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Identifying the Determents of Government E-Service Quality In the UAE

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UAEU



United Arab Emirates University

College of Business and Economics

IDENTIFYING THE DETERMINANTS OF GOVERNMENT
E-SERVICE QUALITY IN THE UNITED ARAB EMIRATES

Mohamed Abdulrahman A. Alahmed

This dissertation is submitted in partial fulfilment of the requirements for the degree
of Doctorate of Business Administration

Under the Supervision of Dr. Ananth Chiravuri

April 2018

Declaration of Original Work

I, Mohamed Abdulrahman A. Alahmed, the undersigned, a graduate student at the United Arab Emirates University (UAEU), and the author of this dissertation, entitled "*Identifying the Determinants of Government E-Service Quality in the United Arab Emirates*", hereby, solemnly declare that this dissertation is my original research work that has been done and prepared by me under the supervision of Dr. Ananth Chiravuri in the College of Business and Economics at the UAEU. This work has not previously been presented, published or formed the basis for the award of an academic degree, diploma or a similar title at this or any other university. Any materials borrowed from other sources (whether published or unpublished) and relied upon or included in my dissertation have been properly cited and acknowledged in accordance with appropriate academic conventions. I further declare that there is no potential conflict of interest concerning the research, data collection, authorship, presentation or publication of this dissertation.

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1/5/2018

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Advisory Committee

- 1) Advisor: Ananth Chiravuri
Title: Assistant Professor
Department of Business Administration
College of Business and Economics

- 2) Member: Kursad Asdemir
Title: Assistant Professor
Department of Business Administration
College of Business and Economics-UAEU

- 3) Member: Yacine Atif
Title: Associate Professor
School of Informatics
University of Skövde, Sweden

Approval of the Doctorate Dissertation

The following Examining Committee Members approved this Doctorate Dissertation:

- 1) Advisor (Committee Chair): Ananth Chiravuri

Title: Assistant Professor

Department of Business Administration

College of Business and Economics

Signature Ananth

Date 26/4/18

- 2) Member: Riyad Eid

Title: Professor

Department of Business Administration

College of Business and Economics

Signature Riyad Eid

Date 26/4/18

- 3) Member: Essam Zaineldin

Title: Associate Professor

Department of Civil & Environmental Engineering

College of Engineering

Signature Essam Zaineldin

Date 26/4/2018

- 4) Member (External Examiner): Kathy Shen

Title: Associate Professor

Faculty of Business

Institution: University of Wollongong, Dubai

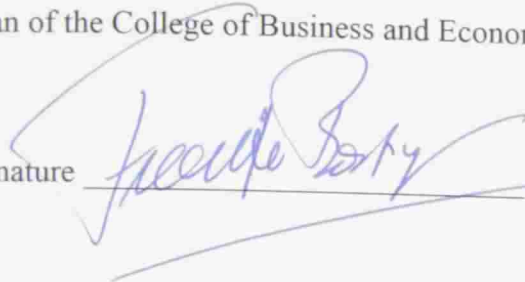
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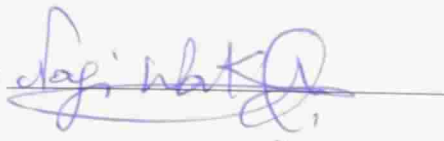


Date

10-05-2018

Dean of the College of Graduate Studies: Professor Nagi T. Wakim

Signature



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Abstract

Globally, government entities are facilitating ever more over-the-internet transactional services. In the Middle Eastern context, the United Arab Emirates (UAE) is at the forefront. Although the Telecommunications Regulatory Authority of the UAE has adopted appropriate e-service quality (ESQ) assessment tools in-house, these tools are designed only for back-end developers, not for gauging end-user satisfaction levels. In light of this, we developed a conceptual framework for the holistic measuring of such citizen opinions. The study incorporated a survey instrument on a sample population ($n = 2,197$) for investigating the ESQ of the UAE Ministry of Interior transactional e-services. Key findings indicate that most ESQ content factors (excepting reliability) and all ESQ delivery factors, along with Trust in government positively impacted the ESQ user perceptions measured in terms of reuse intentions and overall satisfaction levels. However, familiarity with information and communication technology (ICT familiarity) was found to be insignificant. Responsiveness has the largest impact on ESQ perceptions ($\beta = 0.481$; $p = < 0.001$). Interestingly, no differences between the genders were observed, but age, education and nationality all led to statistically significant differences. This research study adds an in-depth case to the relevant literature on public sector e-service provision in the Middle East and also to the one that considers ESQ assessment. The dissertation furnishes some suggestions about the wider and more systematic deployment of the analytical framework in future studies.

Keywords: e-Government; e-Government services; e-Service quality measurement instrument; ICT-mediated service content functions; ICT-mediated service delivery dimensions.

Title and Abstract (in Arabic)

تحديد معايير جودة الخدمة الإلكترونية الحكومية في دولة الإمارات العربية المتحدة

الملخص

على الصعيد العالمي، تعمل الكيانات الحكومية على تسهيل خدمات المعاملات عبر الإنترنت للمتفاعلين. في الشرق الأوسط أن دولة الإمارات العربية المتحدة هي في الطليعة. فعلى الرغم من أن هيئة تنظيم الاتصالات في الإمارات لديها معايير تقييم جودة الخدمات الإلكترونية، إلا أنها مصممة فقط لمطوري البرامج (المبرمجين) وليس لقياس مستويات رضا المتفاعلين لجودة الخدمات الإلكترونية. وفي ضوء ذلك، تم تطوير إطار مفاهيمي لقياس كلي لمشاعر هؤلاء المتفاعلين. فأظهرت النتائج الرئيسية من أداة المسح المصاحبة (الاستبيان لعدد 2,197) حول ما يتعلق بخدمة المعاملات في وزارة الداخلية بدولة الإمارات العربية المتحدة أن معظم عوامل المحتوى لجودة الخدمات الإلكترونية (باستثناء الموثوقية) وجميع عوامل التوصيل لجودة الخدمات الإلكترونية جنباً إلى جنب مع "الثقة في الحكومة" يؤثر بشكل إيجابي على تصورات المستخدم لجودة الخدمات الإلكترونية الذي يقاس من حيث نوايا إعادة الاستخدام ومستويات الرضا الشاملة. كما وجد أن الإلمام بتكنولوجيا المعلومات والاتصالات (الألفة في تكنولوجيا المعلومات والاتصالات) غير ذي أهمية، وأن "الاستجابة" لها أكبر تأثير على إدراك جودة الخدمات الإلكترونية. ومن المثير للاهتمام أنه لم تلاحظ أي اختلافات بين الجنسين إلا أن العمر والتعليم والجوانب كلها أدت إلى اختلافات ذات دلالة إحصائية. وعليه يضيف هذا البحث حالة متعمقة إلى الأدبيات المتعلقة بتوفير الخدمات الإلكترونية للقطاع العام في الشرق الأوسط، وكذلك إلى دراسات تقييم جودة الخدمات الإلكترونية. وفي الخاتمة يقدم هذا البحث اقتراحات فيما يتعلق بالنشر الأوسع والأكثر انتظاماً للإطار التحليلي لهذه الدراسة.

مفاهيم البحث الرئيسية: الحكومة الإلكترونية؛ خدمات الحكومة الإلكترونية؛ أدوات قياس جودة الخدمات الإلكترونية الحكومية؛ وظائف محتوى الخدمات الإلكترونية؛ وسائط توصيل الخدمات الإلكترونية.

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Dedication

To beloved parents, family members, and the UAE that I am proud to belong to.

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Glossary and List of Abbreviations

CDT	Cognitive Dissonance Theory (see, e.g., Bhattacharjee, 2001; Bhattacharjee & Premkumar, 2004).
CSL	The Customer Service Lifecycle model (Ives & Learmonth, 1984).
EDT	Expectation-disconfirmation Theory (Oliver, 1980, 1993; Oliver & Swan, 1989).
EGDI	e-Government Development Index, a United Nations rubric (United Nations, 2016).
e-Government	E-government (or e-government) means the utilisation of ICT to improve and enhance the efficiency and effectiveness of government service delivery to citizens (G2C), business (G2B) and transactions within and between government agencies (G2G).
EPI	E-Participation Index (United Nations, 2016)
e-Services	An e-Service is a service delivered by way of information technology. According to Rowley (2006), there are three core elements: service provider, service receiver and the ICT channel of delivery. Instance, an e-government service comprises i) the public entity that is the service provider ii), the citizens as well as businesses that are the service receivers, and iii) the channel of service delivery (e.g. once primarily the fixed-line telephone but now increasingly the Internet and mobile app-based technologies).
ESQ	Used by this study to mean e-service quality bit can also be form-services and this “over the Internet services.”
ES-QUAL	This is a survey scale devised by Parasuraman, Zeithaml, and Malhotra (2005) that is designed to assess four dimensions of e-service quality that are: efficiency, fulfilment, system availability and privacy.
ICT	Information and Communications Technology
Internet of Things	This term, sometimes abbreviated to IoT in the literature, can be seen as the new infrastructure for interconnecting (physical and virtual) things over the Internet, which enables ‘things’ such as fridges to connect to the Internet to reorder milk when such a product is detected to be low.
IS	Information System(s) are the collection of technical and human resources that provide the storage, computing, distribution, and communication for the information required by all or some part of an enterprise.
MENA	The Middle East and North Africa
M-Services	All G2C services accessed by way of a mobile application

Glossary and List of Abbreviations (Continued)

Over the Internet	This is a term used in this study that, when used, is taken to cover both e-services and m-services. While distinctions exist and are sometimes drawn, in line with scholars such as Archer (2014), the present study considers m-services to be part of the broader e-services architecture.
RFC	Readiness for Change, an organisational theory first set out in the 1940s has taken on new relevancy concerning society and government's readiness to change in light of ICT.
SERVQUAL	A 22-item instrument for assessing customer perceptions of service quality in service and retailing organisations (Parasuraman, Berry, & Zeithaml, 1991; Parasuraman, Zeithaml, & Berry, 1988).
SSF	Supporting Services Functionality, the use of ICT to deliver services that support a core product or service.
TAM	Technology Acceptance Model, devised by Davis (1989) that was designed to understand how individuals (a) come to accept and (b) begin to use a given technology. Typically, a TAM stipulates that some factors influence a given individual's decision about how and when they to use the item of technology. Significant revisions to TAM include those by Venkatesh, Morris, Davis, and Davis (2003); Venkatesh and Bala (2008).
TOG	Trust of Government
TOI	Trust of the Internet
TPB	Theory of Planned Behaviour (see: Ajzen, 1991; Ajzen & Fishbein, 1980)
TRA	The UAE's Telecommunication Regulatory Authority
TRI	Technology Readiness Index, as set out by Parasuraman (2000), focuses on user reactions to technology with a multiple-item scale to measure the phenomena.
UTAUT	Unified Theory of Acceptance and Use of Technology (see, e.g., Venkatesh et al., 2003; Venkatesh, Thong, & Xu, 2012)

Chapter 1: Introduction

The Internet is now a ubiquitous virtual information sphere and has transformed society in a range of systemic ways. These include how citizens carry out various transactions with governmental agencies. As a consequence of the Internet—which is at the heart of this transformation—are the so-called disruptive technological innovations which are fundamentally changing many economic, social and political interactions (e.g., Cadwalladr, 2017; Sardar, 2010). It follows that the accessibility and widespread availability of ICT has significantly changed the way in which services could be provided to and accessed by both the private and public-sector organisations. While the Internet is a prerequisite and *de facto* information enabler, one-factor driving government-to-citizen services (G2C)- especially those online - is the availability and accessibility of the e-services 24/7, which represent efficiency gains from government's perspectives (Schnoll, 2014; West, 2007).

As was emphasised in a report commissioned by the UAE Federal Government, new digital technologies emphasising speed and mobility are bringing about significant paradigm changes through which the community interactions do manifest and take place. Pertinent to this research, the report stated that “*ICT enables governments to radically transform their complex bureaucracies [and be more] citizen-centric.*” (UAE Government/Accenture, 2014, p. 8).

The UAE already has a considerable e-government presence, and thus this research fits with the fourth phase of the four-stage Gartner Model for e-government: “*the transformation of an existing electronic presence*” (Baum & Di Maio, 2000). More specifically, it looks at how the existing e-government infrastructure can be enhanced

(and made more end-user friendly and responsive). Indeed, its motivating purpose is to conceptualise and then validate an analytical framework model capable of assessing the public service quality provided online (i.e., transactional e-services) by the UAE e-government entity. As this dissertation predominantly focuses on the assessing and benchmarking of e-service quality (ESQ) of the public sector, the primary focus will be on the models, approaches, and methodologies that concentrate on such assessment.

Arguably, no model yet exists that is generalizable to all cultural and socioeconomic contexts. Between countries and cultures, there are differences regarding attitudes towards, and acceptance of, technology; this phenomenon is known as *the digital divide*. Different countries and their citizenries will also exhibit differing levels of trust: be it concerning their government or about carrying out ‘over the Internet’ transactions. Lastly, the digital divide in some countries will be far more pronounced than in others (e.g., United Nations, 2016; Wittendorp, 2017).

The digital divide would mainly be manifesting along with the economic lines; however, other factors are involved, such as age, gender, and educational attainment levels (e.g., Alenezi, Ali, & Kumar, 2015; Chung, Park, Wang, Fulk, & McLaughlin, 2010; Gauld, Goldfinch, & Horsburgh, 2010; van Deursen & van Dijk, 2011). Such a divide is not only a concern for politicians seeking equality and fairer societies but also for ICT practitioners. At present, any ‘objective’ assessment from the end-users of a given public sector e-service is likely to be impacted by a range of exogenous factors that do not explicitly related to the service in question’s technical content functions and delivery dimensions.

There is currently a growing body of scholarly literature focusing on the suitable patterns that the e-government entities in the Middle East and North Africa region (MENA) could implement to provide e-public service conveniently. For example, Fakhoury and Aubert (2015) investigated the behavioural intentions towards government e-services in Lebanon, while Abu-Shanab (2017) examined similar attitudes in Jordan. Within the Arabian Gulf context, Al-Gahtani, Hubona, and Wang (2007) and Alfalah, Choudrie, and Spencer (2017) investigated the extent of e-public service adoption in Saudi Arabia, while Khalil and Al-Nasrallah (2014) tackled the traffic violation e-payment system in Kuwait. And, in the context of UAE, Rodrigues, Sarabdeen, and Balasubramanian (2016) utilized the *Unified Theory of Acceptance and Use of Technology*- UTAUT (Venkatesh et al., 2003) to study about the adoption of e-government, while Ahmad and Khalid (2017) relied on the Davis's TAM (1989) to study about the adoption of m-government services.

While this study will consider these two-contemporary works in some detail, it is different in aim, purpose and scope. This dissertation focuses on post-adoption and users' interaction and emphasises the quality aspects of a transactional e-service. It also develops an analytical framework model compatible with the back-end ICT practitioner e-service design/delivery rubrics of the extant UAE Telecommunication Regulation Authority (TRA) (UAE TRA, 2014).

Distinctions between the work of Rodrigues et al. (2016) and the present study include the following: the former considers factors such as "Internet Usage", and it uses as an outcome variable "E-government adoption." The Independent Variable (IV) factors it uses to derive "Overall Satisfaction" (which feeds into E-gov adoption) are an expectation based and do not focus in particular detail on either e-service content

aspects or e-service delivery aspects. Similarities are evident regarding ‘trust’ and “attitude toward using technology” being factored in.

There are also a series of differentiators between the work of Ahmad and Khalid (2017) and the present study. The former has as its dependent variable (DV): “User intention to adopt mobile government (services) in the UAE.” As per the TAM construct. Ahmad and Khalid (2017) adopt “perceived usefulness” and “perceived ease of use.” It also has constructs that assess “cost,” “social influence” and, “variety of services.” One similarity is the use of “Trust” construct as an IV. However, the present study focuses explicitly on trust in government.

Both Rodrigues et al. (2016) and Ahmad and Khalid (2017) control for various demographic delimiters. Like the current study, both consider gender. However, Rodrigues et al. (2016) did not consider age; in contrast, Ahmad and Khalid (2017) did not consider nationality or education level. Both of these works also have rather small sample sizes (380 and 120, respectively, compared to this study’s $n = 2,197$) and they both sampled only students in higher education. The present study has a far broader demographic range (i.e., considering the UAE citizen/resident who holds a driving licence).

The conceptual model set out in this dissertation (Figure 1; p. 17) demonstrates the bundle of the MOI e-services (see Appendix A). The conceptual framework also benefited from the existing models developed by many researchers in the field (e.g., Cenfetelli et al., 2008; Verdegem & Verleye, 2009; Papadomichelaki & Mentzas, 2012; Venkatesh et al., 2012; Tan et al., 2013), as shown in Appendix B. Context-wise and utility-wise, this dissertation was informed and tailored to the scales and

descriptors that the UAE Federal Government has formulated as part of its Government e-service quality criteria rubric (Government of the UAE, 2014; UAE TRA, 2013; 2014).

Before setting out the scope and significance of this dissertation (Section 1.4), the stated research problem (Section 1.5) and the proposed hypotheses (Section 1.6), the next section will gloss over the global ICT transformation currently underway. Also, we will answer what precisely e-government is considered to be, and will appropriately frame ESQ (introducing the key applied and theoretical works that assess and ultimately, seek to enhance public sector e-service provision).

1.1 The ICT Transformation, e-Government and ESQ

The Internet has fundamentally changed the landscape of information availability and access. Such as the way people work, communicate and conduct social, private and public transactions. Therefore, the Internet has become a virtual vehicle of digital documents and data across a boundary-less cybersphere and stored collectively at a multinational corporate server farm (i.e., utilising Internet-enabled cloud computing).

Regarding transactions, they are increasingly done by way of electronic gadgets and corporately owned applications (e.g., Google for email, Apple for media streaming, alongside Microsoft and Dropbox, for within and between company cloud computing collaboration). In the UAE, the average individual is said to spend around 6 hours per day interacting with social media (Maceda, 2016). In fact, the Arabian Gulf is known to have among the world's highest per capita users for platforms like YouTube, Snapchat and Twitter subscribers (e.g., Arab News, 2015; Radcliffe, 2017).

Privacy articulated as Trust of the Internet (TOC) or as Trustee of Government (TOG) is a core concern of the e-service users worldwide as they are willing to forego it to benefit from the convenience of modern technology (e.g., Venkatesh et al., 2012, p. 119). For instance, Amazon and Samsung are storing user voice messages through so-called *always-on devices*, which could answer any question that comes to one's mind and assist with mundane tasks, such as compiling shopping lists and adding songs to online playlists (e.g., Hill, 2017; Rupinta, 2017). As Sardar (2015) states, our lives are increasingly lived online (via, e.g., Facebook or Facebook-owned Instagram and WhatsApp).

Within the realm of ESQ assessment, nonetheless, ICT familiarity remains an important consideration but is increasingly a question better framed about digital divide (e.g., Alfalah et al., 2017; Gauld et al., 2010; Wittendorp, 2017). The importance of models of user perceptions assessment-- developed by Davis (1989); Venkatesh et al. (2003); Parasuraman (2000), and Venkatesh and Bala (2008)-- might become less relevant in time, where ICT usage is set to become universal, while considering the push towards the Internet of Things (The National, 2017b). However, equitable access and trust in the post-Snowden era will likely remain as factors influencing citizen adoption and satisfaction concerning the public-sector provided e-services (Radcliffe, 2017).

Turning now to e-government, while the term is not synonymous with e-governance, there are some overlaps. E-governance encompasses change theory and considers behavioural and political factors to a greater extent than does the literature that primarily considers the quality of e-services provided by any given public-sector entity. E-governance is a broader concept than e-government in that it also includes,

among other considerations, the relationship between government employees, elected or appointed, and society at large (Alathmay, 2015; Layne & Lee, 2001; Yildiz, 2007). Thus, e-government can be taken to mean the usage of a wide range of transmission mechanisms and a wide range of ICT applications and platforms for “delivering government information and services to citizens” (UN/ASPA, 2002, p. 1).

The relevant literature broadly categorised the e-government services into two types i) informational, and ii) transactional. As articulated by Norris and Moon (2005), informational services are referred to the delivery of government information over the Internet, and transactional services are those involved in two-way transactions between the governmental entity and citizens (the end-users). Yet, as mentioned earlier, the revelations made by former CIA agent Edward Snowden, have raised public concerns about online vulnerability and the trustworthiness of public services, which according to Belanche, Casaló, Flavián, and Schepers (2014, p. 627) have led citizens “to reconsider their decisions” in relation to sharing, “private information through e-services” (see also, Cadwalladr, 2017; Grassegger & Krogerus, 2017; Greenberg, 2016).

Therefore, while perhaps it is a given that ICT-enabled services can increase the efficiency of public administrations, they will only be capable of achieving such productivity gains when the majority of citizens use and continue to use such e-services as their default (and preferred) transactional medium. The non-ESQ factor of ‘Trust in government’ then is a crucial consideration when it comes to the designing and assessment of such services.

Looking lastly at what this dissertation terms as e-service quality (ESQ), a prior work has noted the importance of design (e.g., Chase & Apte, 2007; Karwan & Markland, 2006; Narasimhan, Talluri, Sarkis, & Ross, 2005) and delivery (Cenfetelli et al., 2008; Tan et al., 2013). The design of user-centred e-government services is a challenge and complex task, as demands, needs, and requirements for end-users that had changed to become increasingly more sophisticated. As all UAE adult residents, nationals and non-nationals, are potential consumer/user of government services, understanding requirements will necessarily have a significant impact on new service development, and thus it is of both applied and academic utility to examine essential service attributes that affect usage and satisfaction levels (e.g., Froehle & Roth, 2004; Maruping, Venkatesh, & Agarwal, 2009; Venkatesh et al., 2012).

While there has been progressing in understanding users' adoption of services, little attention has been devoted to understanding users' preferences, particularly related to trade-offs between different service attributes. Understanding the trade-offs is important, as designing a good, usable online service frequently requires trade-offs across multiple design characteristics (Karwan & Markland, 2006). A high level of security for public sector transactional e-services may be desired for example, but if the use of security mechanisms make the transaction cumbersome, this may well put users off.

1.2 “Over the Internet” E-government Services in the UAE

The UAE government has been proactive in fostering and implementing some e-government initiatives for over a decade now (Government of Abu Dhabi, 2008; Government of the UAE, 2012). In June 2013, the Government of Dubai, one of UAE

federal government entities, decided to change the name of their e-government initiative to Mobile Government (m-Government), to prioritise the “delivery of government service to the public through their mobile phones” (United Nations, 2014, p. 118). Incidentally, as far back as 2007, PC and laptops were being termed as ‘traditional’ (e.g., Massey, Khatri, & Montoya-Weiss, 2007).

Although this second transition looks set to be the future, m-services (if one defines it as accessing e-government via a smartphone) will not by default always be via an application. As the World Telecommunication/ICT Indicators Database 2014 makes clear while the UAE has one of the world’s highest active mobile-broadband subscriptions at 89 per 100 inhabitants—the UK has 87 while the US has 93—the percentage of the UAE’s Internet traffic by device shows that 60 percent is accessed directly by a Desktop PC (Webcertain Group, 2014).

Nonetheless, it is evident that e-services are increasingly being replaced by m-services (mobile device ‘Apps’), but as will be explained, fundamental elements of the instrument developed and deployed for this study are transferable. In other words, many of the factors used to gauge user sentiment and perception of an e-service will equally apply to m-services. In line with authors such as Archer (2014) and Schnoll (2014), a sound argument can be made for placing m-services within part of the overall e-service architecture. As such, this study uses the term: ‘over the Internet’ services to envelope both e-services and m- services. According to the recently published United Nation’s report on e-government development and depth globally, three Arabian Gulf countries are in the top 20 regarding their integration of e-services, the roll-out of m-government applications and for their provision of opportunities for e-participation (United Nations, 2014, pp. 46-47). The UAE has the Middle East’s second most

comprehensive level of e-government with an “E-Government Development Index” (EGDI) of 0.7136—only Bahrain is higher with an EGDI of 0.8089 (United Nations, 2014, p. 28). The UAE’s EGDI is notably higher than both the global and regional averages (0.4712 and 0.4951, respectively).

According to the EGDI, between 2014 and 2016, four more countries had achieved very-high-EGDI values (i.e., EGDI values greater than 0.75). Of the four new countries that joined this group of top performers, one was the UAE (United Nations, 2016, p. 107). Regarding readiness, the UAE is ranked first among all MENA countries on the Networked Readiness Index, issued by the World Economic Forum, and 26th globally (WEF, 2016). As Rodrigues et al. (2016, p. 19) articulated, UAE government provided e-services have experienced a “paradigm shift” in recent years, “moving from a government-centric service delivery approach to a user-centric one.” Therefore, end-user involvement and perception of quality are essential to measure by which to ensure services become user-centric to an acceptable level.

The UAE has a considerable array of government e-services and m-services, at the local and federal level—For example, both the Emirates of Abu Dhabi and Dubai have their own set of e-government and e-service goals and ambitions (The National, 2017a). On the one hand, there is a case to be made that duplication of similar services might result in inefficiency and confusion within and between government entities and also for the customer (whether businesses or citizens or residents). Authors such as Hvidt (2013) fear such a state of affairs may lead to a waste of resources and encourage more instead of less state protection. However, on the other hand, it might equally be argued that such a state of affairs is transitional and will foster innovation and bring about a refined and streamlined suite of services in the coming period.

This point has been discussed in a slightly different context: that of the Arabian Gulf's transition towards a knowledge-based economy and how, in instances, the countries of the GCC, and even the Emirates of the UAE are creating similar industrial and service sector hubs to one another. Forstenlechner and Rutledge (2010) consider this to be healthy in that it should foster competition and result in efficiency and productivity gains. In 2009, the UAE adopted a strategic "National Agenda," called "UAE Vision 2021," (UAE Prime Minister's Office, 2010). A close reading of this along with the Emirate of Abu Dhabi's "2030 Economic Vision" highlights the extent to which the UAE seeks to create a comprehensive and seamless e-government architecture (Government of Abu Dhabi, 2008), which is demonstrated that the Government of UAE has issued detailed guidelines concerning how public sector entities from a back-end developer's perspective) should design and delivery (Government of the UAE, 2014; UAE TRA, 2013; 2014).

1.3 Scope and Significance

The scope of this dissertation is limited to a single UAE government transactional e-service. It will focus on the Ministry of Interior's traffic penalty payment service. However, while this is limited, the depth of the analysis is not. Indeed, this study builds from scratch a conceptual framework model for ESQ assessment (depicted in the illustrative form in Figure 1; p.17). It seeks, in a holistic way, to provide a comprehensive instrument for assessing user sentiment and perception of such services. The findings will add value to the literature on ESQ assessment and particularly that which considers e-government transactional services. It also makes a significant contribution due to the conceptual and theoretical model used and also because it will be among the first to explicitly consider the context of the UAE.

At a more practical level, that of the practitioner, it will guide the MOI—as well as other departments (governmental or semi-governmental bodies) that are seeking more user-centric assessment methodologies and rubrics for determining the services which they currently provide to the public. In addition to this, a number of gaps in the literature exist in relation to the MENA e-service literature. By setting out a new analytical framework and by offering insight into the demographic differences (where they exist) about ESQ perceptions and sentiments in the UAE, this study helps fill those gaps. In sum, while the scope is limited in its focus on one service, it is ambitious in that the analytical framework designed and contextualised for this study is done so with broad generalisability in mind.

The research is of particular significance for some reasons not least because, despite the significant improvements in e-government development in the past decade, some challenges remain in the content and delivery of user-friendly and customer-focused online services to citizens/residents (UAE Prime Minister's Office, 2010). It is therefore of contemporary relevance because it ties in with the UAE government's smart governance (UAE Government/Accenture, 2014) and "Internet of things" ambitions (The National, 2017b). The *Internet of things* may be defined as the creation of new products and business models by way of combining physical and digital components to the Internet and is now feasible for almost any product as hardware costs are now so low (Wortmann & Flüchter, 2015, p. 222).

The study reported here is of both academic and applied significance. It helps fill some gaps in the extant literature, and it offers practitioners with an analytical framework capable of assessing a broad range of public sector provided over the Internet services. As stated, all UAE government agencies are expected to adopt and conform to the

detailed guidelines and benchmarks set out by the TRA, about their e-service provision. It should be noted that these guidelines are technical and are designed for those tasked with providing the services (i.e., the decision makers and senior ICT staff within the given government agency). This study will be the first to conceptualise and operationalise a model and scales capable of assessing the extent to which users of such transactional e-services within the UAE are experiencing or perceiving ESQ. In doing so, this study aims to better understand and address issues related to the low adoption and usage of transactional e-services within MOI in UAE which are currently below the targeted estimate.

1.4 Research Aim and Problem

This study aims to build on ESQ assessment tool for the MOI. It would be a tool focused on transactional services and one that concentrates on capturing first end-user sentiments. In essence, the problem is simple to articulate, but profoundly more difficult to address. The problem this research seeks to address is how exactly might an analytical framework be developed which can easily (implementation and update wise) gauge end-user sentiments on a government-provided transactional e-service. At first gloss, a straightforward satisfaction survey may seem to suffice but such an instrument would not by definition capture the indirect effects of factors like trust in government or degree of ICT familiarity. At second glance, there is an argument to be made for merely using an existing assessment model such as the “ES-Qual” model developed by Parasuraman et al. (2005) or the “e-GovQual” model that is both more contemporary and indeed bespoke to public sector service providers (Papadomichelaki & Mentzas, 2012).

There would be merit in testing both in the UAE context, but this study placed within a unitary analytical framework constructs to match the TRA's criteria and those that are non-ESQ specific but very much relevant to the context, such as trust in government and ICT familiarity. Therefore, this step aimed at seeking to refine, improve, and tailor a conceptual framework based upon those above and the works of others, such as Cenfetelli et al. (2008), Verdegem and Verleye (2009), Venkatesh et al. (2012) and Tan et al. (2013). Therefore, the research problem of this dissertation set out as follows: *“Determining and testing a methodologically sound framework (conceptual model and survey instrument) for assessing the quality of the UAE government transactional e-services from customers' viewpoint.”*

Regarding deriving testable hypotheses, it is necessary to develop some propositions initially as a basis, to derive hypotheses subsequently. It will be argued that:

- 1) It is both advantageous and possible to develop a scale that can inform and assist back-end ICT developers at government entities about how the transactional e-services they provide are perceived regarding both service content and service delivery qualities by end-users.
- 2) The more positively perceived a government transactional e-service is, the more likely will be “reuse intentions” (adoption) and, having this information will enable back-end ICT developers about refining and updating them over the Internet transactional services.
- 3) Non-ESQ-specific factors such as trust in government and ICT familiarity are considered to impact overall ESQ perceptions, and so it is both advantageous and possible to incorporate such factors into the analytical assessment framework.

Last but not least, research on public-sector ESQ has yet to derive any semblance of a universally accepted (and applicable to all) analytical framework. As Kohlborn (2014) states “*the models that exist are rather diverse if compared to those that have been developed for the private sector*”. This study then also aims to introduce a contemporary analytical framework that is designed to be generalizable and tailored to gauge, in a holistic way, the end-user perspective on public-sector hosted transactional e-services. Also, it will add a valuable and timely contribution to the MENA e-service literature. Alongside this, it will present a new analytical framework and thirdly, offer insight into the demographic differences (if any) about end-user perceptions of ESQ.

1.5 Research Hypotheses

The components of what it is that comprise e-service quality in this regard are firstly divided into two groups: (1) quality of content; and (2) quality of delivery. Each of these is covered in a dedicated chapter (Chapter 3, p. 51- onwards) but in short: H₁ to H₃ consider standard ESQ content components. H₄ to H₆ consider standard ESQ delivery components. As listed below, hypotheses H₇ and H₈ consider the impact of these two exogenous factors.

- H₁.** Usability will enhance end-user ESQ perceptions.
- H₂.** Information quality will enhance end-user ESQ perceptions.
- H₃.** Reliability will enhance end-user ESQ perceptions.
- H₄.** Responsiveness will enhance end-user ESQ perceptions.
- H₅.** Assurance levels will enhance end-user ESQ perceptions.
- H₆.** Customer service support will enhance end-user ESQ perceptions.
- H₇.** Trust in government will positively impact end-user ESQ perceptions.

H₈. ICT familiarity will positively impact end-user ESQ perceptions.

Within each of these two dimensions, some sub-dimensions are proposed. The three sub-dimensions for content are: online usability, information quality and reliability and those for delivery are responsiveness, assurance and customer services. These sub-dimensions are not only based on the applied, technical and theoretical literature on quality of government e-services, but also the comprehensive and detailed benchmark guidelines that the TRA has produced in relation to the ways by which government agencies develop, maintain and upgrade the e-service/s that they provide (Government of the UAE, 2014; UAE Telecommunications Regulatory Authority, 2013, 2014).

The six sub-dimensions depicted that together comprise e-service assessment: quality of content and quality of delivery (the left-hand panel of Figure 1; p.17) can be seen as reflective of what theory and practitioners see as the core elements of a given e-service (i.e., its ICT-mediated service content functions and its ICT-mediated service delivery dimensions). Resultant from this, some testable hypotheses can be formulated.

While these are stated as being core elements, these are in fact compiled as part of this dissertation's conceptual framework model that is informed by (1) an exhaustive literature review; and (2) constrained to a point by the TRA's extant back-end e-service standardised guidelines and measuring rubrics. In addition to these six hypotheses, we added two more as a consequence of a meta-analysis of the associated literature. Many works are identifying trust and technical competency as issues that may influence adoption and perception of a given Internet-based service, irrespective of its inherent functionality and efficiency.

The framework construct, as shown in Figure 1 (p.17) includes 1) reuse intention, and 2) overall satisfaction levels in the outcome variable construct “Perception of ESQ”. The reason behind this is that unlike in the commercial sphere, the public-sector provides the end-customers with the bundle of e-services within the range that might not be relevant to reuse intentions alone. Therefore, this may not be sufficient regarding determining one’s perception of the quality of the service. Reuse intentions are akin to e-service adoption, which is a common theme and benchmark in the transactional e-service literature. Overall satisfaction levels are more aligned to measure of quality benchmark in the SERVQUAL literature. The contention here is that one’s perception of a given transactional over the Internet service would better be determined by a combination of items spanning both reuse intentions (akin perhaps to concepts of usefulness) and more binary overall satisfied/dissatisfied notion items.

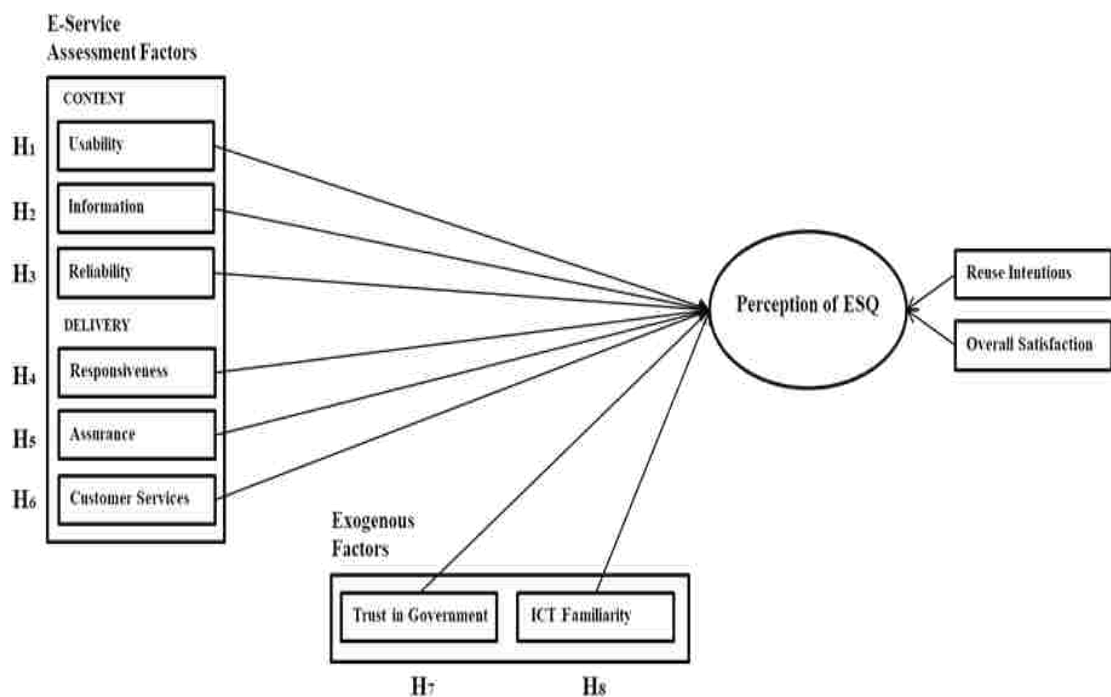


Figure 1: Conceptual Framework Model: “End-user Perception of ESQ”

1.6 Structure of Dissertation

The structure of this dissertation is as follows.

- Chapter 2- **Literature Review** presents a survey and critique of several reputable schools of thought that focus specifically on the logic and rationale for each of proposed hypotheses. It begins with an overview of e-government per se. Following this, it examines the works that consider service quality. The emphasis in this part of the review is to consider public sector services and especially those that involve a financial payment, ‘transaction’, of some sort (as the provision of information-only e-government sites is entirely separate and would benefit from somewhat distinct assessment tools).
- Chapter 3- **Hypothesis Development** is dedicated to setting out the eight proposed hypotheses of this study and adds support and context for each based on a comprehensive reading of the relevant and contemporary literature.
- Chapter 4- **Research Paradigm, Methodology and Methods** set out this study’s guiding theoretical underpinnings, the research paradigm it operates within and then the methods employed. As will be discussed, this study follows a rigorous empirical scale development process to create parsimonious sets of survey items that exhibit satisfactory levels of reliability and validity to be useful in advancing ESQ research. The rationale and motivation for this is that since every citizen is a potential consumer of transactional e-services, understanding citizens’ requirements can have a major impact on e-service development and potentially constrain and guide design considerations (e.g., Froehle & Roth, 2004; Maruping et al., 2009), and thus, it is of practical and scientific significance to examine ESQ factors that affect citizens’ reuse

intentions and overall satisfaction levels. First, a conceptual and theoretical framework model for assessing and measuring ESQ is devised. The purpose is to define an appropriate range of dimensions, scales and items informed, by the relevant theoretical and applied literature. Second, from this, some the testable hypotheses are formulated. These are based on the existing literature, the regional sociocultural context and informed by a pilot study. Third, the refined survey instrument was constructed and deployed. The sampling procedures related to carrying out the survey are covered as well.

- Chapter 5- **Results** presenting the survey's findings in demographic terms. Secondly, hierarchical regression analysis results are reported on, first on ESQ specific factors, and then on non-ESQ specific factors, part of this entails tests for multicollinearity and reliability evaluations for the dependent and independent variables.
- Chapter 6- **Analysis and Discussion** has two principal objectives. Firstly, to explicitly address and discuss the hypotheses and research questions (Section 6.2 and Section 6.3). It will then identify and discuss the significant linkages between this study's findings and observations and the existing literature and, by so doing, highlight new and value-added contributions (Section 6.4). It will then relate the findings to the regional context (Section 6.5).
- Chapter 7- **Conclusions and Implications** provides a summary of the dissertation. It sets out some policy-relevant and practical recommendations (Section 7.1). These recommendations fall into two categories macro and micro. At the micro level, recommendations related to speed, customer support and the promoting of both of these via social media and the like are put forward and emphasised. At the macro level is the suggestion that the instrument—this

study's analytical framework and survey construct that is tailored to gauge ESQ perceptions—be used to test citizen opinion of other UAE government over the Internet services. Regarding limitations (Section 7.2), this study was focused only on one e-service and was not longitudinal. It will be apparent that these limitations constitute some of this study's recommended areas for further research (Section 7.3).

Chapter 2: Literature Review

This chapter begins with introducing and reviewing the existing body of scholarly literature that influences and informs the discourse on service quality, e-services, and lastly that which considers public-sector provided over the Internet services. As set out and discussed in Section 2.1, the critical theories called upon by contemporary ESQ research include:

- 1) Organisational change a central part of which is readiness for change (RFC)
- 2) The Theory of Planned Behaviour (TPB) and the accompanying Expectancy-Value Theory (EVT)
- 3) The Information Services paradigm (IS), within which the IS Success Model and SERVQUAL investigations form a central aspect.
- 4) The more ICT-orientated constructs of TAM, TRI and UTAUT.

In Section 2.2, the works that quantify the various stages of online government including for instance the “Gartner Model” will be discussed. Also, in this section, prior works that cover the growing prominence of e-government and m-government per se will be critiqued. Section 2.3 will focus on the studies that assess ESQ in general, specifically those that cover commercial and public-sector providers. Section 2.4 will concentrate more specifically on the studies that evaluate e-government services with a particular focus on transactional ones.

This body of literature first and foremost seeks to deepen understanding—particularly in a practical way—on adoption and usage of public sector services via electronic means. It also considers the impact of digital divides, trust in all of its forms, the effectiveness of such services from a technical point of view (e.g., utility, speed,

cohesion) and, perceptions about reuse intentions and user satisfaction levels. Table 1 provides in a summative format some key ESQ assessment models/studies, while Table 2 (p.26) provides information on the most widely used ESQ assessment factors.

Table 1: Summary of the ESQ Assessment Methods and Models

Author(s)	Model/Theory	Description/Relevance
Davis, Bagozzi, and Warshaw (1989)	Technology Acceptance Model (TAM)	TAM explains the determinants of computer acceptance, while at the same time being both parsimonious and theoretically justified." The key purpose of TAM is stated as being the basis for, "tracing the impact of external factors on internal beliefs, attitudes, and intentions" (p. 985)
Venkatesh et al. (2003)	The Unified Theory of Acceptance and Use of Technology (UTAUT)	Based on a synthesis of seven previous models, including TAM (p. 436), UTAUT considers four factors to have a significant role about user acceptance which is i) performance expectancy; ii), effort expectancy; iii), social influence; and iv), facilitating conditions. The creators state that those four 'labels' are used to, "describe the essence of the construct and are meant to be independent of any particular theoretical perspective" (p. 447).
Parasuraman et al. (2005)	ES-QUAL scale	The ES-QUAL scale is a 22-item scale of four dimensions: efficiency, fulfilment, system availability and, privacy. This is very much targeted to commercial e-services but covers many key aspects that are relevant to all online services. It makes the following point regarding gauge satisfaction as benefits are some e-SQ dimensions more critical than others when customers seek hedonic benefits (e.g., an entertainment site), as opposed to when they engage in strictly goal-directed shopping interactions? Moreover, does the nature of the benefits sought impact on a user's evaluation?

Table 1: Summary of the ESQ Assessment Methods and Models (Continued)

Author(s)	Model/Theory	Description/Relevance
Fassnacht and Koesse (2006)	Service Quality Framework Survey items (n=39 items) to measure ten different constructs. Sample (n=1,258).	Develops a hierarchical QES model with three dimensions i) "Environment quality" which is related to the appearance of the user interface and includes clarity of layout and the "degree to which the design structure of the user interface helps users to find their way."; ii) "Delivery quality" which captures interaction during service usage including the carrying out of transactions; iii) "Outcome quality" which is related to what the end-user is left with post-delivery one of these constructs sub-dimensions is interesting 'reliability'. They define it as "the extent to which the provider keeps its service promise." They stress that reliability here does not refer to the reliable functioning of the provider's technical infrastructure during service delivery. However, instead, the accuracy and timeliness with which the underlying service promise is fulfilled.
Cenfetelli et al. (2008)	Service Quality about SSF Survey items=68 Sample=647	Integrates theory from both services marketing and TAM to help explain e-service user behaviour. This study's findings attest to the value of distinguishing between service content functions and delivery dimensions in designing e-government websites. Both facets are found to be significant contributors to achieving e-government service quality.
Verdegem and Verleye (2009)	UTAUT Survey items (n=29); Sample (n=1,651)	Considers the different phases that the user of public sector e-services must undergo, starting from the individual reactions to (using) the service and take into account during the whole process and consequently the impact on both usages of and satisfaction with the given service. They contend that research concerning citizen preferences should be an integral part of e-strategies of government. Also, that investigations with citizens concerning e-government to supported by longitudinal research, and furthermore satisfaction measurements can offer added value when it comes to evaluating existing services especially with bench-marking techniques,

Table 1: Summary of the ESQ Assessment Methods and Models (Continued)

Author(s)	Model/Theory	Description/Relevance
Al-Hujran, Al-dalahmeh, and Aloudat (2011)	TAM and national culture Survey items (n=24); Sample (n=197)	Examines the extent to which national cultural factors may influence the adoption of G2C services. Argues that little is known about national cultural factors that may influence e-government adoption in developing countries.
Papadomichelaki and Mentzas (2012)	e-GovQual Survey items (n=22); Sample (n=630)	Within e-GovQual, four dimensions are used: reliability, efficiency, citizen support, and trust. It is noted that all four are verified dimensions revealing a significant impact on overall service quality. It is contended that by way of a deeper understanding of the service quality dimensions for government sites, public sector entities will stand a much better chance of gaining and serving many more citizens. Regarding back-end ICT practitioners (the e-service developers), it is said that e-GovQual can serve as a useful tool for diagnostic and future refinement purposes.
Venkatesh, Chan, et al. (2012)	Sample (n=2,465) A two-stage web-based survey with 16 items	Based on Grönroos (1987) concept of services. Identified that: usability, computer resource requirement, technical support provision and security provision, influenced citizens' intentions, subsequent use and satisfaction. Key observations include: (1) usability and security provision being the two most important attributes for transactional e-government services (2); citizens prefer e-government services to consist of a few steps as possible and (3), technical support is always necessary as it was observed that any service offering no technical support was always ranked the least favourably even if such support was not needed.
Tan et al. (2013)	Theoretical Model of E-Government Service Quality Survey items (n=90); Sample (n=647)	A research model that depicts a comprehensive collection of web-enabled service content functions and delivery dimensions desirable by citizens. Builds on the work of (Cenfetelli et al., 2008) and attempts to design blueprint for e-government websites that embrace a customer-centric focus in the provision of public e-services.

Table 1: Summary of the ESQ Assessment Methods and Models (Continued)

Author(s)	Model/Theory	Description/Relevance
Alawneh, Al-Refai, and Batiha (2013)	Service Quality Satisfaction Survey items (n=36); Sample (n=400)	Based on research in Jordan. Tests five factors—security and privacy, trust, accessibility, awareness of public services and quality of public services—that the literature suggests will impact on user satisfaction. These factors were statistically validated as being significant.
Belanche et al. (2014)	TAM Survey items (n=12); Sample (n=336)	This study shows that trust in the public e-service mediates the influence of both trusts in the public administration and trust in the Internet on continuance intentions. Trust was influenced by e-service quality and recommendations from various public administrations.
Rodrigues et al. (2016)	UTAUT Survey items (n=19); Sample (n=380)	This study identifies confidentiality and users' trust and attitudes toward using technology as key determinants of overall satisfaction and the subsequent adoption of e-government services. The study also identifies significant differences in how different genders adopt the use of e-government services
Weerakkody, Irani, Lee, Hindi, and Osman (2016)	UTAUT Survey items (n=19); Sample (n=1,518).	Demonstrates that citizen “satisfaction” is one of the most significant influences for e-government adoption and diffusion. It investigates the impact of information quality, system quality, trust, and cost of user satisfaction of e-government services. It identifies five factors as having a significant impact on citizen satisfaction with e-government services. It indicated that both information quality and system quality had a positive and significant impact on trust and user satisfaction. Also, trust was found to be positively associated with user satisfaction
Ahmad and Khalid (2017)	TAM Survey item (ns=24); Sample (n=120).	The study tests an extended TAM construct by incorporating determinants of trust, cost, social influence, a variety of services, perceived usefulness in IT and demographic profiles. It finds that trust and social influence are positively associated with the intention of the end-users to adopt m-government services in the UAE.

Table 2: Summary of ESQ Assessment Factors

Construct	Definition	References
Personalisation	User perception of the degree to which an online store provides differentiated services to satisfy specific individual needs	Parasuraman et al. (1988); Yang and Jun (2002)
Website design	End-user perception of the degree of user-friendliness in using an e-service	Parasuraman et al. (1988); Jinwoo Kim and Lee (2002)
Usability	Usability is the degree to which a person believes that using a particular system would enhance [their] performance” and ease of use.	Davis (1989, p. 320); Sanchez-Franco and Rondan-Cataluña (2010). Buckley (2003)
Perceived usefulness	Perceived usefulness is a component of many studies, and although it is not entirely interchangeable it is similar, and regarding assessment, only something that is usable can possible is considered useful.	Floropoulos et al. (2010); Magoutas et al. (2010); Yoojung and Hyung-Seok (2014)
Information	For this study, the quality of information (termed in the model “information quality”) is taken to mean: the extent to which the information provided (its clarity and coherence) is “descriptive, meaningful and readable.”	Nicolaou et al. (2013); Weerakkody et al. (2016)
Reliability	Reliability is defined as the citizen’s confidence towards the e-government site concerning the correct and on-time delivery of the service. Customer perception of the reliability and security of the service provided by an e-service.	Parasuraman et al. (1988); Papadomichelaki and Mentzas (2012)
Responsiveness	The end-users perception of the responsiveness and helpfulness of the service provided by an online store	Parasuraman et al. (1988); Jinwoo Kim and Lee (2002)
Assurance	E-service assurance is related security and privacy. Online assurance is more important than offline assurance because online customers are less able to scrutinise employees or the physical facilities of the business or public-sector entity with which they are conducting the transaction.	Wolfenbarger and Gilly (2003); Semeijn et al. (2005)
Customer satisfaction	In this context, “customer satisfaction” is end-user satisfaction with an over the Internet transactional service	Zhu, Wymer, and Chen (2002)

Table 2: Summary of ESQ Assessment Factors (Continued)

Construct	Definition	References
Trust in government	End-user perception of the level of trust mechanisms provided by an online store	Belanche et al. (2014); Fakhoury and Aubert (2015)
Preserved usefulness	Perceived usefulness refers to “the degree to which a person believes that using a particular system would enhance his or her job performance.”	Davis (1989); Yoojung and Hyung-Seok (2014)
ICT familiarity	Is a measure of an individual’s ability and willingness to use ICT? It also encompasses trust with technology and the service providers.	Parasuraman (2000); Venkatesh, Chan, et al. (2012)
Overall service quality	User sentiment and perceptions of the service quality provided by the service in question	Chiu, Hsu, Sun, Lin, and Sun (2005); Pearson, Tadisina, and Griffin (2012)

2.1 Theoretical Underpinnings

The underpinning theories that guide the e-service investigation include organisational and behavioural change theories; readiness for change theory (RFC) (e.g., Armenakis, Harris, & Mossholder, 1993; Holt, Armenakis, Feild, & Harris, 2007; Lewin, 1947) and trust theories (Judge, Thoresen, Pucik, & Welbourne, 1999; Rotter, 1980). For convenience, these and the following theories/constructs are set out in Table 3 (p. 28). In Table 3, also the theories touched upon in this section are linked to the applied literature set out in Table 1 (p. 22), and correlate to the eleven ESQ assessment models set out in Appendix B. To continue, other theories that guide e-service investigation include the information systems (IS) and the service quality (SQ, SERVQUAL) literature (Parasuraman et al., 1991; Parasuraman et al., 1988).

Table 3: Relevant Theories

Construct	Summary, Utilisation and Relevance
Readiness for Change (RFC)	Change and, in this context, the citizen's or the end-users willingness to adopt new modes/means of interacting with UAE government departments is key to this study's remit. The MOI along with all other UAE public sector entities is keen to move toward an 'over the Internet architecture/ but this is largely contingent on citizens and residences accepting this systemic interactional change. Contemporary works on this theory such as those by Armenakis et al. (1993), Holt et al. (2007) are based on the founding work by Lewin (1947). The process, or behavioural concepts, of 'unfreezing' 'moving' and then (re) 'freezing' lay at the centre of RFC.
Theory of Reasoned Action (TRA); Expectancy-Value Theory (EVT)	TRA alongside EVT state that individuals form beliefs salient to a context of interest and this, in turn, influences their attitude and behaviour within that given context. As a consequence of this, this current study incorporated non-ESQ specific factors because it is hypothesised and stated in the literature that exogenous factors will influence a given user's perception of an e-service that is in some way independent of the objective quality of the service's content/delivery merit. Cenfetelli et al. (2008, p. 162) base their work on this theory.
Expectancy-Disconfirmation Theory (EDT)	This construct is also relevant to this study's analytical frame of reference. End-users, it is said, compare actual performance outcome against a priori expectations, and that their satisfaction/dissatisfaction is a result of the positive/negative discrepancy between the two. It will be noted that the seminal works in the service quality and information systems literature, such as those of Parasuraman et al. (1988) and Bhattacharjee (2001), draw heavily on EDT which was set out by Oliver (1980).

Table 3: Relevant Theories (Continued)

Construct	Summary, Utilisation and Relevance
Cognitive Dissonance Theory (CDT)	CDT is very much interlinked with EDT, EVT and TRA. If end-users typically confirm what they already know (or think), and so attitudes change only gradually over time, there will be resistance to change; RFC will not be in place. This also will subjectively impact on one's assessment of a given e-service.
Technology Acceptance Model (TAM) & Unified Theory of Acceptance and Use of Technology (UTAUT)	UTAUT, as stipulated by Venkatesh et al. (2003) builds on TAM. For end-users to be willing and able to engage with and utilise technology to facilitate service interactions. The critical point within the research stream on technology acceptance postulates that users' attitudes and perceptions ("beliefs") toward a given transactional service will be individualised and influenced by socioeconomic and cultural factors and therefore cannot be construed as purely objective measures (or variables).

Note: The theory in this table moves from human instinct/ behaviour through service quality to ICT familiarity. These theories are all included as precursors in one or more of the seminal studies identified and elaborated on in Table 1 (see p. 22).

DeLone and McLean (1992) argued that in the IS success model, "information quality" and "system quality" were the principal predictors for the use and thus presumably reuse of e-services. A review of the literature on the IS success model by Petter and McLean (2009), covering over 50 empirical studies, concluded by attesting its validity. Furthermore, the underpinning theory also includes technology adoption theory: "Technology Acceptance Model" (Davis, 1989; Venkatesh & Bala, 2008; Venkatesh et al., 2003); the "Technology Readiness Index" (Parasuraman, 2000); increasingly the "Unified Theory of Acceptance and Use of Technology" (Venkatesh et al., 2003). Transitioning from face-to-face to virtual online services 'over the Internet' services enquires paradigm change. Furthermore, it requires trust (albeit a different form), and

it requires ICT familiarity for individuals to be willing and able to engage with and utilise technology to facilitate service interactions. To be clear, this is distinct from the equally significant digital divide and considerations about citizen access to technology. The IS and SQ literature are voluminous.

At a fundamental level, there are similarities regarding perceptions and measurement rubrics, irrespective of how the service is delivered (physically or virtually) or by who (a commercial enterprise or a public-sector entity). It is a widely held view that traditional service quality assessment factors such as competence, cleanliness, courtesy, comfort are not (unless they are reconceptualised) suitable measurements in a digital environment (e.g., Fassnacht & Koese, 2006). Nonetheless, in general terms, Loiacono, Watson, and Goodhue (2002) describe total SQ as “a customer’s perception of the difference between the expected service and the perceived service.” In a seminal work, Grönroos (1982) stated three things in particular which complicate SQ assessment. First, is the difficulty of evaluating a service compared to a physical good, one is intangible while the other is tangible. The second is the consequence of the fact that an individual’s perception of quality results from a comparison between expectations and actual reality (the actual delivery of the service). The third is that SQ evaluations are made relative to the ‘process’ of service delivery and not merely the ‘outcome’ of the given service.

Parasuraman, Zeithaml, and Berry (1985) identified the following three main characteristics of a service to provide an improved understanding of the SQ assessment process: (1) intangibility (2), heterogeneity and (3), inseparability. Building upon this and based on extensive research across a range of industries, Parasuraman et al. (1985) developed the Service Quality Model (SQM). This has ten dimensions but is usually

condensed into the following: (1) reliability (2), tangibles (3), responsiveness (4), assurance and (5), empathy. As pointed out by authors such as Cox and Dale (2001) and Zeithaml, Parasuraman, and Malhotra (2002), factors like communication, security, credibility, accessibility, aesthetics, and availability are particular to, and key for, assessing e-services.

2.1.1 Theory of Reasoned Action

The Theory of Reasoned Action contends that an individual forms beliefs salient to a context of interest and these beliefs influence one's attitude and behaviour within this context (Ajzen, 1991; Ajzen & Fishbein, 1980). According to Expectancy-Value Theory (Ajzen, 1991), external stimuli influence an individual's beliefs regarding the outcomes associated with their performance of for instance using an e-service. Cenfetelli et al. (2008, p. 162) use the Theory of Reasoned Action as a specific foundation for both deriving the theoretical role of supporting service functionality and integrating it within theories of service quality and technology acceptance.

Regarding which dimensions and attributes of the service the customer takes as a reference in the evaluation, Parasuraman et al. (1988) set out a scale of five tangible elements—reliability, response capacity, security, and empathy—and 22 explanatory items and argued that the basic structure of this construct could be adapted to suit any particular organisation and thus, any service (Lucia & Victor, 2005). Since then a large number of applied studies in SQ have adopted SERVQUAL as an instrument. Since the advent of online service provision, according to Lucia and Victor (2005), two critical themes about SERVQUAL dominate the related literature.

The first asks, does it (SERVQUAL) has a role to play in measuring quality in electronic services? The second theme asks whether the instrument is applied directly, or should it be modified? What should context-specific factors influence such decisions? SERVQUAL's utility for predicting customer reactions and responses is evidenced by the large number of studies that have utilised it for determining factors such as loyalty, willingness to pay a premium and service quality perceptions in relation to e-services (e.g., Cenfetelli et al., 2008; Lucia & Victor, 2005; Parasuraman et al., 1988; Parasuraman et al., 2005).

The Customer Service Life Cycle (CSLC) model as articulated by Ives and Learmonth (1984) is used by researchers to generate a list of dimensions that represent all the stages a user goes through when buying a product or using a service. Within this framework, the service content construct is the extent to which the service provider can offer support services to help the user achieve their goals at each stage. While object-based beliefs and attitudes are concerned with the design attributes of technological innovation, behavioural-based beliefs and attitudes about the action of utilising that technology and the consequences arising from its usage (Tan et al., 2013, p. 81). It is clear that Cenfetelli et al. (2008) and Tan et al. (2013) have followed the call by Wixom and Todd (2005) for a separation between object-based and behavioural-based beliefs and attitudes in assessing the quality of technological innovations and predicting their acceptance by intended users.

2.1.2 Technology Adoption

In light of the service literature, the other theory relevant to ESQ assessment is derived from the works on technology adoption. The predominant trends within the technology

acceptance research stream (e.g., Davis, 1989; Parasuraman, 2000; Parasuraman & Colby, 2015), make it apparent that users' attitudes and perceptions ("beliefs") toward a given transactional service will be individualised and influenced by socioeconomic and cultural factors and therefore, cannot be construed as purely objective measures (or variables). Technology—perceptions of it and ability/willingness to use it—a key theme (termed as non-ESQ specific by this present study). TAM, which itself is founded on Ajzen's TPB (beliefs influence intentions, and intentions guide the actions of the individual) is similar in ways to the TRI and UTAUT constructs (Parasuraman, 2000; Parasuraman & Colby, 2015).

A government entity, for example, needs to confront the current situation and create readiness to adapt by seeking to facilitate the envisaged behavioural changes from their citizens' point of view towards the services it delivers. TAM (e.g., Davis, 1989; Venkatesh & Bala, 2008; Venkatesh et al., 2003) and the TRI (Parasuraman, 2000) is not dissimilar to RFC theory, the former focuses in particular upon the human relationship with technology, and the latter seeks to quantify this relationship by indexing it. TAM stipulates that some factors influence a given individual's decision about how and when they to use a given piece of technology. Factors such as the given technology's perceived usefulness and its perceived ease-of-use are said to be of particular importance. The UATUT model/theory that is built on TAM/TRI can be used in order to gain a deeper understanding of how individuals (1) begin to adopt and take advantage of a given technology and (2) then evaluate and rate it (consider this in relation to this study's (1) reuse intentions and (2) overall satisfaction levels; refer back to Figure 1; p.17).

An essential contribution also is what exactly customer satisfaction is? (This study's outcome variable of overall levels of user satisfaction.) Concerning satisfaction, Expectancy-Disconfirmation Theory (EDT) proposes that an individual compares an actual performance outcome against a priori expectations and that their satisfaction /dissatisfaction is a result of the positive/negative discrepancy between the two (Oliver, 1980, 1993; Oliver & Swan, 1989). Parasuraman et al. (1988) utilise EDT concerning the formation of service quality beliefs and the explicit role of expectations in influencing such beliefs. EDT has been well supported in IS research for the formation of either service quality beliefs or satisfaction (Bhattacharjee, 2001). This is relevant regarding framing this study's overall satisfaction level construct.

2.2 Evolution of E-Government

As articulated by the UN agencies and the American Society for Public Administration (ASPA), the e-government uses as its transmission mechanism a wide range of ICT applications and platforms, and provide the following definition for e-governments, *“to utilise the Internet for delivering government information and services to citizens”* (UN/ASPA, 2002). According to West (2007, p. 129), e-government is based on the promise of better service delivery at lower cost to the citizen. In theory (and at times in practice) this manifests by way of economies of scale that are possible only because of ICT.

Digital delivery systems, for example, can save money and over the longer-term may result in substantial savings. Citizens can access information and services from their homes or offices and do so in a way that saves both them and their government time and resources. Ideally, then e-government increases the personal convenience a given

government's citizens and business community (Heeks, 2005; Schnoll, 2014; West, 2007). It has in fact been argued that if the public sector becomes more efficient, responsive, and effective due to e-government, it may be possible for citizens to re-engage with the actual government, become more confident about its performance, and be more likely to trust it.

According to some research, while e-government has increased transparency and improved communication and access to information for citizens, the digital diffusion of information entails a considerable amount of cost (Al-Shafi & Weerakkody, 2010). Moreover, other disadvantages, according to the literature primarily relate to citizen trust levels, their levels of ICT familiarity and factors relating to the digital divide. Also, there are challenges in actually developing and delivering e-services (Gauld et al., 2010; Venkatesh et al., 2012, p. 117), be it regarding ICT infrastructure or human resources for developing e-government platforms for public sector entities (Venkatesh et al., 2012). So, while initiatives like the UAE's move towards smart government may at first gloss seem a guaranteed way of reducing costs (e.g., office space' payroll), it does not necessarily work in practice.

Abortive e-government/e-service schemes in the UK offer cautionary tales. Firstly, the UK Home Office, for instance, wasted GB£350 million on an immigration computer system that was abandoned before actually being used. A second is the UK National Health Service; it lost billions of pounds in an attempt to provide citizens with electronic health records. The third is the breakdown of the e-service system designed for UK's child support agency left thousands of families without money (Cameron, 2014; Syal, 2013).

West (2007, p. 135) argues that no research linked the advent of e-government with an improvement in the levels of trust and beliefs about the effectiveness of public sector problem-solving in the eyes of citizens. Despite this being penned a decade ago, as stated in Chapter 1: Introduction), in the post-Snowden era, nothing suggests trust in government has improved since then. Having said this, as more government services go online, they are by default subjected to greater public scrutiny.

In what is now considered a founding paper on the subject of e-government, Layne and Lee (2001) set out a number of stages—cataloguing, transaction, vertical and, horizontal integration—with the implication that any e-service provided by a government or public sector entity, could be placed in one of four stages. Vertical integration refers to local, state and federal governments connected for different functions or services of government, whereas horizontal integration is taken to mean integration across different functions and services (Layne & Lee, 2001). Another important early work is that by Baum and Di Maio (2000) and the “Gartner Model” that they developed. The Gartner Model which is used for assessing the stages of a given e-government’s depth has four phases (Baum & Di Maio, 2000).

The first step in the evolution can be characterised as merely having an online presence, which requires the government organisation to provide information to stakeholders (i.e., G2C, G2B and G2G). The second phase labelled “interaction” involved the enablement of citizens to carry out electronic interactions with one of the given government’s agencies (e.g., email correspondence). The next phase, “transaction”, as the name suggests permits citizens to complete transactions online, this, for instance, could be renewing a passport or submitting one’s tax returns.

However, it is the final phase of this evolutionary process “transformation” that this research study uses as its term of reference.

Once given e-Government or Government Department/Ministry has and delivers a range of e-services, the focus shifts to redesigning existing e-services, streamlining them and seeking to assess the quality of these services with the purpose of further refining the content, the delivery and the degree of user satisfaction/trust. The MOI already have a range of e-services, and it is now a question of enhancing these services as opposed to transitioning them from transitional face-to-face ones to ICT-mediated ones. A review of critical books (e.g., Heeks, 2005; West, 2007) and journal articles (consult Table 1; p. 22), suggests e-government services to citizens and businesses and e-government services to citizens as part of a ‘political process’ (e-governance or, as it is termed in the UAE, smart government).

The *strategic* use of e-services by government organisations include promoting government policy and disseminating this 24/7 to a wider audience, whereas the ‘organisational’ uses include facilitating the flow of information alongside productivity and the improved allocation of resources. Thus, e-government has organisational and strategic ramifications. For Tan and Benbasat (2009b) e-government may theoretically have a ‘virtual socialising process’: citizens interacting via the medium of e-services will lead to the actual bricks and mortar government entities becoming more responsive. There is, however, an important distinction to be made: e-Governance is a broader concept than e-government in that it also includes the relationship between government employees, elected or appointed, and society at large (e.g., Alathmay, 2015).

Put differently; e-governance is broader and more profound than a narrower focus on e-government service, all the more so for transactional services. As articulated by Norris and Moon (2005), informational services are related to the one way delivery of government information. In contrast, over the Internet transactional services involving two-way interactions (e.g., the submission of electronic forms or the payment of traffic fines). An interesting point made by Wittendorp (2017) is that the need for e-government services is higher for people with lower socioeconomic status, who tend (1) to have fewer ICT skills, (2) older Internet-enabled gadgets, and (3) slower Internet connections.

e-Governance encompasses change theory and considers behavioural and political factors to a greater extent than does the literature that concentrates on e-service transactions. While the two are correlated and interlinked, the focus of this research is very much on e-government and, more specifically, its scope is limited to developing a framework for better assessing the quality of public sector e-services. Nonetheless, issues of trust—be it on the Internet or the government—ICT familiarity and indeed access to technology (be it economic, age or gender-related) all impact ESQ assessment. In a review of the e-government literature, Yildiz (2007, p. 650) points out that governments are increasingly viewed (and organised) regarding “virtual agencies, whose structure and capacity depend for the most part on the Internet.”

In essence, e-government provides information and services by way of ICT, and, it is said, that the ultimate goal of any e-government platform is to enable a citizen or a business to contact one point of government and complete any level of governmental transaction, a “one-stop shop” (or single portal) as it were (see, e.g., Layne & Lee, 2001). As set out by Akman, Yazici, Mishra, and Arifoglu (2005), the advantages of

transforming traditional public services into e-government services include the cost-effective delivery of services and the integration of services which can make government portals/apps 'one-stop shops'.

It is a widely held contention that regardless of the type of political system, many government officials are conservative when it comes to change (see, e.g., West, 2007, p. 7). For the UAE, this may not hold as Internet penetration is near universal, and it is clear that the government has the financial resources and is using these to develop a globally recognised e-government presence (see, e.g., The National, 2017b; UAE Government/Accenture, 2014; United Nations, 2016). Presently as mentioned, the processes that require organisational change as a result of ICT seem to be taking place more frequently than in previous periods. A case in point is the Emirate of Dubai and its recent shift in focus from e-government to m-government, even though the former had by no means been universally adopted and normalised. Also, and as alluded to in the introduction, there currently exists some overlap between Federal and Emirate level services (The National, 2017a).

2.3 Assessing and Measuring ESQ

Although writing some time ago, Buckley (2003, p. 453) stated that as with many aspects of e-commerce, academic discourse on e-service assessment tends to lag that of the practitioner world," and in the private sphere, the literature tends to focus on usability and measurement of use, "with little or no consideration given to the issue of service quality." As Rowley (2006) notes, to understand e-service experiences, it is necessary to go beyond studies of e-service quality dimensions and to take into account

the inherent characteristics of service delivery and the factors that differentiate one service experience from another.

In general, though, in distinction to traditional bricks-and-mortar agencies that are hierarchical, linear, and one-way in their communications style, public sector e-services are non-linear, interactive, and available 24/7. Also, in general terms, convenience is probably the most influential selling point for any e-service (West, 2007). In the words of Pearson et al. (2012), ideally, e-services would meet user expectations without the encounter relying on human-to-human intervention. As can be observed in many of the UAE government e-service related strategic plans, the rationale is to enable citizens and business to seek information and carry out transactions at their convenience (UAE Government/Accenture, 2014).

Several studies seek to examine the impact of social influence on e-service usage within the MENA (e.g., Ahmad & Khalid, 2017; Al-Shafi & Weerakkody, 2010; Alfalah et al., 2017). Positive perceptions which would lead to a given service being recommended were linked to “ease of use” and “convenience”—broadly equivalent to this study’s ‘Usability’ and ‘Reliability’ factors. Moreover, service quality is widely considered to adjust to levels of user trust (Belanche et al., 2014). Zeithaml, Parasuraman, and Malhotra (2000, p. 11) define e-service quality as, “the extent to which a website facilitates efficient and effective purchasing and delivery,” and that quality is also reflected in, “elements such as efficiency, privacy, fulfilment, and system availability.” However, service quality is considered a multi-attribute construct which is the product of the comparison between an individual’s expectations and perceptions of the service provider’s actions (Lucia & Victor, 2005; Parasuraman et al., 1985, 1988).

The utility of being able to determine service quality is to develop strategies to provide services tailored to expectations of service quality; such expectations can be ‘measured’ before a given service’s launch and once it is up and running (Bebko, 2000; Lucia & Victor, 2005). In general, terms, when comparing perceptions with expectations, it is conventionally assumed that the individual uses some quantifiable reference points into consideration. Such items can be and are grouped into specific dimensions, and it is the detailed study of these that allows service providers to develop suitable services, including ones online, and improve the quality of these from the perception of the consumer (e.g., Grapentine, 1995; Parasuraman et al., 2005; Piccoli, Brohman, Watson, & Parasuraman, 2004). Ribbink, Allard, Liljander, and Streukens (2004, p. 448) point out that ‘ease of use’ is an essential element of consumer usage of computer technologies and is of particular importance for new users and thus it is a core determinant of service quality and can be decisive for customer satisfaction for it “enhances the efficiency of using the service.”

In light of this, measuring ESQ is considered to be one of the most important factors for influencing the robustness of a given e-service. The key to long-term success for all e-services providers, is, according to Fassnacht and Koese (2006), the continual and comprehensive measuring of ESQ. Zeithaml et al. (2002) use the term “e-SQ” and define it as “the identification of the underlying dimensions [of an e-service] and the ability to determine how they can be conceptualised and measured.” They stress that determining a viable assessment rubric for ESQ must consider the following: fulfilment, privacy/security, and efficiency/ease of navigation (for a review of e-SQ scales, consult: Ladhari, 2010).

Fassnacht and Koese (2006) set out the following service quality sub-dimensions: ease of use, quality of appearance/layout, information quality, privacy/security, reliability, speed/responsiveness, and content. In light of this, they formulated what might be considered a hierarchical model for e-services assessment. The model they formulated has three dimensions with nine sub-dimensions (1) the dimension of “environment quality” consists of the sub-dimensions of graphics quality and clarity of layout, (2) the “delivery of quality” dimension consists of four sub-dimensions identified as: attractiveness of selection, information quality, ease of use, and technical quality, and (3) “outcome quality,” which covers three sub-dimensions identified as: reliability, functional benefit, and emotional benefit (Fassnacht & Koese, 2006).

Although Surjadjaja, Ghosh, and Jiju (2003, pp. 50-51) identify “20 essential determinants for e-service operations,” they go on to point out that such a number is too high to provide a clear focus and prioritise operations and that several determinants are likely to be related to one another (the top eight are as follow: trust, responsiveness, navigability, up to date information, site effectiveness and functionality, availability, security and, fulfilment). It follows that any service provider needs to identify which determinants are most relevant to their operations and, subsequently, to identify a narrow range of the critical determinants. Yoo and Donthu (2001) set out the site quality model “SiteQual”, which incorporated the following factors: aesthetic design, processing speed, ease of use, and security to ascertain the overall ESQ.

Similarly, the “WebQual” model, developed by Loiacono et al. (2002) and also Barnes and Vidgen (2002) used dimensions including trust, response time, ease of understanding, aesthetics, innovativeness, emotional appeal, consistent image and relative advantage as guides to measuring ESQ. WebQual is typically condensed down

to three overarching dimensions: usability, information quality (similar to this study's "content") and service quality. Another construct is the ES-QUAL model. According to Wolfinbarger and Gilly (2003) and Parasuraman et al. (2005), it typically has four dimensions: efficiency, fulfilment, system availability, and privacy; variations include one that has three: efficiency, fulfilment, and privacy (Table 2; p. 26) sets out the critical components of ESQ assessment).

It will be assumed that a good quality e-service will have to have both a good quality of content and a good quality of delivery (Cenfetelli et al., 2008; Tan et al., 2013). For having either, but not both, will lead to the poor user experience. Therefore, regarding seeking to measure the quality of a given transactional e-service, sentiment on both of these core elements needs to be collected in a delineable way. As will be noted in Figure 1 (p. 17), the factors stipulated by both Zeithaml et al. (2002) and Fassnacht and Koese (2006), broadly speaking, are represented regarding content, delivery and overall user satisfaction. There are some psychometric scales and taxonomies used to assess the quality of a given e-service.

Performance-related constructs cover clarity, reliability, efficiency and site performance. Also, Zeithaml et al. (2002) conceptualised some dimensions of e-service quality (*viz.* access, ease of navigation, efficiency, customisation and personalisation, security/privacy, responsiveness, assurance/trust, price knowledge, site aesthetics, reliability and, flexibility). The concept of usability tends to cover: efficiency of use and subjective satisfaction. More recently, applied research narrowed these to (1) efficiency, (2) reliability, (3) privacy, and (4) user satisfaction. The latter two have less to do with the performance of the e-service per se, but more subjectively with a user's sentiment towards it.

2.4 Assessing Public Sector ESQ

While the bulk of prior research focused on transactional services in consumer contexts (e.g., Cunningham, Young, & Gerlach, 2009; Ding, Hu, Verma, & Wardell, 2010; Groß, 2015; Nguyen, de Leeuw, & Dullaert, 2016), this work focuses specifically on transactional e-government services. It has been stated that many ESQ rubrics mostly focus on online shopping experiences where users have options between brands and web platforms—if, for example, a customer does not like Souq.com they can switch to Dubizzle.com. Arguably such parameters are not suitable ‘as is’, for assessing public sector e-service quality (e.g., Fassnacht & Koese, 2006; Gummerus, Liljander, Pura, & Van Riel, 2004). In a recent review of ESQ assessment tools, Kohlborn (2014) argues that research on public sector ESQ is somewhat limited, the models that exist are rather diverse if compared to those that have been developed for the private sector.

As clearly delineated by Venkatesh et al. (2012), government services are different from commercial services. The critical differentiator concerned with the public-sector transactions tends to be the payment channel. In other words, channel one equals physical bricks and mortar interaction and, channel two equals a virtual one. While the latter may presently include postal or telephone, it will increasingly be limited to an autonomous 24/7 ‘over the Internet’ transaction. While there are parallels between e-government and e-commerce, there are some distinctions. Parallels between e-government and e-commerce relate to pragmatic factors such as infrastructure, access to the Internet, TAM and trust. It is interesting to note that in some parts of the world, governments will be trusted more than the private sector whereas in others it is considered to be the reverse (e.g., Kumar, Mukerji, Butt, & Persaud, 2007; Warkentin, Gefen, Pavlou, & Rose, 2002). Furthermore, distinctions between commercial and

public sector e-services include the nature of a monopoly, legal engagement, and the nature of the data required to access certain transactions (Connolly, Bannister, & Kearney, 2010).

Customer (or ‘user’) choice is another critical distinguishing factor, within the sphere of private sector e-commerce, there are a variety of businesses to select from, but in e-government, a customer has only one government entity that provides that particular service (Jorgensen & Cable, 2002). Carter and Bélanger (2005), argue that to develop a citizen-centred e-government service the government, as the provider of the service must understand the factors that influence a citizen’s willingness to use the given service. Generally speaking, a number of things are considered to be contributors to the overall quality of a given e-service—in practice and in terms of perception—these are: (1) the quality of the service’s content, (2) the quality of the delivery of the service to the public, and (3) the users’ overall satisfaction with the service: perceived usefulness and/or factors like reuse intentions (see Figure 1; p.17). While it is true that a given user’s satisfaction levels will be influenced by the quality of the content and the quality of its delivery it may also be shaped by other considerations such as a holistic sense of trust and their degree of ICT familiarity.

As Venkatesh et al. (2012) make clear, the switch in delivery channels does not necessarily change the nature of the core services. Based on the service theory work of Grönroos (1982), the core services of transactional e-government services are defined as the delivery of such services to citizens through the Internet or other digital means (Lucia & Victor, 2005; Ribbink et al., 2004). With the evolution of technologies in general and the Internet in particular, they can now be delivered online. Research highlighted by Carter, Weerakkody, Phillips, and Dwivedi (2016, p. 133) indicates

that, although citizens are dissatisfied with government, they are pleased with government services provided online. Thus, citizen perceptions of e-government may be different from those of traditional government services.

Carter and Bélanger (2005) integrated elements from TAM, the Web Trust Model developed by (Bélanger, Hiller, & Smith, 2002), and also elements of the diffusion of innovation (Van Slyke, Bélanger, & Comunale, 2004) to create a more hybrid model for assessing user adoption of e-government services. The hybrid model focused on: perceived usefulness, ease of use and, trust (the latter component was two-fold, the trust of the Internet and the given government). They concluded that citizens' intention to use government e-services would increase if a service were perceived to be easier to use. Increased trustworthiness was also found to be significant regarding trusting the government as well as over the Internet services in general.

The findings gained by Grimsley and Meehan (2007) served to identify the following issues. First, the evaluative design of the service system should apply to the whole system as perceived by the client and not just the ICT platform. This again reflects what previous studies have stated about a more client-centred service system being vital to e-service satisfaction levels. Also, it reflects a need for well-informed individuals who value both personal control and trust. The issues that can be focused on regarding adequate information have been identified as initial availability, consistency, and timely feedback. Papadomichelaki and Mentzas (2012) conceptualise, construct, refine, and test a multiple-item scale for measuring the quality of service delivered by official websites: the "e-GovQual" scale.

Guidance can be taken from a recent study by Weerakkody et al. (2016). Much like the present one, it considered ESQ specific and no-ESQ specific factors about e-government services. This UK-based research (n = 1,518) finds that some factors have a significant impact on U.K. citizens' satisfaction with e-government services (it was based on the IS success model set out by DeLone and McLean (1992) along with the external constructs: trust and cost). The model devised by Weerakkody et al. (2016, p. 338) then, combined five constructs: information quality, system quality, cost, trust, and user satisfaction. UTAUT (Venkatesh et al., 2003) is based on some previous IT user acceptance models and, according to its developers (Venkatesh et al., 2012), it explained 69% of the variance, whereas the former ones range between 17 and 53 percent.

It is the case that previous works have noted the importance of service design to the success of services (e.g., Chase & Apte, 2007; Karwan & Markland, 2006; Narasimhan et al., 2005). While there has been progressing in understanding users' adoption of services, little attention has been devoted to understanding users' preferences, particularly related to trade-offs between different service attributes. Understanding the trade-offs is important, as designing a good, usable online service frequently requires trade-offs across multiple design characteristics. Al-Shafi and Weerakkody (2010), for instance, use UTAUT to explore the adoption of e-government services in Qatar (n = 1,179) and determine that both effort expectancy and social influences determine citizens' behavioural intention towards e-government.

Tan et al. (2013, p. 82) argue that there is ample conceptual and empirical justification for a distinction between service content and service delivery when assessing e-service quality. They frame "service content quality" as the effectiveness of service content

functions provided via an e-government service in terms of fulfilling the consumption goals of citizens and, “service delivery quality” as being the efficiency of accessing such content (via an e-service “delivery channel”) in terms fulfilling the process goals of citizens. It is argued that “services” refer to functional processes put in place to assist customers in achieving promised outcomes, whereas transactions are occurrences in time when these processes are activated by consumers to arrive at promised outcomes. They provide the following example: an electronic tax filing system entails a collection of e-government services whereas the electronic filing of a tax return by a citizen should be seen as an independent, time-specific e-government transaction which facilitates citizens in achieving their transactional goals (Tan et al., 2013, p. 82).

The arguments that previously mentioned could be summarised as thus, (1) e-government is not the same as e-governance, (2) the traditional face-to-face service provider assessment has many lessons for e-service providers, and (3) the lessons learned moreover, guidance can also be taken by government e-service providers from the commercial sector, but the two domains are not interchangeable. Another observation is that many studies draw distinctions between service content and service delivery. (Appendix B provides a range of seminal and recent e-service related models). This is the approach adopted by the present study. Critically, the choice of these sub-dimensions was also shaped by the ‘internal’ quality of service benchmarking rubrics that the government agencies in the UAE are mandated to follow (Government of the UAE, 2012, 2014; UAE TRA, 2014). It should be noted that the six sub-dimensions are assumed factors which although can be justified by references to the literature are also found, in instances, to overlap. For instance, what may be

construed as part of the content in one context, could be categorised as delivery in another (see Appendix B; p. 198).

2.5 Summary and Gaps in the Literature

This dissertation would be the first scholarly work that adds to the emerging component of discourse that concentrates specifically on government transactional e-services delivery within the MENA region. To add value, it sets out a new and distinct conceptual model that incorporates crucial aspects examined in recently published works—the impact of familiarity *per se* with ICT and trust about both technology and government institutions—alongside a clear focus on “service quality.”

In summary, this chapter has provided the theoretical and contextual backdrop for this applied study. It has apparently situated the case within the various relevant schools of thought: the assessing of e-government transactional services is an essential line of enquiry because it is highly likely to become the default way in which governing elites interact with their respective citizenries.

The review began by setting out the theoretical underpinnings, the seminal works and the influential models/scales and constraints (see Table 1; p. 22 and Table 2; p. 26). Social sciences that consider human actions and behaviour consider merit in Ajzen’s TPB (Ajzen, 1991; Ajzen & Fishbein, 1980) alongside EDT (Oliver, 1980, 1993; Oliver & Swan, 1989) and CDT (Bhattacharjee, 2001; Bhattacharjee & Premkumar, 2004); all of which originated in the field of psychology. Organisational change, RFC and the interaction with information systems (Holt et al., 2007; Judge et al., 1999), are also essential elements of the paradigm as it has notions of trust (Rotter, 1980). Added to these are the SERVQUAL (Lucia & Victor, 2005; Parasuraman et al., 1991;

Parasuraman et al., 1988) and technology adoption constructs (Davis, 1989; Parasuraman, 2000; Venkatesh et al., 2003; Venkatesh, Thong, et al., 2012; Wixom & Todd, 2005). Thus, to holistically understand an individual user's perception of ESQ, elements of all these theories will come into play. Public-sector over the Internet transactional services is part of e-government. Thus, Section 2.2 covered this is of literature.

While e-government and governance are a broad area of research the focus on transactional e-services is narrower, and the focus on assessing the quality of such transactional services is narrower still. Section 2.3 considered ESQ assessment in general, and Section 2.4 considered as explicitly as possible ESQ assessment of government provided transactional services. While there is considerable overlap, the distinguishing factors are related to (1) differing trust issues (government bodies *vs* private sector entities), (2) the sensitivity of the data being transferred, and (3) the observation that unlike in the commercial sphere, in most instances citizens have but one choice (a given country's Inland Revenue 'is' the Inland Revenue, there's no price comparison website offering a surfeit of service provider options).

In sum, there are indeed some gaps in the literature directly related to this study's research problem; it follows that this study seeks to go some way toward contributing to the following. First and foremost, to add a valuable and timely contribution to the MENA e-service literature. Secondly, to present a new analytical framework and thirdly to offer insight into the demographic differences (where they exist) about ESQ perceptions and sentiments.

Chapter 3: Hypotheses Development

This chapter will provide the rationale, applied and academic support for each of the eight hypotheses. The six e-service assessment factors, three for the quality of content and three for the quality of delivery can be seen as reflective of what theory and practitioners see as the core elements of a given e-service, which are its ICT-mediated service content functions and delivery dimensions. H₁ to H₃ consider ESQ content components that tie in with the TRA's extant back-end e-service standardised guidelines and measuring rubrics. Likewise, in line with TRA documentation, H₄ to H₆ consider standard ESQ delivery components. The chapter begins with the construct "Perception of ESQ"- Section 3.1- this is derived by a computation of items they are associated with end-user reuse intentions and their overall satisfaction levels of a given transactional service.

Section 3.2 sets out the sub-factors that are most typically considered as service content related and, Section 3.3 sets out the sub-factors that are most typically considered as service delivery related. In terms of segmenting the ESQ assessment factors into content and delivery, it is worth noting that in addition to the work above of Tan et al. (2013). Wang and Liao (2008)—who considered e-government services within an IS success model framework (DeLone & McLean, 1992; 2003)—determined that both "content" and "delivery" were distinct from one another and impacted user sentiment toward e-services in different ways. Lastly, Section 3.4 provides context and justification for the inclusion of H₇ and H₈ to this study's conceptual model. A great many works identify trust— 'Trust in Government'—and citizen technical abilities— 'ICT Familiarity'—as having causal impacts on end-user sentiment toward a given e-

service that go above and beyond its ‘objectively’ measured design and delivery qualities.

3.1 The Outcome Variable, “Perception of ESQ”

As is made in the previous chapter, a key outcome variable used in the ESQ assessment literature is satisfaction in some way shape or form (e.g., Lucia & Victor, 2005; Ribbink et al., 2004; Riemenschneider, Jones, & Leonard, 2009; Rodrigues et al., 2016). Other studies focus on adoption (e.g., Ahmad & Khalid, 2017; Khalil & Al-Nasrallah, 2014; Wittendorp, 2017). Both satisfaction and adoption are perfectly valid and useful outcome constructs, for this study neither alone would be sufficient. As Figure 1 (p.17) shows “ESQ perception” is an outcome variable in its own right but it contains two aspects: reuse intentions (different only really semantically from ‘adoption’) and overall satisfaction level. Thus, for the purposes of this study, we treat ESQ perception as a multidimensional construct. Having both is an important part of this study’s analytical framework because it provides the capacity for (1) distinguishing between the two constructs and (2) in an academic and applied way, it enables insight on not only continuance intentions—the planned behaviour of future actions—but also feedback on the given e-service’s form and function.

“Perception of ESQ” is a construct that was deemed best to determine by proxy. The intention here was to have a strong a possible response. Thus, as opposed to simply asking the sample, “How do you perceive this e-service’s quality” on, for example, a scale of one to ten, it was considered more robust to compute this perception by asking a series of questions that logically contribute to one’s perception of a given service.

Therefore, at the pilot stage, some items suited to this were included (reuse, satisfaction, recommend) of these, some were refined, and others were dropped.

It was determined that 'Reuse Intentions' better capture what may ordinarily be the intended capture of 'perceived usefulness' and indeed, the items that constituted Reuse Intentions and Overall Satisfaction loaded as the same. This means that the difference between the means was so small, statistically speaking they measured the same thing. To underscore the intention, reuse implies usefulness, because if an individual did not intend to reuse the e-service (reverting to bricks and mortar transactions), they necessarily would not perceive it as useful. However, reuse alone cannot fully capture ESQ perceptions. Satisfaction is not the same as Reuse. An individual may decide to reuse a service as it is marginally better than the bricks and mortar (or telephone) alternatives but still not be happy with the given e-service's overall quality. This is why the extant models could not be used to answer this dissertation's research problem.

The aim of any e-service provider, in the absence of direct interaction with human service providers, is to be functionally advanced enough (i.e., sufficient service content) and technically easy to operate (i.e., efficient service delivery) without the user needing to engage with the given e-service's support staff directly (Belanche et al., 2014; Cenfetelli et al., 2008; Tan et al., 2013; Venkatesh et al., 2012). The absence of service content quality reduces the likelihood of obtaining desirable outcomes (i.e., continued usage intentions), the lack of service delivery quality amplifies the difficulty of satisfactorily completing the given transaction. In line with the work of Tan et al. (2013), e-Government service quality is here considered to be the citizens' perceptions of the general performance of a given transactional e-service regarding it fulfilling

their transactional goals. Pearson et al. (2012) examined website loyalties of users by examining influential factors such as perceived information quality, perceived e-service quality, and perceived value. Loyalty then can be seen as this study's reuse intention (see the right-hand side of Figure 1; p. 17).

Overall satisfaction is an essential determinant of perceived quality and perceived value. It is, in fact, a strong predictor of an individual's 'continuance intention'. It is however similar in a way to trust, in that it is subjective and will be partially contingent on considerations beyond the service providers 'technical' control (performance-related constructs). Nonetheless, as Chiu et al. (2005) argue, an understanding such a trait can help establish the user-service provider relationship. User satisfaction has proven useful in evaluating the effects of e-service usage and also identified as a principal factor in intention to use a new technology (Negash, Ryan, & Igbaria, 2003).

User satisfaction with the system influences intention to use, which becomes substantially stronger if the personal, group or organisational performance is improved after the system is used. This means that satisfaction and reuse intentions are very much going to be tied to the perception of ESQ as this is based on notions of usability and responsiveness. Chiu et al. (2005) identified see usefulness as a critical aspect of satisfaction. Cenfetelli et al. (2008), who considered customer service features and tools in the e-business environment as functionality, also found that this functionality is the precedent factor of usefulness and user satisfaction.

There is a long tradition of linking service quality with satisfaction, making satisfaction a salient construct to consider in our theory. Satisfaction and attitude are both types of effect. According to Cenfetelli et al. (2008, p. 163), service quality and

satisfaction have significantly been debated concerning their precise definition and application (the primary debate has been whether to explicitly assess an individual's preservice expectations contributing toward their post-service assessments). Satisfaction has widely been defined, but there is general agreement that it is an immediate effective reaction to the appraisal of a specific referent, such as a product or service (Bhattacharjee, 2001; Parasuraman et al., 1988). As noted, EDT also purports that satisfaction is the result of a post hoc comparison of performance to a priori expectations, such that when these expectations are (dis)confirmed, (dis)satisfaction results.

3.2 Quality of Content

While there is potential for overlap between content and delivery this delineation is retained as part of this present study's analytical framework. Design principles of the e-government website as a medium for service delivery have been empirically demonstrated to be distinguishable from the service content as has quality of content is in no small part be predictive of e-government service quality (Cenfetelli et al., 2008; Fassnacht & Koese, 2006; Papadomichelaki & Mentzas, 2012; Tan et al., 2013; e.g., Verdegem & Verleye, 2009). This Section and its three Sub-sections—3.2.1 “Usability,” 3.2.2 “Information” and 3.2.3 “Reliability”—will focus on content components.

In general terms, first, however, the role of design features, such as navigability, accessibility, and clarity, as being deterministic of end-user quality evaluations of commercial service oriented websites (Wolfenbarger & Gilly, 2003). Massey et al. (2007, p. 277) state that an essential prerequisite for the success of any online service

is ensuring that user experience via the interface, “satisfies both sensory and functional needs.” Within the context of e-government, accessibility is positively correlated with citizens’ usage of electronic voting systems, the security of virtual payment functions reduces citizen resistance to online payment methods (Papadomichelaki & Mentzas, 2012; Venkatesh, Chan, et al., 2012; Verdegem & Verleye, 2009). Based in CSLC as an underpinning theory, Cenfetelli et al. (2008) frame service content as the “what” (and the delivery as the “how”). Tan et al. (2013, p. 89) also differentiate the two: the services being offered (termed: “service content”) and how these services are being delivered (termed: “service delivery”). Content is here considered to be the e-service’s usability, reliability regarding content and the quality of the information provided about the transaction (part one of the left-hand panels in Figure 1; p. 17).

3.2.1 Usability

In the context of e-government, a transactional e-government service that requires a large number of steps is likely to be perceived by citizens as being complicated and having poor usability. Usability can be defined as the extent to which carrying out a transaction can be free of effort (Venkatesh et al., 2003). For this study, we adopt the definition of usability as defined by Al-Momani and Noor (2009). Namely, it is the degree to which a user can carry out online transactions effectively and efficiently (effectiveness here referring to notions of usefulness and efficiency referring to ease of use). In line with prior studies, this present one considers usability to be associated with ease of use.

Davis (1989, p. 320) defines usage as “the degree to which a person believes that using a particular system would enhance [their] performance” and ease of use as, “the degree

to which a person believes that using a particular system would be free of effort.” Perceived ease of use is said to influence perceived usefulness, as the easier a system is to use, the more useful it can be (Davis, 1989, p. 324). Within the ESQ literature, “ease of use”, or usability, is said to influence an individual’s attitude and perception towards an e-service (Parasuraman, 2000; Parasuraman & Colby, 2015). However, Ahmad and Khalid (2017) found that perceived usefulness did not have a positive relationship with UAE users’ decisions to adopt m-government. This suggests that the default factors for TAM/UTAUT may be less relevant to public-sector provided e-services.

For Santos (2003), Gefen, Karahanna, and Straub (2003) and Papadomichelaki and Mentzas (2012), ease of use is defined as “*how to secure the website is for citizens to interact with*”. ISO 9241 defines usability as the ease with which a person can employ a product to achieve a goal in a particular context (Massey et al., 2007, p. 279). It is clear that usability of any given e-service (informational or transactional) will have an impact on sentiment. As stated by Flavián, Guinalú, and Gurrea (2006), usability is an attribute that reflects how easy an online service is to use. According to Meuter, Bitner, Ostrom, and Brown (2005), customers are more likely to try and are more satisfied with self-services that are easy to use. To underscore the point further, Harris and Goode (2010) state, the most crucial aspect in which users evaluate service and the most significant determinant of service quality and user satisfaction.

Ease of use has been identified as a usability attribute critical to user acceptance of new systems (Nielsen, 1993). Matusiak (2012, p. 136) considers usability and usefulness and writes that “usability and usefulness are interrelated aspects of applications and information systems that are necessary to ensure a system’s

functionality.” It follows that usability is not a single property of a system, but rather a multidimensional concept that refers to multiple attributes. Perceived usefulness and perceived ease of use are users’ subjective assumptions and opinions of the system and do not necessarily reflect objective reality as is made clear by Matusiak (2012, p. 137), “potential” users can believe that a system is useful, but at the same time be convinced that it is hard to use. Lam and McNaught (2009, pp. 32-33) consider usability and usefulness in relation to eBooks and state that ‘usability’ relates to the practicality of the various procedures required to use the software and hardware, and the ease of use of the technology whereas ‘usefulness’ relates to whether eBooks can be practical learning tools.

Not unsurprisingly, usability has become an essential concern of ICT practitioners and online service providers (e.g., Sanchez-Franco & Rondan-Cataluña, 2010). As Buckley (2003, p. 453) states, typically, “usability” seeks to measure the quality of a user’s experience when interacting with an electronic service. For the present study, online usability is taken to mean: the ease of which a user can (find,) start and complete the given transaction. This sub-dimension can be equated to the elements of the TRA’s rubric that fall under “Usability and Accessibility Criteria” (UAE TRA, 2014, p. 7). This then leads to the following hypothesis:

- *H₁. Usability will enhance end-user ESQ perceptions.*

3.2.2 Information

For this study, the quality of information (termed in the model: “information quality”) is taken to mean: the extent to which the information provided (its clarity and coherence) is “descriptive, meaningful and readable.” Does such information, for

example, follow international best-practice regarding clear language (or in the context of the UAE a range of languages)? This sub-dimension can be equated to the elements of the TRA's rubric covering "Content Criteria" (UAE TRA, 2014; p. 9). In research focused on the UK and the USA, Weerakkody et al. (2016, p. 334) considered the ESQ component of 'Information' and observed that "information quality of e-government services has a positive and significant impact on user's satisfaction."

Nicolaou et al. (2013) provide empirical evidence on the distinctive influences of information quality on competence-trust, goodwill-trust, exchange-risk and relationship-risk and how these different dimensions influencing adoption/reuse intentions about a given e-service. Nicolaou et al. (2013) demonstrate the importance of information quality—albeit in commercial settings—based on a survey of 221 participants. They consider that information quality is a crucial aspect of deepening both goodwill and competence trust. Alenezi et al. (2015) investigated the relationship between improvements in information quality and the performance of e-government based on a survey of government employees in Kuwait (n = 268). Following stepwise regression analysis, it was observed that usability and usefulness attributes of information quality were the key influencers on strategic benefits (Alenezi et al., 2015, p. 340).

It is widely contended that the visual impact of a webpage can have a significant influence on user experience and has significant implications for effective communication (e.g., Cenfetelli et al., 2008; Tan et al., 2013; Venkatesh, et al., 2012; Venkatesh et al., 2012). As far as the quality of information is concerned characteristics such as completeness, accuracy, conciseness, and relevancy are considered as positive while too much or too little information seen as negative

(Santos, 2003). The ease of understanding a document or information provided is crucial since especially in official documents where there is too much terminology and the language used is too formal. Another consideration is the ability to track the progress and the status of a transaction by way of apparently related and relevant information (Zeithaml et al., 2002). According to Papadomichelaki and Mentzas (2012), information relating to assistance may consist of user-friendly guidelines, help and FAQ pages on the site, as well as the availability of multiple communication channels (phone, e-mail, message boards, and the like).

Alenezi and Al-Qirim (2017, p. 85) argue that the work by Paradice and Fuerst (1991) helps underpin the ESQ construct of ‘Information.’ They note that the majority of related literature, with their metaphor of data as the raw material being consumed by a data manufacturing system to produce information. According to Alenezi et al. (2015), the completeness of a website’s (or here read: ‘e-service’s’) information can be defined as “*the degree to which a given data collection includes all the data describing the corresponding set of real-world objects and entities*”. It will, therefore, be argued that the quality of the information will make a given user’s continuance intentions stronger:

- *H₂. Information quality will enhance end-user ESQ perceptions.*

3.2.3 Reliability

Reliability is considered to be a multifaceted concept, and as such has been variously placed as part of a service’s content and delivery dimension, as Barnes and Vidgen (2001; p. 14) put it, reliability is the “provision of reliable information and reliable service.” Intuitively, one can place these two at the core of any successful transactional

e-service. Logically, users will be most concerned with finding accurate information and being able to reliably order and receive the goods and services they want and need. Reliability then can be defined as the ability to perform the promised service accurately and dependable. The sub-dimension of reliability is evidently central to service assessment as is evidenced in the SERVQUAL and ES-QUAL scales (Parasuraman et al., 1988; Parasuraman et al., 2005). Depending on how the term is framed nevertheless, it can arguably constitute part of a service's "content" dimension; it is "delivery" dimension or indeed both.

The items Barnes and Vidgen (2001, p. 24) included in the reliability dimension that they constructed were: when 'the e-service' promises to do something by a certain time, it does so' when you have a problem, 'the e-service' shows a sincere interest in solving it' 'the e-service performs the service right first time' and, 'the e-service provides its services at the time it promises to do so'. Devaraj, Fan, and Kohli (2002; p. 329) used the following items (α : .837; variation explained: 68%): I believe the 'e-service' to be reliable, I believe that what I ask for is what I get' and, 'I trust the 'e-service' to deliver the product on time'.

Fassnacht and Koese (2006) have argued that reliability is the extent to which the service provider keeps its service promise. Indeed, they state that reliability does not refer to the "reliable functioning of the provider's technical infrastructure during service delivery" (p. 22) and that it should be considered as the accuracy and timeliness with which the underlying service promise is fulfilled and can thus "only be judged after service delivery" (p. 27). For Douglas, Muir, and Meehan (2003; p. 487) reliability is considered to be the extent to which the e-service is easy to navigate (e.g., are all the links functioning correctly?). Wolfenbarger and Gilly (2003, p. 193) define

reliability as (1) the accurate display and description of a product so that what customers receive is what they thought they ordered, and (2) delivery of the right product within the time frame promised.

In the context of ESQ studies then, reliability often refers to a functional quality dimension as well as the reliability of the information content provided on the site. As a consequence, Semeijn et al. (2005; p. 184) argued that it has been difficult to establish it as a single factor with sufficient discriminant validity. This study views “reliability” as the reliability of the information, guidelines and instructions directly relevant to carrying out and completing the transaction. The extent to which content is logically set out and consistent with other areas of the MOI’s site will then positively impact on reuse intentions:

- *H₃. Reliability will enhance ESQ perceptions.*

3.3 Quality of Delivery

Delivery is defined as “*the e-service’s responsiveness, the speed of loading and auxiliary customer service support, notifications and range of payment mechanisms*” (e.g., Cenfetelli et al., 2008; Ribbink et al., 2004). Tan et al. (2013, p. 89) define IT-mediated service delivery as “*The manner by which service content are made accessible to citizens via the e-government website as a delivery channel and contend that associated service delivery dimensions influence delivery quality*”. They go on to state that inefficient service delivery can compromise e-government transactional activities. Underscoring this is the point made by (Carter & Bélanger, 2005) that inefficiencies in the delivery of service content for any e-government website may lead

citizens to sense minimal differences between the web medium and its physical counterpart, thereby inhibiting switching behaviour among potential adopters.

As stated in Section 3.3, what this study terms as service delivery factors—and are to be discussed in Sections 3.4.1 “Responsiveness”, 3.4.2 “Assurance” and 3.4.3 “Customer Service” below—do to an extent overlap with the more holistic concepts of usefulness and ease of use, but are classified separately in order to better reflect the TRA benchmark guidelines and service quality criteria. Furthermore, as depicted in Appendix B (p. 198), some relevant public-sector ESQ assessment models are separating delivery of service content.

3.3.1 Responsiveness

Palmer (2002, p. 156) considers responsiveness to be a key factor in relation to user satisfaction concerning using e-services. This dimension is typically considered to encompass the presence of user feedback options and the scope and nature of such feedback mechanisms: the more responsive e-service portals are, the more positively they will be perceived by users. However, although responsiveness, in general, has a positive influence on user satisfaction, it has also been noted that it may impact quality perceptions negatively if customers feel that they are bombarded with emails (Zeithaml et al., 2000). In other words, today’s SMS alerts. For Barnes and Vidgen (2001; p. 24), responsiveness is the provision of a prompt service “via the site” alongside the “willingness to help customers.” To measure this, they used the following items: employees of the entity providing the e-service tell you accurately when services will be performed, provide prompt service, are always willing to offer assistance and are never too busy to respond to requests.

For responsiveness (α : .846; variation explained: 76%) the items that were used by Devaraj et al. (2002; p. 327) are: I believe the e-service is responsive to my needs; in the case of any problem, I think the e-service will give me prompt service; the customer service team providing the e-service will address any concerns that I have. Ribbink et al. (2004) also considered responsiveness and frame it as the degree to which it is easy to get in contact with the service provider, the speed with which queries are responded to and how satisfactorily such responses are considered to be. They reported a positive relationship between responsiveness and e-satisfaction—“E-quality directly and positively influences e-satisfaction” (Ribbink et al., 2004; p. 452). Wolfenbarger and Gilly (2003) pointed out that the aim of e-service related customer support should be ‘responsive’ and capable of responding to user queries in a fast and efficient manner.

Semeijn et al. (2005) investigate responsiveness in relation to SERVQUAL and eTailQ and contend that it should be seen as how easy it is to contact the service provider and also how quickly and satisfactorily do service providers respond to such queries. Responsiveness then, in the context of this study, includes speed of service, sensitivity to customer concerns and awareness of changes in the general needs of customers. Moreover, while it is important to point out that if the service is performing optimally few users would need (or ever use) such feedback options, it will nevertheless be argued that perceptions of responsiveness will positively correlate with reuse intentions:

- *H₄. Responsiveness will enhance end-user ESQ perceptions.*

3.3.2 Assurance

Semeijn et al. (2005) argue that in some respects online assurance is more important than offline assurance. This is because online customers are less able to scrutinise employees or the physical facilities of the business or public-sector entity with which they are conducting the transaction. Consequently, in online environments assurance must be established by other means such as through guarantees and statements of privacy protection. Wolfinbarger and Gilly (2003; p. 193) state that the aim of e-service related security and privacy is “security of credit card payments and privacy of shared information.”

According to Venkatesh et al. (2012; p. 119), security refers to the technical safety of the network against fraudulent access by others, including hackers. Various types of online fraud, such as phishing, are proliferating and receiving attention in the popular media, thus heightening the interest and concern about security. Such negative views conveyed through the media are expected to create an unfavourable awareness of online services that could discourage adoption. As may be assumed, security has been found to be an essential factor affecting citizens’ use of e-government services (Kim, Kim, & Choi, 2006). Consider recent examples such as the 2016 US presidential election and the UK’s decision to leave the European Union in that same year. In both cases, suspected data manipulation may have influenced both (Cadwalladr, 2017; Grassegger & Krogerus, 2017; Greenberg, 2016).

As a higher degree of security is usually achieved at the cost of an increased number of authentication procedures, security measures should be designed in a way that can efficiently protect citizens’ privacy, and at the same time, minimally inconvenience

citizens when they use the services. Given that security measures help enhance citizens' confidence in using the Internet to obtain government services and thus, make the use of transactional e-government services more attractive, security provision represents another key attribute of the supporting services. As was hypothesised by Venkatesh et al. (2012; p. 120), "*Security provision will positively influence citizens' intentions to use transactional e-government services.*"

It also appears that, initially at least, users judge security/privacy based on elements such as the professional look and feel of the website, as well as its functionality and, the reputation of the service provider (Semeijn et al., 2005) which shows how in cases service content and service delivery, as well as meta factors all, do overlap. For this study then: while the TRA considers "assurance" to include factors such as privacy and security, assurance is more typically considered as a trust-related factor:

- *H₅. Assurance levels will enhance end-user ESQ perceptions.*

3.3.3 Customer Service

In the IS literature, customer service is widely viewed to be beneficial in supporting customers in both off and online transactions (Surjadaja et al., 2003; Zeithaml et al., 2002). Intuitively, the more complex the transaction, the more likely will be the need to have in place 24/7 customer support. With adequate technical support, citizens will be able to gain more control over their use of transactional e-government services. In fact, Venkatesh et al. (2012; p. 119), "*Technical support provision will positively influence citizens' intentions to use transactional e-government services.*"

In the context of e-government, technical support can be delivered in various forms, such as text instructions, interactive demos and over the telephone. As users cannot

obtain face-to-face assistance when they use transactional e-government services on the Internet, the practical design and delivery of online technical support are essential. According to Froehle and Roth (2004), while previous research has contributed to a greater understanding of customer contact in face-to-face settings, considerably less work has been done to improve the understanding of customer contact in “technology-mediated settings.”

On the one hand, Wolfinbarger and Gilly (2003) reported that customer-oriented service was only mildly related to overall user perception of the given e-service and suggest that this may be because customers do not need customer service in each transaction probably accounts for the mildness of this effect. According to Vassilakis, Laskaridis, Lepouras, Rouvas, and Georgiadis (2003), user interaction with some e-services offered by the Greek government was hindered by the fact that users did not have access to expert assistance. The example of filling in tax returns was given. In distinction to the submission to the tax office, where the citizens could obtain expert and specific for their cases information from the tax officers, users submitting through the electronic version of the service were limited to accessing generic help documents.

In the past, using the bricks and mortar or face-to-face transaction channel, citizens would only expect support during office hours. However, with over the Internet transactions, such support may well be expected at any time. In this regard, it is interesting to note that regarding “Customer Services” TRA documentation stipulates that these should be: “available around the clock, and through as many channels as possible.” The following hypothesis then will be addressed by survey items relating to how such information is considered to be on the pages of the particular transactional service being subjected to study:

- *H₆. Customer service support will enhance end-user ESQ perceptions.*

3.4 Non-ESQ Specific Variables

While the overriding objective of this study is to devise a model and scale capable of assessing the “quality” of an e-service from the user’s perspective (in terms of overall perception), trust as an exogenous factor (i.e., not the assurance the service itself may provide) is typically seen as a critical component as is the user’s level of ICT familiarity. Regarding factors that are not e-service assessment related but are nonetheless widely assumed to impact an individual’s overall perception of the quality of the e-service, two, in particular, stand out: trust and ICT-related competencies. It has been suggested that there are two targets of trust: the entity providing the service (party trust) and the mechanism through which it is provided (control trust) (Bélanger & Carter, 2008, p. 166).

Satisfaction is something of a catch-all concept that instruments such as the E-S-QUAL framework seek to measure. It can also be derived by gauging user likelihood of recommending the service to others (e.g., Belanche et al., 2014; Cenfetelli et al., 2008). Deploying a survey based on the UTAUT model (n = 380), Rodrigues et al. (2016, p. 27) established that factors similar to the present study’s ‘Trust’ and ‘ICT familiarity’ both act as key determinants of adoption intentions and overall satisfaction (using the terms “Confidentiality and trust” and “Attitude toward using technology”).

3.4.1 Trust in Government

The importance of the variable “trust” in relation to public sector e-services, is due to the greater transactional risks posed by having to provide personal data in many

government e-service transactions (Grimsley & Meehan, 2007). Fassnacht and Koese (2006, p. 30) have pointed out users ‘know’ the degree to which they trust a given service provider, but they might not be able to judge whether the information provided is accurate or the data transfer is safe. Since the concept of trust is strongly related to “uncertainty avoidance”, differences could also be expected in the way it impacts on e-service user satisfaction levels in different cultural settings.

According to Hofstede (1993; p. 90), in countries where uncertainty avoidance is strong a feeling prevails of “what is different, is dangerous.” In weak uncertainty avoidance societies, the feeling would rather be “what is different, is curious.” Arguably in the context of the UAE, where both citizens and non-residents (from a wide range of cultural backgrounds) will use the e-service at the heart of this study, we can surmise that there will be a mixture of rigid and flexible users. Lim, Tan, Cyr, Pan, and Xiao (2012) focused on a Singaporean government e-service (an electronic tax-filing system) is particularly relevant to this research study.

Using a multidimensional integrated framework that specifically identified trust-building strategies was developed. By applying this analytical framework, the research integrated different strategies of trust building, including calculative-based, prediction-based, intentionality-based, capability-based, and transference-based trust. The research of Connolly et al. (2010) drew attention to some characteristics, such as “trust” and overall satisfaction with an e-service by developing a model—based upon a modified version of the ES-QUAL instrument (Parasuraman et al., 2005)—used to evaluate an Irish government e-service (related to revenue).

As trust is a subjective trait and has repeatedly found to impact upon a population's perception of the quality of a given transactional e-service, it has received considerable research attention (see, e.g., Fakhoury & Aubert, 2015). Riemenschneider et al. (2009) use "trust" as a moderator between usability and perceived individual impact and between satisfaction and perceived individual impact. In this instance, 'satisfaction' was defined as the user's response to the use of the given e-service. They conclude that trust directly influences the perceived individual impact of the Web and influencing the relationship between usability/satisfaction.

Previous research showed that the reuse intentions (the degree of website loyalty) increased when both trust and usability were ranked more highly (Flavián et al., 2006). Trust is considered a key factor. As Harris and Goode (2010) observed—albeit in the commercial sphere and with a relatively small sample of 257—the loyalty intentions of online customers are linked to the extent to which they trust the service provider. Belanche et al. (2014) argue that trust in an entity that consists of different components and accumulates or dissipates by the effects of cumulative interactions with different components. A lack of clarity about security, identity and authentication, confidentiality, and jurisdiction may cause users to perceive the Internet as more useful for gathering information than for completing transactions and thus trust in the Internet should act as an antecedent of trust in a public e-service.

Indeed, Belanche et al. (2014; pp. 632-633) contend that in the context of e-service assessment, trust should be considered as a broader and more multi-faceted dimension and include trust in the public administration. Emphasising this, Alfalah et al. (2017) point out that Trust of the Internet (TOI) refers to 'an individual's perceptions of the institutional environment, including the structures and regulations that make an

environment feel safe' and that Trust of the Government (TOG) refers to one's perceptions regarding the integrity and ability of the agency providing the service. Trust can also be used as both a moderator and an outcome variable (Belanche et al., 2014; Fakhoury & Aubert, 2015; Riemenschneider et al., 2009). As this study captures trust in the Internet to some considerable degree in ICT familiarity, here it purposefully focuses on trust in the government:

- *H₇ Trust in government will impact on end-user ESQ perceptions.*

3.4.2 ICT Familiarity

Based on in-depth research in the Netherlands it was found that educational attainment played a significant role (van Deursen & van Dijk, 2011). The relevance and importance of this study are that factors such as this and other non-ESQ specific ones will impact on ESQ perceptions. This means that what may be seen as an entirely straightforward transactional service by one person, maybe seemed as difficult to carry out by another. If trust is correlated to notions of an individual's technological readiness, it follows that two users may perceive the 'same' service rather 'differently' (Parasuraman, 2000; Parasuraman & Colby, 2015). As with trust, theory and practice suggest, one's relationship with technology per se will influence their perspective on the quality of a given e-service's content/delivery. In other words, it will impact on user perception of the service.

In the seminal work on the subject by Parasuraman (2000)—which set out a model and scale capable of assessing a technology-readiness construct—technology in relation to e-services was framed as an individual's willingness/likelihood of embracing and using new technologies in order to achieve “goals in home life and at work” (see also:

Parasuraman & Colby, 2015). According to Venkatesh et al. (2012), much previous IS research emphasises the impact of technology innovations on the delivery of self-service (e.g., Froehle & Roth, 2004). For instance, (Meuter et al., 2005) found that innovation characteristics influenced consumer trial of self-service technologies.

The IS literature has found that the use of innovation requires specific resources, such as specialised computer equipment, that facilitate its use (Venkatesh et al., 2003). van Deursen and van Dijk (2011, p. 894) make the argument that as access to information is evermore contingent on the Internet, ICT skills should be, “considered as a vital resource in contemporary society.” In the context of the UAE indeed, Rodrigues et al. (2016) found attitudes toward using ICT as critical determinants of overall satisfaction and subsequent adoption of e-government services to result in the below hypothesis:

- *H₈ ICT familiarity will impact on end-user ESQ perceptions.*

3.5 Summary

In summary, the first hypothesis—H₁, *Usability will enhance end-user ESQ perceptions*—is designed determine how usable (‘user-friendly’) the service is. Usability is typically defined as the degree to which an Internet-enabled service enhances their ability to retrieve information or carry out a transaction (Buckley, 2003; Sanchez-Franco & Rondan-Cataluña, 2010). For this study, it is distinct from perceived usefulness (Floropoulos et al., 2010; Magoutas et al., 2010; Yoojung & Hyung-Seok, 2014) in that it focuses more on the technical and functional usability of e-service under investigation. The second hypothesis— H₂, *Information quality will enhance end-user ESQ perceptions*—is designed to ascertain user sentiment on the service’s quality of information, its clarity and coherence in relation to completing the

necessary steps of the transaction; it may also cover information on optional help, support and FAQs pages (Nicolaou et al., 2013; Weerakkody et al., 2016).

The third hypothesis—H₃, *Reliability will enhance ESQ perception*—is designed to gauge sentiment on service reliability. Reliability is defined as the citizen's confidence towards the e-government site concerning the correct and on-time delivery of the service. This is taken to mean end-user perception of the reliability and security of the service provided. The literature suggests that there is an essential construct but that it is sometimes found to conflate with the constructs of assurance and responsiveness (e.g., Papadomichelaki & Mentzas, 2012; Parasuraman et al., 1988).

The second set of three hypotheses are designed to measure the quality of the service's delivery. The first of these, the fourth hypothesis—H₄, *Responsiveness will enhance end-user ESQ perceptions*—is designed to provide an insight into the e-service assessment criterion 'responsiveness'. The end-users perception of the responsiveness of any given service is a key consideration and has variously included, speed, promptness and helpfulness (Ribbink et al., 2004; Semeijn et al., 2005). The fifth hypothesis—H₅, *Assurance levels will enhance will enhance end-user ESQ perceptions*—is designed to test for sentiment toward 'assurance'. Assurance is related security (an aspect of which is privacy). It is argued that it is more important than offline assurance because online, users are less able to scrutinise employees. The sixth hypothesis—H₆, *Customer service support will enhance end-user ESQ perceptions*—is designed to provide insight into this part of an e-services' delivery functionality. In this context, "customer service support" is end-user perspectives on the degree of support provided (should they actually require it) that the e-service in question can or

does potentially provide (Surjadjaja et al., 2003; Vassilakis et al., 2003; Venkatesh, Thong, et al., 2012).

The final two hypotheses consider exogenous factors. Factors that do not directly relate the e-service's content or delivery competencies but do typically impact on a given end-users sentiment toward the service regardless. The seventh hypothesis—H₇, *Trust in government will positively impact end-user ESQ perceptions*—is designed to find out if levels of trust in government positively impact perceptions of e-service quality. Trust here is specific to the government or authority in general. Trust in technology will be emphasised as part of ICT familiarity (see, e.g., Belanche et al., 2014; Fakhoury & Aubert, 2015; Lee & Levy, 2014; Riemenschneider et al., 2009; Rotter, 1980).

The eighth hypothesis—H₈, *Trust in government will positively impact end-user ESQ perceptions*—is designed to evaluate confidence and competency of the end-users with using of technical gadgets. As set out in Section 3.4.2, the point and purpose of this forecast factor construct is to ascertain a sample member's confidence and acceptance of ICT, in order to determine the possible influence of this on their sentiment toward the e-service being evaluated (see, e.g., Davis et al., 1989; Parasuraman, 2000; Parasuraman & Colby, 2015).

Chapter 4: Methodology and Methods

As was pointed out in the Literature Review Chapter, while prior research has focused to a fair degree on ESQ in the private-sector (e.g., Groß, 2015), a growing body of relevant studies have concentrated on ESQ in the public sector organisations. It will be the latter that for the most part provide the present one with its methodological reasoning and, methods-wise, its procedural steps (i.e., Belanche et al., 2014; Cenfetelli et al., 2008; Papadomichelaki & Mentzas, 2012; Tan et al., 2013; Venkatesh, Chan, et al., 2012; Verdegem & Verleye, 2009).

As stated, this research study explores the current status of a public sector transactional e-service to gain a comprehensive understanding of the extent to which its form (content) and function (design) are perceived from the viewpoints of the end-users. This study is applied in nature, and it, therefore, seeks to construct and deploy a survey instrument that will provide holistic feedback on ESQ but also feedback that ties in with extant back-end practitioner benchmarks and guidelines. This will be of both academic interest and applied utility. For presently, the dimensions set out in the UAE Government documentation are targeted to back-end IT practitioners (i.e., the service providers) and are not designed to gauge end-user attitudes and sentiment towards transactional e-Government services (Government of the UAE, 2012; 2014; UAE TRA, 2014).

This chapter proceeds as follows. Section 4.1 considers the research paradigm this study operates within and provide context and justification for the decision to adopt a survey-based approach. In Section 4.2, the methods used in this study are discussed, beginning with the analytical framework, namely the conceptual model (see Figure 1;

p. 17) and the rationale for its constituent parts—which are the ESQ specific content and delivery elements, the non-ESQ specific factors of trust in government, perceived usefulness and ICT familiarity and the dependent construct of overall perceptions of ESQ that contains both reuse intentions and overall satisfaction levels.

Section 4.2.2 discusses the process of building the first survey scale. That is, the items incorporated that were considered best suited to address the proposed eight hypotheses. Section 4.2.3 and Section 4.2.4 consider the sample and the associated ethical considerations. Section 4.2.5 considers data collection and subsequent analysis. It is left to section 4.3 to discuss the procedure that this study followed. A pilot study (n = 51) was conducted in the first instance (Section 4.3.1) and following on from that; some items were dropped and reworded as a result of a post-pilot stage focus group (Section 4.3.2). The mechanics and the timeframe of the full-scale survey are covered in Section 4.3.3.

4.1 Research Paradigm

This research study is to a considerable degree post-positivist, within the field of social sciences there is no such thing as certainty. With this in mind, this study may also be categorising as pragmatic. For instance, a pilot study was undertaken for a planned focus group, a wide range of qualitative literature was also relied upon. Both are indicative of constructionist research. However, it also has as its central research tool a quantitative survey. Such numerical data-driven research would by some accounts place this study in the post-positivist school. Indeed, it is argued that a mixed quantitative/qualitative approach should be adopted where feasible to, minimise the weaknesses of each method and thus benefit from the strengths of each. It happens to

be the case also that Tan et al. (2013) use the post-positivist research paradigm as their underpinning research philosophy.

As Feilzer (2010; p. 8) states, adopting a more flexible research approach, “sidesteps the contentious issues of truth and reality” and, this allows the focus to be on “what works as the truth” regarding the research questions under investigation (Tashakkori & Teddlie, 2003; p. 716) According to Merriam (2014; p. 9), it is typically assumed that social reality is socially constructed, and therefore, there is no single, observable reality. While this tends to be taken as a given, it is argued nonetheless that social research should take a scientific approach whenever the research problem calls for it (Wellington & Szczerbinski, 2007; p. 11). While most of the critical government-focused ESQ assessment works set out in Table 1 (p. 22), do not declare themselves as positivist or constructivist, it is clear from the methods they employ they are broadly similar in research philosophy to Tan et al. (2013). For convenience, Table 4 below sets out some fundamental research paradigms.

Table 4: Research Paradigms

Constructivism	
Type of research	Purpose & Methods
Qualitative	Constructivism (also known as interpretive, phenomenology, grounded theory, naturalistic) is considered to: describe, understand and interpret. e.g., Open-ended questions, text and image data
Positivism	
Type of research	Purpose & Methods
Quantitative	To predict, control and generalise, e.g., Closed-ended questions, pre-determined approaches, numeric data
Pragmatism	
Type of research	Purpose & Methods
Mixed	To predict outcomes (hypotheses) and make conditional generalisations, e.g., Open and closed-ended questions, and both, qualitative and quantitative data analysis

The primary distinction between constructivist and positivist research relates to the fact that while positivism argues that knowledge is generated in a scientific method, constructivism maintains that knowledge is constructed by scientists and does not accept that there is a single methodology to generate knowledge (e.g., Fielding, 2010). Constructivism sees reality as a construct of the human mind, and thus is subjective (i.e., pragmatism and relativism). In contrast, positivism is a philosophical theory stating that specific (positive) knowledge is based on natural phenomena and their properties and relations. These different paradigms used to lead to distinct approaches to data collection: the quantitative and the qualitative. Nevertheless, these days many researchers adopt a more flexible mixed methods approach. There are many different paradigms or approaches in social research with labels that, according to Wellington and Szczerbinski (2007; p. 18), imply opposite poles such as positivist/interpretive and qualitative/quantitative, in practice many researchers opt for a combination of the two.

According to Creswell and Clark (2011) and Denzin and Lincoln (2011), to philosophically frame qualitative, quantitative and mixed methods research will be partially contingent on what one believes about the nature of reality (“ontology”) and the nature of knowledge (“epistemology”). Firestone (1987, pp. 18-19) argues that quantitative research must convincingly demonstrate that procedures have been followed faithfully because the minimal concrete description of what anyone does is provided. Whereas, qualitative research must provide a convincing depiction in adequate detail to show that the conclusions are drawn, in some way, makes sense.

The research theories themselves, it is said, can be better understood and interpreted by collecting and analysing data (e.g., Maruyama & Ryan, 2014). Worthwhile and effective social science will be critical, self-critical and systematic and, as Wellington

and Szczerbinski (2007; p. 13) stress, “grounded in and constrained by empirical data.” Merriam (2014; p. 12) sets out four research perspectives: (1) positivist/post-positivist, (2) interpretive, (3) critical, and (4) postmodern/post-structural.

The question of which research paradigm to operate within cannot be considered without reference to the subject being researched. Ultimately, the “what” and the “how” are intrinsically linked. So, for this study, the research questions (the “what”) came first, and the selection of the methods (the “how”) was predicted on those overarching questions. Guba and Lincoln (2011; p. 105) argue that both qualitative and quantitative methods may be used appropriately with any research paradigm. Maruyama and Ryan (2014) point out that strategies that focus exclusively on one type of validity can undermine other types of validity and thus, qualitative and quantitative methods can often be complementary. Critically, it is argued, that a given study’s research methodology should be dictated by the nature of the problem (Wellington & Szczerbinski, 2007, p. 20) or, as (Treiman, 2014; p. 4) put it, the nature of the research generally dictates the kind of data chosen and the manipulations performed.

Richardson and Kramer (2006) suggested that using post-modern (qualitative) information-gathering techniques helps to clarify the differential realities of individuals. For instance, when users are asked for a research survey to rate an e-service holistically. Therefore, it considers research in its broadest sense: a systematic process that results in knowing more about something that was known before the research being conducted (Merriam, 2014; p. 4). It evaluates the literature and the first-hand data systematically and methodologically to affect decisions or actions concerning activity of public interest (Dahler-Larsen, 2013; p. 15). It also employs a constructionist-interpretative approach while investigating the research problem, for

as Guba and Lincoln (2011) argue, as there are multiple meanings and realities surrounding the problem, being investigated.

Some research models have been used to predict and explain user behaviour in the context of e-government adoption. Many of these models focus on IS/ICT adoption theories and, according to Rodrigues et al. (2016), TRA, a great many of these ultimately ground themselves with notions about the theory of reasoned actions (Ajzen, 1991; Ajzen & Fishbein, 1980). This, alongside EVT, CDT and even Rotter's (1980) work on trust link to TPB and thus originate in the discipline of psychology. Similarly, IS contributed to the development of TAM, in which Davis (1989) proposes that technology usage is determined by behavioural intention, which is affected by two fundamental principles; (1) perceived usefulness, and (2) perceived ease of use. That has more recently morphed into the widely deployed UTAUT mode (Venkatesh et al., 2003). Since its inception in 2003, the UTAUT has become a favourite and popular theory within the IS literature (Schaupp, Carter, & McBride, 2010).

4.2 Methods

Regarding methods, this study from inception onward has sought to build an analytical framework that, at its core, has a survey scale capable of gauging end-user sentiment toward public-sector provide transactional e-services. In this regard, a model was first constructed that was based heavily on extant scales and constructs – an important consideration when intending to carry out regression analysis (Attewell & Monaghan, 2015; Field, 2009; Lewis, 2007). As Grapentine (1995) states, model/survey attributes are defined in marketing research textbooks as tangible and intangible characteristics

of a given good or service; scales are developed to represent various ‘attributes’ that can be used to evaluate and describe the good or service.

Such scales are used to compare and contrast user perceptions of services and also for building models that help better explain and understand customer satisfaction about the quality of a given good or service. Such scales include SERVQUAL, and more latterly, the four dimension, 22 item ES-QUAL scale developed by Parasuraman et al. (2005), the ten dimensions Service Quality Framework conceptualised and validated by Fassnacht and Koese (2006) and the more recent 22-item e-GovQual scale by Papadomichelaki and Mentzas (2012).

4.2.1 Model Construct

Some works informed the model constructed for this survey. The key ones and their underpinning theoretical backdrops and construction techniques will be discussed here. Moreover, in Appendix B, ten informative e-service assessment models are depicted. Ladhari (2010, p. 464) points out that some dimensions are regularly utilised in e-service quality assessment scales (e.g., ‘reliability’, ‘responsiveness’, ‘ease of use/usability’ and ‘privacy/security’) but others, are necessarily specific to e-service contexts. This explains why perhaps so many models proliferate. Yet, as set out Halaris, Magoutas, Papadomichelaki, and Mentzas (2007, p. 383), a common feature is a “model” consisting of a number of latent variables and the cause and effect relationships between them (e.g., consumer satisfaction may be the latent variable that is at the centre of the model; it is encased within a system of variables relating to causes and effects).

The most widely applied service quality framework is SERVQUAL (Parasuraman et al. 1985, 1988) and its identification of customers' salient perceptions about a vendor's reliability. That is the assurance, empathy, and responsiveness that the vendor conveys to customers alongside the tangible aspects of the vendor's infrastructure and appearance. This fits well with the six-factor "IS success model" proposed by DeLone and McLean (1992) was updated in 2003 to incorporate a new construct service quality and substituted the variables, individual impact, and organisational impact, with net benefits which accounted for benefits at different levels of analysis (DeLone & McLean, 2003) (see Figure 9; p. 199). According to Weerakkody et al. (2016), satisfaction reflects the "affect status," which is shaped by user's previous experience with the given e-service. It is argued that information provision, interaction with government officials, and access can be expected to contribute to important outcomes such as trust (Moon & Kim, 2001).

In a contemporary study that examined the impact of information quality, system quality, trust, and cost on user satisfaction of e-government services Weerakkody et al. (2016, p. 321) state that, "*satisfaction is recognized as one of the most significant influences for e-government adoption and diffusion.*" Based on a sample of 1,518 e-government service adopters across the United Kingdom their overall model fit resulted in a chi-squared (χ^2) value of 373.382 with a degree of freedom value of 136 and a probability value of less than 0.001. While they concede that the significant p-value indicates the absolute fit of the model is less than desirable (Bélanger & Carter, 2008), Weerakkody et al. (2016; p. 337) contend that as the chi-squared (χ^2) test of the absolute model fit is receptive to sample size and non-normality, the better measure of fit is chi-squared (χ^2) divided by the degree of freedom.

Cenfetelli et al. (2008, p. 162) use the theory of reasoned action (Ajzen, 1991; Ajzen & Fishbein, 1980) as a specific foundation for both deriving the theoretical role of SSF and integrating it within theories of service quality and technology acceptance. Following the conceptualisation by Grönroos (1982), the work by Cenfetelli et al. (2008) identifies key attributes that will be important in the citizens' decision making, tied to the three elements—i.e., core services, facilitating services/goods and supporting services/goods—of transactional e-government services from the IS and SERVQUAL literatures. Cenfetelli et al. (2008) contend that: (1) from a service perspective, e-government services will exhibit characteristics, such as service delivery and (and are expected to be as good as traditional public services in terms of service quality), and (2) that from a system perspective, e-government services are expected to be just as user-friendly as existing commercially-run websites and over the Internet services. This ties in with the UAE government e-service plans, and indeed, the TRA's backend benchmark rubrics.

As explained by Cenfetelli et al. (2008), attitudes are longer lasting and more stable than satisfaction, and so are more resistant to change. Satisfaction has also been compared to an emotion: individuals tend to confirm what they already know (or feel), and so attitudes change only gradually over time as a result of experience with the given target object or behaviour and the influence of situation-specific satisfaction (see, e.g., Bhattacharjee & Premkumar, 2004). This is why this present study looks at both satisfaction 'and' reuse intentions. As Tan et al. (2013, p. 83) state, it is essential to differentiate service content from service delivery as distinct but complementary factors.

Service content quality can be seen as the effectiveness of service content functions provided via an e-government website in fulfilling citizens' consumption goals (what services a citizen is receiving from an e-government website for attaining their consumption goals) and to service delivery quality as the efficiency of accessing service content via the e-government website as a delivery channel in fulfilling citizens' process goals (how well these services are made accessible to the citizen in achieving their process goals). Such a distinction can be observed in Figure 1 (p. 17).

The methodological procedure and rationale for a somewhat similar recent piece of applied research, that of Ahmad and Khalid (2017) study, like this one, used a five-point Likert-type scale with anchors ranging from one (strongly disagree) to five (strongly agree); it had a conditional criterion for taking the survey which was, "having experience using m-government services system at least once in lifetime" (Ahmad & Khalid, 2017; p. 374). Looking at methods employed for analysing survey data, Rodrigues et al. (2016) used exploratory factor analysis to extract the essential constructs and also used regression analysis to identify the influence of individual constructs on end-user adoption intentions and, correlation analysis to identify the relationship between Internet usage and user satisfaction.

4.2.2 Survey Instrument

The survey instrument for this study was built in some stages. It began by evaluating the TRA's ICT developer-focused benchmarking rubrics and juxtaposing these against the range of research studies that in some way focused on assessing e-services, the items/criteria are set out in Table 5 (p. 86) and Table 6 (p. 89). Both Tables present the TRA back-end assessment criteria and also the range of items for consideration for

this study's end-user focused survey. Several studies have suggested that online surveys offer a degree of autonomy and anonymity (and thus arguably, frankness in response) that cannot be replicated in paper-based or face-to-face encounters online approach is more autonomous than on-paper surveys (e.g., Dommeyer, Baum, Hanna, & Chapman, 2004, p. 612; Fike, Doyle, & Connelly, 2010, p. 51). According to Papadomichelaki and Mentzas (2012), content validity is ordinarily to be established deductively. As with the present study. They based their survey items on an extensive literature review and critical screening of the existing approaches on website and e-government quality measurements (previously validated scales). By so doing, it is possible to set the boundaries of the constructs of interest.

In a similar vein to this study, they identified an exhaustive candidate list of items from the domain of all possible items relating to government e-services. Papadomichelaki and Mentzas (2012) noted that although some of the quality evaluation criteria will be generic in nature (i.e., may be suitable for either e-commerce or e-government sites), others may apply only to e-commerce and some may apply only to e-government (e.g., do customers have the same expectations of an e-commerce site that citizens have an e-government site? Are the quality criteria for an e-commerce site the same with the quality criteria of an e-government site?). Ahmad and Khalid (2017) also used a self-administered questionnaire as is now the default option in social sciences survey-based research (Saunders, Lewis, & Thornhill, 2015).

Regarding this study's survey instrument, the items were based on the dimensions and scales in the works referred to in Table 1 (p. 22) and Table 2 (p. 26) and more specifically Table 5 (p. 86) and Table 6 (p. 89). Regarding validating the survey instrument, some steps are typically taken. In short, these entailed setting up the

instrument's face validity; carrying out a pilot survey; remove unusable responses such as partially completed ones or ones where the same response was given to every question. Following on from that dimension reduction (e.g., Exploratory Factor Analysis) and reliability testing (e.g., Cronbach's Alpha validation) is typically conducted. These algorithmic tests help ensure items to combine into factor groupings load well together and that each factor is reasonably distinct from any other factor.

Table 5: TRA E-service Assessment Benchmarks

Dimension	Items
Service Content	
Online usability^a	
1.1 Ease of use	Ease of reaching an eService from the entity's homepage (maximum three clicks). Providing the eService in both Arabic and English throughout the Delivery process. Not allowing pop-up windows/screens throughout the service delivery process. Labelling of all mandatory fields as Required Fields with an asterisk (*). The user must not need to configure the computer or download proprietary software to access the eService or to make it work
1.2 Consistency	Consistent page header and footer throughout the service delivery. Consistent use of the official entity name and logo Consistent location for the Security/Privacy Policy and availability of the Usage Terms and Conditions
Information quality^b	
2.1 Simplicity	Name of the eService is descriptive and easy to understand Clarification of all steps with details during the e-service delivery execution process is provided. A clear description of what (documents or steps) is required to complete an eService
2.2 Completeness	In case the user registration is required to proceed with an eService, the procedure is outlined. The value and details of service charges have been determined. The period foreseen for the implementation of the eService and getting the results is mentioned
2.3 Helpfulness	An indication of data format and type with example/s where necessary. A clear outline of steps after the registration process. The content and readability of the confirmation or receipt of an eService transaction is useful for the customer

Table 5: TRA E-service Assessment Benchmarks (Continued)

Dimension	Items
Reliability^c	
3.1 Usefulness / Value	Availability of various online payment methods. No intermediate physical visit to the government office required from the customer. The user can print the confirmation or receipt of an eService transaction. The user can retrieve the eService Delivery information later if required
3.2 System Stability	An error-free e-service after submission of the request
Service Delivery	
Responsiveness^d	
4.1 Notifications / Status	Notification of registration confirmation and successful electronic payment via SMS, email or any other electronic means to the user Status or notification of the hidden (back-end) processes. Ability to inquire about the status of the eService at different levels of approval. In case an email or SMS is sent to the customer, it contains a reference number for further clarification and inquiry
4.2 Performance / Effectiveness	Appropriate loading time and processing time for all eService pages. Minimum waiting and response time between a mouse click and next e-service page. Multiple browser compatibilities during the service provisioning process
Assurance^e	
5.1 Privacy	Single sign-in option to access all e-Services within the entity and availability of logout option. Availability of online account log and payment history. An option whether to delete or remember the username/passwords at the user end with a natural process for changing the password. No option for the eService user to change the username at the user end and password retrieval by the service user Re-authentication before and after changing a password with verification requirement for resetting a password
5.2 Security	A clear and secure defined process for password recovery and resetting. Availability of a secure electronic channel for the transmission of password/s. Rules outlined for choosing a secure password. Secure & encrypted e-service delivery for the transmission of personal data & information. The system destroys session tokens upon logging out or at session timing out

Table 5: TRA E-service Assessment Benchmarks (Continued)

Dimension	Items
Customer service^f	
6.1 Tact and Interest	Response to the customer within 11 working days for the complex observations max
6.2 Information Availability	The employee can answer all the questions that can be asked about the service provided. Provision of Frequently Asked Questions (FAQs) with easy to understand. The consistency of Information provided across all the channels of customer service
6.3 Response	The time takes to get an email response/reply is appropriate within 48 hours maximum. Registration or submitting a service request via the website does not take more than 5 minutes Customer Service is provided 24/7 through email
6.4 Quality and Reliability	The employee applies all service excellence criteria to all services and deals fairly and equally with all categories of customers

Note: The factors above are informed by the UAE's TRA's generic quality of service criteria (Government of the UAE, 2014); ^a in the context of this study this dimension refers to the ease of use and whether the service is appealing to the user; ^b this dimension covers the extent to which information is descriptive, meaningful and readable; ^c this determines how trustworthy the service is considered to be; ^d this dimension determines sentiment on speed and sensitivity to customer concerns; ^e issues relating to sign-on and number of password steps and stages; ^f gauges the extent to which customer service is, or is considered to be available 24/7.

Table 6: E-service Assessment Items

Dimension, Sub-dimensions and Items
1. Service Content
1.1 Ease of use [Usability]
— The process of completing the transaction was simple and straightforward. [Author's Own / PEA.2012]
— The instructions and procedures for this e-service were confusing and unclear. [R] [TAN.2013 / adapted]
— Carrying out this e-service transaction was quick and easy. [TAN.2013 / adapted]
— Using the e-service saves me time and effort over other means of performing the same task
— This e-service offers the services that I need [YOO.2014]
— I can enjoy a more convenient life thanks to using this e-service [YOO.2014]
— Using the e-service gives me greater control in carrying out my tasks [NAI.2007]
— Using the e-service is a more effective way of servicing my needs [NAI.2007]
— Using the e-service saves me effort over other means of performing the same task [NAI.2007]
1.2 Consistency [Usability]
— The service looked as though it were designed for my browser. ^a
— It was not easy to access this e-service from the MOI's main website. [R] [CON.2010 / adapted]
— The appearance of this e-service is consistent with the MOI's main website. [Author's Own / CEN.2008]
1.3 Simplicity [Information]
— The information provided on this e-service site is well-organised. [PEA.2012 / adapted]
— The appearance of the e-service is not visually appealing. [R] [CEN.2008 / adapted]
1.4 Completeness and Helpfulness [Information]
— Information required to complete the transaction is set out explicitly before the payment stage.
— I could access and complete this transaction with my existing MOI user account details.
— The MOI website has comprehensive FAQs regarding the e-services it provides. [CON.2010 / adapted]
1.5 Usefulness/Value [Reliability]
— The information regarding the payment process was clear and straightforward to follow.
— I was not happy with the range of payment options made available to me. [R] [PEA.2012 / adapted]
— This e-service provided an adequate range of payment options. [CEN.2008 / adapted]

Table6: E-service Assessment Items (Continued)

Dimension, Sub-dimensions and Items
1.6 System stability [Reliability]
— The page/s of the e-service loaded quickly. [Author's Own / PAR.2005; PEA.2012]
— At no point during the transaction, did I feel the service was slow? [Author's Own / PEA.2012]
— This e-service is available 24/7. [PEA.2012]
2. Service Delivery
2.1 Notifications and Status [Responsiveness]
— This e-service lets me review a history of my previously completed transactions. [TAN.2013 / adapted]
— I could quickly obtain a receipt (acknowledgement of payment).
— This e-service informs me about the current status of my outstanding payments. [TAN.2013 / adapted]
2.2 Performance and Effectiveness [Responsiveness]
— Using this e-service allowed me effectively to perform this transaction online. [TAN.2013 / adapted]
— I believe this e-service quickly delivers the service I expect it to. [PAR.2005 / adapted]
— The page/s of the e-service take a long time to load. [PAR.2005; PEA.2012/adapted] ^b
2.3 Privacy and Security [Assurance]
— I am confident that my MOI user account and payment details are stored securely.
— I think that the MOI uses the latest anti-hacking technologies. [TAN.2013 / adapted]
— I felt confident about paying for this service online. [CEN.2008]
— I believe this e-service is backed up with good customer support should I need it.
— The e-service states customer support is provided if required.
— If I were to encounter problems, MOI customer support would help resolve them. [CEN.2008 / adapted]
3. Non-ESQ-specific Factors
3.1 Items of Trust in Government ^c
— I trust the Government of the UAE regarding carrying out bureaucratic transactions
— I consider public sector administrative processes in the UAE to be transparent and fair.
— I feel confident and relaxed when interacting with staff at government agencies.
3.2 Items for ICT Familiarity ^d
— Using modern technology makes me more productive in my personal life
— Government e-services enable me to achieve a better work/life balance
— I am among the first in my circle of friends to adopt and use the latest technologies
— I prefer to use the latest technology (services and products) available

Table6: E-service Assessment Items (Continued)

Dimension, Sub-dimensions and Items
4. Outcome Variables
4.1 Overall satisfaction
— I am satisfied with the usefulness of the eService. [CEN.2008; PEA.2012; TAN.2013 / adapted]
— Overall, I am satisfied with the eService of MOI.
4.2 Future Intentions
— I intend to (re)use this e-service as I perceive it is fast, efficient and reliable. [code: CEN.2008 / adapted]
— I intend to (re)use this e-service as it enabled me to conduct my transaction more quickly. [CEN.2008]
— I intend to (re)use MOI e-services all the time.

Note: ^a Browser will be known by back-end processing; this item helps determine the cross-browser compatibility of the e-service. ^b This is essentially the reverse of the first item of “system stability”, and thus at the component factor analysis stage, there may be overlap. However, it will act as a data robustness check unless it is omitted following the pilot phase of this study. ^c Based in part on the work of Carter and Bélanger (2005, p. 25) and Bélanger and Carter (2008, p. 174). ^d These data enables perceptions on e-service quality to be delineated between those that consider themselves as confident or unconfident concerning ICT. The first two items correlate to “Optimism”; the second two items correlate to: “Innovation” and are based on the work of Parasuraman and Colby (2015, p. 64). The codes are as follow: [TAN.2013] is Tan et al. (2013); [PEA.2012] is Pearson et al. (2012); [CON.2010] is Connolly et al. (2010); [CEN.2008] is Cenfetelli et al. (2008); [PAR.2005] is Parasuraman et al. (2005), [NAI.2007] is Naidoo and Leonard (2007), [YOO.2014] Yoojung and Hyung-Seok (2014), is and, [PAR.2015] is Parasuraman and Colby (2015). [R] Equals reverse code, in other words, responses to these items will be inverted at the point of statistical analysis.

4.2.3 Sample Demographics

Before focusing on this survey sample and sampling techniques, it is necessary to touch upon a few other previous studies briefly. The reason for this is to provide context and justification for this study’s methodological approach. Firstly, online surveys are widely used for carrying out e-service related research. For example, to validate their conceptual model Ribbink et al. (2004; pp. 449-450) collected data from customers of an online bookstore by way of a survey instrument “designed and made available via the Internet; it contained 31 statements and resulted in in184 usable

responses (invitations to participate were sent by e-mail to 350 university students, recent graduates and academics in Europe).

Ahmad and Khalid (2017; p. 371) randomly sampled 338 students in higher education in the UAE, with the justification that such a sample would be diverse regarding nationality, cultures and economic background,” and thus, they contend, “reflect the context of UAE.” 177 responded (52.37%); however, only 120 responses (67.8%) were considered as valid and usable survey data that subjected to statistical analysis. It is here worth noting that in both of these sited examples the target populations were individuals in higher education – this studies demographic was much broader – it is worth noting too that while both were conducted over the Internet – like the present study’s surveys were – they received smaller total usable sample sizes than does this study. Finally, Parasuraman et al. (2005) also collected the data used in their work over the Internet.

For the present study, a large sample was sought (n= 2,197). The precondition was that any potential sample member must have previously completed one transaction on the Ministry of Interior’s traffic payment e-service. It can be stated that a purposive sampling strategy was used to ensure that the individuals approached had indeed used the services one or more times. As the self-administered survey was only made available to citizens and residents of the UAE after they had completed such a transaction with no other precondition, the exact demographic makeup was random. It was not possible to try and stratify responses about the UAE’s demographic composition (Government of Abu Dhabi, 2017). Nevertheless, as will be set out in the following chapter, the sample of the full-scale survey has a reasonably representative range of age groups and nationalities.

4.2.4 Ethical Considerations

The ethical considerations for this study consisted of a couple of issues. First, when approaching the users (participants), the survey needed to have a consent form for participation in the research study that gave participants the full information they needed to understand it, such as why this research was being done and why they were being requested to participate. It also described what participants needed to do to participate and any known risks, inconveniences, or discomforts that they may have had during their participation. The second concern was to maintain the privacy of the respondents (users) and data security. The assurance was given to participants that their personal information and data would be very confidential because all participants were anonymous. Thus, for strict data confidentiality and privacy, the researcher will ensure that subjects are not asked unnecessary, irrelevant, or improper questions. Also, the data was kept confidential for the duration of the study.

About the issue of informed consent, as Bulger (2002) states, this is a “vital step to any research project.” To be clear, it is the process in which participants consent to participate in a research project after being informed of its procedures, risks, and benefits. It follows that the survey will only be conducted after the sample members comprehend the point and purpose of the research project in question fully. It should be noted that this study, used participant information and informed consent documentation based on UAEU’s graduate school requirements (Appendix C; p. 204).

4.2.5 Data Collection and Analysis

It is evident from the literature that the multiple linear regression (MLR) as a statistical tool is not without controversy (e.g., Costello & Osborne, 2005; Petrocelli, 2003;

Robbins & Daneman, 1999). However, as Lewis (2007) points out all applications of stepwise regression are “not equally evil regarding the inflation of Type I error”, and critical remedies are (1) a small number of predictor variables and (2) large sample size. It is stated in various textbooks that robust regression analysis requires large amounts of trustworthy data on the one hand and a small number of predictors on the other (Attewell & Monaghan, 2015; Cronk, 2016; Field, 2009; Tabachnick & Fidell, 2013).

The predictors were chosen (the items that group in the forecast factor groupings) should be known to have exhibited causal relationships in previous research. Each variable in the model needs to be supported by intuition (logical reasoning), the literature and less concretely extant theory. MLR estimates how the changes in each predictor variable relate to changes in the response variable. It enables the data to be held constant when the effect of one variable in the model is being examined from the impact. To be clear, the effect that changes in one predictor have on the response is reported without having to worry about the effects of the other predictors; MLR can isolate the role of one variable from all of the others in the model.

Further, MLR analysis is designed to cope with predictors that are correlated, and, in the social sciences, moderate multi-collinearity is (1) to be expected and (2) is not a problem. However, the last multi-collinearity is problematic because it can increase the variance of the regression coefficients, making them unstable and difficult to interpret. According to Frost (2013), VIF values more significant than ten may indicate that multicollinearity is unduly influencing the regression results. In terms of other studies conducted in the UAE, the data collected by Ahmad and Khalid (2017) and Rodrigues et al. (2016) were subjected to factor analysis to determine the dimensions

of job satisfaction using principal component extraction with Varimax rotation; the software was set to use a minimum of 0.5 loading coefficient as the cut-off point for convergent validity (i.e., to classify an item under a particular factor). Concerning their study, they also used SPSS. As they explain, for analytical purposes some survey statements were combined into an array of “independent” variable items and tested against a “dependent” group of items the extraction process used was Principal Component Analysis and the rotation method utilised was Varimax with Kaiser Normalisation. Field (2009) suggests deletion of items with factor loading less than 0.4.

Once all survey data had been coded and inputted into SPSS, the statistical procedure carried out in this research involved analysing descriptive and inferential statistics. Initially, Cronbach alpha testing for the forecast factor groupings was carried out, following this Tolerance and the Variance Inflation Factor (VIF) checks for multicollinearity were undertaken. As depicted in the Tables above, the alpha values are predetermined in that they are all above .7, for the Beta values – the type II error issue – this study’s large sample size renders these improbable. As is stated, the statistical power problem can be largely mitigated by having a large sample (Ellis, 2010). Finally, hierarchical regression models were estimated. The point and purpose here were to identify the strength of the effect that the independent variables have a dependent variable. The detailed results of this statistical analysis are presented in the next chapter of the dissertation.

The specific goals of the focus groups conducted by Parasuraman et al. (2005), were to (1) understand respondents’ reactions to alternative ways of phrasing scale items and anchors (Likert-type scale versus low-high performance anchors); (2) reword

items to improve clarity; (3) eliminate redundant items; and (4) obtain feedback on the length, format, and clarity of the instructions and initial questionnaire draft. By insights from the focus groups, we simplified the directions, eliminated some confusing items, reworded some others, and chose a Likert-type scale format for collecting responses. The revised questionnaire had 113 items with 5-point scales ranging from 1 (strongly disagree) to 5 (strongly agree).

4.3 Procedure

The survey was intended to take approximately 25 minutes in duration and was carried out online. Participants were provided with an information sheet explaining the general purpose of the research study. This also stated that participation was voluntary and that their responses would be anonymised and in no way be attributable to them. Firstly, a pilot study was conducted ($n = 51$) at one federal level institution to ensure that the questions (and their Arabic translations) were worded and logical. At this stage, some items were dropped, and some reworded aided by face validity checks. As part of this process, the questionnaire was translated into Arabic, and then some participants at the MOI helped translate it back into English, at all stages meanings were compared and both were equivalent. The final survey instrument which consisted of 39 items was designed to provide data to fit this study's model (see Figure 1; p. 17).

4.3.1 Pilot Study

To relate this to the pilot study of another piece of UAE-related research methodologically speaking, Ahmad and Khalid (2017; p. 371) conducted a pilot study with five m-government users, “two senior government officers ... and three university professors, whom main research field are in the area of information technology and

technology management.” They state that based on the feedback amendments were made and incorporated in the final edition of the questionnaire. Based on a sample of 51, the pilot study conducted for the present study helped clarify some things. Following the study, a select number of informal interviews were held. It was a prevailing view that the questionnaire was rather lengthy and some of the questions were unclear and also that some of the questions seemed to be asking the same thing twice (see Table 23; p. 206).

Regarding the latter, this was and remains the case partially and is necessary to ensure that sample members are consistent in their responses, this same methodologically sound logic is evidenced in, for example, the ICT familiarity items. The first stage was to derive a series of question/statements that not only reflected the scales of the sub-dimensions but were constructed coherently as standalone questions. This was aided by the interviews (focus groups) conducted by the author and the pilot survey (n = 51). This exploratory survey evaluated whether the questions effectively capture the topic under investigation and were sound in a psychometric sense. A number of the survey statements were negatively phrased (reverse coded when entered into SPSS) to check and thus omit partial responses. Statisticians argue that negatively phrased questions can be beneficial for checking whether survey respondents are focusing on the instrument: if they read the question carefully, their responses to negatively phrased questions should be consistent with responses to similar positively phrased questions.

In short, the following points were observed. Firstly, regarding sample demographics, there is no statistical difference between the genders or between age groups. However, the means are somewhat difficult to interpret (the older one gets, the lower the mean of satisfaction is apart from a complete reversal at aged 50 and over). The same applies

to nationality; there are no statistical differences between nationalities. However, UAE nationals appear to be the least satisfied. Regarding differences along educational attainment lines, no statistically significant variance was observed. However, note the numbers in the respective subgroups and the distinct lack of satisfaction documented by those who only have secondary level education, Lastly, with respect to the number of uses of the e-service by the given sample member, those who'd used it once were marginally less satisfied than those who'd used it multiple times (in terms of Means) but the differences between means were not statistically significant. Secondly, about possible modifiers to the relationship between X and Y and overall satisfaction, "ICT familiarity" clearly impacts satisfaction levels other things being equal. This is also true about "trust in government", yet it has a much less strong impact.

4.3.2 Survey Instrument Refinements

As Ahmad and Khalid (2017; p. 371) point out, even though the measures used in their study have been used and validated (Rodrigues et al., 2016; Venkatesh et al., 2003; Wang, 2014), a draft of their questionnaire was, "reviewed by key experts to ensure the language was understandable and the purpose of the item question/statement was clear from what would be the assumed respondents' perspective." Regarding refining their survey instrument, Papadomichelaki and Mentzas (2012) engaged an information systems research professor, an information systems research unit senior researcher and an information systems scholar. Options available included rewording items if necessary and making changes to remove repetitive, higher-level, and more general items.

As Wang (2014; p. 143) stated, to ensure the validity of questionnaire design, a pilot test was first carried out. This used a Cronbach's alpha, above the .70 as being the cut-off point. Factor analysis was also utilised for evaluating construct validity; based on the pilot survey feedback, "ambiguous wording and professional terms have been modified." Following this study's pilot study (n = 51), preliminary and exploratory data analysis was conducted as the first response (see the previous section) and the second response was to convene a focus group. In essence, the objective of the focus group was twofold: review the initial data analysis and review the survey's items and the wordings of each statement. The focus group was convened informally at the Ministry of Interior.

Regarding construct validity—if a test indeed measures a particular variable, then the results it produces should be consistent with what the scientific theory and existing empirical data find—the preliminary findings suggest that the pilot sample's responses tie in with what the literature on ESQ finds in a general sense. Regarding face validity—the survey instrument appears to measure what it purports to measure—this study achieved this by way of the pilot survey (see the previous section) and from the feedback and insight gathered at the subsequent focus group meeting. As can be seen in Appendix D (p. 206), of the 53 pilot study questions, 23 were omitted from the full-scale survey. The full-scale survey had 40 questions (items) of which nine were dropped during the dimension reduction stage (see Table 17, p. 125). It is important to point out that negatively worded items, in all instances, were revised (this was a consequence of the focus group that followed the pilot study).

4.3.3 Full-Scale Survey

This study's survey was self-administered and accessed online (after the completing of a transaction on the MOI website). Other related studies adopt different approaches. For instance, Parasuraman et al. (2005) hired a marketing research firm to administer their revised questionnaire to a random sample of Internet users through an online survey. The research firm contacted potential respondents and screened them to determine if they had sufficient online shopping experience (specified as having used the Internet at least 12 times during the past three months and made at least three purchases within that period). With respect to the work by Papadomichelaki and Mentzas (2012), after two evaluation rounds 33 e-government quality attributes remained in the list classified under six main criteria determined as the e-government service quality dimensions: Ease of Use (navigation, personalisation, technical efficiency); Trust (privacy, security); Functionality of the Interaction Environment (support in completing forms); Reliability (accessibility, availability); and Content and Appearance of Information and Citizen Support (Interactivity).

Other scholars, in fact, use paper-based techniques (e.g., Ahmad & Khalid, 2017, p. 371; Rodrigues et al., 2016, pp. 23-24). For instance the work of Ahmad and Khalid (2017), in which the justification was given that first, this study investigates the consumer intention to adopt m-government in the UAE. It was also stated that paper surveys are more effective in encapsulating the validated respondents to meet the requirements of this study. While Ahmad and Khalid (2017; p. 371) concede that even though studies have suggested an online approach is more autonomous than on-paper surveys (Fike et al., 2010), they maintain that paper-based surveys tend to elicit higher response rates (Santoso, Stein, & Stevenson, 2017). However, as stated above, the

present study opted to deploy an over the Internet or electronic survey (which did, over its duration of being online, elicit a reasonably large response rate of 2,197 available records).

Nonetheless, as depicted in Figure 9 (p. 199), the model created by Ahmad and Khalid (2017) paid particular attention to demographic information. This is the case also with this study. The final full-scale survey collected gender, age, nationality and educational attainment level data. Also, it also collected information on the frequency of usage—the assumption being, and as pointed out at the focus group—that repeat users may well have different opinions compared to first-time users (see Table 6; p. 89). Lastly, information was collected about the capacity in which the user was using (had used) the e-service: as an individual or on behalf of a business. Again, it was considered of utility in case responses differed significantly between these two categories.

In short, it happens to be to the case that the majority of ESQ assessment research work in recent times has used an online data collection technique. This study is no exception. For example, Weerakkody et al. (2016, p. 325)—using a closed-ended 7-point Likert-scale ranging from 1 (strongly disagree) to 7 (strongly agree)—employed the services of a specialist company to distribute their survey online (as with the present study, participants were ensured anonymity in relation to their identification). For the study on government e-services in Lebanon, Fakhoury and Aubert (2015; p. 366) used a “web survey by using social media (Face-to-Face, Facebook, LinkedIn, and Twitter) and e-mails.” Lastly, Wang (2014; p. 143) used, “web-based survey methods for data collection” yet, in a clear distinction from the present study, participants were, “awarded certain incentives (e.g., ¥20 telephone cards)”

4.4 Summary

This Chapter has set out in some considerable detail, the research paradigm this study operates within. This is best labelled as post-positivist. It is quantitatively based; it uses a survey instrument comprising of binary or scale choice answers. As the subject matter is inherently subjective, it adopts as its theoretical basis a range of psychological constructs. It also conducted a focus group before carrying out the full-scale survey. This chapter has also clearly situated this study about others that in some way shape or form seek to investigate or test ESQ of public-sector provided transactional services. The procedures involved in carrying out the survey namely the construction of the model and hypotheses based on which a scale was developed. This was tested in a pilot study and after SPSS analysis was conducted the results were discussed at a focus group. Following that, the steps relating to the final survey were covered.

Chapter 5: Results

As has been set out in the previous chapter, the survey instrument that was deployed as a vital part of this study can be viewed to have a sufficient level of reliability and construct validity. As articulated by Palmer (2002), alongside many others, these are important considerations and precursors for quality applied research. This is especially the case if recommendations are to be based on the outcomes and observations made as a consequence of survey data. This instrument achieved such reliability and validity by being based on the scales and models of previous works and of equal import, the existing research and the pilot study with follow-up focus groups. The latter helped reduce the number of items, refine the wording of retained items and ensure that the final survey instrument was compatible with existing TRA documentation. Some factors within the domains of both ESQ content and delivery were observed to have a significant and positive impact on an individual's Perception of ESQ (see, Table 21; p. 127).

The research model used in this study was developed to identify the significance and contribution of each construct on the perception of ESQ. In this process, the first step undertaken in the research was to conduct the Kaiser-Meyer-Olkin Test of Sampling Adequacy (KMO) and Bartlett's Test of Sphericity to assess whether patterns and correlations existed in the data. This was done to confirm the suitability of the factor analysis. KMO measures the shared variance of the items (Beavers et al., 2013) while Bartlett's statistic provides evidence of a statistical difference for the observed correlation matrix (Pett, Lackey, & Sullivan, 2003). The KMO result (0.960) indicates that the degree of shared variance among the 33 variables is more than satisfactory and it will be noted that Bartlett's statistic is significant (Chi-Square, 40376.979; df, 231;

Sig., .000) and as such, factor analysis was appropriate for analysing this study's data set (see Table 16; p. 124). As with the works of Ahmad and Khalid (2017; p. 372) and Rodrigues et al. (2016; p. 24), the principal component analysis was conducted.

As a consequence of the Exploratory Factor Analysis (EFA), eight factors were extracted with a cumulative variance explained of over 81.3 percent and loadings of less than 0.50 were suppressed which resulted in seven items being dropped before the regression analysis (consult Table 24 in Appendix D). As Figure 2 (p.106) shows that Information, Responsiveness and Assurance each have four items, Reliability, Trust in Government and ICT Familiarity have three items each, Usability has two and, Customer Services loaded best by retaining five items. Following this, reliability testing was conducted on each of the constructs (see Table 17; p.125). This is an internal consistency test that estimates the reliability of each extracted construct, the high alpha value of the constructs in this study indicates that the items within each factor measure, within reason, the same thing. Typically for the social sciences, a Cronbach's alpha of greater than $\alpha .70$ is deemed as robust. As this reliability testing was performed on each of the constructs separately, it can be stated that the results validate the model and EFA findings. In other words, the items that the algorithm objectively places together.

As Figure 2 (p.106) highlights (see the following page), it is 'Responsiveness' ("Delivery") that is found to play the most significant role in an individual's reuse intentions and their overall satisfaction levels with the e-service in question. It may be thus assumed that a critical or pivotal consideration is speed—a factor that is partly within the hands of the e-service developers but also in part external as it will be

dependent on a user's device, their WIFI bandwidth and their 3G/4G coverage. If speed is key, it seems that 'Information' ("Content") is the least important, but statistically significant, factor. Quality of information is less pivotal than any other factor. Intuition suggests that if something works merely, explanations are of minimal importance (i.e., information relating to how to proceed with the transaction). A more in-depth analysis of these points and other implications will be undertaken in the forthcoming Discussion chapter.

This Chapter will proceed as follows. First, it will present the descriptive data collected in the survey (Section 5.1). The sample size—after cleaning—is substantial at 2,197 individuals consented to participate and, taken together, 'the sample' encompasses both genders, a range of nationalities and various age and educational attainment groups. Various tests were undertaken to determine how uniform the sample was. In some ways, the sample was found to have statistically significant differences regarding their ratings of the ESQ content and delivery factors in relation rate to their overall satisfaction levels. While those observed differences within the sample will be considered and contextualised in the Discussion Chapter. The hierarchical regression analysis, set out in section 5.2, considers the sample as a whole.

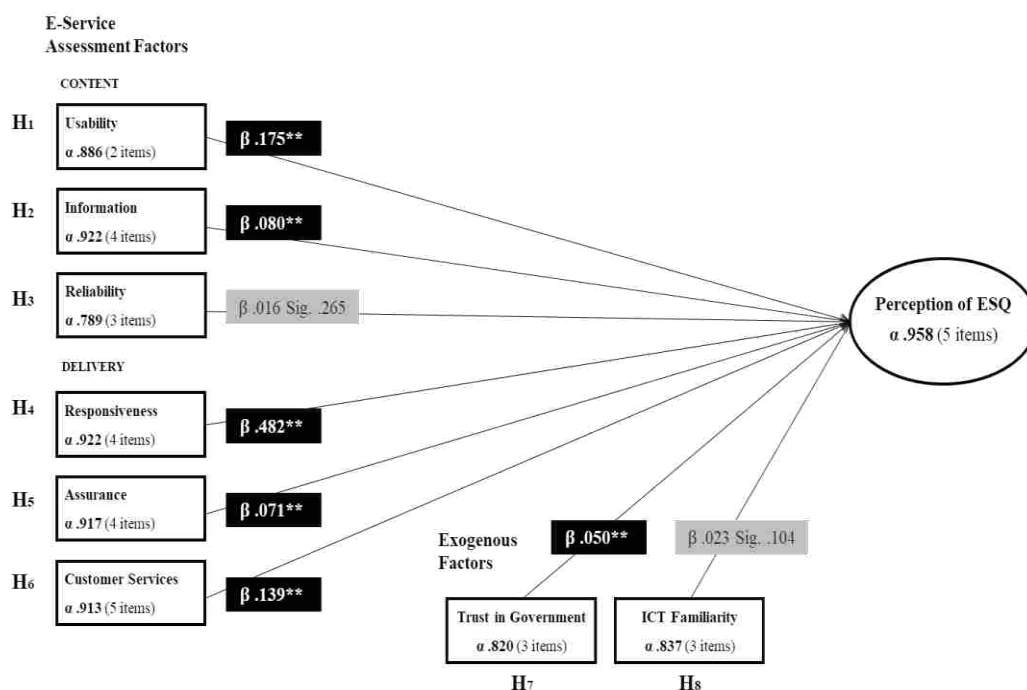


Figure 2: Predicting End-user Perception of ESQ

Note: $n = 2,197$; ** $p < .001$; * $p < .05$. Reported on are the factors (and constituent items) retained following exploratory factor analysis. Cronbach's α , based on standardised items. Significant standardised β coefficients are embossed in black; non-significant relationships are shaded in grey.

5.1 Descriptive Analysis

The descriptive statistics relating to the sample are shown in Table 7 (p.108). It shows that almost nine in ten respondents were male (1,966 to 231), but in a country with a large number of expatriate male workers (Forstenlechner & Rutledge, 2011; Government of Abu Dhabi, 2017) and a conservative attitude towards women and driving, this is not particularly surprising (Rutledge & Madi, 2017; Williams, Wallis, & Williams, 2013). Of the four age brackets, the majority were either between the 31 and 40 years of age (just under half) or between 41 and 50 years of age (just under one quarter). Nationality-wise, it could be observed that close to half were UAE citizens (44.7%).

Regarding the country's demographic make-up, this is an over-representation. UAE citizens comprise only 1 in 8 of the resident population. A substantial fraction of the expatriate population comprises unskilled labourers and domestic helpers, individuals less likely to own a vehicle. Therefore, the fraction of UAE nationals within the sample is not considered an issue or shortcoming in any way. Educational attainment levels—secondary; university/college and post-graduate—helps support this contention: the sample is, on the whole, well-educated and thus more likely to be individuals who own a vehicle. Well over 80 percent of the sample have a tertiary level qualification.

Regarding some uses, the number of times a give sample member has used this particular transaction e-service, it is revealing in itself that four in five had used it on more than one occasion. Revealing because as will be discussed later on in the document, thus suggests that reusing the service in question is the norm. As has been stressed previously (1) reuse is not the same as overall satisfaction, and (2) with such governmental transactional choices, and unlike in the business world, alternative 'online' avenues are not often in existence. Regarding capacity, almost all of the sample encountered the e-service in their private capacity.

Table 7: Sample Demographics

Gender		
	Number	Percentage
Male	1966	89.5%
Female	231	10.5%
Age		
> 50	259	11.8%
41-50	509	23.2%
31-40	1042	47.4%
< 31	387	17.6%
Nationality		
Emirati	983	44.7%
Other Arabs	763	34.7%
Asian	340	15.5%
Western	111	5.1%
Education (Level)		
Secondary Certificate or Less	335	15.3%
Univ./College	1294	58.9%
Postgraduate	568	25.9%
Number of Uses		
Once	390	17.8%
More Than Once	1807	82.2%
Capacity		
Private	2074	94.4%
On Behalf of a Business	123	5.6%

Note: n = 2,197.

The reliability analysis is set out in Table 8 (p. 109) and observed, Cronbach's alpha coefficients are reported on to ensure that the instrument items are measuring the same construct. It is a commonplace in the social sciences to use this measure for assessing an instrument's "internal reliability" and, the value of 0.6 or 0.7 is typically considered as satisfactory (e.g., Hair, Anderson, Black, & Babin, 2016; Saunders et al., 2015, respectively). The outcomes of the statistical analysis demonstrate satisfactory reliabilities, ranging from .789 for 'Reliability' and .922 for both 'Information' and 'Responsiveness'; this could be compared favourably to other related studies, such as that done by Cenfetelli et al. (2008) in which loadings ranged from .95 to .79.

Tan, Benbasat, and Cenfetelli (2010), their study's reliability alphas ranged from .84 to .94 – the latter for content quality whereas for Al-Hujran et al. (2011) reliability alphas ranged from .74 to .87 and, lastly, for Tan et al. (2013) the alphas for the constructs ranged from .77 to .94. To be clear in Table 8 (p. 109) and then Table 9 (p. 112) to Table 13, which set out distinctions within the sample about the various survey factors), were compiled following the factor analysis – reported on in Section 5.2.1. The reason for displaying the reliability statistics and factor loadings at the outset is to be able to begin this Chapter with the sample demographics and concluded with a detailed write up of the *multiple linear regression* (MLR) analysis and to thoroughly set out how all related assumptions were analysed and met.

Table 8: Survey Items Retained (Reliability Alphas & Factor Loadings)

Factor	Mean	Std. Deviation	Reliability>Loading
Usability			α .886 (2 items)
– Using this e-service saves me time and effort	4.53	.702	.932
– Using this e-service gives me greater control	4.44	.701	.763
Information			α .922 (4 items)
– The information relating to completing the	4.22	.829	.908
– The steps/stages of the procedure are	4.25	.806	.895
– The information provided on this e-service	4.24	.844	.760
– Using the site lets me easily understand	4.20	.836	.641
Reliability			α .789 (3 items)
– The page/s of the e-service loaded quickly	4.04	.827	.844
– I do not have any technical issues	4.01	.968	.661
– The information regarding the payment process	4.13	.902	.513
Responsiveness			α .922 (4 items)
– Using this e-service allowed me effectively	4.27	.876	.877
– I believe this e-service was responsive	4.22	.865	.798
– I believe this e-service quickly delivers	4.18	.920	.797
– I believe the functionalities of this e-service	4.22	.815	.381

Table 8: Survey Items Retained (Reliability Alphas & Factor Loadings) (Continued)

Factor	Mean	Std. Deviation	Reliability>Loading
Assurance			α .917 (4 items)
– I am confident that this e-service provides	4.47	.693	.905
– I am confident that the MOI uses the latest	4.49	.718	.881
– I am confident that my MOI user account	4.49	.705	.781
– I felt confident about paying for this e-service	4.47	.730	.719
Customer-oriented Services			α .913 (5 items)
– Customer Service standards about response time	3.91	.922	-.884
– If I were to encounter problems	3.98	.957	-.835
– The e-service clearly states customer support	4.12	.867	-.650
– The e-service site had answers	3.92	.924	-.626
– I believe this e-service is backed	4.16	.917	-.602
ICT Familiarity			α .837 (3 items)
– Using modern technology makes me more			.894
– Government e-services enable me to achieve			.808
– I prefer to use the latest technology			.662
Trust in Government			α .820 (3 items)
– I consider public-sector administrative processes	4.50	.713	1.006
– I feel confident and relaxed when interacting	4.31	.845	.661
– I trust the Government of the UAE regarding	4.63	.615	.581
Perception of ESQ (DV)			α .958 (5 items)
– I intend to reuse this e-service as I perceive it	4.39	.818	.947
– I intend to reuse this e-service as it enabled me	4.37	.832	.942
– I intend to reuse MOI e-services all the time	4.36	.818	.912
– I am satisfied with the usefulness of	4.29	.854	.872
– Overall, I am satisfied with this e-service	4.36	.818	.862

Note n = 2,197; Cronbach's alpha figures based on standardised items; factor loadings based on EFA. Of the 40 original items, the above 33 were retained by way of an EFA dimension reduction process, to see the non-truncated survey items consult Appendix D.

The following Tables consider the sample in various ways regarding their ratings of the six ESQ factors. Testing for equality of means in both customarily distributed and non-normally distributed data is of merit to see the degree to which the sample can be considered as unitary. (ANOVA tests, to determine if there are statistical differences between groups of means.) In instances where the null hypothesis is rejected, at least one of the means is not the same as the other means within the given group. The

relationship between robustness to normality and sample size is based on the central limit theorem—that the distribution of the mean of data from any distribution approaches the normal distribution as the sample size increases (Tabachnick & Fidell, 2013).

The Kruskal-Wallis test is the nonparametric analogue of the parametric one-way analysis of variance, and it tests that the samples are drawn from a population of the same distributions. The Jonckheere-Terpstra Test, likewise, is another nonparametric test for an ordered alternative hypothesis within an independent samples design (Sprenst & Smeeton, 2016). For this study, it was felt of merit to use these tests with follow up Mann-Whitney U Tests (see Appendix E). The Mann-Whitney U test is a nonparametric test of the null hypothesis that it is equally likely that a randomly selected value from one sample will be less than or greater than a randomly selected value from a second sample. In distinction to the t-test, it does not require the assumption of normal distributions.

This test can be used to determine whether two independent samples were selected from populations having the same distribution; The decision to report on both was in part due to the point that nonparametric tests do not assume a specific distribution for the population. The t-test assuming means of the different samples are normally distributed; it does not assume that the population is normally distributed (e.g., Freedman, Pisani, & Purves, 2007; Green & Salkind, 2016). To be clear, however, the underlying purpose is to determine if the difference between the sub-group means are statistically significant (i.e., $p = < 0.05$). Logically if critical distinctions manifest, it would be prudent to consider these, instance by instance. Nevertheless, this does not

mean the sample, in a general way, is not suited to be viewed as homogeneous. Table 9 (see below), shows that there are no statistical differences between the genders.

With age (see Table 10 below), the only observed significant difference between the groups was about 'Reliability.' It can be observed that those in the older age brackets were significantly more positive in their ranking of the e-service's reliability as compared to the group aged less than 31. This, however, is based only on the KWT and J-T tests. Follow on Mann-Whitney U tests were carried out and this highlight various other statistically significant differences (see Table 25; p. 210).

Table 9: Survey Constructs and Gender (KWT and J-T tests)

	Usability	Information	Reliability	Response	Assurance	e-Service
Male ^a	1103.3	1100.5	1100.3	1096.5	1096.8	1092.9
Female ^a	1062.4	1086.6	1087.8	1120.0	1117.9	1150.9
KWT ^b	.35	.75	.77	.59	.61	.19
Chi-Square	.88	.10	.08	.30	.26	1.75
J-T ^c	.35	.75	.77	.59	.61	.19
Std. J-T Stat.	-.94	-.32	-.29	.54	.51	1.32

Note: n = 2197 (male, 1,966; female, 231); df=1; a Likert 1–5 scale was used. ^a Mean Rank derived from Kruskal Wallis Test. ^b KWT = Kruskal Wallis Test, Asymp. Sig. ^c J-T = Jonckheere-Terpstra Test; Asymp. Sig. (2-tailed).

Table 10: Survey Constructs and Age (KWT and J-T tests)

	Usability	Information	Reliability	Response	Assurance	e-Service
Under 31 ^a	1089.30	1110.53	1065.05	1120.60	1087.28	1133.87
31–40 ^a	1086.41	1091.78	1085.44	1087.24	1128.22	1112.29
41–50 ^a	1087.19	1055.74	1098.74	1057.27	1021.46	1012.54
50 and more ^a	1187.34	1195.84	1204.81	1196.06	1151.34	1163.33
KWT ^b	.120	.029	.030	.024	.004	.003
(Chi-Square)	5.834	9.050	8.913	9.442	13.103	13.947
J-T ^c	.155	.590	.019*	.683	.486	.171
Std. J-T Stat.	1.423	.539	2.347	.409	-.697	-1.369

Note: n = 2,197 (Under 31, 387; 31–40, 1,042; 41–50, 509; 50 and more, 259); df=1; a Likert 1–5 scale was used. ^a Mean Rank derived from Kruskal Wallis Test. ^b KWT = Kruskal Wallis Test, Asymp. Sig. ^c J-T = Jonckheere-Terpstra Test; Asymp. Sig. (2-tailed). * p = <0.05.

The following points are made concerning Table 25 (in Appendix E). Observed differences regarding 'Customer services' are that younger sample members saw this more favourably than older ones (under 31 vs 41–50) but this did not hold for comparisons between under 31-year-olds sample members and those over 50 (here there was no statistically significant difference). Moreover, those above 50 were significantly more likely to rank customer services more highly than those in the 41–50 group. Thus, it was the 41–50 cohort who were the least satisfied group. It should be noted that this age group were the second largest if the four classified groups are numerically speaking in the sample.

Statistically significant differences between the means of rating reliability only manifest between the under 31 and over 50 groups and between the 41–50 and the over 50 group. In both cases—see Table 25 (p. 210)—it is the older sample members who apparently view the transactional service as more favourable. Another statistically significant difference between the age cohorts about the 'Assurance' factor grouping. Here it can be noted that the group who rank assurance least favourably are those between 41 and 50, those under 40 and those over 50 perceive the e-service in question, assurance levels more positively. Another noteworthy age distinction observation is that on all six criteria, sample members who were 50 and above were significantly different and favourably so, than those aged 41–50.

In terms nationality, some statistical differences were observed across the six ESQ factors (see Table 11; p. 114). At a general level, it is clear that Westerners, around 5 percent of the sample were the least positive concerning their rankings of 'Usability,' 'Information,' 'Assurance levels' and sentiment towards 'Customer services.' In contrast, non-Emirati Arabs who were most positive towards all six aspects. As Table

26 (p. 212) shows more clearly, UAE citizens rank the service more highly than do Asians. The most notable and statistically different regarding assurance.

The same also can be said for the differences between western and Emirati sample members. On all counts, UAE citizens ranked/rated the elements of ESQ more highly than did their Western counterparts. It is particularly revealing that the most substantial inconsistencies were about ‘Information,’ ‘Assurance.’ and ‘Customer service.’ Arab sample members, excluding Emiratis, were statistically significant found to rank the ESQ components more highly than were the Asian sample members. Of Westerners in comparison to Asians, it was the Westerners who were less favourable toward most of the factors. In sum, with regards to nationality, it can be observed that Arab and UAE nationals were the more likely to rank the various ESQ factor items highly, followed by Asians than Westerners.

Table 11: Survey Constructs and Nationality (KWT and J–T tests)

	Usability	Information	Reliability	Response	Assurance	e-Service
Emirati ^a	1039.3	1084.6	1036.9	1050.0	1113.6	1077.3
Other Arab ^a	1223.9	1213.1	1212.0	1221.2	1255.9	1229.0
Asian ^a	1045.6	970.0	1029.9	996.7	826.3	983.2
Western ^a	932.8	837.4	1083.6	1006.5	726.7	752.8
KWT ^b	.000**	.000**	.000**	.000**	.000**	.000**
(Chi-Square)	49.47	60.71	38.25	47.24	165.89	78.71
J-T ^c	.13	.04*	.03*	.42	.00**	.049*
Std. J-T Stat.	1.51	-2.07	2.18	.81	-5.76	-1.96

Note: n = 2197 (Emirati, 983; Other Arab, 763; Asian, 340; Western, 111); df=3; a Likert 1–5 scale was used. ^a Mean Rank derived from Kruskal Wallis Test. ^b KWT = Kruskal Wallis Test, Asymp. Sig. ^c J-T = Jonckheere-Terpstra Test; Asymp. Sig. (2-tailed). ** p = < 0.01. * p = < 0.05.

Looking now at the differences in relation to educational attainment levels— Table 27 (p. 214)—it can be seen that some statistically significant differences were observed. Analysis of these differences will be provided in the following Chapter; here essential

observations are highlighted and articulated only. The more educated an individual sample member is, the less favourably they ranked information, assurance and customer services related items. Reliability was shown to be in total reverse. This may be a consequence of faster Internet access and newer ICT gadgets. As is shown in Table 27 '*Reliability*' is a critical differentiator between sample members who have a tertiary level qualification and those who do not. While reliability was later dropped from the more advanced statistical testing due to its high correlation with other factors (see Section 5.2 below) it is nevertheless a point of distinction.

Again, it is made clear in Table 27 that between these two cohorts—tertiary level qualifications vs high school certificate only— those significant differences were observed about 'Customer services.' The more highly qualified an individual is, the less positive they were in relation to the customer services related to or connected with the transactional e-service in question. Reliability is ranked much lower by those with a lower level of education while in reverse, those with a higher level of education are much less satisfied with the e-service's associated customer services. This trend continues along the educational attainment cline. There are similar differences between those who have a College Diploma or a University degree on the one hand and those who have a postgraduate level qualification on the other.

Table 12: Survey Constructs and Education (KWT and J-T tests)

	Usability	Information	Reliability	Response	Assurance	e-Service
2 nd or Less ^a	1046.15	1153.94	760.63	1109.57	1187.89	1259.05
Uni./College ^a	1116.59	1109.10	1138.93	1101.30	1103.90	1091.59
Postgraduate ^a	1090.11	1043.59	1207.60	1087.53	1035.41	1021.49
KWT ^b	.173	.024*	.000**	.857	.001**	.000**
(Chi-Square)	3.512	7.493	118.724	.308	13.832	30.424
J-T ^c	.548	.006**	.000**	.583	.000**	.000**
(Std. J-T Stat.	.601	-2.729	9.100	-.550	-3.696	-5.164

Note: n = 2,197 (Secondary or Less, 335; Uni./College, 1,294, Post-Grad, 568); df=2; a Likert 1–5 scale was used. ^a Mean Rank derived from Kruskal Wallis Test. ^b KWT = Kruskal Wallis Test, Asymp. Sig. ^c J-T = Jonckheere-Terpstra Test; Asymp. Sig. (2-tailed). ** p = < 0.01. * p = < 0.05.

The last demographic delimiter that was observed to have various statistically significant differences in relation to the number of times the sample was in relation to the number of times the sample had used the transactional service in question (see Table 13 (p. 117)). This is of interest and importance for several reasons. Not least because one of the outcome variables – used in the linear regression and S.E.M. analyses is ‘Reuse intentions.’ As has been underscored in earlier chapters, unlike private sector business transactional services, e-government services do not typically offer alternatives. Therefore, reuse intentions would not be a satisfactory or insightful outcome variable if it was the only one to have been incorporated into this study’s conceptual framework model. This is why in order to make the model more comprehensive additional outcome factors—i.e., ‘Overall satisfaction’—were incorporated as well as the non-ESQ specific variables of ‘Trust in government’ and also, ‘ICT familiarity.’

Having made these points, it is nevertheless of utility to examine the differences between first-time users and repeat users of this transactional e-service. As is shown

in Table 13, statistically significant differences occurred concerning (1) usability, (2) reliability, and (3) customer services. Regarding 'Usability', there was a strong statistically significant difference between first-time users and those that had used it more than once. Intuitively, those who have conducted transactions on multiple occasions ranked the e-service's usability more favourably. The same is so also for the factor 'Reliability.' Less easily explainable is the observation that first-time users ranked customer services more positively than did repeat users. This may be reflective of the recent improvements the MOI has undertaken its customer support infrastructure in relation to its online service provision.

Table 13: Survey Constructs and Number of Uses (KWT and J-T tests)

	Usability	Information	Reliability	Response	Assurance	e-Service
Once ^a	984.60	1079.70	998.89	1053.36	1103.56	1228.27
More than once ^a	1123.69	1103.17	1120.61	1108.85	1098.02	1071.10
KWT ^b	.000**	.498	.001**	.110	.869	.000**
(Chi-Square)	15.781	.459	11.973	2.555	.027	19.982
J-T ^c	.000**	.498	.001**	.110	.869	.000**
Std. J-T Stat.	3.973	.677	3.460	1.598	-.165	-4.470

Note: n = 2,197 (Once, 390; More than Once, 1,807); df=1. ^a Mean Rank derived from Kruskal Wallis Test. ^b KWT = Kruskal Wallis Test, Asymp. Sig. ^c J-T = Jonckheere-Terpstra Test; Asymp. Sig. (2-tailed). ** p = < 0.01. * p = < 0.05.

5.2 Hierarchical Regression Analysis

MLR is a robust set of methods for examining specific scientific hypotheses and relationships among sets of data. Typically, According to Petrocelli (2003), if using hierarchical regression as the data-analytic strategy it is essential to understand that results may depend mainly on the order in which variables are entered into the analysis. Taking this on board, the present study ran backwards, forward and stepwise MLR

tests in SPSS (Version 22). In every run, the results were broadly similar and in no cases did a different strategy change the significant/non-significant factors or the order of the statistically significant predictors.

Marginal differences in coefficients were noted. Nevertheless, to be more robust a hierarchical MLR approach was adopted. As Petrocelli (2003, p. 20) concludes, “researchers need to provide not only an appropriate rationale for using hierarchical regression but also logical reasoning for why predictor variables were ordered as they were.” Concerning the present study, adopting the hierarchical MLR approach permitted the running of the exogenous factors in separate blocks from the ESQ-specific assessment factors. Variable selection is intended to select the “best” subset of predictors to explain the data most simply. As such, redundant predictors should be removed. As Baek (1997) points out, the principle of Occam’s Razor states that among several plausible explanations for a phenomenon, the simplest is best. Applied to regression analysis, this implies that the smallest model that fits the data is best. Indeed, it can be argued that multi-collinearity can be caused by having too many variables trying to do the same job.

To reiterate, stepwise regression involves choosing which predictors to analyse by statistics whereas with hierarchical regression the research selects the ordering based on logical intuition ‘and’ theoretically and literature-based decisions. As Lewis (2007, p. 9) has discussed, unlike stepwise regression, the order of variable entry into the analysis is based on theory. Instead of letting a computer software algorithm “choose” the order in which to enter the variables, these order determinations are made by the researcher based on theory and past research. As stated, all modes of MLR were run,

and in sum, no substantial differences were observed, and this adds to the reliability and validity of this study's model and analytical framework.

In this section, regression analysis will be used to study the effect of the independent variable (IV) factors that fall within the ESQ domains of content and delivery, namely: 'Usability', 'Information', 'Responsiveness', 'Assurance' and, 'Customer services' on the dependent variable (DV). The first step was to look at the correlations between the predictor variables (Table 14; p. 120) and then investigate the extent to which collinearity between these variables was present (Table 15; p. 120).

The correlations table is also useful for looking for multicollinearity. It is received wisdom that if any two predictor variables have a Pearson's coefficient of .80 or higher, there may be cause for concern in that they may be measuring the same underlying factor; as depicted below this happens just, in only one instance. The Variance Inflation Factor (VIF) and the Tolerance measure are in fact measures of the same thing but to follow convention both are reported here (O'Brien, 2007). If anyone or more factors have a VIF of 5 or more, this is typically considered to imply some level of multicollinearity between the IVs (Studenmund, 2016, p. 274). Using SPSS a matrix of options was computed enabling the illumination of the fewest number and concomitantly achieving lower VIF values (Lance, Butts, & Michels, 2006; Loewenthal, 2001; p. 61).

Table 14: Correlation Statistics

		Fact_1	Fact_2	Fact_3	Fact_4	Fact_5	Fact_6	Fact_7	Fact_8
FACT_1	Pearson <i>r</i>	1							
	Sig.								
FACT_2	Pearson <i>r</i>	.584**	1						
	Sig.	.000							
FACT_3	Pearson <i>r</i>	.700**	.642**	1					
	Sig.	.000	.000						
FACT_4	Pearson <i>r</i>	.709**	.695**	.632**	1				
	Sig.	.000	.000	.000					
FACT_5	Pearson <i>r</i>	.740**	.557**	.593**	.623**	1			
	Sig.	.000	.000	.000	.000				
FACT_6	Pearson <i>r</i>	.802**	.621**	.734**	.658**	.705**	1		
	Sig.	.000	.000	.000	.000	.000			
FACT_7	Pearson <i>r</i>	.523**	.654**	.599**	.651**	.464**	.576**	1	
	Sig.	.000	.000	.000	.000	.000	.000		
FACT_8	Pearson <i>r</i>	.488**	.616**	.470**	.714**	.498**	.495**	.579**	1
	Sig.	.000	.000	.000	.000	.000	.000	.000	

** Correlation is significant at the 0.01 level (2-tailed). ^a FACT_01 = Responsiveness, FACT_02 = Assurance, FACT_03 = Customer Services, FACT_04 = Usability, FACT_05 = Reliability, FACT_06 = Information, FACT_07 = Trust in Government and, FACT_08 = ICT Familiarity.

Table 15: Collinearity Statistics

	Collinearity Statistics	
	Tolerance	VIF
FACT_01 Responsiveness	.252	3.972
FACT_02 Assurance	.391	2.560
FACT_03 Customer Services	.367	2.723
FACT_04 Usability	.279	3.589
FACT_05 Reliability	.397	2.517
FACT_06 Information	.267	3.741
FACT_07 Trust in Government (Non-ESQ Specific)	.455	2.199
FACT_08 ICT Familiarity (Non-ESQ Specific)	.442	2.262

Note: Dependent Variable: Perception of ESQ.

5.2.1 Validating the Model

Concerning some of the standard regression analysis assumptions (i.e., linear relationships; multivariate normality, acceptable levels of collinearity, no autocorrelation and homoscedasticity), a range of tests was conducted and are reported on in the following Figures and Tables. Figure 3 (p. 122) shows a histogram which is one representation of a test for residual normality. It illustrates an approximately normal distribution. As the typical probability plot is a more sensitive graph, this has been generated and depicted in Figure 4 (p. 122). The dots on the graph show the distribution. It should be recalled that small departures are commonplace. As is depicted in Figure 5 (p. 123), the P-P plot of standardised model residuals (or the customarily distributed errors), although some deviation from normality between the observed cumulative probabilities is in evidence, it is not substantial. Therefore, there does not appear to be a severe problem with the non-normality of residuals and, the data is close to being normally distributed, but there are a notable number of residuals close to zero.

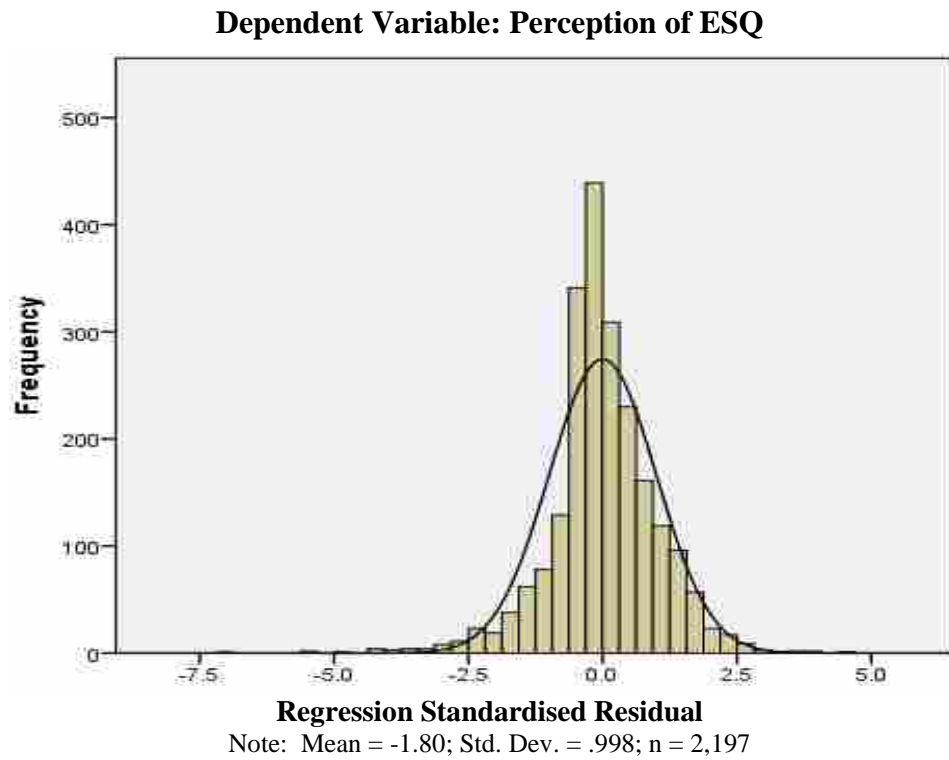


Figure 3: Histogram of Standardised Model Residuals

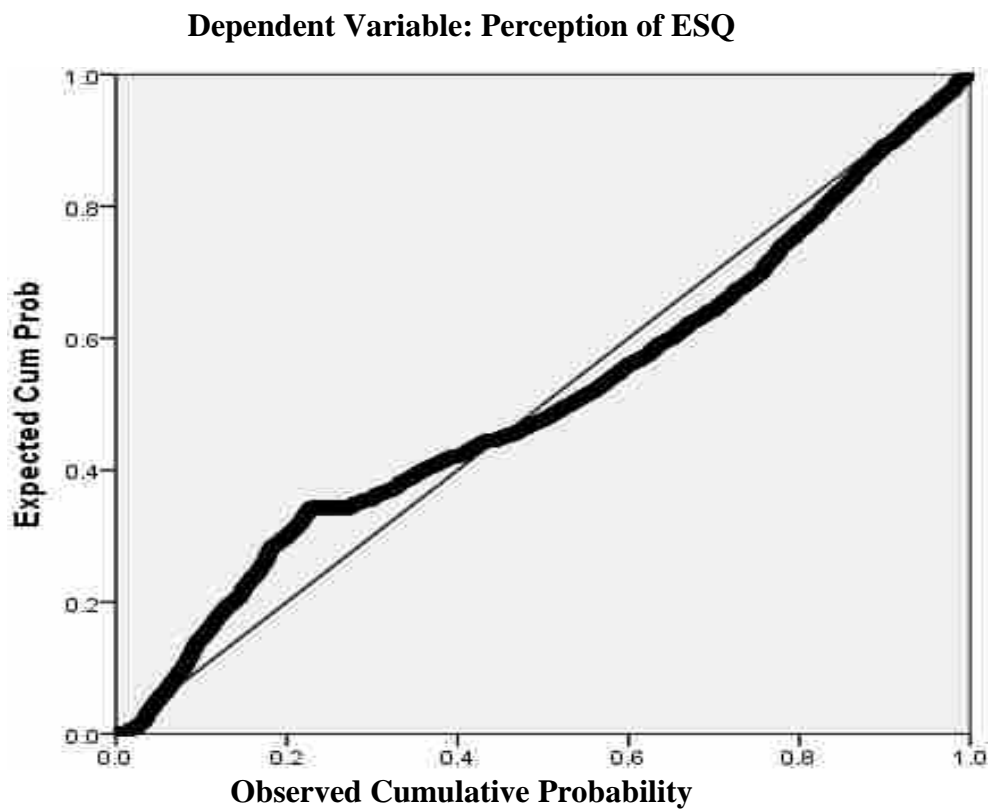


Figure 4: Standardised Residuals Against Standardised Predicted Values

Dependent Variable Perception of ESQ

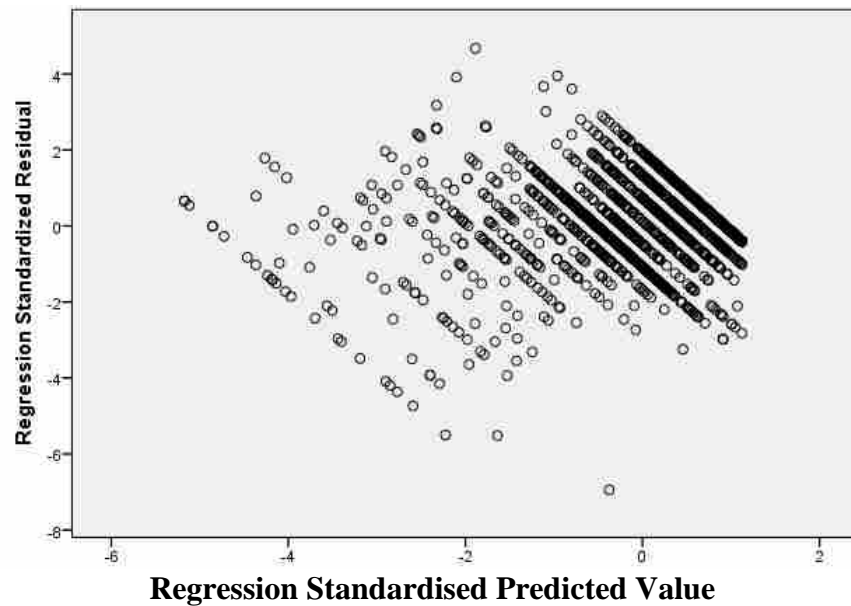


Figure 5: P-P Plot of Standardised Model Residuals

The collected data was screened for univariate outliers and following that $n=2,197$ available records were retained and analysed. Substantially, more than the minimum amount of data for factor analysis was retained with a ratio of over 52 cases per item. The extraction method used was Principal Axis Factoring. The rotation method was Oblimin with Kaiser Normalization; The Kaiser-Meyer-Olkin Measure of Sampling Adequacy statistic was: .960. Statistics for Bartlett's Test are as follow Chi-Square, 40376.979; df, 231; Sig., .000. This demonstrates that the data set was suitable for such factorial analysis. As alluded to at the outset of this chapter, another critical measure is the KMO statistic. It can be seen in Table 16, Table 17, and Table 18 (see below) that this statistic is acceptable in all instances. For according to the literature, KMO values between 0.8 and 1 indicate the sampling is adequate; values close to zero mean that there are substantial partial correlations compared to the sum of correlations.

Table 16: Exploratory Factor Analysis (ESQ Specific Items)

	Factor					
	1	2	3	4	5	6
Responsiveness						
– Using this e-service allowed me effectively	.877					
– I believe this e-service was responsive	.798					
– I believe this e-service quickly delivers	.797					
– I believe the functionalities of this e-service	.381					
Assurance						
– I am confident that this e-service provides		.905				
– I am confident that the MOI uses the latest		.881				
– I am confident that my MOI user account		.781				
– I felt confident about paying for this service online		.719				
Customer Services						
– Customer service standards regarding						-.884
– If I were to encounter problems,						-.835
– The e-service states customer						-.650
– The e-service site had answers						-.626
– I believe this e-service is backed						-.602
Usability						
– This e-service saves me time and effort						.932
– This e-service gives me greater control						.763
Reliability						
– The page/s of the e-service loaded quickly						.844
– I do not have any technical issues						.661
– The information regarding the payment process						.513
Information						
– The information relating to completing the						.908
– The steps/stages of the procedure are						.895
– The information provided on this e-service						.760
– Using the site lets me easily understand						.641

Note: Extraction method used was Principal Axis Factoring. The rotation method was Oblimin with Kaiser Normalization; Rotation converged in 15 iterations. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy statistic was: .960. Statistics for Bartlett's Test are as follow Chi-Square, 40376.979; df, 231; Sig., .000.

Table 17: Exploratory Factor Analysis (Non-ESQ Specific Items)

	Factor	
	1	2
ICT Familiarity		
– Using modern technology makes me more	.894	
– Government e-services enable me to achieve	.808	
– I prefer to use the latest technology662	
Trust in Government		
– I consider public sector administrative processes		1.006
– I feel confident and relaxed when interacting		.661
– I trust the Government of the UAE regarding		.581

Note: Rotation converged in 6 iterations. KMO: .828. Statistics for Bartlett's Test are as follow Chi-Square, 6190.055; df, 15; Sig., .000.

Table 18: Exploratory Factor Analysis (DV, Perception of ESQ)

	Factor	
	1	2
Reuse Intention Items		
– I intend to reuse this e-service as I perceive it947	
– I intend to reuse this e-service as it enabled me942	
– I intend to reuse MOI e-services all the time	.912	
Overall Satisfaction Items		
– I am satisfied with the usefulness of872	
– Overall, I am satisfied with this e-service862	

Note: 'Reuse intentions' and 'Overall satisfaction levels' were thought to possibly manifest as separate constructs but, they comfortably and comprehensively load as one. Extraction method used was Principal Axis Factoring. The rotation method was Oblimin with Kaiser Normalization; Rotation converged in 5 iterations. KMO: .905. Statistics for Bartlett's Test are as follow Chi-Square, 12337.062; df, 10; Sig., .000.

5.2.2 Running the Model

One of the assumptions of regression is that the observations are independent. To test for this (to establish that there is no autocorrelation where subsequent observations are related), the Durbin-Watson statistic should be carried out. The Durbin-Watson statistic tests for correlations between errors and determines whether adjacent residuals are correlated (one of the assumptions of regression is that the residuals should be independent). The Durbin-Watson statistic will range between 0 and 4 with a value of 2 meaning that the residuals are uncorrelated (i.e., are independent and are not correlated).

As is noted in various statistical texts, a general guiding rule is that values less than 1 or greater than 3 are a cause for concern (see, e.g., Field, 2009). As is reported in Table 19, it shows, the Durbin-Watson statistic for the model reported on here is 1.939. In addition to this, it is standard also to run the Cook's distance test. The Cook's distance is the default way of identifying cases which may be having an undue influence on the overall model. Cases, where the Cook's distance is greater than 1.0, may be problematic. The Cook's Distance value is also satisfactory (consult again, Table 19 below). The model summary reported below predicted just over 80% of the variance.

Table 19: Hierarchical Multiple Regression (Model Summary)

Mode	Adjusted <i>R</i> Square	Std. The error of the Estimate	Change Statistics				
			R Square Change	F Change	df1	df2	Sig. F Change
1	.812	.33208	.813	1581.796	6	2190	.000
2	.813	.33099	.001	15.404	1	2189	.000
3	.813	.33087	.000	2.573	1	2188	.109

Note: Dependent Variable: Perception of ESQ. Cook's distance figures are .000 min and .067 max. The Durbin-Watson statistic is 1.939.

Table 20: Hierarchical Multiple Regression (ANOVA Statistics)

Model ^a	Sum of Squares	df	Mean Square	F	Sig.
Regression	1048.579	8	131.072	1197.256	.000 ^b
Residual	239.536	2188	.109		
Total	1288.115	2196			

Note: ^a Dependent Variable: Perception of ESQ. ^b Predictors: (Constant), FACTOR_01 Responsiveness, FACTOR_02 Assurance, FACTOR_03 Customer Services, FACTOR_04 Usability, FACTOR_05 Reliability, FACTOR_06 Information, FACTOR_07 Trust in Government, FACTOR_08 ICT Familiarity.

Table 21: Hierarchical Multiple Regression (Significant β Coefficients)

Model 3 ^a	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant) ^b	3.396	.118		28.712	.000**		
FACT_01	.383	.015	.482	26.239	.000**	.252	3.972
FACT_02	.056	.012	.071	4.801	.000**	.391	2.560
FACT_03	.135	.015	.139	9.171	.000**	.367	2.723
FACT_04	.141	.014	.175	10.006	.000**	.279	3.589
FACT_05	.014	.012	.016	1.114	.265	.397	2.517
FACT_06	.063	.014	.080	4.499	.000**	.267	3.741
FACT_07	.062	.017	.050	3.666	.000**	.455	2.199
FACT_08	.032	.019	.023	1.627	.104	.442	2.262

Note: ^a Dependent Variable: Perception of ESQ. ^b Predictors: (Constant), FACT_01 Responsiveness, FACT_02 Assurance, FACT_03 Customer Services, FACT_04 Usability, FACT_05 Reliability, FACT_06 Information, FACT_07 Trust in Government, FACT_08 ICT Familiarity; ** p = < .001. * p = < .05.

In statistics, the correlation coefficient r measures the strength and direction of a linear relationship between two variables. Regarding interpretation, as is set out by Rumsey (2016), -1.0 would reveal a perfect downhill (negative) linear relationship; -.70, a steady downhill (negative) relationship; -0.30, a weak negative relationship and 0.0 implies that there is 'no' linear relationship positive or negative. The same applies in

the opposite direction: +0.30, reveals a weak uphill (positive) linear relationship; +0.70, a positive and strong relationship and lastly, +1.0 suggests a perfect positive linear relationship is in existence. The statistical measure of how close the data are to the fitted regression line (the coefficient of multiple determination), the percentage of the response variable variation that is explained by a significant linear model as given by the ANOVA results. It is the case moreover that Pearson's r will depend on the sample size also (the degrees of freedom; df). For a two-tailed test, a df of 100 or more would require an r of .195 to be significant – reveal a correlation – at a .05 confidence level and an r of .254 at the .001 confidence level (see also, C. Cameron & Windmeijer, 1997).

5.3 Summary

In summary, this Chapter has provided a comprehensive report of the survey data and how it was analysed. The differences, where significant, between the sample were set out and highlighted in Section 5.1. While the sample was not homogenous in their sentiments—all distinctions were pointed out—it was as a unitary whole subjected to a range of subsequent statistical tests. As is to be discussed, within sample differences did not indicate any fundamental difference and as all distinctions are laid out, treating the sample as a whole can be considered of informative merit. It then provided the factor loadings for all sets of grouped variables (see Table 17; p. 125). Of all six e-service assessment constructs, all bar “Reliability” was found to impact on the perception of ESQ positively.

To recap here, it can be said that it was the service delivery dimension that is of more import than the service content dimension. Recalling that the service in question is a

transactional one, this finding does make intuitive sense. All three delivery sub-dimensions (Responsiveness, Assurance and Customer Services) positively enhanced ESQ perceptions to a statistically significant degree. Of the three content sub-dimensions (Usability, Information and Reliability) only “Usability” and “Information” positively enhanced ESQ perceptions to a statistically significant degree. Moreover, “Responsiveness” was by far the strongest determiner ($\beta = .482, p = .001; \alpha = .922$). “Customer Services” ($\beta = .139, p = .001; \alpha = .913$) and “Usability” ($\beta = .175, p = .001; \alpha = .886$) were similar as were the impacts of “Assurance” ($\beta = .071, p = .001; \alpha = .917$) and “Information” ($\beta = .080, p = .001; \alpha = .922$). Turning now to the two exogenous factors—Trust in Government and ICT Familiarity—only “Trust in Government” had a small but positive influence on perception of ESQ ($\beta = .050, p = .001; \alpha = .820$).

As will be discussed in the following chapter, it had been envisaged that both of these exogenous factors would have acted to skew perception of ESQ positively. To explain, it would be a logical assumption to make that the more one trusts their government (*ceteris paribus*, all other things being equal) the more favourable might be their sentiment towards e-services provided by government entities; perhaps even if the transactional service in question is a traffic excellent payment system. The UAE is indeed known to have a population that is overall satisfied with their government—and it is a government that is seen as enviable by many individuals residing in other MENA countries (ASDA'A/Burson-Marsteller, 2015). It is moreover widely considered to be a safe and secure place to reside (EIU, 2015a, 2015b). So, the finding that Trust in Government, a variable that ‘is not’ linked to the design/delivery of the e-service per se, acts to enhance perceptions of ESQ positively is not unsurprising.

Back-End ICT developers and indeed decision makers tasked with enhancing the UAE's extant government e-services (i.e., the fourth stage of the Gartner Model) do need to factor this in. It is conceivable that exogenous factors act to inflate reported sentiments on e-service quality.

The second exogenous factor, "ICT Familiarity", as depicted in Figure 2 (p. 106) had no (statistically significant) impact on Perception of ESQ ($\beta = .023, p = .104; \alpha = .837$). This is an interesting observation. Intuitively it might be expected that the more tech-savvy an individual was, the more positively they would perceive e-services (as opposed to the bricks and mortar/telephone alternatives) yet a counter case could be made. It is conceivable that the more tech-savvy a sample member is, the less tolerant they will be of any e-service unless it is first-class in all respects. This interpretation rests on the idea that those who have more experience with over the Internet service will have a broader knowledge of what constitutes a good and bad e-service (be it provided by a public-sector entity or a private sector commercial enterprise).

Chapter 6: Analysis and Discussion

As set out, the motivation for this study is twofold. First and foremost, it was to conceptualise, construct and deploy a framework capable of measuring the quality of government transactional e-services in the UAE from the user's perspective. Secondly, it was to construct a model and scale that reflects the internal benchmarks and rubrics formulated by the Telecommunications Regulatory Authority (TRA). After all, these are the benchmarks that all government agencies are mandated to adhere to and comply with (Government of the UAE, 2012, 2014; UAE Telecommunications Regulatory Authority, 2014). This study sought to categorise extant TRA measures into six service-orientated dimensions; these are (1) Online usability; (2) Information quality; (3) Reliability; (4) Responsiveness; (5) Assurance; and (5) Associated/related customer services.

As discussed in the Literature Review chapter, the TRA benchmarking criteria and the accompanying guidelines are practitioner-based and orientated. While these back-end practitioner rubrics are ultimately engineered to enhance the given e-service (and thus will indirectly impact on overall user satisfaction levels), they are not explicitly designed to consider ESQ from the user's perspective. In other words, they are not designed to be fully responsive to citizen feedback. In light of this, the principal objective of this study was to determine the constituent parts of a comprehensive user-orientated ESQ assessment tool and to conceptualise, deploy and validate an instrument capable of (1) being used to gauge citizen sentiment of transactional e-services that are provided by public sector entities in the UAE, and (2) to be suited to work in tandem with extant TRA back-end ESQ benchmarks and rubrics. As conceptualised in Figure 1 (p. 17) and reported in the previous Chapter, a vital purpose

of this study was to develop a model that can assess existing e-services as well as proving a more general insight into how transactional e-services could be enhanced from the citizen's point of view.

While it is acknowledged here that e-services are increasingly being superseded by m-services (mobile device 'apps'), it will be argued that the fundamental elements of the instrument developed and deployed for this study are transferable. It is argued that m-services are in fact part of the e-service architecture, while the device may differ, the factors that determine reuse intentions and overall satisfaction will not be vastly different (Archer, 2014). In this vein, it should be recalled and was indeed highlighted in the literature review chapter that, at a fundamental level, much of what today comprises ESQ determinants is based on ES-QUAL principles (Parasuraman et al., 2005); ones that predate the now ubiquitous Internet, big data and the Internet of things (Sardar, 2010; 2015).

To be clear, the principles that can be used to assess e-service quality (ESQ) can—it will be argued—transfer to the assessing if user satisfaction with government provided transactional m-services. This will be covered in a subsection below called: “Relation the Findings to the Context.” Another critical aspect of this chapter will be to suggest that there is apparent merit in the further development of a dualistic benchmarking system that both covers a rubric for ICT practitioners—back-end e-service developers—and also one that can incorporate more systematically user sentiment via feedback mechanisms—end-users be they individual citizens or businesses.

This chapter will proceed as follows; firstly, it will consider (1) the differences within the sample and (2) the implications of including/excluding non-ESQ specific IVs.

Next, in Section 6.2, it will support or not support the eight hypotheses as were set out in the literature review chapter. It will then address this study's overarching research questions in light of the findings of the data analysis (Section 6.3). It will then move on to relate this study's observations to the literature and then to the context which can be defined as the UAE's public, e-government and 'over the Internet' transactional service provision (Section 6.4).

6.1 The Sample and the Construct

6.1.1 The Sample

As will become apparent in much of the proceeding discussion on statistically significant differences within the sample along demographic lines, these distinctions do merit deeper investigation going forward. The analysis here will contribute toward some of this study's recommendations and calls for further research. As noted in the literature review chapter, much of the ESQ literature considers adoption, usefulness perceptions, trust and overall satisfaction with an eye on demographics (e.g., Ahmad & Khalid, 2017; Al-Gahtani et al., 2007; Alenezi & Al-Qirim, 2017; Alfalah et al., 2017).

It is of academic interest and policymaker/practitioner utility to know about, understand and work towards addressing any differences (e.g., Carter et al., 2016; Rodrigues et al., 2016; Wittendorp, 2017).

- **Firstly**, differences between gender did not result in any statistically significant differences in relation to rating the six ESQ assessment factors. This ties in with research conducted in Saudi Arabia by Al-Gahtani et al. (2007), who did not find gender differences to exhibit significant distinctions with any e-

government predictor latent variables. In a more global context Hargittai and Shafer (2006) argue that gender is not typically a factor that determines online abilities and more recently, van Deursen and van Dijk (2011) found no differences of Internet skill levels between gender while researching the digital divide. However, within the Middle East, some studies did support the moderating role of gender in technology acceptance behaviour, while others do not (see, e.g., Abu-Shanab, 2017; Ahmad & Khalid, 2017). This runs counter to another piece of recently conducted research in the UAE. Rodrigues et al. (2016; p. 28) observed that female users exhibited more considerable reluctance to use e-government services than did their male counterparts.

Moreover, research by Alfalah et al. (2017; p. 2959), based on a sample of 257, found a clear indication of the existence of gender-based digital divides in Saudi Arabia. However, two points need to be noted here, first the sample analysed by Rodrigues et al. (2016; p. 28) was substantially smaller than the one used in this study, and secondly, their population pool was limited to individuals currently in higher education (in other words much narrower than this study does). Concerning the work of Alfalah et al. (2017), Saudi Arabia is quite a lot more conservative and their sample were also on the small side. In sum, this study makes another significant gendered contribution to this ongoing area of social science enquiry.

- **Secondly**, concerning the age, this dissertation found some statistically significant differences. As Table 20 (p. 127) and Table 27 (p. 214) illustrating out, the older sample members were much more positive in their sentiment towards the e-service in question. Interestingly, it was those within the middle age brackets that were least positive by the factor 'Reliability' or 'Customer

services.’ Younger members may show greater impatience and tolerance for lag for unlike the older generation, the concept of life before the Internet and 56K dial-up modems is alien to them. While it is known that an individual’s ICT familiarity will impact receptiveness to a given device or online transaction and indeed several research works have been conducted in this (e.g., Davis, 1989; Parasuraman, 2000; Parasuraman & Colby, 2015).

The impact of age is perhaps less investigated. When age is considered in relation to adoption or ESQ satisfaction, it is considered, convention suggests that younger members of society will be most confident and comfortable in opposition and contrast to older members of society (van Deursen & van Dijk, 2011). Alfalah et al. (2017, p. 2959), find a clear indication of the existence of age-based digital divides in Saudi Arabia. Wittendorp (2017, p. 1) considers e-government services in relation to Internet skills and types of support (utilising data from a sample of 540) finding that age negatively affects the use of information and transaction services. Nevertheless, other studies found age not to have a moderating effect on the relationship between social influence and the adoption of m-government (Chopra & Rajan, 2016). To cite another instance, the work of Chung et al. (2010) concluded that age did not impact on the perceived ease of use in the context of online community engagement. Therefore, while some studies support the moderating role of age in adoption, ESQ perceptions.

This study adds to the ongoing area of investigation and advances the knowledge in this respect by showing that for the UAE at least, age as a moderator to play a role, while is not as clear-cut as young vs old. As Meuter

et al. (2005) articulated some time ago, individual differences, such as demographics, have generated mostly inconsistent findings. For a while, many researchers predict younger members of society will be more willing to adopt innovative products and services, a large-scale review of applied works that in one way or another investigated this, “only half showed a significant relationship between age and adoption behaviour” (Meuter et al., 2005, p. 62).

- **Thirdly**, differences were observed in relation to nationality. There may here be cultural explainers, in that expectations and demands in relation to the proficiency and completeness of e-service provision will be influenced by an individual’s upbringing and sentiment toward governing and ruling bodies (e.g., quiescent and passive or critical and questioning). It follows that such sentiment and satisfaction levels will be partly based on what a given society considers to be adequate or citizens of that society have come to expect (e.g. Al-Hujran et al., 2011). Recalling that the case study transactional e-service for this research was fine traffic payments, it should be noted that in the UAE, a significant fraction of the driving population is from overseas. Thus, they will be in a position to view the UAE’s government provided e-services in relation to what is/is not on offer in their home countries (Government of Abu Dhabi, 2017). This is why Westerners are more critical in their rating than are UAE nationals and why non-Emirati Arabs are ‘more’ favourable in their rankings of UAE citizens. To elaborate, it can be assumed in the more open and post-industrial Western economies that citizens will hold their governments to greater account (Toksabay, 2015).

A consequence of which will be that services are likely to reflect user feedback (Weerakkody et al., 2016). Other recent research did not identify any significant differences in e-government adoption between UAE nationals compared to non-nationals (Rodrigues et al., 2016, p. 28). Carter et al. (2016, p. 132) sought to determine if differences in ethnicity impacted any of the variables in their model (by way of analysis of variance testing). They concluded that national attitudes play more of a factor in the resulting differences as compared to ethnic differences.

- **Fourthly**, in relation to education—as was set out in the previous chapter, it is observed that there are some differences between the sample in relation to how the ESQ factors were perceived and ranked. As was pointed out, the more educated an individual sample member is, the less favourably they ranked information, assurance and customer services related items. The reliability was shown to be in total reverse. The represents another unique contribution to the discourse (Wittendorp, 2017) and advances further the knowledge of demographic factors on ESQ perceptions and satisfaction levels. This may be a consequence of faster Internet access and newer ICT gadgets. The more highly qualified an individual is, the less positive they were in relation to the customer services related to or connected with the transactional e-service in question.

Reliability is ranked much lower by those with a lower level of education while in reverse, those with a higher level of education are much less satisfied with the e-service's associated customer services; this trend continues along the educational attainment cline. Somewhat counterintuitively the research by

Rodrigues et al. (2016; p. 28) did not identify any significant differences in e-government adoption between users of varying educational levels. Nevertheless, Al-Shafi and Weerakkody (2010) carried out in Qatar where a difference concerning educational attainment was observed. This was also found to be so in Saudi Arabia, Alateyah, Crowder, and Wills (2013) noted differences along educational lines regarding e-service adoption.

- **Finally**, concerning the number of times a sample member had used the e-service in question, statistically, significant differences occurred concerning 'Usability,' 'Reliability' and, 'Customer services.' Regarding 'Usability', there was a strong statistically significant difference between first-time users and those that had used it more than once. Intuitively, those who have conducted transactions on multiple occasions ranked the e-service's usability more favourably. The same is so also for the factor 'Reliability.' Less easily explainable is the observation that first-time users ranked customer services more positively than did repeat users. This may be reflective of the recent improvements the MOI has undertaken its customer support infrastructure in relation to its 'over the Internet' service provision. It could also be that first-time users were more likely to browse, think about and inquire about such support services while repeat users may not typically do so.

6.1.2 The Construct

The construct here can be defined as a conceptual model (see Figure 1; p.17), the survey instrument and the forecast, exploratory and confirmatory factor analyses. As discussed, Tan et al. (2013) differentiated between two main antecedents to users' satisfaction in relation to e-services: the service itself ("Content") and how it is

delivered (“Delivery”). Content is here considered to be the e-service’s usability, reliability regarding content and the quality of the information provided in relation to the transaction. Delivery is defined as the e-service’s responsiveness, the speed of loading and auxiliary customer service support, notifications and range of payment mechanisms.

As is the norm, when comparing expectations, perceptions and sentiment, individuals use some quantifiable reference points. These quantifiable points can be grouped into specific dimensions, and it is the detailed study of these that allow e-service back-end practitioners to develop suitable services (e.g., Parasuraman et al., 2005; Piccoli et al., 2004). For the TRA and all UAE government entities, there is utility in being able to determine ESQ from a user perspective. This will help back-end practitioners to develop strategies to provide services tailored to what citizens want.

As discussed in earlier chapters, content and delivery do overlap to a degree and, especially so with transactional services. To explain, as opposed to more information-rich e-government sites and services, transactions tend to be functional, and facets such as online usability and quality of information have more to do with how to complete the function efficiently and expediently; navigability and depth of information will be judged differently. In addition to these ESQ specific items, several items were included that have been used either as moderating variables in previously published works (Cenfetelli et al., 2008) or as part of the matrix of IVs (Tan & Benbasat, 2009a; Tan et al., 2010; Tan et al., 2013).

Therefore, alongside the ESQ tailored factors (Content: usability, information, reliability and Delivery: responsiveness, assurance and customer service) were

included (1) Trust in government (Rotter, 1980), and (2), ICT familiarity (Dajani & Yaseen, 2016) were included into the analytical framework. The purpose and rationale was to incorporate as many variables as feasible to permit this study's model to conclude with the fullest and most comprehensive of pictures of user-orientated sentiment towards a governmental transactional e-service.

Looking first at the 'Trust in government' factor, according to Ahmad and Khalid (2017), trust is one of the most important elements that affects users in relation to their decision of whether or not to adopt e-government services (they hypothesised that trust has a positive relationship with UAE users' decisions to adopt m-government). The decision to engage in e-government transactions requires businesses and citizens to have some degree of trust both in the government and the public sector agencies that provide the given e-services and also the technology mediums through which such transactions are conducted: the Internet (Carter & Bélanger, 2005; Turban & Gehrke, 2000). Trust in this sense is not mutually exclusive—one may trust the government but not trust the technology companies or vice versa. It has been suggested that there are two targets of trust: the entity providing the service (party trust) and the mechanism through which it is provided (control trust) (Bélanger & Carter, 2008; p. 166). In general trust in the context of this study can logically be related to uncertainty and risk of vulnerability (see, e.g., Belanche et al., 2014; Sardar, 2010, 2015).

As discussed in the literature review chapter, Lim et al. (2012), integrated different strategies of trust building, including calculative-based, prediction-based, intentionality-based, capability-based, and transference-based trust. Lim et al. (2012) visited three websites that catered to a wide variety of citizens for their investigation and followed this up by conducting semi-structured interviews of organisational

members responsible for various developmental stages of the e-filing system. Furthermore, to increase the diversity of the sample, taxpayers who were unable to file their taxes at home and who therefore used a community centre instead were also interviewed to understand their motivations for using the e-filing system.

According to Weerakkody et al. (2016; p. 334) various ‘Trusting beliefs’ that an e-government service will act responsively when a citizen visits or transacts with it are central to the e-government services (Teo, Srivastava, & Jiang, 2008) being provided to the users. The government-citizen relationship plays a vital role in the formation of trust in the government web services. As any given e-government service is necessarily a substitute for the government providing public services to citizens through traditional offline channels, it follows then that citizen’s trust in government should directly influence his or her trust in government web services.

Regarding ‘ICT familiarity,’ extensive literature makes clear that it is often found to have a bearing on e-service usage. Concerning this study’s construct of ICT familiarity then, there are a number of questions that scholars seek to understand better and hopefully address (e.g., Parasuraman, 2000; Parasuraman & Colby, 2015). Among this include, how ready are people to embrace and effectively use new technologies? Is it possible to group people into distinct segments by their technology readiness? (thus, the utility in collecting demographic data in survey instruments) What are the managerial implications for marketing to and serving customer segments that differ in technology readiness?

An approach for assessing people’s technology readiness, which is this article’s principal thrust, is a prerequisite for systematically addressing these issues. In light of

the TRI scales (original and modified) and the work of Zhu et al. (2002), this study in its aim to provide a holistic measure of perception of ESQ included a forecast factor grouping named: ICT familiarity. Zhu et al. (2002, pp. 75-76) considered: (1) self-control in using IT, (2) comfort in using IT, and (3) their “personal interaction” with it, arguing that all would likely impact on an individual’s judgment of a given service’s technical aspects and functionalities.

Notions of willingness to engage with new Internet era technology and people-technology interactions are evident in the critical work of Mick and Fournier (1998). That work examined some stated paradoxes such as assimilation/isolation, and, efficiency/inefficiency. Other early and critical works include that of Davis et al. (1989), which found specific consumer beliefs and motivations would encourage or discourage their willingness to use a new technology (the work that leads to TAM). Based on insights from multiple deployments of the original Technology Readiness Index (TRI) scale—a 36-item scale to measure people’s propensity to embrace and use cutting-edge technologies first deployed in 2000—was updated in 2015. According to Parasuraman and Colby (2015), the developers of TRI 2.0, about the seeming contradictions between penetration and use rates are over the Internet service product complexity combined with a lack of user-friendly instructions and support services. Moreover, it is a widely held view that society at large is not as technology savvy as are early adopters of any given gadget or user of an over the Internet service.

Regarding the outcome variable, satisfaction is something of a catch-all concept that instruments such as the ESQ framework seek to measure. It can also be derived by gauging user likelihood of recommending the service to others (e.g., Belanche et al., 2014; Cenfetelli et al., 2008). Overall satisfaction is an essential determinant of

perceived quality and perceived value. It is, in fact, a strong predictor of an individual's 'continuance intention.' It is however similar to the other IVs ESQ specific and non-ESQ specific, in that it is subjective and will be partially contingent on considerations beyond the service providers 'technical' control (performance-related constructs). As will be suggested in the recommendations and limitations sections of this study, revisiting the number of items used to measure these non-ESQ specific factors may be of utility not least if their lack of moderating impact is to be further investigated.

6.2 Answering the Research Hypotheses

Turning now to the hypotheses set out previously (see Figure 1, p.17) and section "3.2.1 Usability", each will now be supported or not supported by a brief explanation as to why. More in-depth analysis and linkage of theory and practice will be reserved for section 6.3 onwards.

6.2.1 (ESQ Content) H₁: Usability

The first hypothesis articulated, constructed and justified for this study was as follows:

- *H₁. Usability will enhance end-user ESQ perceptions.*

It can be stated that this hypothesis was confirmed ($\beta = .175$ $p = < .001$). There was found to be a highly significant and positive relationship between usability and the outcome variable. Recall that as depicted in Figure 2, Figure 3, and Figure 4 at the start of the Results Chapter shows linear relationships for this IV ('Usability') and end-user perceptions of ESQ. Within this construct, the valid inclusion of overall satisfaction levels is of perhaps of most interest to practitioners. This is because for this particular sort of transaction service, users may have little choice but to reuse and therefore

overall satisfaction is of perhaps the best gauge of such a transactional service's quality from an end-user's perspective.

A variety of studies based on TAM, TRI and UTAUT (Davis, 1989; Parasuraman, 2000; Tan et al., 2013; Venkatesh & Bala, 2008; Venkatesh et al., 2003; Venkatesh, Thong, et al., 2012) have demonstrated that sentiment on a service's effectiveness and usability are key factors in relation to ICT device/service adoption. For this present study, it is Perception of ESQ that is considered to determine if users will use the service in preference to a traditional medium of transaction. As the literature states, the decision to adopt a given piece of technology depends on the degree individuals feel that using the technology will improve efficiency and work performance.

As stated previously, Naidoo and Leonard (2007, p. 39) reported that "there is a positive association between users' beliefs about the usefulness of e-service and their continuance intention." The findings of Al-Hujran et al. (2011, p. 101) indicate that attitude toward using e-government websites enhanced the level of citizen intention to use e-government websites, and together, accounted for 43.3 percent of the variance in the intention to use e-government services ($r^2 = 0.433$). The results also indicated that perceived ease of use was a significant predictor of end-user attitude toward using e-government services; the implication being that the government should make such e-services more usable.

As has been stated within TAM, "usefulness" and "ease of use" are said to influence an individual's attitude and perception towards any given e-service (Parasuraman, 2000; Parasuraman & Colby, 2015). ISO 9241 defines usability as the ease with which a person can employ a product to achieve a goal in a particular context. As the literature

suggests, usability has become a key concern of ICT practitioners and online service providers (e.g., Sanchez-Franco & Rondan-Cataluña, 2010; Buckley, 2003, p. 453). As Ribbink et al. (2004, p. 448) argue, ‘ease of use’ is an essential element of consumer usage of computer technologies—consider, for example, Davis (1989) and more latterly, Parasuraman and Colby (2015)—and is of particular importance for new users. Perceived ease of use then is said to influence sentiment on usability, as the easier a system is to use, the more useful it can be (Davis, 1989, p. 324). This sub-dimension can be equated to the elements of the TRA’s rubric that fall under “Usability and Accessibility Criteria” (UAE Telecommunications Regulatory Authority, 2014, p. 7). It is then the ease with which a user can (find,) start and complete the given transaction.

6.2.2 (ESQ Content) H₂: Information

The second hypothesis developed for this applied research study was:

- *H₂. Information quality will enhance end-user ESQ perceptions.*

Hypothesis H₂ was confirmed as well ($\beta = .08$ $p = < .001$). There was found to be a highly significant and positive relationship between information quality and the outcome variable. It can be stated that on all three counts [(Figure 2 (p.106), Figure 3 (p.122), and Figure 4 (p.122)] the more positive information was ranked, the higher were the outcome variables rated. Of all the ESQ factors, ‘Information’ had the weakest impact. For this study, the quality of information (termed in the model: “information quality”) is taken to mean: the extent to which the information provided (its clarity and coherence) is “descriptive, meaningful and readable.” This prompts queries such as does such information follow international best-practice regarding

clear language (or in the context of the UAE a range of languages)? This sub-dimension can be equated to the elements of the TRA's rubric covering "Content Criteria" (UAE TRA, 2014; p. 9).

In a study examining the effect of information quality on trust in e-government systems transformation, it was established that higher accuracy, up-to-date timeliness, and exact relevance of information would lead to higher user trust in e-government services (Lee & Levy, 2014). The findings of Weerakkody et al. (2016; p. 340) also strongly indicate that information quality has a positive and significant impact on trust and overall user satisfaction. According to Weerakkody et al. (2016, p. 334), a large body of applied ESQ literature has established support for the argument that quality information leads to enhanced user satisfaction (e.g., Floropoulos et al., 2010; Nicolaou et al., 2013; Petter & McLean, 2009). For instance, Y.-S. Wang and Liao (2008) presented and validated a model of e-government system success, and found a significant influence of information quality on user satisfaction.

6.2.3 (ESQ Content) H₃: Reliability

The third hypothesis developed for this applied research study was:

- *H₃. Reliability will enhance ESQ perceptions.*

Hypothesis H₃ was not confirmed ($\beta = .016$ $p = .265$) indicating lack of a significant and positive relationship between reliability and the outcome variable. As was discussed in the previous chapter, the factor 'Reliability' consisted of items including: "By using this service, no intermediate physical visit to a government office was required" and, "I do not have any technical issues relating to this e-service..." It may not be surprising to find reliability being insignificant considering the degree to which

'Reliability' can be said to overlap with assurance and responsiveness. It is worth recalling that 'Reliability' is considered to be a multifaceted concept and as such has variously been placed as part of a service's content and delivery dimension. As Barnes and Vidgen (2001; p. 14) state, reliability is the "provision of reliable information and reliable service." In light of this, this study viewed "reliability" as the reliability of the information, guidelines and instructions directly relevant to carrying out and completing the transaction.

The extent to which content is logically set out and consistent with other areas of the MOI's site will then positively impact on a user's continuance intentions. In the context of ESQ, reliability often refers to a functional quality dimension as well as the reliability of the information content provided on the site. As a consequence, Semeijn et al. (2005; p. 184) argue that it has been difficult to establish it as a single factor with sufficient discriminant validity. They go on to state that the solution to this problem is to view functional reliability regarding navigability and the completeness of the content's information. For instance, the reliability of the information provided as part of the e-service can be operationalised as accuracy: the extent to which the service provides visitors with information that is considered useful and reliable. This is most likely to be useful if it is presented attractively and in a consistent style.

6.2.4 (ESQ Delivery) H4: Responsiveness

- *H₄. Responsiveness will enhance end-user ESQ perceptions.*

Hypothesis H₄ was confirmed as well ($\beta = .482$ $p = < .001$). There was found to be a highly significant and positive relationship between responsiveness and the outcome variable. For Barnes and Vidgen (2001; p. 24), responsiveness is the provision of a

prompt service “via the site”, and Devaraj et al. (2002, p. 327) framed it as the extent to which an e-service is responsive to a user’s needs. In their investigation of ‘Responsiveness’ about ESQ, Semeijn et al. (2005) contend that it should be considered as the degree to which the service provider is responsible and how quickly and, how satisfactorily user the queries are being responded? Responsiveness then, in the context of this study, includes speed of service, sensitivity to customer concerns and awareness of changes in the general needs of customers:

It is evident that responsiveness is a key factor in ESQ and correlates strongly with both ‘Reuse intentions’ and ‘Overall satisfaction.’ Therefore, H₄ can be confirmed: responsiveness does positively influence e-service quality. The reaffirms the findings of Ribbink et al. (2004; p. 452) who found a positive relationship between responsiveness and e-satisfaction. As is shown in Figure 2 (p. 106), responsiveness is the factor that has the most bearing on the DV. Indeed, Palmer (2002, p. 156) considers responsiveness to be a key factor in user satisfaction. Intuitively, a factor such as speed will be of considerable influence. The point and purpose—the utility *per se*—of e-services as to make transactions more expedient and, to make them quicker and faster. Yes, e-services may be designed by the corporation/government entity in mind to save money, but they can only really achieve this if the transactional process saves the customer/citizen time.

6.2.5 (ESQ Delivery) H₅: Assurance

As highlighted in the Literature Review Chapter above, Semeijn et al. (2005) argue that in some respects online assurance, is more important than offline assurance, reasoning that online customers are less able to scrutinise employees or the physical

facilities of the ‘over the Internet’ public sector entity with which they are conducting the transaction. Consequently, assurance must be established by other means of privacy protection. The fifth hypothesis this study set out is thus:

- *H₅. Assurance levels will enhance end-user ESQ perceptions.*

Hypothesis H₅ was confirmed as well ($\beta = .071$ $p = < .001$). There was found to be a highly significant and positive relationship between assurance and the outcome variable. Assurance, recall, is not that far removed from the factor ‘Reliability.’ This shared interpretation between the constructs could explain why reliability was insignificant. However, the literature makes clear that reliability, while typically aligned to trustworthiness, is not fully interchangeable with assurance. In the survey conducted for this research, it is clear that assurance was more equitable to trust (here think of the non-ESQ specific factor of ‘Trust in government’).

As mentioned, Wolfinbarger and Gilly (2003; p. 193) state that the aim of e-service related security and privacy is “security of credit card payments and privacy of shared information.” It also appears that initially, consumers judge security/privacy based on elements such as the professional look and feel of the website, as well as functionality of a website, and company reputation. While the TRA considers “assurance” to include elements like security and privacy, assurance tends to be considered as a trust-related criterion. It is thus clear that there is potential for the items that comprise “Reliability” (part of the content sub-dimension) and those that of “Assurance” to overlap or correlate too highly with one another to be considered as separate variables.

About citizens’ perceptions, the safety and security of the Internet are an integral part of e-government adoption. Carter et al. (2016; p. 132) point out that the benefits of e-

government services compared to face-to-face options for contacting the government need to be highlighted. The government also needs to employ trust-building strategies to increase citizen confidence in e-enabled services, since ‘Trust in the Internet’ positively influences e-government adoption.

6.2.6 (ESQ Delivery) H₆: Customer Service

Regarding “Customer Services,” TRA documentation stipulates that these should be: “available around the clock, and through as many channels as possible.” Nevertheless, such information may not necessarily be known, or realised, by users. The sixth hypothesis was designed to gauge sentiment on the extent to which actual or perceived levels of customer support attached to the e-service in question would impact on overall satisfaction about ESQ:

- *H₆. Customer service support will enhance end-user ESQ perceptions.*

Hypothesis H₆ was confirmed as well ($\beta = .139$ $p = < .001$). There was found to be a highly significant and positive relationship between customer service support and the outcome variable. It can be stated that again that on all three counts a respondent’s favourable sentiment towards experienced or assumed customer service support and their sentiment toward ESQ was significant and positive. Interestingly, Wolfinbarger and Gilly (2003, p. 193) report that customer service was only mildly related to overall user perception of the given e-service and suggest that this may be because customers do not need customer service in each transaction probably accounts for the mildness of this effect.

6.2.7 (Non-ESQ specific) H₇: Trust in Government

It can be stated that ‘Trust in Government’ was significant in the multifactor model ($\beta = .05$ $p = < .001$) and positively impacted ESQ perceptions:

- *H₇ Trust in government will positively impact end-user ESQ perceptions.*

For convenience, the three items retained to assess this factor post-pilot study are: (1) “I trust the Government of the UAE in terms of carrying out bureaucratic transactions,” (2) “I consider public sector administrative processes in the UAE to be transparent and fair”, and (3), “I feel confident and relaxed when interacting with staff at government agencies.” Therefore, it can be stated that the more one reports trust in government in general terms, the more likely it is that they will report overall satisfaction with the e-service in question. Initially, at least, it may be presumed that the more one trusts their government (for in this research the e-service provider is a public entity), the more favourable will be their response towards ESQ facets such as reliability and assurance. It is worth noting that in another piece of recent research, Ahmad and Khalid (2017) find that trust is associated with a user’s intention to adopt ‘over the Internet’ services in the UAE positively. Research by Halaweh (2011) also established a statistically significant relationship between security and users’ attitude toward adoption of technology.

The importance of the variable “trust” about public sector e-services, and thus seeking to incorporate it into ESQ models is, according to Grimsley and Meehan (2007), due to the greater transactional risks posed by having to provide personal data in many government e-service transactions. In part based on the earlier work of Brown and Jayakody (2008)—which finds that information quality (our “quality of content” see

Figure 1; p. 17) indirectly influences loyalty intentions through its direct influence on perceived usefulness—Pearson et al. (2012), examined site loyalties of end-users by examining influential factors such as perceived information quality, perceived e-service quality, and perceived value. If loyalty can be seen or broadly interpreted as equating to this study's "trust", intention to reuse and recommend, then it is clear that seeking to measure these attributes (see the right-hand side of Figure 1; p. 17) helps better inform a given government's e-service more holistically.

As the Literature Review chapter sets out, a considerable volume of research shows that critical consideration of using a system is security. In the context of the UAE, Ahmad and Khalid (2017) argue that m-government is relatively new development, and given the lack of confidence, the sophistication of the user, security, face-to-face interaction, and potentially personal information that can be accessed by the providers, users might not trust m-government adequately. As m-government transactions involve transmitting data in a wireless environment setting, users are exposed to privacy and security risks (van Velsen, van der Geest, van de Wijngaert, van den Berg, & Steehouder, 2015). Fassnacht and Koese (2006, p. 30) have pointed out users 'know' the degree to which they trust a given service provider, but they might not be able to judge whether the information provided is accurate or the data transfer is safe. Since the concept of trust is strongly related to "uncertainty avoidance", differences could also be expected in the way it impacts on e-service user satisfaction levels in different cultural settings.

Arguably in the context of the UAE, where both citizens and non-residents (from a wide range of cultural backgrounds) will use the e-service at the heart of this study, we can surmise that there will be a mixture of rigid and flexible users.

Riemenschneider et al. (2009) used “trust” as a moderator between usability and perceived individual impact and between satisfaction and perceived individual impact; “satisfaction” is defined as the user’s response to the use of the given e-service. They conclude that trust directly influences the perceived individual impact of the Web as well as influencing the relationship between usability/satisfaction (Riemenschneider et al., 2009; p. 16).

Another contemporary work by Belanche et al. (2014) is relevant due to its particular focus on trust, ‘trust transfer’, about government e-services, using ‘trust in public e-services’ as a dependent item and ‘continuance intentions’ as a control variable. In other words, Belanche et al. (2014; pp. 632-633) contend that in the context of e-service assessment, trust should be considered as a broader and more multi-faceted dimension and include trust in the public administration. Fakhoury and Aubert (2015) also sought to broaden what trust entails in relation to government e-service utilisation is to determine the quality of e-service, in relation to the (UAE) context-relevant government guidelines and rubric that has been produced for all government agencies to work towards conforming to.

6.2.8 (Non-ESQ specific) H₈: ICT Familiarity

Alongside trust as an exogenous factor, there is also the issue of a given individual’s technical competencies and confidence with using technology. If trust is correlated to notions of an individual’s technological readiness, it follows that two users may perceive the same service somewhat differently. In general terms, the TRI construct can be viewed as an overall state of mind resulting from a wide range of psychological “mental enablers and inhibitors” that collectively determine the extent to which an

individual will be willing/likely to embrace new technologies (Parasuraman & Colby, 2015). The eighth and final hypothesis was:

- *H₈ ICT familiarity will positively impact end-user ESQ perceptions.*

It is interesting to note that ICT familiarity was insignificant ($\beta = .023$ $p = .104$). Thus, the items measuring ICT familiarity— (1) “Using modern technology makes me more productive in my personal life,” (2) “Government e-services enable me to achieve a better work/life balance”, and (3) “I am among the first in my circle of friends to adopt and use the latest technologies”—had no statistically significant impact on one’s perception of ESQ. This could indicate that respondents conducting online transactions were very comfortable and familiar with ICT technologies and were considering it more as a commodity and thus nothing unique so to impact their ESQ. This is in line with prior studies that indicated that IT was a commodity and did not offer any particular competitive advantage unless deployed differently (Carr, 2003).

Any research in the field of ICT practice is necessarily likely to be of finite durability. Indeed, m-services are likely to become more and more prevalent, and the widespread use of mobile apps is likely to render e-services (those conducted via a browser-based webpage) less frequent. As will be set out in the following sections the disruptive power of ICT, economically, socially and behaviorally is making the mobile device at this juncture the default device. In line with Archer (2014), it is the contention here that m-service are necessarily part of the e-service domain.

This contention leads to the usage of the term: ‘over the Internet’ services as a catchall phrase for these two modes of the medium. It is evident that the concept of m-government, “the use of information and mobile technology to support and improve

public policies and government operations, engage citizens, and provide comprehensive and timely government services,” emerged in practice several years after the appearance of e-government (Schnoll, 2014; p. 7). As the literature suggests, some practitioners and academics seek to draw distinctions between the two, while others seek to draw parallels. Wang (2014; p. 141) defines m-government—an ‘information systems—as the provision of products or services using wireless network and portable devices and states that m-government services area, “more convenient and easier way, [to] help users improve work efficiency and complete tasks at any time and anywhere.” Moreover, it has been stated that with m-services there is an enhanced level of customisation and personalisation (yet the same can be said for e-services, via browsers, too).

Arguably, m-government can be seen as an extension or contemporary permutation of e-government. Indeed, this is why this study now employs the term “over the Internet services.” As Archer (2014) argues, the concepts of e-government and m-government are inextricably intertwined. Indeed, Archer refers to m-government as a subset of e-government and underscores the need for mobile e-government services to be smoothly integrated into the stationary e-government landscape.

“Mobile government, as a close sibling of e-government, is becoming more ubiquitous as wireless networks expand and related mobile technologies and applications are applied to government functionalities.” (Archer, 2014; p. 106).

6.3 Addressing the Research Problem

Regarding the research problem investigated by this study—*To determine a methodologically sound framework (conceptual model and survey instrument) for*

assessing the quality of UAE government transactional e-services from an end-user's point of view—it is clear that a wide range of variables does influence user perceptions. To address this question (the MOI's traffic excellent payment system), a range of Likert-style items was asked to users of the e-service in question. These included the following, which have been grouped into their broader domains.

a) ESQ content-related:

- “The navigation throughout the service delivery process is easy;”
- “The steps/stages of the procedure are outlined.”

b) ESQ delivery-related:

- “Using this e-service allowed me effectively perform this transaction online;”
- “I believe this e-service is backed up with good customer support should I need it.”

c) Other non-ESP specific variables:

- “I trust the Government of the UAE regarding carrying out bureaucratic transactions;”
- “I am among the first in my circle of friends to adopt and use the latest technologies.”

d) Outcome variables:

- “I am satisfied with the utility of the e-service;”
- “I intend to reuse this e-service as I perceive it is fast, efficient and reliable.”

(see Table 8; p. 109)

Regarding justifying this study's division of ESQ factors. The bulk of the literature seemingly makes one broad distinction between e-service quality measurement components: “Content” and “Delivery” (Tan & Benbasat, 2009a; Tan et al., 2010; Tan

et al., 2013). To a fair degree, this study followed this typology (see Figure 1; p. 17). One of the valuable contributions this study makes is that in this context of the UAE and for this government entity and particular transactional service (the Ministry of Interior; traffic fine payment system) it is “Delivery” that is a demonstrably more important consideration that is “Content.” Secondly, in all tests, it was the delivery sub-dimension of Responsiveness that had the most bearing.

Looking now at the three research assumptions set out in Chapter 1 (Section 1.4) each will be addressed in light of the survey data analysis and the results of the hypothesis testing just conducted. The first one was:

“It is both advantageous and possible to develop a scale that can inform and assist back-end ICT developers at government entities about how the transactional e-services they provide are perceived regarding both service content and service delivery qualities by end-users.”

It is clear that developing such a scale has been achieved and that there is utility in its deployment. It does provide developers with insights that can be evaluated against the TRA rubrics (see Table 5, p. 86). It will be noted that this study’s model affords the ability to rank—even by demographic criteria (see Chapter 7, Section 7.1, below)—the different aspects of service content functions and service delivery dimensions. The utility of this will be that budgets and priorities can concentrate on particular aspects, focusing on what users are most favourable towards and also least favourable. The second research assumption was:

“The more positively perceived a government transactional e-service is, the more likely will be “reuse intentions” (adoption) and, having this information will enable back-end ICT developers about being refining and updating them over the Internet transactional services.”

In this report the evidence provided by the survey is strong. The more positive an individual is regarding their view on ESQ the higher will be stated reuse intentions. To expand on this, the IT staff at the MOI—those tasked with managing and developing the Ministry's over the Internet transactional services—will be better positioned in future ICT projects to know what works for users. It is one thing to digitise former bricks and mortar face-to-face transactional services, it is another to streamline and integrate government and intradepartmental communication and data archiving architectures, but it is another thing to understand and act upon the feedback of citizens/residents in relation to any given e-service.

As argued in the Introduction chapter, the UAE government can now be considered to be at the fourth stage of the Gartner Model; e-services are being renamed as m-services (reflecting the reality of society's move to mobile) but, as mentioned previously, there are cogent arguments made for such mediums to be considered as the latest element of the overarching e-service architecture. Either way, it does make sense for the government to encourage e-service adoption. The third assumption set out in Chapter 1 was:

“Non-ESQ-specific factors such as trust in government and ICT familiarity are considered to impact on overall ESQ perceptions, and so, it is both advantageous and possible to incorporate such factors into the analytical assessment framework.”

Concerning this study's conceptual framework model, it did incorporate some factors that were not specific to the mechanics of the e-service. In other words, factors that cannot be included in either the service content or service delivery domains, these were Trust in Government and ICT Familiarity. However, when it came to the hierarchical regression analysis only trust in government had a positive influence on the end-user

perception of ESQ (consult Figure 2; p. 106). As the literature highlights, trust in government is also a common theme in the e-service assessment discourse and helps better inform possible moderating impacts on e-service specific evaluations (Belanche et al., 2014; Fakhoury & Aubert, 2015; Lee & Levy, 2014).

In a similar respect to the conclusions of the applied research by Rodrigues et al. (2016, p. 31) this present study's conceptual framework and findings can help inform current strategies and action plans, as well as help, formulate new guidelines, strategies, and objectives for the development of the UAE's e-government infrastructure and become more user-centric. Rodrigues et al. (2016, p. 29) have stated that countries in the Arab world tend to view e-government services as a path to a more sustainable economy and, within this context, they state that user 'trust' is a critical factor in influencing adoption of e-government services. Dajani and Yaseen (2016, pp. 50-51) argue that social norms and the degree of technological acculturation in the Arab world can and does affect the take-up of e-services.

In light of this, this study adds insight to this sociocultural context. As has been stated in the Literature Review and emphasised in other places, the UAE—within MENA at the very least—is at the forefront of seeking to create an e-government/m-government institutional framework. The UAE government is reportedly now moving towards an Internet of things (The National, 2017b). Recall that the "UAE Federal E-government Plan 2014," aimed to catalyse the full-scale adoption of e-services. Its mandates were to enhance the legislative environment for e-services, attain advanced ICT infrastructure, develop the institutional framework for e-government and cloud computing strategy for all federal government entities (UAE Government/Accenture, 2014; p. 53).

As was stated in a UAE government funded piece of research, “governments around the world are trying to fulfil their promises to deliver economic growth, social progress [and security...] by going digital: they are providing citizen-centric public service at the time and place needed, thereby driving high levels of citizen engagement and satisfaction (UAE Government/Accenture, 2014; p. 3). Yaghi and Al-Jenaibi (2017; p. 9) show how the UAE is seeking to overhaul the public sector in two stages; the first stage was from 2009 to 2014 in which agencies were encouraged to introduce some smart services in their usual operations, and the second stage starts in 2015 until 2020 during which all governmental entities are instructed to have well established client-focused strategies, operations, and service-delivery methods including smart services.

6.4 Contributions to the Literature

This study relates most fully to the literature that quantifies, assesses and further advances ESQ. It fits more broadly to the global e-government discourse and the which considers the automation of human interactions. The spirit of our age is, according to Sardar (2010; p. 435), characterised by uncertainty, rapid change, realignment of power, upheaval and chaotic behaviour. It is argued that this is a transitional age. Regarding big data, social media and e-government and the so-called ‘Internet of things’ is hard to deny this.

As Sardar (2015; p. 34) recently wrote, as privacy dissolves, the boundary between public and private becomes increasingly diffused. On the one hand, there is a great deal of concern about the erosion of privacy, yet on the other, there is a simultaneous and contradictory desire to put our private lives in the public domain. Individuals increasingly seem compelled to, “provide a running commentary on [their] lives on

Facebook” and other platforms such as Twitter and Instagram. The Middle East, including the UAE, are no exceptions to this.

All that being said, the first valuable and contemporarily relevant contribution this study makes is regarding its survey instrument and underpinning conceptual framework. Tan et al. (2013; p. 101) adopted. They contend that only by relating content functions and delivery dimensions to their respective higher-order design principles can individuals be sensitised to the service objectives behind lower-order technological specifications of e-government websites. Interestingly, Tan et al. (2013; p. 101) find that service content and delivery quality can be regarded as being equally predictive of e-government service quality. This present study indicates for transactional e-services; delivery is of more import than content.

Another valuable contribution this study makes is about trust and e-service usage. Rotter (1980; p. 1) defined trust as an expectancy that the promise of an individual or group can be relied upon and argued that, “the high trustor is less likely to be unhappy, conflicted, or maladjusted.” Over the decades, subsequent research has suggested that there are two fundamental targets of trust: the entity providing the service and the mechanism through which it is provided. As a consequence, users are believed to consider both the characteristics of the provider of the e-service and then the characteristics of the supporting technology before using it (Carter et al., 2016; p. 124). It follows then that trust in e-government comprises the traditional view of trust in a specific entity, as well as trust in the reliability of the enabling technology (Bélanger & Carter, 2008). This study found trust to be a positive influence be it in the guise of the Assurance provided (and/or assumed to be provided) by the service itself or in the

guise of Trust in Government (an exogenous factor that nonetheless was predicted to and turn out to have an influence on Perception of ESQ).

A third valuable contribution to the literature is to extend the insights derived from the recent UAE-focused studies by Rodrigues et al. (2016) and Ahmad and Khalid (2017), that of another study on public sector transactional services (Khalil & Al-Nasrallah, 2014) alongside the more e-service adoption focused works that have been undertaken in Saudi Arabia (Al-Gahtani et al., 2007; see in particular, Alfalah et al., 2017). (Recall that this study's focus was not adoption, but more retention and quality assessment focused.) While this study deployed a unique survey scale that was aligned and tailored to its research model (see Figure 1; p. 17), it can be compared to these others. The all collect and discuss demographic data and thus touch upon digital divides be they age, gender or educationally demarcated. Ahmad and Khalid (2017) observed that gender, age and household income significantly impact on the relationship between trust and UAE users' decisions to adopt m-government and that gender, age and household income have significantly moderated the relationship between social influence and UAE users' decisions to adopt m-government.

6.5 Summary

Regarding generalising this study's findings there are necessarily two elements to consider, firstly the broader applicability of the findings and observations of the data collected and secondly, the potential use of the conceptual framework and subsequent survey instrument that was developed and deployed. This Chapter has discussed in detail all of the first-hand applied research conducted for this doctoral dissertation. The survey instrument collected 2,197 instances of complete and usable data. This was

checked to ensure it was valid for regression analysis; a range of tests was conducted and reported on. Importantly, the data were fitted to the conceptual model as illustrated in Figure 2 (p. 106).

The findings and observations from the analysed data provide clear evidence of the positive impact some ESQ components have on user satisfaction levels and reuse intentions. The model that this study conceptualised and validated factors in the range of considerations necessary to provide a holistic set of end-user feedback for government-employed back-end IT practitioners to utilise for further enhancing over the Internet transactional services to citizens.

This study will be one of the few thus far to examine e-government service quality in the UAE, and it is expected that this study will make an essential contribution to the body of knowledge about user-centric e-service design and the ongoing assessment mechanisms of such e-services. It demonstrates how each ESQ component interacts with the outcome variables: reuse intentions and overall satisfaction levels. This will be of immediate relevance to the UAE's MOI but also to other government entities.

Chapter 7: Conclusions and Implications

This final chapter will seek to provide a comprehensive summary of the dissertation alongside its implications are set out as a series of recommendations (Section 7.1). Following the recommendations are this study's limitations (Section 7.2). The next Section, 7.3, set out some areas considered worthy of further research and lastly, in Section 7.4, is a succinct summary of the work as a whole. This study is the first to examine e-government service quality in the UAE from the end-user's perspective and moreover, is based on an extensive sample from a representative cross-section of society. It, therefore, adds a valuable case to the e-service assessment literature thus far carried out in the MENA region.

Moreover, this study makes an essential contribution to the body of knowledge about assessment tools used to measure public sector provided transactional services from the existing end-user's point of view. Also, this study's analytical framework and model, at the more practical level, can demonstrate how each e-service assessment construct interacts with the outcome variable: Perception of ESQ. As previously stressed, it is distinct from other works in this domain in that it is focused on e-service quality assessment rather than adoption concerns.

Differences between the work of Rodrigues et al. (2016) and the present study include the following: the former considers factors such as "Internet Usage", and it uses as an outcome variable "E-Gov adoption." The IV factors it uses to derive "Overall Satisfaction" (which feeds into E-Gov adoption) are an expectation based and do not focus in particular detail on either e-service content aspects or e-service delivery aspects. Similarities are evident regarding 'trust' and "attitude toward using

technology” being factored in. There are also a series of differentiators between the work of Ahmad and Khalid (2017) and the present study: the former has as its DV: “User intention to adopt mobile government (services) in the UAE.” As per the TAM construct. Ahmad and Khalid (2017) adopt “perceived usefulness” and “perceived ease of use.” It also has constructs that assess “cost,” “social influence” and, “variety of services.” Also, both of these works have rather small sample sizes (380 and 120 respectively compared to this study’s $n = 2,197$) and they both sample only students in higher education. The present study has a far broader demographic (i.e., any UAE citizen/resident who holds a driving licence).

While it has evidently based itself on existing works, it has conceptualised, constructed and deployed a survey instrument that is bespoke and capable of augmenting what the UAE’s TRA currently has in place for back-end developer usage. Thus, this study is of immediate relevance to the UAE’s MOI and other government entities that offer citizens and businesses *over the Internet* transactional e-services. As indicated earlier, findings from this study will help better understand and address issues related to the low adoption and usage of transactional e-services within MOI in UAE which currently are below the targeted estimate. Recapping on this study’s central implications, firstly, for the discourse, it submits a holistic framework by which to assess public-sector provided transactional e-services. Secondly, it provides the MOI—along with other entities that adhere to the TRA’s e-service quality benchmarking criteria—with a convenient tool for collecting and gauging end-user sentiment on any given transactional over the Internet service. As alluded to in the preceding chapter, this study makes the following key contributions. First and

foremost, it makes a significant contribution to the model which has been specially conceptualised, developed and deployed for this study.

It contributes to the literature on e-service ‘quality’ assessment, especially that which focus on e-government transactional services. It demonstrates that for public sector e-services it is “Delivery” which is demonstrably more important a consideration, that is service “Content.” This study makes a significant contribution to public sector e-service adoption and satisfaction which remains an ongoing area of social science enquiry. It is in fact among the first to correctly consider e-service adoption and satisfaction in the context of the UAE especially so with its focus on the quality assessment side of things.

7.1 Recommendations

The recommendations will firstly focus on the broader use of this study’s methodological approach and secondly, set out some general suggestions for the enhancing of government over the Internet services in the UAE and also the wider MENA region. Concerning the MOI, it is clear that the e-service used for this research study is on the whole positively perceived. It is also clear that the following points can act to enhance this transactional service (1) Speed; (2) Responsiveness; and (3) Customer services.

7.1.1 The Methodological Approach

Regarding this study’s methodological approach, there is merit in considering its more extensive deployment. Referring back to Figure 1 (p. 17), it is clear that to be able to gain clear insight and make credible recommendations about e-service quality, the

critical assessment dimensions of content and delivery needs to be factored in. It is also clear that this study's survey instrument can be used to assess a broader and more diverse range of e-services. One recommendation is to reanalyse this study's dataset using the demographic delineators as moderator variables. The differences observed (be it age, nationality or educational attainment levels) merit further investigation as touched upon in Section 6.1.1. It is clear that a considerable number of works use as moderators (or control variables) demographic variables. Thus, it may be of utility to analyse this in more depth before further utilisation of the survey. Indeed, this more in-depth analysis of the existing data set is one area meriting further research (see Section 7.4.1).

As Carter et al. (2016; p. 124) contend, citizens and customers are now less tolerant of poor, impersonal services in the public sector. This is not least because they are becoming increasingly aware of the power of the Internet and experience good service in the private sector. As a consequence, it is apparent in every government's interest to make their public services more efficient and available to gain more significant usage, trust and satisfaction. As has been articulated in previous chapters, trust in the Internet and the government itself drives trust in the e-service and thus continuance intentions.

ICT practitioners working at government agencies should, therefore, pay particular attention that the transactional e-services operate in an environment that is as sheltered as possible from security threats (Belanche et al., 2014; p. 637). This can be achieved by creating easily recognisable government websites, displaying a clear privacy statement, using government domain names (i.e., Gov and, .ae). It is the case that the UAE does have such documentation in place. The transactional e-service environment

within the UAE can also be achieved by working with internationally recognised ICT multinationals, and signalling reliability with FAQ and contact detail pages, many of these points are indeed in the TRA e-service provision benchmarks (Government of the UAE, 2012, 2014; UAE TRA, 2014).

In a summary of a review of what the literature says about demographic differences, Wittendorp (2017; p. 16) states, the majority find that the higher the level of education, the greater will be the Internet skills and beneficial outcomes from Internet usage. It follows then that people with higher Internet skills find it easier to use e-government services. However, the need for e-government services is higher for people with a lower socio-economic status, who also have lower Internet skills (in Europe this would be referring to benefits and welfare and public as opposed to private healthcare). In light of this, it is suggested that MOI e-service need to be useful service content functions but also efficiently deliver those functions; (in this regard, see also: Tan et al., 2013; p. 83).

7.1.2 “Over the Internet” Services in the UAE

With Expo 2020, the move toward the Internet of things and the slightly further afield 2030 date for the fulfilment of the Abu Dhabi economic transformation to have occurred, it is clear that e-government is going to become the norm (Government of Abu Dhabi, 2008; Jones, 2013). Thus, to facilitate this, government agencies are likely to place more emphasis towards trust to ensure that the maximum number of citizens not only utilise transactional e-services but do so willingly and with a reasonable degree of overall satisfaction and trust. There is then, merit in the following:

- a) To facilitate more government publicity about the secure and speedy nature of ‘over the Internet’ services.
- b) Promote the potential and existing customer service support that is in place to support users at any stage of the e-service transaction.
- c) Ensure that the e-service is ‘responsive’ and capable of responding to user queries in a fast and efficient manner.

Indeed, Weerakkody et al. (2016, p. 339) find that building trust is necessary for keeping the users satisfied with the e-government services. Complimentary to this is effective marketing campaigns to educate current and potential users, or in creating awareness among them – the social influence and word of mouth (via social media) that has previously been called for by Ahmad and Khalid (2017; p. 377).

7.2 Limitations

7.2.1 Sample Issues

Since the survey uses self-administered surveys, reliability regarding the responses received and subsequently analysed may be said to be sub-optimal. In addition, the sample respondents were chosen using purposive/convenience sampling and such self-selection could have led to issues relating to external validity. Nonetheless, this was addressed to an extent by achieving a large sample that was representative of the population. A second limitation is resultant from the fact that the sample, while all are completing the survey upon using an MOI e-service, may not have the experience another sample member has about the range of MOI e-services. Therefore, some variance in responses may be a consequence of this. The study also suffered from biases inherent in most voluntary survey-based research. Either very satisfied or very

dissatisfied users are more likely to respond to a customer survey. In the case of this survey, the responses were skewed towards respondents who were willing to continue using the e-service. In addition, although we tried to check and control measurement bias caused by the wording of the items during the pilot study, it is possible that the wording of some items (“latest anti hacking tools”) may have created a bias in some of the responses.

Also, the selected sample of respondents were engaging in a transactional e-service that was mandatory. Therefore, it is possible that some dimensions of ESQ may not apply when considered for all e-services or alternatively, some additional dimensions of ESQ may show up to be significant when analysing a different e-service.

7.2.2 Data and Data Analysis Issues

Another limitation of this study is in relation to the robustness of the constructs – the choice of the constructs – and the level of analysis conducted. Although a number of insightful and value-added statistically significant observational relationships were found, no advanced Structural Equation Modelling was carried out. While this is due to the key purpose of this study being to create a tool to augment TRA back-end rubrics, for future academic enquiry such advanced statistical analysis would be desirable. Thus, the demographic data collected could be used to determine if such characteristics moderate in some way the relationships between e-service assessment constructs and Perception of ESQ.

In this vein, the factors of Reliability – which was found to have no significant impact – and Usability – which did not load well (only two items were compatible) and was to an extent confused with usefulness – may also benefit from critical review. It needs

to be emphasised that this TRA documentation is designed for back-end developers to enhance services and to make them more uniform across all government departments (this indeed is a UAE e-government Key Performance Indicator). Thus, the very much end-user focused ‘perceived usefulness’ construct is of less relevance. ‘Usability’ as framed by the TRA documentation can be equated to the concept of ‘ease of use’ that is dominant in the associated literature. Another limitation of this study could be that we analysed “pull” factors related to service delivery and content. It is possible to get different results when “push” factors are involved.

Also, for the purposes of this study, we treated ESQ perception as a multidimensional construct consisting of reuse and satisfaction. This could have contributed to measurement error. In addition, since all the data was collected from respondents of the online survey, it is possible that the results may have been affected by common method variance or common method bias. However, we checked for it using Harman’s single factor score test which indicated that none of the items had variance greater than 50%. However, CFA could be a more robust test, which was not used for the study thereby making it a limitation of this study. Lastly, as was mentioned earlier, this study was limited to assessing only one e-service due to the objectives of the study.

7.3 Areas for Further Research

7.3.1 Demographic Data

One area of further research might be to reanalyse this study’s dataset using the demographic delineators as moderator variables. The differences observed (be it age, nationality or educational attainment levels merit further investigation). It is clear that a considerable number of works use as moderators (or ‘control variables’) demographic

variables. A prime example is the recent work of Ahmad and Khalid (2017; p. 371) (see Figure 9) for that study's model). In some instances, gender was found to moderate the relationship between factors affecting the adoption of e-services, but this is by no means consistent within the Middle East (see, e.g., Abu-Shanab, 2017; Ahmad & Khalid, 2017). While some studies support the moderating role of gender in technology acceptance behaviour, there is still inconsistency in the findings, and remain unclear. The presence of age as a moderator would increase the explanatory power of a TAM (Chung et al., 2010). Investigation of consumer's age is particularly useful for explaining variation in m-government adoption behaviour.

Venkatesh et al. (2012) established a relationship between perceived usefulness and behaviour intention was stronger for younger individuals. The moderating effect of age on the impact of perceived ease of use of behavioural intention was not found within the context of online community engagement (Chung et al., 2010). Age was also found to moderate the relationship between social influence and behavioural intention, and the effect was stronger for older people who used m-learning technology. Nevertheless, recent studies found age does not moderate the relationship between social influence and the adoption of m-government or the relationship between trust and the adoption of m-government (Chopra & Rajan, 2016). Therefore, while some studies support the moderating role of age in technology acceptance behaviour, there remains to be established a consistent finding. It is worth noting that more research can be done in this regard with this study's existing dataset, as illustrated in Figure 6 below.

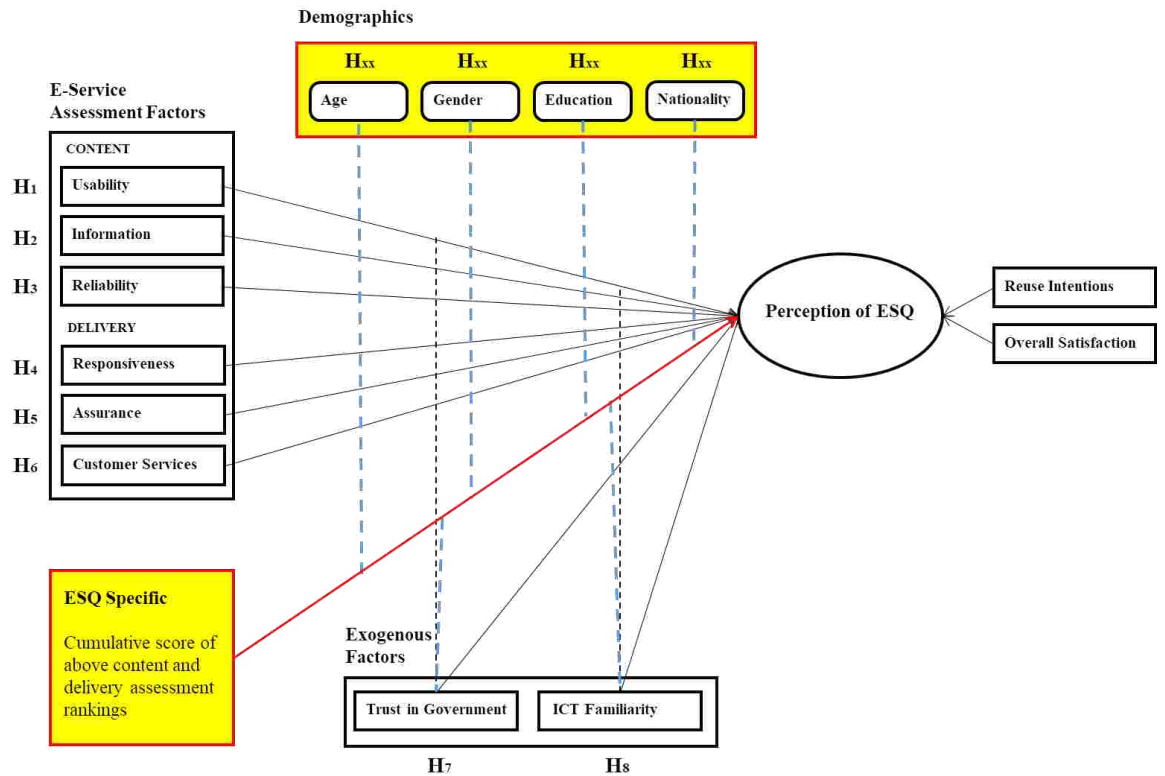


Figure 6: Further Analysis of this Study's Data

7.3.2 Longitudinal Studies

Regarding longitudinal research, one recent study that sought to employ a longitudinal research technique—a survey at the beginning and end of four-month Higher Education course on e-governance—was that by Abu-Shanab (2017; p. 110). Some years before that, Venkatesh, Chan, et al. (2012) also conducted an instance of longitudinal research ($n = 2,465$; interval four months) where they observed usability, computer resource requirement, technical support provision and security provision were of most import at both points in time. This study's survey scale could, for instance, be conducted before and after an ICT-related work readiness program (commonplace in the Arabian Gulf) to see how increased IT-knowhow and exposure to online transactional services may impact on perceptions of ESQ. However, such

research would ideally be based on a different e-service than was this study's focal service as it will only ever be used on an ad hoc sporadic basis

7.3.3 Generalisability Testing

For this study to have extended applied utility the survey would need to be conducted in relation to other public sector transactional services. As mentioned above, work would first need to be done in relation to the survey instrument's demographic data. In short, is what was collected of merit, does it aid/inform end-user perception of ESQ? In addition to this as was covered in the limitations section, a critical analysis will first need to be done on the merits of each construct. It would be of benefit to decide if Reliability might be statistically significant if it comprised of different items and, for example, could Usability be captured by a different combination of variables (i.e., seeking to make all constructs four items each). Once such deliberations are concluded a similar version of this study's survey could be deployed to gauge perceptions and sentiment on different MOI e-services, different IAE government departments and ideally trialled in different countries. Only by so doing can it be more comprehensively concluded that "responsiveness is key for transactional services."

7.4 Summary of Dissertation

This study represents a clear, unique and valuable contribution to the relevant literature by moving to a post-adoption context where enhancing user experience takes precedence over seeking to entice them in the first instance. It advances knowledge by presenting a well-grounded but novel model, instrument and analytical framework for seeking to gauge end-user perceptions of ESQ. It seeks a way in which to understand how content and delivery constructs impact on end-user perceptions of e-service

quality. This study is distinct from those where the focus is an end-user's adoption intentions (which I suggest is the primary objective of TAM/UTAUT based studies, i.e., those of and, Rodrigues et al. (2016). Ahmad and Khalid (2017)). It is holistic in the sense that it incorporates ICT-mediated service content functions, ICT-mediated service delivery dimensions plus the exogenous constructs of ICT Familiarity and, Trust in Government (the latter two to check if such non-ESQ-specific factors have any level of significant distortive impact).

As stated at the outset of this work, government bodies the world over are facilitating a growing number of over the Internet transactional services for their business communities and citizens alike. As has been articulated the UAE is by no means an exception to this trend and is in fact at the helm within the MENA region; while the TRA has ESQ assessment rubrics in place, these are designed only for back-end developers, not for gauging end-user perceptions of quality. In response to that and in response to the need for the MOI to be better able to gauge end-user sentiments on the quality of the e-services it provides, this study developed a conceptual framework capable of measuring of such sentiments holistically.

This study then, sought to (1) provide a way of measuring end-user perception of UAE government transactional services (2), devise a model (scale and survey instrument) that has the potential to be used in sync (or in tandem) with the TRA's backend benchmark rubrics and (3), develop an instrument that 'could be' generalisable to all public-sector provided 'over the Internet' services in the UAE/MENA. Therefore, "Perception of ESQ" is a construct that was deemed best to determine by proxy. The intention here was to have a strong a possible response. Thus, as opposed to simply asking the sample, "How do you perceive this e-service's quality" on, for example, a

scale of one to ten, it was considered more robust to compute this perception by asking a series of questions that logically contribute to one's perception of a given service. Therefore, at the pilot stage, some items suited to this were included (reuse, satisfaction, recommend) of these, some were refined, and others were dropped. The items that constituted Reuse Intentions and Overall Satisfaction loaded as one. This means that the difference between the means was so small, statistically speaking they measured the same thing.

To underscore the intention, reuse implies usefulness, because if an individual did not intend to reuse the e-service (reverting to bricks and mortar transactions), they necessarily would not perceive it as useful. However, reuse alone cannot adequately capture ESQ perceptions. Satisfaction is not the same as Reuse. An individual may decide to reuse a service as it is marginally better than to bricks and mortar (or telephone) alternatives but still not be happy with the given e-service's overall quality. This is why, to answer this dissertation's research problem, extant models could not be used.

This would not only help further refine the model, but also enable quantitative comparisons to be made between different UAE public sector agencies. As reported, it was the service delivery dimension that is of more import than the service content dimension. All delivery sub-dimensions (Responsiveness, Assurance and Customer Services) positively enhanced ESQ perceptions to a statistically significant degree. While, of the content sub-dimensions only two, "Usability" and "Information" positively enhanced ESQ perceptions. "Responsiveness" was by far the most influential ($\beta = .482, p = .001; \alpha = .922$). "Customer Services" ($\beta = .139, p = .001; \alpha = .913$) and "Usability" ($\beta = .175, p = .001; \alpha = .886$) were similar as were the impacts

of “Assurance” ($\beta = .071, p = .001; \alpha = .917$) and “Information” ($\beta = .080, p = .001; \alpha = .922$). With respect to the exogenous factors—Trust in Government and ICT Familiarity—only “Trust in Government” had a small but positive influence on perception of ESQ ($\beta = .050, p = .001; \alpha = .820$). “ICT Familiarity”, had no (statistically significant) impact on Perception of ESQ ($\beta = .023, p = .104; \alpha = .837$).

The finding that Trust in Government, a variable that ‘is not linked to the design/delivery of the e-service per se, acts to enhance perceptions of ESQ positively is not unsurprising. However, it will probably to inflate reported sentiments on e-service quality which is something back-end ICT developers need to account for. Nonetheless, the model presented in this research study was found to be capable of identifying some statistically significant relationships between user experience and perceptions of ESQ. Therefore it would ideally be administered by other UAE government agencies, be they Federal, local or even a state-backed, but a commercially-run entity.

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Appendix A: Ministry of Interior E-services

Table 22: Ministry of Interior E-services

Category	Service Name	Description
Traffic & Licensing	Traffic Fines Payment	This service allows users to pay their traffic fines online.
	Retrieval of mistakenly paid fines	This service allows users to retrieval of mistakenly paid fines.
	Issue a new heavy driving license	This service allows the issuance of a new heavy driving license after the customer passes the driving test.
	cancellation of a heavy vehicle driving license	Through this service, individuals can request the cancellation of a heavy vehicle driving license
	change massive vehicle driving license data	This service allows the change of a heavy vehicle driving license data
Policing General Head Quarter	To whom it may concern certificate loss and damage of passport, Emirates ID Card , military card and labour card	An e-service for people to apply for lost &found certificates
	Issue Police Clearance Certificate	An e-service for those whom seeking a certificate that declares no criminal records available.
Citizenship, Residence & Port Affairs - Visa and Residence	Residency applications - new - servants sponsored by UAE nationals	This service is to issue a visa for servants (For UAE citizen)
	residence - new - servants for resident sponsor	This service is to issue a new visa (Servants) under residence's sponsor
	Issue new passport	One of the services of the Passport Branch provided by the General Directorate of NPR, whereby passports are renewed for citizens
	Issuance of a new family book	This service is one of the Personal Status services provided by the General Directorate of Residency and Foreign Affairs under which new family books are issued in cases of marriage, divorce, separation and transfer.

Table 22: Ministry of Interior E-services (Continued)

Category	Service Name	Description
Crime Security	Licensing explosives companies (new)	A Service rendered by A&E Dept. whereby licenses are issued to commercial explosives companies (manufacture export).
	Licensing explosive consumer companies (new)	A Service rendered by A&E Department whereby licenses are issued to commercial explosives companies.
	Licensing a vehicle transporting explosives	A Service rendered by A&E Department whereby a license is issued to an explosive-carrying vehicle
	Licensing a driver of a vehicle transporting explosives	A Service rendered by A&E Department whereby a license is issued to the driver of explosives carrying vehicle
	Licensing for “Manufacture” Chemical materials (new).	A Service rendered by A&E Department to companies and establishments whereby licenses are issued to “manufacture” explosives

(Source: MOI, 2014)

Appendix B: Informative E-Service Assessment Models

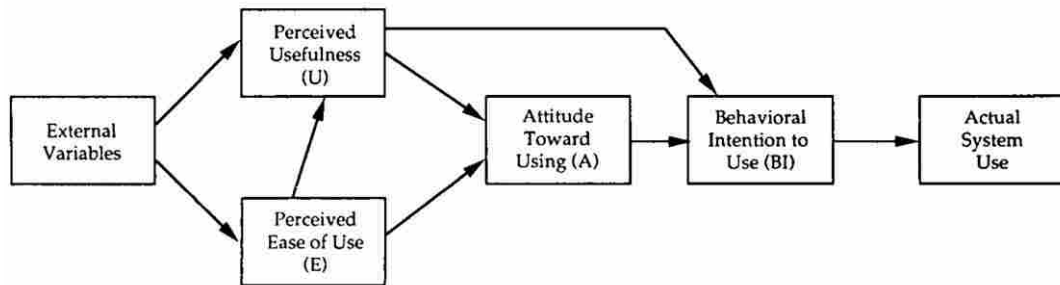


Figure 7: E-Service Assessment Model (1)

(Source Davis et al. (1989, p. 985)

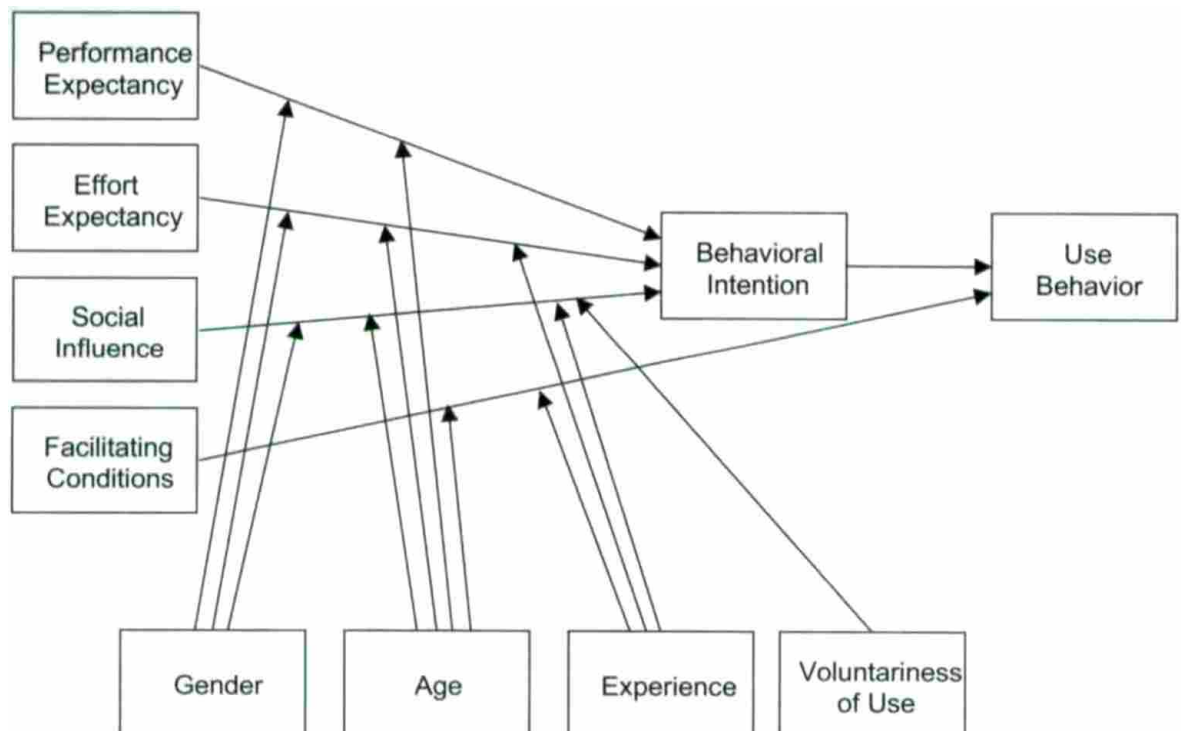


Figure 8: E-Service Assessment Model (2)

(Source Venkatesh et al. (2003, p. 447)

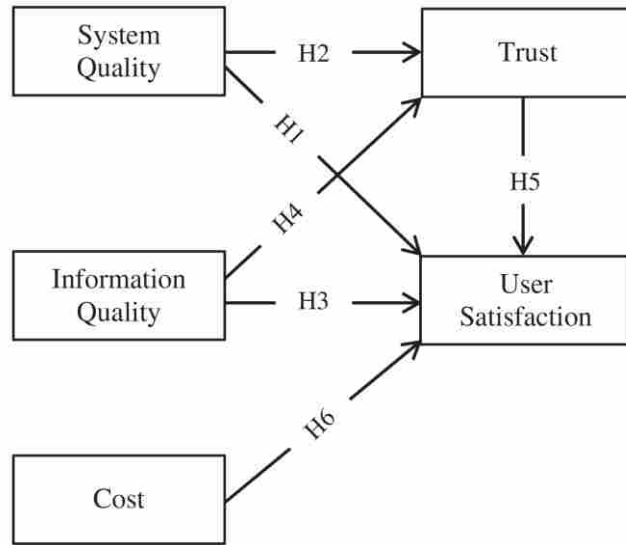


Figure 9: E-Service Assessment Model (3)
 (Source: DeLone and McLean (1992, 2003))

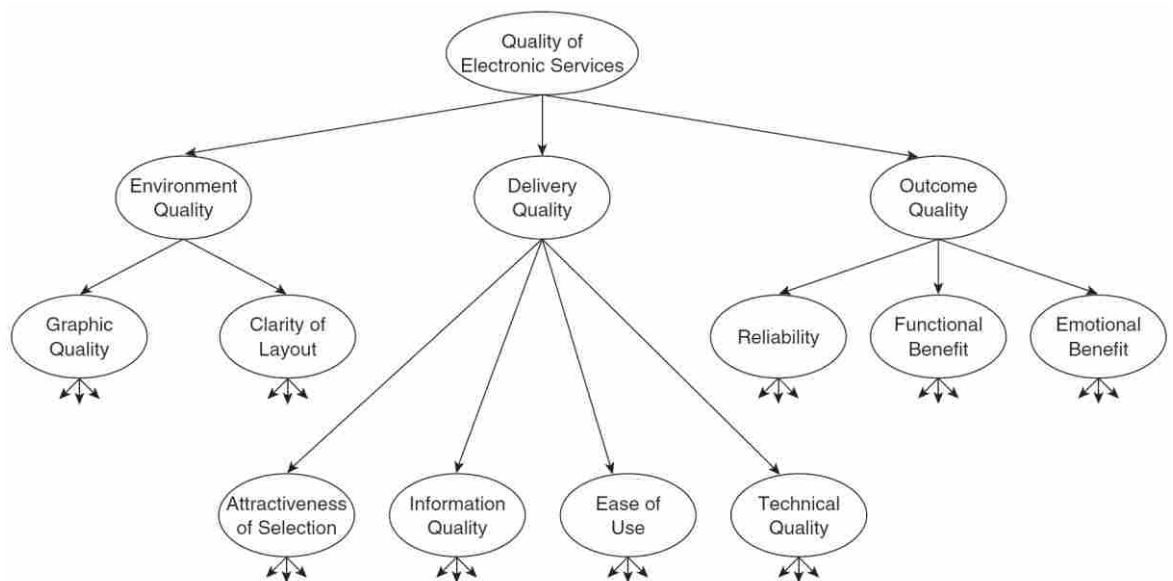


Figure 10: E-Service Assessment Model (4)
 (Source: Fassnacht and Koese (2006, p. 27))

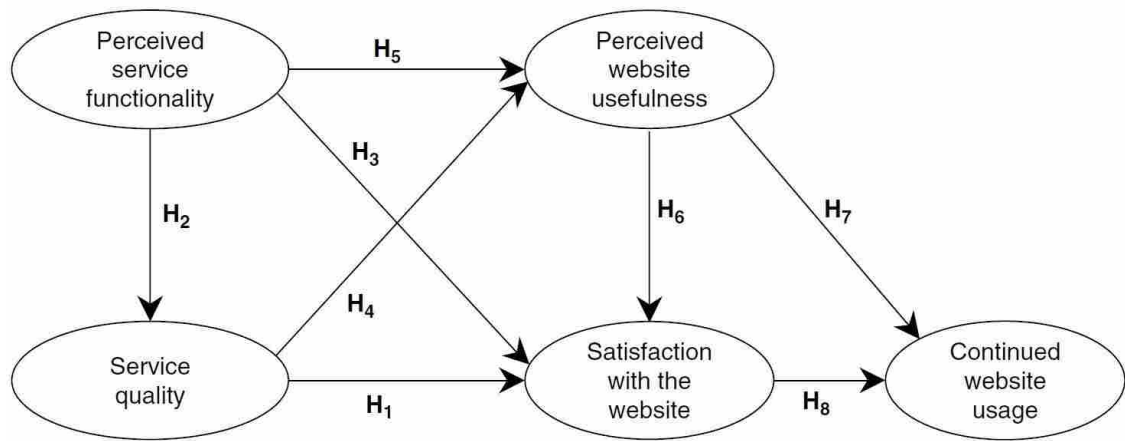


Figure 11: E-Service Assessment Model (5)

(Source: Cenfetelli et al. (2008, p. 162)

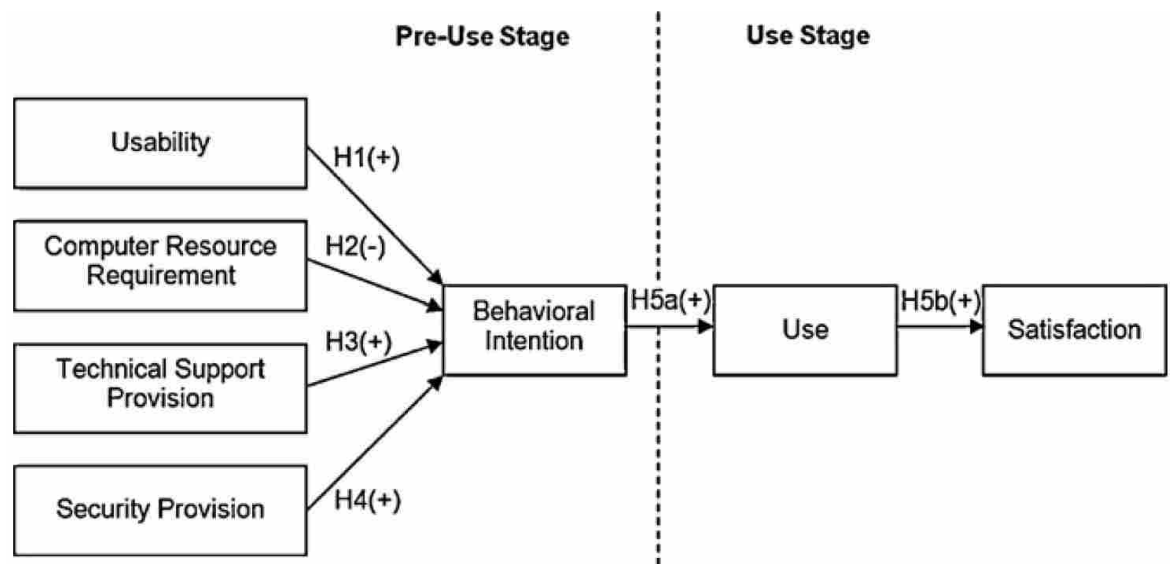


Figure 12: E-Service Assessment Model (6)

(Source: Venkatesh, Chan, et al. (2012, p. 119)

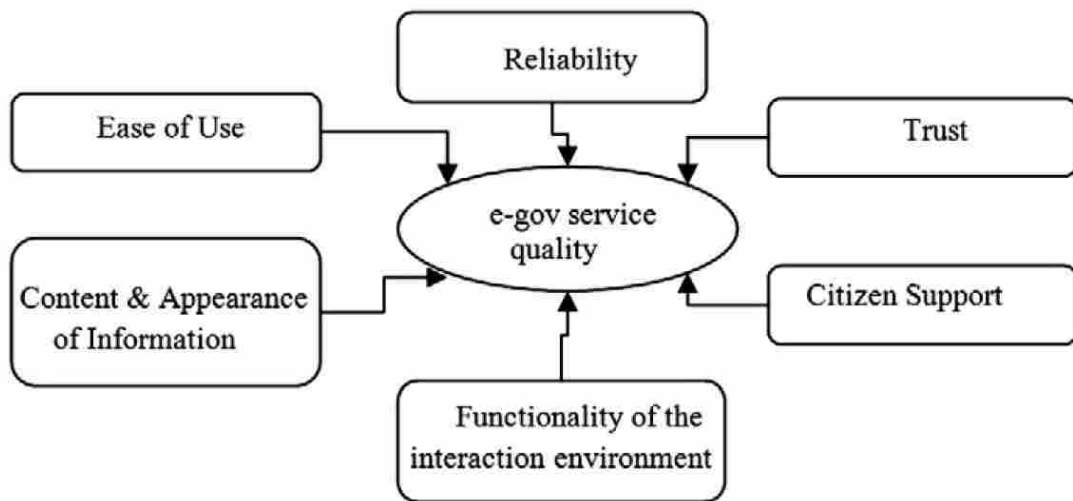


Figure 13: E-Service Assessment Model (7)
 (Source: Papadomichelaki and Mentzas (2012, p. 102))

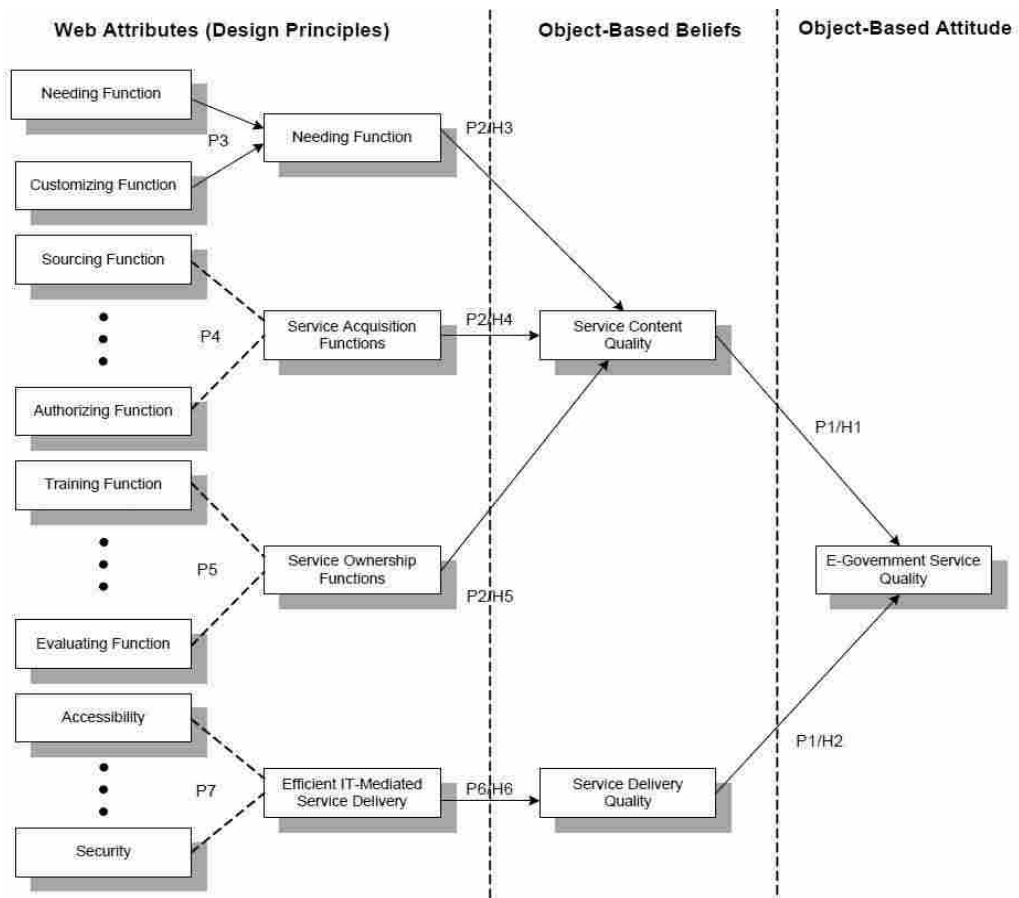


Figure 14: E-Service Assessment Model (8)
 (Source: Tan et al. (2013, p. 80))

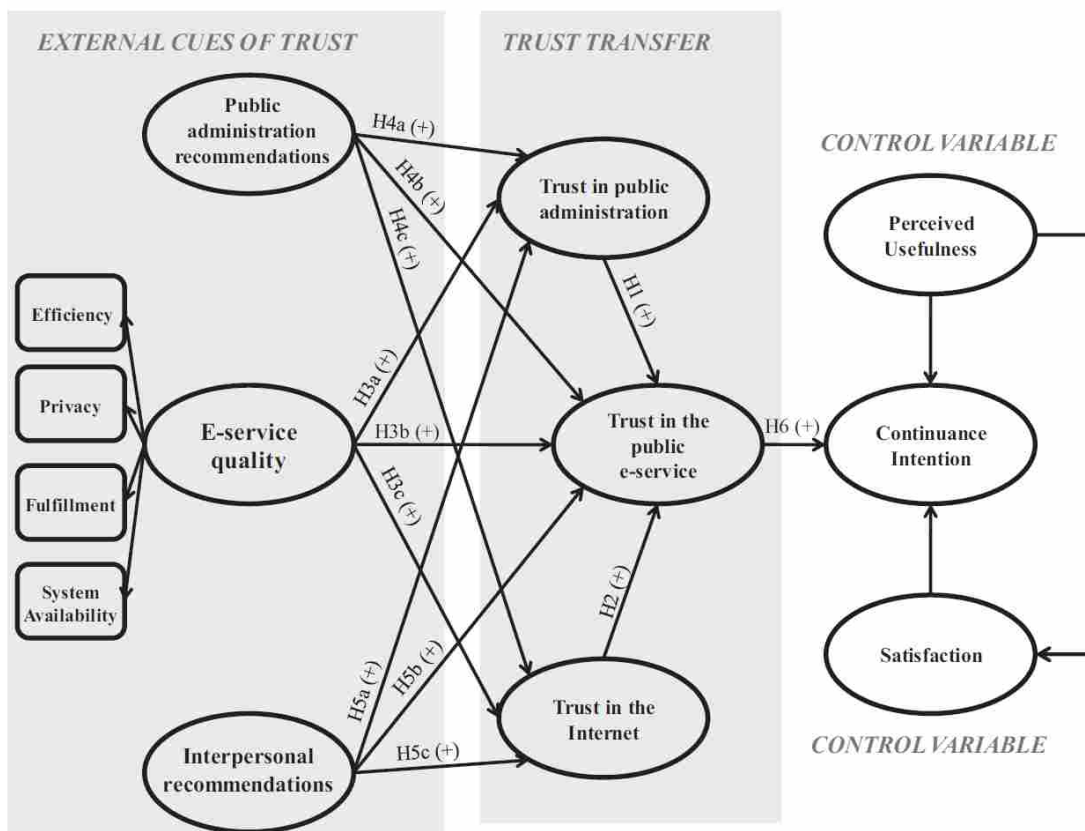


Figure 15: E-Service Assessment Model (9)

(Source: Belanche et al. (2014, p. 632))

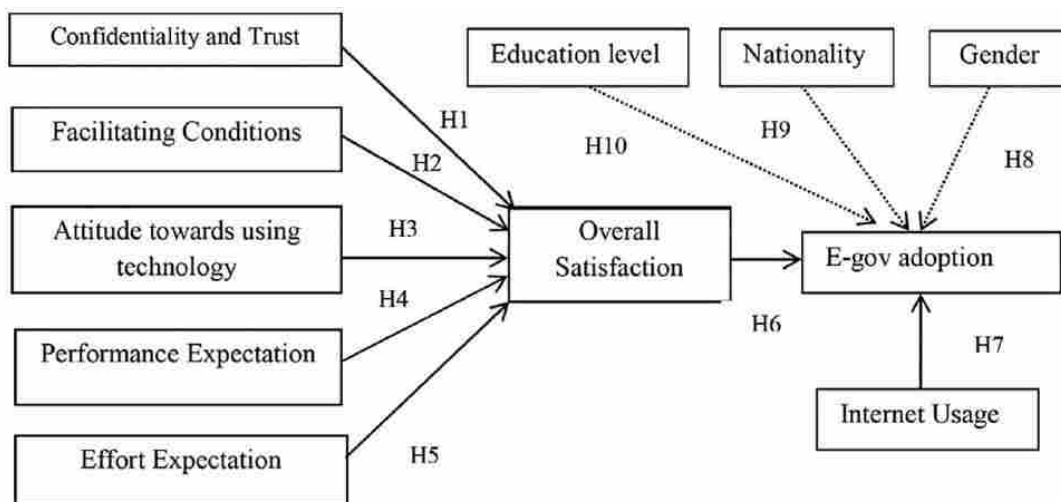


Figure 16: E-Service Assessment Model (10)

(Source: Rodrigues et al. (2016, p. 25))

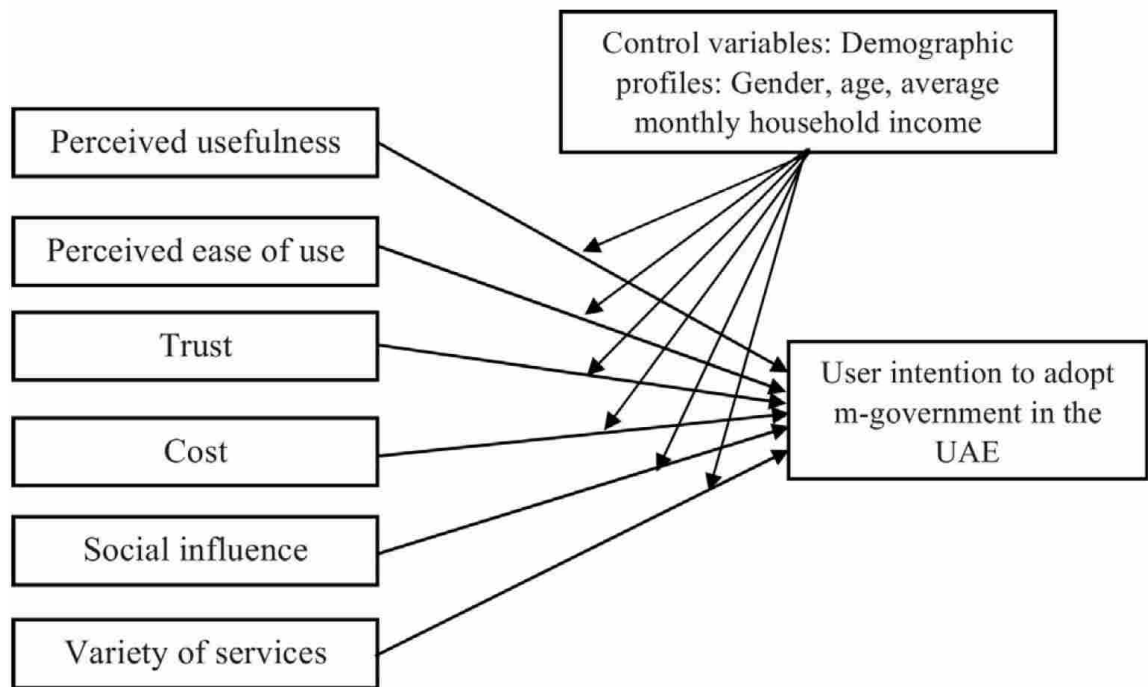


Figure 17: E-Service Assessment Model (11)

(Source: Ahmad and Khalid (2017, p. 371))

Appendix C: Survey Information and Consent Form

Page 1 of 2

Page 1 of 2

Social Sciences Research Ethics Committee - Consent to Participate in a Research Study -

Please read carefully before signing the Consent Form!

***Identifying the Determinants of government E-Service Quality:
A Case Study of the UAE's Ministry of Interior***

You will be asked to provide or deny consent after reading this form.

Topic of the research, the researcher(s) and the location

You have been invited to take part in a study to Identifying the Determinants of government E-Service Quality.

This study will be conducted by Dr Ananth Chiravuri and Mr Mohamed Abdul Rahman Al Ahmed, a DBA student based in the College of Business and Economics, UAE University, Al Ain.

Participation in this study will around 15 minutes for answering the questionnaire.

Benefits of the research

Although there are no direct benefits from this study to the participants, this research may/will help us better understand the variables that influence e-service quality for governmental web sites in UAE, and maybe for other websites in general. Findings from the study will help the e-governmental agencies to identify the important variables for e-service quality and deliver citizen services in a better way.

Procedure/setting

You will answer a questionnaire/survey either online or offline using pen and paper in your office .

Safety Information

Please be aware that this survey has no known potential risk as it is non stressful and non-inducive.

Confidentiality and Privacy Information

Data will be kept confidential and the offline surveys will be securely locked in a cabinet by the researchers. Data from the online surveys will be saved on a secure laptop and deleted from the online server every few days. The laptop with the data will be protected by a password and a backup will be saved on a secure machine to be retrieved in case of an emergency. When published, the data will be analyzed at an aggregate level and will not be individually identified. Finally, the surveys will be shredded once the study is complete.

If needed, a copy of the findings of the study will be made available at a later stage. If interested, please provide us with your email address at the bottom of the survey.

Right to Withdraw

Your participation is voluntary and you may withdraw from the study at any point in time if needed. If you have any questions or would like to withdraw from the study, you may contact the research team at 200250509@uaeu.ac.ae.

Informed Consent

1. I confirm that I have read and understood the above information sheet and have had the opportunity to ask questions.
2. I understand that my participation is voluntary and that I am free to withdraw.
3. I understand that my data will be kept confidential and if published, the data will not be identifiable as mine.

I agree to take part in this study, and demonstrate this by completing the online questionnaire

Appendix D: Survey, Pilot, and Full-scale Instruments

Table 23: Items of the Pilot Survey

Demographic data		
Q1	Gender:	Male Female
Q2	Age:	20 or below 21–30 31–40 41–50 50 or over
Q3	Nationality:	UAE national GCC Citizen Other Arab Western Asian Other
Q4	Education:	Secondary school College/University level Post-graduate
Q5	The frequency of usage:	First usage Less than five uses More than five uses
Q6	Capacity:	Individual on behalf of business
E-Service Assessment		
01	Q07	The process of completing the transaction was simple and straightforward.
02	Q08	The instructions and procedures for this e-service were confusing and unclear.
03	Q09	Carrying out this e-service transaction was quick and easy.
04	Q10	The navigation throughout the service delivery process is easy.
05	Q11	I did not need to download/install any new software to carry out this transaction.
06	Q12	The service looked as though it were designed for my browser.
07	Q13	It was not easy to access this e-service from the MOI's main website.
08	Q14	The appearance of this e-service is consistent with the MOI's main website.
09	Q15	It was clear to see this service was being provided directly by the MOI.
10	Q16	Information and instructions relating to this transactional service are clear to follow.
11	Q17	The information provided on this e-service site is well organised.
12	Q18	The appearance of the e-service is not visually appealing.
13	Q19	The information relating to completing the steps and stages of the transaction is set out and described.
14	Q20	The steps/stages of the procedure are outlined.
15	Q21	Using the site lets me quickly understand the procedure for performing this e-government transaction.
16	Q22	I could access and complete this transaction with my existing MOI user account details.
17	Q23	The MOI website has comprehensive FAQs regarding the e-services it provides.
18	Q24	The information regarding the payment process was clear and straightforward to follow.
19	Q25	I was not happy with the range of payment options made available to me.
20	Q26	This e-service provided an adequate range of payment options.
21	Q27	By using this service, no intermediate physical visit to a government office was required.
22	Q28	The page/s of the e-service loaded quickly.
23	Q29	At no point during the transaction did I feel the service was slow.
24	Q30	This e-service is available 24/7.

Table 23: Items of the Pilot Survey (Continued)

25	Q31	I do not have any technical issues relating to this e-service.
26	Q32	This e-service lets me review a history of my previously completed transactions.
27	Q33	I could easily obtain a receipt (acknowledgement of payment).
28	Q34	This e-service informs me about the status of my outstanding payments.
29	Q35	I believe this e-service was responsive to my needs.
30	Q36	Using this e-service allowed me effectively to perform this transaction online.
31	Q37	I believe this e-service quickly delivers the service I expect it to.
32	Q38	The page/s of the e-service take a long time to load.
33	Q39	I believe the functionalities of this eService site are delivered professionally.
34	Q40	I am confident that my MOI user account and payment details are stored securely.
35	Q41	I am confident that the MOI uses the latest anti-hacking technologies.
36	Q42	I felt confident about paying for this service online.
37	Q43	I am confident that this e-service provides the necessary mechanisms to protect my disclosed personal information from being stolen.
38	Q44	I believe this e-service is backed up with good customer support should I need it.
39	Q45	The e-service states customer support is provided if required.
40	Q46	If I were to encounter problems, MOI customer support would help resolve them.
41	Q47	Customer Service Standards regarding response time and problem resolution are outlined on the e-service website.
42	Q48	The e-service site had answers to all my questions regarding the transaction.
43	Q49	Overall, I consider this e-service to be very useful.
44	Q50	I found this e-service challenging to use and do not intend to reuse it.
45	Q51	I would consider using the site for future transactions.
46	Q52	On the whole, the service content offered on the site is highly useful in supporting me to perform my transactions.
47	Q53	This e-service is fast, efficient and reliable.
48	Q54	This e-service will be my first choice for such transactions in the future.
49	Q55	Using the site enabled me to conduct my transaction more quickly.
50	Q56	I would recommend this e-service to anyone who asks me about it.
51	Q57	I would not encourage colleagues and friends to use this e-service.
Other considerations		
52	Q58	I trust the Government of the UAE regarding carrying out bureaucratic transactions.
53	Q59	The Ministry of Interior can be trusted when handling my personal information.
54	Q60	I consider public sector administrative processes in the UAE to be transparent and fair.
55	Q61	I feel confident and relaxed when interacting with staff at government agencies.
56	Q62	Using modern technology makes me more productive in my personal life.
57	Q63	Government e-services enable me to achieve a better work/life balance.
58	Q64	I am among the first in my circle of friends to adopt and use the latest technologies.
59	Q65	I prefer to use the latest technology (services and products) available.

Note: n = 51, items = 59, conducted in the summer of 2016.

Table 24: Items of the Full-scale Survey

Demographic data		
Q1	Gender:	Male Female
Q2	Age:	20 or under 21–30 31–40 41–50 50 or over
Q3	Nationality:	UAE national GCC Citizen Other Arab Western Asian Other
Q4	Education:	Secondary school College/University level Post-graduate
Q5	The frequency of usage:	First usage Less than five uses More than five uses
Q6	Capacity:	Individual on behalf of business
E-Service Assessment		
01	Q07	The process of completing the transaction was simple and straightforward.
02	Q08	Carrying out this e-service transaction was quick and easy.
03	Q09	The navigation throughout the e-service delivery process is easy.
04	Q10	I did not need to download/install any new software to carry out this transaction.
05	Q11	The information provided on this e-service site is well organised.
06	Q12	The information relating to completing the steps of the transaction is explicitly set out and described.
07	Q13	The steps/stages of the procedure are outlined.
08	Q14	Using the site lets me easily understand the procedure for performing this e-government transaction
09	Q15	The information regarding the payment process was clear and simple to follow.
10	Q16	By using this service, no intermediate physical visit to a government office was required
11	Q17	The page/s of the e-service loaded quickly.
12	Q18	I do not have any technical issues relating to this e-service.
13	Q19	I believe this e-service was responsive to my needs.
14	Q20	Using this e-service allowed me effectively to perform this transaction online.
15	Q21	I believe this e-service quickly delivers the service I expect it to.
16	Q22	I believe the functionalities of this eService site are delivered professionally.
17	Q23	I am confident that my MOI user account and payment details are stored securely.
18	Q24	I am confident that the MOI uses the latest anti-hacking technologies.
19	Q25	I felt confident about paying for this service online.
20	Q26	I am confident that this e-service provides the necessary mechanisms to protect my disclosed personal information from being stolen.
21	Q27	I believe this e-service is backed up with good customer support should I need it.
22	Q28	The e-service states customer support is provided if required.
23	Q29	If I were to encounter problems, MOI customer support would help resolve them.
24	Q30	Customer service standards regarding response time and problem resolution are outlined on the e-service website.
25	Q31	The e-service site had answers to all my questions regarding the transaction.

Table 24: Items of the Full-scale Survey (Continued)

26	Q32	I am satisfied with the usefulness of the e-service.
27	Q33	Overall, I am satisfied with the e-services provided by the MOI.
28	Q34	I intend to reuse this e-service as I perceive it is fast, efficient and reliable.
29	Q35	I intend to reuse this e-service/site as it enabled me to conduct my transaction more quickly.
30	Q36	I intend to reuse Ministry of Interior e-services all the time.
31	Q37	Using the e-service gives me greater control in carrying out my tasks.
32	Q38	Using this e-service enabled me to conduct my transaction more quickly, saving time and effort.
33	Q39	Overall, I find the e-service very useful.
Other considerations		
34	Q40	I trust the Government of the UAE regarding carrying out bureaucratic transactions.
35	Q41	I consider public sector administrative processes in the UAE to be transparent and fair.
36	Q42	I feel confident and relaxed when interacting with staff at government agencies.
37	Q43	Using modern technology makes me more productive in my personal life.
38	Q44	Government e-services enable me to achieve a better work/life balance.
39	Q45	I am among the first in my circle of friends to adopt and use the latest technologies.
40	Q46	I prefer to use the latest technology (services and products) available.

Note: n = 2,197 (usable records), items, 40, conducted in 2017.

Appendix E: Full-scale Survey, Demographic Data

Table 25: Survey Constructs and Age (Mann-Whitney U test)

Under 31 compared to 41–50						
	Age Bracket ^a		Mean of Rank	Sum of Rank		
Usability	Under 31		449.07	173789.5		
	41–50		448.07	228066.5		
Information	Under 31		460.96	178392.5		
	41–50		439.02	223463.5		
Reliability	Under 31		440.48	170464.0		
	41–50		454.60	231392.0		
Responsiveness	Under 31		463.12	179227.5		
	41–50		437.38	222628.5		
Assurance	Under 31		464.51	179764.0		
	41–50		436.33	222092.0		
Customer Service	Under 31		476.52	184412.5		
	41–50		427.20	217443.5		
	Usability	Information	Reliability	Response	Assurance	Customer Service
Mann-Whitney U	98271.5	93668.5	95386.0	92833.5	92297.0	87648.5
Wilcoxon W	228066.5	223463.5	170464.0	222628.5	222092.0	217443.5
Z	-.058	-1.283	-.815	-1.501	-1.687	-2.847
Sig. (2-tailed)	.954	.199	.415	.133	.092	.004**
Under 31 compared to 60 or more						
	Age Bracket ^b		Mean of Rank	Sum of Rank		
Usability	Under 31		312.15	120802.5		
	50 and more		340.46	88178.5		
Information	Under 31		314.05	121537.5		
	50 and more		337.62	87443.5		
Reliability	Under 31		306.90	118771.5		
	50 and more		348.30	90209.5		
Response	Under 31		314.94	121880.5		
	50 and more		336.30	87100.5		
Assurance	Under 31		315.60	122138.5		
	50 and more		335.30	86842.5		
Customer Service	Under 31		320.28	12348.0		
	50 and more		328.31	85033.0		
	Usability	Information	Reliability	Response	Assurance	Customer Service
Mann-Whitney U	45724.5	46459.5	43693.5	46802.5	47060.5	48870.0
Wilcoxon W	120802.5	121537.5	118771.5	121880.5	122138.5	123948.0
Z	-1.911	-1.606	-2.782	-1.453	-1.385	-.540
Sig. (2-tailed)	.056	.108	.005**	.146	.166	.589

Table 25: Survey Constructs and Age (Mann-Whitney U test) (Continued)

Age, 31–40 compared to 41–50						
	Age Bracket ^c		Mean of Rank	Sum of Rank		
Usability	31–40		775.69	808267.0		
	41–50		776.64	395309.0		
Information	31–40		784.15	817088.0		
	41–50		759.31	386488.0		
Reliability	31–40		772.85	805306.0		
	41–50		782.46	398270.0		
Responsiveness	31–40		782.75	815630.5		
	41–50		762.17	387945.5		
Assurance	31–40		800.58	834202.5		
	41–50		725.68	369373.5		
Customer Service	31–40		798.78	832326.0		
	41–50		729.37	371250.0		
	Usability	Information	Reliability	Response	Assurance	Customer Service
Mann-Whitney U	264864.0	256693.0	261903.0	258150.5	239578.5	241455.0
Wilcoxon W	808267.0	386488.0	805306.0	387945.5	369373.5	371250.0
Z	-.040	-1.049	-.400	-.868	--3.277	-2.887
Sig. (2-tailed)	.968	.294	.690	.386	.001**	.004**
Age, 41–50 compared to 50 or more						
	Age Bracket ^d		Mean of Rank	Sum of Rank		
Usability	41–50		372.48	189592.5		
	50 and more		408.12	105703.5		
Information	41–50		367.41	187011.5		
	50 and more		418.09	108284.5		
Reliability	41–50		371.68	189185.0		
	50 and more		409.69	106111.0		
Responsiveness	41–50		367.71	187165.5		
	50 and more		417.49	108130.5		
Assurance	41–50		369.44	188046.0		
	50 and more		414.09	107250.0		
Customer Service	41–50		365.98	186281.5		
	50 and more		420.91	109014.5		
	Usability	Information	Reliability	Response	Assurance	Customer Service
Mann-Whitney U	59797.5	57216.5	59390.0	57370.5	58251.0	56486.5
Wilcoxon W	189592.5	187011.5	189185.0	187165.5	188046.0	186281.5
Z	-2.132	-3.060	-2.263	-2.999	-2.781	-3.270
Sig. (2-tailed)	.033*	.002**	.024*	.003**	.005**	.001**

^a Grouping Variable: Age, Under 31, n = 387; 41–50, n = 509. ** p = < 0.01. * p = < 0.05. ^b Grouping Variable: Age, Under 31, n = 387; 41–50, n = 509. ** p = < 0.01. * p = < 0.05. ^c Grouping Variable: Age, 31–40, n = 1,042; 41–50, n = 509. ** p = < 0.01. * p = < 0.05. ^d Grouping Variable: Age, 41–50, n = 509; 50 or more, n = 259. ** p = < 0.01. * p = < 0.05.

Table 26: Survey Constructs and Nationality (Mann-Whitney U test)

Emirati compared to Asian						
	Nationality ^a		Mean of Rank	Sum of Rank		
Usability	Emirati		660.58	649347.5		
	Asian		666.11	226478.5		
Information	Emirati		679.34	667790.5		
	Asian		611.87	208035.5		
Reliability	Emirati		662.12	650863.5		
	Asian		661.65	224962.5		
Responsiveness	Emirati		669.54	658154.5		
	Asian		640.21	217671.5		
Assurance	Emirati		707.48	695457.5		
	Asian		530.5	180368.5		
Customer Service	Emirati		676.14	664644.5		
	Asian		621.12	211181.5		
	Usability	Information	Reliability	Response	Assurance	Customer Service
Mann-Whitney U	165711.5	150065.5	166992.5	159701.5	122398.5	153211.5
Wilcoxon W	649347.5	208035.5	224962.5	217671.5	180368.5	211181.5
Z	-.233	-2.866	-.019	-1.242	-7.669	-2.306
Sig. (2-tailed)	.816	.004**	.984	.214	.000**	.021*
Emirati compared to Western						
	Nationality ^b		Mean of Rank	Sum of Rank		
Usability	Emirati		552.69	543294.0		
	Western		501.54	55671.0		
Information	Emirati		559.79	535858.0		
	Western		438.68	48694.0		
Reliability	Emirati		545.13	535858.5		
	Western		568.53	63106.5		
Responsiveness	Emirati		549.66	540315.5		
	Western		528.37	58649.5		
Assurance	Emirati		567.08	557444.0		
	Western		374.06	41521.0		
Customer Service	Emirati		563.56	553980.5		
	Western		405.27	44984.5		
	Usability	Information	Reliability	Response	Assurance	Customer Service
Mann-Whitney U	49455.0	42478.0	52222.5	52433.5	35305.0	38768.5
Wilcoxon W	55671.0	48694.0	535858.5	58649.5	41521.0	44984.5
Z	-1.634	-3.911	-7.44	-.685	-6.404	-5.038
Sig. (2-tailed)	.102	.000**	.457	.493	.000**	.000**

Table 26: Survey Constructs and Nationality (Mann-Whitney U test) (Continued)

Arab compared to Asian						
	Nationality ^c		Mean of Rank	Sum of Rank		
Usability	Other Arab		580.19	442687.5		
	Asian		488.73	166168.5		
Information	Other Arab		590.63	450649.0		
	Asian		465.31	158207.0		
Reliability	Other Arab		581.31	443539.0		
	Asian		486.23	165317.0		
Responsiveness	Other Arab		587.90	448569.5		
	Asian		471.43	160286.5		
Assurance	Other Arab		618.30	471761.5		
	Asian		403.22	137094.5		
Customer Service	Other Arab		591.13	451028.5		
	Asian		464.20	157827.5		
	Usability	Information	Reliability	Response	Assurance	Customer Service
Mann-Whitney U	108198.5	100237.0	107347.0	102316.5	79124.5	99857.5
Wilcoxon W	166168.5	158207.0	165317.0	160286.5	137094.5	157827.5
Z	-4.461	-6.169	-4.614	-5.736	-11.047	-6.159
Sig. (2-tailed)	.000**	.000**	.000**	.000**	.000**	.000**
Asian compared to Western						
	Nationality ^d		Mean of Rank	Sum of Rank		
Usability	Asian		231.75	78794.0		
	Western		208.4	23132.0		
Information	Asian		233.79	79487.5		
	Western		202.15	22438.5		
Reliability	Asian		223.01	75823.0		
	Western		235.16	26103.0		
Responsiveness	Asian		226.05	76858.5		
	Western		225.83	25067.5		
Assurance	Asian		233.56	79412.0		
	Western		202.83	22514.0		
Customer Service	Asian		238.85	81209.5		
	Western		186.64	20716.5		
	Usability	Information	Reliability	Response	Assurance	Customer Service
Mann-Whitney U	16916.0	16222.5	17853.0	18851.5	16298.0	14500.5
Wilcoxon W	23132.0	22438.5	75823.0	25067.5	22514.0	20716.5
Z	-1.661	-2.260	-.860	-.016	-2.202	-3.700
Sig. (2-tailed)	.097	.024*	.390	.987	.028*	.000**

^a Grouping Variable: Nationality, Emirati n = 983; Asian, n = 340. ** p = < 0.01. * p = < 0.05.

^b Grouping Variable: Nationality, Emirati n = 983; Western, n = 111. ** p = < 0.01. * p = < 0.05. ^c Grouping Variable: Nationality, Arab (excluding Emirati) n = 763; Asian, n = 340. ** p = < 0.01. * p = < 0.05. Grouping Variable: Nationality, Asian, n = 340; Western, n = 111. ** p = < 0.01. * p = < 0.05.

Table 27: Survey Constructs and Education (Mann-Whitney U test)

Secondary or Less and Uni./College						
	Educational Attainment ^a			Mean of Rank	Sum of Rank	
Usability	Secondary or Less			773.11	258992.0	
	University or College			825.84	1068643.0	
Information	Secondary or Less			841.50	281903.5	
	University or College			808.14	1045731.5	
Reliability	Secondary or Less			591.50	198151.0	
	University or College			872.86	1129484.0	
Responsiveness	Secondary or Less			819.85	274649.0	
	University or College			813.74	1052986.0	
Assurance	Secondary or Less			864.82	289713.5	
	University or College			802.10	1037921.5	
Customer Service	Secondary or Less			914.83	306468.5	
	University or College			789.15	1021166.5	
	Usability	Information	Reliability	Response	Assurance	e-Service
Mann-Whitney U	202712.0	207866.5	141871.0	21521.0	200056.5	183301.5
Wilcoxon W	258992.0	1045731.5	198151.0	1052986.0	1037921.5	1021166.5
Z	-1.850	-1.183	-9.822	-.216	-2.309	-4.394
Sig. (2-tailed)	.064	.237	.000**	.829	.021*	.000**
Secondary or Less and Postgrads						
	Educational Attainment ^b			Mean of Rank	Sum of Rank	
Usability	Secondary or Less			441.04	147748.0	
	Postgraduate level			458.46	260408.0	
Information	Secondary or Less			480.44	160946.0	
	Postgraduate level			435.23	247210.0	
Reliability	Secondary or Less			337.14	112941.0	
	Postgraduate level			519.74	295215.0	
Responsiveness	Secondary or Less			457.72	153336.5	
	Postgraduate level			448.63	254819.5	
Assurance	Secondary or Less			491.08	164510.5	
	Postgraduate level			428.95	243645.5	
Customer Service	Secondary or Less			512.22	171594.0	
	Postgraduate level			416.48	236562.0	

Table 27: Survey Constructs and Education (Mann-Whitney U test) (Continued)

University/College and Postgrads						
	Educational Attainment ^c		Mean of Rank	Sum of Rank		
Usability	University or College		938.24	1214084.0		
	Postgraduate level		916.14	520369.0		
Information	University or College		948.46	1227308.5		
	Postgraduate level		892.86	507144.5		
Reliability	University or College		913.56	1182153.0		
	Postgraduate level		972.36	552300.0		
Responsiveness	University or College		935.06	1209962.0		
	Postgraduate level		923.40	524491.0		
Assurance	University or College		949.30	1228391.0		
	Postgraduate level		890.95	506062.0		
Customer Service	University or College		949.93	1229214.0		
	Postgraduate level		889.51	505239.0		
	Usability	Information	Reliability	Response	Assurance	Customer Service
Mann-Whitney U	358773.0	345548.5	344288.0	362895.0	344466.0	343643.0
Wilcoxon W	520369.0	507144.5	1182153.0	524491.0	506062.0	505239.0
Z	-.826	-2.098	-2.190	-.439	-2.273	-2.248
Sig. (2-tailed)	.409	.036*	.029*	.660	.023*	.025*

Note: ^a Grouping Variable: Education, Secondary or Less, n = 335; Uni./College, n = 1,294. ** p < 0.01. * p < 0.05. ^b Grouping Variable: Education, Secondary or Less, n = 335; Post-Grad, n = 568. ** p < 0.01. * p < 0.05. ^c Grouping Variable: Education, Uni./College, n = 1,294; Post-Grad, n = 568. ** p < 0.01. * p < 0.05.

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