

INTENTION TO ADOPT INTERNET PROTOCOL VERSION SIX AMONG
INFORMATION TECHNOLOGY STAFF IN HIGHER EDUCATION
INSTITUTIONS, MUSCAT, OMAN

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UNIVERSITI TEKNOLOGI MALAYSIA

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DEDICATION

This thesis is dedicated to my father, who taught me that the best kind of knowledge to have is that which is learned for its own sake. It is also dedicated to my mother, who taught me that even the largest task can be accomplished if it is done one step at a time.

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ABSTRACT

An Internet Protocol (IP) address plays an essential role in the structure of the internet by providing a unique address to identify each connected device. A world with continuously evolving modern technologies requires organisations and individuals to keep adapting to the evolved technologies. In this regard, the migration to the IPv6 protocol from the IPv4 protocol has become a critical issue for any organisation. Therefore, this research aimed to investigate the key factors that influence IPv6 adoption. Using the Unified Theory of Acceptance and Use of Technology (UTAUT- 2), this research proposed an integrated model incorporating seven key general attributes. Additionally, the UTAUT-2 was expanded by adding trustworthiness factors and resistance to change to the model. The mediating role of resistance to change was also taken into consideration. To achieve the research objectives, an online survey was designed to collect data from 236 IT employees working in higher education institutions (HEIs) in Oman. The data were analysed using structural equation modelling (PLS-SEM) with the SmartPLS software. The findings revealed that performance expectancy, effort expectancy, hedonic motivation, trust in government, and trust in technology positively and significantly influence the behavioural intention to adopt the IPv6 protocol. Moreover, it was found that resistance to change has a direct negative impact on behavioural intention but has no mediating effect. Social influence, facilitating conditions, price value, and habit showed no significant effect on the behavioural intention to adopt IPv6. Finally, behavioural intention demonstrated a positive and significant relationship with technology adoption behaviour. The present research has implications for theory and practice. From a theoretical perspective, the study contributes to extant knowledge via theory extension and opens new avenues for future studies. In practical terms, the study provides new inputs for successful technology adoption. Lastly, from a methodological point of view, the study demonstrates the importance of conducting an importance-performance map analysis (IPMA) in examining factors that impact technology adoption behaviour.

ABSTRAK

Alamat Protokol Internet (IP) memainkan peranan penting dalam struktur internet dengan memberikan alamat unik untuk mengenal pasti setiap peranti yang disambungkan. Dunia dengan teknologi moden terkini yang terus berkembang memerlukan organisasi dan individu untuk terus menyesuaikan diri dengan teknologi yang berkembang. Dalam hal ini, penghijrahan ke protokol IPv6 dari protokol IPv4 menjadi isu kritikal bagi mana-mana organisasi. Oleh itu, penyelidikan ini bertujuan untuk mengkaji faktor-faktor utama yang mempengaruhi penggunaan IPv6. Dengan menggunakan Teori Penerimaan dan Penggunaan Teknologi Bersatu (UTAUT-2), penyelidikan ini mencadangkan model bersepadu, yang merangkumi tujuh atribut umum utama. Selain itu, UTAUT-2 diperluas dengan menambahkan faktor kepercayaan dan ketahanan terhadap perubahan pada model. Peranan pengantara perlawanan terhadap perubahan diambil kira. Untuk mencapai objektif penyelidikan, tinjauan dalam talian dirancang untuk mengumpulkan data dari 236 pekerja IT yang bekerja di institusi pengajian tinggi di Oman. Data dianalisis menggunakan Pemodelan Persamaan Struktur-Kuasa Dua Terkecil Separa (PLS-SEM) dengan perisian SmartPLS. Hasil kajian menunjukkan bahawa jangkaan prestasi, jangkaan usaha, motivasi hedonik, kepercayaan terhadap kerajaan, dan kepercayaan terhadap teknologi mempengaruhi niat tingkah laku untuk menggunakan protokol IPv6 secara positif dan signifikan. Lebih-lebih lagi, didapati bahawa penentangan terhadap perubahan mempunyai kesan negatif terhadap niat tingkah laku tetapi tidak menunjukkan kesan pengantara. Pengaruh sosial, keadaan pemudahcara, nilai harga, dan kebiasaan juga tidak mempunyai pengaruh yang signifikan terhadap niat tingkah laku terhadap penggunaan IPv6. Akhir sekali, niat tingkah laku mempunyai hubungan positif dan signifikan dengan tingkah laku penggunaan teknologi. Penyelidikan ini mempunyai implikasi terhadap teori dan praktik. Dari perspektif teori, kajian ini menyumbang kepada pengetahuan dengan pengembangan teori serta membuka jalan baru untuk kajian masa depan. Dari segi praktikal, kajian ini memberikan input baru untuk penggunaan teknologi yang berjaya. Terakhir, dari sudut metodologi, kajian menunjukkan pentingnya melakukan analisis peta kepentingan-prestasi (IPMA) dalam meneliti faktor-faktor yang mempengaruhi tingkah laku penggunaan teknologi.

TABLE OF CONTENTS

	TITLE	PAGE
	DECLARATION	iii
	DEDICATION	iv
	ACKNOWLEDGEMENT	v
	ABSTRACT	vi
	ABSTRAK	vii
	TABLE OF CONTENTS	vii
	LIST OF TABLES	xiii
	LIST OF FIGURES	xv
	LIST OF ABBREVIATIONS	xvi
	LIST OF APPENDICES	xvii
CHAPTER 1	INTRODUCTION	1
1.1	Introduction	1
1.2	Background of the Study	1
1.3	Problem Statement	6
1.4	Research Questions	11
1.5	Research Objectives	12
1.6	Research Scope	13
1.7	Selection of the Variables	14
1.8	Conceptual and Operational Definition of the Variables	15
1.8.1	Performance Expectancy	15
1.8.2	Effort Expectancy	16
1.8.3	Social Influence	16
1.8.4	Facilitating Conditions	16
1.8.5	Hedonic Motivation	16
1.8.6	Habit	17
1.8.7	Price Value	17

1.8.8	Behavioural Intention (BI)	17
1.8.9	Trustworthiness	18
1.8.10	Resistance to Change	18
1.8.11	Technology Adoption	18
1.9	Research Significance	19
1.9.1	Theoretical Significance	19
1.9.2	Practical Significance	20
1.10	Organisation of the Thesis	21
1.11	Chapter Summary	23
CHAPTER 2	LITERATURE REVIEW	25
2.1	Introduction	25
2.2	IPv6 Adoption	26
2.2.1	IPv6 Adoption in Oman	32
2.3	Factors Affecting IPv6 Adoption	34
2.4	Theoretical Background	36
2.4.1	Technology Adoption Literature	36
2.4.2	Underpinning Theory (UTAUT-2)	41
2.4.3	Justification for Choosing UTAUT-2	46
2.5	Behavioural Intention	47
2.6	Independent Variables	49
2.6.1	Trustworthiness	50
	2.6.1.1 Trust in Technology	51
	2.6.1.2 Trust in Government	52
2.7	Mediator Variable	54
2.7.1	Resistance to Change	54
2.8	Literature Summary and Identified Gaps	56
2.9	Research Framework	61
2.10	Hypothesis Development	64
2.10.1	Performance Expectancy and Behavioural Intention	64
2.10.2	Effort Expectancy and Behavioural Intention	65
2.10.3	Social Influence and Behavioural Intention	67

2.10.4	Facilitating Conditions and Behavioural Intention	68
2.10.5	Hedonic Motivation and Behavioural Intention	69
2.10.6	Price Value and Behavioural Intention	70
2.10.7	Habit and Behavioural Intention	72
2.10.8	Trustworthiness and Behavioural Intention	74
2.10.9	Mediating Role of Resistance to Change	76
2.10.10	Behavioural Intention and Technology Adoption	78
2.11	Chapter Summary	82
CHAPTER 3	RESEARCH METHODOLOGY	83
3.1	Introduction	83
3.2	Research Philosophy	84
3.3	Research Methodology	86
3.4	Research Approach	87
3.5	Research Design	90
3.5.1	Research Strategy	91
3.5.2	Research Time Horizon	92
3.6	Research Instrument	93
3.6.1	The Questionnaire Design	93
3.6.2	Questionnaire Development	94
3.6.3	Layout of the Questionnaire	99
3.6.4	Translation of the Questionnaire	100
3.7	Population and Sampling	101
3.7.1	Unit of Analysis	101
3.7.2	Target Population	101
3.7.3	Sampling Technique	102
3.7.4	Sample Size	102
3.7.5	Sample Selection	104
3.8	Validity and Reliability of the Questionnaire	105
3.8.1	Content Validity	105
3.8.2	Construct Validity	106

3.8.3	Reliability	106
3.9	Pre-Test	107
3.10	The Pilot Study	108
3.11	Data Collection Procedure	110
3.12	Data Analysis	111
3.12.1	The Measurement Model	113
3.12.2	The Structural Model	114
3.12.3	Mediation Analysis	115
3.13	Importance-Performance Map Analysis (IPMA)	116
3.14	Chapter Summary	118
CHAPTER 4	DATA ANALYSIS AND FINDINGS	119
4.1	Introduction	119
4.2	Response Rates	119
4.3	Assessment of Outliers	120
4.4	Descriptive Analysis	121
4.4.1	Profile of Respondents	121
4.4.2	Normality Test	122
4.5	Multicollinearity Test	124
4.6	Measurement Model Assessment	125
4.6.1	Construct Reliability	127
4.6.2	Indicator Reliability: Outer Loadings	128
4.6.3	Convergent Validity: Average Variance Extracted (AVE)	130
4.6.4	Discriminant Validity	131
4.6.4.1	Cross-Loadings	132
4.6.4.2	Fornell-Larcker criterion	136
4.6.4.3	The Heterotrait-Monotrait Ratio of Correlation (HTMT)	138
4.7	Assessment of The Structural Model	140
4.7.1	Structural Model	140
4.7.2	Direct Hypothesis Testing	142
4.7.3	Coefficient of Determination, R ²	143

4.7.4	Effect Size, f^2	144
4.7.5	Predictive Relevance (Q^2)	145
4.7.6	Mediation Effect Analysis	146
4.8	Importance-Performance Map Analysis (IPMA)	147
4.9	Chapter Summary	150
CHAPTER 5	DISCUSSION AND CONCLUSION	151
5.1	Introduction	151
5.2	Discussion of Findings	151
5.3	Research Contributions	161
5.3.1	Theoretical Contributions	161
5.3.2	Practical Contributions	162
5.4	Limitations and Suggestions for Future Research	166
5.5	Chapter Summary	167
	REFERENCES	169
	LIST OF PUBLICATIONS	217

LIST OF TABLES

TABLE NO.	TITLE	PAGE
Table 1.1	Number of public and private HEIs in Oman	14
Table 2.1	The Omani National Plan of IPv6 migration (Musawi et al. 2018)	33
Table 2.2	Comparing the different models	38
Table 2.3	Definitions of the UTAUT factors	41
Table 2.4	Applied UTAUT in the original context	42
Table 2.5	UTAUT integrations	44
Table 2.6	Four main types of UTAUT extension	45
Table 2.7	List of study hypotheses	80
Table 3.1	Comparison of research philosophies	85
Table 3.2	Summary of the research methodology	87
Table 3.3	Differences between research approaches	89
Table 3.4	Measurement items	96
Table 3.5	Summary of the questionnaire items	99
Table 3.6	Summary of sample selection	104
Table 3.7	Cronbach's alpha values	107
Table 3.8	Sample size for pilot study	109
Table 3.9	Reliability and validity of pilot test data	110
Table 3.10	Summary of the statistical tests and methods	113
Table 3.11	Steps for assessing the structural model using PLS-SEM (Hair et al., 2014)	114
Table 4.1	Usable questionnaires for data analysis	120
Table 4.2	Outlier assessment	121
Table 4.3	Profile of respondents (N=232)	122
Table 4.4	Results of skewness and kurtosis for normality test (N=232)	123
Table 4.5	Test for multicollinearity	124

Table 4.6	Cronbach's alpha and composite reliability	128
Table 4.7	Factor loadings	129
Table 4.8	Average variance extracted (AVE) results	131
Table 4.9	Cross-loading	133
Table 4.10	Results of discriminant validity by Fornell-Larcker criterion	137
Table 4.11	Results of discriminant validity by HTMT	139
Table 4.12	Summary of direct effects	143
Table 4.13	R ² of endogenous latent variables	144
Table 4.14	Effect size, f ² , results	144
Table 4.15	Predictive relevance (Blindfolding) Q ² results	146
Table 4.16	Mediation analysis results	146
Table 4.17	Importance-Performance Map Analysis (IPMA) results	147

LIST OF FIGURES

FIGURE NO.	TITLE	PAGE
Figure 1.1	Current status of IPv6 deployment in Oman	7
Figure 1.2	Thesis structure	21
Figure 2.1	Path of the literature review	26
Figure 2.2	The number of internet users in Oman	32
Figure 2.3	Increase in number of users of IPV6 in Oman	33
Figure 2.4	Classification of technology adoption literature	37
Figure 2.5	UTAUT-2 model	40
Figure 2.6	The proposed theoretical framework	63
Figure 3.1	A summary path of the research methodology	83
Figure 3.2	The “research onion”	84
Figure 3.3	Components of the research approach	88
Figure 3.4	Research design process	91
Figure 3.5	Data analysis steps	112
Figure 3.6	Summary of PLS-SEM Process	115
Figure 3.7	Steps of the IPMA analysis	117
Figure 3.8	IPMA grid	118
Figure 4.1	Measurement model	126
Figure 4.2	PLS bootstrapping results	141
Figure 4.3	Importance-performance map analysis	147
Figure 4.4	IPMA results for the path model	149

LIST OF ABBREVIATIONS

IPV4	-	Internet Protocol Version 4
EE	-	Effort Expectancy
FC	-	Facilitating Condition
HB	-	Habit
HEIs	-	Higher Education Institutions
HM	-	Hedonic Motivation
IANA	-	Internet Assigned Numbers Authority
IETF	-	Internet Engineering Task Force
IOT	-	Internet of Things
IPV6	-	Internet Protocol Version 6
IS	-	Information System
ITA	-	Information Technology Authority
LIRs	-	Local Internet Registry
NIRs	-	National Internet Registry
NRR	-	National Regulators IPv6 Deployment Roadmaps
PE	-	Performance Expectancy
PV	-	Price Value
RIRs	-	Regional Internet Registry
SI	-	Social Influence
TA	-	Technology Adoption
TiG	-	Trust in Government
TiT	-	Trust in Technology
TRA	-	Telecommunications Regulatory Authority
UTAUT	-	Unified Theory of Acceptance and Use of Technology

LIST OF APPENDICES

APPENDIX	TITLE	PAGE
Appendix A	Validation Form	189
Appendix B	Research Questionnaire in English and Arabic Version	200
Appendix C	Researcher Facilitation Letter	213

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter begins with a review of the background of this study, followed by a presentation of the gaps and problem statement. Subsequently, the research questions and research objectives are presented. Then, the key concepts are defined and operationalised. Finally, this chapter ends with a discussion of the study's significance and scope, as well as the organisation of the thesis.

1.2 Background of the Study

Due to advancements in technology, the use of computers, tablets, mobile phones, and other devices or internet services has increased dramatically. This increase has led to the emergence of the Fourth Industrial Revolution (FIR), which includes the development of the Internet of Things (IOT), robots, and Artificial Intelligence (AI). Cisco experts predict that within the next 10 years, the number of IOT devices will reach more than 50 billion at a rate of six Internet-connected devices per person (Cisco, 2013; Nordrum, 2016). These developments have further led to a general increase in the use of the internet as well as an increased demand for various internet services. In particular, in hand with increased scalability, reachability, service quality, and end-to-end interworking of physical devices, vehicles, buildings, mobile devices, and more, the demand for Internet protocol (IP) addresses to identify connected devices and allow them to communicate has dramatically increased the need for the migration to the new protocol.

Indeed, according to Suleiman and Cordry (2017), with the growth in the use of smart physical devices, buildings, and vehicles, along with the construction of

smart cities, new addresses to identify and connect these devices are crucial. Therefore, to solve this issue, it is necessary to provide billions of addresses to accommodate current global market demands. According to Main et al. (2015), the internet protocol (IP) is “a communication protocol used to allow devices to communicate with each other.” The IP version 4 (IPv4), which is currently applied in most countries, allocates only 4.2 billion IP addresses for devices, which has led to the near exhaustion of space due to an increase in the number of internet users and devices (Pickard et al., 2017; Khasawneh, 2019). In this regard, there is a need for a new protocol to resolve this problem in the long term.

In 1992, the Network Working Group of the Internet Engineering Task Force (IETF) realised that the IPv4 address space was inadequate to support the growth of the internet, and would eventually be depleted in the next few years. From exhaustion point, the Internet Assigned Numbers Authority (IANA) can no longer assign a new address space in the IPv4 protocol (Wu et al., 2013; Pickard et al., 2019). Therefore, IPv4 is now a legacy protocol; all future internet growth will occur over the IP version 6 (IPv6). IPv6 has been developed to counter the limitations of IPv4 and to provide a larger address scale to meet the rapid growth in smart devices in the midst of the Fourth Industrial Revolution (Main, Zakaria, & Yusof, 2015; Zander & Wang, 2018; Qasem et al., 2020).

IPv6 deployment has dramatically increased across the world. Google reported that 49 countries have delivered up to 5% of traffic over IPv6, and in 24 countries, the IPv6 traffic exceeds 15%. In addition, up to 25% of networks around the world, such as in Japan, USA, and India, advertise IPv6 connectivity; these countries can be classified as “Innovators” and “Early Adopters” of deployment (Internet Society, 2018).

Considering the exhaustion point of IPv4, IETF has worked to develop a new protocol, which is designed to provide more than one unique address for every connected device. Based on the IETF report, all requirements for the protocol’s technical foundations have been built, but its deployment and capability for use are being challenged at the individual and organisational levels (Musawi, Shubair,

Samih, & Abraham, 2018). Therefore, migration to IPv6 from IPv4 remains a critical issue.

The adoption and transition from IPv4 to IPv6 is a long-term process that leads to improved business performance, competency, competitive advantages and customer satisfaction in any organisation (Main et al., 2015; Dawadi & Shakya, 2016; Degezelle, 2017). Many researchers have studied organisational readiness for migration to IPv6 from different aspects and found that the lack of planning to migrate to IPv6 is a key problem in the ICT industry (Khasawneh & Al-Armouty, 2019; Wang and Zander, 2018; Main et al., 2015; Main et al., 2014). According to the previous literature, individual factors that improve the readiness of the organisations for IPv6 migration can be summarised as follows: sufficient time for planning, financial resources, application compatibility, and a secure network environment. Also, IPv6 readiness is affected by awareness, the current environment, planning, deployment, infrastructure, policy frameworks, training, research, and human resources (Musawi *et al.*, 2020; Khasawneh and Al-Armouty, 2019; Wibowo and Statement, 2017; Akour, 2016).

In the context of higher education institutions (HEIs), a few studies have attempted to determine HEIs' readiness and deployment of IPv6. The results of these studies revealed that IPv6 has not been sufficiently attended to by HEIs and is only partially planned for, implemented, or deployed. Consequently, these studies have raised the need to study the readiness of HEIs to adopt IPv6 based on factors like awareness, current environment, planning, policy framework, research, human resources, and course provision (Southworth, 2016; Wibowo and Statement, 2017; Musawi *et al.*, 2018). Ultimately, the assessment of readiness level must be a first step in the planning process, in order to identify and enhance the factors that influence organisational readiness.

In Oman, the number of internet users is increasing year by year. According to Internet Live Statistics, the number of internet users as of 2019 was 4,011,004, with an annual increase of 4.1% (Retrieved from <https://www.internetlvestats.com/>). This will lead to the exhaustion of Oman's IPv4 in the next few years, which makes

the transition from IPv4 to IPv6 inevitable. However, there is a low level of general awareness about the benefits of IPv6 in Oman, while there is a huge dependence on only IPv4 solutions (TRA Oman, 2020). This may largely be due to the fact that Oman still has millions of IPv4 addresses available; however, with the increasing use of smart devices, this perception will prove to be erroneous. Currently, Oman's higher education sector is one of the sectors that must prepare for IPv6 to ensure their future success in an ever-changing web environment (Musawi et al., 2018).

The Sultanate of Oman has taken significant steps to develop the ICT infrastructure and policy and regulatory framework to cope with IPv6 technology adoption. According to the report of the Telecommunications Regulatory Authority in the Sultanate of Oman, despite the existence of a national plan for the transition to the new protocol, many Omani HEIs have not taken any steps towards adopting the new protocol (Musawi et al., 2018).

Therefore, one way of ensuring the actual implementation of IPv6 protocol is to explore and ascertain the factors that affect HEIs' behavioural intention towards adopting IPv6 protocol prior to implementation. Nevertheless, there is a lack of empirical evidence on the adoption of IPv6 in developing countries like Oman. Besides, although several empirical studies have attempted to explain the IPv6 adoption phenomenon, the factors responsible for resistance to adoption have not been clearly identified (Samhan, 2018; Samhan & Joshi, 2017; Ali, Zhou, Miller, & Ieromonachou, 2016; Zuiderwijk, Janssen, & Dwivedi, 2015; Alomari, Sandhu, & Woods, 2014). Therefore, the consideration of resistance factors that influence an organisation's intention to adopt or resist IPv6 could provide a better explanation.

In the context of higher education, researchers point to the insufficiency of research targeting HEIs with regard to the adoption of IPv6 (Fiaz, Abulkasim, & Ahmad, 2015; Pickard and Patrick, 2015; Southworth, 2016). Furthermore, the current body of literature on IPv6 adoption indicates that most studies have primarily focused on IPv6 readiness, enablement, and effectiveness along with security implications, rather than behavioural intentions (Wang & Zander, 2018). For instance, Fiaz et al. (2015) conducted a study to examine IPv6 enablement on

publicly available websites of 83 HEIs in Malaysia. The study concluded that universities in Malaysia need sufficient time to plan for migration to the IPv6 protocol, as well as funds to replace technological equipment and share data. Likewise, Southworth (2016) conducted a research on 1000 American universities and colleges to find out the factors influencing their migration to the new internet protocol, reporting that factors such as training, policy, infrastructure, and implementation are related to IPv6 adoption.

According to the World Economic Forum, the Middle East has made good efforts towards IPv6 migration. Such efforts include the Sultanate of Oman initiating a significant step by developing Information Communication Technology (ICT) to improve the macroeconomic environment and higher education. However, the country needs to continue its efforts to improve education and training systems (Report et al., 2018). Prior literature states that in Oman, efforts in moving to IPv6 implementation are scarce, which has led to a low level of readiness for IPv6 migration among organisations. This has significant negative implications for the higher education industry in the country in next few years (Musawi et al., 2018; TRA Oman, 2018; Musawi *et al.*, 2020). Musawi *et al.*, (2020) at the end of their research recommended investigating experts' views to determine the Omani higher education institutions readiness to the deployment of IPv6 in terms of: awareness, current environment, planning, policy frameworks, research, human resources. Moreover, they recommended that future research should look into ways to strategize development and implement IPv6.

Accordingly, this research sought to explore the factors that impact the behavioural intention and actual adoption of the IPv6 protocol in Oman HEIs. The identification of these factors is critical to avoid failure in IPv6 adoption. This goal was achieved by using the Unified Theory of Acceptance and Use of Technology (UTAUT-2) in addition to new constructs to extend the current theory and increase the theoretical understanding on the adoption of IPv6. The proposed new variables were trustworthiness and resistance to change (RTC). In this study, trustworthiness included trust in government (TiG) and trust in technology (TiT), both of which were used to predict the formation of behavioural intention and new technology adoption.

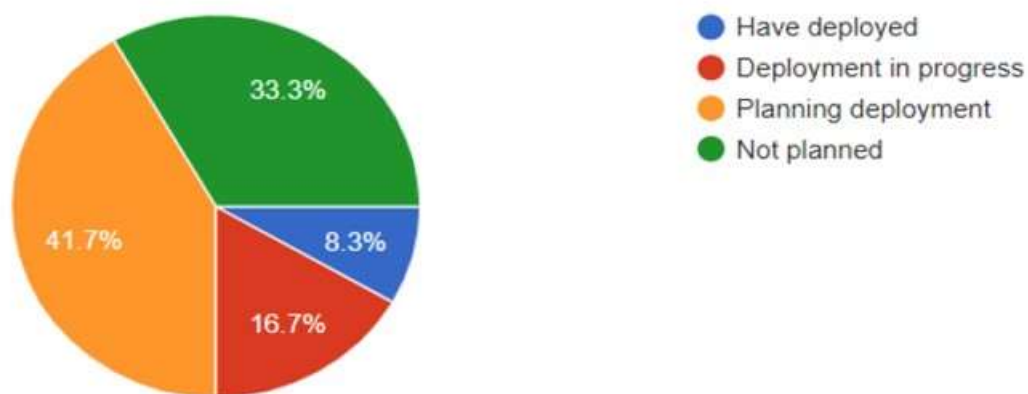
1.3 Problem Statement

The principal technological limitation of the IPv4 is its 32-bit address field in the protocol header, which limits the number of unique IPv4 addresses to 4.3 billion. This is not enough space to accommodate the growth of next generation information technologies such as the IOT, Software Defined Networks, Cloud Computing, and Mobility (Pickard et al., 2019). Due to the deterioration of IPv4 addresses, IPv6 has become a necessity to accommodate the growing number of users, especially in the field of academic institutions (Naagas et al., 2020). Thus, the transition from IPv4 to IPv6 has become inevitable and urgent (Gu et al., 2020).

Accordingly, the new IPv6 is gaining momentum in most countries, particularly in developing nations (Khasawneh & Al-Armouty, 2019b). However, statistics suggest that the actual adoption of IPv6 has been insufficient. Multiple stakeholders are reluctant to replace IPv4 with IPv6, as they have neither the certain future nor the clear technical guideline to do so (Gu et al., 2020). It is clear that the adoption of the new protocol and the readiness of many countries is slow and only noticeable in developing nations. This may lead to a new digital divide which entails significant effects on economic growth, especially for new digitally dependent economies (Khasawneh & Al-Armouty, 2019b). It is significant to note that user acceptance and confidence are crucial for the further development of any new technology. Indeed, acceptance has been viewed as a function of user involvement in system development (Taherdoost, 2018).

A world with modern technologies that keep evolving requires organisations and individuals to continuously adapt to the evolved technologies. Thus, researchers must always remain ahead of these innovations by investigating future technologies (Qasem et al., 2020). In relation to this, the migration from IPv4 to IPv6 protocol in a university requires a long period of time to be implemented. The process requires IPv4 and IPv6 running in one network, with an IPv6 transition mechanism in place to enable both protocols to communicate. Proper planning and a suitable choice of transition mechanism can avoid any interferences to the current campus network during the deployment stage (Naagas et al., 2020).

In the context of this study, IPv6 adoption in Oman is slow and not largely considered for implementation by HEIs. As evidence, a recent study by Musawi et al. (2020) asked participants to describe the IPv6 situation in their institution. Based on the findings, 41.7% of respondents stated that IPv6 has not been deployed, while 33.3% of them believed that there is no current plan to deploy it in their institution (see Figure 1.1). This finding indicates that the readiness to adopt and implement IPv6 in Oman HEIs is still in the early stages, which calls for urgent attention. Moreover, a review of the literature shows that there is a lack of studies on Omani HEIs' IPv6 readiness (Musawi et al., 2020; Musawi et al., 2018).



Source: (Musawi et al., 2020)

Figure 1.1 Current status of IPv6 deployment in Oman

Indeed, IPv6 will form the next generation of Internet protocol, so organisations are well-advised to invest the time, effort, and resources necessary to ensure that IPv6 deployments are done right (Pickard et al., 2019). Therefore, it is essential to investigate the main factors that influence behavioural intention and new technology adoption in the context of IPv6. In fact, future studies have been suggested to examine the effects of individual and organisational factors on IPv6 adoption (Wang & Zander, 2018; Putri & Sucahyo, 2016; Main et al., 2015). In the existing literature, several attributes have been presented as predictors of new technology adoption, such as compatibility, awareness, perceived value (Singh & Sinha, 2020), service quality, relative advantage (Almaiah & Al-Khasawneh, 2020), perceived ease of use, and perceived usefulness (Chatterjee, 2020). However, there is

still a need to empirically test the influence of certain attributes on new technology adoption behaviour. For instance, to date, less attention has been given to technology resistance (Ishak & Newton, 2016; Lallmahomed et al., 2017; Samhan & Joshi, 2017; Samhan, 2018; Shahbaz et al., 2019; Shahbaz, Gao, Zhai, & Shahzad, 2020; Perri et al., 2020). This calls for a deep and rich unified understanding of technology-related resistance to change. Although there are studies that have considered resistance to change as a main or moderating variable that impacts intention to adopt a new technology, there is still dearth of research on resistance to change as an underlying mechanism that impacts technology adoption. Scant literature also exists on the potential predictors of resistance to change in the technology context. For example, Perri *et al.*, (2020), examined the adoption of smart grids by adding resistance to change as an exogenous variable that affects the behavioural intention to adopt technology. Their result indicates that resistance to change has a negative influence on the intention to adopt smart grids.

In another study, Lallmahomed *et al.*, (2017) conceptualised resistance to change as citizens' opposition to switching from using traditional government offices to adopting e-government (e-Gov) services in a pre-adoption stage. Their result shows that resistance to change has a negative relationship with the intention to use e-Gov services. Also, their study suggests that future research should explore the antecedents of resistance to change in the pre-adoption phase.

Studies that examined the moderating role of resistance to change include those by Shahbaz et al. (2019) and Shahbaz et al. (2020), who found that employee resistance to change is a key factor underlying the failure of an innovative system in organisations. It is also stated that resistance to change from employees is a key factor that affects the adoption of different innovative systems, especially in developing countries (Nejati, Rabiei, & Jabbour, 2017; Reginato, Fadda, & Paglietti, 2016). In another study of green supply chain management adoption, the researcher investigated resistance to change as a moderator between behavioural intention and the adoption of green supply chain management, concluding that higher resistance to change among employees leads to the non-implementation of green supply chain management (Nejati et al., 2017). Moreover, Samhan (2018) indicated that future

research needs to pay attention to the different forms of resistance manifestation, including the context in which resistance is being evaluated, the object of resistance, and the potential antecedents that may predict resistance. Scholars have also been encouraged to discuss how technology resistance may lead to different outcome variables by incorporating other potential outcomes, such as continuous commitment, turnover intention, trust and job satisfaction, among others (Ishak & Newton, 2016; Laumer et al., 2015; Samhan, 2018b; Perri et al., 2020; Shahbaz et al., 2020; Shahbaz et al., 2019). By considering the definition of resistance to change in this study which refers to “the degree to which employees are resistant to use a new technology and change accordingly”, and since Piderit (2000) indicated RTC has three dimensional (negative), (affective), and (behavioral). In this study, RTC is examined in the behavioral dimension, which involves behaviors intentions. Although the current literature has examined many RTC antecedents, the interrelationships between them are little investigated, and the need to expand to include various antecedents is essential, for example, mediation analysis. By addressing this knowledge gap, this research studies the role of the impact of mediating the relationship between trust and resistance to change. Therefore, the present study proposed a conceptual model, to uncover factors included (Trust in technology and trust in government) and how relate to resistance to change, and states the mediating effects of resistance to change on trust. The mediating effects of the study variable have never been explored earlier and therefore makes an immense contribution in the field of knowledge for practitioners and academicians. It should be noted that this study chose to investigate the concept of resistance from the perspective of people responsible for implementing or adapting to changes (Jacobs & Keegan, 2016; Kumari, 2017).

In the IPv6 protocol context, the subject of resistance to change has not been given much study by researchers, highlighting the need for greater empirical attention on the different manifestations of resistance. In this study, based on the literature, the researcher found that the mediation effects of resistance to change in adopting the new Internet protocol have not been studied. In this study, the conceptualization of technology resistance suggests that users evaluate technology in terms of its features and existing conditions (as an individual and as an organization) and based on these evaluation users can make projections about the potential adoption of the technology. Which can test the intention to adopt the technology

based on (Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Hedonic Motivation, Habit, Price Value) and intention to resist based on trust in government and trust in technology (Samhan, 2018b). Since resistance behaviours could be distinguished between rejection and non-adoption. Rejection refers to the conscious decision made by the users to avoid the technology, as opposed to non-adoption, which implies potential future use, which can be, after the adoption stage, users can develop different behaviours based on their experience and continuous evaluation of the technology, which may include the manifestation of resistance behaviour towards the technology (Samhan, 2018b). However, in this study and in the contextualization of technology resistance the end-users of this protocol have been identified based on previous experience using Internet protocols and who are involved in making decisions about the adoption of this protocol. Furthermore, the type of technology enforcement can be considered as well voluntary vs. utilitarian. In this study, based on the literature, the researcher found that trustworthiness sets as an antecedent to resistance to change, which includes (trust in technology and trust in government), and the researcher also found that the mediation effects of resistance to change on trustworthiness have not been previously studied. This constitutes a knowledge gap that must be addressed to expand knowledge and open the door for future research in this field.

Moreover, the vast majority of previous studies point out that the way individuals perceive trustworthiness affects their intention to adopt or use technology (Murathan et al. 2017; Al Mansoori 2017; Kayali et al., 2020). Results demonstrate that trustworthiness, including government trust and Internet trust, is inversely associated with resistance to change (Abu-Shanab 2014; Lallmahomed et al., 2017). Referring to the existing empirical evidence, user trust may be treated as a strategic management opportunity critical to new technology adoption (Harwood & Garry, 2017). Therefore, in the context of IPv6 adoption, the present study added trustworthiness, namely trust in government and trust in technology, as a key predictor of behavioural intention for IPv6 adoption.

In addition, the justification of adding trustworthiness as a new construct in this study was because of the lack of studies that have examined the effect of this

factor on IPv6 protocol adoption. As such, its inclusion was intended to improve theoretical contributions in information system research. In the current study, trust in government and trust in technology were suggested as antecedents of IPv6 protocol adoption, with resistance to change as the mediator between trustworthiness and behavioural intention to adopt IPv6 protocol. Therefore, this study examined how trust is associated with the adoption of IPv6 protocol.

Based on the above discussion, this research fills research gaps by examining the factors influencing adoption of this protocol using the factors of the UTAUT-2 model while extending it by adding trustworthiness as a key predictor of adoption and the factor of resistance to change by analyzing the direct effects of the predecessors of resistance to change on the trustworthiness and behavioral intention to adopt this protocol. In doing so, the present study extends the UTAUT-2 model so that it can be used in developing countries like Oman.

Overall, this study addresses the gaps in the literature on the factors that influence the end-user's intention to adopt IPv6. To achieve this objective, seven factors of the UTAUT-2 model were empirically tested, namely performance expectancy, effort expectancy, hedonic motivation, social influence, facilitating condition, price value, and habit. Trustworthiness (trust in government and trust in technology) was presented as main variables that impact behavioural intention. Additionally, the mediating role of resistance to change between trustworthiness and behavioural intention was tested. The results of this study help stakeholders create a beneficial connection with institutions to determine the factors that influence the adoption of this protocol. Moreover, the present study extends the UTAUT-2 model so that it can be used in developing countries like Oman.

1.4 Research Questions

Taking into consideration the research gaps explained in the previous section, the main research question of this study was: "What are the main factors that

influence the decision to adopt IPv6 in Oman HEIs?” To be more precise, the following research questions were presented:

- 1) What is the relationship between UTAUT-2 factors and the behavioural intention to adopt IPv6 in Omani HEIs?
- 2) What is the relationship between trustworthiness factors and the behavioural intention to adopt IPv6 in Omani HEIs?
- 3) What is the relationship between resistance to change and the behavioural intention to adopt IPv6 in Omani HEIs?
- 4) Does resistance to change mediate the relationship between trustworthiness factors and the behavioural intention to adopt IPv6 in Omani HEIs?
- 5) What is the relationship between behavioural intention and IPv6 adoption behaviour in Omani HEIs?

1.5 Research Objectives

This study mainly aimed to use the UTAUT-2 to explore the factors influencing the adoption of the IPv6 protocol in Oman HEIs, particularly in Muscat. In more detail, the following research objectives were established:

- 1) To examine the association between UTAUT-2 factors and the behavioural intention to adopt IPv6 in Omani HEIs.
- 2) To determine the association between trustworthiness factors and the behavioural intention to adopt IPv6 in Omani HEIs.
- 3) To determine the association between resistance to change and the behavioural intention to adopt IPv6 in Omani HEIs.
- 4) To examine the mediating effect of resistance to change between trustworthiness factors and the behavioural intention to adopt IPv6 in Omani HEIs.
- 5) To determine the association between behavioural intention and IPv6 adoption behaviour in Omani HEIs.

1.6 Research Scope

The present study focused on technology adoption, more specifically, the factors determining IPv6 adoption in public and private universities and colleges in Oman. Higher education in Oman is one of the key sectors worthy of more attention to determine the reasons for their limited level of readiness and their general lack of preparation to adopt new technology (MOHE, 2020). These institutions are responsible for providing the needed human capital by producing manpower that has technological knowledge and can realise the Oman Vision 2040.

The population of this research was HEIs in Oman. There are a total of 66 universities and colleges spread all over Oman (Musawi et al., 2018; MOHE, 2020). Considering the number of universities and colleges, it was practically impossible to cover all institutions. Table 1.1, page 13 shows the number and percentage of public and private institutions in the various governorates in the Sultanate of Oman. As can be seen from the table, the vast majority of universities (46%) are located in capital city of Muscat. Therefore, Muscat universities and colleges were thus deemed to be a suitable and strong representative sample of the research population. Also, these colleges and universities in the capital are better positioned and most suitable to use new technology because of the strength of their surrounding infrastructure. They are further provided substantial training (e.g., instruction on installation, implementation, and problem solving) by the bodies responsible for monitoring the performance of these institutions. In addition, the government assists and supports the leaders in providing solutions to any identified problems in university education through technology. Therefore, since the selection of HEIs for empirical investigation was crucial for this study, choosing institutions in Muscat was consistent with the research goal.

Table 1.1 Number of public and private HEIs in Oman

N	The governorates	The number of institutions	Percentage %
1	Dahira	4	6.06 %
2	Al-buraimi	3	4.54%
3	North Al-batinah	11	16.6%
4	South Al-batinah	3	4.54%
5	Dakhliya	4	6.06 %
6	Muscat	30	45.45 %
7	North Sharqia	2	3.03%
8	South Sharqia	4	6.06 %
9	Dhofar	5	7.57%
Total number of institutions			66

Source: Ministry of Higher Education (Statistics, 2019)

With regard to the adoption of IPv6 and the migration from IPv4 to IPv6 in HEIs, technical employees are the end-users and major stakeholders of IPv6 implementation. Therefore, it is important to understand the factors that delay these employees from adopting the protocol or having a positive behavioural intention towards using it in HEIs. Examining employees' intentions to use this new protocol will help universities understand and explain the important factors influencing their behavioural intention towards adopting this protocol. In addition, knowing these factors will enable stakeholders to undertake adequate planning and complete effective decision-making that will pave the way for the successful adoption of the IPv6 protocol (Bankole, 2016; Lallmahomed *et al.*, 2017; Tanduklangi, 2017)

1.7 Selection of the Variables

The selection of variables in this study was done based on a review of established theories referenced extensively in information technology research. The theory chosen to be extended in this study was the UTAUT-2 developed by Venkatesh *et al.* (2012). The choice of this theory and its associated variables was based on several criteria. First, this theory emerged through synthesising eight adoption models with several key factors: performance expectancy, effort expectancy, social influence, facilitating condition, hedonic motivation, price value,

and habit. Second, this theory is characterised by its flexible and expandable nature, which allows for the addition of new constructs. Third, most previous studies used the UTAUT-2 extensively as a foundation model to investigate the factors influencing the adoption of different technologies.

In this study, the UTAUT-2 was extended by adding the new variable of trustworthiness, which includes trust in government and trust in technology. In addition, a new mediating variable, i.e., resistance to change, was introduced to understand the relationship between trustworthiness and the behavioural intention to adopt IPv6. Previous studies indicate that resistance to change plays a vital role in impeding new technology adoption, which calls for empirical studies on resistance factors in different countries (Samhan & Joshi, 2017; Samhan, 2018). The next section reviews the conceptual and operational definitions of the key terms.

1.8 Conceptual and Operational Definition of the Variables

The purpose of this section is to establish an understanding of the constructs in this research, which are defined as follows:

1.8.1 Performance Expectancy

Performance expectancy is defined as "the degree to which using a technology will provide benefits to individual in performing certain activities" (Venkatesh et al., 2003, p.447). Performance expectancy in this thesis referred to "the degree to which an individual believes that using the IPv6 protocol will help him or her enhance job performance."

1.8.2 Effort Expectancy

Effort expectancy is defined as “the degree of ease associated with the use of a system” (Venkatesh et al., 2003, p. 450). Venkatesh et al., (2003) indicated that effort expectancy plays a key role in facilitating the acceptance of technology and has a significant influence on behavioural intention. Effort expectancy in this thesis referred to "the degree of easiness /effort associated with use of the IPv6 protocol".

1.8.3 Social Influence

Social influence is defined as “the degree to which an individual perceives that others believe he or she should use the new system” (Venkatesh et al., 2003, p.451). In this thesis, social influence refers to "the degree to which an individual feels pressure from important others, i.e., friends or colleagues, to adopt the IPv6.”

1.8.4 Facilitating Conditions

Facilitating conditions are defined as “the degree to which an individual believes that an organisational and technical infrastructure exists to support the use of the system” (Venkatesh et al., 2003, p.453). In this study, facilitating conditions referred to "An employee’s perception of the resources and support available to use the IPv6" which is the end-users’ expectations of the availability of technical support.

1.8.5 Hedonic Motivation

Hedonic motivation refers to “the positive emotion of an individual’s immediate satisfaction” (Venkatesh et al., 2012, p.161). In this thesis, hedonic motivation refers to “the pleasure or enjoyment derived from using a new

technology.". When confronting challenging operating conditions occur, users are further eager to adopt new technologies that is delivering the fast completion of most daily tasks, which will create personal satisfaction and positive pleasure and/or fun experienced during technology use, and that contributing positively to the intention to adopt (Akter *et al.*, 2021).

1.8.6 Habit

Habit is defined as "the degree to which the individual automatically performs actions with the technology" (Venkatesh *et al.*, 2012, p. 161). In the context of IPv6, habit is a fundamental element and should be adopted to explain both behavioural intention and user behaviour. Therefore, habit in this thesis referred to "the extent to which employees tend to use the IPv6 automatically because of learning."

1.8.7 Price Value

The price value construct has a positive impact on intention when the benefits of using a technology are perceived as greater than its monetary cost (Venkatesh *et al.*, 2012). Price value in this thesis was defined as "employees' cognitive trade-off between the perceived benefits of the IPv6 and the monetary cost of using it."

1.8.8 Behavioural Intention (BI)

Behavioral intention is a person's perceived likelihood or subjective probability that they will engage in a given behavior (Venkatesh *et al.*, 2012). In this study, behavioural intention was defined as "a person's inclination to use the IPv6 protocol in the near future".

1.8.9 Trustworthiness

Trustworthiness in information technology (IT) and Information Systems (IS) research plays a major role in measuring the links between individual or organisational factors and behavioural intentions to adopt a new technology. In this study, trustworthiness included trust in government and trust in technology. Trust in Government (TiG) refers to: “an individual’s perceptions of a government’s ability to meet their expectations to adopting IPv6 protocol and trustworthy”(Lallmahomed *et al.*, 2017). Whereas Trust in Technology (TiT) refers to: “the degree in which individuals believe IPv6 protocol meet their expectations and can be trusted.” (Abu-shanab, 2014).

1.8.10 Resistance to Change

Kim (2015), defined user resistance as "A resistance to change by users to any project associated with a new information technology implementation." Furthermore, from the organisational readiness perspective, the literature argues that there are three facets that need to be adopted by institutions for an IPv6 strategy: acquisition policies that promote readiness; the development of knowledge and experience; and pilot projects to facilitate the general adoption of IPv6. In this study, the concept of resistance to change was defined as "the degree to which employees are resistant to use the IPv6 and change accordingly”.

1.8.11 Technology Adoption

Generally, technology adoption refers to the acceptance, integration, and use of new technology in society. In this study, technology adoption referred to “the favourable (or unfavourable) attitude towards IPv6 protocol adoption in HEIs.”

1.9 Research Significance

1.9.1 Theoretical Significance

This study has several important research implications. First, it adds empirical literature to the IS field, especially on IPv6, by extending the UTAUT-2 with the addition of trustworthiness and resistance to change. The current study extends the UTAUT-2 not only by introducing new variables, but also by creating new relationships among the variables, i.e., resistance to change as a mechanism through which trustworthiness impacts behavioural intention. Second, the proposed variables of new technology adoption include critical factors identified from the literature review, along with new factors that were understudied in previous research, to determine their role in HEIs' consideration of IPv6 adoption.

This study is also significant from the contextual perspective. It contributes to IPv6 adoption research by studying it as a new technology in the context of Omani HEIs. IPv6 adoption in Oman is slow and largely neglected for implementation by HEIs (Musawi et al., 2020). Therefore, this study fills the contextual gap in the literature by proposing a model on the predictors of IPv6 adoption in Omani HEIs. More specifically, this study examined the relationships among the UTAUT-2 constructs and trustworthiness factors with regard to IPv6 adoption. Trustworthiness factors were added as a new contribution to the original framework because they are considered as key antecedents to any adoption of new technology (Alhogail, 2018; Tariq, Tayyaba, Rasheed, & Ashraf, 2017; Abu-shanab, 2014). Furthermore, the original constructs contained in the UTAUT-2 framework have been extended to account for 'resistance to change' as a mediating variable, which could help fill some theoretical gaps in existing theories about IPv6 adoption (Ishak & Newton, 2016; Rahman, Didarul Alam, & Taghizadeh, 2019). Therefore, the present study builds on the UTAUT-2 model so that it can be used in developing countries like Oman.

1.9.2 Practical Significance

The aim of this study is to examine the factors influencing the adoption of the IPv6 protocol in HEIs in Oman, Muscat. The findings of this study provide new insights to speed up the current progress of IPv6 adoption and facilitate a smoother migration process. This study is impactful for government, technology practitioners, managers/decision-makers, HEIs, and other stakeholders by raising their awareness about factors that contribute to adoption of this new technology. The practical contributions are as follows:

First, the study's findings are significant for the Telecommunications Regulatory Authority (TRA) and Information Technology Authority (ITA) of Oman for the formulation of policies and regulations for a comprehensive and smooth migration from IPv4 to IPv6. In fact, they can use the findings of this study to invest on factors that positively impact intention to adopt IPv6 protocol.

Second, this study is significant for HEIs, universities and college managers. The determination of employees' behavioural intentions to use this protocol assists management in appropriate planning and decision-making for successful adoption. In other words, knowing the factors that contribute to the adoption of IPv6 in colleges and universities is crucial for these HEIs' administrators. In addition, the findings of the study would be valuable to management in making decisions with respect to choosing the best time for migration from IPv4 to IPv6 (Zainab, Bhatti, Pangil, & Battour, 2015; Amara & Atia, 2016; Mohammadyari & Singh, 2015).

Third, this study enhances the knowledge, level of readiness, and preparation to migrate from IPv4 to IPv6 among the internet community. Understanding end-user behaviour with respect to the implementation of new technologies and resistance to change creates awareness to adopt this specific technology. Hence, this study serves as a reference for decision-makers in various institutions when tasked with taking the necessary steps to adopt new technology. Overall, there is a need for decision-makers to concentrate on the development of organisational resources to gain the highest quality of the new technology. Additionally, the results can be used by decision-

makers to develop suitable strategies for adopting a new technology, particularly IPv6.

1.10 Organisation of the Thesis

This study proceeds according to the scientific and logical sequence of its chapters, which provide an adequate explanation of its objectives, research methodology, data analysis, findings, and recommendations related to the successful implementation of the IPv6 protocol in HEIs in Muscat, Oman. This study consists of five chapters which are organized in systematic steps. The structure of this thesis is captured in Figure 1.2 below:

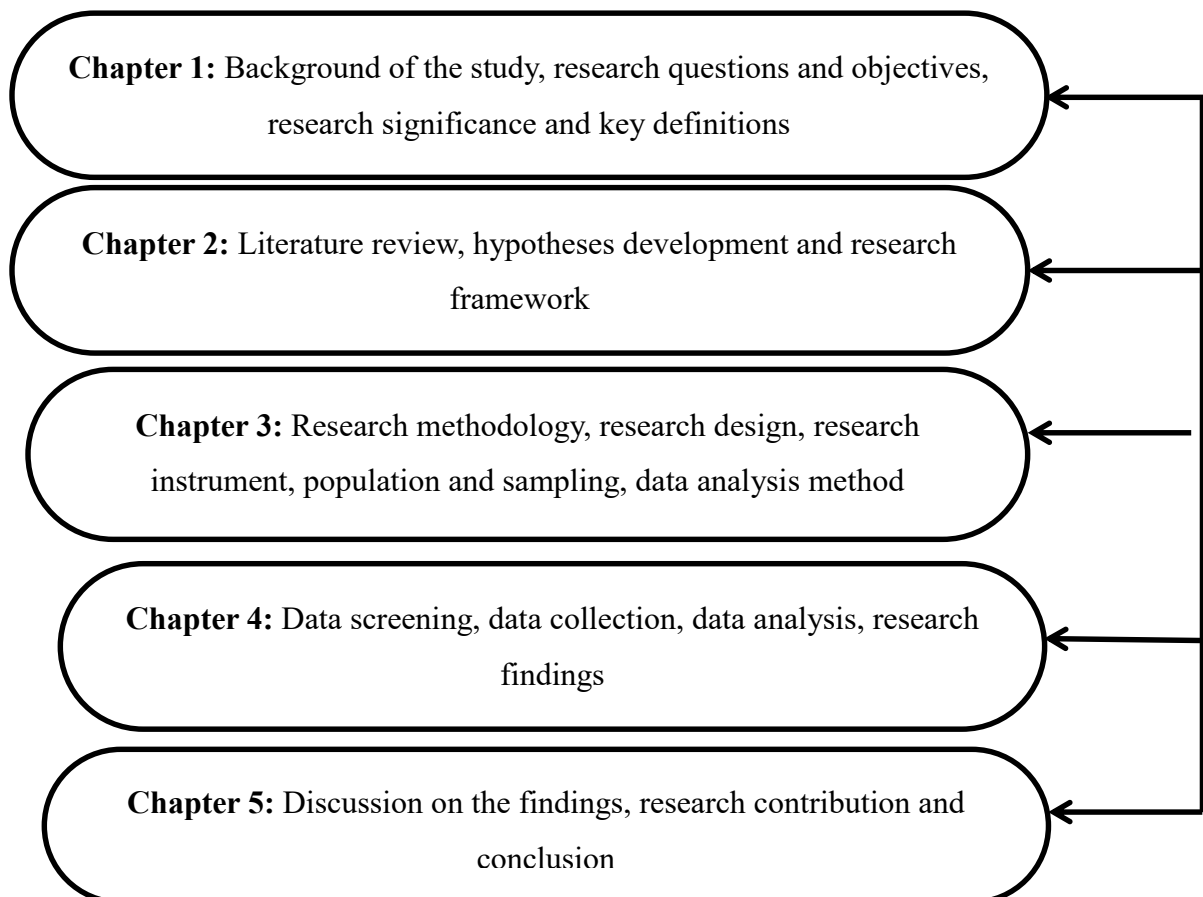


Figure 1.2 Thesis structure

The details of the thesis structure are as follows:

Chapter 1: This chapter provides the background of the study on the adoption of IPv6, specifically in Oman. Then, the research problem and gaps are presented, followed by research questions and research objectives. Moreover, this chapter defines the key terms in the UTAUT-2 model as well as the additional study variables. Finally, details on the scope of the study are provided together with the significance of the research.

Chapter 2: This chapter provides a critical review of previous studies related to the research topic. It includes a review of the dependent variables, independent variables, and the mediator variable. All these variables are linked in a single theoretical framework under the UTAUT-2 theory. The chapter ends with the formulation of the study hypotheses that enable the researcher to answer the research questions and achieve its objectives.

Chapter 3: This chapter identifies, explores, discusses, and justifies the methodology used to determine the factors related to migration from the IPv4 to the IPv6 protocol. This chapter is begins by discussing the research design based on the conceptual framework developed in Chapter 2. Then, the research methodology, procedure of data collection, and measurement instrument is explained. Also, this chapter reviews the data analysis method, which is structural equation modelling.

Chapter 4: This chapter explains the results of the study that were obtained after data analysis. The data was analysed using the latest version of SmartPLS to test reliability, validity, hypotheses significance, and other related parameters. The end of this chapter gives an overview of the overall results.

Chapter 5: In this last chapter of the thesis, the analysis results from Chapter 4 are discussed in relation to previous studies to answer the study questions and achieve the objectives. This chapter ends with a conclusion and recommendations for future research directions.

1.11 Chapter Summary

This chapter has provided the background of this study concerning the adoption of IPv6 protocol in Oman followed by a statement of the research problem. Then, it presented the research questions and research objectives. Finally, details about the scope of the study were provided together with the anticipated significance of the research. The next chapter presents a review of the existing theories used to develop a conceptual framework for this study, which serves as the basis of the research hypotheses used to answer the research questions.

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Appendix A Validation Form



QUESTIONNAIRE VALIDATION

Dear Professor/Assoc. Professor/Dr.,

Greetings.

I am currently pursuing my PhD study under the supervision of Dr. Haliyana Bint Khailed My research topic is related to " **Intention to Adopt Internet Protocol Version Six Among Information Technology Staff in Higher Education Institutions, Muscat, Oman**". I would like to seek your cooperation as a content expert in validating my scales before I proceed for pilot study. The idea behind this validation is to check whether the items are reflecting the operational definition of the study constructs or not. **I would be grateful if you could spend some time to read through the items and assess their content validity.**

Please assess each statement of the question based on the following criteria:

- Indicating whether each item of the amended Items is a "**Identical**" or "**not Identical**" compared with the original items.
- The appropriateness of each of the amended Items of the *dimension and /or the construct*.
- The clarity of each of the amended Items (*The clarity of the language for the intended audience*).

In addition, I highly appreciate any extra suggestion for the improvement of the content of the questions in order to enhance the effectiveness of the survey instrument. Please do not hesitate to contact me if I may provide any clarification on any issue related to the above requirements on the contact numbers below.

Thank you very much for valuable feedback, time and cooperation.

Yours sincerely,

Issa Alghatrifi.

Ph.D. Candidate,

International Business School (IBS),

Universiti Teknologi Malaysia (UTM), Kuala Lumpur, Malaysia

Email: issa1980@graduate.utm.my , +968-93290455

Overview of the research:

An IP address plays an essential role in the structure of the Internet by providing a unique address to identify each connected device. The current version, Internet Protocol version 4 (IPv4), was consolidated in 1981 and has since been the protocol used by all Internet-connected devices remains Worldwide. However, the exponential growth of the Internet since then has not been expected by IPv4 designers. In early 2011, the last five unused Internet protocol version 4 (IPv4) address sets were distributed to the five RIRs. This effectively indicates the end of IPv4's ability to continue to expand. From the exhaustion point of Internet protocol version 4 (IPv4), the IETF (Network Working Group of the Internet Engineering Task Force) worked to developed a new protocol to replacing the current protocol. This new protocol was developed to provide more than one unique address for every connected device, this protocol is Internet Protocol version 6 (IPv6). In addition, and based on the IETF report, all requirements for technical foundations have been built, but the deployment and capability to use is the challenge in the level of individuals and organisation level (Ali, 2018). Therefore, the migration to Internet protocol version 6 (IPv6) from Internet protocol version 4 (IPv4) is a critical issue of any public or private institution. As only a few studies searched the phenomenon in the migration to Internet protocol version 6 (IPv6) from Internet protocol version 4 (IPv4) in the higher education institutions, the researcher has chosen the Oman higher education institutions as the context for this study. The relevant literature exhibits their attention on determining the direct effect of the factors that affect the successful adoption of Internet protocol version 6 (IPv6) with use different theories rather than examining the relationship between this factors and the degree of affect for each factor and behaviour intention toward the adoption. In addition to the above, there is a paucity of studies that examined the resistance to change as a mediator factor on the relationship between the factors that affect the adoption of Internet protocol version 6 and behaviour intention toward the adoption. Hence, this study attempts to bridging this research gap, by using UTAUT-2 theory as a baseline. Therefore, this study follows the positivism philosophy and a single cross-sectional survey strategy to collect the data through a structured questionnaire. The data will be collected from a representative sample of 236 from HEI 's employees through the simple random sampling procedure.

The abbreviations that I used in the form below, they can be explained as follows:

PE	Performance expectancy	<i>“the degree to which an individual believes that using the IPv6 protocol will help him or her enhance job performance.”</i>
EE	Effort expectancy	<i>“the degree of easiness /effort associated with use of the IPv6 protocol.”</i>
SI	Social Influence	<i>“the degree to which an individual feels pressure from important others, i.e., friends or colleagues, to adopt the IPv6.”</i>
FC	Facilitating Condition	<i>“An employee’s perception of the resources and support available to use the IPv6.”</i>
HH	Hedonic motivation	<i>“the pleasure or enjoyment derived from using a new technology.”</i>
PV	Price Value	<i>“employees’ cognitive trade-off between the perceived benefits of the IPv6 and the monetary cost of using it.”</i>
HB	Habit	<i>“the extent to which employees tend to use the IPv6 automatically because of learning”.</i>
TIG	Trust in the Government	<i>“an individual’s perceptions of a government’s ability to meet their expectations to adopting IPv6 protocol and trustworthy.”</i>
TIT	Trust in Technology	<i>“the degree in which individuals believe IPv6 protocol meet their expectations as a safe technology that can provide reliable information and can be trusted. ”</i>
RC	Resistance to change	<i>“ the degree to which employees are resistant to use the IPv6 and change accordingly. ”</i>
BI	Behavioural Intention	<i>“a person’s inclination to use the IPv6 protocol in the near future.”</i>
TA	Technology Adoption	<i>“the favourable (or unfavourable) attitude towards IPv6 protocol adoption in HEIs.”</i>

Explanation:

“Identical”, (maintain item as it is)

“Poor Identical”, (maintain item but needs some redefining)

“not Identical”, (Remove Item)

Construct	Original Items Based on actual source and previous studies	Sources	Amended Items	Your Assessment (Amended Items compared with the Original Items)			Amended Items Please put (√) or (×)		Remark
				Identical	Poor Identical	not Identical	Appropriateness	Clarity	
Performance expectancy (PE)	PE1.I find mobile Internet useful in my daily life.	Venkatesh et al. (2012)	PE1. I find IPv6 protocol useful in my daily tasks.						
	PE2. Using mobile Internet increases my chances of achieving things that are important to me.		PE2. Using the IPv6 protocol increases my chances of achieving things that are important to me.						
	PE3.Using mobile Internet helps me accomplish things more quickly.		PE3. Using IPv6 protocol helps me accomplish things more quickly.						

	PE4.Using mobile Internet increases my productivity.		PE4. Using IPv6 protocol increases my productivity.						
Effort expectancy (EE)	EE1. Learning how to use mobile Internet is easy for me.	Venkatesh et al. (2012)	EE1. Learning how to use IPv6 protocol is easy for me.						
	EE2. My interaction with mobile Internet is clear and understandable.		EE2. My interaction with IPv6 protocol is clear and understandable.						
	EE3. I find mobile Internet easy to use.		EE3. I find IPv6 protocol easy to use.						
	EE4. It is easy for me to become skillful at using mobile Internet.		EE4. It is easy for me to become skillful at using IPv6 protocol.						
Social Influence (SI)	SI1. People who are important to me think that I should use mobile Internet.	Venkatesh et al. (2012)	SI1. People who are important to me think that I should adopt IPv6 protocol.						
	SI2. People who influence my behaviour think that I should use mobile Internet.		SI2. People who influence my behaviour think that I should adopt IPv6 protocol.						

	SI3. People whose opinions that I value prefer that I use mobile Internet.		SI3. People whose opinions that I value prefer that I need to adopt IPv6 protocol.						
Facilitating Condition (FC)	FC1. I have the resources necessary to use mobile Internet.	Venkatesh et al. (2012)	FC1. I have the resources necessary to adopt IPv6 protocol.						
	FC2. I have the knowledge necessary to use mobile Internet.		FC2. I have the knowledge necessary to use IPv6 protocol.						
	FC3. Mobile Internet is compatible with other technologies I use.		FC3. IPv6 protocol is compatible with other technologies I use.						
	FC4. I can get help from others when I have difficulties using mobile Internet.		FC4. I can get help from others when I have difficulties using adopt IPv6 protocol.						
Hedonic motivation (HM)	HM1. Using mobile Internet is fun.	Venkatesh et al. (2012)	HM1. Using IPv6 protocol is fun.						
	HM2. Using mobile Internet is		HM2. Using IPv6 protocol is						

	enjoyable.		enjoyable.						
	HM3. Using mobile Internet is very entertaining.		HM3. Using IPv6 protocol is very entertaining.						
Price Value (PV)	PV1. Mobile Internet is reasonably priced.	Venkatesh et al. (2012)	PV1. IPv6 protocol is reasonably priced.						
	PV2. Mobile Internet is a good value for the money.		PV2. IPv6 protocol is a good value for the money.						
	PV3. At the current price, mobile Internet provides a good value.		PV3. At the current price, IPv6 protocol provides a good value.						
Habit (HB)	HT1. The use of mobile Internet has become a habit for me.	Venkatesh et al. (2012)	HT1. The use of IPv6 protocol has become a habit for me.						
	HT2. I am addicted to using mobile Internet.		HT2. I am addicted to using IPv6 protocol .						
	HT3. I must use mobile Internet.		HT3. I must use IPv6 protocol .						
Trust in the Government	TG-1: I think I can trust government agencies.	Muhammad Z.I	TG-1: I think I can trust government agencies.						

(TiG)	TG-2: I trust that government agencies keep my best interests in mind.	Lallmahomed et al. (2017)	TG-2: I trust that government agencies keep my best interests in mind.						
	TG-3: In my opinion, government agencies are trustworthy.		TG-3: In my opinion, government agencies are trustworthy.						
Trust in Technology (TiT)	TT-1: I believe it is safe to use IT systems.	(Abu-Shanab, 2014); Gao and Bai (2014)	TT-1: I believe it is safe to use IPv6 protocol.						
	TT-2: I think IT systems will provide reliable information.		TT-2: I think IPv6 protocol will provide reliable information.						
	TT-3: I believe it is risk free to use IT systems.		TT-3: I believe it is risk free to use IPv6 protocol.						
	TT-4: I believe that the utilization of IT systems will meet my expectations.		TT-4: I believe that the utilization of IPv6 protocol will meet my expectations.						
	TT-5: I believe that IT systems will keep my best interests in mind.		TT-5: I believe that IPv6 protocol will keep my best						

			interests in mind.						
Resistance to Change	RC-1: I generally consider changes to be a negative thing.	Bhandhira Lertdechdecha 2008	RC-1: I generally consider changes to be a negative thing.						
	RC-2: I like to do the same old things rather than try new and different ones.		RC-2: I like to do the same old things rather than try new and different ones.						
	RC-3: When someone pressures me to change something, I tend to resist it even if I think the change may ultimately benefit me.		RC-3: When someone pressures me to change something, I tend to resist it even if I think the change may ultimately benefit me.						
Behavioural Intention (BI)	BI-1: I intend to use IT systems in the future.	Venkatesh et al. (2012); Gao and Bai (2014),	BI-1: I intend to use IPv6 protocol in the future.						
	BI-2: I predict I would use IT systems in the future.		BI-2: I predict I would use IPv6 protocol in the future.						
	BI-3: I plan to use IT systems in the future.		BI-3: I plan to use IPv6 protocol in the future.						
	BI-4: I will recommend others to		BI-4: I will recommend						

	use IT systems.		others to use IPv6 protocol.						
Technology Adoption	TA-1. IPv6 is more difficult to understand from a technological perspective than IPv4.	John Brooks Southworth May (2016); Tom Yoon (2009).	TA-1. IPv6 is more difficult to understand from a technological perspective than IPv4.						
	TA-2. IPv6 adoption is a more complex process compared to IPv4.		TA-2. IPv6 adoption is a more complex process compared to IPv4.						
	TA-3. IPv6 is compatible with our organisation's existing IT infrastructure.		TA-3. IPv6 is compatible with our organisation's existing IT infrastructure.						
	TA-4: IPv6 is compatible with our organisation's current software's.		TA-4: IPv6 is compatible with our organisation's current software's.						
	TA-5: Our organisation has the technical expertise in-house to adopt IPv6.		TA-5: Our organisation has the technical expertise in-house to adopt IPv6.						
	TA-6: The attitude towards Virtual Word adoption in my organisation is		TA-6: the attitude towards IPv6 protocol adoption in						

	favorable.		my institutions is favorable.						
	TA-7: Virtual Word adoption is consistent with my organisation's business strategy.		TA-7: IPv6 protocol adoption is consistent with my institutions business strategy.						

Appendix B Research Questionnaire in English and Arabic Version



Intention to Adopt Internet Protocol Version Six Among Information Technology Staff in Higher Education Institutions, Muscat, Oman

Dear Respondent,

I am a Phd researcher in Technology Management of International Business School, Universiti Tecknologi Malaysia in Kuala Lumpur, Malaysia. I am examining "**Intention to Adopt Internet Protocol Version Six Among Information Technology Staff in Higher Education Institutions, Muscat, Oman**". This study will contribute to my Doctor of Philosophy degree as well as it will contribute to the extension of knowledge on technology adoption behaviours in the information system field. I would like to request your cooperation in completing the attached questionnaire, your contribution is greatly appreciated.

Confidentiality of Data:

The collected data through this questionnaire will be stored securely so that it can only be accessed by the researcher. Also, the collected data will be used only for scientific research purposes, and all your responses will remain confidential. Note that you are not required to write your name on the questionnaire.

Please Note:

- This questionnaire was judged by academics and specialists.
- The estimated time needed to answer this questionnaire and share your experience will not take more than 10- 15 minutes.
- I welcome any comments, suggestions and inquiries received by you, and I hope that they will be written in the relevant section at the end of the questionnaire.

Issa Alghatrifi.Ph.D. Candidate,
International Business School (IBS),Universiti Teknologi Malaysia (UTM),
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Instructions:

- 1) There are four (4) sections in this questionnaire. please answer all questions in all sections.
- 2) Completion of this form will take you 10 -15 minutes.
- 3) The contents of this questionnaire will be kept strictly confidential.

SECTION(A): DEMOGRAPHIC DATA

Instructions:

In this section, we would like you to fill in some of your personal details. Please choose your answer and your answers will be kept strictly confidential.

1. What kind is your institution?

- Public (College /University)
- Private (College /University)

2. What is your job?

- Administrative
- Technical
- Managerial
- Other:

3. How many years have worked in this institution?

- less than 1 year
- 1 - 3 years
- Over 3 years

4. How many years has your institution been in operation? _____ Years

5. How many years you have expertise with Internet protocol?

- Less than 1 years
- 1 to 3 years
- Over 3 years

Section (B): UTAUT-2

Instructions:

This section is seeking your opinion regarding the importance of IPv6 protocol adoption based on your experience in work with the Internet protocols. Respondents are asked to indicate the extent to which they agreed or disagreed with each statement using 5 Likert scale, please read the following sentences and rate on a scale of 1-5, how much you disagree/agree. (1) being strongly disagree, and (5) being strongly agree.

6. Based on your experience with the IPv6 protocol, please read the following sentences and rate on a scale of (1- 5)

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

NO	Questions	1	2	3	4	5
Performance expectancy <i>“The degree to which an individual believes that using the IPv6 protocol will help him or her enhance job performance.”</i>						
Performance expectancy	PE1	I find the IPv6 protocol useful in my daily tasks.				
	PE2	Using the IPv6 protocol increases my chances of achieving things that are important to me.				
	PE3	Using the IPv6 protocol helps me accomplish things more quickly.				
	PE4	Using the IPv6 protocol increases my productivity.				
Effort expectancy <i>“The degree of easiness /effort associated with use of the IPv6 protocol.”</i>						
Effort expectancy	EE1	Learning how to use the IPv6 protocol is easy for me.				
	EE2	My interaction with the IPv6 protocol is clear and understandable.				
	EE3	I find the IPv6 protocol easy to use.				
	EE4	It is easy for me to become skillful at using the IPv6				

		protocol.					
Social Influence <i>“the degree to which an individual feels pressure from important others, i.e., friends or colleagues, to adopt the IPv6.”</i>							
Social influence	SI1	People who are important to me think that I should use the IPv6 protocol.					
	SI2	People who influence my behaviour think that I should use the IPv6 protocol.					
	SI3	People whose opinions that I value prefer that I use the IPv6 protocol.					
Facilitating Condition <i>“An employee’s perception of the resources and support available to use the IPv6.”</i>							
Facilitating conditions	FC1	I have the resources necessary to use the IPv6 protocol.					
	FC2	I have the knowledge necessary to use the IPv6 protocol.					
	FC3	the IPv6 protocol is compatible with other technologies I use.					
	FC4	I can get help from others when I have difficulties using the IPv6 protocol.					
Hedonic motivation <i>“The pleasure or enjoyment derived from using a new technology.”</i>							
Hedonic motivation	HM1	Using the IPv6 protocol is fun.					
	HM2	Using the IPv6 protocol is enjoyable.					
	HM3	Using the IPv6 protocol is very entertaining.					
Price Value <i>“Employees’ cognitive trade-off between the perceived benefits of the IPv6 and the monetary cost of using it.”</i>							
Price value	PV1	The IPv6 protocol is reasonably priced.					
	PV2	The IPv6 protocol is a good value for the money					
	PV3	At the current price, the IPv6 protocol provides a good value.					

Habit <i>"The extent to which employees tend to use the IPv6 automatically because of learning"</i> .						
Habit	HB1	The use of the IPv6 protocol has become a habit for me.				
	HB2	I am addicted to using the IPv6 protocol.				
	HB3	I must use the IPv6 protocol.				
	HB4	Using the IPv6 protocol has become natural to me.				
Trust in Technology <i>"the degree in which individuals believe IPv6 protocol meet their expectations as a safe technology that can provide reliable information and can be trusted."</i>						
Trust in Technology (TIT)	TT1	I believe it is safe to use IPv6 protocol.				
	TT2	I think IPv6 protocol will provide reliable information.				
	TT3	I believe it is risk free to use IPv6 protocol.				
	TT4	I believe that the utilization of IPv6 protocol will meet my expectations.				
	TT5	I believe that IPv6 protocol will keep my best interests in mind.				
Trust in the Government <i>" an individual's perceptions of a government's ability to meet their expectations to adopting IPv6 protocol and trustworthy."</i>						
Trust in Government (TIG)	TG1	I think I can trust government agencies.				
	TG2	I trust that government agencies keep my best interests in mind.				
	TG3	In my opinion, government agencies are trustworthy.				
Behavioural Intention <i>"a person's inclination to use the IPv6 protocol in the near future."</i>						
Behavioural Intention	BI1	I intend to use IPv6 protocol in the future.				
	BI2	I predict I would use IPv6 protocol in the future.				
	BI3	I plan to use IPv6 protocol in the future.				
	BI4	I will recommend others to use IPv6 protocol.				

Section (C): RESISTANCE TO CHANGE

Instructions:

This set of questions includes several statements describing your attitudes and behaviour toward the change in your organisation.

7. Based on your experience with the IPv4 protocol and your knowledge of IPv6, please read the following sentences and rate on a scale of (1-5).

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Resistance to change " The degree to which employees are resistant to use the IPv6 and change accordingly."							
NO	Questions		1	2	3	4	5
Resistance to Change	RC1	I generally consider changes to be a negative thing.					
	RC2	I like to do the same old things rather than try new and different ones.					
	RC3	When someone pressures me to change something, I tend to resist it even if I think the change may ultimately benefit me.					

Section (D): TECHNOLOGY ADOPTION

Instructions:

This set of questions includes several statements describing your attitudes and behaviour toward the technology adoption in your organisation. Based on your experience with the IPv4 protocol and your knowledge of IPv6, please read the following sentences and rate on a scale of (1-5).

8. Based on your experience with the IPv6 protocol, please read the following sentences and rate on a scale of (1-5).

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree

Technology Adoption “ <i>the favourable (or unfavourable) attitude towards IPv6 protocol adoption in HEIs.</i> ”							
NO	Questions		1	2	3	4	5
Technology Adoption	TA1	IPv6 is more difficult to understand from a technological perspective than IPv4.					
	TA2	IPv6 adoption is a more complex process compared to IPv4.					
	TA3	IPv6 is compatible with our organisation's existing IT infrastructure.					
	TA4	IPv6 is compatible with our organisation's current software's.					
	TA5	Our organisation has the technical expertise in-house to adopt IPv6.					
	TA6	the attitude towards IPv6 protocol adoption in my institutions is favourable.					
	TA7	IPv6 protocol adoption is consistent with my institutions business strategy.					

Note: Please if you would like to receive a copy of the summary of the results of this study, fill the necessary info below:

Name:

phone number or email address:



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

International
Business School

نية اعتماد بروتوكول الإنترنت الإصدار السادس بين موظفي تكنولوجيا المعلومات في مؤسسات

التعليم العالي ، مسقط ، عمان

عزيزي المستجيب ،

أنا باحث دكتوراه في إدارة التكنولوجيا بكلية إدارة الأعمال الدولية بجامعة UTM في كوالالمبور بماليزيا. موضوع دراستي هو " تأثير وساطة مقاومة التغيير بين الجدارة بالثقة والقصد السلوكي لاعتماد بروتوكول IPv6 في مؤسسات التعليم العالي". ستساهم هذه الدراسة في الحصول على درجة الدكتوراه في الفلسفة الخاصة بي ، كما ستساهم في توسيع المعرفة بسلوكيات تبني التكنولوجيا في مجال نظام المعلومات. أود أن أطلب تعاونكم في استكمال الاستبيان المرفق ، ومساهمتم موضع تقدير كبير.

سرية البيانات:

سيتم تخزين البيانات التي تم جمعها من خلال هذا الاستبيان بشكل آمن بحيث يمكن الوصول إليها فقط من قبل الباحث. أيضًا ، سيتم استخدام البيانات التي تم جمعها فقط لأغراض البحث العلمي ، وستظل جميع ردودك سرية. لاحظ أنك لست مطالبًا بكتابة اسمك على الاستبيان.

يرجى الملاحظة:

- تم الحكم على هذا الاستبيان من قبل الأكاديميين والمتخصصين.
- لن يستغرق الوقت التقديري اللازم للإجابة على هذا الاستبيان ومشاركة تجربتك أكثر من 10 الى 15 دقائق.
- أرحب بأي تعليقات أو اقتراحات أو استفسارات ، وآمل أن تكون مكتوبة في القسم ذي الصلة في نهاية الاستبيان.

عيسى بن ناصر الغطريفي

طالب الدكتوراه

كلية إدارة الأعمال الدولية (IBS) ،

جامعة تكنولوجيا ماليزيا (UTM) ، كوالالمبور ، ماليزيا

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تعليمات:

- 1) هناك أربعة (4) أقسام في هذا الاستبيان. يرجى الإجابة على جميع الأسئلة في جميع الأقسام.
- 2) سيستغرق إكمال هذا النموذج 10-15 دقيقة.
- 3) سيتم الاحتفاظ بمحتويات هذا الاستبيان بسرية تامة.

القسم (أ): البيانات الديموغرافية

تعليمات:

القسم (أ): الديموغرافية

في هذا القسم ، نود منك ملء بعض البيانات. يرجى اختيار إجابتك وسيتم الاحتفاظ إجابتك في سرية تامة.

1. ما نوع مؤسستك؟

حكومي (كلية / جامعة)

خاص (كلية / جامعة)

2. ما هو عملك؟

إداري فني مدير (قسم ، شعبة) أخرى:

3. كم سنة عملت في هذه المؤسسة؟

أقل من سنة 1 - 3 سنوات أكثر من 3 سنوات

4. كم سنة كانت مؤسستك تعمل؟ _____ سنوات

5. كم سنة لديك خبرة في بروتوكول الإنترنت؟

أقل من سنة 1 - 3 سنوات أكثر من 3 سنوات

القسم (ب): UTAUT-2

تعليمات:

يبحث هذا القسم عن رأيك فيما يتعلق بأهمية اعتماد بروتوكول IPv6 استناداً إلى خبرتك في العمل مع بروتوكولات الإنترنت. يُطلب من المجيبين الإشارة إلى المدى الذي يوافق فيه أو لم يوافق على كل عبارة باستخدام مقياس ليكرات بمقياس 5 ، يرجى قراءة الجمل التالية واختيار مقياس من 1-5 ، إلى أي مدى لا توافق / توافق.

لا أوافق بشدة ، و (5) أوافق بشدة.

6. بناءً على تجربتك مع بروتوكول IPv6 ، يرجى قراءة الجمل التالية ومعدلاتها على مقياس من (1-5)

1	2	3	4	5
لا أوافق بشدة	لا أوافق	محايد	موافق	موافق بشدة

NO	Questions	1	2	3	4	5
توقع الأداء "الدرجة التي يعتقد بها الفرد أن استخدام بروتوكول IPv6 سيساعده أو يساعدها على تحسين الأداء الوظيفي."						
توقع الأداء	PE1	أجد بروتوكول IPv6 مفيداً في المهام اليومية.				
	PE2	يؤدي استخدام بروتوكول IPv6 إلى زيادة فرص في تحقيق أشياء مهمة بالنسبة لي				
	PE3	يساعدني استخدام بروتوكول IPv6 على إنجاز الأمور بسرعة أكبر.				
	PE4	يؤدي استخدام بروتوكول IPv6 إلى زيادة الإنتاجية.				
توقع الجهد "درجة السهولة / الجهد المرتبط باستخدام بروتوكول IPv6 ."						
الجهد المتوقع	EE1	تعلم كيفية استخدام بروتوكول IPv6 سهل بالنسبة لي.				
	EE2	تفاعلي مع بروتوكول IPv6 واضح ومفهوم.				
	EE3	أجد بروتوكول IPv6 سهل الاستخدام.				
	EE4	من السهل بالنسبة لي أن أصبح ماهراً في استخدام بروتوكول IPv6.				
التأثير الاجتماعي "الدرجة التي يشعر بها الفرد بالضغط من الآخرين المهمين ، أي الأصدقاء أو الزملاء ، لتبني IPv6."						
التأثير الاجتماعي	SI1	يعتقد الأشخاص المهمون أنني يجب أن أستخدم بروتوكول IPv6.				
	SI2	يعتقد الأشخاص الذين يؤثرون في سلوكي				

		أنه يجب علي استخدام بروتوكول IPv6.					
	SI3	يفضل الأشخاص الذين أقدر آرائهم استخدام بروتوكول IPv6.					
تسهيل الحالة "تصور الموظف للموارد والدعم المتاح لاستخدام IPv6."							
تسهيل الحالة	FC1	لدي الموارد اللازمة لاستخدام بروتوكول IPv6.					
	FC2	لدي المعرفة اللازمة لاستخدام بروتوكول IPv6.					
	FC3	بروتوكول IPv6 متوافق مع التقنيات الأخرى التي أستخدمها.					
	FC4	يمكنني الحصول على مساعدة من الآخرين عندما أواجه صعوبات في استخدام بروتوكول IPv6.					
دوافع المتعة "المتعة أو المتعة المستمدة من استخدام تقنية جديدة."							
دوافع المتعة	HM1	استخدام بروتوكول IPv6 أمر مريح.					
	HM2	باستخدام بروتوكول IPv6 ممتع.					
	HM3	استخدام بروتوكول IPv6 مسلي للغاية.					
قيمة السعر "المفاضلة المعرفية للموظفين بين الفوائد المتصورة لـ IPv6 والتكلفة المالية لاستخدامه."							
قيمة السعر	PV1	بروتوكول IPv6 مسعر بشكل معقول.					
	PV2	يعد سعر بروتوكول IPv6 جيد مقابل المال					
	PV3	بالسعر الحالي ، يوفر بروتوكول IPv6 قيمة جيدة.					
العادة "مدى ميل الموظفين إلى استخدام IPv6 تلقائيًا بسبب التعلم."							
العادة	HT1	أصبح استخدام بروتوكول IPv6 عادة بالنسبة لي.					
	HT2	أنا مدمن على استخدام بروتوكول IPv6.					
	HT3	يجب أن أستخدم بروتوكول IPv6.					
	HT4	أصبح استخدام بروتوكول IPv6 أمرًا طبيعيًا بالنسبة لي.					
الثقة في التكنولوجيا "الدرجة التي يعتقد فيها الأفراد أن بروتوكول IPv6 يلبي توقعاتهم كتقنية آمنة يمكنها توفير معلومات موثوقة ويمكن الوثوق بها."							
الثقة في التكنولوجيا	TT1	أعتقد أنه من الآمن استخدام بروتوكول IPv6.					
	TT2	أعتقد أن بروتوكول IPv6 سيوفر معلومات موثوقة.					
	TT3	أعتقد أنه من المخاطره استخدام بروتوكول IPv6.					
	TT4	أعتقد أن استخدام بروتوكول IPv6 سوف يلبي توقعاتي.					
	TT5	أعتقد أن بروتوكول IPv6 سيضع مصالحني في الاعتبار.					
الثقة في الحكومة " تصورات الفرد لقدرة الحكومة على تلبية توقعاتهم لاعتماد بروتوكول IPv6 وجديرة بالثقة".							

الثقة في الحكومة	TG1	أعتقد أنني يمكن أن أثق في الوكالات الحكومية.					
	TG2	إنني على ثقة من أن الوكالات الحكومية تضع مصالحها في الاعتبار.					
	TG3	في رأيي ، الوكالات الحكومية جديرة بالثقة.					
النية السلوكية "ميل الشخص لاستخدام بروتوكول IPv6 في المستقبل القريب."							
النية السلوكية	BI1	أنوي استخدام أنظمة تكنولوجيا المعلومات في المستقبل.					
	BI2	أتوقع أن أستخدم أنظمة تكنولوجيا المعلومات في المستقبل.					
	BI3	أخطط لاستخدام أنظمة تكنولوجيا المعلومات في المستقبل.					
	BI4	سأوصي الآخرين لاستخدام أنظمة تكنولوجيا المعلومات.					

القسم (ج): مقاومة التغيير

تعليمات:

تتضمن مجموعة الأسئلة هذه العديد من العبارات التي تصف مواقفك وسلوكك تجاه التغيير في مؤسستك.

7. بناءً على تجربتك مع بروتوكول IPv4 ومعرفتك ب IPv6 ، يرجى قراءة الجمل التالية ومعدلتها على مقياس من (1-5).

1	2	3	4	5
لا أوافق بشدة	لا أوافق	محايد	موافق	موافق بشدة

مقاومة التغيير "درجة مقاومة الموظفين لاستخدام IPv6 والتغيير وفقاً لذلك."							
NO	Questions		1	2	3	4	5
مقاومة التغيير	RC1	أنا عموماً أعتبر التغييرات شيئاً سلبياً.					
	RC2	أحب أن أفعل نفس الأشياء القديمة بدلاً من تجربة أشياء جديدة ومختلفة.					
	RC3	عندما يضغط عليّ شخص ما لتغيير شيء ما ، فإنني أميل إلى مقاومته حتى لو كنت أعتقد أن التغيير قد يفيدني في النهاية.					

القسم (د): اعتماد التكنولوجيا

تعليمات:

تتضمن هذه المجموعة من الأسئلة العديد من العبارات التي تصف مواقفك وسلوكك تجاه تبني التكنولوجيا في مؤسستك. بناءً على تجربتك مع بروتوكول IPv4 ومعرفتك ب IPv6 ، يرجى قراءة الجمل التالية ومعدلها على مقياس من (1-5).

8. بناءً على تجربتك مع بروتوكول IPv6 ، يرجى قراءة الجمل التالية ومعدلها على مقياس من (1-5).

1	2	3	4	5
لا أوافق بشدة	لا أوافق	محايد	موافق	موافق بشدة

تبني التكنولوجيا "الموقف الإيجابي (أو غير المواثي) تجاه اعتماد بروتوكول IPv6 في مؤسسات التعليم العالي."						
NO	Questions	1	2	3	4	5
اعتماد التكنولوجيا	TA1	يصعب فهم IPv6 من منظور تكنولوجي أكثر من IPv4.				
	TA2	اعتماد IPv6 هو عملية أكثر تعقيداً مقارنة ب IPv4.				
	TA3	IPv6 متوافق مع البنية التحتية الحالية لتكنولوجيا المعلومات في مؤسستنا.				
	TA4	IPv6 متوافق مع برامج منظمنا الحالية.				
	TA5	تتمتع منظمنا بالخبرة الفنية الداخلية لتبني الإصدار IPv6.				
	TA6	الموقف من اعتماد بروتوكول IPv6 في مؤسستنا هو إيجابي.				
	TA7	اعتماد بروتوكول IPv6 متوافق مع إستراتيجية العمل الخاصة بمؤسستنا.				

ملاحظة: من فضلك ، إذا كنت ترغب في الحصول على نسخة من ملخص نتائج هذه الدراسة ، املأ المعلومات

اللازمة أدناه:

الاسم:

رقم الهاتف أو عناوين البريد الإلكتروني:

Appendix C Researcher Facilitation Letter



Universiti Teknologi Malaysia
Jalan Sultan Yahya Petra
54100 Kuala Lumpur, Malaysia
Tel: 03-2615 4100

Our References : UTM.K.55.01.03/13.11/1/4 Jld. 6 (84)
Date : December 30, 2019

TO WHOM MAY IT CONCERN

Dear Sir/Madam,

REQUEST TO CONDUCT AN ACADEMIC RESEARCH / PERMISSION TO COLLECT DATA

Name	:	ISSA NASSER SALIM AL GHATRAIFI
ISID No. @ Passport No.	:	201801M10960 / XJ5358720
Matric No.	:	PBS173034
Admission Status	:	Full Time
Registration Date	:	10 February 2018
Medium of Instruction	:	English
Programme	:	Doctor of Philosophy

With regard to the above matter, this is to certify that Issa Nasser Salim Al Ghatraifi (PBS173034) is pursuing his Doctor of Philosophy (PhD) at Azman Hashim International Business School, Universiti Teknologi Malaysia (UTM).

The student is currently conducting a research on a title of **Mediating Effect of Resistance to Change Between Trustworthiness and Behavioral Intention of IPv6 Adoption in Higher Education Institutions**. In order to fulfill his research requirement, it would be greatly appreciated if you could allow him to conduct an interview in your organization and collect data on related topic.

Data collection will be used for academic purpose only and shall remain confidential and will not be identify in publication or media.

Please contact us at 03-21805032 or email to norharyani.ki@utm.my for further clarification to the above student.

Thank you in advance.

"BERKHIDMAT UNTUK NEGARA"

I, who uphold trust,


NORHARYANI HAMID
Assistant Registrar
Azman Hashim International Business School
Level 10, Menara Razak
UTM Kuala Lumpur
☎ : 03-21805032
✉ : norharyani.ki@utm.my





الرقم: ٩٦ / ١٥ / ٢٠٢٠ م ص خ

التاريخ: ٣ / ٢٠٢٠ م

تعميم رقم (٢٠٢٠ ع ٣٠)

الأفاضل / رؤساء الجامعات الخاصة
الأفاضل / عمداء الكليات الخاصة
المحترمون
المحترمون

السلام عليكم ورحمة الله وبركاته وبعد،،،،

الموضوع: تسهيل مهمة باحث

الحاقا الى تعميم المديرية رقم (٢٠١٩/١٩١ م) والمؤرخ في
٢٠١٩/١٢/١٣ م بشأن تسهيل مهمة باحث للأفاضل/عيسى بن ناصر بن
سالم الغطريف في طالب دكتوراة في جامعة Universiti Teknologi
Malaysia، ويقوم باعداد أطروحة بعنوان:
"Mediating Effect of Resistance to Change Between Trustworthiness and
Behavioral Intention of IPv6 Adoption in Higher Education institutions"

ويستهدف الباحث من اجراء هذه الدراسة المؤسسات التعليمية الخاصة،
وعليه يرجى التكرم- لطفًا- بتقديم ما ترونه ممكنا من تسهيلات للباحث حتى
يتسنى له إتمام عمله بكل يسر، ويمكن للمختصين لديكم التواصل مع
المذكور مباشرة عبر البريد الالكتروني (issa.alghatrifi@nct.edu.om) أو
على رقم الهاتف: (٩٦١٨١٤١٥ / ٩٣٢٩٠٤٥٥)

شاكرين لكم تعاونكم.

وتفضلوا بقبول فائق الاحترام والتقدير



د. جوخة بنت عبد الله الشكيلية
المديرة العامة للجامعات والكليات الخاصة



نحو تعليم عالٍ ذي جودة عالية يلبي متطلبات التنمية المستدامة

سلطنة عُمان ص.ب: ٨٢ روي - الرمز البريدي ١١٢ - هاتف ٢٤٣٤٠٣٦٨ / فاكس ٢٤٣٤٠٣٦٦
Sultanate of Oman, P.O.Box: 82 Ruwi, PC 112, Tel: 24340368 / Fax 24340366 - www.moh.gov.om



Ref. No. :

Date :

الرقم: ٣٠١ / ٢٠١٩
التاريخ: ٥-٥ جادو الأولى - ٢٠١٩
الوقت: ٢١-١٢-٢٠١٩

To whom it may concern in	لمن يهمه الامر
<p>This is to inform you that the employee, Issa Nasser Alghatrifi - ID no 09150605 who has been sent to pursue his PhD studies in (UTM) the Malaysia for the period from 01/02/2017 to 06/02/2022 has started her PhD research in Technology Management Research. The title of his research is " Mediating Effect of resistance to change Between trustworthiness and Behavioral Intention of IPv6 adoption in Higher Education Institutions "</p> <p>For that, the Human Resource Department in the Ministry of Man Power, seek your help and support to the researcher to facilitate her task as a researcher in collecting or providing the needed data for the research. Thank you for your thorough cooperation and ongoing support.</p> <p>Yours sincerely,</p> <p>Issa Hamood Alamri Director Of H.R.D. Department Ministry of Manpower</p>	<p>برجى التكرم بالعلم بان الفاضل/عميسى بن ناصر بن سالم القطريفي والذي يحمل البطاقة الشخصية رقم 09150605 مبعثت الى جامعة UTM بالملكة للبريزية عن تاريخ 01/02/2018م الى تاريخ 06/02/2022م وذلك لنيل درجة الدكتوراه في مجال الإدارة التقنية - ا. علما بان عنوان بحثه هو " تأثير الوساطة لمقاومة التغير بين الجدارة بالثقة و القصد السلوكي لاعتماد IPV6 في المؤسسات التعليم العالي .</p> <p>وكما لا يخفى عليكم دور وأهميه الباحثون العلمية في اشراف العرفه كما لها الدور الفعال في الأخذ بتوصياتها.</p> <p>لذا تأمل دائرة تنمية الموارد البشرية تقديم التسهيلات اللازمة التي تحتاج اليها الباحثة لإجراء الدراسة الميدانية.</p> <p>شاكرين تعاونكم الدائم لنا فيه المصلحة العامة وتفضلوا بقول فائق الاحترام.</p> <p>ع / عميسى بن حمدان العامري مدير دائرة الموارد البشرية وزارة القوى العاملة</p>

LIST OF PUBLICATIONS

1. **Issa Alghatrifi** and Haliyana bt Khalid, " Factors affecting the adoption of IPV6 from IPV4: A systematic mapping study", Article published in International Journal of Current Engineering and Technology, Vol.8, No.5 (Sept/Oct 2018), DOI: <https://doi.org/10.14741/ijcet/v.8.5.9>
2. **Alghatrifi** and H. Khalid, "A Systematic Review of UTAUT and UTAUT-2 as a Baseline Framework of Information System Research in Adopting New Technology: A case study of IPV6 Adoption" 2019 6th International Conference on Research and Innovation in Information Systems (ICRIIS), Johor Bahru, Malaysia, 2019, pp. 1-6, doi: 10.1109/ICRIIS48246.2019.9073292.
3. **Issa Alghatrifi** and Haliyana bt Khalid, " Mediating Effect of Resistance to Change Between Trustworthiness and Behavioural Intention of Ipv6 Adoption in Higher Education Institutions (Pilot Study)" , 8th International Graduate Conference on Engineering, Science and Humanities Universiti Teknologi Malaysia, 18th – 19th August 2020, p 377-381.