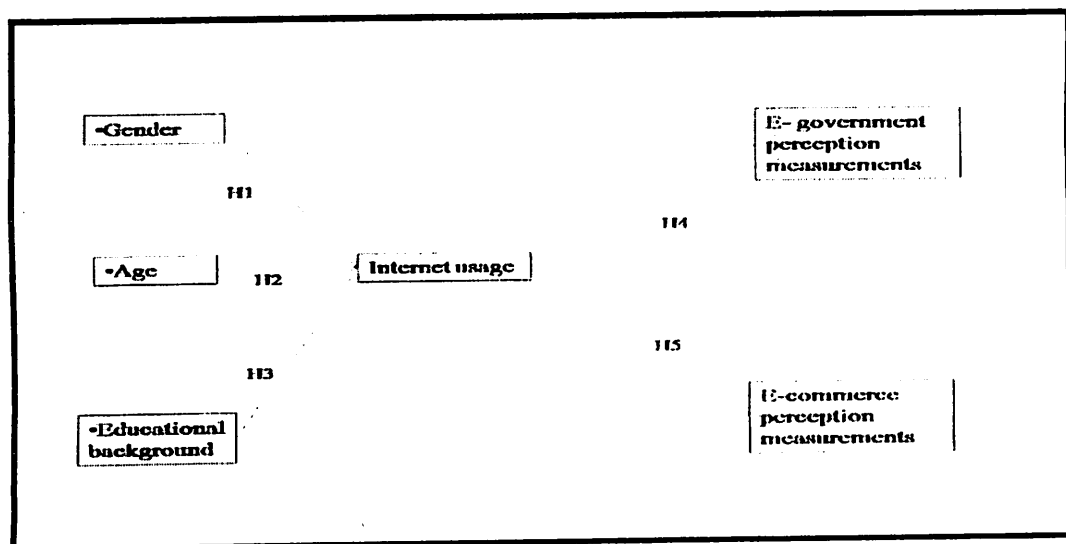


Figure 1 Conceptual Model

The research detailed questions are :

Question 1: is there a relationship between users' gender *and their Internet usage?*

Question 2: is there a relationship between users' Age *and their Internet usage?*

Question 3: Is there a relationship between users' Education background *and their Internet usage.*

Question 4: is there a relationship between t Internet usage *and e-government perceived quality?*

Question 5: is there a relationship between Internet usage *and the e-commerce perceived quality?*

We used a questionnaire to measure consumer perceptions of the research constructs using multiple-item scales (see Table1). Each item was measured on a five-point Likert scale ranging from (1) Strongly Disagree to (5) Strongly Agree.

Category	Items
Usability	<ul style="list-style-type: none"> 1. I find the site easy to learn to operate 2. My interaction with the site is clear and understandable 3. I find the site easy to navigate 4. I find the site easy to use 5. The site has an attractive appearance 6. The design is appropriate to the type of site 7. The site conveys a sense of competency 8. The site creates a positive experience for me
Information Quality	<ul style="list-style-type: none"> 9. Provides accurate information 10. Provides believable information 11. Provides timely information 12. Provides relevant information 13. Provides easy to understand information 14. Provides information at the right level of detail 15. Presents the information in an appropriate format 16. providing structured and organized information 17. conveying appropriate and effective information
Service Interaction	<ul style="list-style-type: none"> 18. Has a good reputation 19. It feels safe to complete transactions 20. My personal information feels secure 21. Creates a sense of personalization 22. Conveys a sense of community 23. Makes it easy to communicate with the organization 24. I feel confident that goods/services will be delivered as promised 25. creating a sense of personal control of one's life, 26. creating a sense of being well informed, 27. creating a sense of influence (ability to comment on the service and give feedback), 28. conveying a sense of commitment (receiving the services)

Table 1. Dimensions

Research Method

Measurement

The questionnaire was tested with an e-commerce and e-government Websites, i.e., Egyptair and Telecom, respectively. The questionnaire was translated into Arabic and tested with the academic and administrative staff at the research institute.

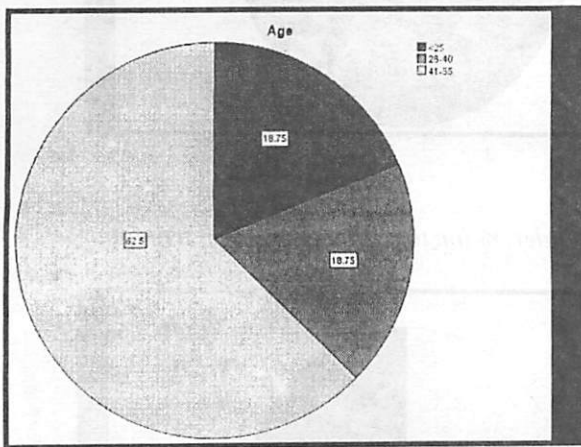


Figure 2

Age% for the e-commerce participants

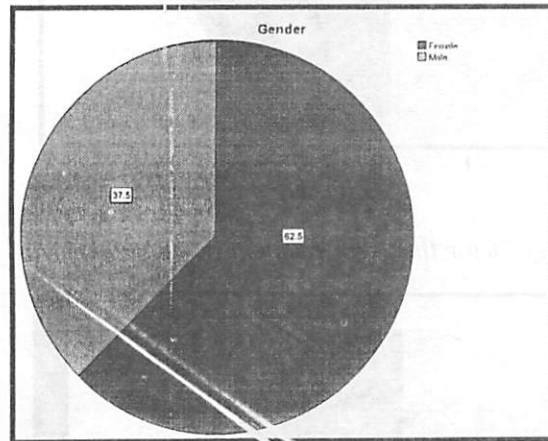


Figure 3

Gender% for e-commerce participants

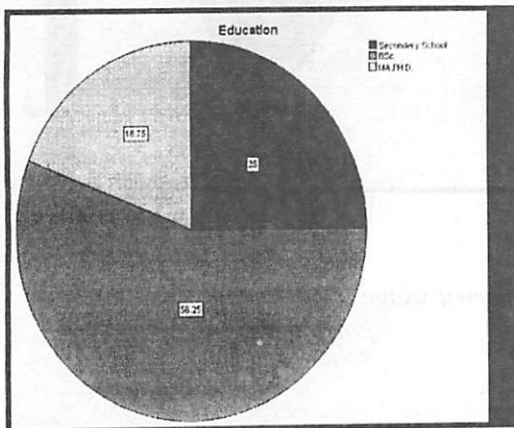


Figure 4

Education % for the e-commerce participants

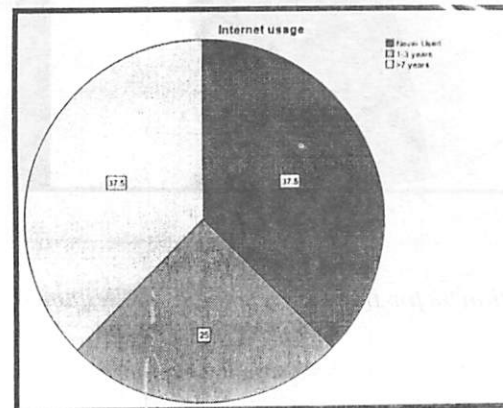


Figure 5

Internet usage % for the e-commerce

participants

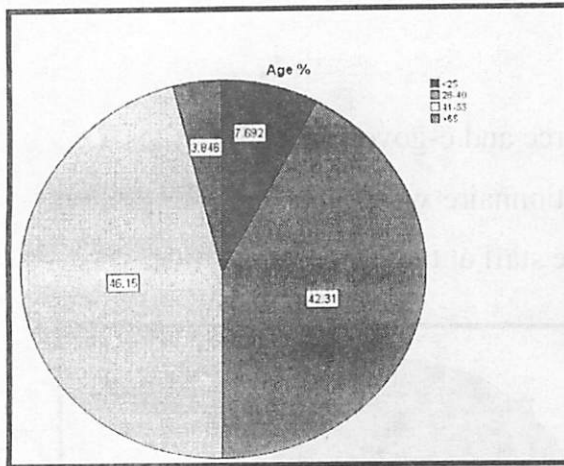


Figure 6

Age % for the e-government participants

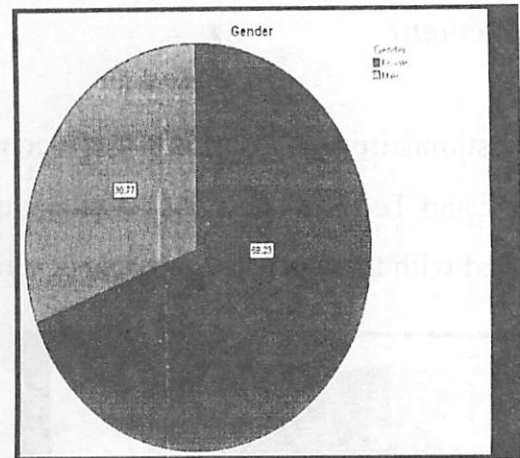


Figure 7

Gender % for the e-government participants

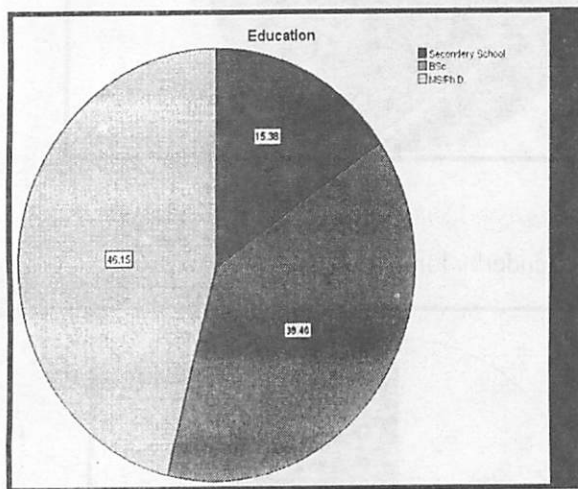


Figure 8

Education % for the e-government participants

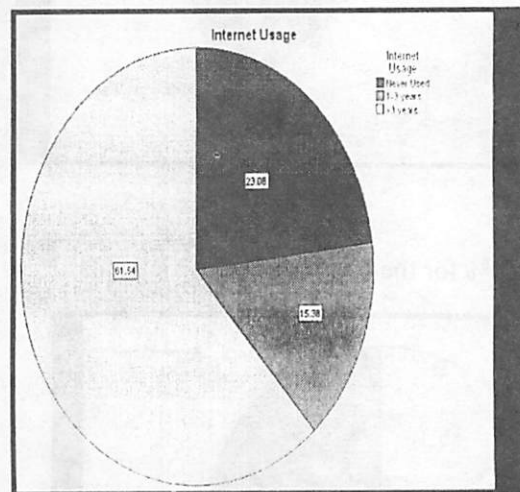


Figure 9

Internet usage % for the e-government participants

Data Collection

Data was collected by a Web survey and we distributed the links to the survey to the participants' e-mail group. To allow testing users with no previous experience with Internet, we have selected the secretaries who have IT skills and use M/S office but Internet. Before answering the questionnaire, there was a briefing about how to use Internet and access the nominated Websites.

Demographically, 42 responses were collected in total, 16 for the telecommunications organization and 26 for the airline. For the e-government participants, 31% of the respondents are male and 69% are female. 4% of the participants are more than 65 years old; 46 % from the age 41 to 55, 42% are aged between 26 and 40 years, 8% were less than 25 years. 46% of the respondents have got a master's and Ph.D degree; 38% have a BS.c. degree ; 15.2 % of the respondents' education are at the institute/ college level; 23% of the participants never used Internet , 15% of the participants used the Internet from a year to 3 years, and 61% have used the Internet 3 years. For the e-commerce participants, 62% of the participants are female and 38% were male. 19% are below 25 years; 19% are between the age 26 and 40 years and 62% are between the age 41 and 55; 56% of the participants have got a BCs degree; 19% have either a MSc or Ph.D degree; and 25% are at the institute/ college level. 37% of the respondents have never used the Internet; 25% have used the Internet between a year to 3 years and 38% of the participants were have used the Internet more than 7 years (See Figure 2,3,4,5,6,7,8,9).

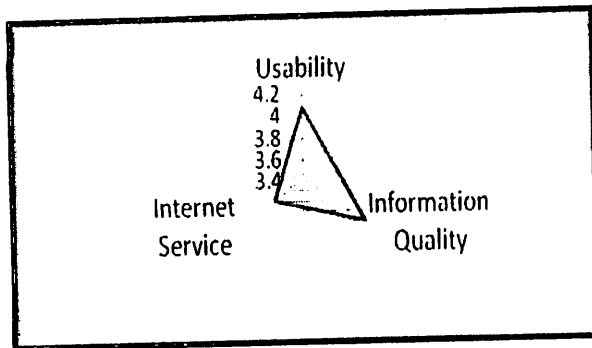


Figure10. Category of e-commerce

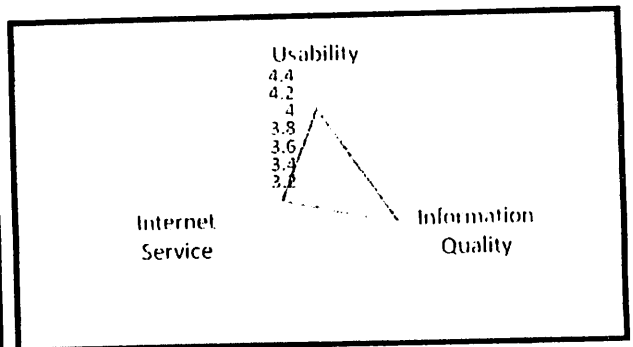


Figure 11. Category of e-government

Usability (mean) 4.06

Information Quality (mean) 4.19

Internet Service (mean) 3.79

Usability(mean) 4

Information Quality (mean) 4.23

Internet Service (mean) 3.67

Data Analysis and Results

Figure 10 & 11 show the mean (average number) of the total results of each category. The *information quality* category of the e-commerce and e-government has been highly perceived and the internet service category is the lowest.

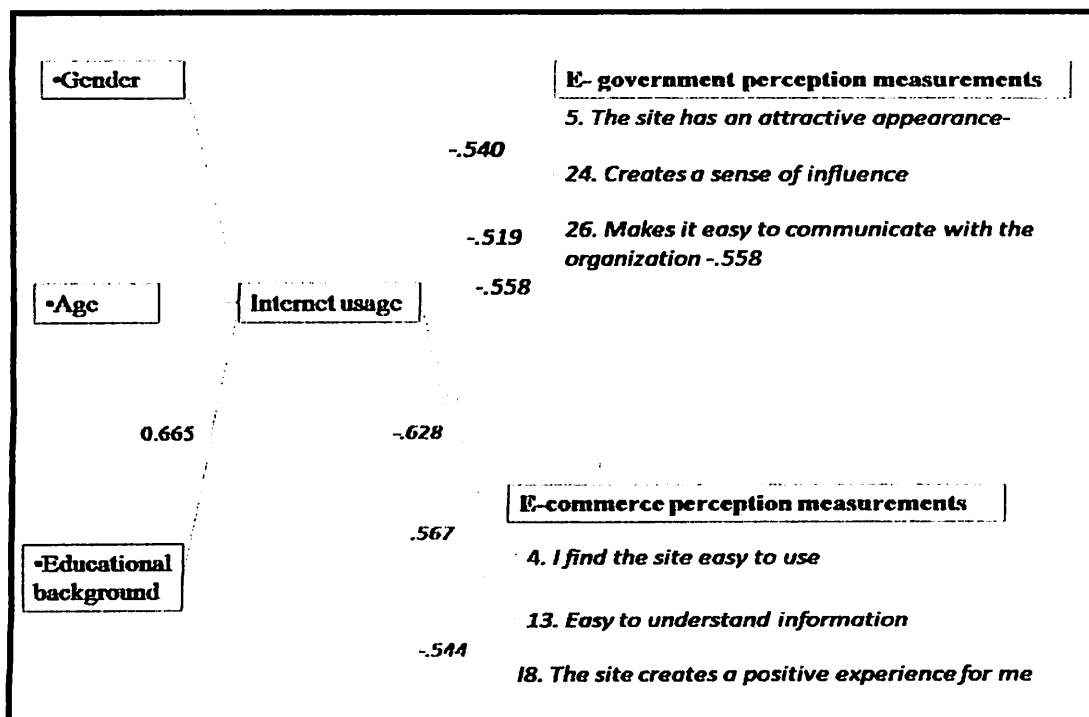


Figure 12 Spearman's rho results

We accept question 3. There is a strong positive Spearman's rho relation between education level and the years of using Internet, for the e-commerce study, $r=0.665$ and for the e-government $r=0.761$. For questions 4 and 5, there is a strong Spearman's rho relation between Internet usage however with particular dimensions. For the e-commerce, there is a strong negative Spearman's rho relation between Internet usage and "4. I find the site easy to use" $R=-0.628$; there is a medium negative Spearman's rho relation between Internet usage and "8. The site creates a positive experience for me" $r=-0.544$; there is a medium negative Spearman's rho relation between Internet usage and "13. Easy to understand information" $r=-0.567$. For the e-government, there is a medium negative Spearman's rho relation between Internet usage and "5. The site has an attractive appearance" $r=-0.540$; there is a medium negative Spearman's rho relation between Internet usage and "24. Creates a sense of influence" $r=-0.519$; there is a medium negative Spearman's rho

relation between Internet usage and “26. Makes it easy to communicate with the organization” $r = -0.558$ (see Figure 12).

Spearman's rho between dimensions

Usability

- 1. I find the site easy to learn to operate > 2. My interaction with the site is clear and understandable R: 0.890
- 1. I find the site easy to learn to operate > 3. I find the site easy to navigate R: 0.685
- 1. I find the site easy to learn to operate > 4. I find the site easy to use R: 0.575
- 1. I find the site easy to learn to operate > 6. The design is appropriate to the type of site R: 0.673
- 1. I find the site easy to learn to operate > 7. The site conveys a sense of competency R: 0.550
- 1. I find the site easy to learn to operate > 8. The site creates a positive experience for me R: 0.618
- 1. I find the site easy to learn to operate > 15. Presents the information in an appropriate format R: 0.581
- 1. I find the site easy to learn to operate > 18. Has a good reputation: R: 0.687
- 1. I find the site easy to learn to operate > 19. It feels safe to complete transactions R: 0.505

- 2. My interaction with the site is clear and understandable > 3. I find the site easy to navigate. R: 0.681
- 3. My interaction with the site is clear and understandable > 4. I find the site easy to use R: 0.701
- 2. My interaction with the site is clear and understandable > 7. The site conveys a sense of competency: 0.513
- 2. My interaction with the site is clear and understandable > 11. Provides timely information: 0.609
- 2. My interaction with the site is clear and understandable > 15. Presents the information in an appropriate format. 540
- 2. My interaction with the site is clear and understandable > 18. Has a good reputation .529

- 3. I find the site easy to navigate > 4. I find the site easy to use. 810
- 3. I find the site easy to navigate > 5. The site has an attractive appearance. 570
- 3. I find the site easy to navigate > 6. The design is appropriate to the type of site. 698
- 3. I find the site easy to navigate > 7. The site conveys a sense of competency. 549
- 3. I find the site easy to navigate > 11. Provides timely information. 599

- 4.I find the site easy to use>11. Provides timely information.609
- 4.I find the site easy to use>15. Presents the information in an appropriate format.540
- 5. The site has an attractive appearance>6. The design is appropriate to the type of site.654
- 5. The site has an attractive appearance>19. It feels safe to complete transactions. 708
- 6. The design is appropriate to the type of site> 7. The site conveys a sense of competency .623
- 6. The design is appropriate to the type of site> 18. Has a good reputation.810
- 6. The design is appropriate to the type of site> 19. It feels safe to complete transactions.609
- 7. The site conveys a sense of competency>18. I has a good reputation.672

Information Quality

- 11.Provides accurate information> 10. Provides believable information.543
- 11. Provides timely information>12. Provides relevant information.622
- 11. Provides timely information>13. Easy to understand information.616
- 11. Provides timely information>14. Provides information at the right level of detail.563
- 14. Provides information at the right level of detail>27. I feel confident that goods/services will be delivered as promised.582
- 15. Presents the information in an appropriate format>27. I feel confident that goods/services will be delivered as promised.550

Table 2 Spearman's rho between *dimensions (e-government)*

Spearman's rho between dimensions

Usability

- 1. I find the site easy to learn to operate>2. My interaction with the site is clear and understandable.709
- 1. I find the site easy to learn to operate>3. I find the site easy to navigate.748
- 1. I find the site easy to learn to operate>12. Provides relevant information.678

1. I find the site easy to learn to operate>22. Clear order and payment process.547

2. My interaction with the site is clear and understandable>3. I find the site easy to navigate.677

2. My interaction with the site is clear and understandable>14. Provides information at the right level of detail.542

4. I find the site easy to use>5. The site has an attractive appearance.686

4. I find the site easy to use>6. The design is appropriate to the type of site.556

4. I find the site easy to use>7. The site conveys a sense of competency.609

4. I find the site easy to use>8. The site creates a positive experience for me.523

4. I find the site easy to use>9. Provides accurate information.600

5. The site has an attractive appearance>6. The design is appropriate to the type of site.705

5. The site has an attractive appearance>7. The site conveys a sense of competency.578

**5. The site has an attractive appearance>28.Implement a dynamic pricing strategy (has promotions and offers)
.658**

6. The design is appropriate to the type of site>7. The site conveys a sense of competency.708

6. The design is appropriate to the type of site>28.Implement a dynamic pricing strategy (has promotions and offers) .718

Information Quality

10. Provides believable information>11. Provides timely information.833

10. Provides believable information>17. It feels safe to complete transactions.677

11. Provides timely information>17. It feels safe to complete transactions.764

11. Provides timely information>18. My personal information feels secure.535

11. Provides timely information>23. Has a clear return policies.506

12. Provides relevant information>17. It feels safe to complete transactions.528

12. Provides relevant information>22. Clear order and payment process.569

13. Easy to understand information>15. Presents the information in an appropriate format.587

14. Provides information at the right level of detail>22. Clear order and payment process.577

14. Provides information at the right level of detail>24. Has a secure transaction system .626

16. Has a good reputation>25. Has a clear description to the product .602

Internet Service

17. It feels safe to complete transactions>18. My personal information feels secure.694

17. It feels safe to complete transactions>19. Creates a sense of personalization.552

17. It feels safe to complete transactions>22. Clear order and payment process.642

17. It feels safe to complete transactions>23. Has a clear return policies.706

17. It feels safe to complete transactions>24. Has a secure transaction system .700

17. It feels safe to complete transactions>27. Provides a wide range of variety to choose from (Sense of alternativeness)
.503

18. My personal information feels secure>23. Has a clear return policy.710

19. Creates a sense of personalization>20. Makes it easy to communicate with the organization.674

19. Creates a sense of personalization>25. Has a clear description to the product.613

20. Makes it easy to communicate with the organization>21. I feel confident that goods/services will be delivered as
promised.670

20. Makes it easy to communicate with the organization>22. Clear order and payment process.669

20. Makes it easy to communicate with the organization>25. Has a clear description to the product .667

21. I feel confident that goods/services will be delivered as promised>22. Clear order and payment process.537

21. I feel confident that goods/services will be delivered as promised>26. Has a clear and obvious promotion .655

22. Clear order and payment process	>24. Has a secure transaction system	.651
23. Has a clear return policies	>24. Has a secure transaction system	.540
25. Has a clear description to the product	28. Implement a dynamic pricing strategy (has promotions and offers)	.508

Table 3 Spearman's rho *between dimensions (e-commerce)*

We have conducted the Spearman's rho test between the dimensions and the categories. Table 2&3 show the details.

Discussions and Conclusions

This work studies users' perception and assess e-services in Egypt to improve their efficiency and effectiveness. The study tested the impact of demographic variables on the Internet usage and consequently the e-services perception. The results show that there is a high Spearman's rho results between education level and using Internet. The higher the education level the longer years Internet is used i.e., the more familiar the Internet becomes. There is Spearman's rho relation between the internet usage and certain dimensions for each e-service, i.e., e-government and e-commerce. More specifically, for the e-commerce, the longer years the Internet is used the lower the perception to "*I find the site easy to use,*" "*The site creates a positive experience for me*" and "*Easy to understand information*". For the e-government, the longer years the Internet is used the lower the perception to "*The site has an attractive appearance*", "*Creates a sense of influence*", and "*Makes it easy to communicate with the organization.*" This gives an indication that expert users are keen to get better interaction with electronic public services. To allow more access to electronic business, the site has to be easy and simple for users to access.

Getting more insight to users' perception for e-services, we found there is a Spearman's rho relation between different dimensions for e-government services, such as finding the site easy to learn and operate and the users feel of the website being safe to complete transactions, finding the website site easy to navigate and use and providing timely information. There is a link between the interactions with the site is clear and understandable and the website provides timely information and has a good reputation. More importantly focusing on the trust aspect, there is a link between feeling safe to complete transactions and the site has an attractive appearance and being appropriate to the type of site, Furthermore, there is a link between feeling confident that goods/services will be delivered as promised and providing information at the right level of details.

For the e-commerce services, there is a link between finding the site easy to use and providing accurate information, and implementing a dynamic pricing strategy i.e., the Site has promotions and offers. Furthermore, there is a link between the attractive appearance and the design is appropriate. The trust which represented by it feels safe to complete transactions and my personal information feels secure is highly linked with providing timely information. Additionally, the perception of the website has a secure transaction system is associated with providing detailed information.

In conclusions, the effort has to be in the direction of integrating the Internet skills from early years of education. This is through developing new obligatory IT curriculums and setting infrastructure of network, Internet connection, software, hardware and training. In addition to the government effort to train government

official, there is a need for public organization to move towards emphasizing circulating papers through Internet in order to force officials to gain the required skills.

Designers, on the other side, in addition to considering the usability elements while developing e-services Websites, have to realize the corresponding dimensions for each e-services type. For example, for e-government, the site has to be clear and understandable to improve perception of providing timely information and to influence trust perception the Site has to have an attractive appearance and provide information at the right level of details. For e-commerce, to influence trust perception, the previous design aspects have to be considered. As implementing a dynamic pricing strategy i.e., the Site has promotions and offers is one of the crucial factors that affects the purchasing decision, the Site has to be easy to use and provides accurate information.

References (Endnote)

1. ⁱ Organisation for Economic Co-Operation and Development (OECD), 2003, *ICT and Economic Growth: Evidence from OECD Countries, Industries and Firms* – ISBN 92-64-10128-4 – © OECD 2003.
2. ⁱⁱ Morawczynski, O and Ngwenyama, O. (2007) Unraveling the Impact of Investments in ICT, Education and Health of Development: An Analysis of Archival Data of Five West African Countries Using Regression Splines, *Electronic Journal of Information Systems in Developing Countries*, **29**, 5, 1-15
3. ⁱⁱⁱ Mahboub, A. and Salman D. (2007), ICT, Market Contestability and Economic Performance: Lessons from ERF Countries By Economic Reform Forum ERF 14th Annual Conference - Institutions and Economics Development Cairo, Egypt, 28 - 30 December 2007
4. ^{iv} Kamel, S., Rateb, D., El-Tawil, M. (2009) ,The Impact of ICT Investments on Economic Development in Egypt, *The Electronic Journal of Information Systems in Developing Countries (EJISDC)*, **36**, 1, 1-21
5. ^v ICT indicator bulletins (March 2010) Ministry of Communication Information Technology
6. ^{vi} The Global Information Technology Report (2009–2010). Information and Communications Technologies In The Arab Countries , 2010 World Economic Forum
7. ^{vii} UNCTAD Report, (2006) UNCTAD
8. ^{viii} The Global Information Technology Report 2009–2010. Information and Communications Technologies In The Arab Countries , 2010 World Economic Forum
9. ^{ix} Kamel, S., Rateb, D., El-Tawil, M. (2009) ,The Impact of ICT Investments on Economic Development in Egypt, *The Electronic Journal of Information Systems in Developing Countries (EJISDC)*, **36**, 1, 1-21
10. ^x (The Global Information Technology Report 2009–2010. Information and Communications Technologies In The Arab Countries , 2010 World Economic Forum
11. ^{xi} ICT indicator bulletins (March 2010) Ministry of Communication Information Technology
12. ^{xii} United Nations Economic and Social Commission for Western Asia (ESCWA) report (2007) ESCWA

-
13. ^{xiii} Aladwani, A. Key Internet Characteristics and E-Commerce Issues in Arab Countries, *Information Technology & People* Vol. 16 No. 1, 2003 pp. 9-20
 14. ^{xiv} Azab,N., Kamel,S. and Dafoulas,G. Suggested Framework for Assessing Electronic Government Readiness in Egypt , *Electronic Journal of e-Government* Volume 7 Issue 1 2009 pp,11-28
 15. ^{xv} Elbeltagi, I. E-Commerce and Globalization: an Exploratory Study of Egypt, *Cross Cultural Management*, *International Journal* Vol. 14 No. 3, 2007 pp. 196-201
 16. ^{xvi} Hyder, A. and Fregidou-Malama, M. Services Marketing in a Cross-Cultural Environment: The Case of Egypt *Journal of Services Marketing* 23/4, 2009 pp.261–271
 17. ^{xvii} Davis, F.D., Bagozzi, R.P. and Warshaw, P.R. User Acceptance of Computer Technology: A Comparison of Two Theoretical Models, *Management Science* (35), 1989, pp. 982 – 1003
 18. ^{xviii} Davis, F.D., Bagozzi, R.P. and Warshaw, P.R. User Acceptance of Computer Technology: A Comparison of Two Theoretical Models, *Management Science* (35), 1989, pp. 982 – 1003
 19. ^{xix} Shewhart, W.A.(1980) *Economic Control Of Quality Of Manufactured Product*, Van Nostrand, The George Washington University
 20. ^{xx} Magoutas,B, Halaris, C.,and Mentzas M.A., G., Wimmer,An Ontology for the Multi-perspective Evaluation of Quality in E-Government Services H.J. Scholl, and A. Grönlund (Eds.): *EGOV 2007*, LNCS 4656, pp. 318–329.
 21. ^{xxi} Cheung, C., Zhu, L. , Kwong, T., Chan, G., Limayem,M.,(2003) *Online Consumer Behavior: A Review and Agenda for Future Research* 16th Bled eCommerce Conference eTransformation, Bled, Slovenia, June 9 - 11
 22. ^{xxii} Constantinides, E., *Influencing the online consumer's behavior: the Web experience*, *Internet Research*,2004, Vol. 14 · No. 2 , pp.111-126
 23. ^{xxiii} Dabholkar, P. Consumer Evaluations of New Technology Based Self-Service Options: An Investigation of Alternative Modes of Service Quality. *International Journal of Research in Marketing*,1996, 13(1), pp. 2951
 24. ^{xxiv} Yoo, B. and Donthu, N. Developing a Scale to Measure Perceived Quality of an Internet Shopping Site (SITEQUAL). *Quarterly Journal of Electronic Commerce*,2001, 2(1), pp. 3146
 25. ^{xxv} Cox, J. and Dale, B.G. Service Quality and Ecommerce: An Exploratory Analysis. *Managing Service Quality*, 2001, 11(2), pp. 121-131

-
26. ^{xxvi} Wolfinbarger, M.F. and Gilly, M.C. COMQ: Dimensionalizing, Measuring and Predicting Quality of The E-tailing Experience. *Journal of Retailing*, 2003, 79(3), pp. 183-198.
 27. ^{xxvii} Loiacono, E.T., Watson, R.T. and Hoodhuc, D.L. WEBQUAL: Measure of Web Site Quality. 2002 Marketing Educators Conference: Marketing Theory and Applications, 2002, 13, 432-437.
 28. ^{xxviii} Parasuraman, A., Zeithaml, V.A. and Berry L.L. SERVQUAL: A Multipleitem Scale For Measuring Consumer Perceptions Of Service Quality. 1998, *Journal of Retailing*, 64(1), 1240.
 29. ^{xxix} Li, H., Liu, Y., Suomi, R., (2009) Measurement Of Eservice Quality: An Empirical Study On Online Travel Service, *Journal: 17th European Conference on Information Systems*, Manuscript ID: ECIS2009-0449.R1, p1-13, 2009, Verona, Italy, 8-10 June
 30. ^{xxx} Chang a, H., Chen, S. Chang, S.W. Chen, Consumer Perception Of Interface Quality, Security, And Loyalty In Electronic Commerce, *Information & Management*, 2009, 46, pp. 411-417
 31. ^{xxxi} Cheung, C., Zhu, L., Kwong, T., Chan, G., Limayem, M. (2003) Online Consumer Behavior: A Review and Agenda for Future Research, 16th Bled e-Commerce Conference e-Transformation, Bled, Slovenia, June 9 - 11
 32. ^{xxxii} Alshaw, S., Alalwany, H. E-Government Evaluation: Citizen's Perspective in Developing Countries *Information Technology for Development*, 2009, Vol. 15 (3), pp. 193-208
 33. ^{xxxiii} Grimsley, M., Meehan, A., Gupta, K. (2006) Evaluative Design of e-Government Projects: A Public Value Perspective: Proceedings of the Twelfth Americas Conference on Information Systems, Acapulco, Mexico August 04th-06th
 34. ^{xxxiv} Grimsley, M., Meehan, A., Gupta, K. (2006) Evaluative Design of e-Government Projects: A Public Value Perspective: Proceedings of the Twelfth Americas Conference on Information Systems, Acapulco, Mexico August 04th-06th
 35. ^{xxxv} Barnes, S. Vidgen, R. (2005) Data Triangulation In Action: Using Comment Analysis To Refine Web Quality Metrics, the 13th European Conference on Information Systems ECIS, conference Rome, Italy
 36. ^{xxxvi} Constantinides, E., Influencing the online consumer's behavior: the Web experience, *Internet Research*, 2004, Vol. 14 No. 2, pp. 111-126

-
37. ^{xxxvii} Alshawwi, S., Alalwany, H. E-Government Evaluation: Citizen's Perspective in Developing Countries Information Technology for Development, 2009, Vol. 15 (3), pp. 193-208
 38. ^{xxxviii} Mike Grimsley, Anthony Meehan, Kushaan Sen Gupta ,Evaluative Design of e-Government Projects: A Public Value Perspective: Proceedings of the Twelfth Americas Conference on Information Systems, Acapulco, Mexico August 04th-06th 2006
 39. ^{xxxix} Barnes, S.J. and Vidgen, R.T. An Integrative Approach To The Assessment Of E-Commerce Quality. Journal of Electronic Commerce Research, 2002, 3 (3), pp. 114-127.
 40. ^{xl} Grimsley, M., Meehan, A., Gupta, K. (2006) Evaluative Design of e-Government Projects: A Public Value Perspective: Proceedings of the Twelfth Americas Conference on Information Systems, Acapulco, Mexico August 04th-06th
 41. ^{xli} Pearson, J., Pearson, A., and Green, D. Determining The Importance Of Key Criteria In Web Usability, Management Research News, 2007, Vol. 30 No. 11, pp. 816-828