

Abstract:

The adoption and use of new technology have seen a rapid increase and evolution worldwide. This phenomenon is especially prevalent in developed countries. Therefore, this study examines the technology readiness in terms of e-Services adoption among Omanis towards the. Based on the Technology readiness (TR) Index 2.0, the people's propensity to embrace and use e-Services in Oman is explored. The TR involves understanding four-dimension optimism, innovativeness, discomfort, and insecurity, explaining the readiness and use of e-Services in this study. Adopting a quantitative stance, a total of 322 response is analysed using SPSS to provide basic descriptive analysis. Subsequently, further assessment is then conducted using the Partial Least Square (SmartPLS) software. Thus, the analysis of this study consists of two stages: the assessment of measurement and the assessment of the structural model. Findings suggest a strong relationship between optimism and innovativeness towards e-service adoption among Omanis, validating the proposed framework. Additionally, discomfort and insecurity are found to have no significant effect on the adoption of e-Services. These findings were then used as a basis to provide recommendations and facilitate government as well as other non-government agencies responsible for e-Services.

Keywords: Technology readiness, e-Services adoption, technology adoption, SPSS, SmartPLS.

An Investigation of E-Services Adoption: Analysis of Technology Readiness among Consumers (Omanis) in Oman

CHAPTER ONE

1.0 Introduction

While the constantly evolving technological landscape poses threats to established business models, it offers several opportunities for implementing new services (Lai, 2016). Individuals' adoption and use of new technology are influenced by many attributes, including technology availability, consumer need, convenience, security, and other benefits. Thus, with the increase in labour cost and technological innovation, the growth of internet-based services, e-Services, is reported to be significantly high. In a broad sense, e-Services can be defined as a concept that involves an online application utilising information and communication technology (ICT) in various areas. Kvasnicova, Kremenova and Fabus (2016) mention that for many, e-Service can be potentially explained as e-government, e-commerce, and e-learning. In government agencies, e-Services are an essential tool that facilitates the provision of high-quality services to clients where it helps save time, increases efficiency, reduces cost, improves transparency besides offering real-time and accessible services to both citizens and residents (Alraja, Hammami, Chikhi, & Fekir, 2016).

Additionally, Anderson (2014) categorises e-Services into several broad categories that are defined by the types of individuals or organisations that provide and use these services where the three main categories are outlined as (1) business-to-business (B2B), (2) business-to-consumer (B2C) and (3) consumer-to-consumer (C2C). Within these categories, however, e-Services involving government agencies are referred to as either government-to-business (G2B) or government-to-consumer (G2C). Services that are offered within the e-Services framework include (a) information providers, (b) application service providers, (c) e-tailers, (d) customer support, and (e) network providers. It is important to note that different organisations provide different types of services where some organisations provide only one type of service while others may provide several at once. For example, an application service provider will often also provide payment services and customer support.

The e-Services technology is expected to continue to chart its implementation growth, especially in terms of consumer-business interactions. As of January 2020, Oman recorded approximately 4.66 million internet users, with an internet penetration rate of 92% (Datareportal.com, 2020). Hence, in

the wake of the COVID-19 pandemic, this research develops a model that predicts and explain individual continuous intentions of adopting e-Services based on the Technology Readiness (TR) model (Parasuraman & Colby, 2014). This study assumes the stance that Omanis' adoption of e-Services depends on expectations linked to innovativeness, optimism, discomfort, and insecurity, whereas Omanis will generally adopt e-Services if their expectations are met. This study focuses on the relationship between consumers and e-Services adoption in Oman, with a particular focus on citizens.

1.1 Problem Statement

Consumers' confidence and acceptance in using technology are essential in any development of new technology. Hamed (2017) describes the acceptance of technology as a function connected to user involvement in the system development. From the perspective of customer services roles, new electronic services such as e-government and various similar web services have become increasingly popular. This phenomenon is visible when most developed nations, such as the United States of America (USA) and most of Europe, have turned their service spaces into virtual environments where interactions between customers and service providers no longer require physical presence. Parasuraman & Colby (2001) contend that this migration from face-to-face contact to online methods has significant implications for managers, particularly when selecting technologies.

The closure of government offices, businesses, schools due to the COVID-19 pandemic reinforces the importance of understanding the fundamental role of consumers' behaviour in adopting new technology or e-Services. To date, there is limited systematic research addressing the challenge Oman consumers (Omanis) face in adopting e-Services despite a number of literature (Jahangir & Begum, 2009; Haque et al., 2009) studying customers' reaction to new technology. A common term concerning these behaviours and reactions is "technology readiness", which refers to consumers' propensity to embrace and use new technology to accomplish daily goals (Parasuraman, 2000).

In the light of these circumstances, this research significantly contributes to expanding the limited literature in the field, especially amid the Covid-19 pandemic.

1.2 Research Objectives

Based on the low adoption rate of e-Services among Oman's citizens, this study explores the variables that contribute to this situation from the citizens' point of view. To effectively promote the adoption

of e-Services, the implementation should be tailored to citizens' needs and desires, considering cultural, religious, traditional, and other relevant factors.

Based on the main aim of this research, the following research objectives are outlined for the current study:

- i. To examine the relationship between consumers' (Omanis) technology readiness and e-Services adoption in Oman.
- ii. To explore consumers' (Omanis) attitudes towards the adoption of e-Services in Oman.

1.3 Research Questions and Hypotheses

The following research questions (RQ) are formulated to achieve the study objectives listed in Section 1.2:

- i. What is the relationship between consumers' (Omanis) technology readiness and e-Services adoption in Oman?
- ii. What is/are the attitude(s) of consumers towards the adoption of e-Services in Oman?

O' Leary (2004) argues that not every research question can/ should be converted into a corresponding hypothesis (H). Therefore, where suitable in the current study becomes appropriate, the research questions are converted into hypotheses as recommended by Creswell (2009).

Table 1. Formulation of Research Questions and Hypotheses according to Creswell's (2009) recommendation

RQ1. What is the relationship between consumers technology readiness and e-Services adoption in Oman?	H1. Innovativeness is positively related to e-Services adoption. H2. Optimism is positively related to e-Services adoption. H3. Discomfort is negatively related to e-Services adoption. H4. Insecurity is negatively related to e-Services adoption.
RQ2. What is the attitude of consumers towards the adoption of e-Services in Oman?	Not Applicable.

1.4 The Significance of the Study

This research is important in many ways since its findings can help Oman's government officials and non-government organisations, emphasising the necessity of e-Services adoption, particularly as the pandemic continues.

More specifically, this study identifies the significant factors responsible for citizens' influence on e-Services adoption in the country. The current study's findings serve as evidence to facilitate the government and policymakers to enhance and implement better e-Services, leading to a higher level of adoption among citizens and residents. Alsaif (2013) argues that a successful implementation of e-Services will only achieve full benefit if the adoption level remains consistently high.

CHAPTER TWO

2.1 Technology Readiness Model

As mentioned in the earlier section, Technology Readiness (TR) refers to people's propensity to embrace and use new technologies to accomplish daily goals (Liljander et al., 2006). Parasuraman (2000) categorises technology readiness into four essential components: optimism, innovativeness, discomfort, and insecurity. The four components are further described as follow:

- i. *Innovation: a proclivity to be the first to use new technology (a tendency to be a technology pioneer and thought leader).*
- ii. *Optimism: a positive view of the technology (belief in increased control, flexibility, and efficiency induced by technology).*
- iii. *Discomfort: a presumption of being overwhelmed by technology; a sense of not having control over the technology.*
- iv. *Insecurity: is the distrust and doubt of technology's ability to perform effectively and safely.*

According to Parasuraman and Colby (2015), optimism and innovativeness are positive drivers of the technology readiness index (TRI) because they stimulate customers to adopt technological services and have a favourable attitude toward technology. In contrast, discomfort and insecurity are inhibitors that increase customers' reluctance and lessen their intention to adopt new technology (Parasuraman & Colby, 2015). In this sense, the technology readiness model can be said to define users according to four groups, distinguished by personality traits involving motivators and inhibitors of new technology usage (Parasuraman, 2000; Parasuraman & Colby, 2001). The significance of ICT has prompted several researchers (Kim, Kim, Moon, & Chang, 2014; Jaafar et al., 2007) have addressed relevant technological issues in emerging economies for the last couple of decades. Their findings, alongside those of Parasuraman and Colby (2015), suggest TR's potential in determining technology readiness among individuals.

2.1.1 Innovativeness

According to Garcia and Calantone, as stated in Buyle, Van Compernelle, Vlassenroot, Vanlshout, Mechant, and Mannens (2018), "innovativeness" is commonly employed to assess the novelty of innovation, with more innovative items being labelled with a higher degree of novelty. As a result,

creative and innovative users are more likely to absorb new ideas sooner and more efficiently than others (Rogers, 2003). Parasuraman and Colby (2015) argue that creativity lies in the inclination “towards being a thought pioneer and an innovation pioneer,” often synonymously describing a bold, innovative user. Additionally, Parasuraman (2000) introduced the technological dimension and referend as “a propensity of being a technology pioneer and influencer”, while the works of Alharbi and Sohaib (2021); Venkatesh and Bala (2012) found a direct correlation between technology readiness and business process standard adoption. We suggest the following hypothesis based on these findings:

H1. Innovativeness is positively related to e-Services adoption.

2.1.2 Optimism

According to Scheier and Carver (1985), optimistic people expect “good things to happen rather than terrible things to happen.” Optimists’ approaches to the world are impacted by their attitude towards risk perception and acceptance of technology. Additionally, Parasuraman (2000) describes optimism as related to a “positive view towards technology and trust that it will offer people more efficiency, flexibility and control”, where optimism is deemed to impact technology readiness positively. e-Services adoption is positively influenced by optimism, according to Alharbi and Sohaib (2021); Buyle et al. (2018); Hallikainen and Laukkanen (2016); Parasuraman and Colby (2015). As a result, we suggest the hypothesis below:

H2. Optimism is positively related to e-Services adoption.

2.1.3 Discomfort

Attributes related to discomfort are often linked to “a perceived lack of control regarding technology and the sense of being overwhelmed by it” (Parasuraman & Colby, 2015; Parasuraman, 2000). Mukherjee and Hoyer (2001) denote that highly complex features in technology products harm the product evaluation due to the cost involved in the user’s learning process. Parasuraman (2000) defined the “apparent absence of command over innovation and sentiments of being overpowered by it” as an indication of uneasiness. Consumers experiencing discomfort are predicted to distrust innovative technology, development, changes and may develop technophobia (Parasuraman, 2000). Alharbi and Sohaib (2021), in their study on cryptocurrency adoption, find that discomfort will have a non-positive

effect on technology adoption, prompting consumers to develop a generally negative perception when there is an innovation. Following these premises, we propose the following hypothesis:

H3. Discomfort is negatively related to e-Services adoption.

2.1.4 Insecurity

Insecurity is often identified with the occasion of “distrusting of technology and scepticism about its ability to work properly” (Parasuraman, 2000). Every now and then, consumers who feel insecure do demonstrate their readiness to rely on innovation. However, the combination of safety concerns, negative technological consequences and the need for assurance induces scepticism among consumers concerning technology usage (Parasuraman, 2000). Haddad, Ameen, Isaac, Alrajawy, Al-Shbami, and Midhun Chakkaravarthy (2019) reported that insecure consumers are linked to both ambiguous and generally low utilisation of innovation. Furthermore, insecure customers often embrace innovation enthusiastically, but only when no more decisions are made.

With regards to measures of innovativeness, unique effects relating to insecurity have been widely researched (Haddad et al., 2019). Godoe and Johansen (2012), alongside Walczuch et al. (2007) as cited in Haddad et al. (2019), confirmed that identifying insecurity is not fundamental where despite what is expected, “one could expect that individuals will realise fundamental estimation for a framework that pays little heed to how things are being handled”. Gelderman et al. (2011) observed a low effect of insecurity and believed the measure to be inconsistent and weak, confirming the findings of Godoe and Johansen (2012) and Walczuch et al. (2007). They came to the conclusion that insecurity is a negative contributor that should be combined with the much more substantial part of discomfort due to its shortcomings (Haddad et al., 2019). Nonetheless, Parasuraman and Colby (2015), in their TR re-assessment 2.0, discovered that insecurity is strongly linked to a lack of trust in innovation and a lesser willingness to use it. This identification establishes a negative connection between insecurity and the general acknowledgement of advances (Alharbi & Sohaib, 2021), prompting us to propose the following hypothesis:

H4. Insecurity is negatively related to e-Services adoption.

The findings of these exploratory research corroborate the emerging themes in earlier technology readiness research, implying that positive and negative beliefs are put together to connect to impact technology behaviour (Parasuraman & Colby, 2015).

2.2 Unified Theory of Acceptance and Use of Technology (UTAUT)

Venkatesh et al. (2003) presented the Unified Theory of Acceptance and Use of Technology (UTAUT) based on communication, psychology, and sociology ideas. While most previous models seek to explain user behaviour using a range of independent factors, the UTAUT proposes four constructs that are direct predictors of usage behavioural intention: performance expectancy, effort expectancy, social influence, and facilitating conditions (Venkatesh et al., 2003).

Furthermore, UTAUT combines constructs from eight different technology acceptance models, including the theory of reasoned behaviour, technology acceptance model, motivational model, theory of planned behaviour, a model that combines planned behaviour and technology acceptance model, model of PC utilisation, innovation diffusion theory, and social cognitive theory. According to Alhujran (2009), managers can utilise UTAUT to assess the possibility of technological acceptance in their organisation. Despite the common use of this theory in the field, UTAUT is deemed unsuitable for this study because it focuses mainly on organisations, while this research involves the readiness of consumers to espouse e-Services in Oman.

2.3 e-Services in Oman

The Oman government has been working on developing a proper framework and successful implementation of e-Services in the country, especially in light of the Covid-19 pandemic, which has impacted government operations and revenue and the lives of the citizens. Evidence of this effort is in the launching of the vision 2040 in the hopes of improving the country's global standing (OmanObserver, 2020). Oman Vision 2040 emphasises the country's participation as a developed country (in the top 20 from the top 40 in Vision 2030) by promoting economic competitive strength and social well-being, stimulating growth, and fostering trust in all economic, social, and developmental connections around the world.

A large number of Oman internet users as of January 2020 indicates a promising future concerning the use of the internet to access e-Services in the country. The Oman government has initiated a considerable effort in encouraging the use of ICT to meet its goals and provide organised services to its stakeholders. For commercial and administrative purposes, the majority of government, corporate, and international organisations in Oman have effective computer systems. Large corporations have

spent a lot of money on computer systems and software to support their business transactions (Parker & Castelman, 2007).

The e-Services portal aims to provide a one-stop online public services platform with an integrated transaction system for the convenience of citizens and residents. The National statistics online, national registration system for higher education, DIAM e-Services Portal, Academic e-Services, Royal Oman Police (ROP) e-Services, Health, and a variety of other e-Services are among the services available.

Furthermore, the infrastructural development, especially in the ICT sector, prompted the Oman government to deliver several interactive and online transactional services with the recent implementation of VAT which was in effect on 16 April 2021. These services are fully operationalised with electronic payment, submission of statistical information, the contribution of social security welfare, and job applications.

The United Nations E-Government Report 2020 (Source: 2020 United Nations E-Government Survey) ranked Oman favourably on the E-government Development Index (EGDI), while infrastructure difficulties could hinder the development of other e-Services.

Several studies (Hamed AL-Shukri Udayanan, 2019; Parasuraman & Colby 2015; Alraja et al., 2015; Venkatesh et al., 2003) show that factors like optimism, innovativeness, discomfort, insecurity, trust in the internet, trust in government, information quality, privacy, performance expectancy, effort expectancy, social influence, and facilitating conditions that are direct determinants of usage intention and behaviour have significant influences on usage intention and. On the other hand, challenges in the implementation of e-Services include factors such as awareness, utilised models, preferred infrastructure, integration process, and the difference in political, cultural, technical and organisation origins (Alraja et al., 2015)

2.4 The Proposed Research Framework

While the advancement of e-Services has gained traction among researchers around the world, literature on e-Services adoption in Oman accounting for the consumers' viewpoint remains limited (Parasuraman & Colby, 2015). Furthermore, the lack of an integrated research model has also fractured a unified research stream (Chan, 2000). The proposed research framework in the current study presents a hypothesised relationship between constructs identified in the relevant literature.

The TR 2.0 Model, according to Parasuraman and Colby (2014), can be used to assess technology readiness levels within a population, a country, a special demographic group of interest (e.g., Asian Americans in the United States, teenagers, seniors), a profession (e.g., teachers, software developers, doctors, clinicians), or a target market or segment (e.g., consumers of superior-tech products).

Upon reviewing sufficient past literature, the researchers also establish TR 2.0 as most suitable for the current study as it aligns with the research focus and has proven to be a robust predictor of technology-related behavioural intentions as well as the realisation of actual behaviours (Parasuraman & Colby, 2015).

Additionally, TR has also been deemed the most appropriate model in determining consumer readiness and adoption of e-Services in Oman as it can be adapted to meet the expected characteristics of e-Service. In particular, technology readiness measured by TRI 2.0 can be used as a potential valuable psychographic variable in applied, decision-oriented research contexts, centring on technology-based innovations. Researchers are also encouraged to integrate TR into more extensive nomological networks to understand better how TR influences technology usage (Parasuraman & Colby, 2015).

The current study accounts for innovativeness, optimism, discomfort, and insecurity in determining the adoption of e-Services among Oman consumers using the proposed study framework, a total of four hypotheses were investigated. (*See Figure 1*). Since this process involves the development of multi-item scales to measure constructs, there is a need to develop a specific set of measures for e-Services as proposed by Colesca & Dobrica (2008) who believe that stakeholders may require different criteria to measure each construct.

The focus of this research is to find out how ready consumers are for e-Services in Oman and their attitudes toward the e-Services. However, because there is no comparable technique in the literature, the researchers devised a model based on Technology Readiness 2.0 with an ideal premise and conducted a survey focusing on Oman's citizens (Rigopoulos, Psarras, & Askoun, 2008). Drawing on past studies, the e-Services adoption constructs in this study is as presented in *Figure 1*. Similarly, the criteria to measure each construct include the adaptation of the criteria used in related studies as well as the results of relevant empirical studies.

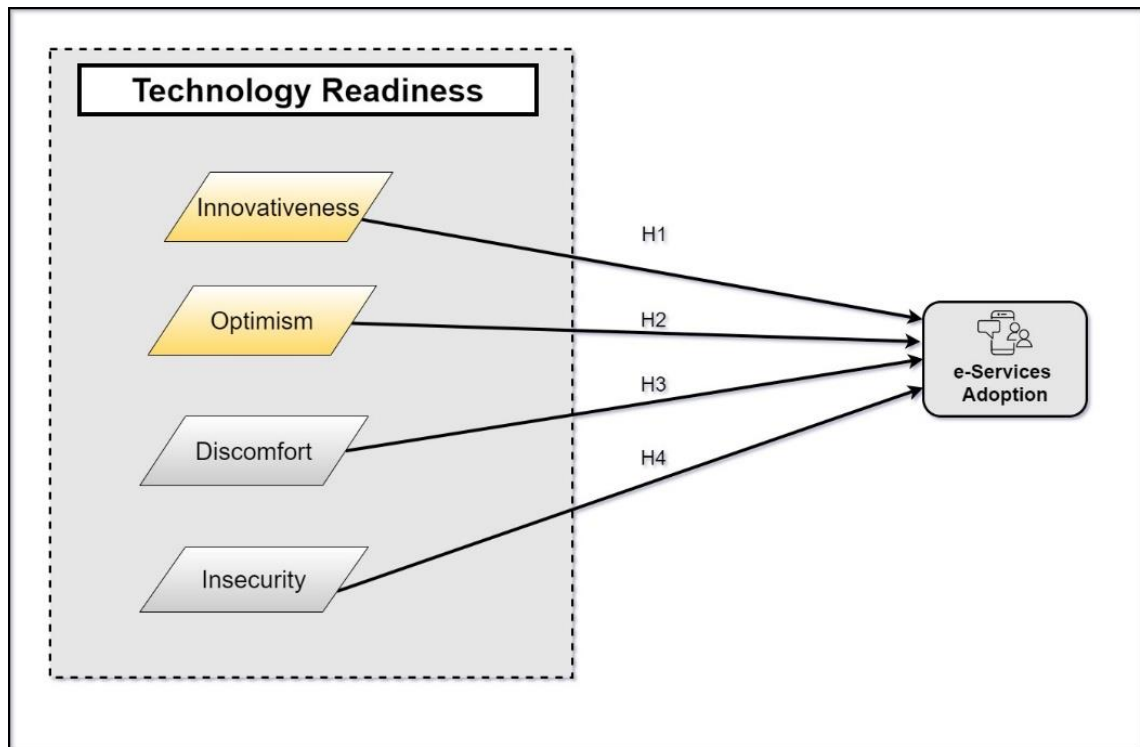


Figure 1. The Proposed Research Framework for the Current Study

CHAPTER THREE

3.0 Research Methodology

Sekaran (2006) defined research methodology as “an organised, systematic, critical, scientific enquiry or investigation into specific problem undertaken with the objective of finding answers or solutions”. In line with the main objective of this study and the components that will be adopted in the technology readiness model, the data collection procedure involves utilising online questionnaires and surveys.

In general, qualitative (interviews, observations) and quantitative (survey) frameworks are the two basic types of research approaches. The research method chosen is determined by the research challenge and the primary goal of the study. Applying the qualitative method requires critical thinking, judgement without bias. Meanwhile, quantitative research requires the ability to develop a proper hypothesis, test the hypothesis using appropriate statistical tools and techniques, interpret the result to descriptive information. This study employs a quantitative stance that aligns with the research direction and objectives highlighted in *section 1.2*. A self-administered questionnaire instrument was then developed and distributed to different participants.

In adopting the general assumption that citizens view the adoption of e-Services differently, the adoption process involved will also be different (Parasuraman & Colby, 2015). Furthermore, this study adopts a deductive reasoning approach, examining theories related to Technology Readiness and technology adoption. The research philosophy of a particular study is usually deciphered via two methods of reasoning, namely deductive and inductive reasoning. Deductive reasoning involves testing a hypothesis where theories are confirmed through acceptance or rejection of hypothesis and allows for replication of findings the finding of study can be replicated. The hypothesis in this study is founded on the notion that citizens’ perceptions of e-Services influence individuals’ willingness to accept them. Inductive reasoning, on the other hand, is more open-ended, with the goal of discovering and understanding new phenomena.

3.1 Data Collection & Analytical Tools

When conducting research, there are two basic categories of data to consider: primary and secondary data. Primary data is gathered by the researcher, whereas secondary data is gathered for other purposes. The main data for this study is obtained through an online survey questionnaire. The

questions and items in the research instrument (see Section 3.5) utilised in this study are linked to the independent and dependent variables.

A total of 322 responses were collected, representing a response rate of 84%, where the survey is distributed via a dedicated website designed specifically for the research. The link containing the questionnaire was also distributed to ensure the minimum sample size has been met. The use of an online survey was intended to facilitate the collection of responses, and participants were encouraged to provide feedback that accurately reflected their genuine opinions. Additionally, using an online survey also reduces the health risk posed by the Covid-19 pandemic.

3.2 Data Sampling Process

The sampling process of this study follows the process adopted by Aaker, Kumar, and Day (2004). It contains eight main activities: 1) identifying the target population, 2) determining the sample frame, 3) resolving differences (if any), 4) selecting the sampling procedure, 5) determining the sample size, 6) obtaining information from participants, 7) dealing with non-response (if any), and 8) obtaining information for decision-making.

3.3 Target Population & Sample Size

The target population in this study is Omanis, with a reported population of 2,738,629, according to the National Centre for Statistics and Information (NCSI) (2021). Rosco (1975) suggests that a sample size larger than 30 and less than 500 is appropriate for most research. Sekaran & Bougie (2016); Sekaran (2006), argue that a larger sample size of more than 500 could pose a serious problem. Adhering to the limit of 30 to 500 samples, a 10% sample size from the parent population is recommended (Rosco, 1975). The sample size for this research is identified as 385 samples upon using Raosoft's (2010) common sample size calculator (<http://www.raosoft.com/samplesize.html>).

3.4 Analytical Tools

Once sufficient data is collected, all filled responses are downloaded into a CSV file for coding and analysis. This process is done using the Statistical Package for Social Sciences (SPSS), a popular data analysis software providing descriptive analysis. Subsequently, the SmartPLS software was employed for further assessment. SmartPLS is software with a graphical user interface that uses the partial least squares path modelling method to model variance-based structural equations. Because SmartPLS is

known for its user-friendliness, robustness, and incremental feature in predicting endogenous variables, it is used in this work. (Ringle and colleagues, 2015; Hair and colleagues, 2017). The analysis phase is divided into two stages: the first is the analysis of the measurement model, and the second is the analysis of the structural model.

Frequency distributions are utilised to demonstrate results related to the respondent's general background and attitude towards e-Services adoption. The technology readiness will show the relationship of respondents towards the adoption of e-services. Additionally, the Convergent Validity and Reliability of Variables, Discriminant Validity-Fornell-Larcker criteria, Discriminant Validity-HTMT, Multicollinearity test, Hypothesis testing – Path Coefficient (Structural Model) are also identified to determine the relationship between consumers' technology readiness and e-Services adoption.

3.5 Research Instrument

According to Parasuraman and Colby (2015); Hayduk and Littvey (2012), a 25-item survey questionnaire was developed as the research instrument for this study and the theory of reasoned action (Aizen and Fishbein, 1980). The questionnaire is divided into three sections: background information, technology readiness constructs, and e-Services adoption attitude questions. The first half comprises five closed-ended items, whereas the second section, which deals with technological readiness, has 16 rating-scale items 1. (Strongly Disagree) 2. (Disagree) 3. (Neutral) 4. (Agree) 5. (Strongly Agree) (Parasuraman and Colby, 2014). Four items in the section on e-Services adoption attitude have a rating scale to record participants' responses. The decision to utilise the multi-item Likert scale is based on the works of Lee, Yoon, and Lee (2009). Earlier researches (Isaac, Abdullah, Ramayah, Mutahar, & Alrajawy (2017); Ameen & Ahmad (2014) has recommended a Likert scale to measure constructs, where 5 represents "Strongly Agree" and 1 indicates "Strongly Disagree". *Appendix A* contains a sample of the questionnaire. The questionnaire is also translated into Arabic because the intended respondents are Arabic speakers.

CHAPTER FOUR

4.0 Data Analysis and Result

4.1 Respondents' Background Information

4.1.1 General Demographic Characteristics of the Sample

Table 4.1 shows the overall demographic features of the respondents from the 322 responses received earlier, whereas Figures 4.1 to 4.5 show visual depictions of these data.

Table 4. 1 Sample Characteristics

		<i>Frequency</i>	<i>Percentage (%)</i>
Gender	Female	163	50.6%
	Male	159	49.4%
Age	<20	78	24.2%
	21 – 40	230	71.4%
	41 – 60	14	4.3%
	>60	0	0.0%
Educational Level	Bachelor's Degree and above	90	28.0%
	Diploma	183	56.8%
	High School	48	14.9%
	Primary Certificate or lower	1	.3%
Occupation	Government Employee	50	15.5%
	Private Employee	22	6.8%
	Self-employed	10	3.1%
	Student	205	63.7%
	Unemployed	35	10.9%
Years of Internet Use	<5 years	50	15.5%
	>10 years	134	41.6%
	5 - 10 years	134	41.6%
	No experience	4	1.2%

4.1.2 Gender and Age

Out of the completed 322 responses, 159 (49.4%) participants are male, while 163 participants (50.6%) identified as female. Additionally, the respondents' age ranges across four different age groups where the most respondents are between the age of 21-40 (71.4%), followed by those aged 20 years or less

(24.2%) and those from the age group of 41-60 (4.3%). There were no respondents above the age of 60 in the current study. Figures 4.1 and 4.2 illustrate these findings, respectively.

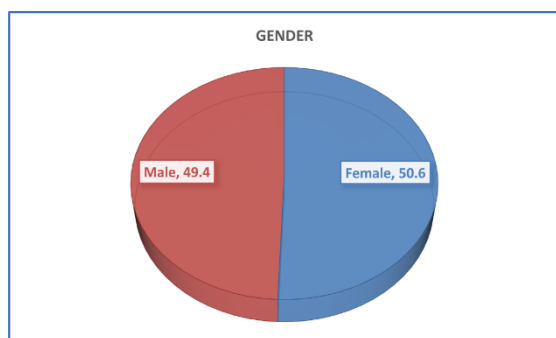


Figure 4. 2 Respondents' gender

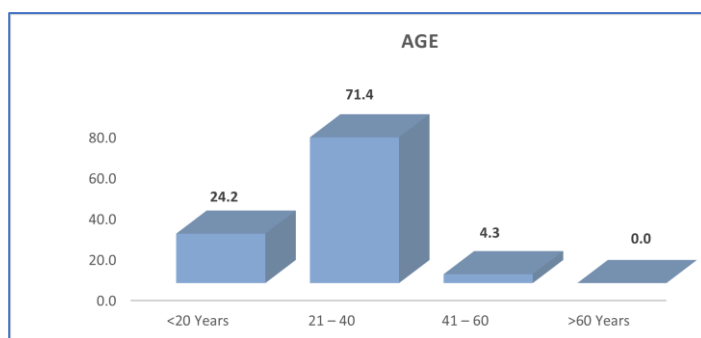


Figure 4. 1 Respondents' age

4.1.3 Educational Level and Occupation

The results presented in Figure 4.3 indicate that most respondent holds a Diploma qualification (56.8%). The rest possess a bachelor's degree and above (28%), high school qualification (14.9%) or a primary certificate (.3%). In terms of occupation, most respondents were students (63.7%), while the remaining respondents are either government employees (15.5%), unemployed (10.9%), private employees (6.7%) or self-employed (3.15).

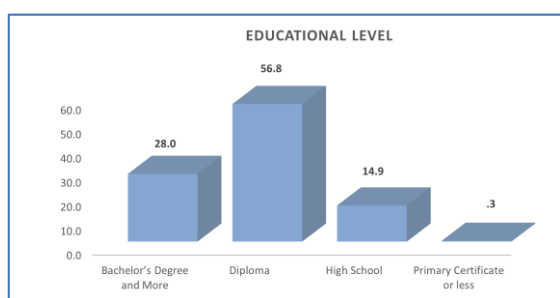


Figure 4. 3 Respondents' educational level

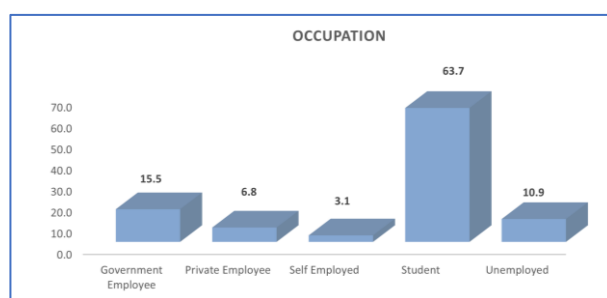


Figure 4. 4 Respondent's occupation

4.1.4 Years of Internet Use

Findings show that 15.5% of the respondents used the internet for a period less than five years, while those who used the 5-10 years constitute 41.6% of the overall figure (Figure 4.5). Similarly, 41.6% of respondents have been using the internet for more than 10 years while those with no internet

experience were recorded at 1.2%. This indicates that a majority of respondents used the internet above 5 years (83.2%).

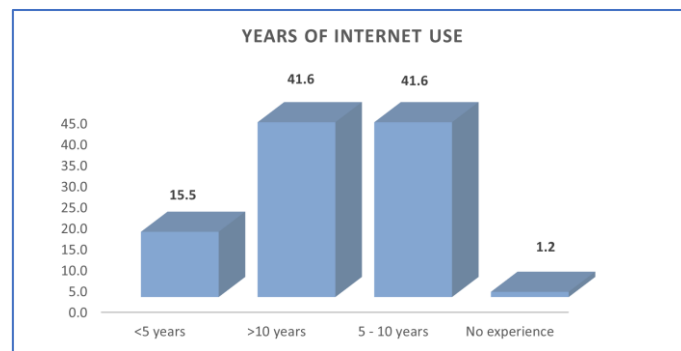


Figure 4. 5 Years of internet use among respondents

4.2 Attitude towards e-Services Adoption

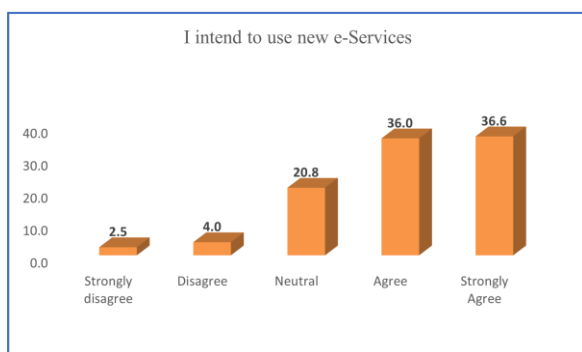


Figure 4. 6 I intend to use new e-Services

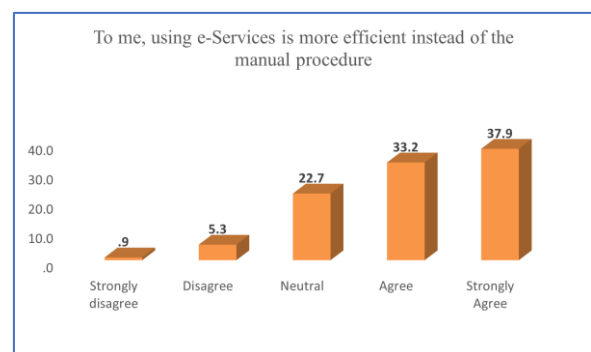


Figure 4. 7 To me, using e-Services is more efficient instead of the manual procedure

The respondents (Omanis) were also investigated on their attitude towards e-Services adoption in the country where the results generated an overall positive attitude. As demonstrated in Figures 4.6-4.9, 73% of respondents want to use e-Services, 71% believe that using e-Services is more efficient than using the manual approach, 73% have positive feelings when using e-Services, and 79 per cent enjoy using e-Services.

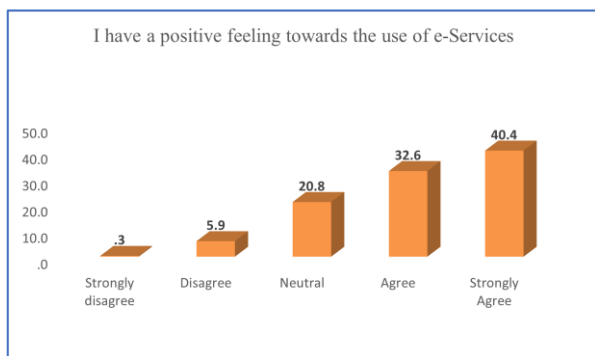


Figure 4. 8 I have a positive feeling towards the use of e-Services

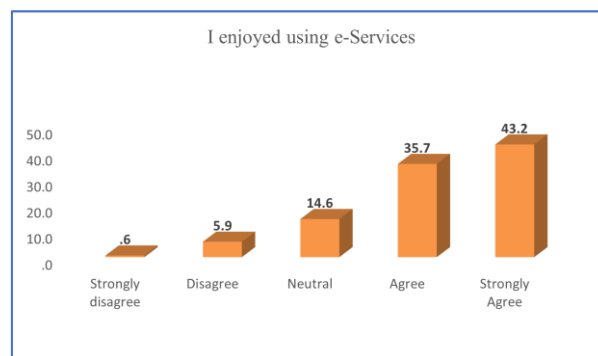


Figure 4. 9 I enjoyed using e-Services

Extending the statistical investigation further, Table 4.2 shows the factors that influence e-Service adoption using the coefficient of variation (CV), with the lowest coefficient being more reliable and consistent. A consistent factor that is reported to influence the adoption of e-Services is that they enjoyed using e-Services (22.22) and the positive feelings they have when using e-Services (22.98). The factor the intention to use e-services (24.51) does not support the adoption of e-Services.

Table 4. 2 Attitude Towards e-Services

<i>Reasons</i>	<i>Mean</i>	<i>SD</i>	<i>CV=(SD/Mean) X 100</i>
<i>I intend to use new e-Services</i>	4.00	.981	24.51
<i>To me, using e-Services is more efficient instead of the manual procedure</i>	4.02	.950	23.65
<i>I have a positive feeling towards the use of e-Services</i>	4.07	.935	22.98
<i>I enjoyed using e-Services</i>	4.15	.922	22.22

4.3 Assessment of Measurement Model

The Partial Least Square (SmartPLS) is selected to further analyse the data due to its robustness and incremental character in predicting endogenous variables (Hair et al., 2017). As mentioned earlier, the analysis of the current study consists of two stages: assessment of measurement model and assessment of the structural model. More specifically, the SmartPLS was employed to assess the

reliability and validity as part of the assessment of the measurement model. Figure 4.10 depicts the research model in graphical form, whereas Figure 4.11 depicts the assessment's value.

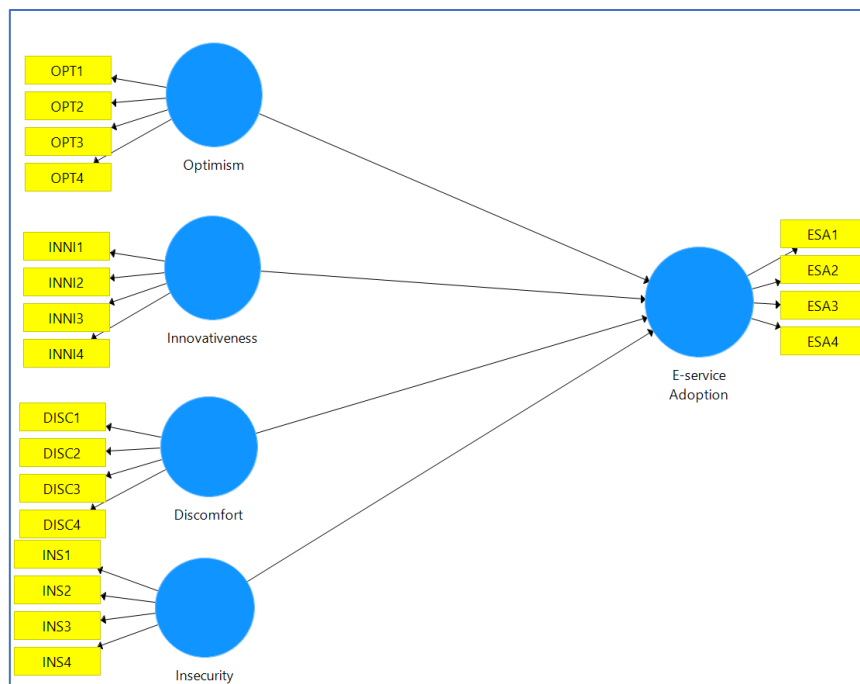


Figure 4. 10 Research Model

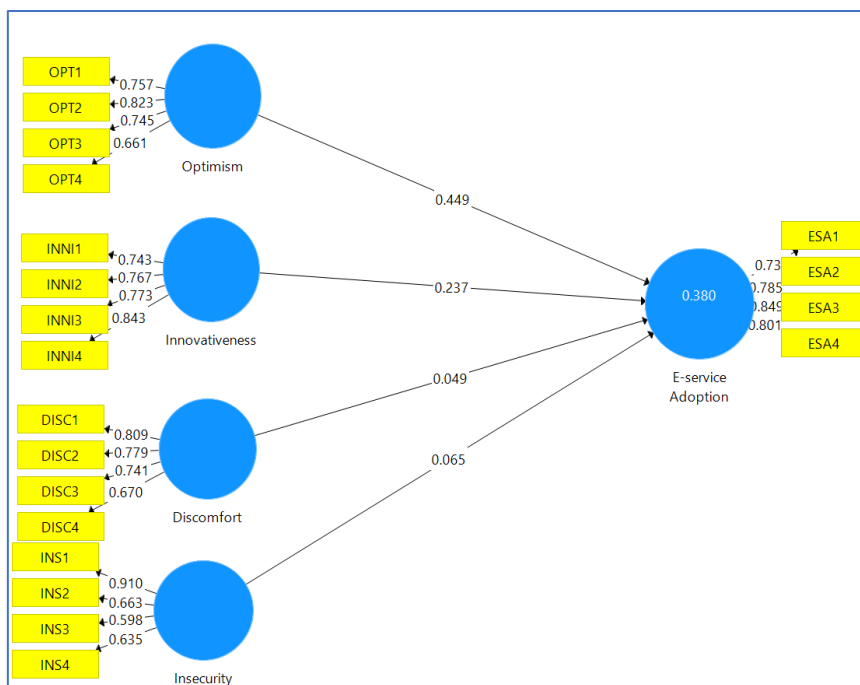


Figure 4. 10 Research model with values

4.3.1 Items Loading

Table 4.3 illustrates the factor loadings for each item where all loadings were recorded to be above .60, indicating a good convergent validity in the model.

Table 4. 3 Items loading

	Discomfort	e-Services Adoption	Innovativeness	Insecurity	Optimism
When I get technical support from a provider of a high-tech product or service, I sometimes feel as if I am being taken advantage of by someone who knows more than I do [DIS1]	0.809				
Technical support lines are not helpful because they don't explain things in terms I understand [DIS2]	0.779				
Sometimes, I think that technology systems are not designed for use by ordinary people [DIS3]	0.741				
There is no such thing as a manual for a high-tech product or service that's written in plain language [DIS4]	0.67				
I intend to use new e-Services [ESA1]		0.737			
To me, using e-Services is more efficient instead of the manual procedure [ESA2]		0.785			
I have a positive feeling towards the use of e-Services [ESA3]		0.849			
I enjoyed using e-Services [ESA4]		0.801			

Other people come to me for advice on new technologies [INN1]			0.743		
In general, I am among the first in my circle of friends to acquire new technology when it appears [INN2]			0.767		
I can usually figure out new high-tech products and services without help from others [INN3]			0.773		
I keep up with the latest technological developments in my areas of interest [INN4]			0.843		
People are too dependent on technology to do things for them [INS1]				0.91	
Too much technology distracts people to a harmful point [INS2]				0.663	
Technology lowers the quality of relationships by reducing personal interaction [INS3]				0.598	
I do not feel confident doing business with a place that can only be reached online [INS4]				0.635	
New technologies contribute to a better quality of life [OPT1]					0.757
Technology gives me more freedom of mobility [OPT2]					0.823
Technology gives people more control over their daily lives [OPT3]					0.745
Technology makes me more productive in my personal life [OPT4]					0.661

****Discomfort (DISC), **Innovativeness (INN), **Insecurity (INS), **Optimism (OPT), **e-Services Adoption**

4.3.2 Reliability of variables & Convergent Validity

Table 4.4 Reliability & Convergent validity

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Discomfort	0.746	0.769	0.838	0.565
e-Services Adoption	0.804	0.806	0.872	0.631
Innovativeness	0.789	0.802	0.863	0.612
Insecurity	0.725	1.096	0.8	0.507
Optimism	0.74	0.756	0.835	0.561

Table 4.4 presents the Cronbach alpha and composite reliability for all variables, which represent the reliability of the measurement tool. All results are found to be greater than 0.70, indicating satisfactory reliability since an AVE value of greater than 0.5 indicates good convergent validity (Hair et al., 2017). Cronbach Alpha, on the other hand, has been used to analyse the internal coherence (consistency) of the questionnaire's various scales. The greater the scale's internal consistency, the more effective the questionnaire is at measuring a concept, resulting in more reliable data and findings. Tavakol and Dennick (2011) proposed that an acceptable and reliable Cronbach value should not be below 0.70. Similarly, Leowenthal (2004) argues that an alpha coefficient of .60 is acceptable, while Ramayah (2011) contends that a Cronbach Alpha coefficient value of more than .70 is considered good and a value of more than .50 is acceptable.

4.3.3 Discriminant Validity: Fornell-Larcker criteria

Table 4.5 Discriminant validity based on the Fornell-Larcker criteria

	Discomfort	e-Services Adoption	Innovativeness	Insecurity	Optimism
Discomfort	0.751				
e-Services Adoption	0.263	0.794			
Innovativeness	0.438	0.438	0.783		
Insecurity	0.068	0.152	0.075	0.712	
Optimism	0.235	0.563	0.388	0.146	0.749

To ascertain the discriminant validity for this study, we employed the Fornell-Larcker (1981) criteria. The finding suggests that all relevant values are greater than the inter-item correlation, with the square root of the AVE in bold and the inter-variable correlation in other values.

The criteria require the bolded values to be higher than the values in their respective rows and column. Hence, the values generated in this study fulfil this requirement and indicate a good discriminant validity.

4.3.4 Discriminant Validity: HTMT Ratio

Table 4. 6 Discriminant Validity: HTMT ratio

	Discomfort	E-service Adoption	Innovativeness	Insecurity	Optimism
Discomfort					
e-Services Adoption	0.327				
Innovativeness	0.566	0.54			
Insecurity	0.18	0.149	0.11		
Optimism	0.314	0.717	0.515	0.147	

Additionally, we also considered the heterotrait-monotrait (HTMT) ratio as shown in Table 4.6, where all values are less than 1, representing a good and established discriminant validity (Franke & Sarstedt, 2019). Upon confirming that the measurement model produces satisfactory reliability, convergent validity, and discriminant validity, we assess the structural model for hypotheses testing in the upcoming sections.

4.5 Assessment of Structural Model

The multicollinearity assessment, t-test, path coefficient, coefficient of determination (R^2), effect size (f^2), and the model's predictive relevance are all part of the structural model assessment (Q^2). Hypothesis testing was also done using the bootstrapping method.

4.5.1 Multicollinearity

Table 4. 7 Multicollinearity

	Discomfort	e-Services Adoption	Innovativeness	Insecurity	Optimism
e-Services Adoption					
Innovativeness		1.385			
Optimism		1.203			
Discomfort		1.246			
Insecurity		1.023			

The generated VIF ranges from 1 to 10 based on the collinearity statistics output. As a result, it can be determined that the dataset has no multicollinearity symptoms. The VIF value threshold should be 5, according to Hair et al. (2017) and Ringle et al. (2015). There are no multicollinearity issues in our data because the VIF values are all less than 3 (<3) in this case.

4.5.2 Hypothesis Testing: Path Coefficient (Structural Model)

The hypotheses in the study are tested using the SmartPLS software, where optimism, innovativeness, insecurity, and discomfort are independent variables while e-Services adoption is the dependent variable.

Table 4. 8 Hypothesis testing: Path Coefficient

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values	F-square
Innovativeness -> e-Services Adoption	0.236	0.235	0.054	4.349	0	0.065
Optimism -> e-Services Adoption	0.451	0.451	0.051	8.842	0	0.273
Discomfort -> e-Services Adoption	0.046	0.053	0.051	0.914	0.361	0.003
Insecurity -> e-Services Adoption	0.065	0.076	0.054	1.202	0.229	0.007
R-square = .379 Q-Square= .226						

H3 and H4 can be ruled out based on Table 4.8, as there is a difference in the adoption of e-Services between the variables. Discomfort ($\beta=.046$, $p>.05$) and insecurity ($\beta=.065$, $p>.05$) had positive but insignificant effects on e-Services adoption, according to the findings. Furthermore, optimism ($\beta=.451$, $p.05$) and innovation ($\beta=.236$, $p.05$) have a favourable and substantial effect on e-Services usage.

According to Hair et al. (2017), the R^2 , F^2 , and Q^2 should be investigated and reported. As per the R-square values in this study, independent variables account for 37.9% of the variation in the dependent variable. The f^2 values, on the other hand, show the predictive power of the independent variable on the dependent variable, with an f-value of above in this study. 02 for inventiveness and optimism, indicating minor to moderate effects. In general, an impact size of 0.02 is regarded as modest, 0.15 is considered medium, and 0.35 is considered substantial (Cohen, 1988; Roldán & Sánchez-Franco, 2012). Finally, Q-square values show the model's predictive relevance based on the sample's construct

(Hair et al., 2004). (2017). In this investigation, the Q-square value represents the predictive relevance of the model, with a value greater than 0 indicating strong predictive relevance.

Table 4.9 Summary of Hypotheses Testing

Hypothesis. No.	Statement	Remarks
<i>H1</i>	<i>Innovativeness is positively related to e-Services adoption.</i>	<i>H1 supported</i>
<i>H2</i>	<i>Optimism is positively related to e-Services adoption.</i>	<i>H2 supported</i>
<i>H3</i>	<i>Discomfort is negatively related to e-Services adoption.</i>	<i>H3 Not supported</i>
<i>H4</i>	<i>Insecurity is negatively related to e-Services adoption.</i>	<i>H4 Not supported</i>

4.5.3 Factors Influencing e-Services Adoption

Overall, the outcomes of this study support the study's hypotheses, which state that innovativeness and optimism are essential factors in the adoption of e-Services (See Table 4.8).

CHAPTER FIVE

5.0 Discussion, Conclusion & Recommendation

5.1 Discussion of the Main Findings

The analysis and results of this empirical study present the relationship between consumer technology readiness and e-Services adoption, offering insights into consumers' attitudes (Omanis) towards e-Services adoption.

The study investigates the potential of using the TR Model to predict Omanis willingness to adopt e-Services, where it is considered one of the first studies to do so in the context of Oman. The TR 2.0 scale we employed is the most recent scale developed by Parasuraman and Colby (2015). This scale is more compact and better suited to modern technological advancements such as the internet, cell phones, tablets, and the applications created for those platforms.

5.2 Technology readiness and e-Services Adoption

When it comes to the use of e-services or technology, Oman, as a member of the Gulf Corporation Council (GCC), lags behind advanced countries like the United States and several European countries; nonetheless, e-Service adoptions range from country to country. This study findings indicate that e-Services acceptance is still evolving because different factors influence e-Services or technology adoption in different countries (Kutty, 2021; Hadad et al., 2019; Alraja et al., 2015).

Offering an insight into the role of the technology readiness model, the findings of this study revealed that innovation has an affirmative effect ($\beta=.236$, $p<.05$) on e-Services adoption in Oman. This outcome is supported by several earlier studies (Alharbi & Sohaib, 2021; Hadad et al., 2019; Buyle et al., 2018; Alraja et al., 2015; Parasuraman & Colby, 2015; Venkatesh & Bala, 2012).

Similarly, optimism affects the adoption of e-Services among Omanis in the country ($\beta=.451$, $p<.05$) where this finding is supported by studies conducted by Alharbi & Sohaib (2021); Hadad et al. (2019); Buyle et al. (2018); Alraja et al. (2015); Parasuraman and Colby (2015). These findings indicate that Omanis are motivated to use new technologies to help the country implement better e-Services technologies.

Discomfort and insecurity, on the other hand, were reported not to affect Omanis' adoption of e-Services ($\beta=.046$, $p>.05$) and insecurity ($\beta=.065$, $p>.05$), respectively. These results can be attributed

to the e-Services technology, especially when they find technology too complicated for an average person or when they presume that technology lowers the quality of personal interaction. These findings align with the works by Alharbi and Sohaib (2021); Parasuraman and Colby (2015); Kotler, Armstrong, Ang, Leong, Tan, and Ho-Ming (2012). According to Alharbi and Sohaib (2021); Parasuraman & Colby (2015), insecurity is inextricably linked to a lack of trust in technology, which reduces the willingness to adopt innovation.

5.3 Attitude towards e-Services Adoption

In terms of attitude, many Omanis agree to the benefit of using e-Services as the result shows respondents of the study strongly agree and accept these e-Services. It can be concluded that the main attitudes related to Omanis are “they enjoyed using the e-services” with a coefficient of variation (CV) of 22.22 followed by the positive feelings they have towards the use of e-services (22.98) as presented in Table 4.2. These findings are consistent with Hamed AL-Shukri Udayanan’s (2019) research into the factors that influence internet shopping in Oman. The perceived advantage includes higher efficiency, positive feelings, and enjoyment of using service, among others. With proper implementation of e-service, more Omanis will be more inclined to use the service (AlAwadhi & Morris, 2012). In particular, these attitudes can facilitate the fast adoption of e-Services, especially when it is obvious that many factors limit the adoption of such services.

5.4 Conclusion & Recommendation

A total of four factors were investigated and established in this study using the TR 2.0 model to measure Omanis’ readiness for the adoption of e-Services. Findings confirm that Innovativeness and Optimism are positively significant to the adoption of e-Services, implying that both variables are driving forces to e-Services adoption. As a result, H1 and H2 are fully supported in this study because they are consistent with previous research (Haddad et al., 2019; Buyle et al., 2018; Alraja et al., 2015; Parasuraman & Colby, 2015). Meanwhile, the Insecurity and Discomfort shows little or insignificant effort on e-Services adoption, the H3 and H4 are not supported (Parasuraman & Colby, 2015; Kotler, Armstrong, Ang, Leong, Tan, & Ho-Ming, 2012). However, the H3 and H4 do not match the findings of Haddad et al. (2019). These findings are in line with previous research, but this is the first of its kind.

The study’s questions were answered, and possible factors affecting e-Services adoption in Oman were recognised. The government of Oman can use this information to boost e-Service adoption,

particularly among Omanis who are concerned about security and discomfort when using e-Services. Through three views, this study also proposes solutions that can be positively adopted when it comes to e-Services. According to the authors, if the recommendations is implemented, the efficiency, efficacy, and quality of e-Services adoption in Oman will improve.

- Societal awareness: It is recommended that the government employ an effective and attractive marketing program to promote e-Services where the government should concentrate more on the benefit of e-Services, including convenience, timeliness, and secure transactions. (AlAwadhi & Morris (2012) suggest the integration of e-Services into the high school curriculum to prepare young Omanis for the future. Furthermore, to avoid scepticism of e-Services among citizens, the government should also enhance public trust and satisfaction by regulating private sectors to improve the transparency and efficiency of their services.
- e-Services efficiency: Because the success of e-Services adoption depends on its efficiency, there should be a collaboration between government agencies and non-governmental agencies on information and knowledge-sharing to help deliver efficient customer service.
- Enhancing websites: The web application needs to be improved to accommodate users in a friendly and convenient manner. Thus, government or policymakers must consider a variety of users, including disabled individuals, emphasising the security and responsiveness of the website and application. An interactive website offers functional features with a concise procedure that will not repel users. Furthermore, information should be frequently updated to ensure consistency in the content and structure of the website.

5.5 Limitations & Direction for Future Research

The study population was limited to Oman citizens only limiting the generalisability of the results. Future research should include various sample populations from around the country to have a more comprehensive understanding of the elements that may influence e-Service usage. Despite the model's successful application in this study, future research should look at other variables such as mediating or moderating variables, as well as experimenting with various statistical tests.

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Appendix A. Research Questionnaire

Thank You for agreeing to complete this short but important survey about consumers readiness and e-Services Adoption in Oman. Your honest answers will help to better understand the suitable policy and implementation plan for a better e-Services adoption.

نشكرك على الموافقة على ملء هذه الدراسة الاستقصائية القصيرة والمهمة حول استعداد المستهلكين لتبني الخدمات الإلكترونية في عُمان. ستساعد إجابتك في فهم السياسة وخطة التنفيذ المناسبة لتبني الخدمات الإلكترونية على نحو أفضل.

This survey is for academic purpose only. All information that is collected in this study will be treated with utmost confidentiality. At **no time** will name company, name of individual will be identified. This survey will take about five (5) minutes to complete. This questionnaire consists of 3 sections. Please circle or tick (✓) option.

هذه الدراسة الاستقصائية مُعدة للأغراض الأكاديمية فقط. سيتم التعامل مع جميع المعلومات التي تم جمعها في هذه الدراسة بـمَنْتهى السرية، ولن يتم ذكر اسم أي شركة أو فرد في أي وقت. سيستغرق إكمال هذه الدراسة حوالي خمس (5) دقائق. يتألف هذا الاستبيان من 3 أقسام. يرجى وضع دائرة أو علامة صح (✓) على الخيار المناسب.

Section 1: General Information of Respondent

القسم 1: معلومات عامة حول المستجيب

1. Gender: ☐ 1. Male ☐ 2. Female

1. النوع: ☐ 1. ذكر ☐ 2. أنثى

2. Age: ☐ 1. <20 ☐ 2. 21-40 ☐ 3. 41-60 ☐ 4. >60

2. العمر: ☐ 1. أقل من 20 ☐ 2. 21 – 40 ☐ 3. 41 – 60 ☐ 4. أكثر من 60

3. Education Level: ☐ 1. Primary Certificate or less ☐ 2. High School ☐ 3. Diploma
☐ 4. Bachelor's Degree and More

3. المستوى التعليمي: ☐ 1. ابتدائي أو أقل ☐ 2. ثانوي ☐ 3. دبلوم ☐ 4. شهادة بكالوريوس و أكثر

4. Occupation: ☐ 1. Self Employed ☐ 2. Private Employee ☐ 4. Student
☐ 3. Government Employee ☐ 5. Unemployed

4. المهنة: ☐ 1. تعمل لحسابك الخاص ☐ 2. موظف في القطاع الخاص ☐ 3. موظف حكومي ☐ 4. طالب
☐ 5. لا تعمل

5. Years of Internet use: ☐ 1. No experience ☐ 2. <5 years ☐ 3. 5 – 10 years ☐ 4. >10 years

5. سنوات استخدام الإنترنت: ☐ 1. لم أستخدم ☐ 2. أقل من 5 سنوات ☐ 3. 5 – 10 سنوات ☐ 4. أكثر من 10 سنوات

We are interested in your views on how technology influences your life. Please indicate whether you **1. (Strongly Disagree) 2. (Disagree) 3. (Neutral) 4. (Agree) 5. (Strongly Agree)** with the following statements:

نحن مهتمون بأرائك حول طريقة تأثير التكنولوجيا على حياتك. يرجى الإشارة إلى إجابتك **1. (لا أوافق بشدة) 2. (لا أوافق) 3. (محايد) 4. (أوافق) 5. (أوافق بشدة)** مع الآراء التالية:

Section 2: Technology Readiness

القسم 2: الجاهزية التقنية

New technologies contribute to a better quality of life تساهم التقنيات الجديدة في تحسين جودة الحياة.	1	2	3	4	5
Technology gives me more freedom of movement تتيح لي التكنولوجيا مزيداً من حرية الحركة.	1	2	3	4	5
Technology gives people more control over their daily lives تتيح التكنولوجيا للأشخاص سيطرة أكثر على حياتهم اليومية.	1	2	3	4	5
Technology makes me more productive in my personal life تجعلني التكنولوجيا منتجاً أكثر في حياتي الشخصية.	1	2	3	4	5
Other people come to me for advice on new technologies يستشيرني الأشخاص الآخرون للحصول على مشورة حول التقنيات الجديدة.	1	2	3	4	5
In general, I am among the first among my friends to obtain new technology when it appears بشكل عام، أنا من بين الأوائل بين أصدقائي في الحصول على تكنولوجيا جديدة عند ظهورها.	1	2	3	4	5
I can usually figure out new high-tech products and services without help from others يمكنني عادة اكتشاف منتجات وخدمات جديدة عالية التقنية دون مساعدة من الآخرين.	1	2	3	4	5
I keep up with the latest technological developments in my areas of interest أنا أواكب أحدث التطورات التكنولوجية في مجالات اهتمامي.	1	2	3	4	5
When I get technical support from a provider of a high-tech product or service, I sometimes feel as if I am being taken advantage of by someone who knows more than I do عندما أحصل على دعم فني من مزود خدمة أو منتج عالي التقنية، أشعر أحياناً كما لو أنني أتعرض للاستغلال من قبل شخص ما يعرف أكثر مني.	1	2	3	4	5
Technical support lines are not helpful because they don't explain things in terms I understand خطوط الدعم الفني ليست مفيدة لأنها لا تشرح الأشياء بعبارات أفهمها.	1	2	3	4	5
Sometimes, I think that technology systems are not designed for use by ordinary people في بعض الأحيان، أعتقد أن أنظمة التكنولوجيا ليست مصممة للاستخدام من قبل الناس العاديين.	1	2	3	4	5
There is no such thing as a manual or instructions for a high-tech product or service that's written in plain and simple language لا يوجد شيء مثل كتيب أو تعليمات لمنتج أو خدمة عالية التقنية مكتوبة بلغة سهلة وبسيطة.	1	2	3	4	5
People depend too much on technology to do things for them يعتمد الأشخاص كثيراً على التكنولوجيا لتقوم بأشياء لمصلحتهم.	1	2	3	4	5
Too much technology distracts people to a point that is harmful الكثير من التكنولوجيا يصرف انتباه الناس إلى نقطة مُضرة.	1	2	3	4	5
Technology lowers the quality of relationships by reducing personal interaction with family and friends تقلل التكنولوجيا من جودة العلاقات من خلال تقليل التفاعل الشخصي مع العائلة والأصدقاء.	1	2	3	4	5