

**EXAMINING EMAIL USAGE AMONG NON-
ACADEMIC STAFF IN PUBLIC AND PRIVATE
MALAYSIAN UNIVERSITIES**

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ABSTRACT

The expansion of information and communication technology (ICT) has been championed as a significant step in improving coordination and logistical ease for greater productivity in workplaces around the world. The Malaysian government has made extensive investment in the expansion of ICT and email usage in workplaces, particularly in the Higher Education Institutions in the country, which are expected to be at the forefront of technological change and knowledge innovation. The levels of ICT as well as email usage have still not reached their optimum level, particularly in public universities, which have been shown to be lagging behind private universities in these matters. As a result, this thesis seeks to examine the role of perceptual attitudes and cultural factors correlated with the adoption of email by non-academic staff in public and private universities. The thesis examines constructs of perceived ease of use and perceived usefulness (derived from Davis' Technology Acceptance Model) mediated by dimensions of national and organisational culture (derived from Hofstede's framework) in relation to email usage.

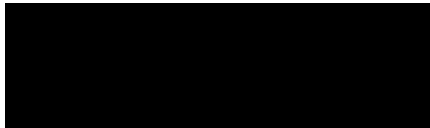
Data collected from 402 non-academic executives in four public and four private universities through survey questionnaires was subjected to a rigorous analysis using Confirmatory Factor Analysis (CFA) and Structural Equation Modelling (SEM). This research has shown that email usage is higher in Malaysian private universities than in public universities. The findings also show that both perceived ease of use (PEOU) and perceived usefulness (PU) in the Technology Acceptance Model (TAM) have a significant relationship with email usage. Further, the dimensions of power distance (PD), uncertainty avoidance (UA), collectivism (C), long-term orientation (LT) and indulgence (I) in the National Culture Model (NCM) has a significant relationship to perceived ease of use (PEOU) or perceived usefulness (PU) – or both – of email usage among organisational members. On the other hand, in the Organisational Culture Model (OCM), need for security (NS), results-oriented (RO) and closed system (CS) have a significant effect on perceived ease of use (PEOU) or perceived usefulness (PU) or both, of email usage among organisational members.

DECLARATION

I, Anuar Shah Bali Mahomed, declare that the PhD thesis entitled '**Examining Email Usage among Non-Academic Staff in Public and Private Malaysian Universities**' is no more than 100,000 words in length including quotations and exclusive of tables, figures, appendices, bibliography, references and footnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work.

Signature

Date

A solid black rectangular box used to redact the signature of the author.

ANUAR SHAH BALI MAHOMED

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LIST OF ABBREVIATIONS

AMOS	Analysis of Moment Structures
AVE	Average Variance Extracted
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CMC	Computer-Mediated Communication
CS	Closed System
HEI	Higher Education Institution
IC	Collectivism/Individualism
ICT	Information and Communications Technology
IDT	Innovation Diffusion Theory
IR	Indulgence/Restraint
IS	Information System
IT	Information Technology
JO	Job-Oriented
LST	Long-Term/Short-Term Orientation
MF	Masculinity/Femininity
MI	Modification Indices
MRT	Media Richness Theory
NCM	National Culture Model
NS	Need for Security
OCM	Organisational Culture Model
PD	Power Distance
PEOU	Perceived Ease of Use
PU	Perceived of Usefulness
RMR	Root Mean Square Residual
RMSEA	Root Mean Square Error of Approximation
RO	Results-Oriented
SCT	Social Cognitive Theory
SEM	Structural Equation Modelling
SPT	Social Presence Theory
TAM	Technology Acceptance Model
TLI	Tucker-Lewis Index
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
UA	Uncertainty Avoidance
UTAUT	Unified Theory of Acceptance and Use of Technology

CHAPTER 1

INTRODUCTION

1.1 Introduction

In the last few years, the Malaysian government has taken many steps to boost the Information and Communications Technology (ICT) sector in the country by investing heavily in ICT infrastructure and promoting ICT use in organisations and workplaces across the country. In particular, as centres of knowledge, innovation and social change, Higher Education Institutions (HEIs) in the country are expected to lead the way in developing an ICT-based work culture (Ministry of Higher Education of Malaysia 2007). Despite the extensive efforts and investments made by the government in promoting ICT use in HEIs, many studies have pointed out that Malaysian universities are lagging behind in adoption of these technologies and the work culture associated with them. In particular, emails, known as one of the important tools in communication are not fully utilised in day-to-day operations in HEIs to improve organisational communication (Husain et al. 2009).

Email is considered an important communication tool for improving the efficiency and productivity of employees at their workplace (Jackson et al. 2001; Mano & Mesch 2010). A study by Osterman Research among mid-sized and large organisations in North America found that 30 minutes of unplanned downtime of email each month by users resulted in a productivity loss of \$52.50 per user per year (Osterman Research 2010, p. 4).

Although email communication predates many of the more recent ICT innovations, such as social networking, Facebook, Twitter etc., email communication is still the most predominant communication tool used worldwide in workplaces. To support this, a recent study conducted in 24 countries across the world by Ipsos (an

independent market research company), suggests that a strong majority of online-connected global citizens (about 85 per cent) use the internet for sending and receiving emails, while 62 per cent use it for social networking (Ipsos 2012). Moreover, numerous studies conducted in various organisations in North America also suggest that the majority of decision-makers prefer to maintain the responsibility for email inside the organisation due to control, security and cost issues (Osterman Research 2010). Since the use of email is still the predominant tool of organisational communication despite other new ICT tools, this research seeks to identify the factors influencing the adoption of email usage by non-academic staff in public and private universities in Malaysia.

This introductory chapter will begin with an outline of the background to the study and discuss the long and short-term initiatives taken by the Malaysian government and Ministry of Higher Education to enhance the use of ICT and email in organisations across the nation and HEIs in particular. The second section will discuss the research problem and a rationale for conducting this research. It is argued that issues of technology adoption and cultural environment underpin the slow uptake of email by staff in Malaysian HEIs. Accordingly, a theoretical model incorporating technology acceptance with variables of national/organisational culture is found suitable for the study. The chapter will then present a brief summary of the scope and aims of the study and end with an overall outline of the dissertation.

1.2 Research Background

The Malaysian government has cited the expansion of Information and Communication Technology (referred to as ICT hereafter) as an important task in its Vision 2020 plan to make Malaysia a developed country by 2020. As a part of this plan, the government has undertaken many initiatives such as creating ICT infrastructure with the Multimedia Super Corridor (MSC) in 1995, implementing the Malaysian Communications and Multimedia Act in 1999, and making ICT a critical priority in the Eighth Malaysia Plan 2001-2005. The general thrust of these government policies and initiatives is to transform Malaysia into an ICT and

multimedia hub by upgrading its existing ICT infrastructure, promoting e-commerce and increasing the level of research and development in these technologies (Eighth Malaysia Plan 2001). A subsidiary but critical goal outlined in this agenda is to increase the use of ICT by introducing E-Public Services and E-Community on which email communication is used in the newly developed system to increase efficiency in communication (Eighth Malaysia Plan 2001, p. 368). The Ninth Malaysia Plan allocated a total of RM 2.2 billion for the development of ICT for the public sector in 2005, and these figures are projected to grow at a rate of 10 per cent annually (Mohamad & Hashim 2010).

These initiatives undertaken by the Malaysian government have led to the growth of ICT usage throughout the nation. The penetration rate of internet usage in Malaysia increased from 15 per cent in 2000 (Union 2010) to 61.7 per cent in 2011 (Internet World Statistics 2011c), indicating that there were 17,723,000 internet users out of the total population of 28,728,607 in 2011 (Internet World Statistics 2011c).

The Ministry of Higher Education of Malaysia introduced the Education Development Plan 2001-2010 in 2001 and the National Higher Education Strategic Plan beyond 2020 in 2007, with a focus on encouraging the use of ICT in Malaysia's HEIs. The objective of promoting ICT use, such as email and a variety of other communication channels, in HEIs is to improve accountability and communication in education and transform the nation's HEIs into institutions matching the highest global standard (Ministry of Higher Education of Malaysia 2007). Malaysian HEIs receive extensive support from the government to acquire resources and capabilities in information technology (Hussein & Sarape 2000). As institutions responsible for introducing and fostering innovation in knowledge, HEIs receive support from the government to access the latest technology and knowledge in computers to supplement their responsibilities in teaching, research and communication. Communities in HEIs usually have earliest access and most exposure to information technology in both developed and developing countries (Gates et al. 1995).

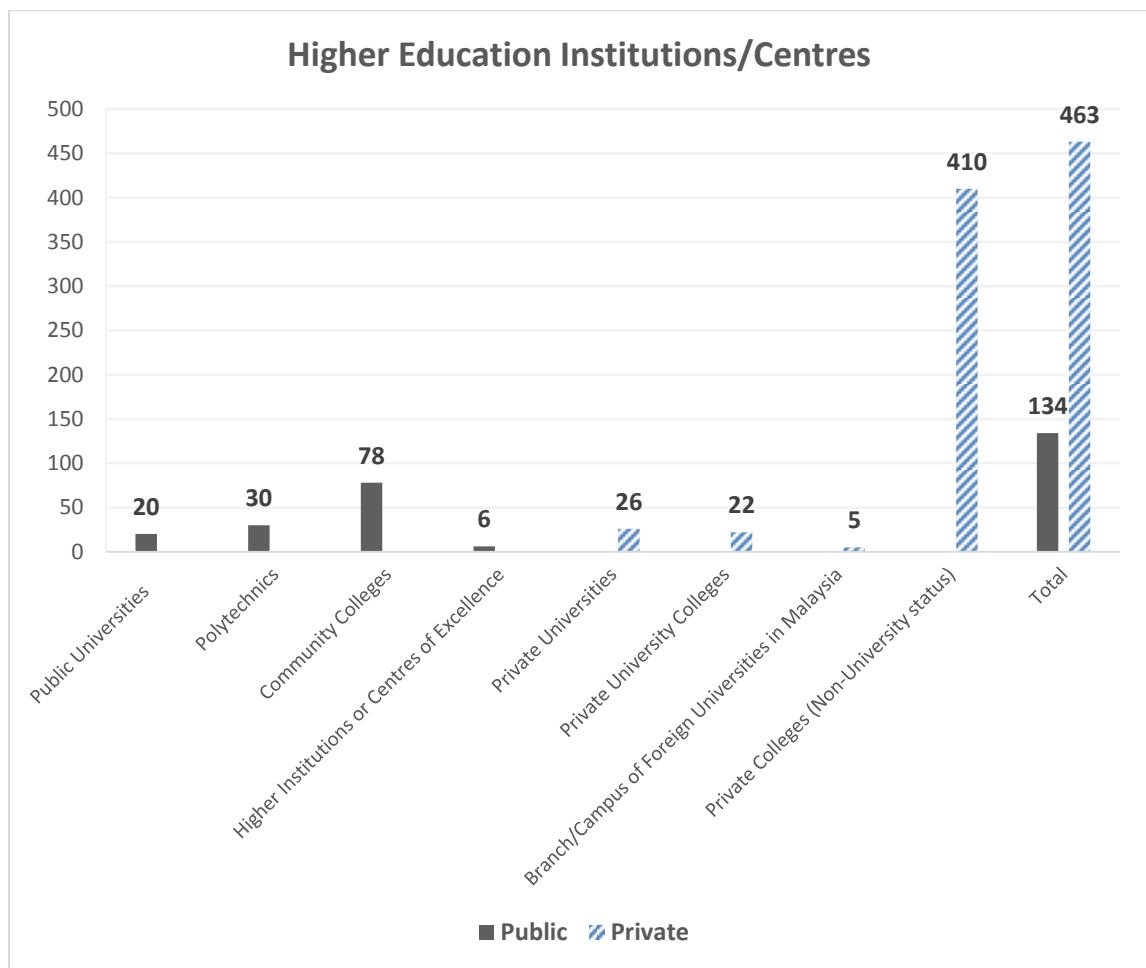
For example, email exchange, video/teleconferencing and live streaming on the internet have been incorporated as part of distance learning in Malaysian universities to allow students to attend lectures without having to be at the site of the institution (Habil 2003). More recently, mobile learning via text messages was also introduced to support distance learners, giving timely important information about the course along with the University Learning Management System (LMS) and social media platforms such as Facebook and Twitter (Lim et al. 2011).

The Ministry of Education is in charge of providing education services to the people and supervision of institutions engaged in preschool to post-secondary education. All matters involving the tertiary education system including universities are handled by the Ministry of Higher Education (MoHE) (Ahlan et al. 2008). Universities in Malaysia are categorised into three groups – Research Universities, Focused Universities (technical, education, management and defence) and Comprehensive Universities. There are currently 20 universities – consisting of five Research Universities, four Comprehensive Universities, and 11 Focused Universities (Official Portal Ministry of Higher Education of Malaysia 2012a). The focus of Research Universities is on research, Focused Universities concentrate on specific academic fields or subjects, while Comprehensive Universities undertake both research and teaching in many subjects (Official Portal Ministry of Higher Education of Malaysia 2012a).

In Malaysia, the higher education system is designed to ensure that the Public Institutions of Higher Education (PIHE) have the capacity to adopt dynamic competitive measures to anticipate future challenges from globalisation. Ongoing efforts are in place to improve the PIHEs' ability to carry out the functions and responsibilities in a more transparent and effective manner (Official Portal Ministry of Higher Education of Malaysia 2012a). National Private Institutions of Higher Education (PvIHE) have also been authorised by the government to ensure that the nation achieves its goal of producing quality human capital possessing the knowledge and entrepreneurial resources to contribute to the nation's continuous growth without relying on government support. Private universities are institutions

that have been founded by private individuals or organisations and funding for private universities comes from government business agencies, political parties or individual owners (Arokiasamy et al. 2009). The number of private universities in Malaysia has increased in recent years. In addition, since 1998 four ‘branch campuses’ of foreign universities have been established in Malaysia, including Monash University, Curtin University, Swinburne University and Nottingham University (Hassan 2006). Figure 1.1 shows the number of higher education institutions in Malaysia with 20 public universities and 26 private universities registered under Ministry of Higher Education of Malaysia. The number of other types of higher education institutions in Malaysia is as figure below:

Figure 1.1: Higher Education Institutions in Malaysia



Source: Ministry of Higher Education, Malaysia (2012a, 2012b, 2012c, 2012d, 2012e)

According to the Ministry of Higher Education of Malaysia (2011), the total number of student entrants for public universities for all levels in 2009 was 153,470 and 167,159 in 2010. Meanwhile, the total number of student entrants for private higher education institutions in 2009 was 168,677 and 160,484 in 2010. In terms of number of enrolments, the total number of enrolments for public universities was 437,420 in 2009 and 462,780 in 2010. In private higher education institutions, the total number of enrolments in 2009 was 484,277 and 541,629 in 2010. The total number of enrolments of international students in public universities in 2010 was 24,241 and there were 62,705 enrolments in private higher education institutions, totalling up to 86,923. The data show that there is an increase in the number of international students' enrolments between 2009 and 2010 from 80,750 (public 22,456 and private 58,294) in 2009 to 86,923 in 2010, marking an increase of approximately 7 per cent. As a result, Malaysia was ranked as the world's 11th most desired international study destination, contributing 2 percent to the global market share of international students (Ministry of Higher Education 2012). A report by Muda (2007), cited in Ramachandran et al. (2011), suggests that the higher education sector contributed RM 1.5 billion to government revenue in 2007. The Ministry of Higher Education also expects an estimated revenue of RM 6 billion from 200,000 international students by the year 2020 (Pemandu 2012). Thus, public and private universities make a significant contribution to government revenue.

1.3 Research Problem

There is a detailed statement of the evolution of email in a publication by Osterman Research that is worth quoting at length:

“Email has changed from a tool focused primarily on communications to an information portal for the typical user. For example, most email clients or browser-based equivalents are used to: send and receive email messages, attach word processing documents, presentations and spreadsheets, create, respond to and [to] be reminded of appointments, manage tasks, manage contacts, manage real-time communications [and] take notes. [In addition], - --email is used as a portal for social networking interactions, a sort of

clearinghouse for various social media feeds, not to mention the integration of real-time communications into email clients that is replacing standalone instant messaging clients”.

(Osterman Research 2010, p. 2).

Yuan et al. (2013, p. 1663) point out that these days some email systems allow integration with its instant messaging tool by displaying people's availability status at the beginning of emails. This feature makes it even easier for people to initiate synchronous conversations.

Scholars, e.g. Derks & Bakker (2010) and Kim et al. (2007), suggest that email communication has many advantages in the workplace compared to other communication channels. For example, email communication allows employees to disseminate and exchange information unrestricted by time and geographical boundaries. Modern communication gadgets, such as the smartphone, enhance our flexibility and responsiveness especially during times of non-physical presence at the workplace (Derks & Bakker 2010). Although SMS is convenient and useful in certain contexts, in the workplace emails are more useful to transmit detailed messages with information richness (Lim et al. 2012, Watjatrakul & Barikdar 2009). Research in Korea, Kim et al. (2007) suggests that instant messaging and SMS are preferred by students, children and parents to coordinate the activities and whereabouts of family/friends, while email is the preferred medium in the workplace due to its ability to transmit lengthy, formal and detailed information needed in workplace environments. To support this MacDonald (2002) suggested that e-mail is able to save cost, speed, time and place, and is conveniently accessible as a permanent record of data.

Granat and Stanoevska-Slabeva's (2007) study on email usage in Swiss companies suggests that email is becoming an important tool, in particular for mobile workers. Due to increased dynamism in communication, email usage can result in improved relationships with customers, co-workers and supervisors.

Levine et al.'s (2013) recent study in four high-technology firms in the United States found that email was the most used communication channel as it allowed workers to transmit, store and search for information easily and not simply to communicate a one-time only message. In addition, Chui et al. (2012, p. 47) find that reading and answering work-related email contributed to a 25-30 per cent improvement in productivity. They also found that the use of social technologies such as the internet and email at the workplace potentially contributed between \$900 billion and \$1.3 trillion in annual value across four industries, namely, consumer packaged goods, retail financial services, advanced manufacturing, and professional services (Chui et al. 2012, p. 3).

Apart from the advantages of email, there are also limitations hindering email communication. According to Jackson et al (2001), the arrival of emails can distract employees from more important tasks. He found that it takes 64 seconds, on average, for employees to recover from an email interruption and return to their original point of work. Marulanda-Carter and Jackson (2012) came to a similar conclusion, and they concluded that a five-minute email interruption can disturb the employee's concentration, causing a task to take one-third more time than without email interruption (Marulanda-Carter & Jackson 2012). Silverstone (2010) calculated the monetary impact of such time lost at about £1.2 million annually from a case study conducted in an HEI in the UK. Some of the main time-wasting chores in email are identified as duplication of messages, erroneous content, irrelevant messages, incomplete messages that require additional explanation and management guidelines through the use of email (Silverstone 2010).

Furthermore, the security and privacy of email content in workplaces often create contentious situations. The content of an email sent from the workplace is treated as the property of the employer by global legal guidelines, posing privacy risks to the individual employee (Eunson 2012; Udo 2001). At the same time, the apparent informality, privacy and speed of email could often lure people into writing things that they would not say in face-to-face conversation. Information overload is another pernicious problem in email, where the ease of sending messages simultaneously to a

large number of people makes it susceptible to the communication of trivial messages that distract employees (Eunson 2012; Udo 2001). Email can also become a target for spam or automatically-generated junk mail (Mishra & Thakur 2013). Despite these limitations and problems as previously indicated (e.g. Marulanda-Carter and Jackson 2012; Silverstone 2012), the organisational benefits of email outweigh its disadvantages especially given the utility of email usage in increasing organisational productivity, as explained by Chui et al. (2012) earlier. Moreover, in the more recent study by Chui et al. (2012), the use of internet and email potentially contributed between \$900 billion to \$1.3 trillion in annual value and increased in productivity (positive effect) while an earlier findings by Silverstone (2010) had emphasized more on time lost during email usage (negative effect). Due to various positive effect of email usage suggested by recent studies especially on increasing productivity at workplace (Chui et al. 2012), Malaysian Government is keen to increase its level of adoption and use within the workplace (Eighth Malaysia Plan 2001; Ministry of Higher Education of Malaysia 2007).

1.3.1 Email Usage in Malaysia

Although the use of ICT (and email communication specifically) has been promoted extensively by the Malaysian government in an effort to improve communication and performance, there have been many problems in the full implementation of email usage in workplaces. A recent study of 4,000 Malaysian citizens across all regions in Malaysia including East Malaysia within the age range of 15-64 years suggests that email usage is limited to only 33 per cent of the random sample population (Nielsen 2010). This is considerably lower than the average usage rate of 78 per cent in the United States and United Kingdom (e-Dialog 2010). Osman et al. (2011) looked into various types of smartphone usage (such as application software, email, internet browsing, ringtones and other mobile applications) among 1,814 individual users from major cities in Malaysia. They found that even though 75 per cent of the respondents are experienced in browsing the internet, almost half (44.3 per cent) of them did not have any experience in accessing email and only 29.8 per cent of the respondents always/often use email. Smartphones remain under-utilised with usage

restricted to core functionalities of the mobile phone, such as making phone calls and sending SMS. Respondents preferred texting with short messaging service (SMS) rather than email (Osman et al. 2011).

A recent initiative called MyEmail.my email service was launched by the Malaysian Prime Minister on 19 April 2011 as an alternative channel for two-way communication between the government and people (Pemandu 2011). Initially, the program managers (Pemandu) set a target of creating a subscription base of around 5.4 million people by the end of 2011; however, the latest data indicates by the middle of October 2011, only 3,000 people (or 0.06 per cent) have subscribed to MyEmail.my (Idris 2011).

1.3.2 Email Usage in Malaysian Universities

More specifically, despite concerted efforts by the Malaysian Government to increase the levels of adoption and use of email in HEIs (Eighth Malaysia Plan 2001, Ministry of Higher Education of Malaysia 2007), email continues to be under-utilised in HEIs in Malaysia. In a comparative study between a Malaysian public university, Universiti Teknikal Malaysia Melaka (UTeM) and a UK public university, University of Brighton (UB), Husain et al. (2009) found that administrative staff working at UB received between 11 and 50 messages with up to 20 work-related emails. In contrast, the majority of administrative staff at UTeM received an average of 5-10 emails per day and sometimes even fewer than five emails. The difference between the level of email usage between these two universities in the UK and Malaysia reflects an issue pointed out by Tryhorn (2009) linking the rate of email adoption with the level of overall economic development of a country. Email usage in developed countries has reached its maximum level of penetration, even up to the point of excessive saturation (Sumecki et al. 2011), whilst developing countries still lack effective means for email adoption and diffusion (Ghuloum and Ahmed 2011; and Tryhorn 2009).

Recent studies also suggest that there is a discernible difference in the pattern of frequency of email usage within institutions belonging to different categories in Malaysia, with the public sector lagging behind the private sector in this matter. Mohamad and Hashim (2010) conducted a study to examine the email responsiveness of administrative staff in 24 Malaysian ministries. They sent the staff a brief mystery email asking them some general information about the agencies under their ministry, but the researchers found a poor response rate – only 8 per cent replied, 75 per cent did not respond and 17 per cent of the emails bounced. The low 8 per cent response rate indicates that email communication is not taken seriously as an important or valid tool of communication for public enquiries (Mohamad & Hashim 2010). It must, however, be added that a mystery email is not the most suitable investigative method as people are generally reluctant to answer emails from unidentifiable sources and the refusal of the officers to answer a ‘mystery email’ may not reflect their general level of email use at work. While it could still be argued that the low response rate shows a low level of email responsiveness by workers in the public sector, this issue still needs more in-depth exploration with better measures of actual email usage.

Studies also show that email use has permeated more successfully into the work culture of private HEIs. The level of ICT proficiencies (the acquisition and development of computer skills and other related technology in performing their tasks efficiently) among educators in private universities is higher than for those in the public universities (Dawam et al. 2009). In fact, educators in private universities claim to possess a more advanced level of computer literacy compared to educators in public universities (Dawam et al. 2009, p. 126). Baninajarian (2009) interrogated 239 executives at a private university in Malaysia and found that 75.5 per cent of the executives used their official email more than five times a day and 71.9 per cent of them had been using email for the last five years. While private HEIs seem to rely more on email for communicating with people from within and outside the organisation, Husain et al. (2009) argue that staff at public universities still tend to rely more on traditional communication tools, such as face-to-face conversations, telephone and letter.

While these statistics indicate the low levels of email usage despite the availability of the infrastructure, there has not been enough research on the issue to clarify the reasons for this neglect of email adoption. Baninajarian (2009) points out that while there is research on ICT in Malaysia, the majority of it focuses on the use of the internet in general and very few studies focus on the level of adoption and use of email in workplaces. This study takes up this problem in an attempt to identify the issues pertaining to email adoption at Malaysian workplaces, specifically focusing on universities in the country. There is a need for an in-depth analysis of patterns of email use in public and private universities across the country to confirm whether there are any significant differences and identify the reasons for such differences. Taking HEIs as the case study, this study, however, focuses on a specific section of workers, namely, non-academic executives in public and private HEIs in Malaysia. Non-academic executives are engaged in administrative duties that involve extensive documentation and communication within and outside the organisations. The speed and efficiency that non-academic executives bring to their work in HEIs with the use of email can influence the overall performance in the administration of the university.

Previous studies, e.g. Husain et al. (2009) and Baninajarian (2009), suggest that the most discernible differences in email usage between Malaysian public and private universities also exist in the category of non-academic executives. On the other hand, Luan et al. (2005) suggested that academic staff in Malaysian public universities were most skillful and competent in the use of word processing, followed by email which is used frequently as a mean of communication either for leisure or for academic purposes. The same is true with the finding by Dawam et al. (2009) which recognized the high level of ICT proficiencies (the acquisition and development of computer skills and other related technology in performing their tasks efficiently) among academic staff in Malaysian private universities. Both studies suggested that ICT including email usage is equally high among academic staffs in both public and private universities. However, it may not be the same among non-academic executives of both private and public universities in Malaysia (Husain et al. 2009; Baninajarian 2009). This study is also motivated by the researcher's personal

experience as a non-academic executive in both public and private HEIs, observing the differing patterns of email use in different universities among non-academic staff members. Studying the reasons behind the significant contrast in email use between non-academic staff at public and private HEIs could also lead to some general hypotheses about the types of work culture that promote or inhibit email use. The areas covered here can clarify issues on technology adoption and email usage, which can play a significant part in the development of the education sector and the nation.

1.4 Email Usage, Technology Adoption and Cultural Factors

As is clear from the foregoing discussion, email, like any other medium of communication, comes with certain advantages and disadvantages, and the choice of using email for organisational communication depends on many contextual factors. This warrants the examination of email usage in Malaysian universities from the perspective of theories on technology adoption. There are various theories in management and information system literature that examine the processes by which users come to make a decision to accept or reject a particular technology; these include Theory of Reasoned Action (TRA) (Ajzen & Fishbein 1980), Theory of Planned Behaviour (TPB) (Ajzen 1985) and Technology Acceptance Model (TAM) (Davis 1989).

This researcher found TAM to be the most appropriate model for the purpose of the study as TAM has been acclaimed as a stable and effective theoretical model with consistent support in empirical research over the last two decades. As Davis et al. (1989) have noted:

“The goal of TAM is to provide an explanation of the determinants of computer acceptance that is general, capable of explaining user behaviour across a broad range of end-user computing technologies and user populations, while at the same time being both parsimonious and theoretically justified”.

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

Scholars have also pointed out the continuing superiority of TAM in comparison to other models on many fronts. In Mathieson's (1991) view, the major advantage of TAM, particularly in relation to TPB, is that TAM is parsimonious, easily able to achieve the objective of empirical analysis equally well with less complication. In fact, Venkatesh and Davis (2000, p. 186) argue that TAM has greater predictive strength than other models as it has been proven to account for approximately 40 per cent of variance in usage intention and behaviour, while the result for alternative models such as TRA and TPB is far less. This was further supported in a dual-theory empirical study by Chau and Hu (2001, p. 710), which found that while TAM explained 40 per cent of the variances in usage patterns, TPB only explained 32 per cent.

More recently, Rouibah et al. (2011) used TAM, TPB and TRA to investigate user intention towards internet banking in Malaysia found that TAM has the best explanatory power (32.7 per cent of the usage patterns), followed by the TPB and TRA models (31.4 per cent and 29.7 per cent). Examining e-learning system adoption among employees in four industries in Taiwan, Lee et al. (2013) found that TAM provides a more parsimonious model to predict employees' intention and both perceived usefulness and perceived ease of use are among the most important factors in determining the acceptance of e-learning systems. As a result, TAM was chosen as the main theory for technology adoption in this thesis owing to its relative ease of application, but more importantly as it provides a more parsimonious model with higher predictive strength and explanatory power.

Apart from these technical advantages and disadvantages of email as a communication medium, its adoption is also determined by the subjective perceptions and attitudes held by users. Ducheneaut (2002) suggests that the effective use of email communication in an organisation does not only depend on technology and financial resources but on national/organisational culture, and individual actors also shape the use of email. National and organisational cultures influence the success or failure of transferring new technology in an organisation (Deal & Kennedy 1982). In fact, many studies have shown that cultural factors are

often the main reasons for the adoption of new technologies in the first place (Al-Gahtani et al. 2007; Ebrahimi et al. 2010; Hill et al. 1998; Johns et al. 2003; Matusitz & Musambira 2013; Shore & Venkatachalam 1996; Straub 1994). Moreover, national and organisational cultures also determine the form of the message being communicated as well as the predisposition of users toward communications media (Straub 1994, p. 23).

There are several approaches to incorporating theories on culture and communication. For example:

“culture can be viewed as part of the communication process in theories, --- theories designed in one culture can be generalised to other cultures, [theories] ---can be generated to explain communication between people from different cultures ---[and]--- theories can be designed to explain how communication varies across cultures”.

(Gudykunst & Mody 2002, p. 25).

Since the aim of this study is to explore the role of national and organisational culture in the acceptance of email usage at Malaysian universities, there are a few prominent theories of culture that are relevant here. These are the GLOBE model by House et al. (2004), Social Identity Theory (SIT) by Straub et al. (2002) and dimensions of cultural variability by Hofstede (1980). SIT focuses on how individuals identify themselves as part of multiple types of culture (e.g. professional, organisational, ethnic, and national culture), and explains how certain cultures will be more salient to the individual at different occasions. As a result, SIT theory is more applicable in analysing how culture affects individual behaviour rather than the effects of culture at the organisational level. Given this, SIT can provide a complementary research perspective for this study, but not necessarily a competing one (Ford et al. 2003).

On the other hand, Hofstede identified six culture dimensions of national culture, namely individualism/collectivism (IC), power distance (PD), uncertainty avoidance (UA), masculinity/femininity (MF), long-term/short-term orientation (LST) and

indulgence/restraint (IR) (Hofstede et al. 2010). A more recent theory on national culture is the GLOBE model developed in mid-1990s by House et al. (2004). The GLOBE model has not received as much criticism as Hofstede's model perhaps due to the fact that being a more recent publication it has not been thoroughly tested or analysed to the same extent (Shi & Wang 2011b, p. 93). The key element of GLOBE theory is that it argues that values and practices can exist at both the societal and organisational levels, while Hofstede's framework proposes that values differentiate societies and practices differentiate organisations (Shi & Wang 2011a). However, the sample countries (and regions) which participated in the development of these two models are quite different. The sample countries and regions in Asia were more widely chosen by Hofstede, while GLOBE uses more samples from European countries and regions. In addition, the GLOBE study only focused on the managerial level, while Hofstede covered both managerial and non-managerial levels (Shi & Wang 2011b). As this research is conducted in Malaysia with a sample involving both the managerial and non-managerial workers, Hofstede's model was viewed as being more suitable for this study compared to GLOBE.

A baseline theory on how to measure the effect of cultural differences while using IT-based innovations is presented in Hofstede's model of National Culture (Straub et al. 1997, p. 3). In addition, Hofstede's dimensions are more flexible and directly linked to social and organisational processes (Kaba & Osei-Bryson 2013). Hofstede's model has been widely used in technology adoption research (McCoy et al. 2007) and over 60 per cent of studies on information systems utilise one or more of Hofstede's National Culture dimensions (Leidner & Kayworth 2006). Numerous studies have verified the stability of the dimensions advanced by Hofstede's model on information system adoption (Alhujran 2009; Tan et al. 1998). As Hofstede's framework has received the most acceptance and support as a useful theory in empirical studies on information system adoption, this study uses Hofstede's national and organisational culture frameworks. Hofstede's theories on national and organisational culture offer parsimonious yet effective models to incorporate complex issues of culture in research on technology acceptance.

It must also be acknowledged that Hofstede's National Culture dimensions have also received their fair share of criticism. Most have come from a methodological perspective relating to the generalisability and validity of using survey questionnaires as the method of data collection for measuring culture (McSweeney 2002). McSweeney (2002, p. 94-95) also criticised Hofstede's dimensions as "*---radically compounded by the narrowness of the population surveyed*", which are not necessarily the same as national values. McSweeney (2002) also criticized the IBM data as old and obsolete. However, many recent studies have verified the stability of Hofstede's National Culture dimensions to argue that the model is still relevant and applicable, especially in contemporary IS research (Alhujran 2009; Alhujran & Al-dalahmeh 2011; Saribagloo et al. 2011). Even though there are many criticisms of Hofstede's framework, many studies on technology acceptance have applied Hofstede's principles (McCoy et al. 2007, p. 82). In fact, a review of hundreds of studies by Taras et al. (2009) clearly confirms that Hofstede's survey questionnaire has traditionally prevailed as the dominant method for quantifying culture in business and information systems research.

Although there are various definitions of the term 'culture', this study will use the definition suggested by Hofstede (1980) in the realms of both national and organisational culture. Hofstede (1980) defined culture as norms, values and beliefs shared by members of a particular group or community in a particular area or geographic location. Culture, specifically national culture, can magnify the barriers to effective communication. For example, in a country like Malaysia, which is characterised by Hofstede as a high power-distance culture, individuals within lower ranks are expected to show deference to their superiors and avoid confrontations with them (Zakour 2004), so employees may be more unwilling to express their opinions and disagreements openly (Khatri 2009). In contrast, in a low power-distance organisation, employees with less authority (formally vested power) will use fundamental power sources (e.g. expert knowledge, control over information provision etc.) to realise their local goals, which may often not be congruent with wider (official) organisational goals (Pfeffer 1981, pp. 27-28).

1.5 Scope and Aims of Study

The research background above has outlined the concerted effort made by MoHE to boost ICT in HEIs and highlighted the many aspects of under-utilisation of email in HEIs in the country. This study on email communication seeks to explore the extent to which the goal of enhancing the use of ICT in the education sector, as stated in the National Higher Education Strategic Plan: Laying the Foundation Beyond 2020, has been implemented in public/private HEIs in the country. It seeks to understand the role of national and organisational culture in determining email usage among non-academic staff in private and public universities in Malaysia. It also seeks to create a holistic conceptual framework integrating theories of culture and technological acceptance to address this question. This was achieved by integrating theories of culture and technological acceptance, namely, the theory of Technology Acceptance Model (TAM) (Davis 1989) with Hofstede's theories of National and Organisational Culture (Hofstede et al. 2010).

In total, eight universities – four public and four private – were selected, to compare and contrast these two organisational categories. Universities with more than 200 employees in all and 50 or more personnel at the managerial level were selected for this research. This minimum standard was imposed to ensure that the study would have sufficient respondents. To ensure consistency in the types of institutions studied in this research, private colleges were excluded and private and public universities with similar organisational and functional dimensions were selected. Since public universities are dominated by Malays and private universities have a mix of people from different ethnicities, the use of public and private universities also ensured that the study accounted for the factors of race and religion. The study also ensured that the private and public universities selected were distributed across metropolitan and non-metropolitan areas.

The research questions guiding this study can be summarised as below:

- a) What is the rate of email usage amongst non-academic executives in Malaysian universities?

- b) Are there differences in email usage across non-academic executives in public and private Malaysian universities?
- c) How does national and organisational culture (measured using Hofstede's dimensions) affect email usage among non-academic executives in Malaysian universities?

In order to answer the research questions, the study followed a systematic research process with the following aims guiding each stage of the research:

- a) Measurement of the general level of email usage of non-academic executives in public and private universities in Malaysia.
- b) Analysis of email usage and volume in the day-to-day work of non-academic executives in public and private universities.
- c) Employment of a holistic conceptual framework, integrating models of Hofstede's model of national/organisational culture and technology acceptance, for the purpose of analysing email usage within public/ private HEIs in Malaysia.
- d) Exploration of the role of Hofstede's model of national culture in determining the level of email usage between non-academic staff at public and private HEIs.
- e) Exploration of the role of Hofstede's model of organisational culture in determining the level of email usage between non-academic staff at public and private HEIs.
- f) Establishment of the mediation effect of TAM constructs on Hofstede's model of national/organisational culture and email usage.

The main contribution of the findings of this research is in bridging the knowledge gap that exists in the literature regarding email usage in Malaysian public and private universities. Specifically, this study contributes knowledge in the following areas:

- a) Providing evidence of the level and patterns of email usage in the two target groups.

- b) Providing evidence to determine the extent to which national culture influences email usage in order to understand the reasons behind the under-utilisation of email in Malaysia.
- c) Providing evidence to determine the extent to which organisational culture influences email usage in order to understand the reasons behind differing levels of email use in public and private HEIs.
- d) Providing evidence to determine the mediating effect of TAM between Hofstede's model of National Culture and email usage.
- e) Providing evidence to determine the mediating effect of TAM between Hofstede's model of Organisational Culture and email usage.

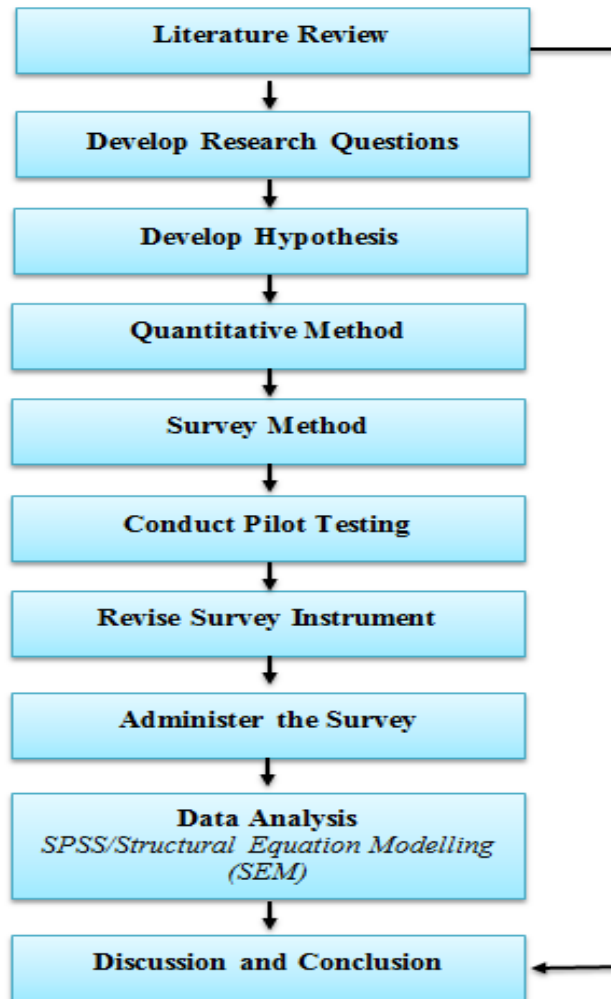
In terms of its practical contribution, this study can foster the development of ICT use in private and public Malaysian universities by conveying practical knowledge about email usage among non-academic staff. Specifically, this study makes a practical contribution by:

- a) Providing valuable information on the factors, which influence email usage by non-academic executives.
- b) Providing knowledge that might allow the Malaysian Government (and other interested parties) to increase the uptake of email communication, thereby, improving workplace efficiency.

1.6 Research Methodology

Figure 1.2 shows an overview of the research processes involved in completing the study.

Figure 1.2: Research Design Overview



The first phase of the study is focused on a literature review to identify relevant theoretical concepts and issues that can help define research questions and hypotheses. This is followed by the empirical research with the target population, where survey questionnaires are tested with a pilot study before being administered to willing participants. The last part of the study is concerned with data analysis interpreting the results, which are then reviewed to present a final discussion and conclusion.

This research is based on a quantitative methodology measuring data on the patterns of email use that are statistically analysed to derive inferences about the relationship of national/organisational culture with perceived ease of use and usefulness towards

email use. Quantitative research design uses statistical methods to examine the relationship between variables in the research model and present evidence to support or disprove the research hypotheses (Bélanger & Carter 2008; Warkentin et al. 2002). This thesis used self-administered survey questionnaires for data collection in eight universities – four public and four private. McCoy et al. (2007) state that the survey questionnaires have been used as the core method for measuring constructs of culture and technology acceptance. Even in the Malaysian context, most studies in management and information systems research with a cultural focus have mostly used questionnaire survey, for example, Abdullah and Lim (2001), Lim (2001) and Ebrahimi et al. (2010).

The sample for this study was carefully planned and chosen. The private and public universities studied in this research are evenly distributed across metropolitan and non-metropolitan areas with a diverse demographic profile covering race, religions, gender, age and location. One hundred non-academic executives (specifically, administrative staff members) from each university were chosen randomly, making a total of 800 subjects. Universities with more than 200 employees in all and 50 or more personnel at the managerial level were selected. A pilot study was conducted among 20 prospective respondents to test the appropriateness of the content and language of the questionnaire. After gathering some useful feedback from the pilot study, the actual data collection was conducted. A total of 800 questionnaires was distributed at the universities, from which 402 questionnaires were received, making a response rate of 50.25 per cent.

After the data collection process, data analysis was carried out on the coded and cleaned data using statistical software called Software Package for Social Science (SPSS), with Structural Equation Modelling (SEM) and Analysis of Moment Structures (AMOS) software. SEM is a widely-used method in behavioural sciences (Igbaria 1992). It has proved useful for a wide class of problems (Chin & Todd 1995) and is capable of confirming relationships between different constructs (Bollen 1989). Previous studies in Western (Srite 2000) and Eastern countries (Mutlu & Ergeneli 2012) on culture and email acceptance, culture and e-government (Alhujran

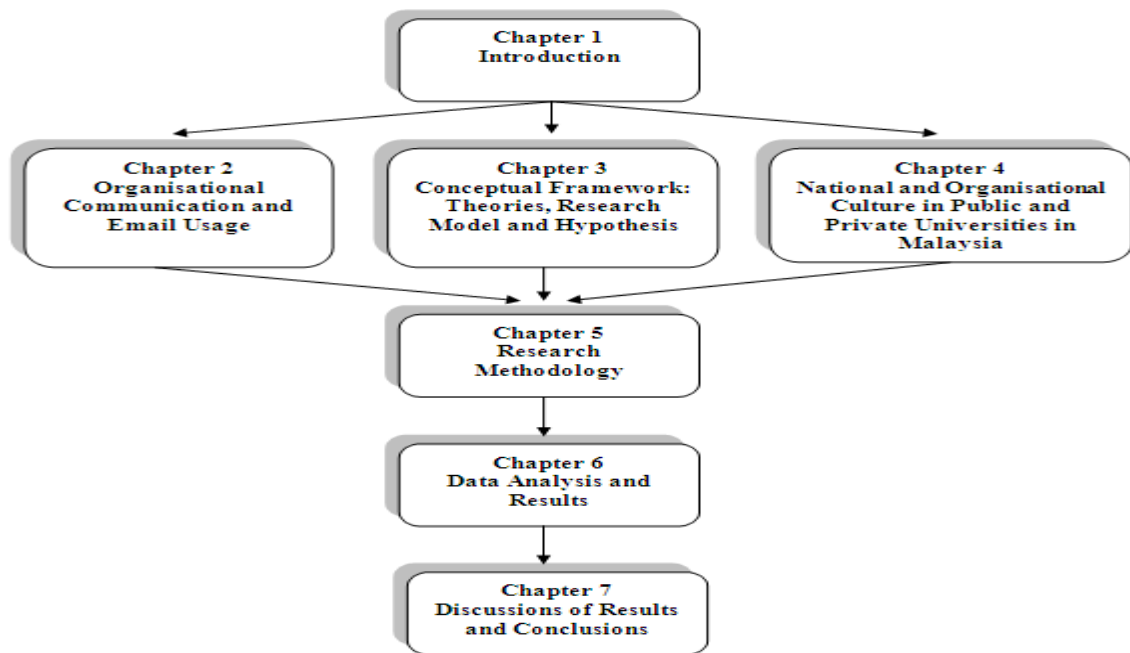
2009) and internet usage and culture (Kripanont 2007) have proven that SEM is an appropriate method for analysing data in technology acceptance studies.

The SPSS statistical software was use in descriptive analysis for demographic characteristics such as gender, race, religion, age group, education level, university type, name of university and respondents' position in their universities. This study also use ANOVA (Analysis of Variance) (or Kruskal Wallis) analysis and independent T-test (or Mann Whitney U) which are part of SPSS, depending on the number of categories under each demographic variable. The T-test is used to compare the values of the means from two samples (Field 2009) and is used here for demographic variables of gender (male/female), location (metropolitan/non-metropolitan) and organisation type (public/private), which are all made up of two categories. AMOS software was use for hypotheses that posit predictive relationship between variables using Factor Analysis. AMOS software was used as compared to SPSS (regression analysis) since AMOS could fit multiple models with a single analysis (Arbuckle 2005). This study also tested the specific indirect effect of mediators and this is where AMOS perform better than regression analysis when it is involved with mediations analysis as suggested by Iacobucci et al. (2007). AMOS also features powerful techniques to address key problems in information system research and provides more robust results in comparison to other methods such as regression analysis (Zain et al. 2005).

1.7 Thesis Outline

This outline provides an overview of the chapters constituting this thesis. The detailed explanation of the topic and content of each chapter is given below and the structure of the thesis is presented in Figure 1.3

Figure 1.3: Outline of the Thesis



Chapter 2: Organisational Communication and Email Usage

This chapter gives an overview of organisational communication focusing on the importance of internet and email in organisational communication. In addition to some statistics on email usage across the world, there is a brief outline of previous research on email usage in Malaysia. The chapter also notes two prominent theories of Media Richness Theory and Social Presence Theory that explain the process of selection of media in organisational communication.

Chapter 3: Conceptual Framework: Theories, Research Model and Hypotheses

This chapter describes the theories underlying the conceptual framework that will guide the empirical examination of email usage in Malaysian universities. A review of relevant theories in the field of technology adoption is conducted to identify theories that can address the technical aspects and cultural factors conditioning the attitude and perception of users towards email. With this purpose in mind, the chapter incorporates the Technology Acceptance Model (Davis 1989) with Hofstede's theories of national culture and organisational culture (Hofstede et al. 2010) to build a holistic conceptual framework. Consequently, a detailed list of hypotheses is developed for testing with the analyses of the empirical data.

Chapter 4: National and Organisational Culture in Public and Private Universities in Malaysia

This chapter provides the contextual background to the study, outlining relevant information relating to Malaysia including the demographic makeup of the Malaysian population in terms of race, religion, age and gender. This is followed by a discussion of Malaysian national culture and previous research in this area. The organisational values and practices of Malaysian public and private universities are also discussed in relation to Hofstede's Organisational Culture theory discussed in chapter 3.

Chapter 5: Research Methodology

This chapter discusses the research method and design used for this study. The study is based on a quantitative research design using survey questionnaires. The chapter provides a detailed explanation of the methodology used in this research, including, data collection methods, questionnaire development and data analysis techniques.

Chapter 6: Data Analysis and Results

Chapter 6 discusses the results and findings produced from the analysis of data in the SPSS and AMOS Software. The chapter began with descriptive statistics of the demographic profile of the sample population and the current levels of email usage in Malaysian public and private universities. This was followed by the main discussion pertaining to the results for each hypothesis from the confirmatory factor analysis (CFA) and SEM.

Chapter 7: Discussions of Results and Conclusions

The final chapter of the thesis proceeds to a critical discussion of the findings of the empirical analysis. The discussion explains the results from data analysis in relation to each hypothesis. The discussion is further extended to propose the implications of the findings for the academic literature and practical context of email usage in Malaysian universities. Some limitations of this research along with some avenues for future research are discussed before a final concluding note to the thesis.

CHAPTER 2

ORGANISATIONAL COMMUNICATION AND EMAIL USAGE

2.1 Introduction

This chapter discusses contemporary scholarship and debate on the use of email as a medium of organisational communication and its role in workplaces. As the adoption and usage of email varies in different national and economic contexts, this research is motivated by the differing rates of email adoption in the higher education sector in Malaysia. It is therefore important for us to consider the literature discussing the differing impact and disparate rates of email adoption in different organisational and national contexts.

The first section will look at the impact of innovations brought about by the development of internet technology on organisational communication. The next section draws from the existing literature on organisational communication research to understand the role, function and types of organisational communication and the relationship of organisational communication with the study on email usage. This will be followed by an overview of statistics of internet and email usage around the world, Asia and Malaysia particularly with a focus on the changing landscape of internet usage and uneven growth in email usage both nationally and in different sectors. Then, the chapter reviews the efficacy of email from the criteria postulated by Media Richness Theory and Social Presence Theory for media selection in organisational communication. The last section will review existing research on the use and selection of email for organisational communication in Malaysian organisations particularly email usage in Malaysian public and private universities showing different patterns of email usage in private and public universities.

2.2 Information Technology and Organisational Communication

Information technology refers to the use of computers, both hardware and software, and its varied services for processing, transmitting and storing information (Martin et al. 2002). There are many portals for communication purposes provided by ICT such as electronic mail, world wide web (Miller 2006), and recently, social networking sites such as MySpace and Facebook (Miller 2008). Innovations in information technology have helped to increase the speed of message transmission, allowed information exchange between geographically dispersed members and asynchronous communication between individuals at different points in time (Miller 2006). Currently, most organisations around the world use mobile phones and social media for external communication as well as Skype and other technology for conference calls, video conferencing and instant online technologies for internal communication (Langan-Fox 2001).

Modern communication technologies bring numerous advantages to organisations – these include speed, cost reduction, increased bandwidth, vast connectivity and integration of communication with computer technologies (Fulk & DeSanctis 1995). Advancements in technology have enabled organisations to overcome many communication problems and improve the productivity of the organisation's members (Langan-Fox 2001). As communication affects organisational structure, design and decision making, it has been argued that the expansion and speeding up of communication channels may lead to better management and coordination in organisations (Huber 1990). The development of latest software updates on smartphones such as the use of Skype, Facebook and even email as a communication channel help members of organisations to not only gather information in the office but also receive and transmit data to or from anywhere around the world. Employees can track information external to the organisation, track other organisations' profiles and develop profiles of consumer groups and service users or potential employees.

In 2003, a new form of computer-mediated communication, Skype, using voice over internet protocol was developed to provide video chats and instant messaging. In 2010, Apple, Inc. announced Face Time, which enables its users to video chat

through its computers, tablets and cell phones (Casarico 2012). Skype and Face Time technology offer their users with the capacity to convey their message using voice, text, and/or video communication simultaneously during a call. On the other hand, social media applications like Facebook have digital platforms that allow people to manage their personal relationships and links (Van Zyl 2009) and open forums that allow users to contribute to discussions (Ariyur 2008). Apart from that, organisations can use these platforms to manage an online resource of which knowledge and information can be gathered and subsequently shared (Cairncross 2001, p. 134). This helps the organisation to improve their knowledge sharing by allowing customers direct access to information, for which they would previously have had to telephone or email, which can cause delays in information (ClearSwift 2007).

The rapid growth of new technology has also led to many changes in workplace culture and practices across world. Stohl (1995) speculated that the implementation of new technology would cause traditional means of communication such as paper based communication (letter, memo) to become obsolete. However it seems that paper usage has increased instead with the use of new information technology (Miller 2006). This could be attributed to the fact that the extensive capacity for recording and storing information in computers has led to greater formalisation of communication, where most information is now relayed in the written form and then printed on paper when needed.

Perhaps, the most dramatic effect of ICT devices on present-day work culture is the blurring of distinctions between workplace and non-workplace related data collection and transmission processes. Without being physically present in the workplace, people can check their work email outside their official work time or have a long-distance meeting through teleconferencing outside the office. As Wiesenfeld et al. (1998) state, in such situations when you work and where you work from is not important as long as the work is done. With the expansion of new technology, there has been a rise in non-conventional forms of work like telework leading to a phenomenon of work-life blend and the 24-7 nature of working life now (Crang et al. 2006).

2.3 Defining Organisational Communication

In the simplest terms, Barrett (2006) defines communication as the transmission of meaning, either verbally or non-verbally, from one individual to another individual or the general community. Communication is often conceptualised in a straightforward triangular form connecting the correspondent, the information, and the receiver (Barrett 2006). Verbal communication refers to processes such as face-to-face conversation, telephone conversation, group discussion, where the message is delivered directly by speech from the messenger to the receiver, while non-verbal communication is not delivered directly by speech but effected through memos, letters, reports, notes, instructions, notice boards and other media using the written form (Sigband & Bell 1994).

Barrett's (2006) definition of communication as transmission of meaning from one individual to other members of his community is helpful, but the complexities of organisational communication need to be etched out in greater detail with theories focussed on this subject. In an organisational context, communication often relates to the process of where people convey information about guidelines, actions, finance and customers to other members within the company (Vandenberg et al. 1999). However, communication is complex in organisational contexts as it takes place in horizontal and vertical ways both within the organisation, between organisations and between organisations and their relevant 'publics'. Myers and Myers (1982, p. 34) state that organisational communication is "*---the central binding force that permits coordination among people and thus allows for organised behaviour*". In fact, Kaplan and Norton (2001) opine that communication is a crucial area of operation which can ensure organisational achievement. There are many organisational communication theorists from Goffman and Weick and du Guy to Colleen Mills and Miller, who have studied the performative aspects of communication in groups and organisations through to the frameworks used by individuals to 'make sense' of their experiences in groups and organisations.

Weick (1969, p. 91) defines the process of organisational communication as "*---the resolving of equivocality in an enacted environment by means of interlocked*

behaviours embedded in conditionally related processes". The central thrust of Weick's argument is that an organisation is not simply a physical environment but an information environment, where a complex model comprising three processes of enactment, selection and retention are required to reduce the equivocality or unpredictability that is inherent in the information environment (Weick 1969). Weick's theory also established the importance of sense making so that complicated things can be easily interpreted subsequently easing further action (Weick et al. 2005, p. 409). Miller (2009), on the other hand, proposes a model whereby people use assembly rules (set procedures) and communication cycles to create causal maps to make sense of future uncertainties. Assembly rules are procedures that can guide organisational members in set patterns of sense making, especially in situations where the information environment is relatively unambiguous. However, when equivocality in the environment is high, organisational members engage in communication cycles where organisational members introduce and react to ideas that help to make sense of the information in the environment. When this process of sense making is effective, the rules and cycles used in one instance can be retained in the form of causal maps that are used to make sense of future equivocality in the information environment (Miller 2009).

As evident in the general definition of organisational communication outlined above, coordinating the functions of organisational members is a key function of organisational communication. According to Robbins et al. (2011), communication serves five major functions in an organisation – controlling member behaviour; motivating employees them about their duties and performance; allowing emotional expression of feelings; satisfying the social need for interaction among members; and disseminating information to facilitate decision-making in the workplace. But there are also barriers that disrupt effective communication, which include filtering, selective perception, information overload, emotions, language, silence, communication apprehension, gender differences and 'politically correct' communication (Robbins et al. 2011, p. 284-285). In this manner, organisational communication is not merely a matter of flow of information but is also related to the organisational structure of different departments, interrelationships between different

departments (Hatch & Cunliffe 2006) and hierarchy among members in different organisational levels (Daft 2009; Mintzberg 1973).

For Miller (2006, p. 1), apart from its transactional aspect as interaction between two or more people within an environment, there is another level to communication, where it is better understood as a symbolic form in which messages ‘stand for’ other things at various levels of abstraction. On this two-fold level, the transactional form of communication is related to direct and straightforward completion of a goal, whereas the symbolic level shows the more complex socio-psychological aspects of how the communication structures organisational behaviour. As Miller argues:

“To study organisational communication then involves understanding how the context of the organisation influences communication processes and how the symbolic nature of communication differentiates it from other forms of organisational behaviour”.

(Miller 2006, p. 1).

All this points to the more complex entanglement of communication with organisational culture rather than being a mere channel for passing information. This aspect of organisational communication will be examined in greater detail in the next section.

2.4 Forms and Networks of Organisational Communication

There are many aspects of organisational communication including structures, channels, culture, roles, and processes of managing information, data knowledge and learning (Eunson 2012). Organisational communication can be categorised into two forms, depending on the direction and manner in which information flow occurs in an organisation.

Vertical Communication: Vertical communication encompasses communication between the highest and lowest members in an organisation which is directed mainly toward the control of the organisation (Daft 2009). Galbraith (1977) explains that

there are five structural devices to achieve vertical linkages in organisational communication, namely hierarchical referral, rules, plans and formal management information systems. Vertical communication is also more prevalent in more traditional organisations (Daft 2009). As vertical communication relates to the flow of information across different levels in the organisation, it can take the form of either downward communication or upward communication.

Downward communication in vertical linkages refers to communication from a higher level to a lower level in the organisation hierarchy (Daft 2009) and Robbins et al. (2011) also defines this as top-down communication. Downward communication is implemented by leaders and managers to reach employees at the lower levels. It is usually concerned with assigning goals, providing job instructions, informing them about policies and procedure, pointing out areas that need attention, and offering feedback about performance. Upward communication occurs when a member or group from a lower level communicates with a member or group higher up in the organisation hierarchy (Robbins et al. 2011). According to Robbins et al. (2011), upward communication is initiated by people to their superiors in the hierarchy to respond to certain orders, update them of the progress of a job or pass on information about current problems. It helps leaders to become aware of their employees, their perceptions, progress and problems (Robbins et al. 2011).

Horizontal Communication: Robbins et al. (2011) explains that horizontal or lateral communication occurs when members of an organisation at the same hierarchical level share information with each other. This could involve communication between members of the same work group, members of different work groups at the same level, or managers at the same level. Daft (2009) argues that horizontal communication enables coordination between members working on the same job to achieve unity of effort and organisational objective. Robbins et al. (2011) also argues that horizontal communication is often necessary to save time and facilitate coordination. Horizontal communication is characteristic of contemporary organisations that stress innovation and learning (Daft 2009). There are five structural devices to achieve horizontal communication, namely information system,

direct contact, task force and full-time integrator. The following table provides an overview of the features of these two different forms of communication.

Table 2.1: Organisation Theory and Design

Communication Linkages	Criteria
Vertical Communication	<ul style="list-style-type: none"> - Specialised tasks - Strict hierarchy, many rules - Vertical communication and reporting system - Few teams, task forces, or integrators - Centralised decision-making
Horizontal Communication	<ul style="list-style-type: none"> - Shared tasks, empowerment - Relaxed hierarchy, few rules - Many teams and task forces - Decentralised decision-making

Source: Reproduced from Daft (2009, p. 93)

Another important aspect of organisational communication is related to the kind of networks present in the organisation for information flow to occur. According to Robbins et al. (2011), communication networks describe the ways in which information flows in the organisation. Monge and Contractor (2003) state that communication networks show the pattern of information flow between communicators in time and space. Farace et al. (1977) argue that communication network is an important aspect of any organisation since it provides a holistic view about who is linked with whom, what channels are used, what kind of messages move along these networks and how the networks meets the organisation's needs. Robbins et al. (2011) suggests that communication networks in any organisation are mainly of two types, formal and informal.

Formal Communication Network: According to Johnson et al. (1994), a formal communication network is normally the official channel through which information is distributed. Hellweg (1996) suggests that formal communication networks transmit officially authorised information that follows the organisational procedures on dispersal of information within the organisation. For example, subordinates communicate their progress on a job to supervisors through a formal reporting system. Communication in formal networks may take the form of memoranda, bulletins, newsletters, spoken orders and messages, and in formal communication these can be divided into Task Messages, Maintenance Messages and Human Messages (Hellweg 1996).

Formal networks are closely interrelated with organisation structure and the actual role in the hierarchy determines and influences the way members communicate with each other here (Hellweg 1996). Monge and Eisenberg (1987) add that formal communication is a more hierarchical network based on one's role and is defined by a more rigid and unchanging structure which conforms to a top-down configuration. Dow (1988) also argues that formal communication networks are centred on configurations resulting from formal authority relationships represented in the organisational hierarchy. Formal networks are also relatively predictable and stable in terms of their activity as their structure is fixed and delimited.

Informal Communication Network: The actual manner in which communication occurs in organisations may be less rational than the preconceived channels of a formal system. There are also informal channels of communication within organisations that are not controlled by management, such as informal meetings, grapevine or rumour mill (Eunson 2012). According to Johnson (1993), informal communication networks satisfy a diversity of needs especially the need to socialise. Zaremba (2010) defines such informal networks as networks which transmit information on routes that are not prescribed by the organisation. While Robbins (1998) suggests that informal networks are free to move in any direction, capable of sidestepping authority levels and likely to fulfil group members' social needs. Oftentimes, such informal networks are even faster as they are not hindered by the

bureaucracy of hierarchy often found in formal communication networks (Robbins 1998). Hellweg (1996) states that an informal network differs from a formal network in that it does not have a permanent structure and members of the organisation may become part of the network in particular situations and then they may separate. The informal network has four main criteria – communication is not controlled by the organisation, it is regarded by the majority of members as being more believable and reliable than formal communications, the information flows very quickly and it is used mainly to serve the self-interests of people within it (Robbins 1998).

2.5 Internet Use Statistics

This section surveys data on internet usage to identify patterns and reasons behind varying usage rates across the world. The Internet World Statistics (2011a) state that the total number of internet users in the world is estimated to be 2,267,233,742. This works out to around 32.7 per cent of internet penetration in the world population. North America, Europe and Oceania/Australia regions are the only three regions which have a penetration rate above 60 per cent – North America has a 78.6 per cent penetration rate in a total population of 347,394,870, the Oceania/Australia region also has high penetration at 67.5 per cent and Europe a 61.3 per cent penetration rate in a total population of 816,426,346. Latin America ranks fourth with an internet penetration rate of 39.5 per cent. As the most populous continent, 44.8 per cent of the world's internet users are in Asia; however, with a total population of 3,879,740,877 and 1,016,799,076 internet users, the penetration rate of internet within the Asian region is quite low at 26.2 per cent. Although, the internet penetration rate in Asia has shown some improvement, rising from 10.6 per cent in 2005 (Internet World Statistics 2006) to 26.2 per cent in 2010 (Internet World Statistics 2011a), the Asian region is still lagging behind North America, Oceania/Australia, Europe and Latin America. Last on this list is the African continent where internet users account for only 13.5 per cent of the total population. The details on the world internet usage and population statistics are given in the table 2.2:

Table 2.2: World Internet and Population Statistics

WORLD INTERNET USAGE AND POPULATION STATISTICS						
December 31, 2011						
World Regions	Population (2011 Est.)	Internet Users Dec. 31, 2000	Internet Users Latest Data	Penetration (% Population)	Growth 2000-2011	Users % of Table
<u>Africa</u>	1,037,524,058	4,514,400	139,875,242	13.5 %	2,988.4 %	6.2 %
<u>Asia</u>	3,879,740,877	114,304,000	1,016,799,076	26.2 %	789.6 %	44.8 %
<u>Europe</u>	816,426,346	105,096,093	500,723,686	61.3 %	376.4 %	22.1 %
<u>Middle East</u>	216,258,843	3,284,800	77,020,995	35.6 %	2,244.8 %	3.4 %
<u>North America</u>	347,394,870	108,096,800	273,067,546	78.6 %	152.6 %	12.0 %
<u>Latin America / Carib.</u>	597,283,165	18,068,919	235,819,740	39.5 %	1,205.1 %	10.4 %
<u>Oceania / Australia</u>	35,426,995	7,620,480	23,927,457	67.5 %	214.0 %	1.1 %
<u>WORLD TOTAL</u>	6,930,055,154	360,985,492	2,267,233,742	32.7 %	528.1 %	100.0 %

Source: Reproduced from Internet World Statistics (2011a)

There are only six countries in the world with a penetration rate exceeding 90 per cent, namely Iceland (97.8 per cent), Norway (97.2 per cent), Sweden (92.9 per cent), Falkland Island (Malvinas) (92.4 per cent), Luxembourg (91.4 per cent) and Greenland (90.2 per cent). The details of the penetration rates are given in the table below:

Table 2.3: Countries With Highest Internet Penetration Rate in the World

No	Country	Population	Internet users	Internet Penetration (%)	Data date
1.	Iceland	311,058	304,129	97.8	Dec/2011
2.	Norway	4,691,849	4,560,572	97.2	Dec/2011
3.	Sweden	9,088,728	8,441,718	92.9	Dec/2011
4.	Falkland Island (Malvinas)	3,140	2,900	92.4	Dec/2011
5.	Luxembourg	503,302	459,833	91.4	Dec/2011
6.	Greenland	57,670	52,000	90.2	Mar/2008

Source: Reproduced from Internet World Statistics (2011b)

On the other hand, there are seven countries, which have less than 1 per cent penetration rate, namely East Timor (Timor-Leste) (0.2 per cent), Myanmar (0.2 per cent), Liberia (0.5 per cent), Ethiopia (0.7 per cent), Niger (0.8 per cent), Guinea (0.9 per cent) and Sierra Leone (0.9 per cent). The details of the penetration rates are given in the table below:

Table 2.4: Countries With Lowest Internet Penetration Rate in the World

No	Country	Population	Internet users	Internet Penetration	Data date
1.	East Timor (Timor-Leste)	1,177,834	2,361	0.2 per cent	Dec/2011
2.	Myanmar	53,999,804	110,000	0.2 per cent	June/2010
3.	Liberia	3,786,764	20,000	0.5 per cent	Nov/2008
4.	Ethiopia	90,873,739	622,122	0.7 per cent	Dec/2011
5.	Niger	16,468,886	128,749	0.8 per cent	Dec/2011
6.	Guinea	10,601,003	95,823	0.9 per cent	Dec/2011
7.	Sierra Leone	5,363,669	48,520	0.9 per cent	Dec/2011

Source: Reproduced from Internet World Statistics (2011b)

Four countries in the world have the highest number of internet users, each exceeding 100 million users. They are China (513,100,000)*, United States (245,203,319), India (121,000,000) and Japan (101,228,736) (Internet World Statistics 2011b). Although China has a large population, the penetration rate is only half the United States penetration rate. While the penetration rate in China is between 30-40 per cent, the penetration rate of some their cities exceeds 70 per cent. For example, Shenzhen has a 76.8 per cent penetration rate while Beijing has a penetration rate of 70.3 per cent. The different penetration rates in China are due to differences in the level of infrastructure development and standard of education level within the cities in China (China Internet Watch 2012). The details of the penetration rates are given in table 2.5:

Table 2.5: Countries With Highest Number of Internet Users

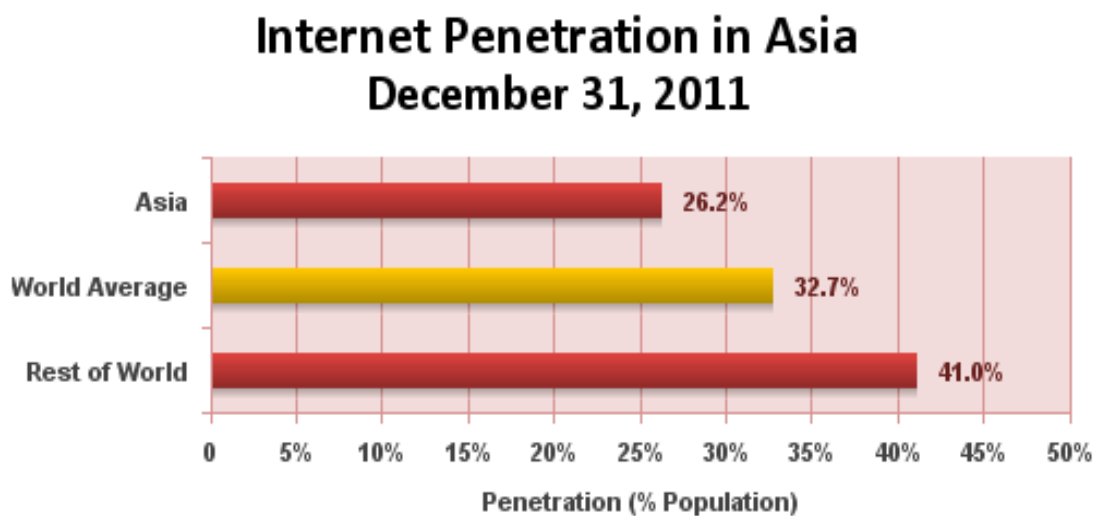
No	Country	Population	Internet users	Internet Penetration (%)	Data date
1.	China*	1,336,718,015	513,100,000	38.4	Dec/2011
2.	United States	313,232,044	245, 203,319	78.3	Dec/2011
3.	India	1,189,172,906	121,000,000	10.2	Dec/2011
4.	Japan	126,475,664	101,228,736	80.0	Dec/2011

* China figures do not include SAR Hong Kong, SAR Macao nor Taiwan.

Source: Reproduced from Internet World Statistics (2011b)

In the Asian context, the internet penetration is 26.2 per cent while the world average is 32.7 per cent and the rest of the world is 41 per cent as shown in the figure below:

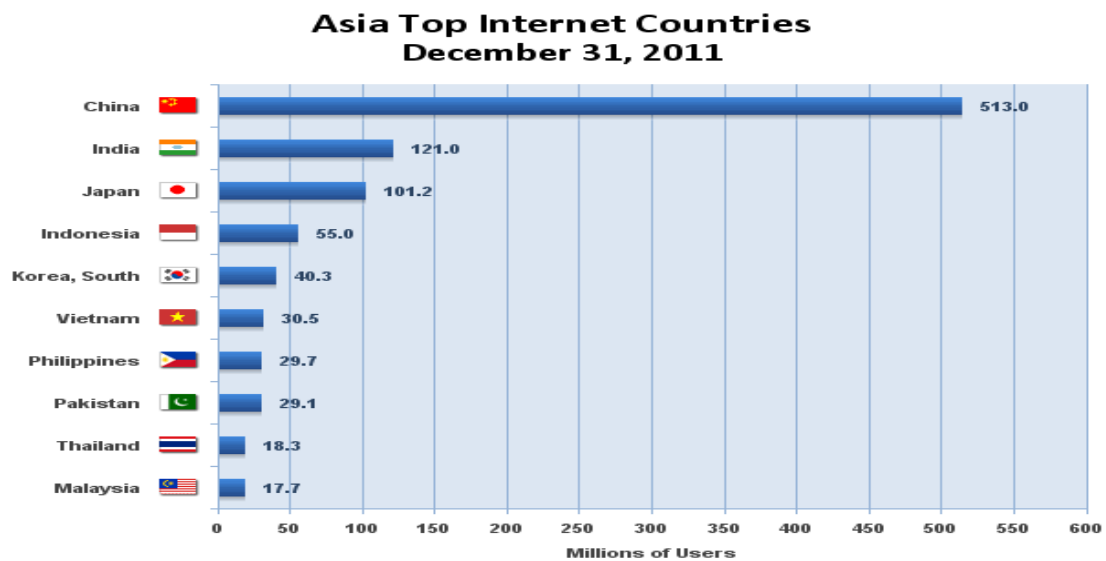
Figure 2.1: Asia Internet Penetration as Compared to World Average and the Rest of the World



Source: Reproduced from Internet World Statistics (2011c)

Ten countries in Asia with the highest number of internet users are China, India, Japan, Indonesia, South Korea, Vietnam, Philippines, Pakistan, Thailand and Malaysia (Internet World Statistics 2011c). The details of the number of users according to countries are given in the Figure 2.5.

Figure 2.2: Asia Top 10 of the Highest Number of Internet User



Source: Reproduced from Internet World Statistics (2011c)

However, in terms of internet penetration rate in the population, there are six countries in Asia with a penetration exceeding 60 per cent. They are South Korea (82.7 per cent), Japan (80.0 per cent), Brunei (79.4 per cent), Singapore (77.2 per cent), Taiwan (70 per cent) and Malaysia (61.7 per cent) (Internet World Statistics 2011c). The details of the penetration rates are given in Table 2.6.

Table 2.6: Countries With Highest Internet Penetration Rate in Asia

No	Country	Population	Internet users	Internet Penetration (%)	Data date
1.	South Korea	48,754,657	40,329,660	82.7	Dec/2011
2.	Japan	126,475,664	101,228,736	80	Dec/2011
3.	Brunei	401,890	318,900	79.4	Dec/2011
4.	Singapore	4,740,737	3,658,400	77.2	Dec/2011
5.	Taiwan	23,071,779	16,147,000	70.0	Dec/2011
6.	Malaysia	28,728,607	17,723,000	61.7	Dec/2011

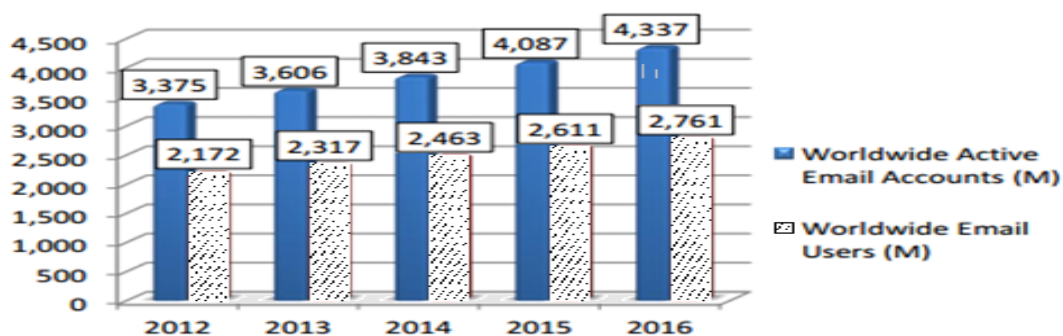
Source: Reproduced from Internet World Statistics (2011c)

This data shows that Malaysia has one of the highest internet penetration rates in Asia, ranking at sixth place with 61.7 per cent. It also has a large number of internet users at around 17.7 million and is ranked 10th in Asia. In terms of global rankings, Malaysia has been ranked at number 53 among countries with the highest internet penetration rates and number 28 among countries with the highest number of internet users in the world (Internet World Statistics 2011b). The internet seems to be emerging as a dominant medium for all sorts of information and communication purposes in Malaysia. Citing a McKinsey and Company survey on internet use, Ibrahim (2012) says that Malaysian consumers spend more time on the internet than on other media such as television, radio or newspaper. Moreover, consumers who are in their 30s spend twice as much time surfing the internet than watching television.

2.6 Email Usage Statistics

In terms of the level of email use across the world, the worldwide total of email accounts is expected to rise from 3.3 billion in 2012 to more than 4.3 billion by the end of 2016. That gives an average annual growth rate of 6 per cent per year over the next four years (Radicati 2012, p. 2). The data also show that the number of individual email users in 2012 is 2.1 billion and it is projected that this number will increase to 2.7 billion users in 2016, which is around a 22 per cent increase. The details of the worldwide data on email accounts and email users for 2012-2016 from Radicati are shown in the figure below:

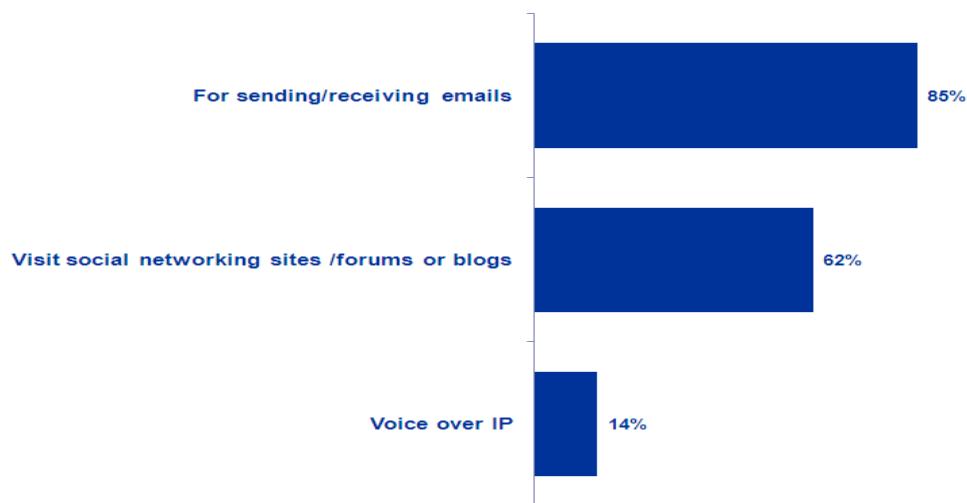
Figure 2.3: Email Accounts and Users around the world from 2012-2016



Source: Reproduced from Radicati (2012, p. 12)

A recent study released on 27 March 2012 by Ipsos (an independent market research company) suggests that a strong majority of online-connected global citizens (about 85 per cent) use the internet for sending and receiving emails while 62 per cent use it for social networking, which indicates that email is still a popular communication channel used among online global citizens.

Figure 2.4: Email usage percentages compared to other channels



Source: Reproduced from Ipsos (2012)

From a comparative perspective on different regions, about half of the total population of email users are in the Asia-Pacific region, while Europe makes up about 22 per cent of email users, North America constitutes about 14 per cent and the rest of the world accounts for the remaining 14 per cent (Radicati 2012, p. 2). This shows that in terms of overall population ratio, there are more email users in Asia than Europe, North America and the rest of the world.

The statistics of consumer and corporate email accounts also show some interesting trends. Consumer email accounts, which are freely available from large portals and ISPs, make up the majority of worldwide email users, representing 75 per cent of mailboxes worldwide in 2012. Corporate or business email accounts represent 25 per cent of mailboxes globally, but it is expected that corporate email accounts will increase at a faster pace than consumer email accounts in the next four years as organisations continue to extend email services to employees who previously did not

have access to them (Radicati 2012, p. 2). The statistics on the number of consumer and corporate email accounts are shown in the table below:

Table 2.7: Corporate vs. Consumer Email Accounts from 2012 to 2016

	2012	2013	2014	2015	2016
Worldwide Email Accounts (M)	3,375	3,606	3,843	4,087	4,337
Corporate Email Accounts	850	918	991	1,070	1,151
<i>% Corporate Email Accounts</i>	<i>25%</i>	<i>25%</i>	<i>26%</i>	<i>26%</i>	<i>27%</i>
Consumer Email Accounts	2,525	2,688	2,852	3,017	3,186
<i>% Consumer Email Accounts</i>	<i>75%</i>	<i>75%</i>	<i>74%</i>	<i>74%</i>	<i>73%</i>

Source: Reproduced from Radicati (2012, p. 3)

From the standpoint of global email traffic, the corporate sector tops the list with the number of business emails sent and received per day totalling up to 89 billion in 2012. This figure is expected to grow steadily at an average annual rate of 13 per cent over the next four years and will reach over 143 billion by the end of 2016 (Radicati 2012, p. 3) (see Table 2.8 below):

Table 2.8: Worldwide Daily Email Traffic From 2012-2016

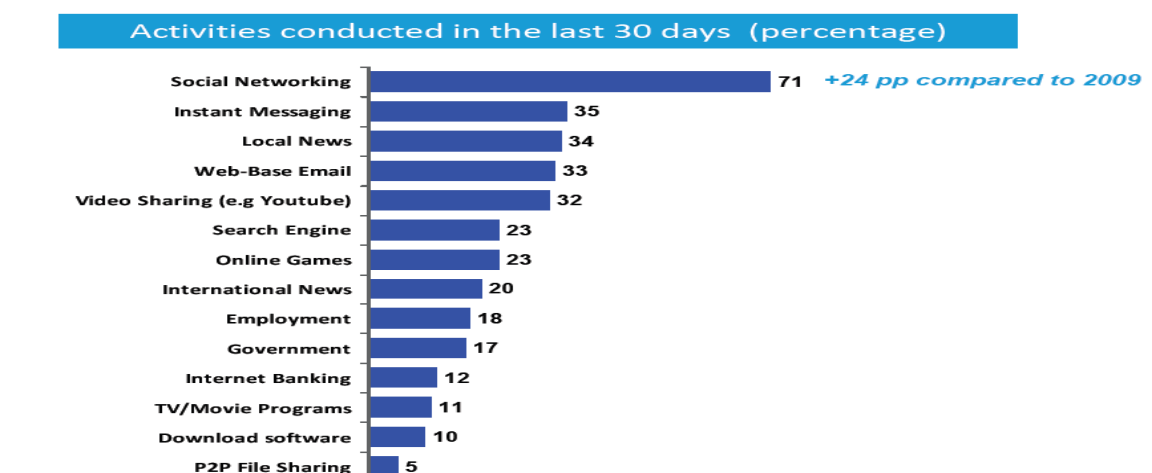
Daily Email Traffic	2012	2013	2014	2015	2016
Total Worldwide Emails Per Day (B)	144.8	154.6	165.8	178.3	192.2
<i>% Change</i>		<i>7%</i>	<i>7%</i>	<i>8%</i>	<i>8%</i>
Business Emails Per Day (B)	89.0	101.0	114.3	128.6	143.8
<i>% Change</i>		<i>13%</i>	<i>13%</i>	<i>13%</i>	<i>12%</i>
Consumer Emails Per Day (B)	55.8	53.6	51.5	49.7	48.4
<i>% Change</i>		<i>-4%</i>	<i>-4%</i>	<i>-3%</i>	<i>-3%</i>

Source: Reproduced from Radicati (2012, p. 3)

In the segment of mobile email, growth can be attributed to the increasing number of consumer and business users who access their email accounts with their mobile devices, especially Android-based and Apple iOS devices. The steady rise in the number of users who use mobile devices for personal and business purposes has resulted in a significant increase in the number of mobile email users around the world, who totalled 730 million in 2012. At present, only 34 per cent of email users access their email through mobile devices (Radicati 2012, p. 4). In Malaysia, research on 1091 mobile web users suggests that they spend only 13 per cent of their time on email (Edge 2011). Osman et al. (2011) examined the usage practices of 1,814 individual smartphone users in major cities in Malaysia to find that 75 per cent of the respondents browsed the internet and 84 per cent played games. However, almost half (44.3 per cent) of them did not access email and only 29.8 per cent of the respondents always/often used email.

Many studies show that email usage in Malaysia is languishing at less than 35 per cent of total internet users. A recent study of 4,000 Malaysian citizens (customers) between the ages of 15 and 64 years across all regions in Malaysia shows that email usage was only found in 33 per cent of the population, while social networking such as Facebook was used by about 71 per cent (see figure 2.8) (Nielsen 2010).

Figure 2.5: Internet Activities Among Malaysian Citizens Between October and December 2010 for the last 30 days



Source: Reproduced from Nielsen (2010)

The number of Facebook users in Malaysia as on 31 March 2012 was 12,365,780, which is nearly 70 per cent of internet users in Malaysia (Internet World Statistics 2011c). These data show that there is a significant percentage difference between email and Facebook usage in Malaysia. These results suggest that Malaysia is facing an issue in email usage, volume and responsiveness especially when compared to developed countries.

Exploring the differences in internet connectivity among OECD countries, Hargittai (1999, p.1) found that economic wealth and telecommunication policy are the most significant factors contributing to internet penetration rate. This is also in line with Tryhorn's (2009) conclusions that the problem of a low level of email adoption is linked to the level of overall economic development. While email usage in developed countries has reached a level of maximum – even over-excessive – saturation (Sumecki et al. 2011), developing countries face issues in effective email adoption and diffusion (Ghuloum & Ahmed 2011; Tryhorn 2009).

2.7 Email as a Medium of Organisational Communication

Electronic mail, more popularly known in its shortened form as email, was introduced early in the 1960s as a channel of communication and interaction linking single computer users (Peter 2004). With the development of internetworking in the early 1970s, the first batch of email messages was sent to different users on different computers (Leiner et al. 1997). A commercial email system was begun in the 1990s and after being established in government and education institutions in the 1990s, electronic email became the common medium of communication in other workplaces in the 2000s (Peter 2004). Culnan and Markus (1987) define email as an 'asynchronous' medium, in which a user can communicate with one or many other people at the same time. In its early stages, the main functions and operations of email revolved only around reading and sending messages (Peter 2004). It can now be used for a range of informational data services, such as attaching word processing documents, making presentations and spreadsheets, creating and reminding appointments, managing contacts, and taking notes (Osterman Research 2010, p. 2).

An early study by Rice (1997) showed that the most frequent message types sent via email by people, in declining order of frequency, were announcements, requests, explanations, replies, notices, confirmations, reminders and a few other types of messages.

The use of email can reduce the use of paper, save time, enable the sender to provide information to a number of specific people in one action and overcome logistical issues related to face-to-face communications (Ratchukool 2001). Chui et al. (2012, p. 9) explores the possible economic influence through social technologies by investigating their present utilization and progressing usage in four profitable sectors in the US- consumer packaged goods, retail monetary services, advanced manufacturing and professional services. The finding shows that reading and answering work-related email contributed to an improvement of productivity between 25 and 30 per cent. The findings also show that the use of social technologies such as the internet and email at the workplace potentially contributed between \$900 billion to \$1.3 trillion in annual value across these four sectors (Chui et al. 2012, p. 3).

Eunson (2012) lists the different advantages provided by email as below:

- a) Provide documentation of events
- b) Can ensure that the same message reaches everyone
- c) Asynchronous – that is, sender can send them out at one time and receivers can receive them at another time
- d) Can be used to deliver attachments (graphics etc.) that display real information more vividly than memos can
- e) Can instigate more upward and lateral communication
- f) Quicker than paper-based memos

According to Fallows (2003), while most employees in organisations have a positive perception of email as a work tool that helps them work efficiently and fulfil their tasks, there are also certain drawbacks to email. Fallows explains that while email works best for managing tasks that only require targeted and clear messages, more

complicated interactions in tasks such as decision-making cannot be completed by email. Also, while email serves as a communication link between all employees, it can sometimes lead to a sense of isolation since employees do not engage in actual face-to-face interaction which can infuse a sense of warmth, familiarity and solidarity in an organisation (Brocklehurst 2001). Again, Eunson (2012) has summarised the weaknesses of email as follows:

- a) May be pointless and annoying
- b) If sent too many times, may not be read or given attention
- c) May be an excuse for some writers to avoid face-to-face communication with others
- d) If produced in a hurry (as most are), this may create the notion of carelessness and being devoid of professionalism
- e) May become problematic to store, file and access
- f) May disappear if hardware and/or software become damaged
- g) May not be taken seriously as much as a hard copy document

Fallows (2003) also contends that when more complex communication is required, email is seen as less effective compared to other communication tools. Employees and managers of organisations often find they spend far too much time reading and answering emails. This unproductive time increases with an increasing usage of email. Consequently, organisational staff are compelled to allocate specific time to manage checking, organising and prioritising emails more efficiently (Robinson & Bennett 1997). A recent research study conducted by Eunson (2012, p. 209), found that email traffic has exploded so dramatically that it has contributed to email overload to such an extent that organisations have implemented 'quiet time' regimes (no email or phone for the first four hours of the day). Large volumes of unsolicited commercial email called spam also add to email overload. Another interesting phenomenon is the 'no-email Friday', whereby people are forced into using richer forms of communication such as face-to-face or the telephone (Eunson 2012).

Malik (2007) argues that the persistent flow of communication on email and information overload has led to a situation where email usage has become time-consuming rather than time-saving, leading users to shut down or temporarily suspend their email accounts. In a case study at Pembrokeshire College United Kingdom in 2010, Silverstone (2010) noted that staff usage of email generated a time cost of £1.2 million and 52.5 per cent of the respondents felt that they had wasted some of their time because of email. Some chores in email usage can also lead to further time-wastage, such as duplication of messages, erroneous content, irrelevant messages, and incomplete messages that require additional explanation (Silverstone 2010).

An email system needs to be maintained and monitored by organisational administrators and IT personnel which may add to administrative overhead costs (Zelikovich 2011). In addition, despite the progress in encryption and privacy laws, email privacy remains a major concern to users (Udo 2001). Given the apparent informality, privacy, impermanence and speed of email, email users could touch on matters that they would never bring up in real-life conversations. But legal policy around the world generally states that an email sent from the workplace is the property of the employer rather than the sender, and sensitive information shared by users can be retrieved by their organisation (Eunson 2012). Several organisations require their employees to sign email policies, in which they agree to such monitoring on a continuous basis. It is permissible for employers to monitor email correspondence if there is a reasonable business reason for doing so (Udo 2001). Even with deletion of the email, it is possible for the data shadow of an email to be restored on a network server (Brake 2004). One of the major barrier to use email over letters is the lack of its official weight. Pallen (1995, p.1488) argues that email is seen as a less formal/official communication channel because of few reasons:

- a) Email messages often carry little information about the social status, hierarchical position, race, age, or appearance of the sender
- b) Emails lack fancy letterheads or corporate logos
- c) Email turnaround times are fast. Two individuals can exchange several messages a day, leaving little time for formalities

2.8 Theories of Media Selection in Organisational Communication

The channels of communication chosen for transferring information can influence the manner in which the senior organisational management and employees communicate and share information. The suitability and usefulness of a channel to deliver messages and information is directly related to the strength of that form of media (Madhavan & Grover 1998). There are many types of communication channels, namely face to face, telephone, email, letter and others. According to Eunson (2012), the best channel for communication will be determined by the situation and the task. Effective organisational communicators use more than one channel to make sure that messages are repeated and reinforced in different ways. Table 2.9 below suggests four strategies for effective organisational communication:

Table 2.9: Effective Organisational Communication

Strategy 1	Match the channel to the message and the audience or target.
Strategy 2	Repeat and vary the message via different channels to reinforce the message.
Strategy 3	Be ready to step outside our comfort zone to use the channels we are not necessarily comfortable with.
Strategy 4	Be aware that the channel chosen may transform the content of the message.

Source: Reproduced from Eunson (2012, p. 9)

Given the importance of media selection, theories have been developed to understand the suitability of media for different contexts in organisational communication. This section reviews two main theories in this field – Media Richness Theory and Social Presence Theory – and explains how these theories relate to email as a channel of organisational communication.

a. Media richness theory

Probably the leading theory for explaining media choice in organisation and information sciences, according to Daft & Lengel (1986), Media Richness Theory was established by two researchers namely Richard L. Daft and Robert H. Lengel for

examining the relationship between the content of managerial communication and media selection. Media Richness Theory (MRT) states that individuals select the most suitable communication medium to complete a particular task after matching the content of the assignment with the information richness of the media (Daft et al. 1987). The right medium is chosen in light of the level of uncertainty and equivocality in a particular task. For assignments high in uncertainty and ambiguity, like negotiations and conflict resolution, people will most likely use face-to-face and telephone channels. For assignments with less uncertainty and ambiguity, used in simple information exchange, leaner channels, such as memos and emails are preferred (Straub 1994, p. 26).

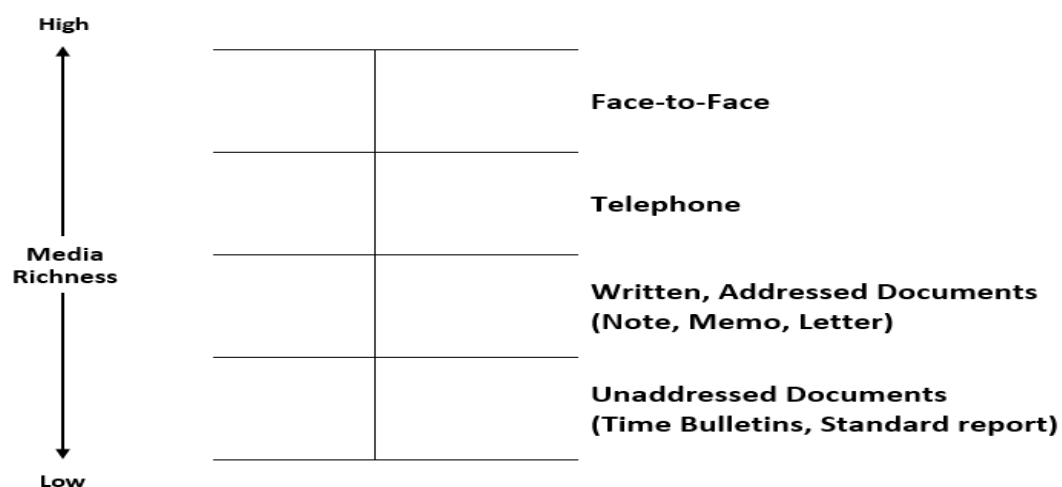
Communication media can be ranked based on their content of equivocality and uncertainty (El-Shinnawy and Markus 1997, p. 444). Daft et al. (1987) proposed a media richness hierarchy ranking as shown in figure 2.9 and explained that:

“---media richness hierarchy which [contains] four media classifications—face-to-face, telephone, addressed documents and unaddressed documents. The richness of each is based upon a blend of four criteria – feedback, multiple cues, language variety, and personal focus”.

(Daft et al. 1987, p. 358).

The hierarchy is shown in the figure below:

Figure 2.6: Hierarchy of Media Richness



Source: Reproduced from Daft et al. (1987, p. 358)

The medium with the richest communication medium is obviously face-to-face meetings. The second richest is telephone followed by e-mail, memos and letters (Rice & Shook 1990). According to MRT, it is more effective to communicate a message through face-to-face conversations than through any other media (Turner et al. 2010). Discussion by way of face-to-face meeting has the ability to communicate multiple cues in the form of tone of voice, body language, facial expressions, appearance and dress; besides, the effects of the setting and ambience make this communication medium richer (Otondo et al. 2008). These multiple signals also convey other important information, such as credibility, power, status and emotions of all people involved in the discussion; these intangible cues are not easily communicated in Computer Mediated Communication (CMC) (Otondo et al. 2008).

Rich media, such as face-to-face and telephone, are thought to be suitable for dealing with equivocal messages or fragile situations. Lean media such as written documents are assumed to be more appropriate for messages with less uncertainty (El-Shinnawy & Markus 1997, p. 444). Based on MRT, electronic mail ranks third after face-to-face and telephone. According to MRT, email is less rich in cue variety, immediate feedback and message personalisation in comparison to other communication media in equivocal circumstances (Trevino et al. 1990). Email is also recognised to have a lower degree of information richness because it is unable to give extra non-verbal cues for vague information (Steinfeld 1990).

Connell et al. (2001) noticed that people use different media of communication for different purposes; sometimes these choices are quite different from those prescribed by MRT. For example, people prefer to use face-to-face communication for tasks which are people-oriented, such as performance feedback, impression management and socialising; CMC was opted for tasks which are task-oriented such as planning, problem-solving and information exchange (Connell et al. 2001).

Trevino et al. (1987, p. 560) found that managers' choices of media are based on three factors as quoted below:

“---ambiguity of the message content and richness of the communication medium, symbolic cues provided by the medium and [finally, and] situational determinants such as time and distance”.

(Trevino et al. 1987, p. 553).

The findings also showed that managers preferred to use face-to-face communication for messages which were ambiguous in content, whereas telephone and electronic mail were selected on the basis of situational determinants (Trevino et al. 1987). Trevino et al. (1990, p. 176) suggested that individual differences matters only when conveying information with low equivocality or ambiguity. They found that when information is highly equivocal, a richness imperative masks the influence of individual differences.

Russ et al. (1990) focused on media use in a large company by testing data from 94 managers to examine organisational media selection behaviour as predicted by the media richness and symbolic interactionism theories. The findings showed that managers, especially those in higher positions, were more inclined to face-to-face communication for highly equivocal communications and written media for clear, objective communications (Russ et al. 1990, p. 151). While MRT was originally established to examine traditional forms of communication, such as face-to-face or telephone, it has now been expanded to studies of new media such as voicemail and email by scholars like El-Shinnaway and Markus (1992).

The propositions of MRT are valid when applied to traditional media such as telephone and letters. However, they cannot explain the higher degree of effectiveness of richer media, particularly newer media such as email (Simon 2006). MRT perceives many CMC devices as unsuitable for complex problem-solving tasks. However, research has proven that such devices, especially the powerful CMC devices developed now, are capable of producing superior and more effective decisions than the face-to-face method of communication (Valacich et al. 2002).

As Mennecke et al. (2010) show, CMC devices now enable avatar bodies for virtual conversations that provide a medium that is equally engaging and useful as face-to-face conversations without the logistical problems associated with arranging such meetings. According to Griffin (2009), MRT upholds that CMC is too restricted in capacity to offer relational richness to those who participate in it. However, the introduction of Skype in 2003 has changed this and the face-to-face communication in real time offered by Skype has a richness of communication not afforded by computer-mediated communication or texting (Chang & Michels 2011). This type of communication presents an immediate response, provides the opportunity for timely feedback and conveys cues through vocal inflection not afforded by written communication (El-Shinnawy & Markus 1997). The combination of verbal and non-verbal communication on Skype, such as instant message and video chat, provides a richer communication medium compared to email, telephone and sms.

Thus, support for MRT has not been unanimous but mixed (Teoh 2012). Propositions of MRT also do not hold much importance in contemporary workplaces because the focus on efficiency and speed has increased over time. For example, in modern workplaces people seldom use the telephone, which is a richer medium for faster communication, and instead use text-messaging system. The latest communication devices such as Blackberries, iphone and other smartphones have made it possible to send quick emails while people are on the move. Shaw et al. (2009) conducted experiments to study the effects of hypermedia, multimedia and hypertext on the three levels of awareness relating to information security: perception, comprehension and projection. The results of the study confirm that media richness is positively correlated to security awareness levels. Sun and Cheng (2007, p. 662) found that the use of multimedia instructional material design in e-learning attracted learners attention and interest (Sun and Cheng 2007, p. 674). However, Suh (1999) did not find evidence of significant interaction between task and communication medium to record task performance or satisfaction to support the propositions of media richness theory.

A case study done by Damianos & Drury (2006) on collaboration within a corporate environment in MITRE's Information Technology Center, United States suggests that email is the most favourite method for communication. Email is frequently selected for formal communication, low-level details, organizing thoughts, or when it is desired to keep a historical record of interactions. Although central information window such as Microsoft SharePoint or electronic document exchange folders are used to share resources, human resource team still uses email to distribute notifications and details of new informations. The study also dictates that video conferencing is only useful when the participants involved are the same person at each session and they use it frequently and regularly. Despite the fact, the 1-2 seconds of delay in audio and the poor image quality has made this type of communication medium less likely to be used (Damianos & Drury 2006).

b. Social presence theory (SPT)

MRT looks only at information-richness of a medium, so it tends to overlook complex factors of human behaviour that determine the selection of a particular medium. In contrast, social presence theory was formulated to account for the role that social characteristics such as sociability, warmth and sensitivity play in affecting the level of use of a particular medium of communication in an organisation. Social presence is *"the degree to which a medium permits users to experience others as being psychologically present"* (Fulk et al. 1987, p. 532). Sociability, warmth and sensitivity play a role in determining how communicators perceived the psychological presence of their conversation counterparts (Rice 1993, p. 454). The theory also covers the different degrees of social presence expressed by various means of communication media as well as selection of these media for different types of tasks. Therefore, this theory does not focus on the characteristics of the task like MRT but on the psychological effect on employees in using a particular form of communication (Rice 1993).

Sia et al. (2002) claimed that settings of high social presence cause users to treat others involved in an interaction as human beings with emotions. The users would not regard others involved in an interaction as inanimate objects that can be ignored

at will. According to Swan and Shih (2005), usage of a high social presence medium for communication yields high levels of satisfaction, greater levels of interactions and greater learning opportunities. Zhang and Ge (2006) found that media which possess higher levels of social presence tend to stimulate greater level of interactions among team members. Salisbury et al. (2006) assert that media with higher levels of social presence forge greater group cohesion among team members. CMC too is capable of passing information which increases perceived social presence; however, the rate of transfer is slower compared with that of face-to-face communication (Havard et al. 2008).

Wong and Lai (2005) suggested a task-medium based on propositions of social presence theory. People seem to know in advance the level of social presence required for solving a particular task; they then select a communication medium based on that foreknowledge (Wong & Lai 2005). Therefore, tasks that are highly interpersonal and subjective in nature require a communication medium with high social presence, such as face-to-face communication. On the other hand, tasks involving exchange of objective information require a communication medium with low social presence (CMC) (Wong & Lai 2005).

In the SPT hierarchy of media, email communication is lower in the level of social presence. Media such as face-to-face meetings and telephone calls are perceived to have rich social presence, whereas media like email and FAX are perceived to be low in social presence (Huang 2003, p. 11-12). Schmitz and Fulk (1991) examined email from the social presence perspective and discovered that:

“(a) perceived electronic mail richness (1) varied across individuals and (2) covaried with relational social influences and with media experience factors; (b) perceived electronic mail richness predicted individuals' electronic mail assessments and usage; (c) social influences of colleagues had pervasive effects on others' media assessments”.

(Schmitz & Fulk 1991, p. 487).

With email, receivers of the information are not socially and psychologically 'present' when communication is initiated. So users do not really depend on email for 'interpersonally involving' tasks. Also, email cannot send non-verbal information and the feedback is also not instant (Schmitz & Fulk 1991). Sherblom (2010) stated that a leaner medium like CMC transfers less information, cues, feedback and language; therefore it is more suitable and efficient for targeted and unambiguous communication but less effective for equivocal and more complex tasks.

Face-to-face communication has been found to carry a higher level of social presence than CMC (Swan & Shih 2005). Traditional face-to-face communication generally includes verbal and visual cues while CMC only includes textual cues (Sia et al. 2002). Verbal and visual cues are more effective in conveying immediacy and thus generate higher levels of social presence (Sia et al. 2002). Sherblom (2010) also emphasises that a reduction in cues limits the communication of social information of a person, resulting in generation of unclear impressions and messages. Roberts et al. (2006) conducted research on groups of people involved in dispersed CMC discussions and found that participants suffered from lower levels of social presence, which led them to produce the lowest quality of group discussion and teamwork. While Wong and Lai (2005) found that CMC is still lagging behind in social presence compared with traditional face-to-face communication, conflicting results in recent studies show that face-to-face communication may not always possess higher levels of social presence than CMC (Wong & Lai 2005).

In summary, in terms of current thoughts regarding media selection, the effects of MRT and social presence theory in relation to communication media are very similar. Due to differences in these qualities, interactions between participants of discussions may be different, depending on the communication medium used (Gunawardena et al. 1997). More specifically, based on these two theories, face-to-face communication is 'richer' and carries more social presence compared to CMC. These qualities make face-to-face communication more suitable for complicated, uncertain, emotional and subjective tasks. These theories tend to rank CMC channels such as email below traditional forms of communication.

2.9 Understanding Medium-Selection and Email Use in Malaysian Organisations

As outlined in the introduction chapter, existing research has pointed out the significant lag in the uptake of email in Malaysian organisations. In a comparative study of administrators in a Malaysian public university and a UK public university, Universiti Teknikal Malaysia Melaka (UTeM) and University of Brighton (UB), Husain et al. (2009) found significant differences in the volumes of email received by administrative staff at the two universities. While assessing email usage among administrative staff in 24 ministries in Malaysia, Mohamad and Hashim (2010) found that only 8 per cent replied, 75 per cent did not respond and 17 per cent of the emails bounced – possibly indicating that email communication is not taken seriously as an important or valid tool of communication for public enquiries. Ahmad et al. (2009) suggest that while there is a high level of email use among academics in public and private universities, private universities academicians have higher ICT proficiency than public university academicians. This issue then begs the question of why email lags behind in Malaysian HEIs and how media selection is determined in an organisational context.

Ean (2010) examined employees' perspectives on various communication channels in five private-sector organisations in Malaysia and found that CMC such as email was used as the main communication tool. The most frequently used channels for communication in the workplace are summarised as follows (in descending order): email, instant messaging, intranet and corporate website. Habil and Rafik-Galea (2010) carried out a study on workers in a Malaysian automotive manufacturing firm. The highest function of email messages is 'inform' which is 39.2 per cent followed by 'request' which is 19.6 per cent while none of the workers used email to 'instruct'. The tasks for which email communication is used are listed below:

Table 2.10: Function of Email Messages

No.	Function of Email Messages	per cent
1.	Inform	39.2
2.	Request	19.6
3.	Explain	18.6
4.	Call for meeting	6.2
5.	Confirm	6.2
6.	Acknowledge	4.1
7.	Explain-request	3.1
8.	Inquire	2.1
9.	Disagree	1.3
10.	Instruct	0

Source: Reproduced from Habil and Rafik-Galea (2010)

Investigating patterns of email discourse in two leading private manufacturing companies, Habil (2003) discovered some interesting societal and cultural perceptions regarding email as a social action as email writers ascribed active social meaning in their email exchanges. The study discovered ‘institutional ideology’, or the mindset of the firm, as an invisible force that influenced and shaped the way people used and interpreted communication for specific purposes. This means that a medium was not selected on an impartial and rational basis determining the practical or functional value of a form of communication; rather, it was filtered through the institutional ideology of the organisation and the values it adopted and adapted in a bid to stay competitive. The study found that values adopted by the institutional ideology of the organisation reflected very strongly in their email use, for example, politeness was valued in both organisations and was reflected in the email messages written by people in both organisations (Habil 2003). The main findings of the study are given in Table 2.11.

Table 2.11: Electronic Mail : The Fancies of the Millennium

Influence of technology	<ol style="list-style-type: none">1. To portray the company's good image.2. To reflect the technological culture the company is adopting.
Features of email	<ol style="list-style-type: none">1. Messages could be forwarded to multiple receivers at the same time.2. Senders do not have to meet face-to-face with the persons with whom they are interacting.3. It resembles spoken communication more than written communication.
Attitudes of users	<ol style="list-style-type: none">1. Writers feel more relaxed writing email than memos or letters.2. Writers respond to email faster compared to memos and letters.3. Writers follow no specific format when writing email.

Source: Reproduced from Habil (1999)

Recruiting 218 academic and non-academic staff members in a public university in Malaysia as respondents, Bidin (2000) examined media richness, social influence and electronic mail in the workplace. The findings from this study suggest that: (1) there was significant difference in media richness perception between his respondents in Malaysia in comparison to that discovered by Daft (2007) in a study on US workers; (2) keyboard skill was a significant antecedent to email richness perception; and (3) social influences from co-workers and supervisors contributed significantly towards email use and usefulness assessments of their peers. The study also suggests that it is essential to consider both technological features and social interaction planning in implementing and maintaining the use of communication technology in an organisation (Bidin 2000).

While Bidin's study uses concepts of media richness and social presence derived from two theories of MRT and SPT explained earlier in this chapter, this study

contends that the adoption of email in Malaysia needs to be examined with the use of a holistic model of technology acceptance. Theories such as MRT and SPT tend to focus too much on the characteristics of the medium itself, rather than the factors of perceptual and attitudinal change among users, which can encourage the adoption of a particular technology. In other words, these theories tend to adopt a medium-focussed approach rather than user-focussed approach to understand technology adoption. Consequently, they also overlook the role that national and organisational culture play in shaping the behaviours and perceptions of users towards a particular technology. Husain et al. (2009) finds that there is a significant amount of empirical research suggesting that attitude and usage of the internet differs across cultural and gender groups showing a strong interrelationship between culture and communication (Carey 2008; Cushman & Craig 1976; Edward 1959; Schall 1983). Therefore, this study will examine the problem of email use in Malaysian universities with the help of a user-focussed technology adoption theory called the Technology Acceptance Model in conjunction with Hofstede's models of National and Organisational Culture. Moreover, previous studies have proven the high validity of the Technology Acceptance Model in research on technology usage with cultural aspects. These theories and the conceptual model for the study derived from them will be discussed in detail in the next chapter.

2.10 Conclusion

This chapter was concerned with the medium of email and its utility as a means of organisational communication. With this in mind, the chapter sketched an outline of the meaning of organisational communication, its forms and functions in improving performance, coordinating functions and maintaining organisational hierarchy. In light of these constraints in organisational communication, the utility of email as a medium was discussed and its advantages and disadvantages were highlighted. A survey of existing research on this issue in the Malaysian context showed that different institutional constraints and user biases affect the selection of the medium of communication in Malaysian organisations. In particular, Bidin's study drew upon the two theories of MRT and SPT explained earlier in this chapter. However, as this

research seeks to understand the adoption of email in Malaysian HEIs from a more holistic technology acceptance perspective, it requires a more user-focussed rather than medium-focussed theory. Theories, such as MRT and SPT, tend to focus too much on the characteristics of the medium itself, rather than the factors of perceptual and attitudinal change among users that encourage the adoption of a particular technology. Therefore, the next chapter is concerned with identifying suitable theoretical models on user acceptance of new technology that can help explain factors impeding or encouraging email adoption in Malaysian HEIs.

CHAPTER 3

CONCEPTUAL FRAMEWORK

3.1 Introduction

This chapter presents a literature review of the theoretical concepts in order to establish the research model to guide this study. It will give a detailed overview of the three theoretical perspectives underpinning the framework, i.e. Davis's Technology Acceptance Model (TAM), Hofstede's models of National Culture (NCM) and Organisation Culture (OCM). Of the three, the TAM is a globally-used theory that can measure reasons behind success or failure in the adoption of a particular technology on the basis of its inherent merits and utility as a product. The second theoretical concept of National Culture is based on the conviction that the cultural specificities of a particular location affect the adoption of a technology, so it accounts for the role of national culture in influencing the adoption of a technology in a particular cultural context. The adoption of technology may also differ according to the work culture in different organisations and the theory of organisational culture measures how specific patterns of work ethic and culture in different organisations influence the adoption of a particular technology. After having explained each of these theories in detail, this discussion will also draw from previous studies to highlight the relationships between the three theories and explain how they can work in combination to provide a holistic research model for this study. Given the localised nature of this study and its focus on email adoption in Malaysian universities, the chapter will also highlight the crucial importance of filtering generic theories of technology adoption like TAM with theories of national/organisational culture.

3.2 Theories of Technology Acceptance

3.2.1 Introduction

Technology adoption refers to the level of use or acceptance of a new technology or product in the market. Many theories have been used to investigate the adoption of new technologies in general as well as the adoption of new ICTs in organisations in particular. Some of these theories are Innovation Diffusion Theory (IDT) (Rogers 1983), Social Cognitive Theory (SCT) (Bandura 1986), Theory of Reasoned Action (TRA) (Ajzen & Fishbein 1980), Theory of Planned Behaviour (TPB) (Ajzen 1985), Decomposed Theory of Planning Behaviour (DTPB) (Peter & Shirley 1995), and Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al. 2003). A number of these will now be briefly introduced before discussing the Technology Acceptance Model (TAM) (Davis 1989) in more detail. The TAM has been employed as a foundation of the conceptual model used in this study.

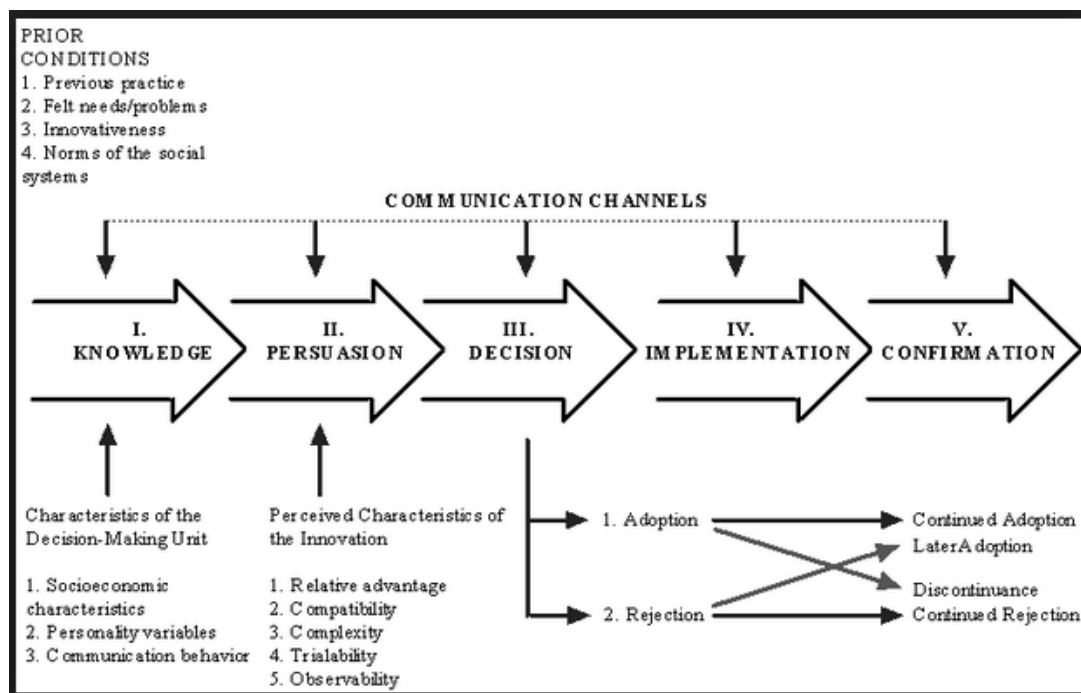
3.2.2 Early Work

Innovation diffusion theory focuses on the behaviour of uncertainty reduction among potential adopters when technological innovations are introduced (Rogers 1983). IDT measures the level of technology acceptance by examining the overall innovation decision process in the adoption of a technology across various categories of adopters on the basis of the speed at which they take up innovations (Rogers 1995). Innovation diffusion theory (IDT) has four main elements, namely innovation, communication channels, time and social system (Rogers 2003). *“An innovation is an idea, practice, or project that is perceived as new by an individual or other unit of adoption”* (Rogers, 2003, p. 12). On the other hand, a communication channel is *“a process in which participants create and share information with one another in order to reach a mutual understanding”* (Rogers 2003, p. 5), while a social system is *“a set of interrelated units engaged in joint problem solving to accomplish a common goal”* (Rogers, 2003, p. 23).

Rogers (2003) also introduced five attributes of innovations namely relative advantage, compatibility, complexity, trialability and observability. Relative advantage is *“the degree to which an innovation is perceived as better than the idea*

it supersedes” (Rogers 1995, p. 250). The extent of relative advantage is often indicated in terms of economic profitability but it may be measured in other ways, such as a social perspective (Rogers 1995, p. 212). Compatibility is “*the degree to which an innovation is perceived as consistent with existing values, past experiences, and needs of potential adopters*” (Rogers 1995, p. 250). Rogers (1995, p. 250) posited a relationship between perceived compatibility and rate of adoption. Complexity is “*the degree to which an innovation is perceived as relatively difficult to understand and use*” (Rogers 1995, p. 250). He also suggested that there is a negative relationship between complexity of an innovation and its rate of adoption (Rogers 1995). Trialability is “*the degree to which an innovation may be experimented with on a limited basis*” (Rogers 1995, p. 251). Rogers (1995, p. 251) suggested that the perceived trialability of an innovation can increase its rate of adoption. Finally, Observability is the “*degree to which the results of an innovation are visible to others*” (Rogers 1995, p. 251). This also means that the perceived observability of an innovation is positively related to its rate of adoption (Rogers 1995). This model of innovation-decision (see Figure below) is counted among the best-known theories on the adoption of new technology.

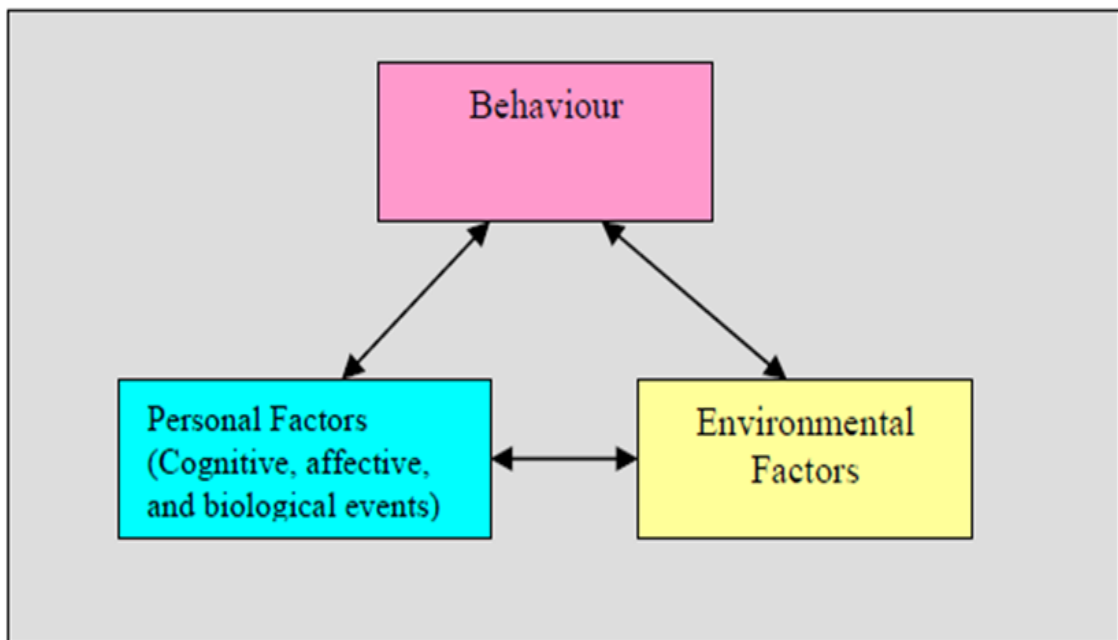
Figure 3.1: A Model Exhibiting Stages in the Innovation-Decision Process



Source: Reproduced from Rogers (1995)

Bandura (1986) is credited with introducing social cognitive theory in his important book, *The social foundations of thought and action: a social cognitive theory*. SCT explains psychosocial functioning using a logic of triadic reciprocal causation involving personal determinants, behaviour and environmental influences. The way in which the results of behaviours are interpreted informs and alters people's environments and the personal traits they possess, which in turn informs and alters their subsequent behaviours. This three-way interaction across these elements is shown in the figure below.

Figure 3.2: Social Cognitive Theory



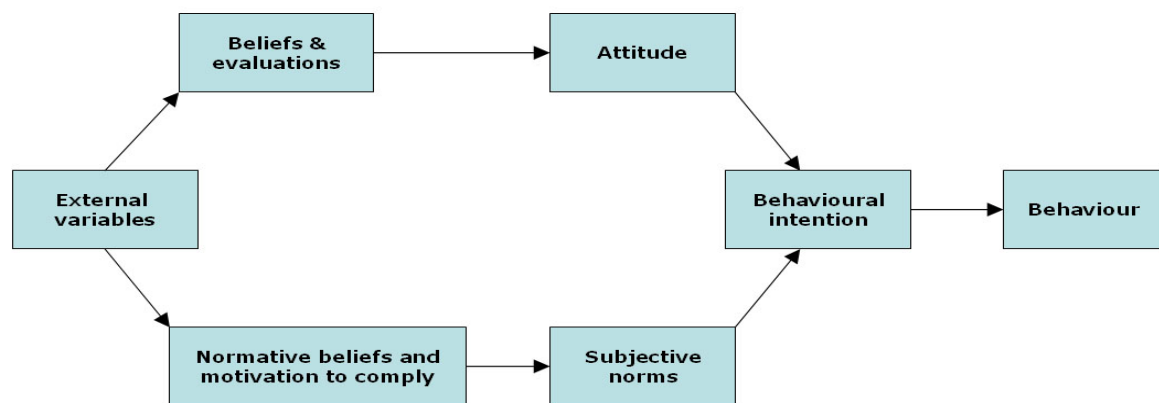
Source: Reproduced from Bandura (1986)

Fishbein and Ajzen (1975) formulated the Theory of Reasoned Action (TRA) as a way to obtain more in-depth understanding about how attitudes and beliefs are interrelated with performance of individual intentions. TRA is an intention-based model originating from the field of social psychology. Social psychology researchers are not concerned with classifying the characteristics of a technology but are more interested in factors that determine the behaviour of a person. A general survey of current research shows that most modern research on technology adoption is

premised on behavioural intentions. The TRA model has a good record in predicting and explaining a diverse array of human behaviour (Ajzen & Fishbein 1980, p. 4).

The primary assumption of this model is that an individual can generally be considered as a rational being who makes systematic use of information and considers the implications of his/her actual behaviour before engaging in a given behaviour (Ajzen & Fishbein 1980, p. 5). Subsequently, an individual's behavioural intention is defined by two factors namely attitude towards behaviour and subjective norm. Attitude towards behaviour is “---an individual's positive or negative feelings (evaluative affect) about performing the target behaviour” (Ajzen & Fishbein 1980, p. 216). Subjective norm define as “---a person's perception that most people who are important to him think he should or should not perform the behaviour in question” (Fishbein & Ajzen 1975, p. 302).

Figure 3.3: Theory of Reasoned Action



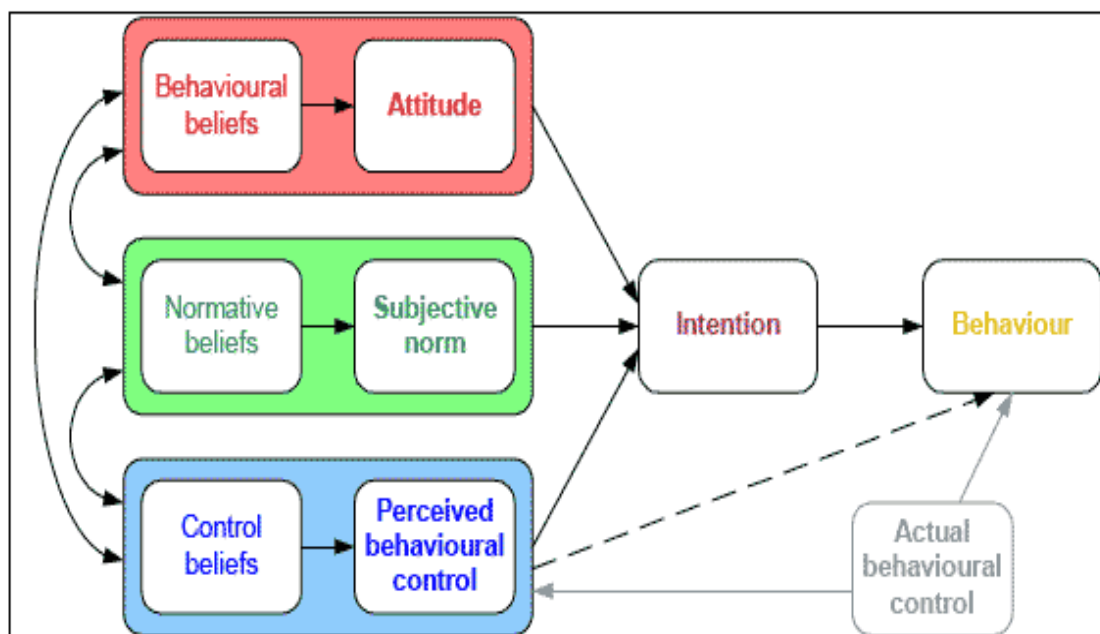
Source: Reproduced from Fishbein and Ajzen (1975)

IS researchers have often utilised this theory to study the determinants of usage behaviour in IT innovations (Han 2003). A comparative study by Teo and Schaik (2012) used TRA, TPB, TAM and an integrated model to determine the most parsimonious model and assess the effect of each construct in these models on intention to use technology among pre-service teachers in Singapore. The study found that these four models succeeded in accounting for more than 50 per cent of observed variance on intention to use, even though an increase in the number of constructs did not increased their explanatory power. Between the models, little

difference was found between the integrated model and the other models. The construct of attitude emerged as the most significant determinant of the intention to use technology. The same result was echoed by Liang and Yeh (2011) who found that a user's attitude contributed to the intention to continue playing mobile games.

The theory of planned behaviour (TPB) builds on TRA and refines its focus to provide a theoretical framework that “---dealing *with behaviours over which people have incomplete volitional control*” (Ajzen 1991, p. 181). It includes a third determinant called ‘perceived behavioural control’ which recognises that not all behaviours are under an individual's volitional control (Ajzen 1991, p. 181). According to the TPB model, people's attitudes toward behaviour, subjective norms, and perceived behavioural control can predict their intention to perform a certain behaviour (Ajzen 1991, p. 179). Attitude toward behaviour includes highly subjective behavioural elements arising from personal experiences and dispositions that influence an individual's favourable or unfavourable evaluation using a certain technology (Ajzen 1991, p. 188). Subjective norm is “---*the perceived social pressure to perform or not to perform the behaviour*” (Ajzen 1991, p. 188).

Figure 3.4: Theory of Planned Behaviour



Source: Reproduced from Ajzen (2006)

TPB has provided the theoretical foundation for 222 studies available in the Medline database, and 610 studies available in the PsycINFO database, from 1985 to January 2004 (Francis et al. 2004, p. 2). The TPB model still cannot account for a large proportion of variance in both intentions and behaviours (Baltic 2005, p. 245).

Yi et al. (2006) integrated TAM, IDT and TPB to analyse the adoption of PDAs in medical treatment among physicians in the United States. They found that perceived usefulness, subjective norm (SN), and perceived behavioural control exert influence on usage intention, but perceived ease of use does not. Personal innovation characteristics also have an effect on perceived behavioural control, perceived ease of use and subjective norm (Yi et al. 2006). Nasri and Charfeddine (2012) found that social norm has a significant effect on adoption of internet banking in Tunisia, particularly in the early stages when users have only a limited direct experience. This study also found that the construct of perceived behavioural control influences the intention to adopt internet banking (Nasri & Charfeddine 2012).

3.2.3 Technology acceptance model (TAM)

Introducing TAM, Davis et al. (1989) stated that:

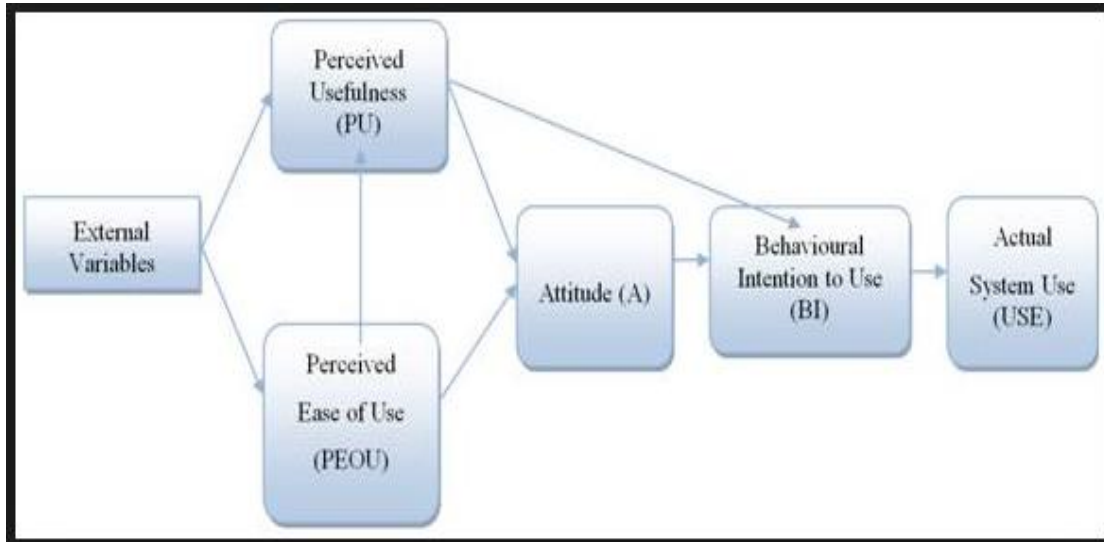
“The goal of TAM is to provide an explanation of the determinants of computer acceptance that is general, capable of explaining user behaviour across a broad range of end-user computing technologies and user populations”.

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

While Davis (1985) believes that technology adoption is mediated through behaviour, subjective norm as a construct in TRA had uncertain theoretical status and was difficult to measure, a point that was accepted even by Fishbein and Ajzen (1975) who felt that subjective norm was the least understood aspect of TRA. Subjective norm is an all-encompassing term that can range from a person's individual dispositions to internalisation of social norms. It is also assumed to be possessed by a person or is attributed to him/her, whereas attitude is a more objective

term that a person articulates specifically in relation to the object at hand. As a result, Davis (1985) adopted only the construct of attitude.

Figure 3.5: Technology Acceptance Model (TAM)



Source: Reproduced from Davis (1989)

Davis (1985) relied on numerous other interrelated studies to conceptualise the two distinct constructs of perceived usefulness and perceived ease of use. Perceived Usefulness (PU) is defined as *“the degree to which a person believes that using a particular system would enhance his or her job performance”* (Davis 1989, p. 320). Usefulness refers to the capability of a technology to reduce time and achieve higher efficiency and accuracy (Teo et al. 2008). PU has been found to be a significant factor influencing the use of email communication in many studies (Adams et al. 1992; Davis 1989, 1993; Huang 2003). Perceived Ease of Use (PEOU) is defined as *“the degree to which a person believes that using a particular system would be free of effort”* (Davis 1989, p. 320). Ease defined as *“freedom from difficulty or great effort”* (Davis 1989, p. 320). Although PU has been proven to be a stronger determinant than PEOU, users’ expectations of ease of use are also important (Davis 1989) and it has been validated as a factor affecting email usage (Adams et al. 1992; Baninajarian 2009; Davis 1989, 1993; Huang 2003). Moreover, Hong et al. (2006, p. 1819) also suggested that TAM is the most parsimonious that can be applied to research both initial and continued IT acceptance.

3.2.4 Technology acceptance model 2 (TAM2)

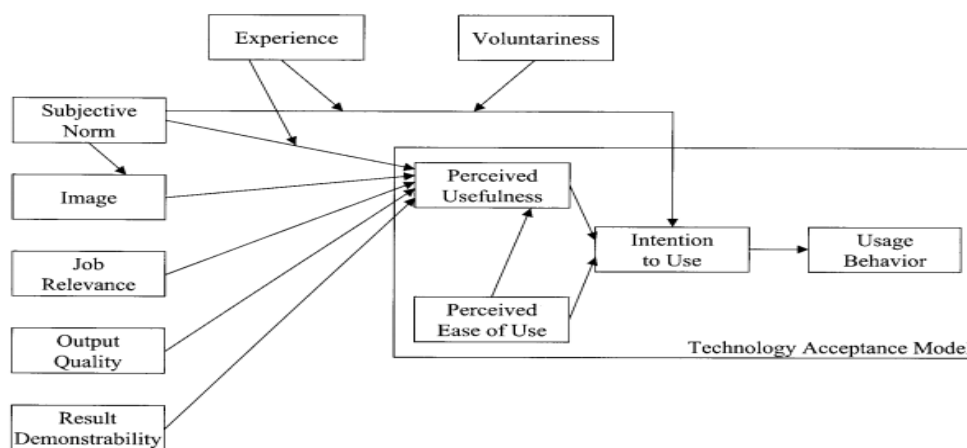
Venkatesh and Davis (2000) introduced TAM2 which is a theoretical extension of the Technology Acceptance Model (see Figure 3.6). Venkatesh and Davis (2000) stated that:

“Using TAM as the starting point, TAM2 incorporates additional theoretical constructs spanning social influence processes (subjective norm, voluntariness, and image) and cognitive instrumental processes (job relevance, output quality, result demonstrability, and perceived ease of use”.

(Venkatesh and Davis 2000, p. 187).

Venkatesh and Davis (2000, 186) found that social influence processes (subjective norm, voluntariness, and image) and cognitive instrumental processes (job relevance, output quality, result demonstrability, and perceived ease of use) has significant affect on user acceptance. They also found that as individuals became familiarized with a system over time, they are able to give their own opinion on how they perceive the technology usefulness and needs, while not depending as much on social information. However, individuals tend to judge a technology usefulness by how high they will be look upon while using the technology (Venkatesh & Davis 2000, p. 199). An empirical test of TAM2 showed that TAM2 was able to account for 40 per cent to 60 per cent of the variance in usefulness perceptions and 34 per cent to 52 per cent of the variance in usage intentions (Venkatesh & Davis 2000).

Figure 3.6: Technology Acceptance Model 2 (TAM2)

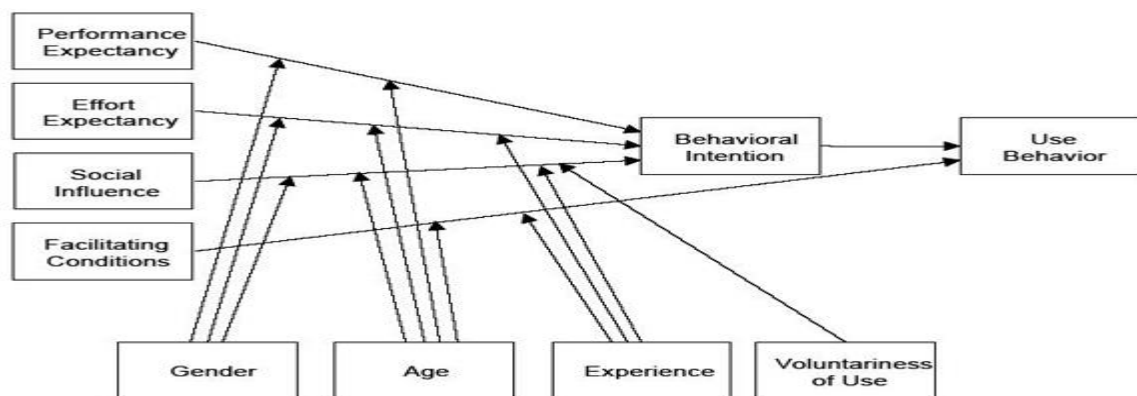


Source: Reproduced from Venkatesh and Davis (2000)

3.2.5 Unified theory of acceptance and use of technology (UTAUT)

Venkatesh et al. (2003, p. 425) established UTAUT which were based on four main constructs of intention and usage and four moderators of key relationships (see figure 3.7). After reviewing previous models in the field, Venkatesh et al., developed UTAUT by utilizing the most critical factors and contingencies from available theories to predict behavioural intention to use technology in organisational contexts. UTAUT integrates key elements from an initial set of 32 main effects and four moderators as determinants of intention to adopt technology.

Figure 3.7: Unified Theory of Acceptance and Use of Technology (UTAUT)



Source: Reproduced from Venkatesh et al. (2003)

As illustrated in the figure given above, UTAUT uses many determinants to measure user acceptance and usage behaviour:

- 1) Performance Expectancy - *“the degree to which an individual believes that using the system will help him or her to attain gains in job performance”* (Venkatesh et al. 2003, p. 447).
- 2) Effort Expectancy - *“the degree of ease associated with the use of the system”* (Venkatesh et al. 2003, p. 450).
- 3) Social Influence - *“the degree to which an individual perceives that important others believe he or she should use the new system”* (Venkatesh et al. 2003, p. 451).
- 4) Facilitating Conditions - *“the degree to which an individual believes that an organisational and technical infrastructure exists to support use of the system”* (Venkatesh et al. 2003, p. 453).

Arguing the superiority of UTUAT over other theories, Venkatesh et al. (2003) included four moderators namely age and gender, experience and voluntariness of use on the basis of the rationale that these contingencies of user profile are critical for technology adoption but have not been included in previous theories. An empirical test of UTAUT showed that UTAUT was able to account for 70 per cent of variance in usage (Venkatesh et al. 2003, p. 467). While its originators are confident of UTAUT, it is still a relatively new model that has seen limited use since its publication, whereas TAM has enjoyed a (relatively) long history in the research literature (Straub 2009, p. 639).

3.2.6 Choosing TAM

The researcher examined some meta-analytical studies of theories of technology acceptance to choose one that has been generally deemed to be the most useful and valid. Of these studies, one conducted by Taylor and Todd (1995, p. 144) compared TAM and two variants of the TPB to assess their utility for understanding usage of information technology. This study found that although these three models are relatively parsimonious, TAM was more parsimonious and superior in predicting IT usage than the other two models (Taylor and Todd, p. 169). The same was true with a study done by Hong et al. (2006) which suggests TAM is more parsimonious and has greater exploratory power than other technology acceptance models.

Many studies have been undertaken to assess the applicability of TAM in user adoption of telecommunications and internet technology. In more recent studies on IT adoption using TAM, Nasri and Charfeddine (2012) found that perceived usefulness to be a significant determinant of the intention to use internet banking in Tunisia. The results also show that perceived ease of use has a significant effect on perceived usefulness and attitude toward internet banking. In their research on the store image of online travel agents in Taiwan, Chen and Teng (2013) used the extended TAM model and found usefulness to be one of the most significant predictors of purchase intention on the part of consumers. The findings also indicate that the perceptions of ease-of-use were important antecedents of trust and these can result in enjoyment, as can the online store owners' ability to provide interfaces that

are funny, cute, pleasurable and attractive for online shoppers (Chen & Teng 2013). Similarly, while adapting the model for acceptance of e-commerce in Rome (Italy), Capece et al. (2013) found that trust, PU and PEOU are better able to determine whether customers decide to use e-commerce websites in Italy. The study also concluded that the propensity as well as actual use of e-commerce websites increased when users realised its higher PU in terms of quick sales, greater choice, reduced transaction costs and convenience. Similarly, higher PEOU in terms of interaction, content and quality of the site along with increased consumer trust in personal data and means of payment, will both increase the PU of an e-commerce website. Increased PU, in turn will increase the relative use of these websites. Iplik et al. (2012) explored the acceptance and usage of information technologies among academicians in Turkey with TAM and found that PEOU has a positive influence on PU, while both PU and PEOU are also found to have a significant positive influence on intention to use information technologies.

Recent studies have also focused on email acceptance using TAM. Mutlu and Ergeneli's (2012) investigated email acceptance among white-collared participants in a Turkish iron and steel company and found that perceived ease of use and subjective norm were factors in e-mail usage intention. If a system is viewed by people as user-friendly, they would usually use it more frequently (Mutlu & Ergeneli 2012). Akour et al. (2006) analysed a sample of 507 Jordanian managers and found that perceived usefulness and perceived ease of use influenced the relationship between cultural dimensions and managers' intentions to use the internet (Akour et al. 2006).

The studies reviewed above support the use of TAM for technology acceptance but there is also a contrary strand in the IS literature which has questioned TAM. There have been several studies which suggest that PU and PEOU have no relationship with technology acceptance. In a recent study, Saeed et al. (2012) found that PU and PEOU failed to influence the intention of university students in Australia and the United States to use Twitter. After examining the adoption of e-government services by Jordanian citizens, Alhujran (2009) found that individualism/collectivism (IC) and long-term/short-term orientation (LST) had no discernible impacts on PEOU and

PU. Nevertheless, as the review of existent research earlier has shown, TAM has been applied for a range of IT adoption studies and has been validated in email adoption research, showing greater evidence of its usefulness and predictive power.

A recent study by Munir (2013) on the acceptance of mobile banking services among bank customers in Makassar, Indonesia found that PEOU and PU significantly influence intention to use. Moreover, PEOU also significantly influences PU on intention to use mobile banking services. Sharma et al. (2013) found that online social capital is built mainly due to the usefulness of an online community and confirmed the robustness of TAM for predicting the intention to use an information system (Sharma et al. 2013). In a study on e-learning system adoption among employees in four industries in Taiwan, Lee et al. (2013) found that TAM provides a parsimonious model to predict employees' intention to use e-learning systems and both usefulness and ease of use are important factors in determining the acceptance of e-learning systems. Again, in another study from Taiwan using revised TAM, Li (2013) suggested that PEOU and PU have significant positive effects on customer attitude towards using internet banking, with PEOU being less important than PU. The effect of PEOU on attitude toward technology generally decreases as users become more familiar with an internet banking system, so PEOU may not be as important as PU.

Many previous studies have accepted TAM as a model with parsimonious but acute exploratory power applicable across various countries and cultures in relation to email usage (Huang 2003; Mutlu and Ergeneli 2012). According to Ducey (2013) with the exclusion of Venkatesh and Davis (2000), there have been lesser studies that have empirically tested and validated TAM2 as compared to TAM which has been tested in multiple types of samples for example in organizational, student, and general people samples. TAM has proof its ability to forecast acceptance of various types of information technology medium (Ducey 2013). Moreover, most of the studies on technology acceptance in general and email acceptance specifically uses TAM rather than TAM2 (Akour et al. 2006; Baninajarian 2009; Mutlu and Ergeneli 2012). Therefore, this study decided to apply TAM to explore the level of email

usage in Malaysian universities. It is also important to note here that there are significant differences between this study and other previous studies. For example, Huang (2003) looked at the intention to use email among mainland Chinese, while this study investigates the actual email usage among non-academic executives in Malaysian universities. In addition, this study also included six additional demographic factors, such as organisational type (public or private), race, religion, gender, age, and location to address the limitation of TAM, as discussed in section 3.2.8 (Limitations of TAM).

3.2.7 Advantages of TAM

Apart from these empirical studies validating the applicability of TAM, scholars have studied the theory itself and shown that TAM has a higher predictive power compared to other technology acceptance models (Hong et al. 2006). TAM has been validated in a variety of technology adoption studies in diverse settings. With a two-dimensional measure of behavioural intention, the model is relatively parsimonious in comparison to other theories and has less complications predictions in empirical research. Mathieson (1991) found TAM better than TPB since it is not only easier to apply, but its constructs allow uniform measurement in different situations. It has become the most widely used (Thowfeek & Jaafar 2010) and popular model in technology acceptance studies (McCoy et al. 2007). As evidence of its higher predictive power over other theories, Venkatesh and Davis (2000) state that TAM has been found to account for approximately 40 per cent of variance in usage intention in empirical research in contrast to other studies using alternative models such as TRA and TPB. This is also affirmed by Chau and Hu's (2001) research on physicians' usage of telemedicine which found that TAM explained 40 per cent of the variances in usage intention whereas TPB explained 32 per cent.

TAM can easily and conveniently gather general information about individuals' perceptions of a technology and measure levels of satisfaction across a range of users with diverse interests (Mathieson 1991, p. 187). TAM is also easy to implement in different national cultural contexts. It can be integrated with factors of rural/urban location, gender, age, race, religion and types of organisation. Several studies using

TAM to analyse email usage have obtained results with high validity in Western countries (Adams et al. 1992; Davis 1989, 1993) and Eastern countries (Mutlu & Ergeneli 2012) as well as Malaysia (Baninajarian 2009). TAM possesses the flexibility and capacity to interact with moderators of national culture in international studies (McCoy et al. 2007), Western countries (Davis 1989; Mathieson 1991; Segars & Grover 1993), Eastern countries (Al-Sukkar 2005; Alhujran 2009; Huang 2003) and Malaysia (Ebrahimi et al. 2010). In Malaysia, TAM has been widely used in many fields. For example, Ndubisi et al. (2001) used TAM for predicting IT usage among Malaysian entrepreneurs, Ramayah et al. (2005) to explain computer usage among tertiary students and Ma'ruf et al. (2005) for predicting internet shopping. Given these positive appraisals of TAM, the researcher also chose to use TAM as the foundational theory of technology acceptance for this study.

3.2.8 Limitations of TAM

TAM also has a number of constraints and limitations. One major limitation is that the information from TAM about ease of use and usefulness tend to be a little too general, for example, providing insights like a system was easy to use without identifying other issues that enable system use (Mathieson 1991, p. 187). Apart from the generality of TAM's insights, Chuttur (2009, p. 16) argue that TAM uses self-reported data instead of examining actual data of system usage.

In addition, TAM does not incorporate any social variables, such as, age, gender and cultural factors (Mathieson 1991, p. 177). McCoy et al. (2007) and Straub et al. (1997) suggest that TAM may not apply uniformly to all people in different cultural contexts. Davis (1989, p. 334) acknowledged this weakness and realised that further research was required to shed more light on its finding. In order to address TAM limitations, this research had included the national and organisational culture dimensions as an extended TAM, along with additional factors which are not addressed adequately in previous work – such as type of organisation, race, religion, gender, location and age. The model in this study also has one item called Actual Usage to measure the actual volume of email received and sent rather than just behavioural intention to use email.

3.3 National Culture

There is no single clear definition of culture. However, Hofstede et al. (1990) argue that:

“... most authors will probably agree on the following characteristics of the organizational or corporate culture construct: it is holistic, historically determined, related to anthropological concepts, socially constructed, soft, and difficult to change”.

(Hofstede et al. 1990, p. 286).

According to Hofstede et al. (2010, p. 18) the layers of culture are divided into:

- (1) *“a national level according to one’s country (or countries, for people who migrated during their lifetimes”;*
- (2) *“a regional and/or ethic and/or religious and/or linguistic affiliation level”;*
- (3) *“a gender level, according to whether one was born as a girl or as a boy”;*
- (4) *“a generation level, separating grandparents from parents from children”;*
- (5) *“a social class level, associated with educational opportunities and with a person’s occupation or profession”;* and
- (6) *“for those who are employed, organizational, departmental, and/or corporate levels according to the way employees have been socialized by their work organization”.*

On the other hand, Trompenaars and Hampden-Turner (1998) state that culture can be divided into three layers namely explicit culture, norms and values. Trompenaars and Hampden-Turner (1998) argue that:

“Explicit culture is the observable reality of the language, food, buildings, houses, monuments, agriculture, shrines, markets, fashions and art. Norms are the mutual sense a group has of what is ‘right’ and ‘wrong’. Norms can develop on a formal level as written laws, and on an informal level as social

control. Values, on the other hand, determine the definition of 'good and bad', and are therefore closely related to the ideals shared by the group".

(Trompenaars and Hampden-Turner 1998, p. 21-22).

Hofstede and Hofstede (2005) categorise three types of cultures: meta culture (global culture), national culture and micro culture (organisation culture). Obviously, activities like Computer-Mediated Communication (CMC) are enmeshed in the meta-discourse of global culture and the universal focus on economic development. However, it is the national and organisational cultural factors operating within Malaysian universities that need to be examined in order to study the reasons behind email adoption in the country. According to Hofstede et al. (1990), using the term 'culture' for both national and organisational culture can be misleading because they are phenomena of different orders. Therefore, this study uses 'national culture' for aspects related to traditions and social norms in the country and the term 'organisational culture' for aspects related to work ethics and practices in organisations.

The most important part of culture, societal values, is defined as *"a broad tendency to prefer certain states of affairs over others"* (Hofstede 198, p. 19). Kluckhohn (1951, p. 86) states that culture refers to patterned ways of human behaviour that are acquired and transmitted mainly by symbols. Apart from the artefacts or rituals that embody these symbols, the essential core of culture is driven by historically derived and selected ideas and values. Based on the literature and empirical studies, Moghadam and Assar (2008) suggest that a country's national culture can limit or encourage the adoption of ICT. In the Malaysian context, Ebrahimi et al. (2010) have examined culture's role in acceptance and use of new technologies in organisations. It is important to include discussions of national culture in tandem with generic models of technology acceptance like TAM. McCoy et al. (2007) and Straub et al. (1997) suggest that TAM may not apply in the same manner across people with different cultural orientations. For example, in their study on email usage in three airline companies, Straub et al. (1997) found consistent results in the United States

and Switzerland, but inconsistent results in the Japanese company where TAM was unable to reflect accurate figures.

There are many prominent theories that can be used to measure national culture, such as the GLOBE model of House et al. (2004), Social Identity Theory (SIT) proposed by Straub et al. (2002) and Hofstede dimensions (1980). SIT is focused on the process by which an individual identifies themselves as part of multiple types of culture (e.g. professional, organisational, ethnic, and national culture), particularly, to understand how certain layers of that culture will be more salient to the individual at different occasions. A more recent theory on culture, namely the GLOBE study introduced by House et al. (2004) used quantitative data based with responses of about 17,000 managers from 951 organisations functioning in 62 societies throughout the world. This theory has established nine cultural dimensions – namely, uncertainty avoidance, power distance, institutional collectivism, in-group collectivism, gender egalitarianism, assertiveness, future orientation, performance orientation, and human orientation.

Hofstede (1980) provided a rigorous framework for studying core societal values. He observed the values and attitudes of workers and managers and distributed a statistical analysis of 116,000 questionnaires in about 20 languages at a multinational company (IBM) in 40 countries between 1967 and 1973. Hofstede's investigation contains a great deal of data and depth of theoretical interpretation based on a review of sociological and anthropological theories and research. Jones and Alony (2007, p. 407) argue that Hofstede's work on culture is the most widely cited academic work on the topic. This thesis used Hofstede's model as it has been widely accepted in information systems and management literature across the world (as detailed in Chapter 1).

Hofstede (1997, p. 5) defines national culture as *“the collective programming of the mind which distinguishes the members of one group of people from another”*. Hofstede's model also differentiates national culture from organisational culture. National culture differentiates members of one nation from another, while

organisational culture differentiates the staff of an organisation from another (Hofstede et al. 2010). By using nationality as a precursor of culture, Hofstede identified individualism/collectivism (IC), power distance (PD), uncertainty avoidance (UA) and masculinity/femininity (MF) as important dimensions of his framework of national culture. After further studies for another 10 years, a fifth and sixth dimension known as long-term/short-term orientation (LST) and indulgence/restraint (IR) were also introduced (Hofstede et al. 2010).

There are some differences between Hofstede's culture theories with the other prominent theories of GLOBE model by House et al. (2004) and SIT by Straub et al. (2002). As mentioned earlier, SIT focuses on how individual selects from multiple types of culture to develop shifting identities at different times. This theory examines the dynamics of culture at the individual level and not at the organisational level, it provides a complementary research perspective for this study, but not necessarily a competing one (Ford et al. 2003).

GLOBE theory argues that values and practices can exist at both the societal and organisational levels, while Hofstede's framework proposes that values differentiate societies and practices differentiate organisations (Shi & Wang 2011a). However, the sample countries (and regions) which participated in the two models are quite different. The sample countries and regions in Asia were more widely chosen by Hofstede, while GLOBE uses more samples from Europe countries and regions. In addition, the respondents to the GLOBE study focus only on the managerial level while Hofstede's study covered both manager and non-manager levels (Shi & Wang 2011b). This research, however, is conducted in Malaysia and the sample involves both the manager and non-manager levels, which may suggested that Hofstede's model may well be more suitable than GLOBE.

Hofstede's model of National Culture presents a baseline theory to measure the effect of cultural differences on adoption and usage of IT-based innovations (Straub et al. 1997, p. 3). Moreover, Hofstede's theories on national and organisational culture offer parsimonious yet effective models to incorporate complex issues of

culture in research on technology acceptance. In addition, Hofstede's dimensions are more flexible and directly linked to social and organisational processes (Kaba & Osei-Bryson 2013). As a result, Hofstede's model has been widely used in technology adoption research (McCoy et al. 2007) and over 60 per cent of studies on information systems utilise one or more of Hofstede's National Culture dimensions (Leidner & Kayworth 2006). Numerous studies have verified the stability of the dimensions advanced by Hofstede's model on information system adoption (Alhujran 2009; Huang 2003; Tan et al. 1998). As Hofstede's framework has received the most acceptance and support as a useful theory in empirical studies on information system adoption, this study used Hofstede's national and organisational culture frameworks.

However, there are also many arguments against Hofstede's work. Most have come from a methodological perspective relating to the generalisability and validity of using survey questionnaires as the method of data collection for measuring culture (McSweeney 2002). McSweeney (2002, p. 94-95) also criticised Hofstede's dimensions as “---radically compounded by the narrowness of the population surveyed”, which are not necessarily the same as national values. For example, many researchers argue that the survey method is not the best instrument in measuring cultural disparity and the IBM data used are old and obsolete (McSweeney 2002). Scholars have also argued that the terminology of this model might be improved to avoid misinterpretations; for example, Triandis (1993) argues that masculine/feminine stereotypes should be avoided for the sake of gender neutrality, while De Mooij (2009) suggests that the terms ‘masculine/feminine’ could be construed as politically incorrect. Moulettes (2007) further argues that Hofstede's dimensions use gender stereotypes to construct notions of masculine culture and feminine culture. In a review of the model, Harzing and Hofstede (1996) accept that the use of self-reported perceptions from IBM employees to construct a generic model of national culture is not the best method, since it depends on the personal perceptions of a restricted pool of people.

Even though there are many criticisms of Hofstede's framework, many studies on national culture have applied Hofstede's concepts and measures (McCoy et al. 2007, p. 82). The large body of empirical research in the field provides testimony to the efficacy and applicability of Hofstede's method of using variables to represent dimensions of cultural orientation and collecting information through surveys to examine how these dimensions affect people's behaviour and attitude. In fact, a review of hundreds of studies by Taras et al. (2009) clearly confirms that Hofstede's survey questionnaire has traditionally prevailed as the dominant method for quantifying culture in business and information system research. So, in spite of the critique of the survey as a method for measuring culture, the substantive results supporting the use of surveys, at least in business and information systems research, supports this methodology (Taras et al. 2009). Encouraged by the relevance of the underlying framework and the rigour of the method, researchers across the world have applied Hofstede's survey questionnaire directly to target populations as well as to cross-cultural research (Søndergaard 1994). Even in the Malaysian context, most studies examining the role of culture in technology adoption have used questionnaire surveys, for example, Abdullah and Lim (2001), Lim (2001), Ebrahimi et al. (2010) etc.

McSweeney (2002) criticized that the IBM data are old and obsolete. However, many recent studies have verified the stability of Hofstede's National Culture dimensions as relevant and applicable in current IS research (Alhujran 2009; Alhujran & Al-dalahmeh 2011; Saribagloo et al. 2011). Leidner and Kayworth (2006) found that over 60 per cent of studies on national culture in information systems research use one or more of Hofstede's cultural dimensions.

In Newburry (2013) words:

“Geert Hofstede’s seminal 1980 book, Culture’s Consequences: International Differences in Work-Related Values, along with its 2001 reissue and expansion and related journal articles, is without question the most influential work on culture in the field of international management. The two versions of the book alone have been cited over 9,000 times in the Web of

Science Database and over 33,000 times by Google Scholar. Related articles and books that reiterate and expand upon his original exposition of his four cultural dimensions have been cited thousands of times more. While his work is not without criticism, as will be noted later in this bibliography, it has nonetheless stood the test of time, and Google Scholar citation patterns suggest that Hofstede's collective work has been cited as many times between 2007 and 2012 as it has since its original publication".

(Newburry 2013).

Most studies in IS literature have used Hofstede's (1980) framework of cultural dimensions or cultural values due to its extensive evidence and validity (Kumar et al. 1993). It is broadly used in research explaining cultural dissimilarity in organisations (Twati 2006) and is an important starting point in any analysis of culture and its influence on information systems (Shanks et al. 2000). Hofstede's dimensions are suited to the practical needs of information systems research and widely supported by empirical research in that area (Jones & Alony 2007). For example Huang (2003) used four (4) dimensions namely individualism/collectivism (IC), power distance (PD), uncertainty avoidance (UA) and masculinity/femininity (MF) to explore the culture influences on intention to use email among mainland Chinese, while Al-Sukkar (2005) and Alhujran (2009) used five (5) dimensions including Long Term/Short Term Orientation. In a Malaysian study, Ebrahimi et al. (2010) only used four dimensions and ignored Long Term/Short Term Orientation and Indulgence/Restraint dimensions. Ng et al. (1981) suggested that Malaysian Chinese and Indian are long-term oriented while Malays are short-term oriented.

At this moment, there appear to be no studies in Malaysia using Indulgence/Restraint as one of the dimensions (it was just included as a new national culture dimension in 2010). This also means that there is no study in Malaysia using all six dimensions together. This study used all six dimensions of Hofstede's model, including Long Term/Short Term Orientation and Indulgence/Restraint dimensions. The following table presents the relationship between the levels of national culture and email usage as suggested by Straub et al. (1997) with the higher UA, PD, MF and lower IC

contributed to lower level of email usage while lower UA, PD, MF and higher IC contributed to higher email usage.

Table 3.1: Relationship Between National Culture and Email Usage

Level of UA	Level of PD	Level of MF	Level of IC	Level of use of a lean medium like email
High	High	High	Low	Low
Low	Low	Low	High	High

Source: Reproduced from Straub et al. (1997, p. 4)

Hofstede's cultural dimensions are now discussed in more detail as below:

a) Power distance (PD)

Power distance (PD) is defined as:

“the extent to which the less powerful members of the institutions and organisations within a country expect and accept that power is distributed unequally”.

(Hofstede et al. 2010, p. 61).

High PD leads to a more hierarchical system which is based on existential inequality and preferred centralized power, while low PD produces an existentially equal and hierarchical system, based on inequality of roles with a flat hierarchical pyramid (Hofstede et al. 2010, p. 73-74). It seems reasonable to assume that, where organisational PD is high, email might encourage greater peer-to-peer communication. The key differences between small and large power distance societies in the workplace are explained below:

Table 3.2: Small and Large Power Distance Characteristics in Workplace

Small Power Distance	Large Power Distance
Hierarchy in organisations means an inequality of roles, established for convenience.	Hierarchy in organisations reflects existential inequality between higher and lower levels.
Decentralisation is popular.	Centralisation is popular.
There are fewer supervisory personnel.	There are more supervisory personnel.
There is a narrow salary range between the top and the bottom of the organisation.	There is a wide salary range between the top and the bottom of the organisation.
Managers rely on their own experience and on subordinates.	Managers rely on superiors and on formal rules.
Subordinates expect to be consulted.	Subordinates expect to be told what to do.
The ideal boss is a resourceful democrat.	The ideal boss is a benevolent autocrat, or 'good father'.
Subordinate-superior relations are pragmatic.	Subordinate-superior relations are emotional.
Privileges and status symbols are frowned upon.	Privileges and status symbols are normal and popular.
Manual work has the same status as office work.	White-collar jobs are valued more than blue-collar jobs.

Source: Reproduced from Hofstede et al. (2010, p. 76)

Zakour (2004) states that low power distance cultures are more receptive towards IT compared to individuals in high power distance cultures. This is because IT poses a threat to hierarchy in high power distance cultures, while individuals in low power distance cultures are interdependent on each other regardless of their rank in the hierarchy, so they will be more in favour of IT usage. According to Huang et al. (2003) there is a negative relationship between the interaction effect of PD and two variables, namely subjective norm and intention to use email. This implies that as the level of PD increases, its influence on the relationship with subjective norm and intention to use email decreases. Mutlu and Ergeneli (2012) found that there is a significant negative relationship between power distance and email usage intention

among white-collared workers in Turkey. According to Adapa (2008), there is a negative relationship between power distance and internet shopping adoption among Indian women residing in Australia. Saribagloo et al. (2011) also found that power distance had an indirect negative influence on PEOU and PU of computer usage in a Tehran university. This negative relationship was also established in an earlier study by Straub et al. (1997) (see Table 3.1).

b) Uncertainty avoidance (UA)

Uncertainty avoidance (UA) is defined as *“the extent to which the members of a culture feel threatened by uncertain or unknown situations”* (Hofstede et al. 2010, p. 191). Here, Hofstede further adds that people in uncertainty-avoiding cultures tend to shun ambiguous situations instead preferring structure in their organizations, institutions, and relationships. But, in this bid, they can paradoxically engage in risky behaviour in order to reduce ambiguities and maintain structure, such as engaging in conflict to question a change in rules rather than adjusting to the change (Hofstede et al. 2010, p. 197-198). Research has also shown that a high index of uncertainty avoidance has an undesirable effect on innovativeness of users (Steenkamp et al. 1999). Individuals in cultures characterised by low uncertainty avoidance are more inclined towards innovativeness because they exhibit greater tolerance for risk (Yeniyurt & Townsend 2003). Table 3.3 shows the differences between weak uncertainty avoidance and strong uncertainty avoidance culture in work, organisation, motivation and technology listed by Hofstede et al. (2010).

According to Straub (1994), organisations in countries with high uncertainty avoidance such as Japan are less likely to adopt email. Downing et al. (2003) argue that countries with high uncertainty avoidance are likely to adopt more information-rich, socially present forms of media, such as, face-to-face conversations, fax and phone. On the other hand, countries with low uncertainty avoidance are likely to adopt leaner forms of electronic media such as email. Several researchers also agree that cultures with high UA are late adopters of technology (Garfield & Watson 1997; Keil et al. 2000; Straub 1994). Garfield and Watson (1997) explain that the development of technology infrastructure is hampered by high UA. Adapa (2008)

found that there is a negative relationship between uncertainty avoidance and the adoption of internet shopping patterns among Indian women residing in Australia. The same result was found by Matusitz and Musambira (2013) who used data from 48 countries to argue that uncertainty avoidance has negative correlations with internet use. Saribagloo et al. (2011) used TAM and Hofstede's national culture model together as their framework and found that uncertainty avoidance has an indirect negative influence on PEOU and PU of computer usage in Tehran University. However, some other studies have found uncertainty avoidance to be insignificant. For example, Akour et al. (2006) suggested that UA had no significant impact on Jordanian managers' intentions to use the internet. Al-Sukkar's (2005) study on bank managers in Jordan on internet banking suggested no relationship between UA with PU and PEOU on internet banking.

Table 3.3: The differences Between Weak Uncertainty Avoidance and Strong Uncertainty Avoidance Societies in Workplace, Motivation and Technology

Weak Uncertainty Avoidance	Strong Uncertainty Avoidance
More changes of employer, shorter service.	Fewer changes of employer, longer service, more difficult work-life balance.
There should be no more rules than strictly necessary.	There is an emotional need for rules, even if they will not work.
Work hard only when needed.	There is an emotional need to be busy and an inner urge to work hard.
Time is a framework for orientation.	Time is money.
Tolerance for ambiguity and chaos.	Need for precision and formalisation.
Belief in generalists and common sense.	Belief in experts and technical solutions.
Top managers are concerned with strategy.	Top managers are concerned with daily operations.
More new trademarks.	Fewer new trademarks.
Focus on decision process.	Focus on decision content.

Weak Uncertainty Avoidance	Strong Uncertainty Avoidance
Entrepreneurs are relatively free from rules.	Entrepreneurs are constrained by exiting rules.
There are fewer self-employed people.	There are more self-employed people.
Better at invention, worse at implementation.	Worse at invention, better at implementation.
Motivation by achievement and esteem or belonging.	Motivation by security and esteem or belonging.
There is fast acceptance of new features such as mobile phones, email and the internet.	There is hesitancy toward new products and technologies.

Source: Reproduced from Hofstede et al. (2010, p. 217)

c) **Collectivism/individualism (IC)**

According to Hofstede et al. (2010, p. 92), individualism (I) is found in:

“---societies in which the ties between individuals are loose: everyone is expected to look after himself/herself and his/her immediate family only”.
 [Collectivism (C) is prevalent in a] *“---societies in which people from birth onwards are integrated into strong, cohesive in-groups, which throughout people’s lifetimes continue to protect them in exchange for unquestioning loyalty”.*

(Hofstede et al. 2010, p. 92).

Erumban and de Jong (2006) add that people who have higher individualism have been raised in an environment which encourages free expression of an individual’s views, which in turn, means that they are likely to be more innovative and are likely to be earlier adopters of new concepts. Hofstede et al. (2010) believe that the internet and email have higher usage in an individualism culture as compared to a collectivism culture in which email is less attractive and used less frequently. The table below explains the differences between Collectivist and Individualist Societies in workplaces and ICT.

Table 3.4: The Differences Between Collectivist and Individualist Societies in the Workplace and ICT

Collectivist	Individualist
Employees are members of in-groups who will pursue the in-group's interest.	Employees are 'economic persons' who will pursue the employer's interest if it coincides with their self-interest.
Hiring and promotion decisions take employees in-group into account.	Hiring and promotion decisions are supposed to be based on skills and rules only.
The employer-employee relationship is basically moral, like a family link.	The employers-employee relationship is a contract between parties in a labour market.
Management is management of groups.	Management is management of individuals.
Direct appraisal of subordinates spoils harmony.	Management training teaches the honest sharing of feelings.
In-group customers get better treatment (particularism).	Every customer should get the same treatment (universalism).
Relationship prevails over task.	Task prevails over relationship.
The internet and email are less attractive and less frequently used.	The internet and email hold strong appeal and are frequently used to link individuals.

Source: Reproduced from Hofstede et al. (2010, p.124)

The distinction of dimension related to individualism versus collectivism is strongly associated with the relative importance attached to work goal items as shown in the table below:

Table 3.5: Individualist and Collectivist Poles in the Workplace

Individualist Pole	Collectivist Pole
Personal Time – have a job that leaves you sufficient time for your personal or family life.	Training – have training opportunities (to improve your skills or learn new skills).

Freedom – have considerable freedom to adopt your own approach to the job.	Physical conditions – have good physical working conditions (good ventilation and lighting, adequate work space, etc).
Challenge – have challenging work to do (work from which you can get a personal sense of accomplishment).	Use of skills – fully use your skills and abilities on the job.

Source: Reproduced from Hofstede et al. (2010, p. 92-93)

Recent studies have confirmed that higher individualism contributes to a higher innovation rate (Kaasa & Vadi 2008; Willems 2007). Downing et al. (2003) explain that collectivist countries tend to select more information-rich, socially presentable forms of media, such as face-to-face conversations and phone, while people with high individualism tend to choose leaner forms of media, such as email. On the other hand, in his study on adoption of e-government in 26 countries Alhujran (2009) rejects the significance of collectivism as it had no discernible impacts on perceived ease of use and perceived usefulness on e-government adoption among Jordanian citizens. However, overall, existing surveys show that IT tools are more easily, frequently and eagerly adopted in individualist societies rather than collectivist societies. The Gallup Organisation conducted a study by using Eurobarometer Surveys which showed that people in more individualist European countries were more likely to have access to the internet and to use email (The Gallup Organisation 2008). Arslan (2009) found that higher individualism (lower collectivism) is correlated with a higher rate of technology adoption of e-government.

d) Masculinity/femininity (MF)

Hofstede et al. (2010) defines two types of societal formations along gender roles:

“when emotional gender roles are clearly distinct: men are supposed to be assertive, tough, and focused on material success, whereas women are supposed to be more modest, tender, and concerned with the quality of life. [Femininity (F) is the dominant social feature in a society] when emotional gender roles overlap: both men and women are supposed to be modest, tender, and concerned with the quality of life”.

(Hofstede et al. 2010, p. 140).

Hofstede (1997) states that organisations focus on rewards, recognition, training and improvement of an individual in masculine cultures. Thowfeek and Jaafar (2010) believe that these characteristics are common in innovative organisations. The masculinity/femininity cultural dimensions also states that individuals exhibiting high masculinity tend to focus more on reaching their goals and focus less on usability of technology. They also possess a higher level of self-confidence and assume that they possess the capability to make full use of the technology. On the other hand, a feminine characterisation means that individuals in a society tend to be more docile, non-assertive and self-effacing (McCoy et al. 2007). The table below shows that this dimension is associated most strongly with the importance attached to the following work goal items:

Table 3.6: The Differences Between Masculine and Feminine Poles

Masculine Pole	Feminine Pole
Earnings: have an opportunity for high earnings.	Manager: have a good working relationship with your direct superior.
Recognition: get the recognition you deserve when you do a good job.	Cooperation: work with people who cooperate well with one another.
Advancement: have an opportunity for advancement to higher-level jobs.	Living area: live in an area desirable to you and your family.
Challenge: have challenging work to do-work from which you can get a personal sense of accomplishment.	Employment security: have the security that you will be able to work for your company as long as you want to.

Source: Reproduced from Hofstede et al. (2010, p.139)

The feminine and masculine indices of a society are said to have different implications for the type of work culture in an organisation. The differences are explained in the table below:

Table 3.7: The Differences Between Feminine and Masculine in the Workplace

Masculine	Feminine
Management: decisive and aggressive.	Management: intuition and consensus.
Resolution of conflicts by letting strongest win.	Resolution of conflicts by compromise and negotiation.
Rewards are based on equity.	Rewards are based on equality.
Preference for larger organisations.	Preference for smaller organisations.
People live in order to work.	People work in order to live.
More money is preferred over more leisure time.	More leisure time is preferred over more money.
Careers are compulsory for men, optional for women.	Careers are optional for both genders.
There is a lower share of working women in professional jobs.	There is higher share of working women in professional jobs.
Humanisation of work by job content enrichment.	Humanisation of work by contact and cooperation.

Source: Reproduced from Hofstede et al. (2010, p. 170)

Triandis (1993) is of the opinion that while Hofstede's dimensions make sense, their terminology might be improved to avoid misinterpretations, for example, terms such as masculine/feminine and egalitarianism should be avoided for the sake of gender neutrality. While De Mooij (2009) suggests that the term 'masculine/feminine' borders on sexist, Moulettes (2007) argues that as far as a gender perspective is concerned, Hofstede is unable to evoke women's voices in his survey. Moulettes also argues that Hofstede's definition of masculine culture and feminine culture pose some intriguing questions (Moulettes 2007).

In Moulettes' words:

"... if men 'as a rule' are more masculine and women 'as a rule' are more feminine how can he assume that it would be any different on a society level? Why would a feminine culture suddenly come to include gender overlaps?"

(Moulettes 2007, p. 451).

Moulettes further contends that Hofstede considers gendered aspects of culture in an attempt to provide a democratic and unbiased view, but his definition of feminine culture based on traditional female categories is quite stereotypical.

Despite these criticisms, the masculinity and femininity dimension has served as one of the five main National Culture dimensions, especially in research related to information systems. Studies that use the masculinity/femininity dimension are: Straub et al. (1997) testing email adoption at workplaces in three countries (US, Switzerland and Japan), Srite (2000) on information technology adoption in the US, Huang (2003) on email acceptance among the people in China, Al-Sukkar (2005) on internet banking adoption among bank managers in Jordan, and Ebrahimi et al. (2010) on behavioural intention towards technology adoption in Malaysian organisations. On the other hand, a study by Alhujran (2009) suggests that the MF dimension had no discernible impacts on perceived ease of use and perceived usefulness on e-government adoption among Jordanian citizens.

e) Long-term and short-term orientation (LST)

According to Hofstede et al. (2010, p. 239) long-term and short-term orientation was added in 1991. Hofstede et al. (2010, p. 239) describe long-term orientation (LT) as “---the fostering of virtues oriented toward future rewards- in particular perseverance and thrift”. While, short-term orientation (ST) defined as “---the fostering of virtues related to the past and present- in particular, respect for tradition, preservation of ‘face’, and fulfilling social obligations”. Van Everdingen and Waarts (2003) suggest that long-term orientation (LT) represents a more innovative culture than short-time orientation (ST), since ST focuses on the past and tradition whereas long-term orientation looks forward to the future. Moreover, according to Arslan (2009) cultures with low long-term orientation place priority on tradition, so they may not be receptive to creative expression and new concepts. On the other hand, cultures with high long-term orientation do not place as much importance on tradition, so individuals in high long-term orientation cultures are probably prepared to carry out the latest plans as long as their full participation is

needed. There are many differences between short and long-term orientation as explained in the table below:

Table 3.8: The Differences Between Short and Long-Term Orientation Societies

Short-term orientation	Long-term orientation
Main work values include freedom, rights, achievement, and thinking for oneself.	Main work values include learning, honesty, adaptiveness, accountability, and self-discipline.
Leisure time is important.	Leisure time is not important.
Focus is on the 'bottom line'.	Focus is on market position.
Importance of this year's profits.	Importance of profits ten years from now.
Managers and workers are psychologically in two camps.	Owner-managers and workers share the same aspirations.
Meritocracy, reward by abilities.	Wide social and economic differences are undesirable.
Concern with possessing the Truth.	Concern with respecting the demands of Virtue.
There are universal guidelines about what is good and evil.	What is good and evil depends on the circumstances.
Dissatisfaction with one's own contributions to daily human relations and to correcting injustice.	Satisfaction with one's own contributions to daily human relations and to correcting injustice.
Matter and spirit are separated.	Matter and spirit are integrated.
If A is true, its opposite B must be false.	If A is true, its opposite B can also be true.
Priority is given to abstract rationality.	Priority is given to common sense.
There is a need for cognitive consistency.	Disagreement does not hurt.
Analytical thinking.	Synthetic thinking.

Source: Reproduced from Hofstede et al. (2010, p. 251)

It is suggested that countries with high scores in long-term orientation have a higher rate of ICT adoption. For example, Al-Sukkar (2005) found long-term orientation to have a positive relationship with perceived usefulness (PU) of internet banking acceptance among bank managers in Jordan. In a study conducted on e-government

adoption in 26 countries, Arslan (2009) found that countries with higher long-term orientation have a higher rate of technology adoption. Also, Lee (1994) argues that there is evidence email tends to promote immediate but not well-considered responses. Most of the empirical studies have suggested that long-term orientation is positively related to technology acceptance, but Alhujran (2009) has rejected the significance of Hofstede's dimensions as he found that long-term orientation had no discernible impacts on PEOU and PU of e-government adoption among Jordanian citizens.

f) Indulgence/restraint (IR)

The indulgence/restraint dimension was added by Hofstede as a result of a study conducted by Misho Minkov (Hofstede et al. 2010, p. 281). Hofstede et al. (2010) opined that:

“the correlates and predictors of happiness at the national level are therefore, first, a perception of life control, a feeling that one has the liberty to live one's life more or less as one pleases, without social restrictions that curb one's freedom of choice; and second, importance of leisure as a personal value. Happiness, life control, and importance of leisure are mutually correlated”.

(Hofstede et al. 2010, p. 281).

Drawing on this thought, Hofstede et al. (2010, p. 281) describe indulgence as:

“---a tendency to allow relatively free gratification of basic and natural human desires related to enjoying life and having fun. In the opposite pole, restraint, reflects a conviction that such gratification needs to be curbed and regulated by strict social norms”.

(Hofstede et al. 2010, p. 281).

High indulgence groups are more inclined to a positive attitude which in turn promote innovations (Hofstede et al. 2010). According to Didero et al. (2008), some of the positive attitudes found in high indulgent cultures which are needed to increase innovation are: readiness to accept change, open to new information and positive

attitude toward science, and early adopters. The table below shows the key differences between Indulgent and Restrained societies:

Table 3.9: The Differences Between Indulgent and Restrained Societies

Indulgent	Restrained
Higher percentage of very happy people.	Lower percentage of very happy people.
A perception of personal life control.	A perception of helplessness: what happens to me is not my own doing.
Higher importance of leisure.	Lower importance of leisure.
Higher importance of having friends.	Lower importance of having friends.
Thrift is not very important.	Thrift is important.
Loose society.	Tight society.
More likely to remember positive emotions.	Less likely to remember positive emotions.
Less moral discipline.	Moral discipline.
Positive attitude.	Cynicism.
More extroverted personalities.	More neurotic personalities.
Higher percentages of people who feel healthy.	Lower percentages of people who feel healthy.
Higher optimism.	More pessimism.
In countries with well-educated populations, higher birth rates.	In countries with well-educated populations, lower birth rates.
Lower death rates from cardiovascular diseases.	Higher death rates from cardiovascular disease.
Email and the internet are used for private contacts.	Less use of email and the internet for private contacts.
More email and internet contacts with foreigners.	Fewer email and internet contacts with foreigners.

Source: Reproduced from Hofstede et al. (2010, p. 291 & 297)

According to Hofstede et al. (2010), cultures with a high indulgence score have more email and internet contacts with foreigners than those characterised by restraint. In addition, cultures with a high indulgence score uses email and the internet for private contacts, while the restrained group uses less email and the internet for private contacts. Since this dimension was added by Hofstede in 2010, there is not enough empirical research to prove his contention. Even studies after 2010, such as that by Ebrahimi et al. (2010), Sriwindono and Yahya (2012) and Al-Smadi (2012), continue to use the five pre-existing dimensions and exclude IR from their model. However, a recent study by Zardosht and Ghasem-Aghaee (2011) suggests that indulgence has a positive correlation with the online shopping behaviour of consumers in 24 European countries. Examining composite innovation among EU27 countries, Lažnjak (2011) found that a higher rate of innovation adoption is more prevalent in people inclined towards indulgence than restraint. While there is some early support for this dimension, Li et al. (2011) suggest that more researchers should include this dimension in future research on technology adoption.

3.4 Organisational Culture

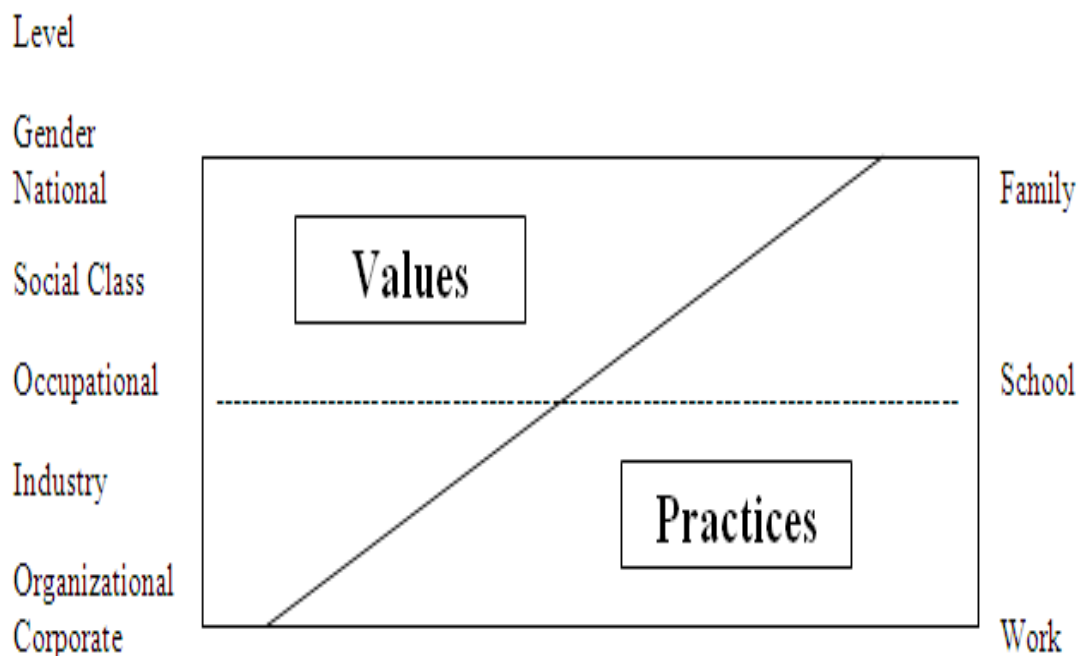
The term ‘organisational culture’ was first introduced by Pettigrew (1979). Krefting and Frost (1985, p. 155) define organizational culture as “---*patterns of belief, symbols, rituals, and myths that evolve across time and that function as social glue*”. According to Wallach (1983, p. 29), corporate culture is “---*the shared understanding of an organisation’s employees – ‘how we do thing around here’*”.

Hofstede et al. (1990) carried out a study on 20 units representing 10 different organisations, five in Denmark and five in the Netherlands. On the dimensions of IBM national culture, the scores of these two countries were fairly similar as both belong to the same Nordic-Dutch cluster. What was surprising in this study was that the differences in values and behaviours of the people across different organisations were more pronounced than those due to factors of nationality, education, gender and age group (Hofstede et al. 1990). This shows that the work culture in an organisation is an important factor in employee behaviour. Pothukuchi et al. (2002) reinforce the importance of study on organisational culture differences. This means that

transferring new technologies would most likely be successful if the work cultures in the concerned organisations are amenable to the use of that technology. For example, Aziz and Salleh (2011) suggest that organisational culture plays a key role in the successful implementation of IT/IS in the construction industry in Malaysia.

According to Hofstede et al. (2010, p. 346), there is a different mix of values and practices across national and organisational cultures. At the national level, cultural differences reside mostly in values and less in practices. However, at the organisational level, cultural differences reside mainly in practices (Hofstede et al. 2010). Hofstede (2003) also argues that organisations usually do not attain the depth and richness of socially acceptable understanding of paradigmatic cultures as researched by anthropologists. The reason is that values are acquired mainly in the early part of a person's life whereas practices are learnt through socialisation with other people at workplaces or schools. The figure below explains the balance of values and practices at various levels of culture.

Figure 3.8: Values and Practices at Various Levels of Culture



Source: Reproduced from Hofstede et al. (2010, p. 10)

Cameron and Quinn (1999, p.14) argue that organizational culture consists of the assumptions, expectations, and memories that define 'how things are around here'. Organizational culture conveys a sense of identity to employees, gives them implicit guidelines for action, and ensures the stability of the social system in the organization. Schein (1992, p. 12) defined organisational culture as:

“---a pattern of shared basic assumptions that the group learned as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore to be taught to new members as the correct way to perceive, think, and feel in relation to those problems”.

(Schein 1992, p. 12).

This thesis used the definition of organisational culture advanced by Hofstede et al. (2010, p. 344) as *“the collective programming of the mind that distinguishes the members of one organisation from others”*. Hofstede (2003) observed that when a child grows to the age of 10, most of the child's basic values have been programmed into his/her mind. On the other hand, organisational practices are learned through socialisation at workplaces. Most people join organisations as adults with the bulk of their values firmly set. Their values are already formed because the learning place of those values is the family, but the learning of organisational culture takes place as an adult working in an organisation. It is worth noting that members of organisations seldom live in total isolation in their institutions and are also exposed to other orientations. Hofstede (2003) advises that it is preferable to have a unit with homogeneous characteristics when studying organisational culture.

Organisational culture is:

“---the 'implicit', 'invisible', 'intrinsic' and 'informal' consciousness of an organisation which guides the behaviour of the individuals and which shapes itself out of their behaviour”.

(Scholz 1987, p. 80).

Some scholars have attempted to develop measures of organisational culture (Berenice 2010). There are also some more detailed measurement tools developed by other scholars to capture organisational culture such as that of Cameron and Quinn (1999) and Hofstede et al. (1990). Cameron and Quinn (1999) developed the Organisational Culture Assessment Instrument (OCAI) based on the Competing Values Framework, which offers an explanation of the underlying value orientation that characterises an organisation. Here, the entire culture profile of an organisation can be identified using the following categories (Cameron and Quinn 2006, p. 67):

- a) Clan: organisations that focus on maintenance of internal order with concern for people and sensitivity towards customers.
- b) Hierarchy: organisations that focus on maintenance of internal order with stability and control.
- c) Adhocracy: organisations that focus on external positioning with higher emphasis on flexibility and individuality.
- d) Market: organisations that focus on external positioning for stability and control in the market.

3.4.1 Hofstede's framework of organisational culture

The models of organisational culture offered by Hofstede et al. (1990) are not only widely used but amenable to quantitative research. Hofstede (1998, p. 483-484) explains that as a consequence there are six dimensions of organisational culture, as follows:

- a) Process-oriented versus results-oriented – Process-oriented cultures advocate risk-avoidance traits among its people. They put in only the minimal effort required in their work and they see each day as the same as the previous day. On the other hand, in a results-oriented culture, people face up to unfamiliar situations and exert maximal effort to explore new challenges (Hofstede 1998, p. 483).
- b) Employee-oriented versus job-oriented – In employee-oriented cultures, organisations take responsibility for employee welfare and employees are

considered in decision-making processes. In contrast, people in job-oriented organisations are more interested in the work employees do without much focus on employee welfare (Hofstede 1998, p. 483).

- c) Parochial versus professional – In a parochial culture, employees feel that the company takes their social and family background into account as much as their job competence. In a professional culture, employees consider their private lives to be their own business, and the management only hires employees on the basis of job competence (Hofstede 1998, p. 483-484).
- d) Open systems versus closed systems – In open cultures, both the organisation and its people are open to newcomers and outsiders. In contrast, an organisation with a closed culture often acts in a secretive manner even with insiders. People have difficulty adjusting in the organization and may not feel included even after being in the organisation for some time (Hofstede 1998, p. 484).
- e) Loose versus tight control – In a loosely controlled environment, people feel that cost, punctuality and norms are not strictly followed. People in a tightly controlled environment are encouraged to be cost-conscious, punctual and serious about rules (Hofstede 1998, p. 484).
- f) Normative versus pragmatic – The main emphasis in a normative culture is on correctly following organisational procedures in matters of business ethics. In a pragmatic culture, there is more emphasis on results rather than correct procedures, so employees are encouraged to follow a pragmatic rather than dogmatic attitude in their activities (Hofstede 1998, p. 484).

Since these dimensions are exclusively focused on organisations, they can also be identified easily within an organisational setting (Beshay & Sixsmith 2008). According to Beshay and Sixsmith (2008), these six dimensions are focused on the level of organisations and can be easily translated to the level of projects for purposes of analysis. To further strengthen this finding, Cabrera et al. (2001) state that Hofstede's organisational culture framework is relatively simple to map onto organisational issues. Hence, it has been proved as an effective framework to manage change. In fact, there are tools available in the market that can help practising

managers utilise the framework in real-life scenarios at a rather low cost compared to other methods.

However, there are also some problems associated with this model. According to Berenice (2010), these six organisational culture dimensions of Hofstede were based on 20 units from two countries, so they are too narrow to be considered as universally valid and sufficient for describing cultures in other countries or in other types of organisations. Berenice is of the opinion that additional dimensions may be necessary or some of the six may be less useful. In light of this problem, this study used an earlier model proposed by Hofstede et al. (1990) which used values and practices as items to measure organisational culture. This is a simpler model yet it captures all the aspects of organisational culture listed in the last model. According to Ciganek et al. (2010), from the six practices delineated in Hofstede's model of Organisational Culture, three of the practices are more appropriate for the studies of technology and system usage. The three practices are Results-Oriented (RO), Job-Oriented (JO) and Closed System (CS). Therefore, this study used the three dimensions of practice as suggested by Ciganek et al. (2010) in conjunction with one value-based dimension called need for security (NS) to make the research model parsimonious and manageable. These four dimensions are now described.

a) Need for security (NS)

The dimension of need for security represents an organisational culture wherein people require constant assurance of security for their acts. Ciganek et al. (2010) stated that the acceptance of the system used depends on whether employees can reveal, support and trust the information given by their co-workers through technology. This means that people will prefer to use more secure communication channels, such as face-to-face and telephone. On the other hand, people in organisations with a lower level of need of security may prefer to use emails in the workplace despite awareness of the risks involved. As previous studies have emphasised, there are many risks to privacy associated with email. Even if an email is deleted, it is possible for the data shadow of the email to be restored on a network server (Brake 2004). Several organisations require employees to sign email policies

allowing employers to monitor email correspondences if there is a reasonable business motive for doing so (Udo 2001). Global legal regulations stipulate that the content of an email sent from the workplace is the property of the employer rather than the sender (Eunson 2012). Consequently, employees may be reluctant to use email as it can be divulged against their will by the management in legally acceptable ways. Therefore, organisational cultures where employees have a greater need for security will tend to use email less.

b) Results-oriented (RO)

This dimension posits that process-oriented organisations focus on the means and procedures that employees must follow to perform a task, whereas, results-oriented organisations are concerned mainly with the targets pertaining to that task. Mechanistic or bureaucratic organisations with many rules and procedures are typically process-oriented and organic, while risk-taking organisations are typically categorised as results-oriented (Cabrera et al. 2001). Conversely, results-oriented organisations are risk-oriented, thus creating an environment that provides for and advocates innovative methods for the organisation to survive and grow (Hofstede et al. 1990).

Results-oriented organisations are more inclined towards technology adoption. Organisations that encourage innovativeness and a willingness to explore new ideas among their employees are more successful with technology adoption (Ruppel & Harrington 2001). Ciganek et al. (2010) state that individuals working in result-oriented organisations tend to have more experience using innovation in technology, whereas those in a process-oriented work environment would perceive it as a threat and less helpful in decision-making. In a result-oriented culture, employees are also given the opportunity to choose any technology suitable for the work regardless of the procedural formalities leading to more innovative behaviour in technology adoption (Ciganek et al. 2010). Ciganek et al. (2010) further suggest that there is a positive significant relationship between result-oriented with PEOU and PU on system use. Therefore, results-oriented organisations will have a greater tendency to use email than process-oriented organisations.

c) Job-oriented (JO)

Employee-oriented vs. job-oriented is an indicator of whether an organisation considers the welfare of its employees or is interested only in completion of the job. In employee-oriented cultures, major decisions are usually in the hands of groups or committees, and an effort is made to assist new members to fit in. On the other hand, individual and top-down decision-making is usually found in job-oriented cultures (Cabrera et al. 2001). According to Ruppel and Harrington (2001), the adoption of an innovation or system usually happens in organisations, which place a higher priority on its employees. Therefore, an organisation with a job-oriented culture will tend to adopt IT tools such as email, less in comparison to employee-oriented organisations.

d) Closed system (CS)

An open or closed system describes the type of communication environment in an organisation. If information flows freely through the organisation, it is said to possess an open system culture, whereas closed cultures tend to keep their activities secret (Cabrera et al. 2001). The use of technology requires support from co-workers, supervisors and managers and without this support employees may not be prepared to share their knowledge and experiences with others. Ciganek et al. (2010) state that organisations with an open communication system are bound to be more prepared to adopt technology than organisations with closed communication systems. In an open system, employees are prepared to share their experiences and help one another (Ciganek et al. 2010). This means that organisations with a closed communication system will tend to have less emphasis on sharing knowledge and experience, which could contribute to reduced adoption and usage of email in comparison to organisations with open communication systems.

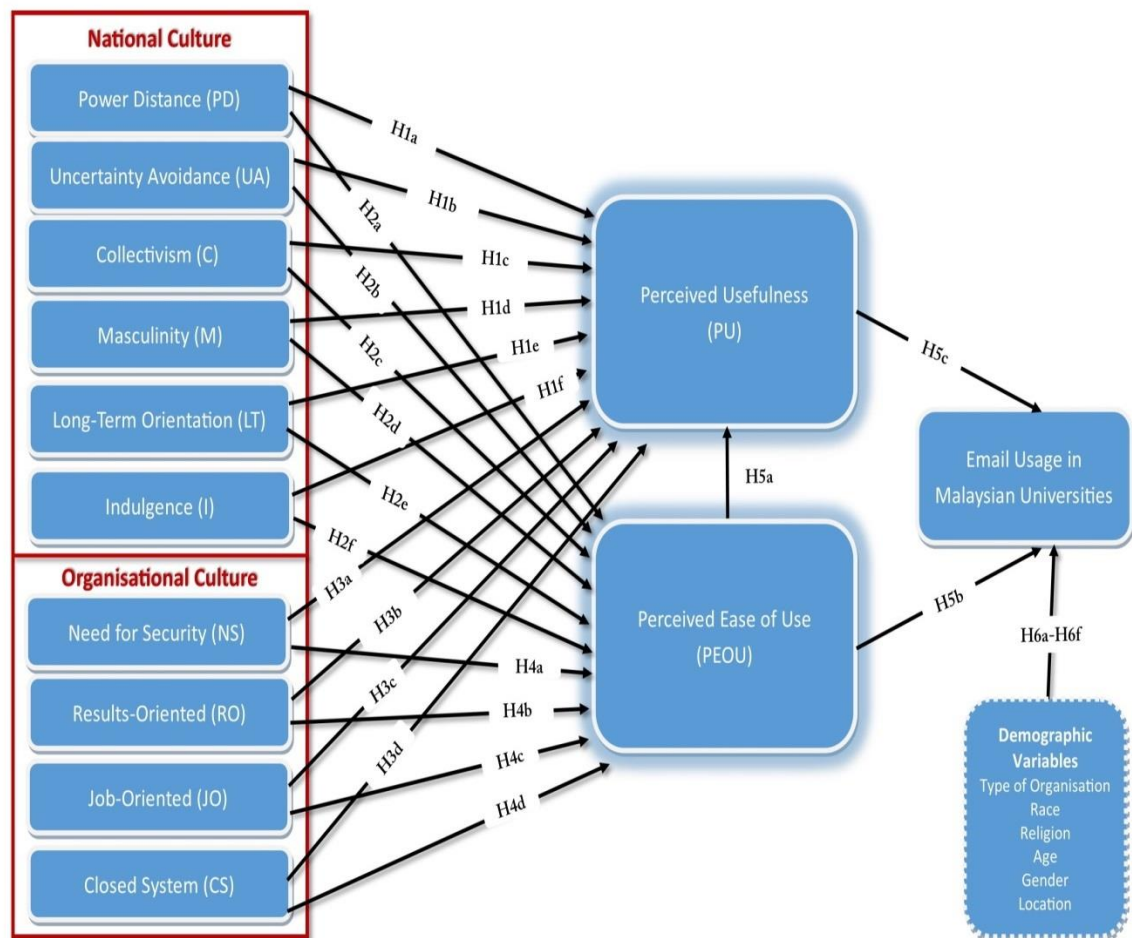
3.5 Research Model and Hypotheses

The integration of National Culture with TAM in the research framework of the study helps to address the specific characteristics of race, gender, religion, age and geographical location pertaining to Malaysia. By incorporating the framework of organisational culture into the model, this study will account for differences in work culture and ethic across different organisations – namely public and private

universities. By considering these factors, the study provides a more fine-grained analysis of technology uptake (in this case, email) than is possible with the basic TAM model. Each theory provides its own insights into the complex problem of email adoption and improves the efficacy of the integrated theoretical model in elucidating the factors that influence the adoption of email usage.

The research model and hypotheses showing the relationships between National Culture Model (NCM), Organisational Culture Model (OCM), Technology Acceptance Model (TAM) and email usage in Malaysian Universities are illustrated in Figure 3.9 and Table 3.10:

Figure 3.9: Research Model



Source: Adopted from Davis (1989), Hofstede et al. (1990) and Hofstede et al. (2010)

Table 3.10: Hypotheses for Testing

Hypothesis
National Culture, Technology Acceptance Model on Email Usage in Malaysian Universities
H1a: Power distance (PD) has a significant negative relationship with perceived usefulness (PU) on email usage in Malaysian universities.
H1b: Uncertainty avoidance (UA) has a significant negative relationship with perceived usefulness (PU) on email usage in Malaysian universities.
H1c: Collectivism (C) has a significant negative relationship with perceived usefulness (PU) on email usage in Malaysian universities.
H1d: Masculinity (M) has a significant negative relationship with perceived usefulness (PU) on email usage in Malaysian universities.
H1e: Long-term orientation (LT) has a significant positive relationship with perceived usefulness (PU) on email usage in Malaysian universities.
H1f: Indulgence (I) has a significant positive relationship with perceived usefulness (PU) on email usage in Malaysian universities.
H2a: Power distance (PD) has a significant negative relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.
H2b: Uncertainty avoidance (UA) has a significant negative relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.
H2c: Collectivism (C) has a significant negative relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.
H2d: Masculinity (M) has a significant negative relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.
H2e: Long-term orientation (LT) has a significant positive relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.
H2f: Indulgence (I) has a significant positive relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.
Organisational Culture, Technology Acceptance Model on Email Usage in Malaysian Universities
H3a: Need for security (NS) has a significant negative relationship with perceived usefulness (PU) on email usage in Malaysian universities.
H3b: Results-oriented (RO) has a significant positive relationship with perceived usefulness (PU) on email usage in Malaysian universities.
H3c: Job-oriented (JO) has a significant negative relationship with perceived usefulness (PU) on email usage in Malaysian universities.
H3d: Closed system (CS) has significant negative relationship with perceived usefulness (PU) on email usage in Malaysian universities.

Hypothesis
H4a: Need for security (NS) has a significant negative relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.
H4b: Results-oriented (RO) has a significant positive relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.
H4c: Job-oriented (JO) has a significant negative relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.
H4d: Closed system (CS) has a significant negative relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.
Technology Acceptance Model on Email Usage in Malaysian Universities
H5a: Perceived ease of use (PEOU) has a significant positive relationship with perceived usefulness (PU) on email usage in Malaysian universities.
H5b: Perceived ease of use (PEOU) has a significant positive relationship with email usage (U) in Malaysian universities.
H5c: Perceived usefulness (PU) has a significant positive relationship with email usage (U) in Malaysian universities.
Demographic Factors on Email Usage in Malaysian Universities
H6a: Organisation type (public or private) has a significant relationship with email usage in Malaysian universities.
H6b: Race has a significant relationship with email usage in Malaysian universities.
H6c: Religion has a significant relationship with email usage in Malaysian universities.
H6d: Age has a significant relationship with email usage in Malaysian universities.
H6e: Gender has a significant relationship with email usage in Malaysian universities.
H6f: Location has a significant relationship with email usage in Malaysian universities.
Mediation Effect of Perceived Usefulness (PU)
H7a: Perceived usefulness (PU) mediates the relationship between power distance (PD) and email usage (U).
H7b: Perceived usefulness (PU) mediates the relationship between uncertainty avoidance (UA) and email usage (U).
H7c: Perceived usefulness (PU) mediates the relationship between collectivism (C) and email usage (U).

Hypothesis
H7d: Perceived usefulness (PU) mediates the relationship between masculinity (M) and email usage (U).
H7e: Perceived usefulness (PU) mediates the relationship between long-term orientation (LT) and email usage (U).
H7f: perceived usefulness (PU) mediates the relationship between indulgence (I) and email usage (U).
H7g: Perceived usefulness (PU) mediates the relationship between need for security (NS) and email usage (U).
H7h: Perceived usefulness (PU) mediates the relationship between results-oriented (RO) and email usage (U).
H7i: Perceived usefulness (PU) mediates the relationship between job-oriented (JO) and email usage (U).
H7j: Perceived usefulness (PU) mediates the relationship between closed system (CS) and email usage (U).
Mediation Effect of Perceived Ease of Use (PEOU)
H8a: Perceived ease of use (PEOU) mediates the relationship between power distance (PD) and email usage (U).
H8b: Perceived ease of use (PEOU) mediates the relationship between uncertainty avoidance (UA) and email usage (U).
H8c: Perceived ease of use (PEOU) mediates the relationship between collectivism (C) and email usage (U).
H8d: Perceived ease of use (PEOU) mediates the relationship between masculinity (M) and email usage (U).
H8e: Perceived ease of use (PEOU) mediates the relationship between long-term orientation (LT) and email usage (U).
H8f: Perceived ease of use (PEOU) mediates the relationship between indulgence (I) and email usage (U).
H8g: Perceived ease of use (PEOU) mediates the relationship between need for security (NS) and email usage (U).
H8h: Perceived ease of use (PEOU) mediates the relationship between results-oriented (RO) and email usage (U).
H8i: Perceived ease of use (PEOU) mediates the relationship between job-oriented (JO) and email usage (U).
H8j: Perceived ease of use (PEOU) mediates the relationship between closed system (CS) and email usage (U).

3.6 Conclusion

This chapter has described the process behind the development of the conceptual framework, which guided the empirical examination of email usage in Malaysian universities in this study. A review of relevant theories in the field of technology adoption was conducted to identify theories that are able to address the technical aspects and cultural factors that condition the attitude and perception of users towards email. TAM as a generic model has a limitation in that it ignores the specific contextual details of a particular locale, but the model used in this study addressed this by including various factors, such as gender, race, religious, age, location and type of organisation. Mathieson (1991) states that the original TAM model does not explicitly include any cultural variables. So this study incorporated national and organisational culture variables with TAM to build a holistic conceptual framework with a detailed list of hypotheses for empirical analysis. The next chapter turns to a systematic appraisal of Malaysia and Malaysian universities on the various dimensions of national culture and organisational culture.

CHAPTER 4

NATIONAL AND ORGANISATIONAL CULTURE IN PUBLIC AND PRIVATE UNIVERSITIES IN MALAYSIA

4.1 Introduction

The previous chapter stressed the importance of national and organisational culture in technology acceptance. Since generic theories of technology acceptance such as technology acceptance model (TAM) focus only on the practical efficacy of the technology and personal motivation of users, there is a need to add some theoretical perspective on how elements of national and organisational culture moderate the behaviour of non-academic staff working universities in Malaysia. To that end, Hofstede's frameworks of National and Organisational Culture were presented as relevant theoretical paradigms that could be used along with the theory of TAM to build a conceptual model for this study.

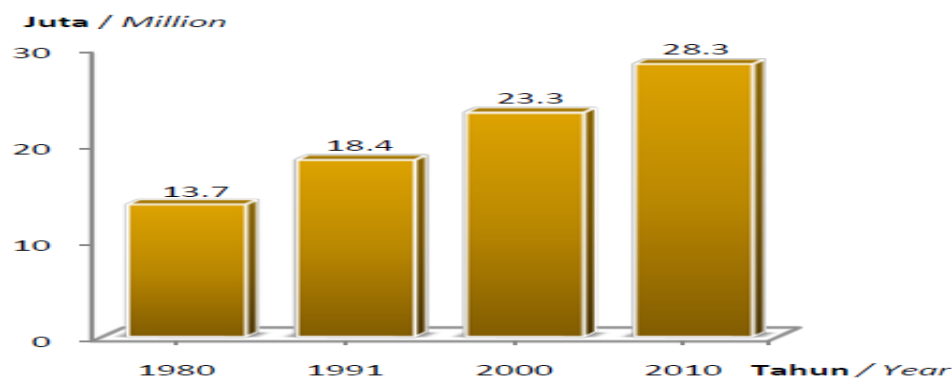
This chapter uses the two models of national and organisational culture to present a systematic appraisal of cultural norms in Malaysia as a nation and Malaysian universities as organisations. The chapter will begin with an overview of the demographic and cultural background of Malaysia to familiarise the reader with the country. The next section will describe attributes of Malaysia's culture as a nation using Hofstede's Framework of National Culture. After that, the chapter will provide an overview of public and private universities in Malaysia. The chapter will end with a comparative discussion of organisational culture in these two types of institutions.

4.2 Demographic and Cultural Context

As this study seeks to ground the investigation of factors behind email usage in Malaysian universities in its national culture, it is important to understand the demographic and cultural attributes of Malaysia as a nation.

According to data from the 2010 Census, the total population of Malaysia has risen from 23.3 million in 2000 to 28.3 million in 2010 and above 30 million in 2012, showing an average annual growth rate of 2.0 per cent in that decade. This growth rate is lower than the 2.6 per cent growth rate recorded during the 1991-2000 period (Department of Statistics Malaysia 2010, p. 1). The details of the total population of Malaysia in 1980, 1991, 2000 and 2010 are shown in the figure below:

Figure 4.1: Total Population of Malaysia for the Years 1980, 1991, 2000 and 2010



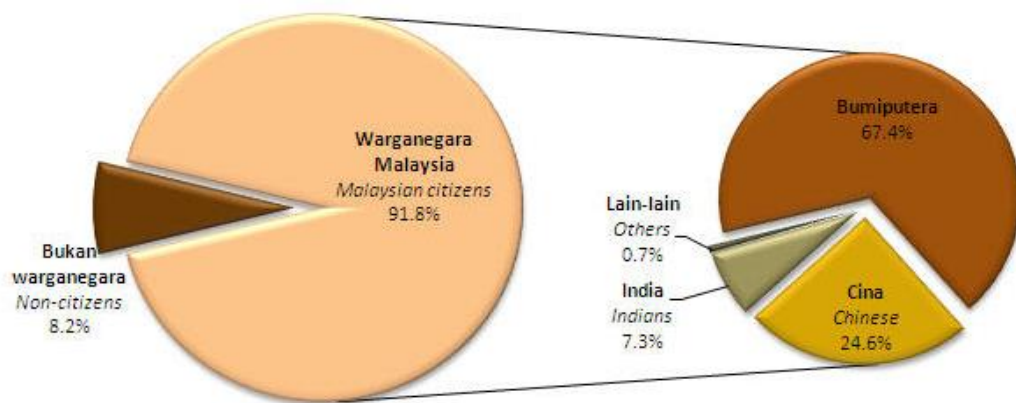
Source: Reproduced from The Department of Statistics, Malaysia (2010, p. 1)

a) Race

Another important dimension of the demographic and cultural makeup of Malaysia is the distribution of races and religions. According to Husin (2012), Malaysia is a highly pluralistic society with more than 80 ethnic groups but the major ethnic groups are Malays (Bumiputera), Chinese and Indian (Husin 2012). The Chinese and Indian groups are descendants of immigrants who came to Malaya (the pre-independence name of Malaysia) during the middle of the 19th century to fill the labour gap in colonial economic activities (Husin 2012). Malays are engaged

predominantly in farming work in rural areas and in government jobs, whereas the Chinese hold economically dominant position as entrepreneurs and business owners, and Indians often work in large plantation estates and public works (Merriam & Mohamad 2000). Of the total population of 28.3 million in 2010, 91.8 per cent were Malaysian citizens and 8.2 per cent were non-citizens. Malaysian citizens are made up of these main ethnic groups – Malays and Bumiputeras (sons of the soils) (67.4 per cent), Chinese (24.6 per cent), Indian (7.3 per cent) and Others (0.7 per cent) (Department of Statistics Malaysia 2010, p. 5).

Figure 4.2: Percentage of Malaysian Citizens and Distribution of Population By Ethnic Group



Source: Reproduced from The Department of Statistics, Malaysia (2010, p. 5)

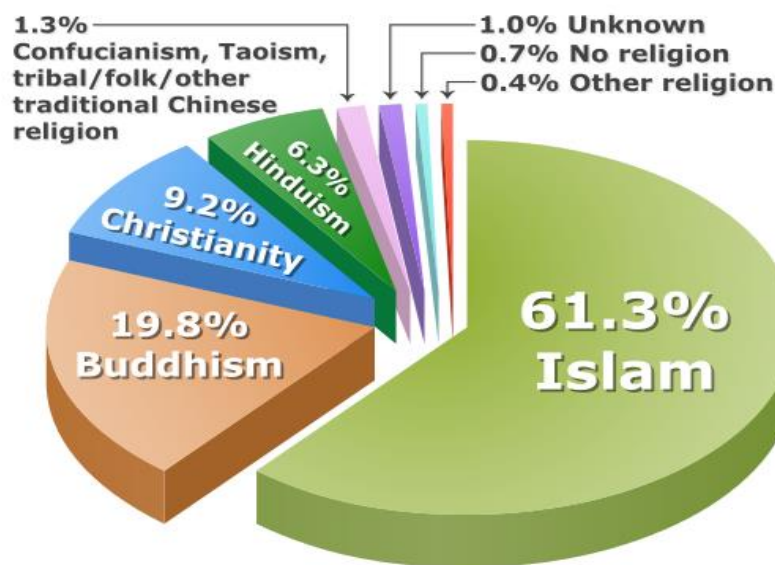
Politics in Malaysia is closely related with race, where race-political parties form the backbone of the political process. The current government led by the *Barisan Nasional* (National Front) coalition was formed by a collaboration of race-based political parties, including the United Malays National Organisation (UMNO) representing Malays, the Malaysian Chinese Association (MCA) for Chinese and the Malaysian Indian Congress (MIC) for Indians. Saad (1979) has criticised this form of political activity and stated that the majority of political parties in Malaysia act as pressure groups that merely look out for privileges and advantages for their members

instead of the broader national interest. Jamil (2011), on the other hand, is more moderate in his estimation of race-based political parties and suggests that they act as mediators of ethnic symbols and interests, although he accepts that ethnic dissimilarities are often given a political dimension.

b) Religion

With regard to religion, 61.3 per cent of Malaysians follow Islam, 19.8 per cent Buddhism, 9.2 per cent Christianity and 6.3 per cent Hinduism (Department of Statistics Malaysia 2010, p. 9). As this study focuses only on public and private universities in Peninsular Malaysia, it will not include the races and religions of people in the Borneo region in its category of demographic identifiers.

Figure 4.3: Percentage Distribution of the Malaysian Population by Religion



Source: Reproduced from The Department of Statistics, Malaysia (2010, p. 9)

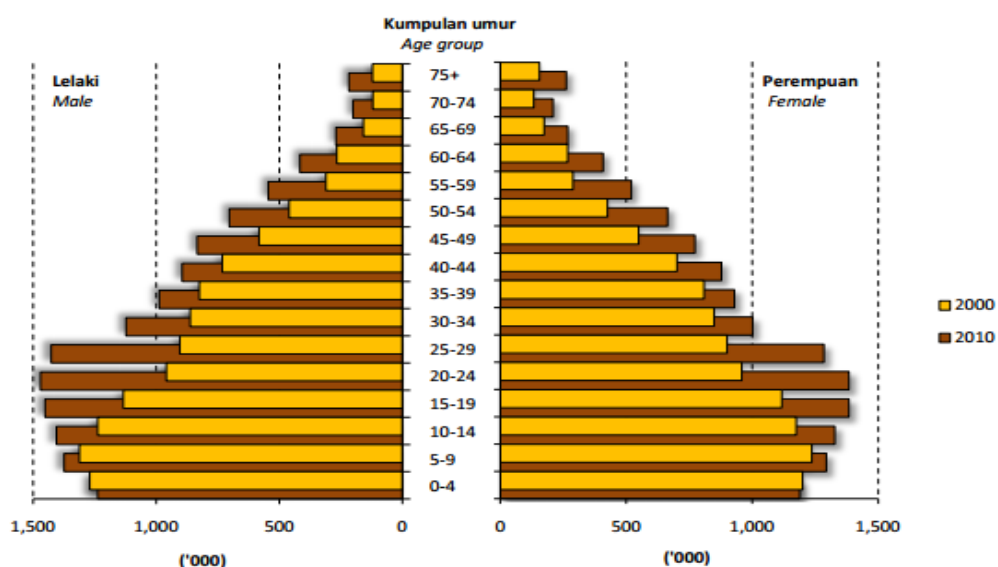
Past studies suggest that religion is a vital dimension of employee cultural orientation in the Malaysian workplace (Abdullah & Lim 2001; Lim 2001). Religion, especially Islam, appears to be a key cultural force in the Malaysian workplace (Abdullah & Lim 2001); however, the element of religion has always been ignored in the study of organisational culture (Schwartz 1994). Developing their model of national culture for Malaysia, Abdullah and Lim (2001) argue that most Malaysian citizens manifest

similar values and attitudes with regard to most issues and religion is the only dimension where Malaysians show divergent behaviours. Survey results from Kennedy and Mansor (2000) further corroborates this argument that cultural perception towards religion is the only significant difference between the main ethnic groups. Fontaine and Richardson (2005) also suggest that religion is the only significant difference between the three major ethnic groups in Malaysia.

c) Age

Age is another important dimension of the demographic makeup of a country. The proportion of Malaysian population below 15 years of age declined from 33.3 per cent in 2000 to 27.6 per cent in 2010. The proportion of working age population (from 15 to 64 years) decreased from 67.3 per cent to 62.8 per cent, and the proportion of the population aged 65 years and above grew from 3.9 per cent to 5.1 per cent. Accordingly, the median age increased from 23.6 years in 2000 to 26.2 years in 2010, while the dependency ratio decreased from 59.2 per cent to 48.5 per cent. These indicators signal the transition towards an ageing population in Malaysia (Department of Statistics Malaysia 2010, p. 6). The details of composition of population by sex and age group are depicted in the figure given below:

Figure 4.4: Composition of Population by Sex and Age Group in 2000 and 2010



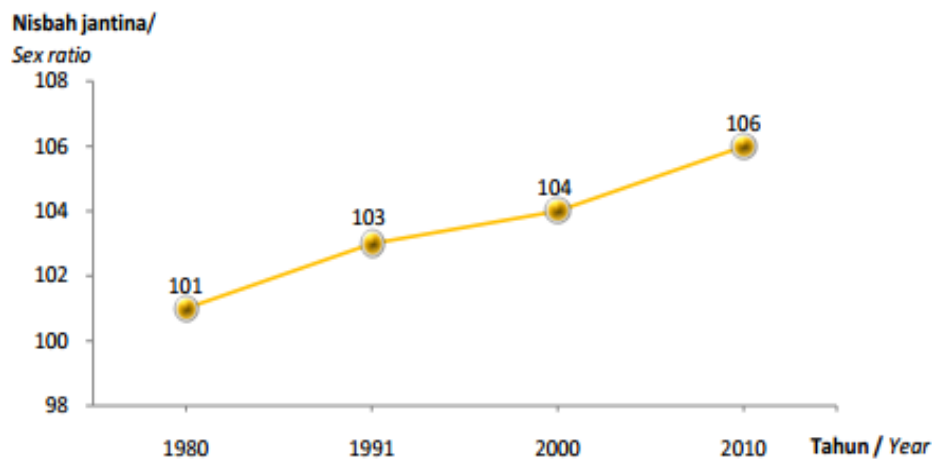
Source: Reproduced from The Department of Statistics, Malaysia (2010, p. 6)

Hofstede's 1980 study indicates that age is an important factor behind the intention to use ICT; however, this factor needs to be re-evaluated from a Malaysian perspective. Sathye (1999) found no such relationship between age and IT/IS adoption in Australia, but many other previous studies suggest that younger age groups show greater willingness to adopt new IT/IS technology, particularly in developing countries (Al-Sukkar 2005; Alhujran 2009; Venkatesh & Morris 2000).

d) Gender

With regard to gender, the disparity of male/ female ratio has shown a slow rise from 1980 onwards. While there were 101 men to 100 women in 1980, this has slowly risen to 103 men in 1991, 104 men in 2000 and 106 men in 2010 to every 100 women (Department of Statistics Malaysia 2010). The details of the sex ratio of the general population are given below in this figure:

Figure 4.5: Sex Ratio in Malaysia for the Years 1980, 1991, 2000 and 2010



Source: Reproduced from The Department of Statistics, Malaysia (2010, p. 7)

Scholars in gender-differentiated Islamic societies like Jordan and Lebanon have found that there is a significant effect of gender on the level of IT/IS adoption (Al-Gahtani et al. 2007; Alhujran 2009; Houtz & Gupta 2001) and specifically email usage (Gefen & Straub 1997), where male usage is significantly higher than among females. Some studies also suggest that female workers are more competent than males in using technologies. Luan et al. (2005) found that female academicians in

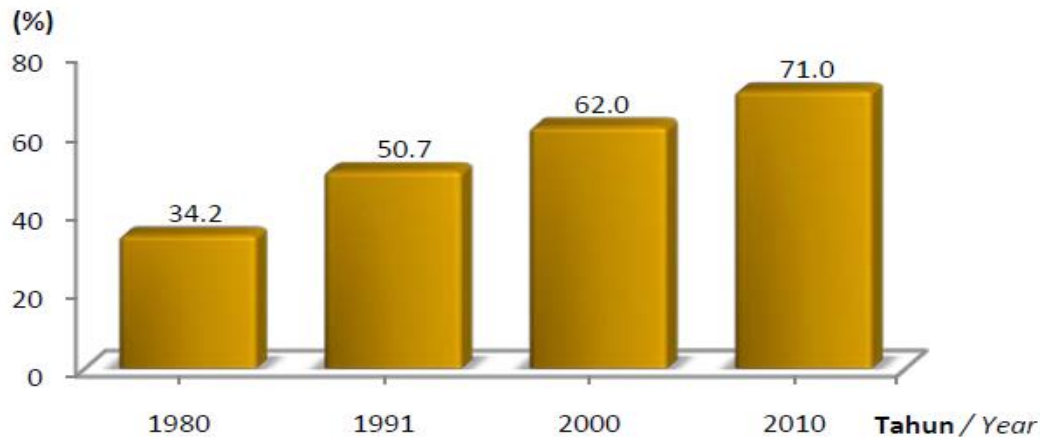
Malaysian public universities are more competent in using most ICT tools than their male counterparts and average email usage by female respondents is higher than for males (Luan et al. 2005). However, many studies also argue that there is no difference in technology usage between genders (Tsai et al. 2001; Wong and Hanafi 2007). Tsai et al. (2001) found no key differences in terms of gender concerning the perceived usefulness of the internet and Wong and Hanafi (2007) noted that there was no significant gender disparity between Malaysian educators in terms of IT proficiency. Furthermore, Atan et al. (2002) indicate the absence of gender disparity in computer software usage. Given these conflicting results, it is important to verify whether there is any influence of gender on email usage among non-academic executives at Malaysian universities.

e) Location

Explaining the importance of location as a demographic factor, Hindman (2000) observes that metropolitan people are more open to using technology compared to non-metropolitan people. Mills and Whitacre (2003) also suggest that there is still a digital divide between metropolitan and non-metropolitan locations. Given this divide, some have suggested that differences will dissipate over time (Compaine 2001), but others, such as Wang et al. (2011), suggest that there are no significant differences in internet access between metropolitan and non-metropolitan areas.

In this study, in order to account for the geographical and demographic diversity of universities, both groups of public and private universities have two institutions from metropolitan and two from non-metropolitan areas. As this study compares patterns of email usage between metropolitan and non-metropolitan organisations, it is important to understand the current data on urbanisation in Malaysia. Given Malaysia's rapid development, the proportion of urban population rose from 62 per cent in 2000 to 71 per cent in 2010 (Department of Statistics Malaysia 2010, p. 4). The following figure shows the rate of urbanisation in the last three decades from 1980 to 2010.

Figure 4.6: Level of Urbanisation in Malaysia for the Years 1980, 1991, 2000 and 2010



Source: Reproduced from The Department of Statistics, Malaysia (2010, p. 4)

f) Organisation type

Public sector organisations differ from private sector organisations in a number of dimensions, including the influence of political authority, personal-related functions and resource acquisition (Scott & Falcone 1998). Ahadi et al. (2011) note that while a hierarchical culture prevails in Malaysian organisations, observance of power distance is more marked among academicians in Malaysian Research Universities (Public Universities). Consistent with this, it has been found that some private universities face financial constraints and lack facilities and staff (Arokiasamy et al. 2009). Wilkinson and Yussof (2005) suggest that private universities in Malaysia observe more adhocratic cultures than public universities. However, a different result was found in a study done by Ramachandran et al. (2011) suggesting that adhocracy culture is more rampant in public than private higher education institutions. It has also been observed that there is a richer cultural setting in public HEIs as many of their administrators and academics are transferred from other reputable public HEIs, which have their own set of organisational cultures in place. As discussed in the introduction chapter, Malaysian public and private universities have varying composition of ethnicities, where public universities are predominantly composed of Malay (Bumiputera) staff, while private universities are more equally distributed

across Malay, Chinese, Indian and other minorities. Before 1970, the Chinese were the major ethnic group in public universities but after the implementation of New Economic Policy (NEP) in 1969, the racial composition in public universities has changed and the Bumiputeras have become and continue to be the predominant ethnic group in public institutions (Wan 2007).

4.3 National Culture in Malaysia

As such, the concept of national culture is a difficult notion to understand or pin down, and this difficulty is compounded in a nation with such a heterogeneous and complex demographic makeup like Malaysia. It has been said that Malaysia's racial and ethnic diversity does create some tensions, yet it functions as a harmonious and unified nation (Abdullah & Lim 2001).

Merriam and Mohamad (2000) note that ethnic and racial identity are critical determinants of cultural orientation and Husin (2012) also notes that there are values which are different among ethnic groups in Malaysia. While Malays are typically viewed as being tolerant, courteous and cooperative, the Chinese are known for their hardworking nature and community spirit. It has been argued that although there are numerous sub-ethnic groups within the Malay race, they share similar attributes regardless of geographical location or communal groups (Husin 2012). Therefore, this study further explores the role of different cultures in the context of various races and religions and the relationship of culture with email usage in Malaysian universities.

Drawing on data gathered from a study on employees in IBM, Hofstede developed his model of National Culture which has been widely used by researchers across the world (McCoy et al. 2007). Numerous studies have verified the stability of the conceptual model and the dimensions it proposes (Alhujran 2009; Huang 2003; Tan et al. 1998). In fact, over 60 per cent of studies have utilised at least one or more dimensions of Hofstede's National Culture model (Leidner & Kayworth 2006). Nevertheless, Lim (2001) finds that there is insufficient follow-up research on

Hofstede's work on Malaysian cultural values. Hence, this thesis utilised Hofstede's National Culture framework to systematically analyse aspects of Malaysia's national culture. The following table presents an outline of the scores given for Malaysia's national culture in Hofstede's model of National Culture along with the rationale for the score given on each dimension:

Table 4.1: Six Dimensions of National Culture for Malaysia

Dimensions	Score	Explanation
Power Distance (PD)	104 (Very High PD)	High level of power distance means inequality of power and wealth within the society. People accept a hierarchical order in which everybody has a place which cannot be questioned or undermined. Malaysia has the highest PD in the world from 74 countries. around the world.
Individualism/Collectivism (IC)	26 (Very High Collectivism)	Malaysia is a more collectivist society with close ties between individuals which means that the country has a very low score of individualism. Collectivist cultures reinforce extended families and communal groups where everyone takes responsibilities for fellow members of their group.
Masculinity/Femininity (MF)	50 (Average MF)	Malaysia has an average score on MF.
Uncertainty Avoidance (UA)	36 (Very low UA)	Malaysia scores very low on UA which means that people are not risk averse and are more tolerant to mistakes, ambiguity and chaos.
Long-Term/Short-Term Orientation (LST)	41 (Average LST)	Malaysia has an average score on LST.
Indulgence/Restraint (IR)	57 (Above average Indulgence)	Malaysia has an above average score on IR.

Source: Hofstede (1991) and Hofstede et al. (2010)

a) Power distance (PD)

In his evaluation, Hofstede (1991) states that Malaysia is a high PD country. This implies that power is unequally distributed and members of the society recognise that there is an autocratic, hierarchical and paternalistic system. Although, Cheng (1999) suggests that Malaysian organisations have low PD, most scholars agree that Malaysian society as a whole tends to display high PD tendencies. This statement is further supported by Abdullah (1992) who found that Malaysians typically place high importance on respect for authority and hierarchical differences, whether this in the context of a family or an organisation, and the possession of authority is based on a person's position. Furthermore, research done by Lim (1998) on the cultural attributes of Malay and Chinese people in Malaysia highlights that Malays are slightly more hierarchical and more oriented towards relationship building, while Chinese are more hierarchical when it concerns business dealings. The hierarchical nature of social order contributes to a centralised form of decision-making by those in power who view it as their responsibility and entitlement to have the final say. As a result, subordinates continue to be receptive to centralised power and look to their superiors for directions (Lim 2001). Research by Ramachandran et al. (2011) suggests that both Malaysian public and private higher education institutions are hierarchical.

Based on an interview with Asma Abdullah, a well-known Malaysian cultural studies scholar, Schermerhorn (1994) suggests that Americans have the ability to freely express individual views and opinions while Malaysians tend to be reserved and introverted. In addition, Malaysians often display what is seen as passive obedience to their superiors, and decision-making seems to take a top-down approach (Schermerhorn 1994). Kennedy (2002) also agrees that decision-making in Malaysia is influenced by hierarchical power structures, where considerable emphasis is placed on seniority in employment at the expense of performance criteria. Moreover, the power distance and hierarchical nature of Malaysian society is also revealed by the fact that all elders must be addressed in deferential terms, since calling someone older by his or her name is considered rude. It is also discourteous to display

assertive behaviour, give negative feedback or challenge elders openly (Abdullah 1996).

The PD scores hold some important implications for technology adoption. Zakour (2004) states that low PD cultures are more receptive towards ICT than individuals in high power distance cultures. This is because ICT poses a threat to the maintenance of hierarchy in high PD cultures as it enables direct communication between people on different organisational levels. On the other hand, individuals in low PD cultures are interdependent on each other regardless of their ranks in the hierarchy and favour ICT usage. Based on a study of cultural dimensions of the British, Australians and Malaysians, Abdullah and Lim (2001, p. 9) suggest that Malaysians are more hierarchical than the British and Australians. The Malays, more so than the Chinese and Indians, place more emphasis on the practice of hierarchy. Consequently, they conclude that *“Malaysians generally practise a high context form of communication where they attach meanings to elements surrounding the explicit message”* (Abdullah & Lim 2001, p. 9).

b) Collectivism/ individualism (IC)

With a score of 26 on Hofstede’s model, Malaysia can be characterised as being more inclined towards being a collectivist country. Many studies in Malaysia concur with Hofstede’s finding (Ahmad 2001; Bashah 1989; Kennedy 2002). For instance, Ahmad (2001) along with Bashah (1989) and Kennedy (2002) suggest that most Malaysians feel a strong need for group affiliation. Abdullah (1992) states that Malaysians practise shared beliefs in the importance of encouraging practices which reward the collective distribution of resources. Interestingly, Lim (1998) finds that while Malays and Chinese possess a strong spirit of collectivism, the Chinese are seen as displaying a stronger strain of collectivist spirit particularly with regard to business activities. Cheng (1999) is an exception, in that he suggests that Malaysian organisations are more individualistic, whereas most findings by Malaysian scholars see Malaysians as more collectivist than individualist. Moreover according to Cheng (1999), *bumiputera* (ethnic Malay) dominant organisations are more collective than non-*bumiputera* organisations.

With regard to the effect of collectivism/individualism tendencies on technology adoption, Hofstede et al. (2010) believes that in individualist countries the internet and email have a strong appeal and are often used to connect individuals to one another. On the other hand, in collectivist countries the internet and email are less attractive and used less frequently. Downing et al. (2003) explain that collectivist countries tend to select more information-rich, socially present forms of media such as face-to-face, fax and phone, while countries with high individualism tend to choose leaner forms of electronic media such as email.

c) Uncertainty avoidance (UA)

Hofstede (1991) found that Malaysia has a low UA ranking of 46 among 53 countries. Malaysians are inclined to honour their past and value past symbols to perpetuate the experiences of their ancestors using their ancient and rich traditions to serve as guidelines for future actions (Abdullah & Lim 2001, p. 9). Their communication patterns are often indirect as meaningful information is found in the physical context or is internalised in the recipient of the information, where the message is usually interpreted in relation with the messenger, the recipient, the time and method of transmission and those present during the transmission (Abdullah & Lim 2001, p. 10). As communication is a social act between two or more individuals, precise interpretation can only be reached in light of the social conventions and cultural values that describe the correct norms of communication specific to a particular ethnic group. In the Malaysian context, to communicate effectively means that the sender is frequently required to frame the content of a message in a manner that the emotions of the recipient being addressed are respected. The focal point is not so much on what the sender wants to say, but on how it is being said and its likely impact on the other party. The sender has to demonstrate greater sensitivity and read the subtleties that are embedded and implicit in the way Malaysians interact with their peers and significant elders (Abdullah & Pedersen 2009).

In her interview with Schermerhorn, Abdullah (1996) mentioned that Malaysians tend to avoid confrontation and build relationships in order to maintain harmony (Schermerhorn 1994). Abdullah further adds that disagreements will be conveyed

through indirect communication since this helps to maintain group harmony and avoid direct conflict (Abdullah 1996). Being too direct is taken as being insensitive and rude, and Malaysians do not usually voice their opinions even if they think they are right due to fear of being labelled arrogant, troublesome and self-opinionated (Abdullah 1996). The motive to preserve harmonious relationships makes it hard for Malays to act assertively, especially with Westerners who favour a direct and confrontational style of communication.

Uncertainty avoidance with its stress on information context and message clarity has significant repercussions on the choice and use of the type of media for communication. Ng et al. (1981) found significant differences in UA between Malay and Chinese students where Chinese students are less liable to avoid uncertainty and more willing to take risk. Cheng (1999) also argued that *bumiputera*-dominant organisations (Malays) have higher UA than non-*bumiputera* organisations.

d) Masculinity/femininity (MF)

Malaysia is ranked 25-26 among 53 countries on the Masculinity/Femininity index (Hofstede 1997). This means that Malaysian society is neither too rigid nor too lenient in terms of gender norms. According to Cheng (1999), *bumiputera*-dominant organisations which consist of Malays have higher scores of masculinity compared with non-*bumiputera* organisations in Malaysia. Previous literature indicates that there is a relationship between MF and the ICT adoption rate but this needs to be validated further. In the context of workplace, gender also plays some role. For example, an assertive female manager who speaks her mind openly can be seen by her male colleagues as being too self-centred. In addition, most Malaysians will also consider those who are direct and use a 'get it done' and 'matter of fact' approach in completing a task as cold, harsh and rather impersonal (Abdullah & Pedersen 2009, p. 15).

e) Long/short-term orientation (LST)

Arslan (2009) explains that cultures with short-term orientation place priority on tradition, so they may not be receptive to creative expression and new concepts. On

the other hand, cultures with high long-term orientation do not place as much importance on tradition, so individuals in high long-term orientation cultures are probably prepared to carry out the latest innovative plans as long as their full participation is needed.

In their first study, Hofstede and Bond (1988) examined only 23 countries and Malaysia was not included in their study on LST. However, a later study by Hofstede et al. (2010) ranked Malaysia at number 50 among 93 countries. This means that the Malaysian society is neither too future-orientated nor too past and present-orientated. However, taking this further with more detailed research, Ng et al. (1981) suggested that Malaysian Chinese and Indians are long-term oriented, while Malays are short-term oriented. However, this study was done more than 30 years ago and may be outdated.

f) Indulgence/restraint (IR)

Hofstede et al. (2010) placed Malaysia between 27 to 29 among 93 countries on the IR dimension. This means that Malaysian society tends more towards the indulgence end of the spectrum rather than restraint. According to Hofstede et al. (2010), people in cultures with a high degree of indulgence tend to take up activities that give them pleasure while those in cultures with high restraint are more disapproving and cynical about pleasure. According to Abdullah (1992), management in Malaysian organisations emphasise social obligations and the responsibility of employees towards their work with a work environment mixing work and social activities as part of social obligations. This characteristic is in line with Minkov's (2007) suggestion that high-indulgence environments tend to mix work and social activities. Currently, there are no studies on Malaysia using the IR factor since it was only included as a new dimension in Hofstede's National Culture model in 2010. This research will be the first study we are aware of to use all six dimensions of Hofstede's model (including LST and IR), in Malaysia. This is in contrast to previous studies, such as Ebrahimi et al. (2010), who ignored the LST and IR dimensions, and Amir (2009) who excluded the three dimensions of MF, LST and IR. By including the LST and IR dimensions, this study extends the current

knowledge on national and organisational culture in the Malaysian context and provides a more in-depth understanding of the influence of cultural factors on email usage in Malaysian workplaces.

4.4 Organisational Culture in Malaysia

In this study, Hofstede's framework of organisational culture (composed of values and practices) is used to analyse the relationship between organisational culture and the way people in the organisation adopt new technology. This includes the way people choose the medium of communication, be it traditional communication such as face-to-face interaction or new communication technology such as electronic mail. Conrad (1990) shows that organisational culture can influence how members of an organisation communicate with others. Shared practices in terms of styles and techniques need to be developed to support those core values and beliefs.

Examining managerial practices in Malaysia, Abdullah (1992, p. 3) argues that its national culture not only influences the way people behave, it also plays some role in expected norms and practices in organisations. Abdullah (1992) believes that the fundamentals of organisational culture must reflect a thorough understanding of core Malaysian values. Abdullah (1992, p. 11-13) lists the values and practices of Malaysian organisations as follows: a) non-assertiveness, b) respect for senior/elderly people and preserving face, c) underlying value of loyalty, respect for authority, d) collectivism – 'we' orientation-teamwork-cooperation, e) value of harmony, f) value of preserving face, g) status, good manners and courtesy, h) respect for hierarchy, i) harmony and non-aggressiveness, j) trust and relationship-building, k) tolerance and respect for differences. A comparative analysis of different values and practices between managers in Malaysia and America shows how organisational culture can also be shaped by national context. This is evident in the table below:

Table 4.2: Values Underlying Management Practices

PRACTICE	MALAYSIAN	ANGLO-AMERICAN
Coaching/Counselling	Face works/feelings Parent-child relationship Flexibility Extended family Shame Group harmony Third party intervention Indirectness	Information, data, guilt Adult to adult Task Time specificity Individual/immediate Directness Specificity Guilt Self esteem Face to face/one on one Frankness, openness
Conflict resolution	Indirectness, subtle Avoidance Compromise Feelings, Collaborate Relationships-long term	Directness Confrontation/out in the open Logic, facts Competition Task/result -short term
Leadership	Informal power Humility-hand in hand Deference to elders Trust and relationship Seniority-maturity Consensus seeking Admiration	Power based/influence Skills/competences Assertive spokesperson Ahead of others Result orientation Achievement oriented Combative
Motivating	Affiliation Relationship Family oriented Spiritual fulfilment Collectivistic Rapport with family, friends and associates	Self-actualisation Task orientation Individual achievement Future based Materialism
Communicating	Indirect, subtle Holistic Softness Politeness Vocal/tonal qualities Third-party intervention Person to person	Direct, to the point Linear Open, frank Assertiveness Face to face
Teambuilding	Consensus seeking Subjugation of self Consensus Spontaneity, Voluntariness	Winning the game Problem solving Work team Role clarification Task orientation Boundary definition

PRACTICE	MALAYSIAN	ANGLO-AMERICAN
Staffing	Extended family Nepotism Loyalty Long term commitment Social obligation	Expertise Competence Skills Objectivity Forms

Source: Reproduced from Abdullah (1992, p. 16-17)

In addition, Abdullah (1992) states that ethnic values play an important role in determining and developing the culture of an organisation as well as influencing managerial practices. Abdullah (1992, p. 10) lists and classifies values according to ethnic groups as shown below:

Table 4.3: List of Malaysian Ethnic Values

Malays		
Respect for elders,	Friendliness	Not aggressive
Spirituality	Politeness	Cooperation (<i>gotong royong</i>)
Humility	Harmony/peace	Good manners (<i>sopan santun</i>)
Face	Loyalty	Faith in God (<i>Tawakkal</i>)
Tact	Apologetic	Family oriented
Generosity	Formalities	Obedience
Caring	Accommodating	Fairness
Patience	Trustworthiness	Sincerity
Harmony,	Discipline	Courtesy
Sensitivity to feelings	Teamwork	Self respect (<i>Hormat diri</i>)
Sense of appropriateness	Non-confrontational	Honesty
Indirect	Tolerance	Rituals
Food and ceremonies	Compliance	Deference to elders
Tacit system of reciprocal obligations		Harmony with environment
Chinese		
Food	Money	Gambling, Risk taking
Hard work	Perseverance	Filial piety
Success	Position	Respect for hierarchy
Diligence	Face	Integrity
Education	Thrift	Modesty
Wealth	Meritocracy	Honesty
Family oriented	Generosity	Entrepreneurship
Happiness	Prosperity	Being pragmatic/practical
Harmony	Family	
Indians		
Fear of God	Participation	Loyalty
Sense of belonging	Hardwork	Karma
Brotherhood	Security	Champion of causes
Family	Filial piety	Harmony
Modesty	Face	

Source: Reproduced from Abdullah (1992, p. 10)

4.5 Organisational Culture in Malaysian Public and Private Universities

Developing the country's education system has been an important priority on the national agenda in Malaysia since the nation gained independence in 1957. The national education system was introduced when Malaysia gained independence from Britain in 1957 and was modelled on the English grammar school system of the British colonial era. However, in 1961 with the main goal of having national unity, the post-independence leaders had introduced the *Education Act 1961* which laid the foundations for the development of the education system (Zakaria 2000). From the *Education Act 1961* the then government took the first major initiative in establishing the first university in Malaysia known as University Malaya. With the expansion of higher education in Malaysia, there were about 130 public HEIs and 450 private sector-owned HEIs in 2011. Of the total number of public HEIs in Malaysia, 20 are public universities and 110 non-university institutions that include polytechnics and community colleges. However, the number of universities might increase in the near future in line with the initiative from the government to upgrade polytechnics and teachers institutions to the status of university (Ministry of Higher Education of Malaysia 2007).

Operations in universities have changed drastically. For example, increases in resource funding has led to faculty staff being pressurised to increase their productivity while maintaining the quality of their teaching and research output. Since Malaysian public universities are fully controlled and funded directly by the Federal Government (Hassan 2006), public universities may possess more resources for investment in ICT. Consistent with this, it has been found that some private universities face financial constraints and lack facilities and staff (Arokiasamy et al. 2009). This means that private universities may have limited resources and may be unable to invest heavily in ICT compared to public universities. However, Putih (2007) argues that even though public universities have more resources for investment in ICT, the lack of training among public universities staff, especially in technical skills, contributes to lesser technology usage in public universities.

In comparing public and private universities, Sampaio (1991) found that public and private universities are significantly different from each other in terms of their organisational processes. As discussed in the introduction chapter, Malaysian public and private universities have varying compositions of ethnic groups in which the public universities are predominantly Malay (Bumiputera) staff while the private universities have multiple races, consisting of Malay, Chinese, Indian and other minorities as well.

Besides the different racial composition between public and private universities staff, the difference in organisational culture in both public and private sectors has also been noted in Malaysian universities. Ahadi et al. (2011) note that while a hierarchical culture prevails in Malaysian organisations, observance of power distance is more marked among academicians in research universities (public universities). Ramachandran et al. (2011) also find that public universities in Malaysia display a higher hierarchy-based culture compared to private universities. On the other hand, private universities are viewed as individual institutions which conform to a market-based culture focusing on recruitment of students as well as other income-generating activities (Ramachandran et al. 2011). Therefore public universities are more inclined to process-oriented characteristic with many rules and procedures, while private universities are more results-oriented, creating an environment that advocates innovative methods for the organisation to survive and grow (Hofstede et al. 1990).

Wilkinson and Yussof (2005) suggest that adhocracy cultures are more prevalent in private universities than public universities, but Ramachandran et al. (2011) find the reverse. It has also been observed that there is a richer cultural setting in public HEIs, as many of their administrators and academics are transferred from other reputable public HEIs, which have their own organisational cultures in place. There is also a dominance of clan culture in public HEIs, indicating that academics in public HEIs cooperate to complete tasks such as consultation, administration and research. In addition, public HEIs are government organisations, therefore, loyalty/commitment to the respective HEIs is perceived as loyalty to the government (Ramachandran et

al. 2011, p. 627). According to Muda (2008) Malaysian public universities receive up to 90 per cent of their funding from the government and the remainder from student fees. Hassan (2006) also suggests that since Malaysian public universities are funded directly by the Federal Government, they are fully controlled by the government. Public universities are more prone to top-down policy implementation from the government, specifically MOHE. The Ministry of Higher Education of Malaysia (MOHE) under the MOHE Action Plan 2007-2010 states:

“Being owned and funded by the Government, public higher education institutions must ensure that their strategic objectives are in line with those of the Ministry”.

(Ministry of Higher Education of Malaysia 2007, p. 18).

This element is closely related to the job-oriented culture which follows a top-down decision-making process (Cabrera et al. 2001). However, private HEIs run independently with marginal interference from MOHE and usually conduct their own in-house training (Ramachandran et al. 2011, p. 626).

Hence, the abovementioned factors may be the reason for public HEIs having a more centralised system (Ramachandran et al. 2011). These factors of hierarchy-based culture, centralised and top-down decision-making in public universities also contribute to a more closed system where their processes are limited and bound by policies, rules and regulations from MOHE. In contrast, private universities are characterised by an open-system, which gives them more capacity to innovate and share experiences, without being strictly bound by government policies, rules and regulations.

Ramachandran et al. (2011, p. 616) believe that three main reasons can be used as a basis to support the need for studies on organisational culture in public and private HEIs. The first point is the fact that HEIs located globally have a crucial part in the growth of any country's workforce and the economy as a whole. The role of HEIs in Malaysia is no exception; this is the driving force behind transformation of Malaysian HEIs since 1996. During this period, private universities started to emerge

alongside public-owned tertiary institutions to provide more opportunities for Malaysians to pursue higher education locally. Secondly, organisational culture is a principal component of functional decision-making. The cultural issues present big challenges pertaining to change management; among them are in terms of adoption of innovation strategies. The third reason is that there are several significant organisational differences between the public and private sectors (Ramachandran et al. 2011). These three reasons, related to organisational culture in HEIs, identified by Ramachandran et al. (2011), support the focus of this study on differences in email usage between public and private universities based on organisational compatibility with innovation adoption.

Research done in Malaysia in the area of organisational culture in higher education institutions has found that improvement in innovation can be attributed to cultural values in universities. Practices that hamper creativity and innovativeness need to be stopped in order to ensure success in knowledge management (Altbach 2007; Asmawi & Mohan 2010). Ahadi et al. (2011) state that an effective university culture can be defined by the following components: teaches and displays acceptable behaviour, encourages individuals, and governs information processing; internal relations and values are moulded by these components. Therefore, it can be concluded that the values and practices in organisational culture play a major role in innovation and technology adoption, which may influence email usage in Malaysian universities.

4.6 Conclusion

This chapter has provided the contextual background to the study, outlining relevant information about Malaysia on the demographic factors of race, religion, age, location, organisation type and gender, which can influence the attitudes of staff towards email adoption. This was followed by a discussion of Malaysia's national culture in terms of the scores given to Malaysia on the different dimensions of Hofstede's framework of National Culture as well as the views of other researchers on Malaysia's cultural characteristic on those dimensions. After that, organisational

culture in Malaysian public and private universities was also discussed on basis of the four dimensions of organisational values and practices devised in Hofstede's theory of Organisational Culture as discussed earlier in Chapter 3. The next chapter will elaborate the methods used to collect data to test the study hypotheses and solve the research problem.

CHAPTER 5

RESEARCH METHODOLOGY

5.1 Introduction

Following the development of the hypotheses derived from the research model, this chapter will elaborate the methods used to collect data to test the hypotheses and solve the research problem. This chapter on research methodology is important for the overall study as it defines the manner in which the whole research process has been organised to achieve the objectives of the study and answer the research questions. This chapter first explains the broad approach of the research methodology, discussing the research paradigm and the quantitative method underpinning the study. It then discusses the development of the questionnaires, the survey instrument and the scales of measurement incorporated into them. The fieldwork was undertaken in two phases – the first phase involved a pilot study with 20 prospective respondents to rectify any loopholes in the survey questionnaires and test the reliability of all the measurement items; the next phase involved the actual data collection with a large sample of non-academic executives from Malaysian universities. The processes of identification, sampling of survey respondents and the procedure of distributing the questionnaires to the participants are explained in detail. This is followed by a discussion of the measures undertaken for data preparation to ensure the accuracy and quality of data. The chapter ends with the discussion of the statistical techniques used to test the hypotheses of the study.

5.2 Research Paradigm and Conceptual Framework

A research paradigm is a critical issue to be considered when planning and executing a study and scholars have defined its importance in different ways. Taking a holistic perspective, Creswell (2009, p. 3) defines a research paradigm as the “---plans and the procedures for research that span the decisions from broad assumptions to detailed methods of data collection and analysis”. On the other hand,

Deshpande (1983, p. 101) highlights the epistemological aspects of the research paradigm in academic disciplines and defines the concept of a research paradigm as “---a set of linked assumptions about the world which is shared by a community of scientists investigating the world”. Both these definitions emphasise that a research paradigm encompasses the basic intellectual framework as well as the logistics of data collection that provide the scaffolding for any research endeavour.

According to Guba (1990) there are four types of research paradigm, namely, positivism, post-positivism, critical theory and constructivism. This research can be categorised as belonging to the positivist paradigm in this typology. According to Kuhn (1996), the positivist approach is based on the assumption that there is a single existing reality which is objectively measurable, inherently understandable and outcome-oriented. Adopting a positivist paradigm entails translating an empirical situation into a clear framework of items for which quantifiable data can be gathered. This positivist paradigm has been criticised by Patomaki and Wight (2002) who argued that:

“---positivism is not only epistemologically ontologically flawed; it is also co-responsible for many of the social ills and political catastrophes of the modern world”.

(Patomaki and Wight 2002, p. 213).

However, positivism is useful and relevant as a paradigm for research fields that require quantifiable results. As a result, it is the dominant paradigm used by empirical studies in business and information systems research. This research also adopts a positivist paradigm as it considers email use among staff at Malaysian universities to be an existent social phenomenon that is measurable in terms of patterns and behaviours.

Drawing from this positivist paradigm, this research also adopts a quantitative approach for data collection and analysis. Although there are many approaches underlining the methodology for any research, Wibowo (2008) explains that most research methodologies can be categorised under qualitative and quantitative, which

are the two most dominant approaches. The quantitative method involves definition of the variables and design of suitable scales to measure the variables to test the hypotheses needed to analyse the research problem.

Using a quantitative approach, this research developed a framework of measurable questions, which could help determine the patterns of email usage among staff in Malaysian universities. Measurement involves operations carried out to determine the number of variables possessed by an object (Churchill 1979) and the relationship among variables (Creswell 2009). The framework was developed from constructs from national culture, organisational culture and the Technology Acceptance Model (TAM) with scales of measurement developed from precedents used and proven in previous studies. This section will discuss the questions developed for these three theories and their measurement of each construct on email usage.

5.2.1 National culture

For the framework of national culture, this thesis adopted a measurement scale developed by Erez and Earley (1987), Huang (2003), Al-Sukkar (2005), and Hofstede et al. (2008). The national culture framework consists of six dimensions. The six variables were further refined to developed question items for each variable. Table 5.1 below shows the six variables of national culture with the question items and sources under each variable in the survey instrument.

Table 5.1: National Culture Items

No	Constructs	Code	Statement
1.	Power distance (PD)	PD1	“Managers should be careful not to ask the opinions of subordinates too frequently, otherwise the manager might appear to be weak and incompetent” (Huang 2003, p. 115; Al-Sukkar 2005, p. 188).

No	Constructs	Code	Statement
		PD2	“Managers should make most decisions without consulting subordinates, because managers should look powerful and authoritative” (Huang 2003, p. 115).
		PD3	“Employees should not question their manager’s decisions” (Huang 2003, p. 115; Al-Sukkar 2005, p. 188).
		PD4	“Employees should not show their disagreement to their managers” (Huang 2003, p. 115).
		PD5	“Decision-making power should stay with top management in the organisation and not be delegated to lower-level employees” (Al-Sukkar 2005, p. 188).
2.	Collectivism (C)	C1	“Individual rewards are not as important as group welfare” (Huang 2003, p. 115; Al-Sukkar 2005, p. 188).
		C2	“Being accepted as a member of a group is more important than having autonomy and independence on the job” (Huang 2003, p. 115; Al-Sukkar 2005, p. 172).
		C3	“Group success is more important than individual success” (Huang 2003, p. 115; Al-Sukkar 2005, p. 188).
		C4	Working within a team is better than working alone (Erez & Earley 1987, p. 660).
		C5	“It is more important for a manager to encourage loyalty and a sense of duty in subordinates than it is to encourage individual initiative” (Huang 2003, p. 115; Al-Sukkar 2005, p. 172).
3.	Uncertainty avoidance (UA)	UA1	“It is important to have job requirements and instructions spelled out in detail so that people always know what they are expected to do” (Huang 2003, p. 116; Al-Sukkar 2005, p. 188).
		UA2	“People should avoid making changes because things could get worse” (Huang 2003, p. 116).

No	Constructs	Code	Statement
		UA3	“Rules and regulations are important because they inform workers what the organisation expects of them” (Huang 2003, p. 116; Al-Sukkar 2005, p. 188).
		UA4	“It is better to have a bad situation that [I] know about, than to have an uncertain situation that might be better” (Huang 2003, p. 116).
		UA5	“Working in a structured environment is better than working (rules and regulations) in an unstructured work environment” (Al-Sukkar 2005, p. 188).
4.	Masculinity (M)	M1	“It is more important for men to have a professional career than it is for women to have a professional career” (Huang 2003, p. 115; Al-Sukkar 2005, p. 172).
		M2	“It is preferable to have a man in a high-level position rather than a woman” (Huang 2003, p. 115; Al-Sukkar 2005, p. 188).
		M3	“Men usually solve problems with logical analysis; women usually solve problems with intuition” (Al-Sukkar 2005, p. 188).
		M4	“Solving organisational problems usually requires an active, forcible approach which is typical of men” (Al-Sukkar 2005, p. 188).
		M5	“Women do not value recognition and promotion in their work as much as men do” (Huang 2003, p. 115; Al-Sukkar 2005, p. 172).
		M6	“There are some jobs in which a man can always do better than a woman” (Huang 2003, p. 116; Al-Sukkar 2005, p. 172).
5.	Long-term orientation (LT)	LT1	“Respect for tradition hampers performance” (Al-Sukkar 2005, p. 188).
		LT2	“The exchange of favours and gifts is not necessary to excel” (Al-Sukkar 2005, p. 188).
		LT3	“Upholding one’s personal image makes little difference in goal achievement” (Al-Sukkar 2005, p. 188).

No	Constructs	Code	Statement
6.	Indulgence (I)	I1	It is important to keep time free for fun (Hofstede et al. 2008, p. 1).
		I2	It is important to have moderation: having few desires (Hofstede et al. 2008, p. 1).
		I3	I'm a happy person in the workplace (Hofstede et al. 2008, p. 2).
		I4	There are no other people or circumstances that ever prevent me from doing what I really want to do in the workplace (Hofstede et al. 2008, p. 2).

5.2.2 Organisational culture

For organisational culture, this thesis adopted a measurement scale developed on the basis of concepts of values and practices of organisational culture advanced by Hofstede et al. (1990). These items for measuring 'values' *"---describe what the respondent feels 'should be' [and] 'practices' [for] what she or he feels 'is'"* (Hofstede et al. 1990, p. 294). Value items can be measured as one factor while practice items are divided into three dimensions. Table 5.2 and Table 5.3 below show the items of organisational culture in the survey instrument.

Table 5.2: Organisational Culture (Values) Items

No	Construct	Code	Statement
1.	Need for security (NS)	NS1	"Having little tension and stress at work is important" (Hofstede et al. 1990, p. 300).
		NS2	"Employees are afraid to disagree with superiors" (Hofstede et al. 1990, p. 300).
		NS3	Being consulted by my boss is important (Hofstede et al. 1990, p. 300).
		NS4	Having a job you like is not more important than a career (Hofstede et al. 1990, p. 300).
		NS5	Most people can be trusted (Hofstede et al. 1990, p. 300).

Table 5.3: Organisational Culture (Practices) Items

No	Constructs	Code	Statement
1.	Results-oriented (RO)	RO1	People are comfortable in unfamiliar situations at my workplace (Hofstede et al. 1990, p. 303).
		RO2	Each day brings new challenges to employees at my workplace (Hofstede et al. 1990, p. 303).
		RO3	People put in maximal effort at my workplace (Hofstede et al. 1990, p. 303).
2.	Job-oriented (JO)	JO1	Important decisions are made by individuals at my workplace (Hofstede et al. 1990, p. 303).
		JO2	The organisation is interested only in the work of employees at my workplace (Hofstede et al. 1990, p. 303).
		JO3	There is little concern for personal problems of employees at my workplace (Hofstede et al. 1990, p. 303).
3.	Closed system (CS)	CS1	Only specific kinds of people fit in at my organisation (Hofstede et al. 1990, p. 303).
		CS2	The organisation and people are closed and secretive (Hofstede et al. 1990, p. 303).
		CS3	“New employees need more than a year to feel at home” (Hofstede et al. 1990, p. 303).

5.2.3 Technology acceptance model (TAM)

For TAM, this thesis adopted a measurement scale developed by Davis (1989, p. 324 & 340) and Davis et al. (1989) in their original model which has been used in most TAM studies (Alhujran 2009; Davis et al. 1989; Hung et al. 2010; Kripanont 2007; Ramayah & Aafaqi 2004; Teo et al. 2008). Finally, for measuring usage, the thesis used scales developed by Hart and Porter (2004, p. 50), which was also used by Hung (2011) along with one item of actual usage (email received and sent) gathered from the respondents of participating universities. Table 5.4 below shows the items of TAM under the three main variables of perceived usefulness, perceived ease of

use and (email) usage. For a comparison of the statements used in this research with those employed in the two major studies from which they were derived, see Table 5.5.

Table 5.4: TAM Items

No	Constructs	Code	Statement
1.	Perceived usefulness (PU)	PU1	Using email for work enables me to accomplish tasks more quickly (Davis 1989, p. 324 & 340).
		PU2	Using email for work improves my job performance (Davis 1989, p. 324 & 340).
		PU3	Using email for work increases my job productivity (Davis 1989, p. 324 & 340).
		PU4	Using email for work enhances my effectiveness (Davis 1989, p. 324 & 340).
		PU5	Email for work is useful in my job (Davis 1989, p. 324 & 340).
2.	Perceived ease of use (PEOU)	PEOU1	Learning how to use email is easy (Davis 1989, p. 324 & 340).
		PEOU2	My interaction with email is clear and understandable (Davis 1989, p. 324 & 340).
		PEOU3	I find email to be very flexible (Davis 1989, p. 324 & 340).
		PEOU4	I find it easy to get email to do the work I want it to do (Davis 1989, p. 324 & 340).
		PEOU5	Overall, I find that email is easy to use (Davis 1989, p. 324 & 340).
3.	Usage (U)	U1	Currently, I use email frequently at my workplace (Hart & Porter 2004, p. 50).
		U2	Currently, I use email more than any other communication channels (Hart & Porter 2004, p. 50).
		Actual Usage	The actual email usage (received and sent).

Table 5.5: Comparison of TAM Statements on Previous Studies

Constructs	This Study	Huang (2003) page 115	Davis (1989) page 324/340
Perceived usefulness (PU)	Using email for work enables me to accomplish tasks more quickly.	Huang (2003) does not use this item.	“Using in my job would enable me to accomplish tasks more quickly”.
	Using email for work improves my job performance.	“Using email improves my performance in my job”.	“Using would improves my job performance”.
	Using email for work increases my job productivity.	“Using email in my job increases my productivity”.	“Using in my job would increase my productivity”.
	Using email for work enhances my effectiveness.	“Using email enhances my effectiveness in my job”.	“Using would enhance my effectiveness on the job”.
	Email for work is useful in my job.	“I find email to be useful in my job”.	“I would find useful in my job”.
Perceived ease of use (PEOU)	Learning how to use email is easy.	Huang (2003) does not use this item.	“Learning to operate would be easy for me”.
	My interaction with email is clear and understandable.	“My interaction with email is clear and understandable”.	“My interaction with would clear and understandable”.
	I find email to be very flexible.	Huang (2003) does not use this item.	“I would find to be flexible to interact with”.
	I find it easy to get email to do the work I want it to do.	“I find it easy to get email to do the work I want it to do”.	“I find it easy to get electronic mail to do what I want it to do”/ “I would find it easy to get to do what I want it to do”.
	Overall, I find that email is easy to use.	“I find email to be easy to use”.	“I would find easy to use”/ “Overall, I find the electronic mail system easy to use”.

5.3 Quantitative Survey

This study found the survey method to be the most appropriate method for collecting data on the variables proposed in the conceptual framework. Babbie (2007) has stated that survey research is the ideal method available for conducting descriptive studies that have too large a population to be observed directly. Surveys are especially useful in deciding the actual values of variables being studied and the strength of relationships between the variables (Newsted et al. 1998). This is important as the present study aims to develop statistically measurable relationships between the variables to understand the holistic impact of the factors that contribute to email usage. Apart from its relevance to the specific needs of this study, the survey method has been proven to be the most useful method for research in the field of technology adoption. According to Fulk (1993), surveys can be employed to identify people and groups most in need of innovations and tap into prevailing attitudes towards a technology. Newsted et al. (1998) find that surveys are the most popular investigative method in the information systems research community. Overall, there are many features which make surveys the most preferable method for quantitative research. Newsted et al. (1998, p. 553) have listed a range of features to support this contention. According to them, surveys are not only easy to administer, they can be scored in a convenient manner. Surveys can be used to predict behaviour, or determine relations between variables. They provide responses that can be generalised to a similar population, and can be reused across groups for the same purpose. Finally, surveys are a useful research tool because they can empirically test theoretical propositions as well as quantify findings of qualitative research.

Over the years, various survey-based instruments have been developed for TAM and Organisational/National Culture research in the information technologies domain (Ebrahimi et al. 2010; Hung et al. 2010; McCoy et al. 2007; Parboteeah et al. 2005). There are, however, some critics who point out that surveys are not well-suited to the measurement of cultural differences (Harzing & Hofstede 1996). However, the large body of empirical research in the field provides testimony to the efficacy and applicability of Hofstede's method of using variables to represent dimensions of cultural orientation and collecting information through surveys to examine how these

dimensions affect people's behaviour and attitude. So, in spite of the critique of surveys as a method for measuring culture, the substantive results supporting the use of surveys, at least, in business and information systems research, supports this methodology. Encouraged by the relevance of the underlying framework and the rigour of the method, researchers across the world have applied Hofstede's survey questionnaire directly to target populations as well as to cross-cultural research (Søndergaard 1994). Even in the Malaysian context, most studies examining the role of culture in technology adoption have used questionnaire surveys, for example, Abdullah and Lim (2001), Lim (2001) and Ebrahimi et al. (2010).

McCoy et al. (2007) explain that while various methods, including in-depth interviews and intense observations of behaviours, can be used to investigate the applicability of TAM to culture or surveys, there is no existing research using interviews and observations, which validates the relevance of their results (McCoy et al. 2007). In contrast, there is extensive literature establishing the validity and reliability of surveys for technology acceptance, culture constructs and their interrelationship (McCoy et al. 2007). In fact, McCoy et al. assert that the survey method has been used as a core method for measuring both culture and technology acceptance constructs and their interrelationship. A meta-analysis by Taras et al. (2009) reviewing hundreds of studies in this field further supports this contention by showing that Hofstede's approach of survey questionnaires is almost the only way available to quantify culture.

This thesis used self-administered survey questionnaires for data collection. Neuman (1997) suggests that self-administered survey questionnaires are easy to administer, relatively cost-effective and enable collection of a wide variety of data. Self-administered surveys are an easy cost-effective method that allows the researcher to access a large number of respondents in a short time. According to Iriani (2006), the self-administered approach is appropriate in contexts where the respondents have a relatively high level of education and can understand the contents of the questionnaire. Iriani (2006, p. 85) argues that self-administered surveys are effective as 1) respondents have more confidence and freedom to express their opinions

compared to interrogative methods and 2) data can be collected from a relatively large number of respondents in a short period of time with minimal logistical problems. In light of these benefits, self-administered surveys were used in this study as the respondents also have a high level of education.

The researcher developed the survey questionnaire based on previous studies. This questionnaire comprises closed-ended questions. According to Sekaran (2003), open-ended questions allow respondents to answer them in any way they like, whereas closed-ended questions require respondents to select their answers from the choices given. Closed-ended questions were chosen in this survey because they help to simplify the data analysis process as the range of answers is limited (Collis & Hussey 2003) and the answers are easy to quantify (Wimmer & Dominick 1997). The questionnaire is divided into five sections as below:

- a) Section 1: Demographic information
- b) Section 2: Internet and email usage
- c) Section 3: Statements related to technology acceptance on email usage
- d) Section 4: Statements related to National Culture
- e) Section 5: Statements related to Organisational Culture.

This 5-point Likert scale was used for Section 3, 4 and 5, while a number of defined response choices were used for Sections 1 and 2. According to Sekaran (2003), Likert scales are the most frequently-used scales in information systems research. Malhotra and Peterson (2006) have pointed out that 5- and 7-point scales are the most frequently used Likert scales. Alhujran (2009) states that a 5-point scale makes it easier for participants to read through the complete list of descriptors (Agree, strongly agree, etc). Since the number of questions in the questionnaire of this study is quite high, using a standardised 5-point Likert scale would make it easier for participants to answer the questions (where 1 is 'strongly disagree' and 5 is 'strongly agree') and easier for the researcher to analyse the feedback.

5.4 Testing the Questionnaire

5.4.1 Pilot study

A pilot study can be used as a trial run for particular aspects of a research project and help in enhancing the quality of methodology. A pilot study is usually less structured and uses a large number of open-ended questions to test the research instrument on a smaller sample size. It can help to identify difficulties encountered by respondents in understanding the questionnaire, detect any vague or biased questions and rectify any issues in the questionnaire prior to actual data collection from the intended population sample (Sekaran 2003). A pilot study also helps to test the compatibility of the language of the questionnaire with the respondents. Sekaran (2003) has emphasised the importance of careful wording of the questionnaire and ensuring that it suits the level of understanding of the respondents taking into account their education level, the usage of idioms in the culture, and frames of references of the participants. According to Teijlingen and Hundley (2001), the main benefits of carrying out a pilot study are as follows:

- a) The pilot study may alert the researcher to areas that can cause potential failure of the research project.
- b) It indicates whether the suggested instruments and methods are too complex or unsuitable.
- c) It might highlight areas where research protocols may not be followed.

Sudman (1983) proposes that the appropriate sample size for a pilot test must range from 20 to 50 respondents to provide trustworthy and adequate data and reveal any large errors in the prepared questionnaire. However, Sheatsley (1983 p. 226) suggests a smaller sample size for pilot research, arguing that, *“It usually takes no more than 12–25 cases to reveal the major difficulties and weaknesses in a test questionnaire”*. In the pilot study for this research, the number was kept at 20 participants, a median number between the two suggestions. The 20 pilot participants were randomly selected from the sample that would be used in the

actual survey to ensure the transparency and suitability of the items in the instruments for the intended population.

The pilot study was conducted informally and a number of steps were taken by researcher before handing over the questionnaires. First, the researcher explained the aims of the research and the objectives for conducting the pilot study. The researcher then explained that all information provided in the questionnaire would be treated as private and confidential. Once the respondents were satisfied with the explanation and agreed to participate in the study by signing the consent form, questionnaires were handed over to them. The pilot study found that the language of the questionnaire and time constraints in answering the questions were significant impediments to its successful completion. Therefore, it was decided that the questionnaire needed to be translated into the Malay language and the Likert scale needed to be reduced from 7 to 5. More details of action taken as a result of the pilot study are detailed below:

5.4.2 Translating the questionnaire

The time taken by each respondent to complete the questionnaire in the pilot study was around 35 minutes, which is slightly above a reasonable length of time. One of the reasons behind this was the large number of questions as well as the language used in the questionnaire as respondents, especially from public universities, took longer to answer the questionnaires in English. The respondents in public universities preferred questionnaires in Malay, while all the respondents in the private universities preferred the survey in English. The medium of communication and writing in public universities is Malay whereas most private universities use English. Although the participants from public universities have enough understanding of written English to complete the questionnaire, it was translated into Malay for their convenience. The following procedures were followed to ensure the accuracy of translation:

- a) The questionnaire as well as the information manual and consent form for participants (**Appendix B, D and F**) were translated by the researcher using dictionaries and other online translation software.

- b) The translated questionnaire and other forms were sent to translation experts to check for any discrepancies and make any necessary improvements.
- c) After completing the translation and checking with the experts, the documents were sent to a recognised translation body in Malaysia called the Malaysian National Institute of Translation for certification. The Malaysian National Institute of Translation certified the accuracy of translation by stamping its approval.

5.4.3 Reliability test

Upon completion of the pilot survey, it is crucial to check whether the survey provides reliable data. According to Hair et al. (2006), measurement errors refer to:

“---inaccuracies of measuring the “true” variable values due to the fallibility of the measurement instrument (i.e., inappropriate response scales), data entry errors, or respondent errors”.

(Hair et al. 2006, p. 2).

Some data entry errors can occur due to inaccuracies in the measurement instrument (e.g. using 7-point rating scales for attitude measurement even when the researcher is aware that respondents can only provide accurate answers using a 3-point rating). Mistakes can also occur due to inaccurate information given by respondents (e.g. responses to household income may be reasonably accurate but are rarely precise) (Hair et al. 2010).

Measurement errors can affect correlations or means, causing them to decrease in significance and accuracy. There are vital tests needed to avoid measurement errors especially that of reliability, as checking the reliability of data helps to prevent any uncertainties in subsequent analyses, determine the goodness of measure and indicate accuracy in the measurement (Sekaran 2003). Even though the questionnaire was adopted from established research, a reliability check is important because instruments developed or validated in previous research do not necessarily assure satisfactory reliability when applied in other studies (Chau & Hu 2002).

A reliability test was employed for testing the pilot and actual data obtained from the questionnaires to identify the consistency of respondents' answers to all the questions in the study and measure the concepts in terms of their relationship with one another. Cronbach's alpha was used to evaluate the reliability of questions for each variable. Nunnally (1978) specifies a value of Cronbach's alpha above 0.70 as indicative of reliability. The strength of reliability was measured according to guidelines given by Hair et al. (2006) and the details of *Rule of Thumb* for Cronbach's Alpha are as below:

Table 5.6: Cronbach's Alpha Value

Alpha	Strength
<0.6	Weak (Not Acceptable)
0.6 - <0.7	Moderate
0.7 - <0.8	Good
0.8 - <0.9	Very Good
0.9 and above	Excellent

Source: Reproduced from Hair et al. (2007)

In this research, the reliability test focuses on important variables that use Likert scale points in sections 3, 4 and 5 of the questionnaire. The results of the reliability test for each section suggested that the range of the reliability is between 0.725 and 0.971. As Cronbach's alpha value for all constructs is more than 0.70, all the constructs can be accepted as being reliable.

In conclusion, compatibility of the language in the questionnaire was improved and the key variables in this research using the Likert scale have met the reliability assumptions. Hence, it can be deduced that the questionnaire employed in this research has met the criteria of the understandability and reliability needed for any research instrument. No amendments to the instrument were necessary before proceeding to actual data collection.

5.5 Data Collection

This section explains the procedure undertaken for conducting the final survey, including the selection of the sample, the survey date and time for data collection. The questionnaire was attached with a letter of introduction and explanation of the research with a self-addressed, stamped envelope for participants to return the completed questionnaire.

5.5.1 Survey sample

Appropriate respondents for a study can be selected after considering two issues – population and sample. Sekaran (2001, p. 225) defined population as “---the entire group of people, events, or things of interest that the researcher wishes to investigate”. While a sample can be defined as “---a subset of a population and should represent the main interest of the study” (Collis & Hussey 2003, p. 56). The target population of this study comprises non-academic executives (specifically, administrative staff members) from universities in Malaysia. The sample for this study was taken from universities with more than 200 employees in all and 50 or more personnel at the managerial level to ensure that sufficient numbers of potential respondents were available at the location.

According to Kumar (2011), sampling in quantitative research can use random/probability sampling designs or non-random/non-probability sampling designs. As non-random sampling selects a predetermined sample size, random probability sampling was used as the study required as many respondents as could be generated from the list of names of staff for each university. There are four commonly used types of random/probability sampling design, namely, a) simple random sampling, b) systematic sampling, c) stratified random sampling and d) cluster sampling (Zikmund & Babin 2010, p. 322). While for non-probability, one of the sampling design often use is convenience sampling (Salkind 2010). “Convenience sampling involves drawing samples that are both easily accessible and willing to participate in a study” (Teddle & Yu 2007, p. 78). Convenience sampling divided into two namely captive and volunteer sample. The benefit of using

convenience sampling is the samples are easy to get at a lower budget. Unfortunately, the results from convenience sampling do not represent the general population (Salkind 2010). This study use random sampling rather than convenience sampling since it has established a sampling frame and to avoid selection bias and over sampled of staff from one particular public or private universities. Therefore, the result may later represent the population it caters.

Kumar (2011) explains that the cluster sampling technique is suitable when there is a large population. The researcher can divide the sampling population into groups (based on visible or easily identifiable characteristics) to include geographical proximity or common characteristics that have a correlation with the main variables of the study. Cluster sampling in this study involved dividing the target group into public and private universities from metropolitan and non-metropolitan locations. After that, a simple random sampling method was used to identify individual respondents randomly drawn from the list of staff employed at those universities.

In all, eight universities – four public (two metropolitan and two non-metropolitan) and four private (two metropolitan and two non-metropolitan) – were selected, given that a key aim of the study is to compare and contrast these two organisational categories and locations. One hundred non-academic executives from each university were targeted, making a total sample of 800 subjects. Since public universities are dominated by Malays and private universities have a mix of people belonging to different ethnicities, the use of public and private universities also ensured that the study took account of the factors of race and religion. It can be asserted that the population sample was representative of the general population in terms of race, religious, age and gender. To ensure consistency in the selection, this study excluded private university colleges and focused only on private universities with similar organisational capacities (infrastructure and ICT facilities) to those of public universities.

5.5.2 Approval, consent and process of data collection

Since this study involves research and interaction with people, an ethics approval for the study was obtained from the Human Research Ethics Committee, Victoria University, prior to data collection. This study was also granted a notification letter of approval from the Ministry of Higher Education Malaysia (**Appendix G**). After acquiring the requisite approvals, the researcher went to the site of research and met with the university management to explain the purpose and procedure of research. The management at participating universities approved the survey and asked members of their non-academic staff to participate in the study. Willing participants were sent the information sheet (**Appendix A**) and consent form (**Appendix C**) before the study. On obtaining their consent, the questionnaire (**Appendix E**), in both hardcopy and softcopy, was sent to the university management representative for distribution among participants. Participants were asked to return the completed questionnaire in a specified time-period, by post in the stamped envelope provided by the researcher, or send it through the university representative. Those using the softcopy version of the questionnaire were asked to send it directly to the researcher's email.

5.5.3 Response rate

Finally, 800 questionnaires were distributed at the universities selected for this study and 402 questionnaires were received, which means that the return rate was 50.25 per cent. The 402 questionnaires received could be categorised as follows:

- a) Public and private universities
 - i) Public universities – 217 (54 per cent)
 - ii) Private universities – 185 (46 per cent)

- b) Metropolitan and non-metropolitan universities
 - i) Metropolitan universities – [public universities – 113 (28.1 per cent), private universities – 99 (24.6 per cent)] and total 212 (52.7 per cent).
 - ii) Non-Metropolitan Universities – [Public Universities - 104 (25.9 per cent), Private Universities – 86 (21.4 per cent)] and total 190 (47.3 per cent).

5.6 Data Preparation

Following the completion of data collection, several procedures need to be followed to check the quality of data before data analysis can be carried out. Data quality must be checked for correctness, coherence and reliability. This process of data preparation before commencing data entry encompasses data coding, data cleaning, measurement of errors, detecting missing values and treating them (Fink 2006). The following sections outline the procedures undertaken in this process of data preparation.

5.6.1 Data coding

Briefly, coding refers to the process of condensing wordy question responses and information into short and specific categories. It is necessary to code the collected data transcribed from the questionnaire to facilitate data analysis (Kerlinger & Lee 2000). In this study, symbols were used to code the data collected from the respondents and clearly indicate the category or theme relating to the data, such as age, gender, type of university, national culture and organisational culture.

5.6.2 Initial data screening and statistical overview

The next stage after the coding process involved keying in the data to Statistical Package for the Social Sciences (SPSS) and Excel. Editing of the data was necessary to ensure that it was complete and data entry was error-free. Several statistical measures were used to process the data including mean, standard deviation, percentages, minimum and maximum values and correlations (Ferrer 2010). In addition, the statistical methods of Pearson correlation and Cronbach's alpha were used. Pearson's correlation is used to gauge the correlational measure or the magnitude and direction of correlation relationship between two variables, where 0 means no relationship and 1 (+ or -) shows maximum strength in relationship (Ferrer 2010). A correlation of $r=0.5$ is deemed suitable; however, if the value reaches 0.8 or greater, it indicates that the measures are not measuring something significantly different. As previously noted, Cronbach's alpha is a test of the inter-item consistency within a chosen measure (Babbie 2005). A value of Cronbach's alpha above 0.70 has been deemed reliable by Nunnally (1978).

5.6.3 Missing data

Although the questionnaires used in this research have been filtered and only complete and usable questionnaires were included in the data file, some missing data values can still exist in the file. According to Hair et al. (2006), missing data can occur due to data entry or data collection error by the researcher, or the respondents' refusal to answer specific sections of the questionnaire. Moreover, Aryani (2009) emphasises that missing data in multi-variate analysis can also impact the generalisability of the results.

According to Hair et al. (2006), there are two categories of missing data, one is ignorable and the other is not ignorable. Missing data can be ignored if it is a natural characteristic in the method used (Schafer 1997). However, Arbuckle (2005) states that when using Structural Equation Modelling (SEM) with 'Analysis of Moment Structure' (AMOS) to fit the saturated and independence models on top of the research model, any missing values will cause problems and necessitate a lot of computation to fit the models together. Since AMOS is used for this study, the missing data could not be ignored and that issue needed to be resolved before SEM analysis was conducted.

Kripanont (2007) suggests that four techniques specially designed for missing data analysis in SPSS are available for diagnosing the randomness of missing data; they are Listwise, Pairwise, Expectation Maximisation (EM) and Regression. The EM method is suitable for treating missing data in this study as it is compatible with SPSS. Ferrer (2010) also argues that the EM Method is better than Listwise and Pairwise deletion because unlike Listwise and Pairwise techniques, the EM Method will not result in biased parameter estimates and inflated Chi-square values. Moreover, the EM method was most appropriate for this study as the missing data amounted to less than 5 per cent and did not display any particular pattern (Ferrer 2010).

5.6.4 Multi-variate measure

The next course of action was to test whether the data complies with the underlying statistical assumptions of the multi-variate methods. This process deals with the fundamentals of the methods in making statistical inferences and generating results. Hair et al. (2006) believe that data has to fulfil the statistical assumptions for an analysis to be successful. Certain methods with conceptual strength are not really influenced even though they go against particular assumptions. Nevertheless, it is necessary for all methods to comply with some of the assumptions as this is critical for explaining an effective analysis (Hair et al. 2006). In this research, the data was tested to determine if they were normally distributed and fulfilled the parametric assumptions.

5.6.5 Multi-variate outliers

After rectifying the loophole of missing data, the next step was to identify multi-variate outliers. Hair et al. (2006) define outliers as extreme observation values that differ significantly from other observations. According to Hair et al. (2006) outliers can either be treated as problematic outliers that do not represent the group, or beneficial outliers that indicate a population characteristic which in typical analysis sequence will not be identified. An outlier should not be classified as beneficial or problematic but must instead be observed based on the framework of the analysis and assessed according to the kinds of information available (Hair et al. 2006). Outliers are usually retained unless they are proved to be abnormal, or not representative of any observation in the population (Hair et al. 2006). Deletion of outliers is a double-edged sword as this may improve the process of multi-variate analysis but decrease the generalisability of the data (Aryani 2009). Hence, where possible, outliers in the data were retained in this study.

It is not always easy to spot multi-variate outliers. This is because extreme scores of two or more variables may be present, or there may be an anomaly in the pattern of scores (Kline 2005). In this case, Mahalanobis distance needs to be calculated which estimates the distance of a specific case from centroid or the median aggregate point of all the variables' means (Tabachnick & Fidell 2001). Based on the Mahalanobis d-

squared statistic computed by AMOS, this study explored multi-variables to spot the extreme values from the centroid.

5.6.6 Multi-variate normality

Aryani (2009) states that normality reflects the extent to which the values for all the measures are relatively evenly spread across the sample and is reflected in the distribution of information across the sample. Statistical tests that are carried out on non-normal data may be invalid and questionable (Kerlinger & Lee 2000). Two dimensions to evaluate the degree of non-normality are: 1) the shape of the distribution and 2) the sample size (Hair et al. 2006). Gravetter and Wallnau (2004, p. 48) state that the normal distribution is characterised by a “---symmetrical, bell shaped curve which has the greatest frequency of scores in the middle with smaller frequencies towards the extremes”. A bell-curve shape in the distribution implies normal distribution and a small sample size usually results in greater non-normality. While the sample size cannot be modified, the bell-curve test is useful in identifying whether a data set is well-modelled.

Many methods are available to assess the normality of data, including histograms, stem-and-leaf plots and boxplots, normal probability plots, detrended normal plots and kurtosis and skewness tests. The normality of data in this study was assessed by examining skewness and kurtosis values. Following the suggestion of Hair et al. (2006), skewness and kurtosis values were used as a mean for univariate normality assessment, whereas Mardia's multi-variate kurtosis coefficient was employed in evaluation of multi-variate normality. “*Skewness provide information on the symmetry of the distribution*”, while “*kurtosis provides information on the 'peakedness' of the distribution*” (Pallant 2005, p. 51). According to Kline's (2005) guidelines, severe non-normality is reflected when skewness > 3; kurtosis > 10. On the other hand, Bollen (1989) mentioned that Mardia's multi-variate kurtosis must be greater than $p(p + 2)$ to indicate violation of multivariate normality (p = number of observed variables). This thesis first analysed the normality within each items (univariate) and subsequently analysed Mardia's multi-variate kurtosis. The Bollen-

Stine bootstrap technique can be used to obtain the p-value required for the research in situations of non-normality (Bollen & Stine 1992).

5.6.7 Multi-collinearity

According to Hair et al. (2006), multi-collinearity exists when there is high correlation between dependent variables, or more than one variable measures the same value. Collinearity can be detected by correlation of variables used from a tolerance and variance inflation factors (VIF) test (Hair et al. 2006, p. 230). According to Pallant (2005), multi-collinearity exists when a dependent variable is highly correlated with other variables with a coefficient of 0.80 or 0.90. Belsey et al. (1980) suggest that VIF value should not exceed 10 to ensure non-collinearity. Finally, tolerance value should not be less than 0.1 and if the tolerance value is less than 0.1 there is a problem of multi-collinearity (Clark-Carter 2009).

5.7 Data Analysis and Statistical Techniques

Data analysis involves classification and organisation of the collected data into groups. This step is carried out to identify whether the information in hand is able to provide a solution to the problem of the study. SPSS, AMOS and Microsoft Excel software were used for analysing the data in this study. The analysis included Confirmatory Factor Analysis (CFA), SEM and the assessment of Goodness of Fit. The various steps of statistical analysis conducted in this study are explained below in detail.

5.7.1 Confirmatory Factor Analysis (CFA)

Confirmatory Factor Analysis (CFA) is a confirmatory technique for testing “---the theoretical relationships among the observed and unobserved variables” (Schreiber et al. 2006, p. 323). As Suhr (2006, p. 1) explains, CFA permits the researcher to test whether there is a relationship between the observed variables and their underlying latent construct(s). Lu et al. (2007, p. 858) suggest that CFA is able to assist a researcher to identify 1) pairs of common factors that are correlated, 2) the effect of common factors on observed variables, 3) the effect of an error term factor on observed variables, and 4) pairs of error terms that are correlated. Following Hair

et al. (2006), most of these indicators given below are also used in this study in the measurement model.

- a) The chi-square (χ^2)
- b) One incremental fit index (i.e. CFI or TLI)
- c) One absolute fit index (i.e. GFI, RMSEA or SRMR)
- d) One goodness-of-fit index (GFI, CFI, TLI, etc)
- e) One badness-of-fit (RMSEA, SRMR, RMR, etc)

5.7.2 Structural Equation Modelling (SEM)

Structural Equation Modelling (SEM) has become popular among researchers across disciplines, especially social sciences (Hooper et al. 2008, p. 53). SEM has been explained as a mixture of exploratory factor analysis and multiple regression (Ullman 2001). Similarly, Hair et al. (2006) define SEM as a multi-variate technique which elaborates the relationship among variables using multi-variate regression and factor analysis. Hair et al. (2006, p. 635) also explain that SEM has three characteristics:

- a) It estimates multiple and interrelated dependence relationships.
- b) It can represent unobserved concepts in these relationships and account for measurement error in the estimation process.
- c) It defines a model to explain the entire set of relationships.

According to Tomarken and Waller (2005), SEM's strength lies in its:

“---ability to specify latent variable models that provide separate estimates of relations among latent constructs and their manifest indicators (the measurement model”.

(Tomarken and Waller 2005, p. 34).

It can also illustrate the relations between constructs (the structural model). SEM also utilises the AMOS software package, which possesses a unique graphical interface, specially designed to facilitate fitting of SEM, to measure the variations between observed and latent variances, which can be used to test research hypotheses.

The following table shows the list of hypotheses in this study and the type of analysis used for each:

Table 5.7: Hypothesis testing and type of analysis

Hypotheses	Type of Analysis
H1a: Power distance (PD) has a significant negative relationship with perceived usefulness (PU) on email usage in Malaysian universities.	SEM
H1b: Uncertainty avoidance (UA) has a significant negative relationship with perceived usefulness (PU) on email usage in Malaysian universities.	SEM
H1c: Collectivism (C) has a significant negative relationship with perceived usefulness (PU) on email usage in Malaysian universities.	SEM
H1d: Masculinity (M) has a significant negative relationship with perceived usefulness (PU) on email usage in Malaysian universities.	SEM
H1e: Long-term orientation (LT) has a significant positive relationship with perceived usefulness (PU) on email usage in Malaysian universities.	SEM
H1f: Indulgence (I) has a significant positive relationship with perceived usefulness (PU) on email usage in Malaysian universities.	SEM
H2a: Power distance (PD) has a significant negative relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.	SEM
H2b: Uncertainty avoidance (UA) has a significant negative relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.	SEM
H2c: Collectivism (C) has a significant negative relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.	SEM
H2d: Masculinity (M) has a significant negative relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.	SEM

Hypotheses	Type of Analysis
H2e: Long-term orientation (LT) has a significant positive relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.	SEM
H2f: Indulgence (I) has a significant positive relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.	SEM
H3a: Need for security (NS) has a significant negative relationship with perceived usefulness (PU) on email usage in Malaysian universities.	SEM
H3b: Results-oriented (RO) has a significant positive relationship with perceived usefulness (PU) on email usage in Malaysian universities.	SEM
H3c: Job-oriented (JO) has a significant negative relationship with perceived usefulness (PU) on email usage in Malaysian universities.	SEM
H3d: Closed system (CS) has a significant negative relationship with perceived usefulness (PU) on email usage in Malaysian universities.	SEM
H4a: Need for security (NS) has a significant negative relationship with Perceived Ease of Use (PEOU) on email usage in Malaysian universities.	SEM
H4b: Results-oriented (RO) has a significant positive relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.	SEM
H4c: Job-oriented (JO) has a significant negative relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.	SEM
H4d: Closed system (CS) has a significant negative relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.	SEM
H5a: Perceived ease of use (PEOU) has a significant positive relationship with perceived usefulness (PU) on email usage in Malaysian universities.	SEM
H5b: Perceived ease of use (PEOU) has a significant positive relationship with email usage (U) in Malaysian universities.	SEM

Hypotheses	Type of Analysis
H5c: Perceived usefulness (PU) has a significant positive relationship with email usage (U) in Malaysian universities.	SEM
H6a: Organisation type (public or private) has a significant relationship with email usage in Malaysian universities.	T-test/Mann Whitney U
H6b: Race has a significant relationship with email usage in Malaysian universities.	ANOVA/ Kruskal Wallis
H6c: Religion has a significant relationship with email usage in Malaysian universities.	ANOVA/ Kruskal Wallis
H6d: Age has a significant relationship with email usage in Malaysian universities.	ANOVA/ Kruskal Wallis
H6e: Gender has a significant relationship with email usage in Malaysian universities.	T-test/Mann Whitney U
H6f: Location has a significant relationship with email usage in Malaysian universities.	T-test/Mann Whitney U
H7a: Perceived usefulness (PU) mediates the relationship between power distance (PD) and email usage (U).	SEM/Phantom Model
H7b: Perceived usefulness (PU) mediates the relationship between uncertainty avoidance (UA) and email usage (U).	SEM/Phantom Model
H7c: Perceived usefulness (PU) mediates the relationship between collectivism (C) and email usage (U).	SEM/Phantom Model
H7d: Perceived usefulness (PU) mediates the relationship between masculinity (M) and email usage (U).	SEM/Phantom Model
H7e: Perceived usefulness (PU) mediates the relationship between long- term orientation (LT) and email usage (U).	SEM/Phantom Model
H7f: Perceived usefulness (PU) mediates the relationship between indulgence (I) and email usage (U).	SEM/Phantom Model

Hypotheses	Type of Analysis
H7g: Perceived usefulness (PU) mediates the relationship between need for security (NS) and email usage (U).	SEM/Phantom Model
H7h: Perceived usefulness (PU) mediates the relationship between results-oriented (RO) and email usage (U).	SEM/Phantom Model
H7i: Perceived usefulness (PU) mediates the relationship between job-oriented (JO) and email usage (U).	SEM/Phantom Model
H7j: Perceived usefulness (PU) mediates the relationship between closed system (CS) and email usage (U).	SEM/Phantom Model
H8a: Perceived ease of use (PEOU) mediates the relationship between power distance (PD) and email usage (U).	SEM/Phantom Model
H8b: Perceived ease of use (PEOU) mediates the relationship between uncertainty avoidance (UA) and email usage (U).	SEM/Phantom Model
H8c: Perceived ease of use (PEOU) mediates the relationship between collectivism (C) and email usage (U).	SEM/Phantom Model
H8d: Perceived ease of use (PEOU) mediates the relationship between masculinity (M) and email usage (U).	SEM/Phantom Model
H8e: Perceived ease of use (PEOU) mediates the relationship between long- term orientation (LT) and email usage (U).	SEM/Phantom Model
H8f: Perceived ease of use (PEOU) mediates the relationship between indulgence (I) and email usage (U).	SEM/Phantom Model
H8g: Perceived ease of use (PEOU) mediates the relationship between need for security (NS) and email usage (U).	SEM/Phantom Model
H8h: Perceived ease of use (PEOU) mediates the relationship between results-oriented (RO) and email usage (U).	SEM/Phantom Model
H8i: Perceived ease of use (PEOU) mediates the relationship between job-oriented (JO) and email usage (U).	SEM/Phantom Model

Hypotheses	Type of Analysis
H8j: Perceived ease of use (PEOU) mediates the relationship between closed system (CS) and email usage (U).	SEM/Phantom Model

All of the hypotheses under H1 to H5 are analysed using Factor Analysis and SEM as these hypotheses posit predictive relationships between variables. On the other hand H6, being concerned with the influence of demographic factors, is exploratory in nature and does not predict the nature of relationships. For H6, the study uses ANOVA (Analysis of Variance) (or Kruskal Wallis) analysis and independent T-test (or Mann Whitney U) depending on the number of categories under each demographic variable. The T-test is used to compare the values of the means from two samples (Field 2009) and is used here for demographic variables of gender (male/female), location (metropolitan/non-metropolitan) and organisation type (public/private), which are all made up of two categories. ANOVA is similar to the two-sample T-test, but it compares means across more than two groups, so it is used for the demographic variables of race, religion and age which are all made up of more than two categories (Patel 2009). However, it is important to note here that ANOVA and the independent T-test depend greatly on the normality of data, and if a study somehow finds some evidence of non-normality in the variable/s to be examined, a non-parametric test (Mann-Whitney U or Kruskal Wallis) must be used instead.

Finally, for testing H7 and H8 to capture the specific indirect effect of mediators (PEOU and PU), this study employed the phantom approach (part of SEM) developed by Macho and Ledermann (2011). This approach only involves latent variables, which will eventually force AMOS to compute the mediation effect of PU and PEOU independently through the mean of bootstrapping. For all these tests, the *P*-value should be less than or equal to 0.05 for the hypothesis to be accepted (Hair et al. 2006).

5.7.3 Assessing Goodness of Fit

The process of determining the model that best represents the data in cohesion with its underlying theory is known as assessing model fit (Hooper et al. 2008). Hair et al. (2006, p. 489) argue that SEM has no single statistical test to describe the predictive strength of a model and in a later study Hair et al. (2010) suggest that multiple fit indices should be assessed prior to concluding a model's goodness-of-fit. But with the variety of fit indices and debates about the cut-offs for various indices, researchers can often be overwhelmed by all the conflicting information (Hooper et al. 2008, p. 53). There are no index indicators that are considered compulsory and even the numbers of indicators used also varies from researcher to researcher. For example, Kline (1998) suggests the use of at least four indicators, while Jaccard and Wan (1996) suggest reporting a minimum of three indicators. This thesis followed Hair et al. (2006) who suggest reporting on the three categories of fit indices; namely absolute, incremental and parsimonious. The model fit indicators reported in this thesis are 1) Chi-Square (χ^2), 2) Normed chi-square the ratio of the (χ^2) to its degree of freedom (df), 3) Root Mean Square Error of Approximation (RMSEA), 4) Tucker-Lewis index (TLI), 5) Comparative Fit Index (CFI) and 6) Root Mean square Residual (RMR). The detailed explanation of each indicator is given below:

Chi-Square (χ^2) – Chi-Square value “*assesses the magnitude of discrepancy between the sample and fitted covariance's matrices*” (Hu & Bentler 1999, p. 2). According to Jöreskog & Sörbom (1993), the Chi-Square value represents the discrepancy between the unrestricted and restricted covariance matrix. A low Chi-Square value, indicating non-significance, would point to a good fit. Chi-Square has a weakness in that it is highly sensitive to sample size, especially when the observations are greater than 200 (Hoe 2008, p. 78). Therefore, this thesis will also report an alternate evaluation to the Chi-Square (χ^2) statistic, which is known as the normed Chi-Square.

Normed Chi-Square – Normed chi-square is an alternate evaluation of the χ^2 statistic which minimises the impact of sample size on the Model Chi-Square (Hooper et al. 2008, p. 54). A small value of χ^2 , relative to its degree of freedom, is

indicative of a good fit (Hoe 2008, p. 78), however, there is disagreement among scholars as to the best value of Normed Chi-Square. Wheaton et al. (1977) suggested that a value between 2 to 5 is reasonable, while Kline (1998) suggested that a value of 3 or less for the χ^2/df ratio is a reasonably good indicator of model fit and Carmines and McIver (1981) argue that a χ^2/df ratio between 1 to 3 is indicative of a good fit. This thesis followed the guideline given by Carmines and McIver (1981) which requires Normed Chi-Square to be between 1 to 3.

Root Mean Square Error of Approximation (RMSEA) – Root Mean Square Error of Approximation (RMSEA) approximates “---the difference between the sample data and the expected outcome if the model was assumed to be correct” (Wee 2010, p. 96). Hooper et al. (2008, p. 54) suggest that RMSEA favours parsimony and chooses the model with the least number of parameters. However, MacCallum et al. (1996) argue that the value for RMSEA should be less than 0.08 and one above 0.10 indicates poor fit, while Browne and Cudeck (1993) state that a value of less than 0.05 indicates a satisfactory fit.

Tucker-Lewis index (TLI) – The Tucker-Lewis index (TLI), also known as non-normed fit index (NNFI), is meant to compare:

“---a proposed model’s fit to a nested baseline or null model. Additionally, [TLI also] measures parsimony by assessing the degrees of freedom from the proposed model to the degrees of freedom of the null model. [TLI] also seems resilient against variations in sample size and thus is highly recommended”.

(Hoe 2008, p. 77).

An acceptable threshold for this index is estimated to be 0.90 or greater (Hoe 2008, p. 77). While a value close to 0.95 indicates superior fit (Hu & Bentler 1999).

Comparative Fit Index (CFI) – Comparative Fit Index (CFI) is one of the indicators categorised under Incremental fit index. It was introduced by Bentler (1990). Hopper et al. (2008) argued that:

“this statistic assumes that all latent variables are uncorrelated (null/independence model) and compares the sample covariance matrix with this null model”.

(Hooper et al. 2008, p. 55).

According to Fan et al. (1999), CFI indicators are less affected by the sample size and with this advantage CFI has become one of the most commonly used fit indices in SEM. “---Values for this statistic range between 0.0 and 1.0 with values closer to 1.0 indicating good fit” (Hooper et al. 2008, p. 55). Hooper et al. (2008) specify a cut-off criterion of $CFI \geq 0.90$ for good-fit and Hu & Bentler (1999) argue that a value close to 0.95 indicates superior fit.

Root Mean Square Residual (RMR) – According to Brown (2006, p. 82), root mean squared residual (RMR) reflects the average discrepancy between observed and predicted covariances. Hair et al. (2006) suggest that RMR value should be less than 0.08, while Brown (2006) and Wu (2009) suggest that RMR less than 0.05 would signifies reasonable model fit.

The table below summarises the model fit indicators used in this study:

Table 5.8: Summarises of the model fit indicators

Type	Determiner	Symbol	Specification
Absolute fit index	Chi-Square	χ^2	A non-significant Chi-square test provides support for the model
Absolute fit index	Normed Cmin	Cmin/df	$1.0 \text{ cmin/df} < 3.0$
Absolute fit index	Root Mean Square Error of Approximation	RMSEA	RMSEA < 0.08 means acceptable RMSEA < 0.05 satisfactory fit

Type	Determiner	Symbol	Specification
Incremental fit index	Tucker-Lewis Index	TLI	TLI ≥ 0.9 means well fitting TLI close to 0.95 indicates superior fit
Incremental fit index	Comparative Fit Index	CFI	CFI ≥ 0.9 means satisfactory fit CFI close to 0.95 indicates superior fit
Badness of fit index	Root Mean Square Residual	RMR	RMR < 0.08 means acceptable RMR < 0.05 satisfactory fit

Sources: Reproduced from Hair et al. (2006), Arbuckle (2003), Byrne (2001), Kline (1998), Bentler and Bonett (1980), Carmines and McIver (1981), Doll et al. (1994) and Bentler (1992).

5.8 Conclusion

This chapter has explained the methodology followed in this research in detail. The chapter began with an elaboration of the research paradigm underpinning this study in terms of the positivist ontology, empiricist epistemology and quantitative methodology guiding the research. It explained the suitability of the survey questionnaire method for the research. After testing the survey instrument in the pilot study, data was collected and prepared for the final analysis with various statistical techniques. These statistical techniques were explained in this chapter. Results from the data analysis generated from SPSS, AMOS and Microsoft Excel software for the testing of the hypotheses and the models are presented in the next chapter.

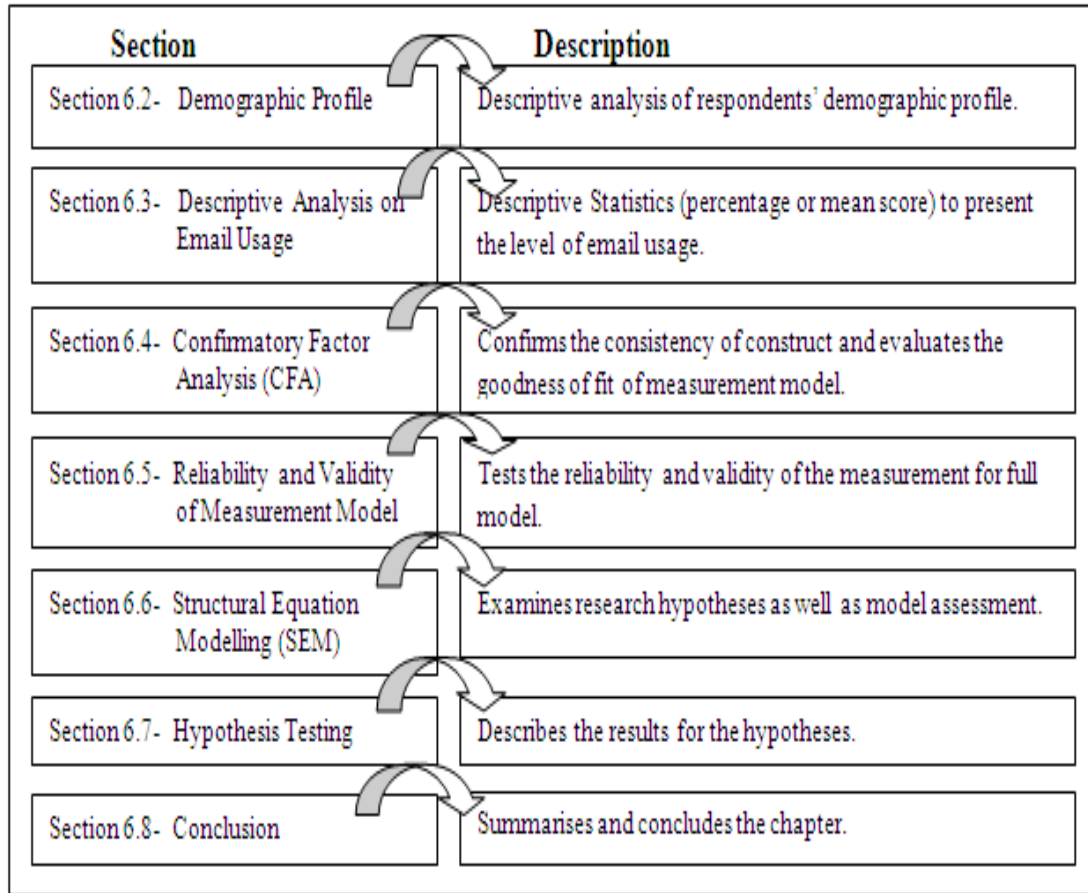
CHAPTER 6

DATA ANALYSIS AND RESULTS

6.1 Introduction

The methodology for this research was justified and discussed in detail in the previous chapter. This chapter presents results of the data analysed via Software Package for Social Science (SPSS), with Structural Equation Modelling (SEM) and Microsoft Excel Software, collected from 402 questionnaires. The process of data analysis has been designed on the basis of the objectives and hypotheses of this study. Section 6.2 provides comprehensive information on the demographic profile of the respondents, while Section 6.3 reports descriptive analysis of the current level of email usage in Malaysian public and private universities. Section 6.4 reports statistics pertinent to the Confirmatory Factor Analysis (CFA), which is divided into four phases: CFA for Technology Acceptance Model (TAM), CFA for National Culture Model (NCM) and CFA for Organisational Culture Model (OCM), before finally running the CFA for the full model. Later, Section 6.5 reports on the reliability and validity of the measurement for the full model established. Section 6.6 provides the results of the SEM analysis which serve to clarify the research's objectives. Later, the research hypotheses are assessed in Section 6.7 based on the p-value obtained from the analysis. Figure 6.1 depicts the summary of organisational flow for this chapter.

Figure 6.1: Chapter Organisational Flow



6.2 Demographic Profile

The data collection process was conducted with non-academic staff in public and private universities in Malaysia. Data on the demographic background of respondents were collected by categories encompassing gender, race, religion, age group, education level, university type, name of university and respondents' position in their universities. This provided better insight into the profile of subjects which was employed in the interpretation of results. Most of the universities clearly stated that they did not want a third party to form any unnecessary inferences from responses provided by them, therefore, the researcher used only code names to represent the universities specifying the nature of the university, whether public or private. Table 6.1 summarises the descriptive analysis for demographic characteristics of the participants:

Table 6.1: Respondents' Profile

Gender	Frequency	Percentage (%)
Male	181	45
Female	221	55
Race		
Malay	288	71.6
Chinese	95	23.6
Indian	14	3.5
Other	5	1.2
Religion		
Muslim	292	72.6
Buddhist	73	18.2
Hindu	14	3.5
Christian	20	5
Other	3	0.7
Range		
20-25 years	33	8.2
26-30 years	134	33.3
31-35 years	92	22.9
36-40 years	43	10.7
41-45 years	19	4.7
46-50 years	41	10.2
51-55 years	31	7.7
56-60 years	7	1.7
Over 60 years	2	0.5
Education		
Diploma	43	10.7
Bachelor Degree	263	65.4
Master Degree	94	23.4
PhD/Professional Doctorate	2	0.5
Type of university		
Public	217	54
Private	185	46

Name of university		
PBKM (Metropolitan Public University)	47	11.7
PBPM (Metropolitan Public University)	66	16.4
PBSNM (Non-Metropolitan Public University)	29	7.2
PBUNM (Non-Metropolitan Public University)	75	18.7
PRKM (Metropolitan Private University)	53	13.2
PRPNM (Non- Metropolitan Private University)	10	2.5
PRRM (Metropolitan Private University)	46	11.4
PRRNM (Non-Metropolitan Public University)	76	18.9
Location		
Metropolitan	212	52.7
Non-Metropolitan	190	47.3
Position at PublicUniversity		
Senior Deputy Registrar	4	1.8
Deputy Registrar	6	2.7
Head Assistant Registrar	27	12.4
Senior Assistant Registrar	33	15.2
Assistant Registrar	147	67.7
Position at PrivateUniversity		
Senior Executives	40	21.6
Executives	71	38.4
Junior Executives	74	40

A quick look at the demographic table tells us that gender representation is even in this data sample with 45 per cent male and 55 per cent female respondents. Looking at the race distribution, each ethnic group is sufficiently represented similar to the national population proportion with 71.6 per cent Malay, 23.6 per cent Chinese and 3.5 per cent Indian. In terms of age groups, more than 50 per cent of respondents are lower than 35 years old. It is important to note that the age group 56-60 years old and 60 years old above are two groups that are least represented in this study with seven staff 56-60 years old and only two staff above 60 years. Moving forward, the data involved only 8 universities from the peninsular region of Malaysia which means the

study does not have samples from states in East Malaysia (Borneo), namely Sabah and Sarawak. Fortunately, given the standardised policy of government in education (Ministry of Higher Education of Malaysia 2007), basically all universities can be assumed to have similar pattern systems. Thus, findings from this study can still be applicable to universities from Borneo East Malaysia, albeit with some limitations.

According to the Ministry of Higher Education of Malaysia (2012a, 2012e), there are 20 public universities, 26 private universities, 22 private university-run colleges and 410 independent private colleges. To ensure consistency in the types of institutions studied in this research, private colleges were excluded and only private and public universities with similar organisational and functional dimensions were examined. The sample size for universities was deemed adequate and the distribution of respondents is good enough to represent the population of non-academic executives in Malaysian universities in general.

6.3 Descriptive Analysis of Email Usage

This section describes the results of descriptive analysis for each part of the questionnaire pertaining to their previous and current usage pattern of internet and email. The patterns of respondents' answers are explained and graphically illustrated with composition score, mean and standard deviation.

6.3.1 Patterns of computer, internet and email usage

Figure 6.2: Distribution of Computer Usage

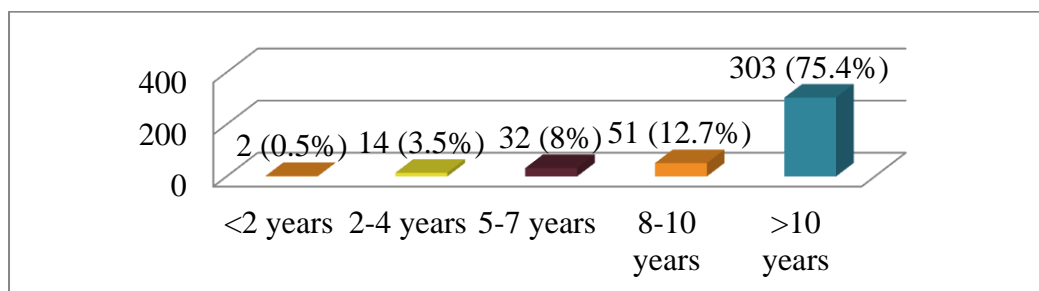


Figure 6.2 portrays the pattern of respondents' computer usage by years. The results show that at least three-quarters of the respondents had been using computers for more than a decade (75.4 per cent or 303 respondents). It was then followed by those respondents who claimed to have used a computer for roughly 8 to 10 years (12.7 per cent or 51 respondents), 8 per cent or 32 respondents have been using a computer for 5 to 7 years, 3.5 per cent or 14 respondents have been using a computer for 2 to 4 years and only 0.5 per cent or two respondents have been using a computer for less than two years. Therefore, it is clear that 99.5 per cent of total respondents have been using a computer for at least two years.

Figure 6.3: Frequency Distribution of Internet Use

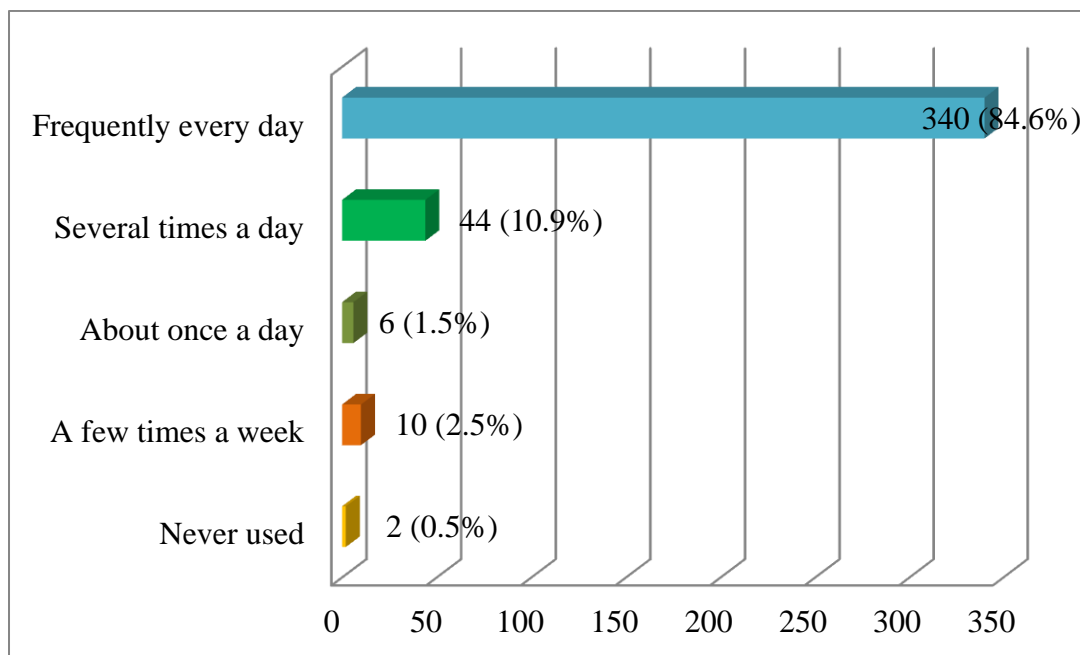


Figure 6.3 illustrates how frequently respondents use the internet at their workplace. In terms of the usage frequency, 84.6 per cent of the respondents were daily users of the internet, 10.9 per cent used it a few times daily, 2.5 per cent were weekly users who used it several times a week, 1.5 per cent used the internet about once a day and 0.5 per cent admitted that they had never used the internet.

Figure 6.4: Distribution of Duration of Time Using Email

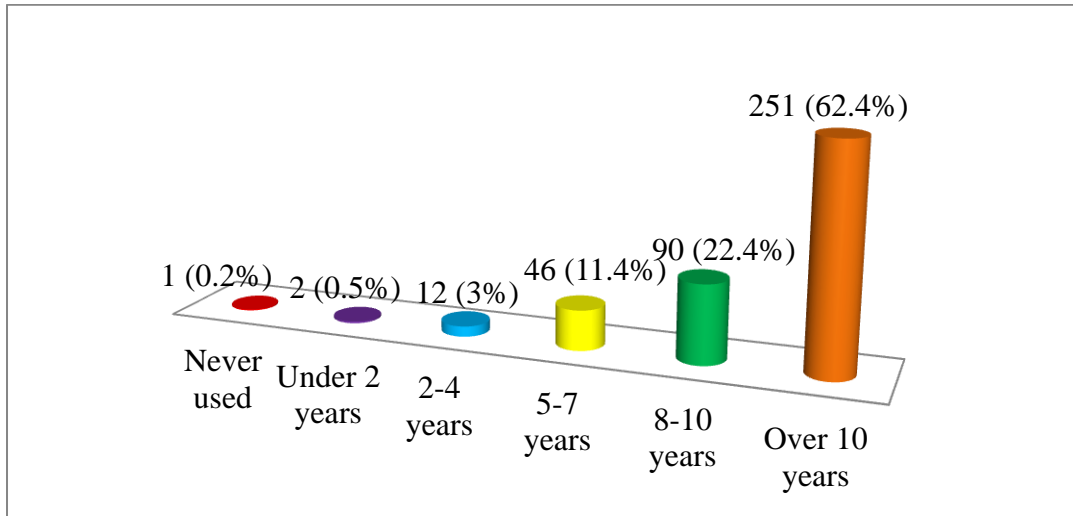


Figure 6.4 depicts the distribution of respondents' experience in using email. Results reveal that 62.4 per cent or 251 of respondents had been using email for more than a decade, followed by 22.4 per cent or 90 who had been utilising email for 8 to 10 years, 11.4 per cent or 46 respondents had been using email for 5 to 7 years, 3 per cent or 12 respondents had been using email for roughly 2 to 4 years, 0.5 per cent for less than 2 years and 0.2 per cent of respondents claimed that they had never been exposed to email.

6.3.2 Number and frequency of use of official/personal email address

Figure 6.5: Distribution of Official Email Address

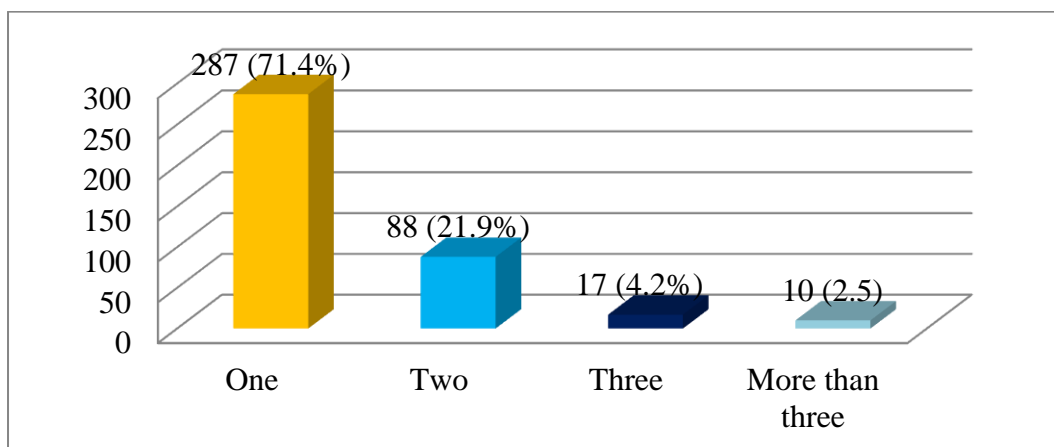


Figure 6.5 indicates the distribution of the number of respondents with an official email address. All respondents have at least an official email addresses for work purposes. The findings show that, out of 402, about 71 per cent are using one official address, followed by 21.9 per cent claiming to have two official email addresses, 4.2 per cent have three official email addresses and 2.5 per cent have more than three official addresses.

Table 6.2: Number of Personal Email Address

		Having any personal email addresses		
		Yes (%)	No (%)	Total (%)
The numbers of personal email addresses	No Email	0.00	14.20	14.20
	One	36.1	0	36.1
	Two	34.3	0	34.3
	Three	10.90	0	10.9
	More than three	4.50	0	4.5
Total		85.80	14.20	100.00

Table 6.2 above reports the relationship between personal email address ownership and the number of personal email addresses. The results show that about 14.2 per cent respondents do not have any personal email address, while 85.8 per cent or 345 respondents have a personal email address. Out of 402 respondents, 36.1 per cent of the respondents have one personal email address, followed by 34.3 per cent with two personal email addresses and 10.9 per cent with three.

6.3.3 Email type and volume at workplace

Figure 6.6: Pie Chart for Actual Official Email Messages Received in a Day

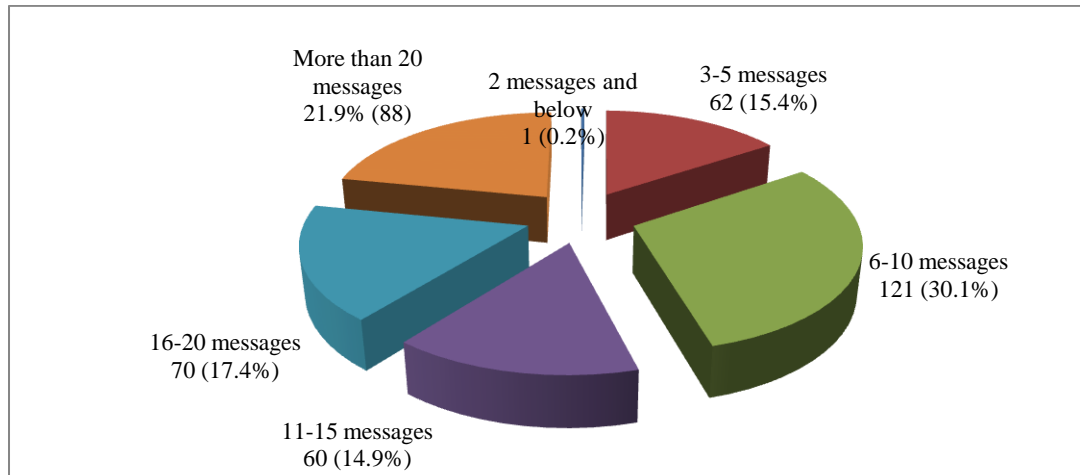


Figure 6.6 reports the number of official email messages received by respondents in one day. Results showed that 30.1 per cent or 121 of the respondents received 6-10 messages, followed by 21.9 per cent or 88 of the respondents receiving more than 20 messages, 17.4 per cent or 70 respondents 16-20 messages, 15.4 per cent or 62 respondents received around three to five messages and 14.9 per cent received 11 to 15 messages. Only 1 respondent reported receiving two messages or less.

Table 6.3: Percentages of Daily Official Email Messages Received Between Malaysian Public and Private Universities

Email Usage (Received)	Never Received (%)	2 messages and below (%)	3-5 messages (%)	6-10 messages (%)	11-15 messages (%)	16-20 messages (%)	More than 20 messages (%)
Public	0	0.5	21.7	33.6	15.2	15.2	13.8
Private	0	0	8.1	25.9	14.6	20	31.4
Total	0	0.5	29.8	59.5	29.8	35.2	45.2

Table 6.3 reports the different levels of daily official email messages received between public and private universities. Results show that staff at private universities received more email than public universities – 31.4 per cent respondents from private university received more than 20 messages per day compared to only 13.8 per cent among respondents from public universities; 21.7 per cent of respondents from public universities received 3-5 email messages per day while only 8.1 per cent respondents from private universities received the same amount.

To support this, a further assessment was conducted to investigate the differences in email usage received between private and public universities using the Mann-Whitney U test (non-parametric test). T-test was excluded as there was a non-normal distribution in the data on this issue. Results of the normality test (Kolmogorov-Smirnov) showed that both p-values are less than 0.05, indicating that the data significantly deviated from the normal distribution. The Mann-Whitney U test results for the difference between private and public universities in terms of official emails received showed Z values of -5.279 with a p-value ≈ 0.00 . This means that there is a significant difference in official emails received by private universities and public universities at 0.05 significance levels. In addition, the mean rank of 173.44 of public universities versus 234.41 of private universities shows that, in general, private universities received a significantly higher number of official emails compared to public universities.

Figure 6.7: Frequency of Messages Sent Through Official Email

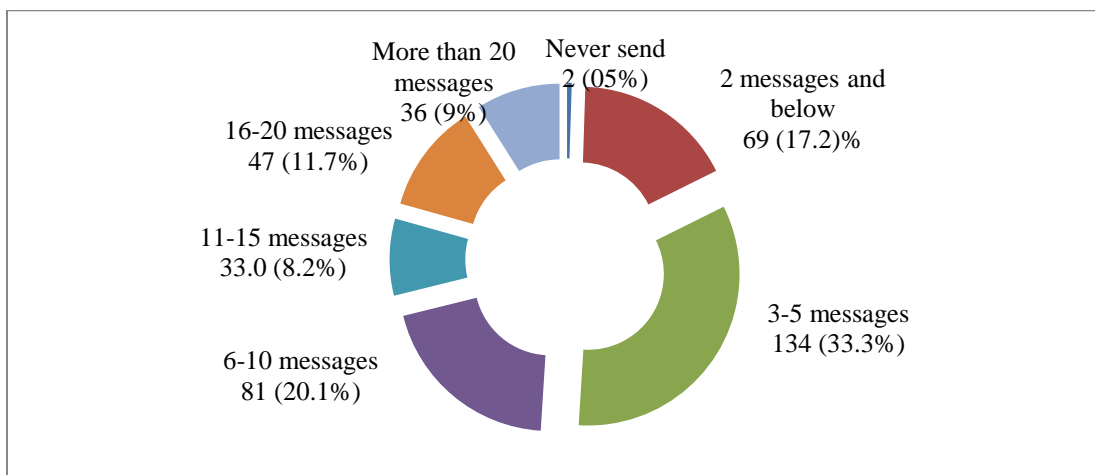


Figure 6.7 describes the daily frequency of messages sent using official email. Results showed that exactly one-third of the respondents (33.3 per cent or 134 respondents) sent 3-5 messages per day. Of those with a higher frequency of sending official emails, 20.1 per cent or 81 respondents sent 6-10 messages daily, 11.7 per cent or 47 respondents sent 16-20 messages, 9 per cent sent more than 20 messages, while 33 respondents (8.2 per cent) sent 11-15 messages. On the other hand, 17.2 per cent or 69 respondents sent only about two messages or below per day. Only 0.5 per cent or two respondents sent two messages or less per day in the past.

Table 6.4: Percentages of Daily Official Email Messages Sent Between Malaysian public and Private Universities

Email Usage (Sent)	Never Sent (%)	2 messages and below (%)	3-5 messages (%)	6-10 messages (%)	11-15 messages (%)	16-20 messages (%)	More than 20 messages (%)
Public	0.9	22.6	38.2	19.8	6.5	8.3	3.7
Private	0	10.8	27.6	20.5	10.3	15.7	15.1
Total	0.9	33.4	65.8	40.3	16.8	24	18.8

Table 6.4 reports the different levels of official email messages sent in public and private universities. Results show that private universities send more emails than public universities, where 15.1 per cent of respondents from private universities claimed to have sent more than 20 messages per day while only 3.7 per cent of respondents from public universities sent more than 20 messages per day. For the category ‘sent two messages and below per day’, public universities have 22.6 per cent respondents while private universities have 10.8 per cent respondents. To support this, the Mann-Whitney U test (non-parametric test) was used to further investigate the differences in email usage. T-test was excluded as there was a non-normal distribution in the data. Results of the normality test (Kolmogorov-Smirnov) show that p-values are less than 0.05 suggesting that the data significantly deviated from the normal distribution. Results, using the Mann-Whitney U test, showed Z value of -5.615 with p value ≈ 0.00 , indicating that there is a significant difference in

official emails sent by private universities and public universities. In addition, a mean rank of 172.26 for public universities and 235.79 for private universities clearly reflect that private universities have higher numbers of official emails sent compared to public universities.

Table 6.5: Types of Message Received by Respondents

Types	Frequency	Per cent
Related to work: involving further conversation	262	65.2
Related to work: involving no further conversation	138	34.3
Personal	1	0.2
Other	1	0.2
Total	402	100.0

Table 6.5 reports the type of message received by respondents. The results show that 65.2 per cent of total respondents reported receiving mostly work-related email needing further conversation. This showed that approximately two-thirds of respondents received work-related emails that needed action to be taken. It was then followed by 34.3 per cent of the respondents who mostly reported receiving messages related to work and not involving any extended conversations (34.3 per cent), indicating that these respondents mainly received information or instruction-type emails requiring no further communication. However, only one respondent said that they received mostly personal or unclassifiable messages. This shows that the respondents are receiving messages related to work most of the time, with a cumulative percentage of 99.5 per cent equivalent to 400 respondents out of 402.

Table 6.6: Types of Messages Mostly Sent by Respondents

Types	Frequency	per
Related to work: involving further conversation	361	89.8
Related to work: involving no further conversation	39	9.7
Personal	1	0.2
Other	1	0.2
Total	402	100.0

Table 6.6 reveals the results for the type of message mostly sent by respondents. It highlights that more than 80 per cent of the respondents sent messages related to work with further conversation expected, followed by 9.7 per cent of the respondents who sent email associated to work not involving any further conversation), 0.2 per cent of the respondents admitted sending personal or other types of email respectively. Interesting to note here is that the result for sending personal and other emails coincide with email received which was illustrated in the last section (with 0.2 per cent). It could mean that the same respondents who admitted to receiving mostly personal or other email also only sent email of that nature.

6.3.4 Preferred communication channel at work

Table 6.7: Preferred Channel of Communication With Superior

Communication Channel	Most Preferred (%)	Second Preferred (%)	Third Preferred (%)	Fourth Preferred (%)	Least Preferred (%)
Email	32.8	18.9	44.8	3.5	-
Face to Face	48.8	35.1	13.9	2.23	-
Telephone	11.2	45.8	38.6	4.47	-
Online Social	5	-	1	57.7	36.3
Other	2.2	-	2	32.3	63.4

The results in Table 6.7 reveal that in terms of the communication medium of choice, face-to-face was the most preferred communication (48.8 per cent), followed by email (32.8 per cent), telephone (11.2 per cent), online social network (5 per cent) and other (2.2 per cent). For the second preferred medium of communication, most respondents preferred telephone with a percentage of 45.8 per cent; for the third preferred channel, email was ranked the highest with 44.8 per cent. On the other hand, for the fourth and least preferred communication channel, respondents chose online social networking such as Facebook (57.7 per cent) while others chose Short Message Service (SMS) and fax as the least preferred (63.4 per cent).

Table 6.8: Preferred Channel of Communication With Subordinates

Communication Channel	Most Preferred (%)	Second Preferred (%)	Third Preferred (%)	Fourth Preferred (%)	Least Preferred (%)
Email	30.1	16.7	48.8	4.5	-
Face to Face	55.2	32.3	10	2.2	-
Telephone	11.2	50.2	38.6	-	-
Online Social Network	1.2	-	1	61.4	36.3
Other	2.2	-	-	32.3	63.4

Table 6.8 above reports respondents' preferences about the channel of communication with subordinates. Here, 55.2 per cent chose face-to-face as the most preferred channel followed by email (30.1 per cent), telephone (11.2 per cent), other (2.2 per cent) and online social network (1.2 per cent). Telephone ranked highest as the second preferred communication channel with 50.2 per cent while email came close as the third preferred medium at 48.8 per cent. The least preferred for communication with subordinates was online social network and other communication channels such as SMS and fax.

Table 6.9: Preferred Channel of Communication with Colleagues

Communication Channel	Most Preferred (%)	Second Preferred (%)	Third Preferred (%)	Fourth Preferred (%)	Least Preferred (%)
Email	29.3	16.7	48.8	5.2	-
Face to Face	55.2	31.6	10	2.2	1
Telephone	11.2	50.2	36.6	2	-
Online Social Network	2.2	1	3.0	59	34.9
Other	2.2	-	2.0	31.9	64

Table 6.9 reports respondents' preferences in regard to the channel of communication with colleagues. 55.2 per cent chose face-to-face as the most preferred channel followed by email (29.3 per cent), telephone (11.2 per cent), other (2.2 per cent) and online social network (2.2 per cent). Again, telephone was ranked highest as the second preferred communication channel with 50.2 per cent, while email was the third preferred medium with 48.8 per cent. The least preferred channels were online social network and other communication channels such as SMS and fax.

Table 6.10: Preferred Channel of Communication in Relation to Work

Communication Channel	Most Preferred (%)	Second Preferred (%)	Third Preferred (%)	Fourth Preferred (%)	Least Preferred (%)
Email	34.3	19	43.2	3.5	-
Face to Face	44	36.3	17.4	2.2	-
Telephone	14.7	44.2	36.6	4.5	-
Online Social Network	5	-	2	57.8	36.3
Other	2.2	-	2	32.3	63.4

Table 6.10 above reports the responses with regard to the overall communication channel preferred in universities. The pattern of responses for preferred communication channel for all three specific purposes (superiors, colleagues, subordinates) was identical. The same result is reflected again here in the overall communication channel preferred by respondents – 44 per cent chose face-to-face as the most preferred channel followed by email (34.3 per cent), telephone (14.7 per cent), online social network (5 per cent) and other (2.2 per cent). Telephone was ranked highest in the second preferred communication channel with 44.2 per cent, while email was rated highest as the third preferred choice with 43.2 per cent. The least preferred were online social network and other communication channels such as SMS and fax.

6.4 Confirmatory Factor Analysis (CFA)

This section examines the reliability and validity of measurement model and its three measurement instruments, i.e. TAM, NCM, as well as OCM. The measurement dimensions or aspects for NCM encompassed power distance (PD), collectivism (C), uncertainty avoidance (UA), masculinity (M), long-term orientation (LT) and indulgence (I). On the other hand, OCM measures include value (V) – need for security (NS), and practices (P) – sub dimensions: results-oriented (RO), job-oriented (JO) and closed system (CS). Lastly, TAM is operationalised through the measurement of PU, PEOU and usage U. For assessing the reliability and validity for the proposed measurement model, CFA was conducted to identify problematic items that might be omitted from analysis.

In this section, CFA serves to justify that the proposed measurement model is in fact reliable, valid and fit for the data collected. Jöreskog (1969) states that the CFA technique requires a prior specification of indicators or items associated with the variables. As a ‘confirmatory technique’, CFA is a theory-driven analysis that endeavours to confirm the appropriateness or practicality of a theory. Thus, “*---the planning of the analysis is driven by the theoretical relationships among the observed and unobserved variables*” (Schreiber et al. 2006, p. 323). This research framework incorporates three measurement models namely, TAM, NCM and OCM. In the rest of this section, analyses will be carried out independently on each model prior to testing the full model and the combination of the three measurement frameworks.

This thesis employs the ‘omit items’ approach when a particular item jeopardises or causes severe damage to goodness of fit of the model. Holmes-Smith (2001) suggests deleting items that are not contributing to the model, so in line with that suggestion the researcher decided to discard any item(s) showing a factor loading lower than 0.5. In addition, deleting item(s) will also increase model parsimony (Holmes-Smith 2001). The deletion of items for goodness of fit should be undertaken with caution to ensure that it does not cause the loss of useful information from the study. In other words, while deleting items could facilitate model fitting, some limitation must be

placed on the number of items to deliver reliable results. According to Kline (2005), at least two items would be necessary if two or more factors were estimated, or at least three items per factor if a one-factor model is being estimated. Bollen (1989) has argued that two items could cause an estimation problem if sample size were less than 100. Hair et al. (2006) have argued that there should be at least three items for one dimension. This thesis has adopted the advice given by Hair et al. (2006) and ensured that the model has at least three items for each factor when the omit item approach is employed.

Prior to re-specifying the model, there are two aspects that need to be taken into consideration: (1) the modification indices (MI) and (2) standardised residual.

“The Modification Index is a lower bound estimate of the expected Chi-square decrease that would result when a particular parameter is left unconstrained (making it become [a] free parameter), or adding it as an extra path”.

(Damme et al. 2012, p. 133).

Consequently, it is essential to correlate or delete the items with the highest MI followed by the second largest for better goodness of fit Chi-square. Once the highest MI was identified the researcher checked the standardised residual. A positive standardised residual suggests that the model parameters were underestimated in the context of covariance between the two variables, whereas a large negative residual suggests model overestimation between two variables (Brown 2006). Most importantly, Rosseni et al. (2008, p. 170) state that:

“---typically standardized residuals less than |2.5| do not suggest a problem; conversely residuals greater than |4| raise a red flag and suggest a potentially unacceptable degree of error”.

(Rosseni et al. 2008, p. 170).

Items are investigated when standardised residuals are between |2.5| and |4|, but they are retained if further analyses do not require these items should be deleted (Hair et al. 2006). Table 6.11 lists indicators for goodness of model fitting to be used for this

study. The indicators cover a number of categories of fit indices, namely, absolute fit index, incremental fit index, goodness of fit index and badness of fit index. As advised by Hair et al. (2010), multiple fit indices should be assessed prior to concluding a model's goodness of fit analysis.

Table 6.11: Guidelines for Model Fit Indices

Type	Determiner	Symbol	Specification
Absolute fit index	Chi-Square	χ^2	A non-significant chi-square test provides support for the model
Absolute fit index	Normed Cmin	Cmin/df	1.0<cmin/df<3.0
Absolute fit index	Root Mean Square Error of Approximation	RMSEA	RMSEA<0.08 means acceptable RMSEA < 0.05 satisfactory fit
Incremental fit index	Tucker-Lewis Index	TLI	TLI >=0.9 means well fitting TLI close to 0.95 indicates superior
Incremental fit index	Comparative Fit Index	CFI	CFI >=0.9 means satisfactory fit CFI close to 0.95 indicates superior fit
Badness of fit index	Root Mean square Residual	RMR	RMR<0.08 means acceptable RMR < 0.05 satisfactory fit

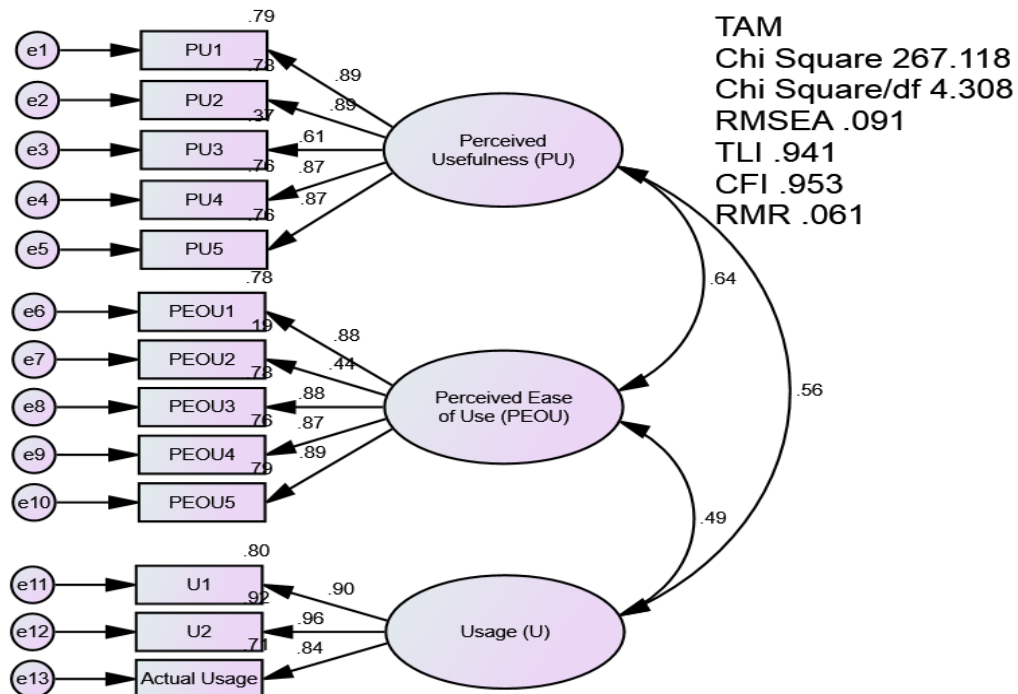
Sources: Hair et al. (2006), Arbuckle (2003), Byrne (2001), Kline (1998), Bentler and Bonett (1980) and Bentler (1992)

6.4.1 CFA for TAM

The study proceeded with confirmatory factor analysis for the TAM model, using the initially proposed model with five items for PU, five items for PEOU and three items for U. It is important to note here that an additional observed variable was included in the U dimension, namely actual usage which is the actual daily email usage (received and sent). Figure 6.8 below presents the CFA for the TAM measurement model, together with the goodness-of-fit of the proposed three latent variables model. Based on the indices, TLI and CFI values of 0.941 and 0.953 are both above the 0.90 cut-off value, suggesting adequate fit of the model. In addition, the RMR value (0.061) is lower than 0.08, suggesting that the model fits the data. The RMSEA value (0.091), however, was higher than the suggested 0.08 threshold value, providing

evidence of inadequate fit with data. On the other hand, a normed Chi-square value of 4.308 is outside the 1 to 3 range, which provides some evidence of inadequate fit in the model. Further investigation of the model in terms of model re-specification was used to remedy the high normed Chi-square value as well as the high RMSEA value. Investigation of the standardised residual covariance matrix (Table 1 in Appendix I) shows that there are two indicators/items, i.e. PU3 and PEOU2, which exhibited high standardised residual (>2.5) with many pairs of items, therefore they were chosen as potential items for discarding. Further, inspection of the MIs in Table 2 (Appendix I) provides consistent findings where high correlation was detected for the error terms of PU3 and PEOU2 with other latent variable such as PU, PEOU and U. Also, based on the factor loading in Figure 6.8, PU3 and PEOU2 were shown to have relatively lower loading compared to others, at 0.61 and 0.44 respectively. Subsequently, the researcher decided to omit PU3 and PEOU2 from further analysis.

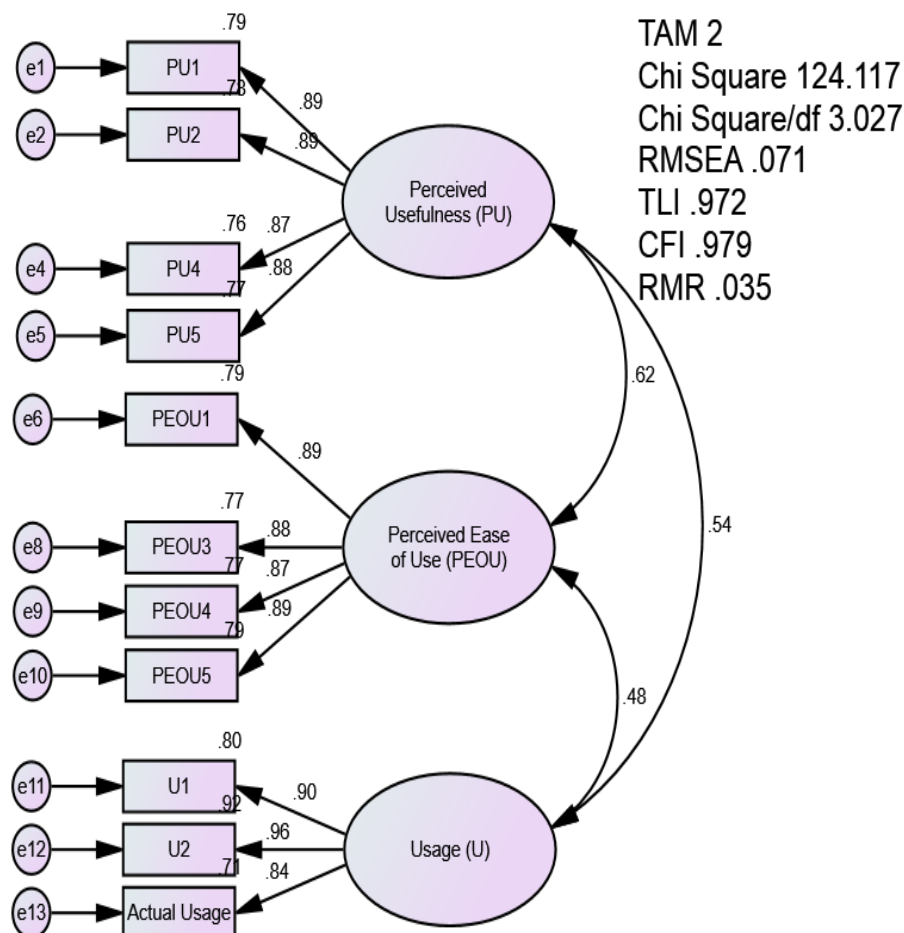
Figure 6.8: CFA for Technology Acceptance Model



Accordingly, the re-specification of TAM (named as TAM 2) was reassessed with CFA. Figure 6.9 presents the results of CFA on TAM model 2 after omitting both

PU3 and PEOU2. It seems that the model now has better fit indices with both TLI and CFI values of 0.972 and 0.979. Further, the RMSEA for TAM 2 dropped from 0.091 to 0.071 and the RMR value dropped from 0.061 to 0.035, hence providing evidence of acceptable model fit. Lastly, the normed Chi-square value of 3.027 was still slightly higher than the threshold value of 1 to 3, but the difference was negligible. This re-specification corrected the offending values for RMSEA and Chi-square shown by the earlier model. TAM 2 now shows acceptable model fit with current data and was used in CFA of the full model as well as the SEM in hypotheses testing.

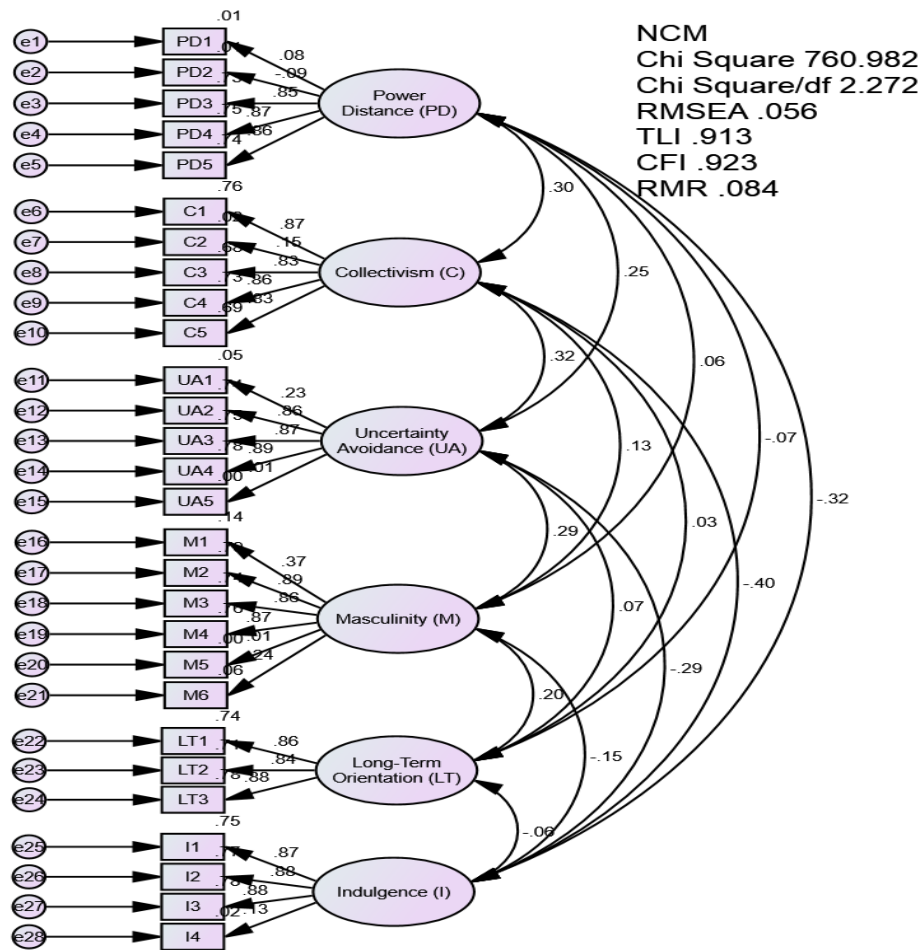
Figure 6.9: CFA for TAM 2



6.4.2 CFA for NCM

Figure 6.10 portrays the initial NCM in confirmatory factor analysis encompassing 28 items divided into six latent variables (dimensions).

Figure 6.10: CFA for NCM

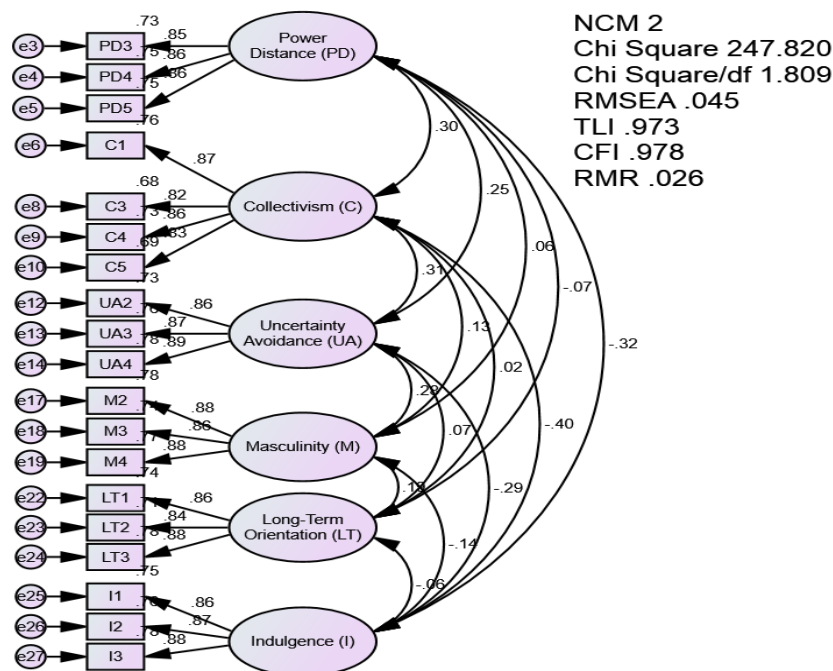


The results provide evidence that all incremental fit indices support the acceptable fit of the model with the data. TLI and CFI values (0.913 and 0.923) are both above the 0.90 cut-off value, suggesting a satisfactory fit of the model. On the other hand, the RMR value (0.084) was slightly greater than 0.08 suggesting inadequate fit of the model, but this difference was negligible. Moreover, the RMSEA value of 0.056 shows that the proposed model of NCM has satisfactory fit with the data. Lastly, the normed mean square value of 2.272 is definitely in between the 1 to 3 range, suggesting a good fit of the model. However, perusal of factor loadings in Figure

6.10 shows that PD1, PD2, C2, UA1, UA5, M1, M5, M6 and I4 are definitely exhibiting low factor loading, which is particularly concerning as the value is lower than 0.5. It was decided that a more parsimonious model can be obtained by omitting nine items, particularly PD1, PD2, C2, UA1, UA5, M1, M5, M6 and I4, with further investigation of the standardised residual matrix and MIs (See Table 3 and Table 4 in Appendix I).

Following the re-specification of the NCM model, the new model named NCM 2 was examined. Figure 6.11 presents the results of CFA for NCM 2 after omission of PD1, PD2, C2, UA1, UA5, M1, M5, M6 and I4. The model now has better-fit indices with both TLI and CFI values of 0.973 and 0.978. In NCM 2, the RMSEA further dropped from 0.056 to 0.045, indicating that the model fit improved with the parsimonious model. Meanwhile, the RMR value dropped substantially from 0.084 to 0.026, hence providing evidence of acceptable model fit. Lastly, the normed Chi-square value of 1.809 is within the range of 1 to 3, likewise showing a good fit of the model. Thus, NCM 2 shows acceptable model fit with current data, so it was used in CFA of the full model and SEM in hypotheses testing.

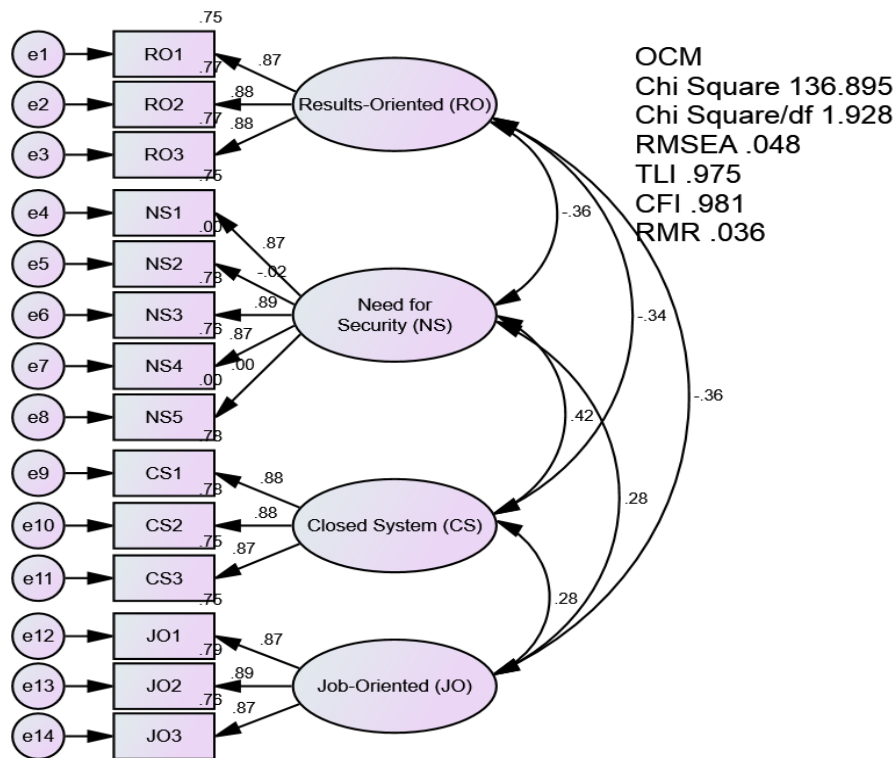
Figure 6.11: CFA for NCM 2



6.4.3 CFA for OCM

Figure 6.12 shows the CFA for OCM comprising four dimensions with 14 items. All model fit indices show that the model has acceptable fit.

Figure 6.12: CFA for Organisational Culture Model

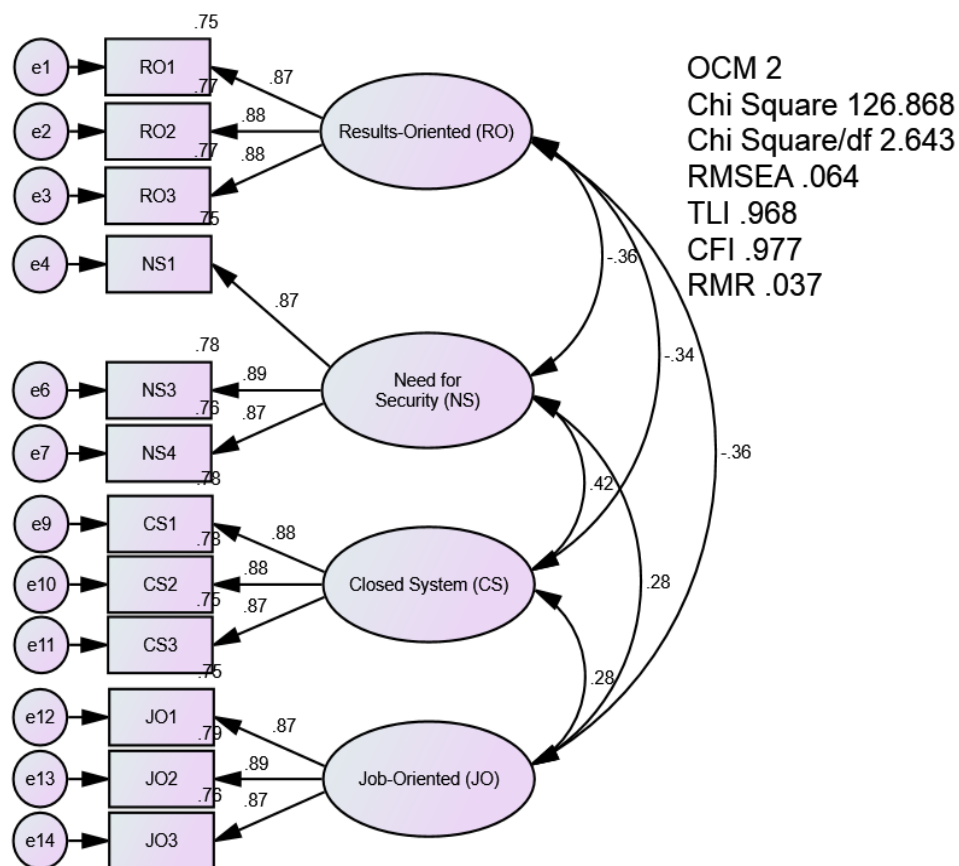


Perusal of the indices shows that both TLI and CFI values (0.975 and 0.981) are above the 0.95 cut-off value, suggesting a satisfactory fit of the model. In addition, the RMR value of 0.036 and the RMSEA value of 0.048 are both much lower than the 0.08 threshold values, suggesting that the model fits the data very well. In terms of the normed mean square, results generated a value of 1.928, which is in the acceptable 1 to 3 range. Therefore, all the indices suggest that the model fits well with the data. Scrutiny of Figure 6.12, however, shows that some items have low factor loadings, suggesting that a simpler model can be obtained by omitting those items that do not contribute to the model. Two items, NS2 and NS5, were found to have loadings of -0.02 and 0.00 – both lower than 0.5. Therefore, with further

investigation of the standardised residual matrix and MIs, it was decided that a more parsimonious model could be obtained by omitting NS2 and NS5 (See Table 5 and Table 6 in Appendix I).

The re-specified OCM model (named as OCM 2) was then assessed using CFA. Figure 6.13 presents the results of CFA for OCM 2 after the omission of NS2 and NS5. Based on the results, it seems that the parsimonious model has adequate model fit with both TLI and CFI values of 0.968 and 0.977. Furthermore, the RMSEA value of 0.064 indicates that the model has a satisfactory fit and the RMR value of 0.037 reflects the same. Lastly, the normed Chi-square value of 2.643 is also within the acceptable range of 1 to 3, illustrating a good fit of the model. Thus, the study concluded that OCM 2 shows acceptable model fit, so it was employed in the CFA of the full model as well as the SEM in hypotheses testing.

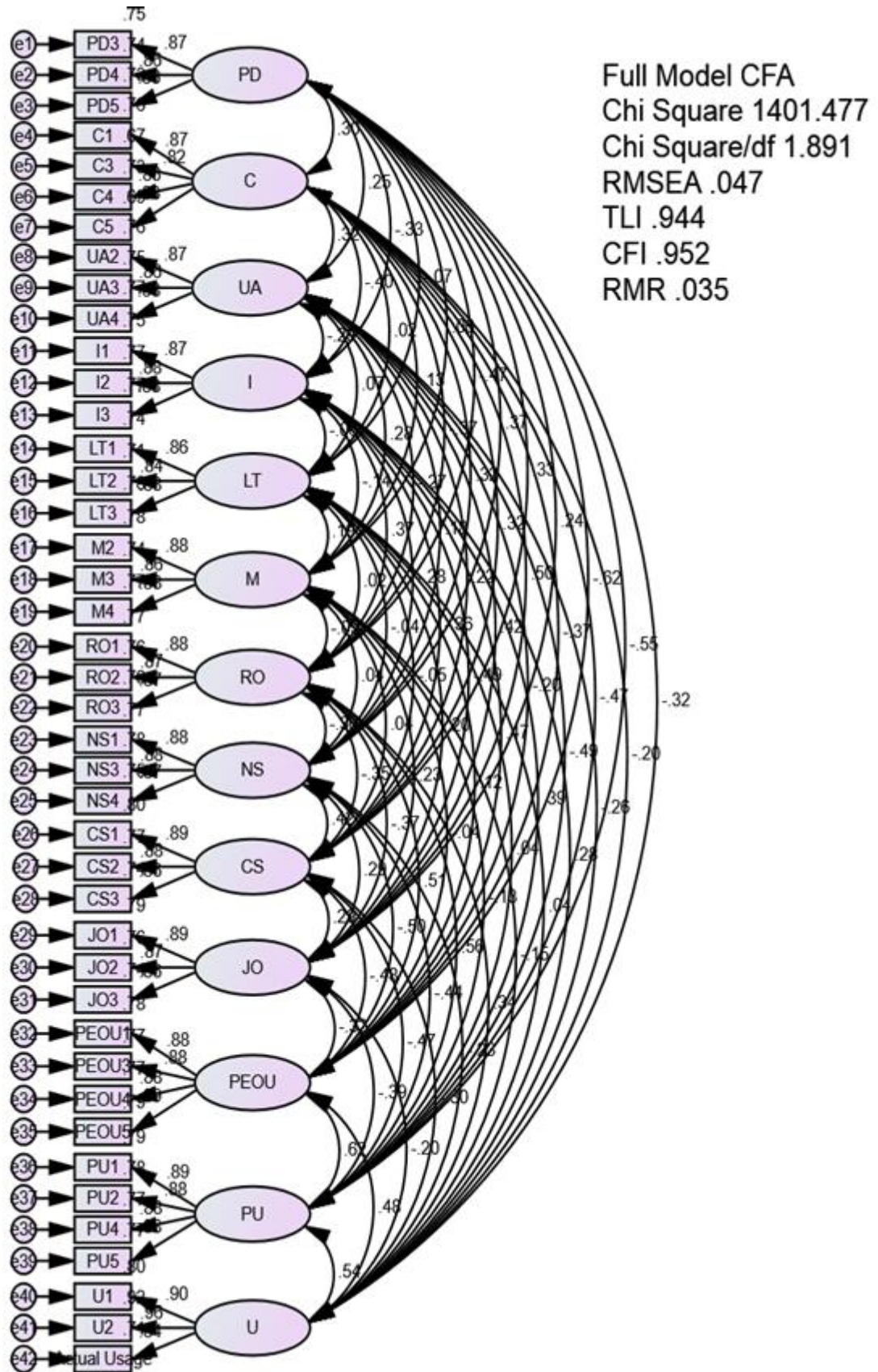
Figure 6.13: CFA for OCM 2



6.4.4 CFA for full model

This section incorporates the three measurement models, i.e. TAM, NCM and OCM, which were individually analysed and re-specified in the previous section into a full model for further CFA. Figure 6.14 presents the model in graphical terms and the results of model fit are presented within the figure itself. The results show that the full model has achieved acceptable fit with the data. First, the TLI and CFI values were greater than 0.90 (0.944 and 0.952), indicating that the model has acceptable fit. In addition, both RMSEA and RMR values were posited below 0.08 (0.047 and 0.035), proving that the full model has acceptable fit with the data. Results further reveal that the normed Chi-square value of 1.891 is definitely within the suggested range of 1-3. Therefore, it was concluded that the full model has acceptable fit with data and the analysis could proceed to the reliability and validity assessment of the measurement instrument. The standardised residual matrix and MIs for the full model is shown in Tables 7 and 8 in Appendix I.

Figure 6.14: CFA for Full Model



6.5 Reliability and Validity of Measurement Model

Following the assessment of goodness of fit of the measurement model, this stage adapts the reliability and validity examination for the measurement model as suggested by Hair et al. (2006, p. 707). According to these authors, composite reliability (CR) which is analogous to Cronbach's alpha is more suitable in evaluating construct or dimension reliability. Wee (2010) also considers the construct validity necessary and argues that the proposed measurement model can only be supported if the construct meets the validity rule. So this study examined construct validity from two aspects, i.e. convergent and discriminant validity.

Convergent validity refers to “---the extent to which it (the measure) correlates highly with other methods designed to measure the same construct” (Churchill 1979, p. 70). In other words, convergent validity indicates that items belonging to the same construct are highly correlated to each other and converge in the same dimension. There are many ways to determine convergent validity, such as size of factor loading, average variance extracted (AVE) and construct reliability (Hair et al. 2010). According to Hair et al. (2006, p. 709), AVE is defined as “the mean variance extracted for the items loading on a construct” and the AVE value should be 0.5 and above to provide evidence of convergent validity and high construct reliability, with composite reliability exceeding 0.7 (Hair et al. 2006).

Discriminant validity is defined by Churchill (1979, p. 70) “as the extent to which the measure is indeed novel and not simply a reflection of some other variable”. According to Holmes-Smith et al. (2004), large correlations between latent constructs of more than 0.90 indicate a lack of discriminant validity. Kline (2011) also states that the correlations between variables should be less than 0.9 for discriminant validity. More rigorous guidelines given by Hair et al. (2010) stipulate that constructs have to prove that the variance extracted estimates should be greater than the squared correlation estimate. This is necessary to show that the latent construct can explain more of the variance in its item measures than it shares with another construct.

Table 6.12 presents the factor loadings (BETA) for each items, AVE values as well as composite reliability as advised by Hair et al. (2010).

Table 6.12: Convergent Validity and Reliability for Measurement Model

Path			B	Beta	P	AVE	CR
Power Distance (PD)							
PD3	<---	PD	1.000	0.866		0.740	0.895
PD4	<---	PD	1.074	0.859	***		
PD5	<---	PD	1.109	0.855	***		
Collectivism (C)							
C1	<---	C	1.000	0.874		0.715	0.909
C3	<---	C	0.883	0.820	***		
C4	<---	C	1.039	0.857	***		
C5	<---	C	1.003	0.830	***		
Uncertainty Avoidance (UA)							
UA2	<---	UA	1.000	0.871		0.759	0.904
UA3	<---	UA	1.085	0.863	***		
UA4	<---	UA	1.070	0.878	***		
Indulgence (I)							
I1	<---	I	1.000	0.866		0.763	0.906
I2	<---	I	1.166	0.876	***		
I3	<---	I	1.282	0.879	***		
Long-Term Orientation (LT)							
LT1	<---	LT	1.000	0.859		0.743	0.896
LT2	<---	LT	1.019	0.842	***		
LT3	<---	LT	1.126	0.884	***		
Masculinity (M)							
M2	<---	M	1.000	0.885		0.765	0.907
M3	<---	M	1.077	0.861	***		
M4	<---	M	1.043	0.878	***		
Results-Oriented (RO)							
RO1	<---	RO	1.000	0.875		0.761	0.905
RO2	<---	RO	1.171	0.870	***		
RO3	<---	RO	1.297	0.872	***		
Need for Security (NS)							
NS1	<---	NS	1.000	0.876		0.765	0.907
NS3	<---	NS	1.009	0.881	***		
NS4	<---	NS	1.071	0.867	***		
Closed System (CS)							
CS1	<---	CS	1.000	0.894		0.770	0.910
CS2	<---	CS	0.968	0.877	***		
CS3	<---	CS	0.938	0.862	***		

Path			B	Beta	P	AVE	CR
Job-Oriented (JO)							
JO1	<---	JO	1.000	0.887		0.764	0.907
JO2	<---	JO	1.121	0.873	***		
JO3	<---	JO	1.024	0.862	***		
Perceived Ease of Use (PEOU)							
PEOU1	<---	PEOU	1.000	0.884		0.779	0.934
PEOU3	<---	PEOU	0.909	0.877	***		
PEOU4	<---	PEOU	0.943	0.879	***		
PEOU5	<---	PEOU	1.009	0.890	***		
Perceived Usefulness (PU)							
PU1	<---	PU	1.000	0.886		0.777	0.933
PU2	<---	PU	0.966	0.885	***		
PU4	<---	PU	1.087	0.878	***		
PU5	<---	PU	0.961	0.878	***		
Usage(U)							
U1	<---	U	1.000	0.896		0.812	0.928
U2	<---	U	1.169	0.959	***		
Actual Usage	<---	U	1.353	0.844	***		

As the table shows, all items showed high factor loadings, ranging from 0.820 to 0.959. Furthermore, the AVE values are all greater than the 0.5 threshold value, with values that range from 0.715 to 0.812. The least variance in items that can be explained by constructs is 71.5 per cent. Lastly, the reliability of each dimension reflected by composite reliability also ranged from 0.895 to 0.934. This is sufficient evidence for the study to conclude that the measurement model has good construct reliability and adequate convergent validity.

Table 6.13 reports the squared multiple correlation matrix for the purpose of discriminant validity assessment. As mentioned before, a rigorous way to prove discriminant validity is by showing that the AVE value of a particular construct is greater than the squared correlation between that construct and other constructs. Scrutiny of the table shows that all AVE values are basically greater than the squared multiple correlation value, suggesting that each construct can explain its items better than items from other constructs and the measurement model has good discriminant validity.

Table 6.13: Discriminant Validity (Squared Multiple Correlation Matrix)

	U	PU	PEOU	JO	CS	NS	RO	M	LT	I	UA	C	PD
U	0.812												
PU	0.293	0.777											
PEOU	0.228	0.382	0.779										
JO	0.041	0.155	0.101	0.764									
CS	0.087	0.217	0.228	0.083	0.770								
NS	0.055	0.196	0.251	0.084	0.177	0.765							
RO	0.114	0.310	0.255	0.139	0.120	0.132	0.761						
M	0.022	0.018	0.002	0.051	0.001	0.002	0.008	0.765					
LT	0.001	0.002	0.015	0.039	0.002	0.002	0.000	0.035	0.743				
I	0.076	0.153	0.217	0.240	0.132	0.076	0.138	0.020	0.003	0.763			
UA	0.066	0.243	0.038	0.177	0.047	0.033	0.073	0.080	0.004	0.084	0.758		
C	0.040	0.216	0.134	0.246	0.103	0.100	0.138	0.016	0.001	0.158	0.101	0.715	
PD	0.104	0.299	0.386	0.059	0.111	0.136	0.219	0.003	0.005	0.106	0.064	0.093	0.740

AVE value: Bold and diagonal value

In summary, the results of this section show extensive evidence of convergent validity, construct reliability and discriminant validity in the measurement model, so the study could now proceed to structural equation modelling.

6.6 Structure Equation Modelling (SEM)

This section investigates the whole model of email usage within organisations based on the measurement models examined in the previous section (NCM, OCM and TAM) in order to answer the research questions and test the hypotheses. A specific model of email usage within the organisation that best fits the data was generated (see Section 6.5). The key feature of the structural model is that the covariance arrows between variables in the measurement model are replaced with one-way arrows that specify the relationship and direction of relationship between variables (Holmes-Smith 2001). The assessment of the structural equation model is explained below.

6.6.1 Assumptions and requirements of SEM

Prior to developing the structural model for TAM, OCM and NCM, some salient assumptions of the SEM process must be examined to ensure the suitability as well as the reliability of the technique or approach employed in SEM estimation, particularly maximum likelihood estimation. Aspects considered in this section consist of sample size, missing data and normality of data.

a) Sample size and missing data

This study has 402 respondents, which is far greater than the 200 recommended by many studies. Note that the 42 observed variables involved in SEM yield a ratio of 20:1 between sample size and observed variables, which is more than the acceptable 10:1 ratio suggested by many studies. In terms of missing values, descriptive statistics in Table 6.14 shows that there are no issues with missing values for each construct; therefore, no imputation or remedy is necessary for the data.

Table 6.14: Descriptive Statistics for Missing Data

Variable	No. of Item (s)	Missing Data (%)
NATIONAL CULTURE		
Power Distance (PD)	3	0
Collectivism (C)	4	0
Uncertainty Avoidance (UA)	3	0
Masculinity (M)	3	0
Long-term Orientation (LT)	3	0
Indulgence (I)	3	0
ORGANISATIONAL CULTURE		0
Values (V)		0
Need for Security (NS)	3	0
Work Practices (P)		0
Results-Oriented (RO)	3	0
Job-Oriented (JO)	3	0
Closed System (CS)	3	0
TECHNOLOGY ACCEPTANCE		0
Perceived Usefulness (PU)	4	0
Perceived Ease of Use (PEOU)	4	0
Usage (U)	3	0

b) Normality

This section aims to shed light on the normality of variables, which is critical for the multivariate technique and inferential statistics. According to Hair et al. (2006), robust techniques are less affected when the assumption of normality is met and this assumption is critical to ensure successful analysis. In this research, the normality test was conducted for both uni-variate and multi-variate analysis as the AMOS analysis requires normality for delivering an unbiased estimation. Skewness and kurtosis values were used for univariate normality assessment, while Mardia's multi-variate kurtosis coefficient was employed for evaluation of multi-variate normality. According to Kline (2005), the guidelines of severe violation of uni-variate normality arise when skewness > 3 and kurtosis > 10 . In addition, Bollen (1989) mention that Mardia's multi-variate kurtosis must be greater than $p(p + 2)$ to indicate violation of multi-variate normality (p = number of observed variables).

The result of uni-variate normality data are presented in Table 2 (Appendix H). The skewness and kurtosis values for each item were between ± 2 , respectively, showing uni-variate normality for each item. However, uni-variate normality alone is not sufficient to ensure a good SEM model estimation in AMOS. Subsequently, Mardia's multi-variate kurtosis was preferred and the value (31.835) was indeed much lower than the threshold value of 1848 (42×44). As a result, the variables were deemed to exhibit multi-variate normality, ruling out any significant risk of bias of estimation.

c) Multi-variate outliers

The data should also be tested to identify multi-variate outliers exhibiting extreme value characteristic in each variable. As described in the previous chapter, an outlier is an observation or case, which is substantially different from other cases and not representative of the entire population. Outliers are usually retained unless they are proved to be abnormal, or not representative of any observation in the population (Hair et al. 2006). In this research, the Mahalanobis d-squared method was conducted by AMOS to detect outliers. The result presented in Table 1 (Appendix H) shows that approximately 20 cases had relatively small values in columns p1 and p2; these outliers can either be deleted or retained. According to Aryani (2009) deletion of outliers is a double-edged sword as this may improve the process of multi-variate

analysis but decrease the generalisability of the data. Accordingly, outliers in this research were retained to ensure the generalisability of data.

6.6.2 SEM model fit assessment

The SEM model fit analysis illustrated in Figure 6.15 shows satisfactory model fit with a Chi-square value of 1412.116 and normed Chi-square value of 1.880, and both RMSEA and RMR, with values of 0.047 and 0.036, are lower than 0.08. Also, both TLI and CFI values of 0.944 and 0.952 give definite evidence that the model exhibited good fit with the data. Given this positive evidence, analysis could proceed to SEM hypotheses testing. Further, Figure 6.16 illustrates a simplified structural model which provides the standardised Beta (β) coefficient for each of the regression pathways. The standardised Beta (β) coefficient indicates the impact of the relationship (Holmes-Smith 2001).

Figure 6.15: Structural Equation Model

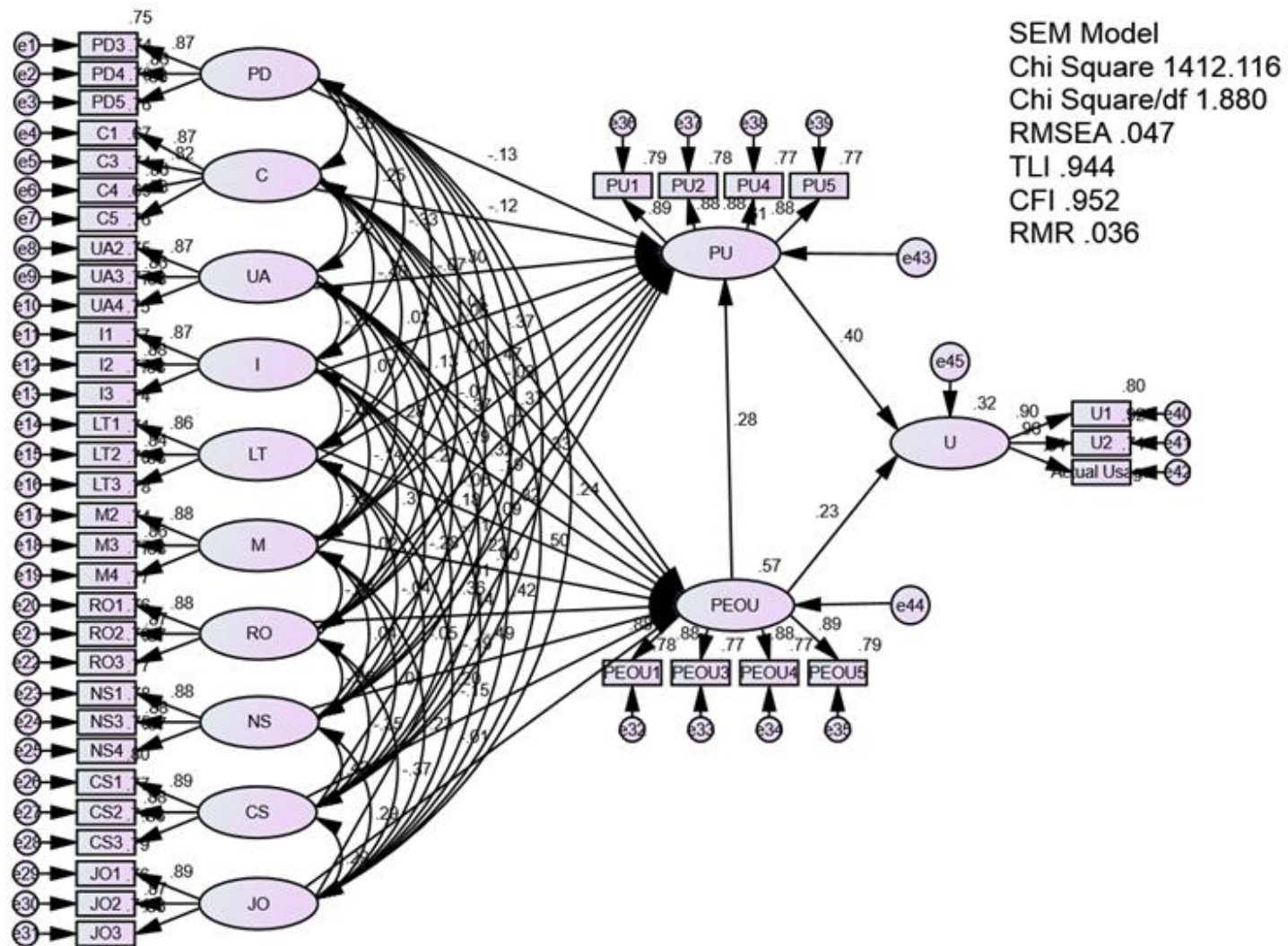
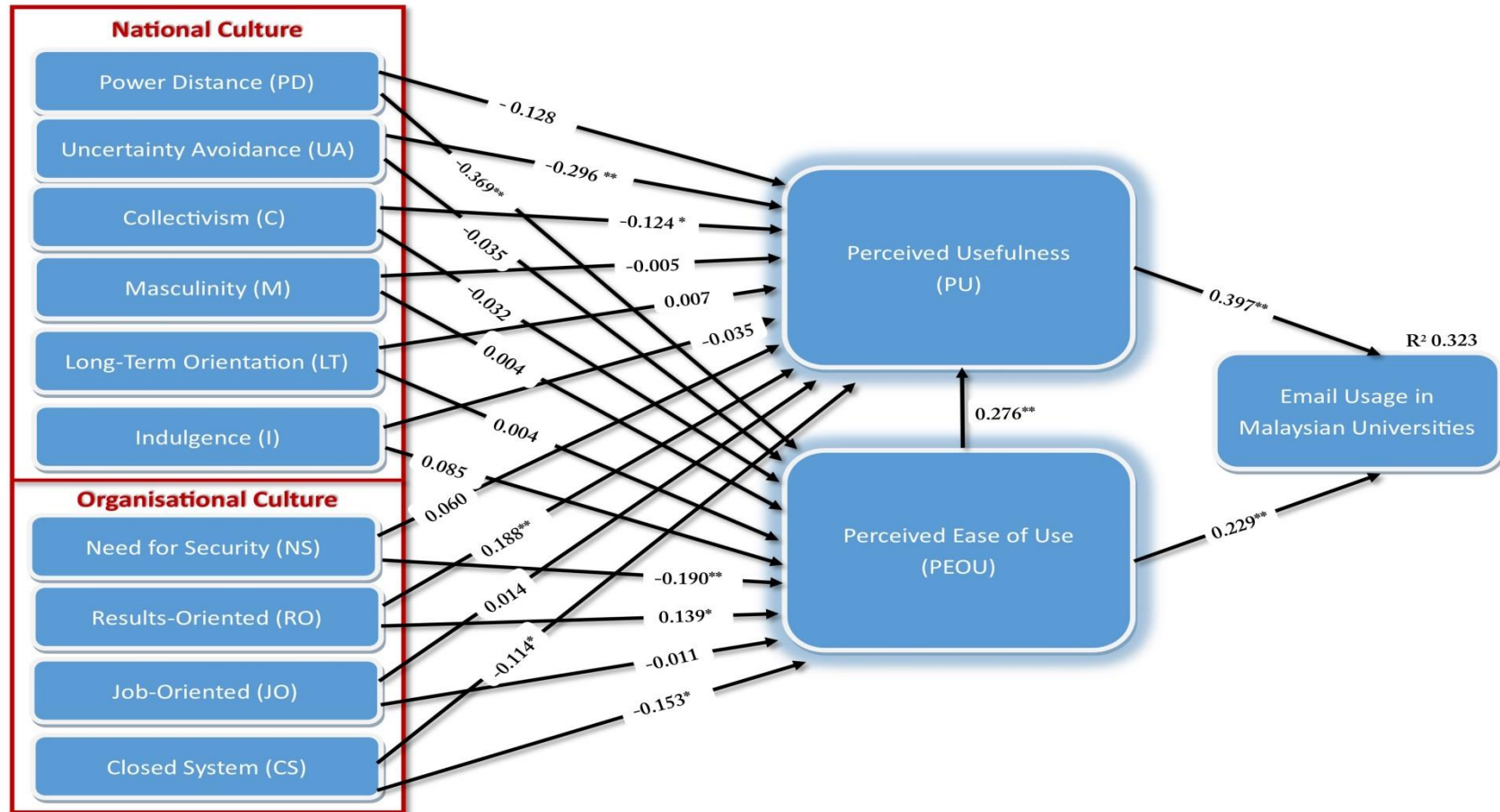


Figure 6.16: Simplified Structural Model



*P < .05, **p<.001

6.6.3 Result of SEM

Table 6.15 reports the p-values for the estimated path and found that 14 out of 23 paths were estimated to be statistically significant at the 0.05 level of significance. Perusal of the table shows that JO and M do not have any significant path connection to either PEOU or PU. The remaining exogenous dimensions had at least one significant path pointing to PEOU or PU, showing their causal relationship to email usage.

Table 6.15: Regression Weights

			B	Beta	P	Hypothesis
PEOU	<---	PD	-0.453	-0.369	<0.001	Supported
PEOU	<---	C	-0.034	-0.032	0.504	-
PEOU	<---	UA	0.072	0.067	0.139	-
PEOU	<---	I	0.213	0.193	<0.001	Supported
PEOU	<---	LT	0.086	0.085	0.036	Supported
PEOU	<---	M	0.004	0.004	0.924	-
PEOU	<---	RO	0.150	0.139	0.005	Supported
PEOU	<---	NS	-0.181	-0.190	<0.001	Supported
PEOU	<---	CS	-0.145	-0.153	0.001	Supported
PEOU	<---	JO	-0.010	-0.011	0.835	-
PU	<---	PD	-0.155	-0.128	0.014	Supported
PU	<---	C	-0.129	-0.124	0.007	Supported
PU	<---	UA	-0.315	-0.296	<0.001	Supported
PU	<---	I	-0.038	-0.035	0.467	-
PU	<---	LT	0.007	0.007	0.855	-
PU	<---	M	-0.005	-0.005	0.894	-
PU	<---	RO	0.202	0.188	<0.001	Supported
PU	<---	NS	-0.057	-0.060	0.189	-
PU	<---	CS	-0.107	-0.114	0.012	Supported
PU	<---	JO	0.013	0.014	0.779	-
PU	<---	PEOU	0.274	0.276	<0.001	Supported
U	<---	PEOU	0.241	0.229	<0.001	Supported
U	<---	PU	0.419	0.397	<0.001	Supported

Table 6.16 reports the square multiple correlations for the dependent variables, namely PU, PEOU and U. This value reflects the proportion of variance that is accounted for with a particular dependent variable or endogenous dimension by its predictors. The squared multiple correlations (R^2) reported in Table 6.16 interpreted as the predictors can explain:

- 56.9 per cent of the variance of PEOU
- 60.9 per cent of the variance of PU
- 32.3 per cent of the variance of U

Table 6.16: Squared Multiple Correlations

	Estimate
PEOU	0.569
PU	0.609
U	0.323

6.6.4 Mediation Effect of PU and PEOU

This section aims to shed light on the mediation effect of PU and PEOU on the relationship of OCM and NCM with U. The indirect effect from X to Y is the sum of all mediated effects between the source variable X and the final outcome variable Y. The total effect is the sum of the direct and indirect effects. For example, the specific effect of a source variable X on a final outcome variable Y that is mediated by a subclass of the mediators (intervening variables – more than 1) is involved in the effect of X on Y only. The evaluation of such specific effects calls for special techniques that unfortunately are not implemented in all SEM programs and require some expertise in matrix algebra (Macho & Ledermann 2011). Therefore, this study employed the phantom approach developed by Macho and Ledermann (2011) to capture the specific indirect effect of the mediation effect of the particular mediator. This approach only involved latent variables, as this will eventually force AMOS to compute the mediation effect of PU and PEOU independently through bootstrapping. Following bootstrapping with 5,000 samples, a 95 per cent bias-corrected confidence interval and maximum likelihood methods were employed. The graphical output for

the mediation effect in tandem with the phantom model for PU and PEOU are presented in Figure 6.17. Notice that the model fit indices are similar to those in Figure 6.15. The insertion of the additional variable with fixed variance and the direct effect constrained as a function of the other model parameters does not influence the estimation of parameters for the main model. Macho and Lendermann (2011) claim that the phantom model's strategy is to force the program to provide estimates and standard errors for the structural coefficient represented by the formula. Phantom model A tricks AMOS into calculating the mediation effect of PU, while phantom model B tricks AMOS into computing the specific mediation effect for PEOU as shown in Figure 6.17.

Figure 6.17: Phantom model for specific effect

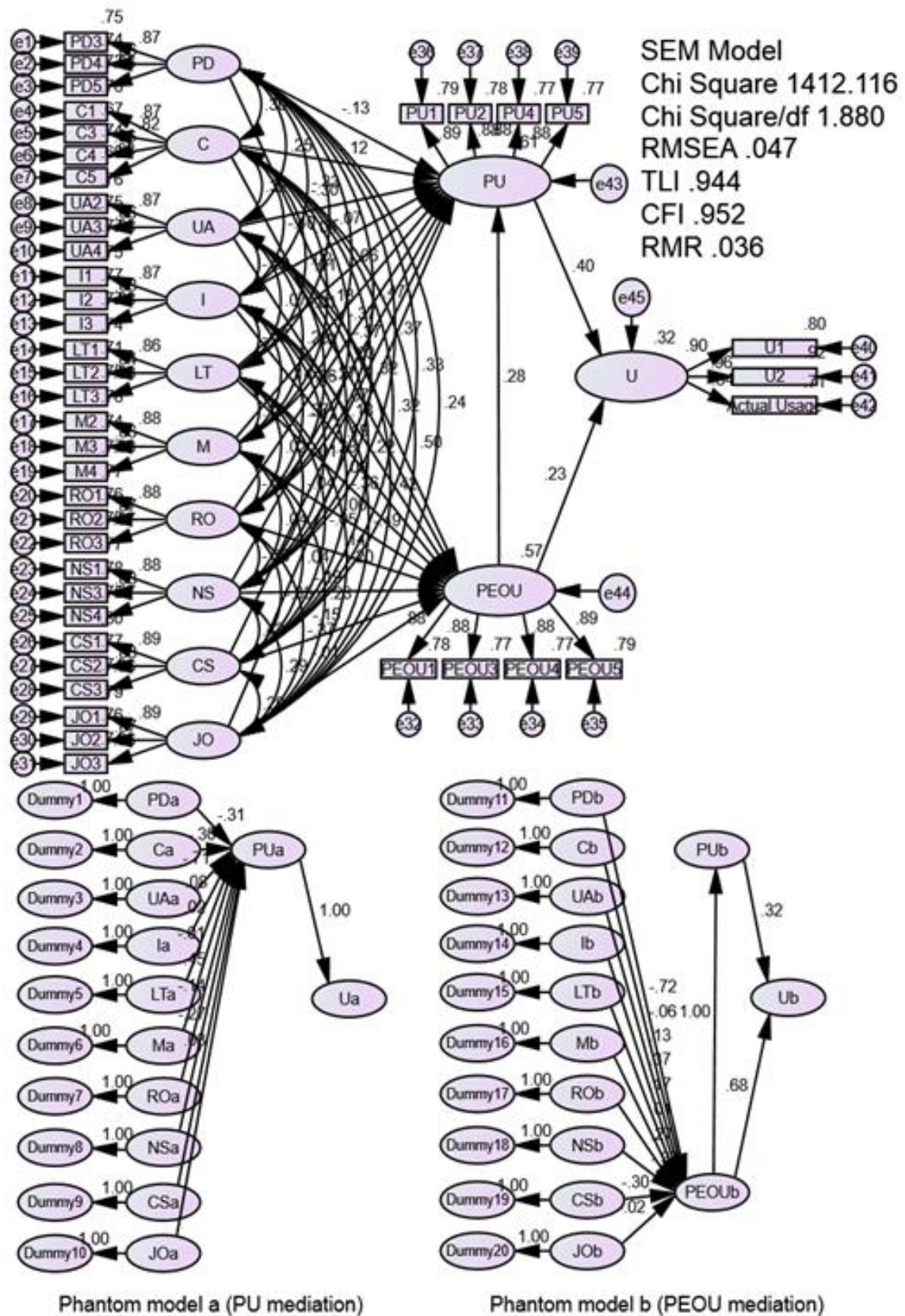


Table 6.17 presents the standardised mediation effect of PU and PEOU on each independent variable obtained from the bootstrapping method. The table shows that PU significantly mediates the relationship of CS, RO, UA, C and PD on U at the 0.05 significance level, while PEOU mediates the relationship of CS, NS, RO, LT, I and PD on U at the 0.05 significance level.

Table 6.17: Mediation Effect of PU and PEOU

	Beta(PU)	P	Mediate	Beta(PEOU)	P	Mediate
JO	0.035	0.750	No	-0.022	0.829	No
CS	-0.274	0.007	Yes	-0.297	0.001	Yes
NS	-0.144	0.185	No	-0.369	0.000	Yes
RO	0.452	0.000	Yes	0.269	0.002	Yes
M	-0.013	0.851	No	0.008	0.911	No
LT	0.017	0.834	No	0.166	0.015	Yes
I	-0.084	0.434	No	0.375	0.000	Yes
UA	-0.713	0.000	Yes	0.13	0.106	No
C	-0.298	0.003	Yes	-0.063	0.498	No
PD	-0.307	0.012	Yes	-0.717	0.000	Yes

6.7 Hypotheses Testing

6.7.1 National culture, technology acceptance model and email usage in Malaysian universities

H1a: Power distance (PD) has a significant negative relationship with perceived usefulness (PU) on email usage in Malaysian universities.

The study hypothesised that there is a significant negative relationship between power distance and perceived usefulness. Referring to Table 6.15, a Beta value of -0.128 with p-value of 0.014 provides evidence for the study to accept H1a as power distance has a significant negative relationship with perceived usefulness at the 0.05 significance level. This supports the literature on the relationship of power distance to email usage. The higher the level of power distance in a university, the lower the tendency to accept the perceived usefulness of email usage.

H1b: Uncertainty avoidance (UA) has a significant negative relationship with perceived usefulness (PU) on email usage in Malaysian universities.

It was hypothesised that there is a significant relationship between uncertainty avoidance and the perceived usefulness of email usage. The result shows a Beta value of -0.296 and p-value less than 0.001 at the 0.05 significance level, resulting in acceptance of hypothesis H1b. Therefore, the study concludes that there is a significant negative relationship of uncertainty avoidance with perceived usefulness on email usage in Malaysian universities. This means that when there is a higher uncertainty avoidance culture in a university, there is a lower level of perceived usefulness on email usage.

H1c: Collectivism (C) has a significant negative relationship with perceived usefulness (PU) on email usage in Malaysian universities.

The study hypothesised that collectivism has a significant negative relationship with the perceived usefulness of email usage. The result, that there is Beta value of -0.124 and p-value of 0.007, provides sufficient evidence to accept H1c at the 0.05 significance level. This supports the claim that there is a significant negative relationship of collectivism with perceived usefulness of email usage. This means that collectivism tends to lessen the perceived usefulness of email usage.

H1d: Masculinity (M) has a significant negative relationship with perceived usefulness (PU) on email usage in Malaysian universities.

The table shows a Beta value of -0.005 and p-value of 0.894 (more than 0.05) at the 0.05 significance level, so the study failed to accept H1d. This means that there is no significant relationship between masculinity and the perceived usefulness of email usage in Malaysian universities.

H1e: Long-term orientation (LT) has a significant positive relationship with perceived usefulness (PU) on email usage in Malaysian universities.

Referring to the results in Table 6.15, the Beta value is 0.007 and the p-value is 0.855 at the 0.05 significance level, which indicates that the study failed to accept H1e. Therefore, the study concludes that there is no significant relationship between long-term orientation and perceived usefulness of email usage in Malaysian universities.

H1f: Indulgence (I) has a significant positive relationship with perceived usefulness (PU) on email usage in Malaysian universities.

It was hypothesised that there is a significant positive relationship between indulgence and perceived usefulness of email usage. The result shows a Beta value of -0.035 and p-value of 0.467 suggesting that the study failed to accept H1f, which means that indulgence does not have a significant relationship with perceived usefulness of email usage in Malaysian universities at the 0.05 significance level.

H2a: Power distance (PD) has a significant negative relationship with perceived ease of use (PEOU) of email usage in Malaysian universities.

The study proposed that there is a significant relationship between power distance and perceived ease of use of email usage. The result of the SEM estimation shows that PD has a Beta value of -0.369 with p-value less than 0.001 at the 0.05 significance level. This is sufficient evidence to accept H2a and conclude that there is a significant negative relationship between power distance and perceived ease of use. This means that a higher power distance culture in a university leads to a lower tendency to accept the perceived ease of use of email usage.

H2b: Uncertainty avoidance (UA) has a significant negative relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.

H2b stated that there is a significant relationship between uncertainty avoidance and perceived ease of use. The result showed a Beta value of 0.067 and p-value of 0.139 at the 0.05 significance level. This evidence indicates that study failed to accept H2b and must conclude that there is no significant relationship between UA and perceived ease of use of email usage.

H2c: Collectivism (C) has a significant negative relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.

H2c looks at the relationship between collectivism and perceived ease of use with a Beta value of -0.032 and a p-value 0.504 at the 0.05 significance level. This implies that the study failed to reject H2c as null, thus there is no significant relationship between collectivism and perceived ease of use of email usage in Malaysian universities.

H2d: Masculinity (M) has a significant negative relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.

The study hypothesised that there is a significant relationship between masculinity on perceived ease of use. A Beta value of 0.004 as well as p-value of 0.924 at the 0.05 significance level, strongly suggest that study failed to accept H2d, which means that masculinity does not have a significant relationship with perceived ease of use on email usage in Malaysian universities.

H2e: Long-term orientation (LT) has a significant positive relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.

The study proposed that LT has a significant relationship with perceived ease of use for email usage in Malaysian universities. Results reported a Beta value of 0.085 and p-value of 0.036 which give definite evidence that the study can accept H2e to conclude that long-term orientation does have a positive significant relationship with perceived ease of use on email usage in Malaysian universities.

H2f: Indulgence (I) has a significant positive relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.

In H2f, the study presumes that indulgence has a significant positive relationship on the perceived ease of use of email usage. A Beta value of 0.193, together with a p-value less than 0.001 at the 0.05 significance level, indicates that this study obtained sufficient evidence to say that there is a significant positive relationship between indulgence and perceived ease of use of email usage. The higher the indulgence index in a university, the higher the tendency of the staff to accept the perceived ease of use of email usage.

6.7.2 Organisational culture, technology acceptance model and email usage in Malaysian universities

H3a: Need for security (NS) has a significant negative relationship with perceived usefulness (PU) of email usage in Malaysian universities.

Previously, the study hypothesised that there is a significant relationship between need for security and perceived usefulness. A Beta value of -0.060 and p-value of

0.189 suggest that the study failed to accept H3a and concludes that there is no significant relationship between need for security and perceived usefulness of email usage in Malaysian universities.

H3b: Results-oriented (RO) has a significant positive relationship with perceived usefulness (PU) of email usage in Malaysian universities.

Results-oriented has a positive Beta value of 0.188 with p-value less than 0.001, thus providing sufficient evidence to accept H3b and the claim that there is a significant positive relationship between results-orientation and perceived usefulness of email usage. This means that a results-oriented university tends to have a higher tendency of perceived usefulness of email usage as compared to a process-oriented university.

H3c: Job-oriented (JO) has a significant negative relationship with perceived usefulness (PU) of email usage in Malaysian universities.

The study hypothesised that job-oriented has a significant relationship with perceived usefulness of email usage. JO has a Beta value of 0.014 with a p-value of 0.779, suggesting that the study failed to accept H3c as null and concludes that there is no significant relationship between job-oriented and perceived usefulness of email usage in Malaysian universities.

H3d: Closed system (CS) has a significant negative relationship with perceived usefulness (PU) of email usage in Malaysian universities.

Based on the hypothesis proposed, closed system is deemed to have a significant relationship with perceived usefulness of email usage. A negative Beta value of -0.114, with a p-value of 0.012, implies that the study can accept H3d and conclude that closed system has a significant negative relationship with perceived usefulness at the 0.05 significance level. Accordingly, this means that a closed system university will more likely exhibit low perceived usefulness of email usage compared to a university with an open system.

H4a: Need for security (NS) has a significant negative relationship with perceived ease of use (PEOU) of email usage in Malaysian universities.

H4a suggests that need for security has a significant relationship with perceived ease of use of email usage. Based on the result, NS has a negative Beta value of 0.190 and p-value less than 0.001, which provides evidence to accept H4a and conclude that need for security has a significant negative relationship with perceived ease of use in the context of email usage. This means that a high level of need of security in a university lowers the tendency of its staff to view the perceived ease of use of email usage.

H4b: Results-oriented (RO) has a significant positive relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.

As far as the results-oriented dimension is concerned, results showed that RO has a Beta value 0.139 with a p-value of 0.005. This finding suggest that study has sufficient support to accept H4b at the 0.05 significance level and conclude that there is a significant positive relationship between results-oriented and perceived ease of use of email usage in Malaysian universities. This means that a results-oriented university is more likely to exhibit higher acceptance of perceived ease of use with regard to email usage.

H4c: Job-oriented (JO) has a significant negative relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.

In terms of job-oriented dimension, the study hypothesised that JO has a significant relationship with perceived ease of use pertinent to email usage. Based on the table, results showed that JO has a Beta value of -0.011 and p-value of 0.835, indicating that the study failed to accept H4c. Therefore, it can be concluded that there is no significant relationship between job-oriented and perceived ease of use of email usage in Malaysian universities.

H4d: Closed system (CS) has a significant negative relationship with perceived ease of use (PEOU) of email usage in Malaysian universities.

The study proposed that a closed system has a significant impact on perceived ease of use related to email usage. Results showed that CS has a negative Beta value of

0.153 and p-value of 0.001, which is basically significant at the 0.05 significance level. So, the study can accept H4d and conclude that there is a significant negative relationship between closed system and perceived ease of use of email usage. This means that a university implementing a closed system will tend to have lower perceived ease of use for email usage compared to a university with an open system.

6.7.3 Technology acceptance model on email usage in Malaysian universities

H5a: Perceived ease of use (PEOU) has a significant positive relationship with perceived usefulness (PU) on email usage in Malaysian universities.

Perceived ease of use showed a Beta value of perceived usefulness of 0.276 with p-value less than 0.001. Therefore, the researcher concludes that there is a significant positive relationship between perceived ease of use and perceived usefulness. This is to say, a university with a higher perceived ease of use will more likely believe in the perceived usefulness of email usage.

H5b: Perceived ease of use (PEOU) has a significant positive relationship with email usage (U) in Malaysian universities.

Perceived ease of use has a Beta value of 0.229 with p-value less than 0.001, suggesting that the study obtained sufficient evidence to accept H5b at the 0.05 significance level. It can be concluded that perceived ease of use has a significant positive relationship with email usage. This means that a university with a higher perceived ease of use tends to have higher email usage.

H5c: Perceived usefulness (PU) has a significant positive relationship with email usage (U) in Malaysian universities.

The study proposed that perceived usefulness has a significant relationship with email usage in Malaysian universities. Results show that perceived usefulness has a Beta value of 0.397 and p-value less than 0.001, which provides sufficient evidence to accept H5c at the 0.05 significance level. As a result, the study concludes that perceived usefulness has a significant positive relationship with email usage in Malaysian universities. This means that when workers tend to rate the perceived usefulness of email highly they also exhibit higher levels of actual email usage.

6.7.4 Email usage (U) difference by demographic factors

The Kruskal test and Mann-Whitney U test investigated the influence of demographic profile on U. Prior to this, a normality test of demographic groups showed that one variable did not pass the normality test, hence, a non-parametric test was conducted to select the relevant demographic factors. The summary of results of the comparison of mean ranks is given in Table 6.18.

Table 6.18: Differences of Email Usage (U) by Demographic Factor

Race	Mean Rank	Chi Square	p-value
Malay	187.94	17.704	0.001
Chinese	237.83		
Indian	253.54		
Other	146.8		
Religion	Mean Rank	Chi Square	p-value
Muslim	187.03	19.081	0.001
Buddhist	247.74		
Hindu	220.04		
Christian	236		
Other	168		
Age	Mean Rank	Chi Square	p-value
20-25 years	277.36	22.474	0.004
26-30 years	199.09		
31-35 years	203.4		
36-40 years	179.7		
41-45 years	178.68		
46-50 years	212.66		
51-55 years	157.31		
56-60 years	179.71		
Over 60 years	241.5		
Gender	Mean Rank	Z	p-value
Male	198.64	-0.454	0.65
Female	203.84		

Location	Mean Rank	Z	p-value
Metropolitan	194.06	-1.379	0.168
Non-Metropolitan	209.8		
Type of Organisation	Mean Rank	Z	p-value
Public	145.91	-10.563	<0.001
Private	266.7		

It must be noted here that the actual usage variable was converted to a 1-5 scale prior to testing the six hypotheses related to demographic factors. This is because U1 and U2 employed a 1-5 scale while actual usage employed a 1-7 scale, so they need to be converted into a comparable scale to obtain a valid mean score of U.

H6a: Organisation type (public or private) has a significant relationship with email usage in Malaysian universities.

Table 6.18 shows a Z value of -10.563 with p-value less than 0.001, thus the study accepted H6a, saying that organisation type of university did influence email usage in Malaysian universities. Further examination of mean rank showed that private universities have higher email usage compared to public universities.

H6b: Race has a significant relationship with email usage in Malaysian universities.

As can be seen in Table 6.18 above, a Chi-square value of 17.704 and p-value of 0.001 indicate that the study can accept H6b to conclude that race has a significant relationship with U in Malaysian universities. Based on the mean rank values, it is obvious that Chinese and Indian staff have higher email usage, followed by Malays and other races.

H6c: Religion has a significant relationship with email usage in Malaysian universities.

Results for this hypothesis show a Chi-square value of 19.081 and p-value of 0.001, indicating that the study accepts H6c at the 0.05 significance level, leading to the conclusion that religion has a significant relationship with U. Once again, referring to Table 5.18, Buddhist, Hindu and Christian workers have relatively higher email

usage (refer to the mean rank) compared to Muslim and other religions. This result was not unexpected as respondents' religion is highly dependent on race, which was already shown to be a significant demographic variable.

H6d: Age has a significant relationship with email usage in Malaysian universities.

The table shows a Chi-square value of 22.474 and p-value of 0.004. This suggests that the study can accept H6d at the 0.05 significance level to conclude that respondents' age has a significant relationship with U. Table 6.18 shows that respondents from age group 20-25 years old have the highest email usage, followed by those over 60 years, 46-50 years, 31-35 years, 26-30 years, 56-60 years, 36-40 years, 41-45 years and lastly 51-55 years. The data shows that the highest mean age is for 20-25 years. The effect of the age variable on email usage in Malaysian universities shows that the younger non-academic executives (20-25 years old) are the most willing to use email. However, for other age ranges, the results are mixed. It is important to stress that even though the range 60 years and above is at the second-highest level, this age range represents only two respondents. Consequently, no conclusions of significance can be drawn from this data.

H6e: Gender has a significant relationship with email usage in Malaysian universities.

Perusal of table 6.18 with a Z value of -0.454 and p-value of 0.65 shows that H6e cannot be accepted. This leads to the conclusion that respondents' gender does not have a significant relationship with email usage. This shows that gender is an insignificant demographic variable in terms of email usage in Malaysian universities.

H6f: Location has a significant relationship with email usage in Malaysian universities.

The study failed to accept H6f at the 0.05 significance level as the Z value was -1.379 with a p-value of 0.168. This leads the study to conclude that location of university does not have a significant relationship with email usage. In other words, email usage does not differ between metropolitan and non-metropolitan universities.

6.7.5 Mediation effect of perceived usefulness (PU)

H7a: Perceived usefulness (PU) mediates the relationship between power distance (PD) and email usage (U).

This study hypothesised that there is a significant mediation effect of PU on the relationship between power distance and usage. Referring to Table 6.17, a Beta value of -0.307 with p-value of 12 provides evidence for the study to accept H7a and to conclude that PU mediates the relationship between power distance and email usage at the 0.05 significance level.

H7b: Perceived usefulness (PU) mediates the relationship between uncertainty avoidance (UA) and email usage (U).

It was hypothesised that there is a significant mediation effect of PU on the relationship between uncertainty avoidance and email usage. The result show a Beta value of -0.713 and p-value less than 0.001, resulting in rejection of null hypothesis H7b. Thus, this study concludes that there is a significant mediation effect of PU on the impact of uncertainty avoidance on email usage in Malaysian universities at the 0.05 significance level.

H7c: Perceived usefulness (PU) mediates the relationship between collectivism (C) and email usage (U).

The study hypothesised that PU has a significant effect of mediation on the relationship between collectivism (C) and email usage. The result illustrated a Beta value of -0.298 and p-value of 0.003, which provides sufficient evidence to reject H7c as null at the 0.05 significance level and support the claim that there is a significant mediation effect of PU on the impact of collectivism on email usage.

H7d: Perceived usefulness (PU) mediates the relationship between masculinity (M) and email usage (U).

A Beta value of -0.013 and p-value of 0.851 (more than 0.05) show that the study failed to reject H7d as null at the 0.05 significance level. Thus, there is no significant effect of mediation for PU on the relationship between masculinity and email usage in Malaysian universities at the 0.05 significance level.

H7e: Perceived usefulness (PU) mediates the relationship between long-term orientation (LT) and email usage (U).

Looking at the results in Table 6.17, a Beta value of -0.017 and p-value of 0.834 indicate that the study failed to reject H7e as null at the 0.05 significance level. Therefore, the study concludes that there is no significant mediation effect of PU on the relationship of long-term orientation on email usage in Malaysian universities at the 0.05 significance level.

H7f: Perceived usefulness (PU) mediates the relationship between indulgence (I) and email usage (U).

It was hypothesised that there is a significant mediation effect of PU on the relationship between indulgence and email usage. The result shows a Beta value of -0.084 and p-value of 0.434, suggesting that study failed to reject H7f as null. Hence, PU does not mediate the effect of indulgence on email usage in Malaysian universities at the 0.05 significance level.

H7g: Perceived usefulness (PU) mediates the relationship between need for security (NS) and email usage (U).

The study hypothesised that there is a significant mediation effect of PU on the relationship between need for security and email usage. Based on the results, a Beta value of -0.144 and p-value of 0.186, the study failed to reject H7g as null. This means that there is no significant mediation effect of PU on the relationship between need for security and email usage at the 0.05 significance level.

H7h: Perceived usefulness (PU) mediates the relationship between results-oriented (RO) and email usage (U).

Results show that PU has a significant mediation effect with a Beta value of 0.452 with p-value less than 0.001, thus providing sufficient evidence to reject H7h as null and claim that PU significantly mediates the influence of RO on email usage in Malaysian university at the 0.05 significance level.

H7i: Perceived usefulness (PU) mediates the relationship between job-oriented (JO) and email usage (U).

The study hypothesised that PU mediates the influence of job-oriented on email usage in Malaysian universities. A Beta value of -0.035 with a p-value of 0.750 suggest that the study failed to reject H7i as null, to conclude that there is no significant mediation effect of PU on the influence of JO on email usage in Malaysian universities at the 0.05 significance level.

H7j: Perceived usefulness (PU) mediates the relationship between closed system (CS) and email usage (U).

PU was deemed to mediate the relationship of a closed system on email usage. Result reports a negative Beta value of 0.274 with a p-value of 0.007, indicates rejection of H7j as null and concludes that PU has a significant mediation effect on the relationship between CS and email usage at the 0.05 significance level.

6.7.6 Mediation effect of perceived ease of use (PEOU)

H8a: Perceived ease of use (PEOU) mediates the relationship between power distance (PD) and email usage (U).

The study hypothesised that there is a significant mediation effect of PEOU on the relationship between power distance and usage. Referring to Table 6.17, a Beta value of -0.717 with a p-value less than 0.001 provides evidence for the study to reject H8a as null and concludes that PEOU mediates the relationship between power distance and email usage at the 0.05 significance level.

H8b: Perceived ease of use (PEOU) mediates the relationship between uncertainty avoidance (UA) and email usage (U).

It was hypothesised that there is a significant mediation effect of PEOU on the relationship between uncertainty avoidance and email usage. A Beta value of -0.13 and p-value of 0.106 suggest that the study failed to reject null hypothesis H8b. Thus, the study concludes that there is no significant mediation effect of PEOU on the relationship of uncertainty avoidance on email usage in Malaysian universities at the 0.05 significance level.

H8c: Perceived ease of use (PEOU) mediates the relationship between collectivism (C) and email usage (U).

The study hypothesised that PEOU has a significant effect of mediation on the relationship between collectivism (C) and email usage. A Beta value of -0.063 and p-value of 0.498 suggest that the study failed to reject H8c as null at the 0.05 significance level and, thus, there is no significant mediation effect of PEOU on the relationship of collectivism to email usage.

H8d: Perceived ease of use (PEOU) mediates the relationship between masculinity (M) and email usage (U).

Based on Table 6.17, a Beta value of 0.008 and p-value of 0.911 (more than 0.05) show that the study failed to reject H8d as null at the 0.05 significance level, thus there is no significant effect of mediation for PEOU on the relationship between masculinity and email usage in Malaysian universities at the 0.05 significance level.

H8e: Perceived ease of use (PEOU) mediates the relationship between long-term orientation (LT) and email usage (U).

Looking at the result in Table 6.17, a Beta value of 0.166 and p-value of 0.015 indicate that the study can reject H8e as null at the 0.05 significant level. Therefore, the study concludes that there is a significant mediation effect of PEOU on the effect of LT on email usage in Malaysian universities at the 0.05 significance level.

H8f: Perceived ease of use (PEOU) mediates the relationship between indulgence (I) and email usage (U).

It was hypothesised that there is a significant mediation effect of PEOU on the relationship between indulgence and email usage. The result shows a Beta value of 0.375 and p-value less than 0.001, suggesting that the study can reject H8f as null and conclude that PEOU significantly mediates the relationship of indulgence and email usage in Malaysian universities at the 0.05 significance level.

H8g: Perceived ease of use (PEOU) mediates the relationship between need for security (NS) and email usage (U).

The study hypothesised that there is a significant mediation effect of PEOU on the relationship between need for security and email usage. A Beta value of -0.369 and p-value of less than 0.01 suggest that the study can reject H8g as null and accept that there is a significant mediation effect of PEOU on the relationship between NS and email usage at the 0.05 significance level.

H8h: Perceived ease of use (PEOU) mediates the relationship between results-oriented (RO) and email usage (U).

A Beta value of 0.269 with p-value less than 0.001 provide sufficient evidence to reject H8h as null for the study to claim that PEOU significantly mediates the influence of RO on email usage in Malaysian universities at the 0.05 significance level.

H8i: Perceived ease of use (PEOU) mediates the relationship between job-oriented (JO) and email usage (U).

The study hypothesised that PEOU mediates the influence of job-oriented on email usage in Malaysian universities. A Beta value of -0.022 with p-value 0.829 means that there is no significant mediation effect of PEOU on the influence of JO on email usage in Malaysian universities at the 0.05 significance level.

H8j: Perceived ease of use (PEOU) mediates the relationship between closed system (CS) and email usage (U).

It was hypothesised that PEOU mediates the relationship of a closed system on email usage. The result reports a negative Beta value of 0.297 with a p-value of 0.001, implying that the study has rejected H8j as null. This means that PEOU has a significant mediation effect on the relationship between CS and email usage at the 0.05 significance level.

The results of the analyses for all the hypotheses of the study are summarised below in Table 6.19:

Table 6.19: Summary of Hypothesis Testing Results

Hypothesis	Supported
National Culture, Technology Acceptance Model on Email Usage in Malaysian Universities	
H1a: Power distance (PD) has a significant negative relationship with perceived usefulness (PU) on email usage in Malaysian universities.	Yes
H1b: Uncertainty avoidance (UA) has a significant negative relationship with perceived usefulness (PU) on email usage in Malaysian universities.	Yes
H1c: Collectivism (C) has a significant negative relationship with perceived usefulness (PU) on email usage in Malaysian universities.	Yes
H1d: Masculinity (M) has a significant negative relationship with perceived usefulness (PU) on email usage in Malaysian universities.	No
H1e: Long-term orientation (LT) has a significant positive relationship with perceived usefulness (PU) on email usage in Malaysian universities.	No
H1f: Indulgence (I) has a significant positive relationship with perceived usefulness (PU) on email usage in Malaysian universities.	No
H2a: Power distance (PD) has a significant negative relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.	Yes
H2b: Uncertainty avoidance (UA) has a significant negative relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.	No
H2c: Collectivism (C) has a significant negative relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.	No
H2d: Masculinity (M) has a significant negative relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.	No
H2e: Long-term orientation (LT) has a significant positive relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.	Yes
H2f: Indulgence (I) has a significant positive relationship with perceived ease of use (PEOU) on email usage in Malaysian universities.	Yes

Hypothesis	Supported
Organisational Culture, Technology Acceptance Model on Email Usage in Malaysian Universities	
H3a: Need for security (NS) has a significant negative relationship with perceived usefulness (PU) on email usage in Malaysian universities.	No
H3b: Results-oriented (RO) has a significant positive relationship with perceived usefulness (PU) on email usage in Malaysian universities.	Yes
H3c: Job-oriented (JO) has a significant negative relationship with perceived usefulness (PU) on email usage in Malaysian universities.	No
H3d: Closed system (CS) has a significant negative relationship with perceived usefulness (PU) on email usage in Malaysian universities.	Yes
H4a: Need for security (NS) has a significant negative relationship with Perceived Ease of Use (PEOU) on email usage in Malaysian universities.	Yes
H4b: Results-oriented (RO) has a significant positive relationship with Perceived Ease of Use (PEOU) on email usage in Malaysian universities.	Yes
H4c: Job-oriented (JO) has a significant negative relationship with Perceived Ease of Use (PEOU) on email usage in Malaysian universities.	No
H4d: Closed system (CS) has a significant negative relationship with Perceived Ease of Use (PEOU) on email usage in Malaysian universities.	Yes
Technology Acceptance Model on Email Usage in Malaysian Universities	
H5a: Perceived ease of use (PEOU) has a significant positive relationship with perceived usefulness (PU) on email usage in Malaysian universities.	Yes
H5b: Perceived ease of use (PEOU) has a significant positive relationship with email usage (U) in Malaysian universities.	Yes
H5c: Perceived usefulness (PU) has a significant positive relationship with email usage (U) in Malaysian universities.	Yes
Demographic Factors on Email Usage in Malaysian Universities	
H6a: Organisation type (public or private) has a significant relationship with email usage in Malaysian universities.	Yes

Hypothesis	Supported
H6b: Race has a significant relationship with email usage in Malaysian universities.	Yes
H6c: Religion has a significant relationship with email usage in Malaysian universities.	Yes
H6d: Age has a significant relationship with email usage in Malaysian universities.	Yes
H6e: Gender has a significant relationship with email usage in Malaysian universities.	No
H6f: Location has a significant relationship with email usage in Malaysian universities.	No
Mediation Effect of Perceived Usefulness (PU)	
H7a: Perceived usefulness (PU) mediates the relationship between power distance (PD) and email usage (U).	Yes
H7b: Perceived usefulness (PU) mediates the relationship between uncertainty avoidance (UA) and email usage (U).	Yes
H7c: Perceived usefulness (PU) mediates the relationship between collectivism (C) and email usage (U).	Yes
H7d: Perceived usefulness (PU) mediates the relationship between masculinity (M) and email usage (U).	No
H7e: Perceived usefulness (PU) mediates the relationship between long-term orientation (LT) and email usage (U).	No
H7f: Perceived usefulness (PU) mediates the relationship between indulgence (I) and email usage (U).	No
H7g: Perceived usefulness (PU) mediates the relationship between need for security (NS) and email usage (U).	No
H7h: Perceived usefulness (PU) mediates the relationship between results-oriented (RO) and email usage (U).	Yes
H7i: Perceived usefulness (PU) mediates the relationship between job-oriented (JO) and email usage (U).	No
H7j: Perceived usefulness (PU) mediates the relationship between closed system (CS) and email usage (U).	Yes
Mediation Effect of Perceived Ease of Use (PEOU)	
H8a: Perceived ease of use (PEOU) mediates the relationship between power distance (PD) and email usage (U).	Yes

Hypothesis	Supported
H8b: Perceived ease of use (PEOU) mediates the relationship between uncertainty avoidance (UA) and email usage (U).	No
H8c: Perceived ease of use (PEOU) mediates the relationship between collectivism (C) and email usage (U).	No
H8d: Perceived ease of use (PEOU) mediates the relationship between masculinity (M) and email usage (U).	No
H8e: Perceived ease of use (PEOU) mediates the relationship between long- term orientation (LT) and email usage (U).	Yes
H8f: Perceived ease of use (PEOU) mediates the relationship between indulgence (I) and email usage (U).	Yes
H8g: Perceived ease of use (PEOU) mediates the relationship between need for security (NS) and email usage (U).	Yes
H8h: Perceived ease of use (PEOU) mediates the relationship between results-oriented (RO) and email usage (U).	Yes
H8i: Perceived ease of use (PEOU) mediates the relationship between job-oriented (JO) and email usage (U).	No
H8j: Perceived ease of use (PEOU) mediates the relationship between closed system (CS) and email usage (U).	Yes

6.8 Conclusion

From the detailed analysis of all aspects of the collected data, this study can conclude that type of university is a significant factor correlated with the level of email usage – private universities in Malaysia tend to have higher email usage than their public counterparts. Besides that, respondents' race was found to have a significant effect on email usage as Chinese and Indian workers tend to have higher email usage compared to Malays and other races. All issues of normality, validity and reliability in the conceptual model were addressed before the hypotheses were tested with SEM. In terms of the hypothesised relationships, all independent dimensions have a significant relationship on either PEOU or PU or both, except JO and M. The next chapter proceeds to a critical discussion of these results in terms of their implications for the research objectives.

CHAPTER 7

DISCUSSION AND CONCLUSION

7.1 Introduction

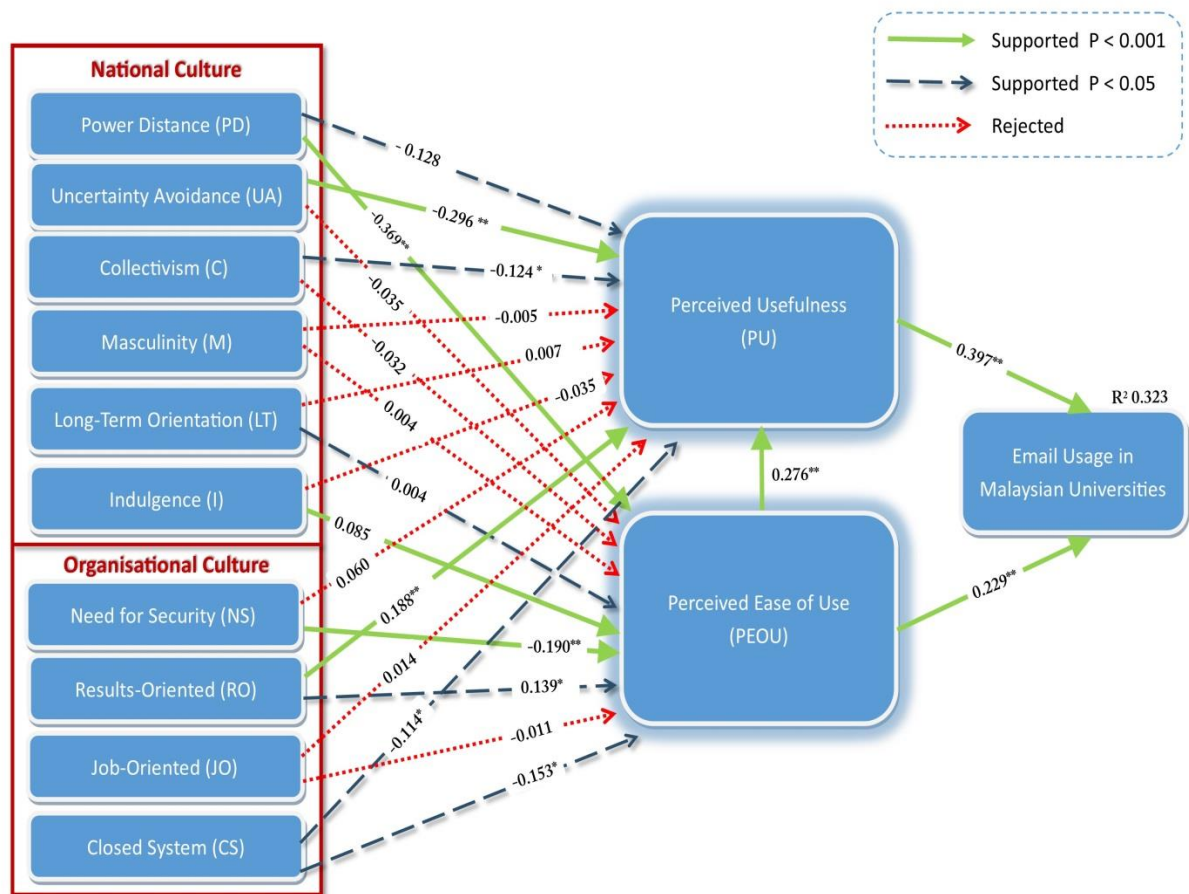
This research was designed to provide an understanding of email usage by non-academic staff at public and private universities in Malaysia. To this end, the thesis established a conceptual framework based on the technology acceptance model (TAM) and Hofstede's National and Organisational Culture theory. The model linked demographic data and technology usage data according to Hofstede's theory of culture which uses binary terms such as masculine/feminine, process-oriented/results-oriented etc. to conceptualise national/organisational culture along with the TAM. The data gathered in the surveys from respondents at the participating universities were analysed using the Software Package for Social Science (SPSS) with Structural Equation Modelling (SEM) and the process as well as the results of the analyses were extensively reviewed in Chapter 5 and 6. This final chapter will proceed to a critical discussion of the results of analysis and review the implications of the findings for the research problem at hand.

The first section begins with a comprehensive list of the results from data analysis for each hypothesis along with an explanation of the findings in relation to other studies. Next, the chapter will elaborate the implications of the findings for each hypothesis in relation to the academic research on technology acceptance and email usage as well as the practical context of promoting email communication in Malaysian universities. As with any research, this chapter was constrained by some limitations, which are discussed in the final concluding note to the thesis, along with some possible avenues for future research to extend the findings of this study and enhance further understanding of the topic at hand.

7.2 Summary of Results

This study integrated Hofstede's model of National and Organisational Culture with the TAM to explore variances in email usage in Malaysian universities. Specifically, the study posited that certain dimensions of national culture, namely, power distance (PD), uncertainty avoidance (UA), collectivism (C), long-term orientation (LT) and indulgence (I), have a relationship with at least one or both constructs of the TAM, perceived ease of use (PEOU) and perceived usefulness (PU) of email usage. The second set of hypotheses posited that dimensions of organisational culture, including, need for security (NS), results-oriented (RO) and closed system (CS) have a significant relationship with PEOU or PU – or both – of email usage among organisational members. In turn, it was found that the resultant levels of PEOU and PU in the TAM have significant relationships with email usage. The next set of hypotheses explored the relationship of the demographic factors of organisation type as well as the age, gender, location, race and religion of organisational members with email usage in Malaysian universities. Finally, the study explained the role of the mediation effect of the PU and PEOU on the relationships of national/organisational cultures and email usage. The previous chapter demonstrated the various analytical procedures conducted on the data and reported the findings for all of the hypotheses underlying the study. The results of the analyses for all the hypotheses of the study are summarised in Figure 7.1.

Figure 7.1: Causal Connection and Results of the Hypotheses



Apart from understanding the factors correlated with email usage, this study focussed on the differences in email adoption between private and public universities in Malaysia, which have been reported or indicated in previous research but have not been explained in detail. The table below lists the difference between public and private universities on all the parameters underlying the measurement of email adoption in this study.

The results of the analysis for all the hypotheses are explained in detail in the next few sections, with each section dedicated to one class of hypotheses. This includes a critical discussion of how the positive or negative evidence for each of hypothesis listed can be interpreted in relation to the research problem and how the differences between public/private universities on the different variables, listed in the Table 7.1, explain variations in email usage between these institutions.

Table 7.1: Measurements of Variables Between Malaysian Public and Private Universities

National Culture	Public Universities	Private Universities
Power distance (PD)	Higher	Lower
Uncertainty avoidance (UA)	Higher	Lower
Collectivism (C)	Higher	Lower
Masculinity (M)	Higher	Lower
Long-term orientation (LT)	About the same	About the same
Indulgence (I)	Lower	Higher
Organisational Culture	Public Universities	Private Universities
(Value) Need of security (NS)	Higher	Lower
(Practices) Results-oriented (RO)	Lower	Higher
(Practices) Job-oriented (JO)	Higher	Lower
(Practices) Closed system (CS)	Higher	Lower
Technology Acceptance Model	Public Universities	Private Universities
Perceived usefulness (PU)	Lower	Higher
Perceived ease of use (PEOU)	Lower	Higher
Usage (U)	Lower	Higher

7.3 National Culture and TAM in Malaysian Public and Private Universities

7.3.1 Power Distance (PD)

The first of Hofstede's dimensions of national culture, PD, is of particular importance for this research as it has been shown to be the most significant for research in technology adoption for communication purposes. As outlined in the literature review in section 3.2.3, Huang et al. (2003) argued that PD is a critical dimension for email research because of its theoretical connection to communication behaviour and email should be treated primarily as a topic within communication research. This is because communication via email among organisational members would place individuals of different social strata on a par with each other (Huang et al. 2003). The results of this research are consistent with the previous research done on the effect of PD on email usage by Huang et al. (2003) and Mutlu and Ergeneli (2012), which posit a negative relationship between PD and subjective norm and email usage.

This study found that PD had a significant negative relationship with PEOU and PU of email usage among non-academic executives in Malaysian universities. The higher the level of power distance in a university, the lower is the effect of PEOU and PU on email. Moreover, the finding also suggested that both PU and PEOU significantly mediate the relationship between PD and email usage. This is echoed by Saribagloo et al. (2011) who found that PD had an indirect negative influence through PEOU and PU on computer use as discussed in section 3.2.3.

This study indicated that Malaysian public universities have a higher PD than those in private universities. This finding is in line with a study done by Cheng (1999) which suggested the different levels of PD within Malaysian organisations. In addition, a recent study conducted by Ramachandran et al. (2011) also indicated that public universities in Malaysia display higher levels of hierarchy-based culture compared with private universities. Since public universities in Malaysia are government organisations, loyalty to the respective HEIs is perceived as loyalty to the government (Ramachandran et al. 2011, p. 627). The higher PD in public universities meant that there was lower perception of PEOU and PU of email usage in public universities. Moreover, PU and PEOU also significantly mediated the relationship between PD and email usage. This might possibly be one reason why non-academic staff in Malaysian public universities have lower email usage than private universities.

7.3.2 Uncertainty Avoidance (UA)

As the name of the dimension suggests, UA indicates the extent to which people in a certain culture act in a way that ensures messages and behaviours are clear and unambiguous. From this, it can be inferred that people in high UA cultures would prefer forms of communication which emphasised clarity and certainty to a more distant modes of communication. As outlined in the literature review in section 3.2.3, it has been argued that many previous studies have suggested that UA has a negative relationship with innovation and technology acceptance (Adapa 2008; Kaasa & Vadi 2008; Matusitz & Musambira 2013; Saribagloo et al. 2011; Williams & McGuire 2005). However, again as highlighted in section 3.2.3, there have been some studies

which suggested no significant relationship between UA and technology acceptance (Akour et al. 2006; Al-Sukkar 2005).

This study found contradictory results about the relationship of UA on email usage, as the hypothesis posited the negative relationship of this cultural dimension with PU was proved but rejected for PEOU. The same was true with the finding on the mediation effect of PEOU and PU where PU was found to be significantly mediating the relationship between UA and email usage while PEOU did not significantly mediate that relationship. In other words, the higher the level of UA in a university, the lower the effect of PU on email among non-academic staff in that university.

The affirmative evidence for a negative relationship was consistent with the basic theoretical contention about UA and some empirical studies on technology adoption and email usage. Adapa (2008) found that there was a negative relationship between UA and the adoption of internet shopping patterns among Indian women residing in Australia. The same holds true for Saribagloo et al. (2011) who suggested that UA had an indirect negative influence (through PEOU and PU) on computer use.

However, it must be noted that some other studies have found UA to be insignificant. Akour et al. (2006) suggested that UA had no significant relationship with Jordanian bank managers' intentions to use the internet. Al-Sukkar's (2005) study on bank managers in Jordan on internet banking suggested no relationship between UA, PU and PEOU and internet banking. As this study found no relationship between UA and PEOU on email usage, the contradictory evidence about UA also reflected the divergence in the findings of previous studies.

This study found that public universities have higher UA than private universities in Malaysia. This finding is in line with Cheng's (1999) argument that there were different levels of UA within Malaysian organisations. This was possibly due to the different working environments in each sector. Public universities are fully funded and controlled by the government (Hassan 2006), which had possibly created an environment of rule observance and risk avoidance. In contrast, private universities were more business-oriented and operated independently with minimal intervention

from government (Ramachandran et al. 2011). Although no argument could be made in relation to PEOU, it could be asserted that the higher UA in public universities was correlated with a tendency of lesser PU of email in public universities than private universities, and this might possibly be one of the reasons why Malaysian public universities have lower email usage than private universities.

7.3.3 Collectivism (C)

Hofstede's explanation in relation to this dimension stated that individuals working in cultures which emphasised on collectivism placed less priority on their own needs and were more prepared to tolerate lower usability for the sake of achieving goals important to others (McCoy et al. 2007). Earlier (in section 3.2.3), it was stated that Hofstede et al. (2010) considered individualistic cultures as being more inclined to email adoption compared to collectivist cultures where emails were less attractive and were used less frequently. As discussed in the same section, many recent studies confirmed that higher individualism contributed to a higher innovation rate (Kaasa & Vadi 2008; Willems 2007). As a result, collectivism was considered to have a negative influence on technology acceptance (Chattalas & Reyes 2008; Hofstede et al. 2010).

This study had found that collectivism has a significant negative relationship with PU on email usage in Malaysian universities. This was consistent with Arslan's (2009) findings on adoption of e-government in 26 countries correlating higher individualism (lower collectivism) with a higher rate of technology adoption of e-government. However, this study found no significant relationship between collectivism and PEOU of email usage in Malaysian universities. Although Alhujran (2009) found that collectivism had no discernible impact on PEOU and PU, the evidence here suggested that it was relevant for PU but not for PEOU. The same result was found in the mediation effect of PEOU and PU for collectivism. Results indicated that PU mediates the relationship between collectivism and email usage while PEOU failed to mediate that relationship.

This study found that public universities have higher collectivism than private universities, thus, reinforcing Cheng's (1999) point that there were different levels of

collectivism within Malaysian organisations. Ramachandran et al. (2011) (in section 4.4.2) also indicated that public universities staff in Malaysia have higher levels of collectivism orientation than private universities staff. The higher level of collectivism could also be possibly the reason why Malaysian public universities have lower email usage than private universities.

7.3.4 Masculinity (M)

As discussed in the literature review, there have been many criticisms of the masculinity/femininity dimension. Triandis (1993) argued that the dimension should be avoided for the sake of gender neutrality, while De Mooij (2009) found that the term masculine/feminine touched on sexist. Moulettes (2007) even went to far as to argue that Hofstede (as a representative of the male sex) defined feminine culture based on traditional female categories as giving the impression of being more modern, democratic and humane without disturbing his own masculine culture. Despite these criticisms, the masculinity/femininity dimension has served as one of the five main national culture dimensions, especially in research related to information systems as discussed in section 3.2.3.

This study found that acceptance and use of technologies such as email were not dependent on the masculinity dimension. Moreover, the findings also suggested that there was no significant mediation effect of PEOU and PU on masculinity and email usage. The findings of this study have supported previous studies in the field, which have all invalidated any significant relationship between masculinity and technology adoption. For example, Alhujran (2009) suggested that masculinity had no discernible impacts on PEOU and PU, which was reinforced by Ebrahimi et al. (2010) who found no significant relationship between masculinity and behavioural intention towards technology adoption in Malaysian organisations. In Jordan, two separate studies on the banking sector have also invalidated these dimensions. Akour et al. (2006) found that masculinity had no significant impact on Jordanian managers' intentions to use the internet and Al-Sukkar (2005) found no significant relationship between masculinity, PEOU and PU and internet banking adoption among bank managers in Jordan.

The insignificance of masculinity and femininity (MF) as a cultural determinant of email usage can perhaps be linked with the earlier criticism of this dimension as a flawed measurement of culture. As Al-Sukkar (2005) argues, Hofstede made an inferential leap when he stated that these items measured work values that were typical of masculine and feminine cultures. Although this dimension was irrelevant to the overall study, it must be noted here that public universities have higher levels of masculinity than private universities in Malaysia. This was, however, measured narrowly in the terms proposed by Hofstede which link technology usage in masculine culture with improving task performance, and relationship building and improving the quality of the work environment in feminine cultures.

7.3.5 Long-term orientation (LT)

Earlier (in section 3.2.3), Everdingen and Waarts (2003) argued that LT represented a more innovative culture than short-term orientation (ST), since ST focused on the past whereas LT look forward to the future, so organisations in high LT cultures might be more prepared in the future to adopt and use innovative technologies.

This study found a significant positive relationship between LT and the PEOU of email usage but no relationship between LT and PU on email usage. The same was true for the mediation effect of PEOU and PU, where PEOU proved to mediate the relationship between LT and email usage while PU failed to mediate that relationship. Contradictory evidence was also reported in previous studies. Al-Sukkar (2005) found LT to have a positive relationship with PU of internet banking acceptance among bank managers in Jordan. Arslan (2009) found that countries with higher LT have a higher rate of technology adoption. However, the results of his study prompted Alhujran (2009) to suggest that LT had no discernible impact on PEOU and PU. This study found that public and private universities share the same high levels of LT.

7.3.6 Indulgence (I)

This was a new dimension added by Hofstede in 2010 as a result of a study conducted by Minkov (2007a). As outlined in the literature review in section 3.2.3, Hofstede et al. (2010) argued that people from cultures with a higher indulgence

score have more email and internet contacts with foreigners than those with a higher restraint score. In addition, people with a high indulgence score also used email and the internet for private contacts, while people with a low restraint score use less email and internet for private contacts. In the context of attitude, the indulgence group was more inclined towards a positive and optimistic attitude than the restraint group (Hofstede et al. 2010). This positive attitude was significantly associated with the innovation characteristic. According to Didero et al. (2008), this positive attitude increases openness to innovation and readiness to accept change.

As explained in the literature review, no existing studies on TAM that have used this dimension as a construct. However, some general studies on information technology, for example those of Zardosht and Ghasem-Aghaee (2011), have suggested that indulgence has a positive correlation with online shopping behaviour of consumers in 24 European countries. In addition, Lažnjak (2011) found that higher innovation-oriented EU countries display a greater indulgence characteristic than restraint.

This study found that indulgence has a significant positive relationship with PEOU on email usage among non-academic executives in Malaysian universities, while PEOU successfully mediated the relationship between indulgence and email usage. However, this study found no significant relationship between indulgence and PU on email usage in Malaysian universities. In addition, the findings on the mediation effect of PU suggested that PU has failed to mediate the relationship between the indulgence and email usage.

Private universities in Malaysia have higher indulgence than their public universities counterparts. Higher scores of indulgence among employees in private university were correlated with a tendency towards higher PEOU of email. This might possibly have contributed to higher email usage among non-academic staff in Malaysian private universities than in public universities.

7.4 Organisational Culture and Technology Acceptance Model in Malaysian Public and Private Universities

7.4.1 Need for Security (NS) - Value

The dimension of NS emphasised the existence of an organisational culture where people require constant assurance of security for their acts. In such cultures, people preferred to use more secure communication channels, such as face-to-face and telephone. As outlined in the literature review, previous research has emphasised many risks to privacy associated with email. Ciganek et al. (2010) argued that the acceptance of the system used depends on whether employees can reveal, support and trust the information given by their co-workers through the technology.

This study found that NS has a significant negative relationship with PEOU of email usage in Malaysian universities, which means that a higher need for security tends to makes staff perceive email as less easy to use. In contrast, this study found no significant relationship between NS with PU of email usage. The same was true for the mediation effect of PEOU and PU, where PEOU was shown to mediate the relationship between NS and email usage, while PU failed to mediate that relationship.

Public universities were found to have a higher NS than private universities in Malaysia. The NS dimension was also related to power distance and uncertainty avoidance since it was associated with avoiding conflicts with superiors and risks in the work place. As a result, higher NS in public universities was correlated with a tendency towards less PEOU of email in public universities. This could be another reason behind lower email usage in public universities than private universities.

7.4.2 Results-oriented (RO) – practice

This dimension posited that process-oriented organisations focused on the means and procedures that employees must follow to perform a task, whereas RO organisations were concerned mainly with the targets pertaining to a specific task. As highlighted in the literature review in section 3.3.2, mechanistic or bureaucratic organisations with many rules and procedures were typically process-oriented (Cabrera et al. 2001). In contrast, RO organisations were risk-oriented and created an environment

that provides for and advocates innovative methods for the organisation to survive and grow (Hofstede et al. 1990).

RO organisations were more inclined towards technology adoption as they encouraged innovativeness and willingness to explore new ideas among their employees (Ruppel & Harrington 2001). Ciganek et al. (2010) stated that individuals working in RO organisations tend to have more experience using innovations in technology, whereas those in a process-oriented work environment perceived technology as a threat and less helpful in decision-making. In a RO culture, employees were also given the opportunity to choose any technology suitable for the work process regardless of the procedural formalities leading to more innovative behaviour in technology adoption (Ciganek et al. 2010).

This study found that RO has a significant positive relationship with both PEOU and PU of email usage in Malaysian universities. A higher level of RO in a university is correlated with a tendency towards higher PEOU and PU of email usage. This was supported by Ciganek et al. (2010) who suggested that there was a positive significant relationship between RO and PEOU and PU. Moreover, the finding also suggested that both PU and PEOU mediates the relationship between RO organisational culture and email usage.

This study found that private universities in Malaysia tend to be more RO than public universities. The high RO measure in private universities was correlated with a tendency towards higher PEOU and PU of email in private universities. Moreover, PU and PEOU also significantly mediate the relationship between RO and email usage. This meant that the RO nature of private universities may have resulted in higher email usage than their public university counterparts.

7.4.3 Job-oriented (JO) – practice

Earlier (in section 3.3.3), it was stated that Cabrera et al. (2001) consider employee-oriented vs. job-oriented as an indicator of whether the organisation was concerned with the welfare of its employees or was only interested in completion of the job. In employee-oriented cultures, major decisions usually lie in the hands of groups or

committees and an effort was made to assist new members to fit in. On the other hand, top-down decision-making is usually found in JO cultures. According to Ruppel and Harrington (2001), the adoption of system has higher levels in organisations with a culture that placed high priority on its employees.

However, this study found no evidence to suggest any significant relationship between JO and PEOU/PU of email usage. Moreover, the finding also suggested that both PU and PEOU failed to mediate the relationship between JO and email usage. Nevertheless, public universities were found to have a higher JO level than private universities in Malaysia.

7.4.4 Closed system (CS) - practice

As explained in the literature review, an open or closed system describes the type of communication environment in an organisation. If information flows freely through the organisation, it was said to possess an open system culture, whereas closed cultures tend to keep more secrets (Cabrera et al. 2001). The use of technology requires support from co-workers, supervisors and managers and without this support employees may not be prepared to share their knowledge and experience with others. Ciganek et al. (2010) state that organisations with an open communication system are more prepared to adopt technology compared with organisations with a closed communication system. In an open system, employees were prepared to share their experiences and to help one another, while organisations with a closed communication system do not practise as much knowledge- and experience-sharing compared with their counterparts with more open communication systems. This can contribute to lower usage of email for sharing knowledge and information.

This study found that there was a significant negative relationship between CS, PEOU and PU on email usage. Organisations with a higher CS measure have a tendency towards lower PEOU and PU of email compared to those with an open system. Moreover, the finding also suggested that both PU and PEOU successfully mediate the relationship between CS and email usage.

This study found that public universities tend to follow a more CS than private universities in Malaysia. This created a lower tendency towards accepting PEOU and

PU of email in public universities. This might be another reason why non-academic staffs in Malaysian public universities have lower email usage than private universities.

7.5 Technology acceptance model and email usage in Malaysian universities

As outlined in the literature review, Davis (1989) developed TAM on the premise that PU and PEOU are the main factors affecting the intention to adopt and use new technology. This study found that PU and PEOU have significant positive relationships with email usage among non-academic executives in Malaysian universities. These findings supported previous studies on TAM (Akour et al. 2006; Capece et al. 2013; Chau & Hu 2001; Davis 1989; Denan & Aliman 2005; Mathieson 1991; Ndubisi et al. 2001; Ramayah 2010; Ramayah et al. 2005; Ramayah et al. 2003; Venkatesh & Davis 2000). For example, in a study on email usage at a public university in Malaysia, Denan and Aliman (2005) found strong relationships between PU and intention to use, PEOU and intention to use, and PEOU and PU of email use. The same was true for Mutlu and Ergeneli's (2012) research on email usage in a private company in Turkey, which suggested that PEOU of email causes a direct and positive effect on usage intention and that PEOU was a strong determinant of PU.

There are also several studies that reject any relationship between PU and PEOU and technology usage, for example, Saeed et al. (2012), who suggested that PU and PEOU failed to influence intention to use Twitter among university students in Australia. The same was true with another study on Twitter adoption in an e-commerce unit in an Australian higher education institution which failed to validate PU and PEOU on Twitter adoption (Saeed & Sinnappan 2011). Heijden (2004) and Holsapple and Wu (2007) argue that this shows the inability of TAM to explain adoption in today's highly interactive, socialised and multi-user technology environments.

It was found that, overall, staff of Malaysian universities perceived email as a useful tool. The positive evidence confirmed PEOU as an important factor in determining email usage in Malaysian universities. PEOU was also an important determinant of usage of email, since email needs to be easy to use before users even think about using it. This study also suggests that PEOU had a significant positive relationship with PU on email usage. The easier email is to be used, the more useful the staff perceived it to be. This was in line with previous studies which found that PEOU had a significant positive relationship with PU in the acceptance of various technologies (Chau 2001; Davis 1989; Hong et al. 2002; Lallmahamood 2007; Ramayah & Aafaqi 2004; Yusoff et al. 2009) and email adoption contexts (Huang 2003; Mutlu & Ergeneli 2012).

The findings of this study also suggested that PU has a stronger impact on usage ($\beta=0.397$) than PEOU ($\beta=0.229$). Some studies in existing TAM research also show that PU is a better predictor of adoption than PEOU (Alhujran 2009; Davis 1989; Li 2013). The variance of PEOU was 56.9 per cent, while PU accounted for 60.9 per cent. This study found that private universities have higher PEOU and PU, which is correlated with higher email usage in public universities. As discussed in the literature review, Puteh (2007) has argued that the lack of training provided to public university staff, especially in technical skills, contributed to lower technology usage in public universities.

7.6 Demographic Factors in Email Usage Among Non-Academic Staff in Malaysian Universities

This study suggested that there was a significant effect of demographic factors on email usage in Malaysian universities. The first of these demographic factors was organisation type, suggesting that there was a significant difference in email usage between public and private universities. This study found that email usage was higher in private universities than public universities, with mean values of 266.70 and 145.91 respectively. This was consistent with previous studies in Malaysia by Baninajarian (2009) on private universities and Husain et al. (2009) on public universities which indicated that private universities were more active in their email

usage than public universities. Further, based on the additional data collected on communication channel preferences at the workplace, this research indicated that non-academic staff in private universities ranked email as the second most preferred communication channel. In contrast, respondents from public universities ranked email as only their third preferred communication channel after face-to-face and telephone. Therefore, higher email usage at private universities is in line with the higher preference for email shown by private university staff members.

As discussed in Chapter 4, Malaysia is a multi-racial country with three major races, namely, Malay, Chinese and Indian. It was found that there was a significant difference among different races in email usage among non-academic staff at Malaysian universities. The results in this study suggested that executives from Chinese and Indian racial backgrounds had higher email usage compared with those from Malay backgrounds. Further, while respondents with Chinese and Indian backgrounds ranked email as their second choice of communication after face-to-face communication, Malays ranked email as the third preferred choice after face-to-face and telephone. It has been argued that in contrast to people of Chinese and Indian ethnicity, Malays tend to prefer high-context forms of communication with verbal communication attaching meanings to elements surrounding the direct message (Abdullah & Lim 2001).

Although race is a highly-controversial term constructed by debatable notions of self-identification, scholars have argued that the character of a typical Malaysian rests on his/her racial and cultural background and depends on family and community (Abdullah & Gallagher 1995). As discussed in the literature review, race has been found to be a significant demographic factor in multiple international studies. Jackson et al. (2008) found a difference in intensity of internet use between African-American and Caucasian-Americans. Similarly, Johnson et al. (2008) suggested that there was a significant difference in IT self-efficacy between African-Americans and Anglo-Americans. Ibrahim & Ibrahim (2006) found significant differences in email usage among different ethnic groups with 38.8 users of Chinese ethnic background using email every day compared to only 28.8 per cent of people with Malay ethnic background.

The variable of religion was also shown to have a significant relationship with email usage in Malaysian universities, but it can be argued that the effect of religion coincides with that of race. As explained in chapter 4, race and religion are overlapping categories in Malaysia, where almost all Malays are Muslim, while the majority of Chinese are Buddhist and a minority are Christian, and the majority of Indians are Hindu while a minority are Christian. However, some interesting points were also thrown up by the demographic analysis of religion. The data showed that the Buddhists, Christians and Hindus had significantly higher email usage than Muslims, but Christians hold the highest email usage among all religions in Malaysia. Further, Muslim respondents consistently ranked email as their third choice of communication while Buddhist, Hindu and Christian respondents ranked email as their second choice of communication channel.

Reflecting on the correlation of religion with innovation, Didero et al. (2008) argued that strict segregation of church and public affairs is considered to be beneficial toward innovation, a social phenomenon that was not as prevalent in Islamic countries (Muslim) as compared to those with a Christian background. Segal (1996) argued that Islam is not the key problem facing scientific and innovation achievement in the Muslim world. There may possibly be other factors such as demographics, education and language contributing to science and technology innovation. For example, in the context of Malaysian culture, some studies suggested that Malay Muslims are lagging behind in their mastery of English for various reasons. For example, Manan and Shamsudin (2012) found that Malay Muslim students have less mastery over communication in English compared to non-Muslim Chinese students. Malay Muslims may be lagging behind due to this linguistic barrier; however, further research is needed to validate this.

The results of the study indicated that there was a significant link between age and email usage. The data showed that the highest usage was among users from 20-25 years. Even though Sathye (1999) found no such relationship between age and IT/IS adoption in Australia, many other previous studies suggested that younger age

groups show greater willingness to adopt new IT/IS technology particularly in developing countries (Al-Sukkar 2005; Alhujran 2009; Venkatesh & Morris 2000).

In terms of the influence of gender, this study found that there was no significant difference among male and female staff in Malaysian universities. The p-value of 0.65, which was more than 0.05, suggested that there was no link between gender and email usage. Furthermore, the types of communication channel preferred by male and female respondents displayed a similar pattern with no gender distinction.

As outlined in the literature review, previous studies in gender-differentiated Islamic societies like Jordan and Lebanon have found that there was a significant relationship between gender and level of IT/IS adoption. In these countries, male users are more prolific in technology usage than their female counterparts (Al-Gahtani et al. 2007; Alhujran 2009; Houtz & Gupta 2001), and specifically in email usage (Gefen & Straub 1997), but some studies also found that female users were more competent users of technologies (Jackson et al. 2001; Luan et al. 2005).

As highlighted in the literature review, Jackson et al. (2001) argued that females in Western countries used email more than their male counterparts. Moreover, in the Malaysian university context, Luan et al. (2005) found that female academicians in Malaysian public universities were more competent than their male counterparts in using most Information and Communications Technology (ICT) tools. In fact, the mean for email usage for female respondents was higher than for males (Luan et al. 2005). However, there have also been many studies that found no difference between male and female users in technology usage (Tsai et al. 2001; Wong and Hanafi 2007). Tsai et al. (2001) found no key differences in terms of gender concerning the perceived usefulness of the internet. Wong and Hannifin (2007) found that there was no significant gender disparity in email use among Malaysian educators. Atan et al. (2002) further argued that the absence of gender disparity was particularly distinct in a learning environment. The absence of gender disparity in this study could also be attributed to the fact that this study was based in educational institutions where staff experience similar levels of exposure to computer usage.

Finally, this study suggested that there was no significant difference in email usage between metropolitan and non-metropolitan universities. This variable was adopted on the basis of Hindman's (2000) observation that metropolitan people were more open to technology usage compared to non-metropolitan people. Mills and Whitacre (2003) also suggested that there was still a digital divide between metropolitan and non-metropolitan locations. Some have proposed that regional differences in internet use will eventually disappear with the passage of time as part of a normal trend of core-periphery spatial diffusion (Compaine 2001). Wang et al. (2011) have suggested that internet access between metropolitan and non-metropolitan areas have receded. This was, perhaps, true since this study found no significant difference in email usage between metropolitan and non-metropolitan universities. This absence of disparity could also be due to the nature of work in universities, as they were involved in intellectual work and have access to technology from government funding.

7.7 Implications

This study was designed to identify the levels of email usage and factors influencing this in public and private Malaysian universities. This section explains the implications of the findings of this study.

7.7.1 Theoretical implications

Some implications can be drawn for academic research on the effect of national and organisational culture on email adoption and email usage specifically in the context of Malaysian universities.

- 1) This study has included a new dimension of Hofstede's National Culture, namely indulgence (I), which was only introduced in 2010 and has not been tested extensively in other empirical studies on technology acceptance. Even studies after 2010, such as those by Ebrahimi et al. (2010), Sriwindono and Yahya (2012) and Al-Smadi (2012), continued to use the five pre-existing dimensions and excluded the indulgence dimension from their models. This

study found indulgence to have a significant relationship with email usage. Given its significance, this study supports Li et al. (2011) who exhorted researchers in technology adoption to further explore this dimension.

- 2) This research has shown a significant negative relationship between PD and PEOU/PU of email usage. In fact, PD has emerged as the most relevant dimension in the overall national culture model as it has been established as significant for both PU and PEOU. Huang (2003) also suggested that there were reasonable grounds to state that a person's negative mindset about email usage may be caused by the level of PD in the work environment. Similarly, Srite (2000) discovered that people from higher PD cultures had lower amounts of innovation as well as trust in regard to IT. Zakour (2004) concurred with this finding and explained that individuals from societies with lower PD are more receptive towards ICT than individuals in higher PD cultures. This is, perhaps, because ICT poses a threat to the hierarchy of authority and rank maintained in higher PD cultures as ICT communication channels removed barriers for interaction between people in different ranks and provided a channel for communication with reduced formality. In contrast, individuals in lower PD cultures were interdependent on each other regardless of their rank in the hierarchy, so they tend to favour ICT usage as it further supports internal group dynamics and communication.
- 3) The relationship between email usage and PD was particularly critical in comparison to other cultural dimensions. Apart from being the first cultural dimension in Hofstede's original model, its relationship to email usage was deeper and more nuanced. This is because it not only exerts an influence on level of email usage, but email use can, in turn, modulate the level of PD in a workplace. Email could reduce the gap in communication between people distanced by their positions, and this interaction could have a levelling effect on power and hierarchy in the organisation (Sarbaugh-Thompson & Feldman 1998).

- 4) The dimensions of Hofstede's national culture that only have a bearing on one variable of perception, either PEOU or PU, were UA, C, LT and I. UA and C impact on PU rather than PEOU, which means that the tendency to avoid uncertainty and collectivist orientation in Malaysian people makes them perceive email as a useful medium but not necessarily easy to use. On the other hand, the relationship of LT and I with PEOU instead of PU could imply that the tendency of Malaysian people to focus on long-term goals and not indulge in short-term results might determine whether they perceive email as easy to use or not. Future studies in the field should differentiate between these types of categories of perception to clearly identify the structure of the effect and not implement usage as a single undifferentiated concept.
- 5) Interestingly, this study found masculinity as the only national culture variable that was not a significant determinant of either PEOU or PU, thus, invalidating its overall relationship to email usage. Many previous studies have also validated the unanimous or partial effect of all dimensions of Hofstede's model except masculinity/femininity. According to Arslan (2009), PD, UA, collectivism/individualism and long-term/short-term orientation have the most significant bearing on differences in technology acceptance. Erumban and de Jong (2006) stated that differences in ICT adoption rates among countries can be attributed to cultural factors pertaining to the PD and UA dimensions. These previous studies as well as the results that invalidated the relevance of masculinity/femininity could perhaps mean that this dimension should be re-evaluated. One option is to establish a better set of items to capture this dimension in the context of work values in order to establish a more parsimonious model.
- 6) From the six variables delineated in Hofstede's model of organisational culture, three of them are most appropriate for the study of technology and system use (Ciganek et al. 2010). These three dimensions of RO, JO and CS have also been used here in this study in conjunction with one value-based dimension called NS. The two variables of RO and CS were found to have a significant relationship with both PU and PEOU, whereas JO was rejected for

both PU and PEOU. Finally, the value-based dimension of need for security was accepted for PEOU but not for PU, meaning that the tendency to seek security for their actions determines perceptions of ease of use of email but not its perceived usefulness.

- 7) This research employed the phantom model approach by Macho and Ledermann (2011) to assess specific effects that cannot be classified as direct, indirect or total effects estimated by most SEM programs. In this study, the mediation effect of PU and PEOU were assessed simultaneously, while the phantom model approach served as a means to calculate or compute the specific mediation effect of PU and PEOU. Therefore, this research may serve as an example for future research frameworks involving more than one mediator.
- 8) Apart from incorporating Hofstede's models of national and organisational culture to study the impact of cultural orientations on email usage in workplaces, this study also examined the relationship of demographic factors with email usage. Interestingly, while organisation type, race, religion and age were found to be significant determinants of the level of email usage, gender and location were not. Here, organisation type was not only used as a demographic factor, but also as the basis for a comparative analysis between public/private universities. Previous studies have observed that organisations in the government and public sector in Malaysia are lagging behind those in the private sector in terms of email usage. This observation was indicated with evidence of how different cultural orientations between public/private universities eventually lead to difference in their overall email usage.
- 9) Location and gender were, however, not accepted as relevant demographic variables. This was the first study in Malaysia to have incorporated location as a demographic variable with the expectation that access to technology as well as cultural orientation between metropolitan and non-metropolitan universities would be different. The rejection of the location variable as significant not only indicated its irrelevance, but implies that the claim to universal and equal

access to technology made by the ICT revolution is not without foundation. An innovation diffusion process has taken place at least in the context of university staff. The irrelevance of gender could also be seen as a positive indication of gender equality in access to email and ICT capability. Studies have suggested that gender-based differences are fading away as computers become widespread in society and as familiarity with and usage of computers start at a younger age (Durndell & Thomson 1997; Moldafsky & Kwon 1994). In fact, previous studies in Malaysia have shown that women, who are mostly employed in administrative jobs, displayed higher level of ICT confidence than men. According to Luan et al. (2005), female academicians in Malaysian public universities were significantly more competent in using emails than their male colleagues. In fact, the mean for email use for female respondents was higher than males.

- 10) In contrast, race, religion and age were identified as significant determinants of level of email use. There was a general perception in Malaysia that Malays were more conservative, etiquette-conscious and collectivist in their behaviour. This general trait of Malays means that they favour conventional forms of communication with more emphasis on verbal communication, socialisation and courtesy, such as face-to-face and telephone calls. On the other hand, Chinese people, for example, were rightly or wrongly, perceived as being business-minded and practical, so the responses here seemed to align that type of behaviour with greater acceptance of terse and lean forms of communication like email. Religion coincides with race so this explanation could be applied to religion, which was also accepted as a relevant variable. The positive evidence for age here was also consistent with previous studies in Malaysia, which have shown that older people, generally occupying senior positions, preferred conventional forms of communication like telephone and meetings to email. This has been attributed to a generation gap as older people find it more difficult to adapt to the constantly evolving world of ICT communication and lag behind the rest of the staff in their level of email usage.

7.7.2 Practical implications

New technology can affect both the core work executed and lead to the introduction of new requirements in the behaviours expected of users. Determining whether a technological innovation results in producing the desired outcome partly depends on whether the behavioural requirements introduced fit with the existing culture, or whether changes can be made to the existing culture in order to fit with those requirements (Cabrera et al. 2001). The findings in this study also hold some practical implications that can be used to improve the policy and managerial aspects of email usage in Malaysian universities. In general, the findings provide knowledge that will enable policy makers to increase the uptake of email communication, thereby, generating substantial economic benefits.

- 1) The study showed that staff in public universities were falling behind their counterparts in email usage and this could be attributed specifically to the somewhat traditionalist and conservative methods of national and organisational culture in place in public universities. The management in public universities may want to consider these cultural factors and take measures that could ameliorate some of their negative effects if they plan to increase email usage among their staff. For example, management in public universities may want to reduce the PD dimension by encouraging a more cohesive and egalitarian workplace culture, or encourage an open organisational culture value to promote innovation. Ciganek et al. (2010) suggested that users need to communicate freely with other organisation members to develop a more open communication culture. This suggestion could be applied to not just the Malaysian public universities but to all Malaysian government institutions as well. Users can also be rewarded by management for their openness, such as for expressing opinions about the system and providing constructive feedback to improve it (Ciganek et al. 2010). Such changes will not only provide strategies to encourage faster and more efficient adoption of email, they will also improve the overall levels of cooperation and communication in public universities.

- 2) An alternative strategy for the management of public universities would be to capitalise on existing cultural orientations in the organisation and utilise them in creative ways to enforce better usage of email. For example, the measurement for national culture has shown that public universities have a high level of PD where hierarchy and authority is respected. In this case, senior management may want to take an authoritative position enforcing guidelines for non-academic staff to use email in order to speed up communication in the workplace.
- 3) In his evaluation, Hofstede (1991) stated that Malaysia is a high PD country. However, Hofstede also categorised other countries such as Slovakia, Guatemala, Panama, Philippines, Russia, Mexico, Venezuela, China and Arab countries etc. as high PD (Hofstede et al. 2010, p. 57). The characteristics of these countries are very much similar to Malaysia in the context of PD (Hofstede et al. 2010). Therefore, both public and private universities operating in these countries may perceive the finding on PD and the suggestions above beneficial, which could be applied within these countries of high PD as in Malaysia.
- 4) The issue of security and privacy of information in communication technology has been debated widely. In spite of progress in data encryption and new laws, email privacy remains a major concern to users (Udo 2001). The apparent informality, privacy, impermanence and speed of email can mislead some people to speak their mind on matters they would never bring up in real-life conversations. However, email does not give total privacy to the user and this can result in problems. Policy-makers in the universities need to supply essential training to alleviate anxiety, especially pertaining to risk and security of email use.
- 5) Organisational culture in public universities was more inclined towards a CS and a less RO structure, which may impede the overall performance of the university. There is a need for superiors to encourage a more open communication network allowing staff to use more options while

communicating with others. Open communication channels will also allow employees to express their opinions or make any suggestions, which will help to strengthen the organisation. Superiors should give priority to the targets of job tasks rather than the processes of attaining the desired results and promote less risk-averse behaviours, such as experimentation and exploration.

- 6) As the PEOU and PU of email was lower in public universities, there is a need to look into the current email system to provide more user-friendly interfaces. Even though, this study does not provide any information on the email software used in Malaysian public and private universities, the design and characteristics of an application play an important role in technology usage as suggested by Al-Sukkar (2005). Therefore, future work may need to explore the design and characteristics of the email systems used in Malaysian public and private universities and their relationship with PEOU of email usage. This will help to provide some important information, particularly for public universities to increase their email uptake. Finally, the PU is an important aspect contributing to email usage. Employees will use email if they perceive it as a useful tool for communication within the organisation. Policy-makers should employ training and promotion approaches to develop confidence among staff about the usefulness of email in the workplace.

7.8 Limitations and Directions for Future Research

Just like any other work of research, this study has some limitations. Some of these limitations relate to methodological weaknesses.

- 1) This research only used self-reported perceptions to measure the different parameters of national and organisational culture. Even though this method is widely used in empirical studies and was in fact used by Hofstede in his original study to develop his theory, some researchers such as McSweeney (2002) and Triandis (1988) have expressed doubt about the validity of self-reported perceptions as measures of cultural orientation.

- 2) The research model accounted only for 32.3 per cent of the actual email usage in Malaysian universities.
- 3) Although this research took care to include both metropolitan and non-metropolitan universities from different provinces, it does not cover all the regions in the country. This study only covers universities in peninsular Malaysia and leaves out the Borneo region.
- 4) Various demographic variables were used as probable factors behind different email usage across people of different gender, religion, race, age and location. In-depth focus was however, only applied to the type of organisation, with comparative analysis of email usage across public and private universities.

Although the limitations of this study point to some of the conceptual and methodological weaknesses of the study, they also provide some directions for future research to further extend the findings of this study or elaborate on some latent implications.

- 1) The data for this study were drawn from the self-reported perceptions of respondents at Malaysian universities. A future study needs to adopt an alternative approach to survey questionnaire method, such as example observations and experiments as suggested by Taras and Steel (2009). For example, an intensive experiment at a single university with the cooperation of the university management could be devised. Here, an aspect of national or organisational culture, such as PD, could be manipulated and its effect on changing levels of email usage observed. The data gathered from these alternative frameworks could be used to validate the findings of this study and address any of the issues of response bias that can occur in self-reported surveys.
- 2) Secondly, this study used a cross-sectional design where the variables were measured across the sample in a single instance. It would be useful to carry out a longitudinal study to observe whether the variables and their relationships

observed here are consistent over time. A longitudinal study is also recommended to check if email usage at a university changes before and after the institution implements measures to promote email usage.

- 3) As we know, email has been in the domain of ICT communication for over 20 years. Although its popularity, especially for workplace communication, is incontestable, the last few years have seen the advent of a range of internet communication portals, such as, Facebook, Twitter, LinkedIn etc. There is a need to look at the cultural aspects of these new forms of social media to understand their utility and impact on work culture in Malaysian organisations and, in particular, to what extent they are being used as substitutes for email.
- 4) Fourthly, future research using Hofstede National Culture on technology acceptance study should include the new dimension namely Indulgence since this study validated the significant relationship of indulgence with email usage. Apart from that, there is a concern about the validity of Hofstede's model (1980) which was introduced more than 30 years ago. In the context of Malaysia, Hofstede's model explained a single 'national' culture for Malaysia. This study found that there were different manifestations of National Culture even within different types of organisation. There is a need to re-validate Hofstede National Culture dimensions indexes for Malaysia given the rapid social change in the last few decades.
- 5) Although this study considered the influence of demographic factors, it focused on comparing email usage on the basis of the type of organisation and national/organisational culture between public and private universities. Future studies on technology acceptance can be conducted to incorporate these demographic factors in a more comprehensive manner. As a multi-racial country with a Malay-Muslim majority, Malaysia has significant differentiations across divisions of gender, race and religion, so these cultural aspects must be considered for a better understanding of technology acceptance in Malaysian organisations.

- 6) Finally the overall model explained only 32.3% of the variance in email usage in Malaysian universities. There is a need to refine the actual usage construct and improve its measurement especially by including more items that represent the actual usage of the technology. The construct of usage needs to be fine-tuned, by differentiating between categories, such as actual or intended usage, to increase the explanatory power of technology acceptance models.

7.9 Conclusion

Although there are some limitations to this research, this study has made a significant contribution to technology acceptance research on email use in Malaysia. The study incorporated a combination of national and organisational culture together with technological factors in describing email usage among non-academic executives in Malaysian public and private universities. In particular, the study integrated the TAM with Hofstede's national and organisational culture theory. The research model developed in this research will be able to serve as a foundation for future research on email usage as well as other research related to technology acceptance.

This research has shown that email usage was higher in Malaysian private universities than Malaysian public universities. The findings have shown that national and organisational cultures influence the level of email usage in Malaysian universities. Specifically, the dimensions of PD, UA, C, LT and I in the national culture have a significant relationship with PEOU or PU, or both, of email usage. In addition, with regard to organisational culture, the NS, RO and CS have a significant relationship with PEOU or PU, or both, of email usage. Finally, on technological factors, both constructs of TAM – namely the PEOU and PU – had a significant relationship with email usage among non-academic staff in Malaysian universities.

Broadly, this study has found that culture was significantly correlated with technology acceptance and email use. The study also showed that the tendency towards lower email use in public universities is correlated with higher PD, UA, C and lower I, as compared to private universities. Findings related to organisational

culture showed that a tendency towards lower email usage in public universities is correlated with higher NS, CS and lower RO. In analysis of the technology acceptance model, public universities scored lower on PEOU and PU as compared to private universities which have higher PEOU, PU and email usage.

On mediation effect, this study employed the phantom approach developed by Macho and Ledermann (2011) to capture the specific indirect effect of the mediation effect. This study found that PU significantly mediates the relationship of CS, RO, UA, C and PD on email usage, while PEOU significantly mediates the relationship of CS, NS, RO, LT, I and PD on email usage.

On demographic factors, this study has employed six variables namely race, religion, gender, age, location and type of organisation and found that race, religion, age and type of organisation were significantly correlated with email usage in Malaysian universities. These findings will hopefully provide some useful information to policymakers in public and private universities and government agencies on education and productivity to improve the levels of email usage in Malaysian universities.

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APPENDIX

APPENDIX A

INFORMATION TO PARTICIPANTS INVOLVED IN RESEARCH

INFORMATION TO PARTICIPANTS INVOLVED IN THE RESEARCH

You are invited to participate

You are invited to participate in a research project entitled “**Examining Email Usage among Non-Academic Staff in Public and Private Malaysian Universities**”. This project is being conducted by Anuar Shah bin Bali Mahomed as part of a Doctor of Philosophy (PhD) study at Victoria University under supervision of Professor G. Michael McGrath from the School of Management and Information Systems and Dr Maree Keating from the School of Communication and Arts.

Project explanation

This study intends to investigate the email usage among non-academic executives in Malaysia public and private universities. This research will provide valuable information to Malaysian public and private universities on the factors which influence email usage.

What will I be asked to do?

Participants will be asked to respond to a set of questions concerning demographic information, internet and email use, statements related to the intention to use email communication, and finally statements related with national and organisational culture. The questionnaire will take around 25 minutes to complete.

What will I gain from participating?

You will be contributing to the provision of valuable information to Malaysian public and private universities on the factors which influence email usage.

How will the information I give be used?

All information is only for research purposes and will be treated as private and confidential, hence it will not be revealed under any circumstances.

What are the potential risks of participating in this project?

There are no risks involved in participating in this project.

How will this project be conducted?

Data will be collected through the attached questionnaire given to non-academic executives in Malaysian public and private universities. It will be analysed to explore relationships between national/organisational culture, technology acceptance model (TAM) and email usage.

Who is conducting the study?

The study is being carried out by researchers at Victoria University; the Principal Researcher is Professor G. Michael McGrath Michael.McGrath@vu.edu.au telephone +613 9919 4627, the Associate Researcher is Dr Maree Keating maree.keating@vu.edu.au telephone +613 9919 2280, and the student researcher is Anuar Shah bin Bali Mahomed anuarshah.balimahomed@live.vu.edu.au telephone +61425003031 (Australia) or +60189660841 (Malaysia). Any queries about your participation in this project may be directed to the Chief Investigator listed above. If you have any queries or complaints about the way you have been treated, you may contact the Research Ethics and Biosafety Manager, Victoria University Human Research Ethics Committee, Victoria University, PO Box 14428, Melbourne, VIC, 8001 or phone (03) 9919 4148.

APPENDIX B

TRANSLATION

INFORMATION TO PARTICIPANTS

INVOLVED IN RESEARCH

MAKLUMAT UNTUK PESERTA YANG TERLIBAT DALAM PENYELIDIKAN

Anda dipelawa untuk menyertai penyelidikan ini

Anda dipelawa untuk turut serta dalam projek penyelidikan bertajuk **"Mengukur Tahap Penggunaan E-mel dalam kalangan Kakitangan Bukan Akademik di Universiti Awam dan Swasta di Malaysia"**. Projek ini dikendalikan oleh Anuar Shah bin Bali Mahomed sebagai sebahagian daripada keperluan pengajian Doktor Falsafah (PhD) di Victoria University di bawah penyeliaan Profesor G. Michael McGrath dari Sekolah Pengajian Pengurusan dan Sistem Maklumat dan Dr Maree Keating dari Sekolah Pengajian Komunikasi dan Sastera.

Penjelasan Projek

Kajian ini bertujuan untuk menyelidik penggunaan e-mel dalam kalangan eksekutif bukan akademik di universiti awam dan swasta di Malaysia. Penyelidikan ini akan menyediakan maklumat berguna kepada universiti awam dan swasta di Malaysia tentang faktor yang mempengaruhi penggunaan e-mel.

Apakah yang perlu anda buat?

Peserta akan diminta untuk menjawab satu set soalan berkenaan maklumat demografi, internet dan penggunaan e-mel, pernyataan berkaitan dengan tujuan menggunakan komunikasi e-mel dan akhir sekali pernyataan berkaitan dengan budaya negara dan organisasi. Borang soal selidik akan mengambil masa kira-kira 25 minit untuk dilengkapkan.

Apakah yang anda peroleh daripada penyertaan ini?

Anda akan memberikan sumbangan ke arah penyediaan maklumat berguna kepada universiti awam dan swasta di Malaysia tentang faktor yang mempengaruhi penggunaan e-mel.

Bagaimanakah maklumat yang anda beri digunakan?

Semua maklumat hanya untuk tujuan penyelidikan sahaja dan dianggap sebagai sulit dan peribadi maka, ia tidak akan didedahkan kepada mana-mana pihak dalam apa jua keadaan.

Apakah kemungkinan risiko dalam menyertai penyelidikan ini?

Penyelidikan ini tidak melibatkan sebarang risiko.

Bagaimanakah penyelidikan ini dijalankan?

Data akan dikumpul melalui borang soal selidik yang dilampirkan yang diberikan kepada eksekutif bukan akademik di universiti awam dan swasta di Malaysia. Data tersebut kemudiannya akan dianalisis untuk memeriksa kaitan antara budaya negara/organisasi, Model Penerimaan Teknologi (Technology Acceptance Model atau TAM) dengan penggunaan e-mel.

Siapakah yang menjalankan kajian ini?

Kajian ini dijalankan oleh penyelidik di Victoria University; Penyelidik Utama ialah Profesor G. Michael McGrath dengan alamat e-mel, Michael.McGrath@vu.edu.au dan nombor telefon +613 9919 4627. Penyelidik Bersekutu ialah Dr Maree Keating dengan alamat e-mel, maree.keating@vu.edu.au dan nombor telefon +613 9919 2280 dan pelajar yang terlibat dalam penyelidikan ini ialah Anuar Shah bin Bali Mahomed dengan alamat e-mel, anuarshah.balimahomed@live.vu.edu.au dan nombor telefon +61425003031 (Australia) atau +60189660841 (Malaysia).

Sebarang pertanyaan berkenaan penyertaan anda dalam penyelidikan ini boleh ditujukan kepada Penyelidik Utama yang disenaraikan di atas. Jika anda mempunyai sebarang pertanyaan atau aduan tentang layanan yang anda terima, anda boleh menghubungi Research Ethics and Biosafety Manager, Victoria University Human Research Ethics Committee, Victoria University, PO Box 1442B, Melbourne, VIC, 8001 atau menelefon talian (03) 9919 4148.

APPENDIX C
CONSENT FORM

CONSENT FORM FOR PARTICIPANTS INVOLVED IN RESEARCH

INFORMATION TO PARTICIPANTS:

We would like to invite you to be a part of a study into “**Examining Email Usage among Non-Academic Staff in Public and Private Malaysian Universities**”. This study investigates the email usage among non-academic executives in Malaysian public and private universities. This research will provide valuable information to Malaysian public and private universities on the factors which influence email usage. All information is for research purposes only and will be treated as private and confidential, hence it will not be revealed under any circumstances. There are no risks involved in participating in this project.

CERTIFICATION BY SUBJECT

I, of certify that I am at least 18 years old and that I am voluntarily giving my consent to participate in the study “**Examining Email Usage among Non-Academic Staff in Public and Private Malaysian Universities**” being conducted at Victoria University by Anuar Shah bin Bali Mahomed as part of a Doctor of Philosophy (PhD) under the supervision of Professor Michael McGrath and Dr Maree Keating.

I certify that the objectives of the study, together with any risks and safeguards associated with the research procedures listed hereunder, have been fully explained to me by Anuar Shah bin Bali Mahomed, and that I freely consent to participation involving the below-mentioned procedures:

I certify that I have had the opportunity to have any questions answered and that I understand I can withdraw from this study at any time, and that this withdrawal will not jeopardise me in any way.

I have been informed that the information I provide will be kept confidential.

Signed:

Date:

Any queries about your participation in this project may be directed to the Principal Researcher, Professor G. Michael McGrath Michael.McGrath@vu.edu.au telephone +613 9919 4627, or Associate Researcher Dr Maree Keating maree.keating@vu.edu.au telephone +613 9919 2280. If you have any queries or complaints about the way you have been treated, you may contact the Research Ethics and Biosafety Manager, Victoria University Human Research Ethics Committee, Victoria University, PO Box 14428, Melbourne, VIC, 8001 or phone (03) 9919 4148.

APPENDIX D
TRANSLATION CONSENT FORM



BORANG PERSETUJUAN UNTUK PESERTA YANG TERLIBAT DALAM PENYELIDIKAN

MAKLUMAT KEPADA PESERTA:

Kami ingin mempelawa anda untuk turut serta dalam penyelidikan bertajuk **"Mengukur Tahap Penggunaan E-mel dalam kalangan Kakitangan Bukan Akademik di Universiti Awam dan Swasta di Malaysia"**. Penyelidikan ini menyelidik penggunaan e-mel dalam kalangan eksekutif bukan akademik di universiti awam dan swasta di Malaysia. Penyelidikan ini akan menyediakan maklumat berguna kepada universiti awam dan swasta di Malaysia tentang faktor yang mempengaruhi penggunaan e-mel.

Semua maklumat hanya untuk tujuan penyelidikan sahaja dan dianggap sebagai sulit dan peribadi maka, ia tidak akan didedahkan kepada mana-mana pihak dalam apa jua keadaan. Penyelidikan ini tidak melibatkan sebarang risiko.

PERAKUAN

Saya, dari

memperakui bahawa saya berumur tidak kurang daripada 18 tahun dan saya secara sukarela bersetuju untuk turut serta dalam kajian bertajuk **"Mengukur Tahap Penggunaan E-mel dalam kalangan Kakitangan Bukan Akademik di Universiti Awam dan Swasta di Malaysia"** yang dikendalikan di Victoria University oleh Anuar Shah bin Bali Mahomed sebagai sebahagian daripada keperluan pengajian Doktor Falsafah (PhD) di bawah penyeliaan Profesor Michael McGrath dan Dr Maree Keating.

Saya memperakui bahawa objektif penyelidikan, termasuk apa-apa risiko dan perlindungan yang dikaitkan dengan prosedur penyelidikan ini yang disenaraikan di bawah telah dijelaskan sepenuhnya kepada saya oleh Anuar Shah bin Bali Mahomed dan saya dengan sukarela bersetuju untuk turut serta dalam penyelidikan ini yang melibatkan prosedur seperti yang dinyatakan di bawah:

- Melengkapkan borang soal selidik

Saya memperakui bahawa saya telah diberikan peluang untuk mendapatkan jawapan bagi sebarang persoalan dan saya faham yang saya boleh menarik diri daripada penyelidikan ini pada bila-bila masa dan penarikan diri ini tidak akan menjejaskan saya dalam apa jua keadaan.

Saya telah dimaklumkan bahawa segala maklumat yang saya berikan akan dirahsiakan.

Tandatangan:

Tarikh:

Sebarang pertanyaan berkenaan penyertaan anda dalam penyelidikan ini boleh ditujukan kepada Penyelidik Utama, Profesor G. Michael McGrath di alamat e-mel, Michael.McGrath@vu.edu.au dan nombor telefon +613 9919 4627 atau Penyelidik Bersekutu, Dr Maree Keating di alamat e-mel, maree.keating@vu.edu.au dan nombor telefon +613 9919 2280. Jika anda mempunyai sebarang pertanyaan atau aduan tentang layanan yang anda terima, anda boleh menghubungi Research Ethics dan Biosafety Manager, Victoria University Human Research Ethics Committee, Victoria University, PO Box 14428, Melbourne, VIC, 8001 atau menelefon talian (03) 9919 4148.



APPENDIX E

QUESTIONNAIRE

Dear Dato'/Prof./Dr./Mr/Mrs

My name is **ANUAR SHAH BIN BALI MAHOMED**, a PhD candidate at the School of Management and Information Systems, Victoria University, Melbourne, Australia. For your information, my thesis title is: **"Examining Email Usage among Non-Academic Staff in Public and Private Malaysian Universities"**.

This study investigates email usage at work among Non-Academic Executives in Malaysian public and private universities. This research will provide valuable information on factors that influence your email usage for work purposes. I am therefore inviting you to take part in this research.

Information related to the attached questionnaire is outlined following.

i. The questionnaire consists of five sections:

Section 1: Demographic information

Questions in this section relate to your general background.

Section 2: Internet and email usage

Questions in this section provide information on your previous and current usage of internet and email.

Section 3: Statements related to technology acceptance on email usage

Questions in this section relate to email and how you perceive its usefulness, its ease of use and your intention to use email in future.

Section 4: Statements related to National Culture

Questions in this section revolve in the aspect of national culture which includes Power Distance, Collectivism, Uncertainty Avoidance, Masculinity, Long-Term Orientation and Indulgence

Section 5: Statements related to Organisational Culture

Questions in this section relate to your work value and practice.

ii. Completion of the questionnaire should take around **25 minutes**.

iii. All information is for research purposes only and will be treated as private and confidential, hence it will not be revealed under any circumstances.

If you have any question or queries please contact me at anuar2705@gmail.com, Tel: +60196666172, or contact my Principal Supervisor, Professor G. Michael McGrath Michael.McGrath@vu.edu.au telephone +613 9919 4627 or Associate Supervisor Dr Maree Keating maree.keating@vu.edu.au telephone +613 9919 2280 for verification.

Your cooperation would be highly appreciated. Thanking you in advance.

ANUAR SHAH BIN BALI MAHOMED

PhD Candidate

School of Management and Information Systems

Victoria University

Melbourne, Australia

SECTION 1

DEMOGRAPHIC INFORMATION

This section relates to your general background.

Instruction:

For each statement, please mark your response with an X in only one box.

1.1 What is your gender?

☐ Male ☐ Female

1.2 What is your race?

☐ Malay ☐ Chinese ☐ Indian ☐ Other (please specify):

.....

1.3 What is your religion?

☐ Muslim ☐ Buddhist ☐ Hindu ☐ Christian ☐ other (please specify):

.....

1.4 What age group are you in?

☐ 20-25 years ☐ 26-30 years ☐ 31-35 years ☐ 36-40 years ☐
41-45 years

☐ 46-50 years ☐ 51-55 years ☐ 56-60 years ☐ Over 60 years

1.5 What is your highest education level?

☐ Diploma ☐ Bachelor Degree ☐ Master Degree ☐ PhD/Professional
Doctorate

1.6 Which type of university do you work for?

☐ Public ☐ Private

1.7 What is the name of university you work for?

.....

1.8 What is your position?

If you are working for a Public University

☐ Senior Deputy Registrar ☐ Deputy Registrar ☐ Head Assistant Registrar

☐ Senior Assistant Registrar ☐ Assistant Registrar

If you are working for a Private University

☐ Senior Executives ☐ Executives ☐ Junior Executives

SECTION 2

INTERNET AND EMAIL USAGE

This section provides information on your previous and current usage of internet and email.

Instruction:

For each statement, please mark your response with an X in only one box.

2.1 How long have you been using computers?

☐ Under 2 years ☐ 2-4 years ☐ 5-7 years ☐ 8-10 years ☐ over 10 years

2.2 How often do you use the internet?

☐ Never used ☐ About once a month ☐ A few times a month ☐ A few times a week ☐ About once a day ☐ Several times a day ☐ Frequently every day

2.3 How long have you been using email?

☐ Never used ☐ Under 2 years ☐ 2-4 years ☐ 5-7 years ☐ 8-10 years ☐ over 10 years

2.4 Do you have an official email address?

☐ Yes ☐ No

2.5 If yes, how many official email addresses do you have?

☐ One ☐ Two ☐ Three ☐ More than three

2.6 Do you have any personal email addresses?

☐ Yes ☐ No

2.7 If yes, how many personal email addresses do you have?

☐ One ☐ Two ☐ Three ☐ More than three

2.8 How often do you use your official email address/es?

☐ Never use ☐ About once a month ☐ Once a week ☐ Once a day

☐ Twice a day ☐ 3-5 times a day ☐ 6-10 times a day ☐ 11-15 times a

day ☐ More than 16 times a day

2.9 How often do you use your personal email address/es?

☐ Never use ☐ About once a month ☐ Once a week ☐ Once a day

☐ Twice a day ☐ 3-5 times a day ☐ 6-10 times a day ☐ 11-15 times

a day ☐ More than 16 times a day

2.10 Which type of email do you prefer to use in your workplace?

☐ Official email ☐ Personal email

2.11 How many official email messages do you receive in one day?

☐ Never receive ☐ 2 messages and below ☐ 3-5 messages ☐ 6-

10 messages ☐ 11-15 messages ☐ 16-20 messages ☐ More than 20 messages

2.12 How many official email messages do you send in one day?

☐ Never send ☐ 2 messages and below ☐ 3-5 messages

☐ 6-10 messages ☐ 11-15 messages ☐ 16-20 messages ☐

More than 20 messages

2.13 If you are receiving official email, what types of message do you mostly receive?

☐ Related to work: involving (further conversation needed) ☐ Related to work: uninvolved (no further conversation) ☐ Personal ☐ Other (please specify):.....

2.14 If you are sending official email, what types of message do you mostly send?

☐ Related to work: involving (further conversation expected) ☐ Related to work: uninvolved (no further conversation) ☐ Personal ☐ Other (please specify):.....

2.15 Are your superiors email oriented?

☐ Yes ☐ No

Instruction:

For questions 2.16-2.19, please rank your most preferred communication channel by selecting numbers from 1 to 5 in the appropriate box. Number 1 represents your most preferred, followed by numbers 2, 3, 4 and 5 as least preferred.

2.16 Which communication channel do you prefer to communicate with your superior?

☐ Email ☐ Face-to-Face ☐ Telephone ☐ Online Social Network-please specify (for example LinkedIn, Facebook, Yahoo Messenger or Twitter)..... ☐ Other- please specify (for example SMS, letter or Fax)

2.17 Which communication channel do you prefer to use when you communicate with subordinates?

☐ Email ☐ Face-to-Face ☐ Telephone ☐ Online Social Network-
please specify (for example LinkedIn, Facebook, Yahoo Messenger or
Twitter)..... ☐ Other- please specify (for example SMS, letter or
Fax)

2.18 Which communication channel do you prefer to use when communicating with your colleagues who have same level of position as you?

☐ Email ☐ Face-to-Face ☐ Telephone ☐ Online Social Network-
please specify (for example LinkedIn, Facebook, Yahoo Messenger or
Twitter)..... ☐ Other- please specify (for example SMS, letter or
Fax)

2.19 Overall, which communication channel do you prefer for to communicating in relation to your work?

☐ Email ☐ Face-to-Face ☐ Telephone ☐ Online Social Network-
please specify (for example LinkedIn, Facebook, Yahoo Messenger or
Twitter)..... ☐ Other- please specify (for example SMS, letter or
Fax)

SECTION 3

TECHNOLOGY ACCEPTANCE ON EMAIL USAGE

This section relates to email and how you perceived its usefulness, its ease of use and your intention to use email in future.

Instruction:

Using the scale below, please circle only one number (from 1 to 5) which corresponds to your view on each matter.

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

A. Perceived Usefulness (PU)

Using email for work:

3.1	Enables me to accomplish tasks more quickly.	1	2	3	4	5
3.2	Improves my job performance.	1	2	3	4	5
3.3	Increases my job productivity.	1	2	3	4	5
3.4	Enhances my effectiveness.	1	2	3	4	5
3.5	Makes me useful in my job.	1	2	3	4	5

B. Perceived Ease of Use (PEOU)

3.6	Learning how to use email is easy for me.	1	2	3	4	5
3.7	My interaction with email is clear and understandable.	1	2	3	4	5
3.8	I find email to be very flexible.	1	2	3	4	5
3.9	I find it easy to get email to do the work I want it to do.	1	2	3	4	5
3.10	Overall, I find that email is easy to use.	1	2	3	4	5

C. Usage (U)

3.11	Currently, I use email at the workplace frequently.	1	2	3	4	5
3.12	Currently, I use email more than any other communication channels.	1	2	3	4	5

SECTION 4 NATIONAL CULTURE

This section revolve in the aspect of national culture which includes Power Distance, Individualism/Collectivism, Uncertainty Avoidance, Masculinity /Femininity, Long Term/Short Term Orientation and Indulgence/Restraint.

Instruction:

Using the scale below, please circle only one number (from 1 to 5) which corresponds to your view on each matter.

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

A. Power Distance (PD)

4.1	Managers should be careful not to ask the opinions of subordinates too frequently, otherwise the manager might appear to be weak and incompetent.	1	2	3	4	5
4.2	Managers should make most decisions without consulting subordinates, because managers should look powerful and authoritative.	1	2	3	4	5
4.3	Employees should not question their manager's decisions.	1	2	3	4	5
4.4	Employees should not show their disagreement to their managers.	1	2	3	4	5
4.5	Decision-making power should stay with top management in the organisation and not be delegated to lower-level employees.	1	2	3	4	5

B. Collectivism (C)

4.6	Individual rewards are not as important as group welfare.	1	2	3	4	5
4.7	Group success is more important than individual success.	1	2	3	4	5
4.8	Working within a team is better than working alone.	1	2	3	4	5
4.9	Being accepted as a member of a group is	1	2	3	4	5

	more important than having autonomy and independence on the job.					
4.10	It is more important for a manager to encourage loyalty and a sense of duty in subordinates than it is to encourage individual initiative.	1	2	3	4	5

C. Uncertainty Avoidance (UA)

4.11	It is important to have job requirements and instructions spelled out in detail so that people always know what they are expected to do.	1	2	3	4	5
4.12	People should avoid making changes because things could get worse.	1	2	3	4	5
4.13	Rules and regulations are important because they inform workers what the organisation expects of them.	1	2	3	4	5
4.14	It is better to have a bad situation that I know about, than to have an uncertain situation that might be better.	1	2	3	4	5
4.15	Working in a structured environment is better than working (rules and regulations) in an unstructured work environment.	1	2	3	4	5

D. Masculinity (M)

4.16	It is more important for men to have a professional career than it is for women to have a professional career.	1	2	3	4	5
4.17	It is preferable to have a man in a high-level position rather than a woman.	1	2	3	4	5
4.18	Men usually solve problems with logical analysis; women usually solve problems with intuition.	1	2	3	4	5
4.19	Solving organisational problems usually requires an active forcible approach which is typical of men.	1	2	3	4	5
4.20	Women do not value recognition and promotion in their work as much as men do.	1	2	3	4	5
4.21	There are some jobs in which a man can always do better than woman.	1	2	3	4	5

E. Long-Term Orientation (LT)

4.22	Respect for tradition hampers performance.	1	2	3	4	5
4.23	The exchange of favours and gifts is not necessary to excel.	1	2	3	4	5
4.24	Upholding one's personal image makes little difference in goal achievement.	1	2	3	4	5

F. Indulgence (I)

4.25	It is important to keep time free for fun.	1	2	3	4	5
4.26	It is important to have moderation: having few desires.	1	2	3	4	5
4.27	I'm a happy person in the workplace.	1	2	3	4	5
4.28	There are no other people or circumstances that ever prevent me from doing what I really want to do at the workplace.	1	2	3	4	5

SECTION 5 ORGANISATIONAL CULTURE

This section relates to your work value and practice.

Instruction:

Using the scale below, please circle only one number (from 1 to 5) which corresponds to your view on each matter.

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

A. Work Value (V) – Need for Security

	Need for Security (NS)					
5.1	Employees afraid to disagree with superiors.	1	2	3	4	5
5.2	Having little tension and stress at work is important.	1	2	3	4	5
5.3	Being consulted by the boss is important.	1	2	3	4	5
5.4	A job you like is not more important than career.	1	2	3	4	5
5.5	Most people can be trusted.	1	2	3	4	5

B. Work Practices (P) - Results-Oriented, Job-Oriented and Closed System

Where I work:

	Results-Oriented (RO)					
5.6	People are comfortable in unfamiliar situations.	1	2	3	4	5
5.7	Each day brings new challenges to employees.	1	2	3	4	5
5.8	People put in maximal effort in the workplace.	1	2	3	4	5
	Job-Oriented (JO)					
5.9	Important decisions made by individuals.	1	2	3	4	5
5.10	Organisation is interested only in the work of employees.	1	2	3	4	5
5.11	There is little concern for personal problems of employees.	1	2	3	4	5

	Closed System (CS)					
5.12	Only specific kinds of people fit in the organisation.	1	2	3	4	5
5.13	Organisation and people are closed and secretive.	1	2	3	4	5
5.14	New employees need more than a year to feel at home.	1	2	3	4	5

If you would like to make any suggestions or comments concerning this research in the space below it would be highly appreciated.

If you would like an electronic copy of this survey report, please write your email in the space provided in the questionnaire.

Email:

**Thank you for your time and cooperation in completing this
questionnaire**

APPENDIX F
TRANSLATION QUESTIONNAIRE

Y. Bhg. Dato'/Prof/Dr./Tuan/Puan,

Saya, **ANUAR SHAH BIN BALI MAHOMED**, pelajar Doktor Falsafah (PhD) di Sekolah Pengajian Pengurusan dan Sistem Maklumat, Victoria University, Melbourne, Australia. Untuk makluman pihak tuan, tajuk tesis saya adalah: **"Mengukur Tahap Penggunaan E-mel dalam kalangan Kakitangan Bukan Akademik di Universiti Awam dan Swasta di Malaysia"**.

Kajian ini menyelidik penggunaan e-mel di tempat kerja dalam kalangan Eksekutif Bukan Akademik di universiti awam dan swasta di Malaysia. Kajian ini akan menyediakan maklumat berguna tentang faktor yang mempengaruhi penggunaan e-mel anda bagi tujuan kerja. Oleh itu, saya mempelawa pihak tuan untuk mengambil bahagian dalam kajian ini.

Maklumat berkaitan dengan borang soal selidik yang dilampirkan diringkaskan di bawah:

i. Borang soal selidik ini merangkumi lima bahagian:

Bahagian 1: Maklumat demografi

Soalan dalam bahagian ini berkaitan latar belakang umum diri anda.

Bahagian 2: Internet dan penggunaan e-mel

Soalan dalam bahagian ini memberikan maklumat berkaitan penggunaan internet dan e-mel anda yang lepas dan pada ketika ini.

Bahagian 3: Penyataan berkaitan penerimaan teknologi dalam penggunaan e-mel

Soalan dalam bahagian ini berkaitan e-mel dan bagaimana anda melihat kebergunaannya, adakah ia mudah untuk digunakan dan hasrat anda untuk menggunakan e-mel pada masa depan.

Bahagian 4: Penyataan berkaitan Budaya Negara

Soalan dalam bahagian ini berkisar pada aspek budaya negara yang termasuk Jarak Kuasa, Kolektivisme, Mengelak Ketidakpastian, Kelelakian, Orientasi Jangka Panjang dan Kenikmatan.

Bahagian 5: Penyataan berkaitan Budaya Organisasi

Soalan dalam bahagian ini berkaitan nilai dan amalan kerja anda.

- ii. Penyempurnaan borang soal selidik ini akan mengambil masa kira-kira **25 minit**.
iii. Semua maklumat hanya untuk tujuan penyelidikan sahaja dan dianggap sebagai sulit dan peribadi, maka, ia tidak akan didedahkan kepada mana-mana pihak dalam apa jua keadaan.

Jika anda mempunyai sebarang pertanyaan atau kemusykilan, anda boleh menghubungi saya melalui e-mel: anuar2705@gmail.com dan nombor telefon: +60196666172, atau Penyelia Utama saya, Profesor G. Michael McGrath melalui e-mel: Michael.McGrath@vu.edu.au dan nombor telefon: +613 9919 4627 atau Penyelia Bersekutu, Dr Maree Keating melalui e-mel: maree.keating@vu.edu.au dan nombor telefon: +613 9919 2280.

Segala kerjasama daripada pihak tuan/puan amat saya hargai. Terima kasih.

Yang benar,

ANUAR SHAH BIN BALI MAHOMED

Pelajar Doktor Falsafah (PhD)

Sekolah Pengajian Pengurusan dan Sistem Maklumat

Victoria University

Melbourne, Australia

BAHAGIAN 1 MAKLUMAT DEMOGRAFI

Bahagian ini berkaitan latar belakang umum diri anda.

Arahan:

Bagi setiap soalan, sila berikan jawapan anda dengan menandakan X pada satu kotak sahaja.

1.1 Apakah jantina anda?

☐ Lelaki ☐ Perempuan

1.2 Apakah bangsa anda?

☐ Melayu ☐ Cina ☐ India ☐ Lain-lain (sila nyatakan):

.....

1.3 Apakah agama anda?

☐ Islam ☐ Buddha ☐ Hindu ☐ Kristian ☐ Lain-lain (sila nyatakan):

1.4 Apakah kumpulan umur anda?

☐ 20-25 tahun ☐ 26-30 tahun ☐ 31-35 tahun ☐ 36-40 tahun

☐ 41-45 tahun ☐ 46-50 tahun ☐ 51-55 tahun ☐ 56-60 tahun ☐
60 tahun ke atas

1.5 Apakah tahap pendidikan tertinggi anda?

☐ Diploma ☐ Ijazah Sarjana Muda ☐ Ijazah Sarjana

☐ Doktor Falsafah/Kedoktoran Profesional

1.6 Apakah kategori universiti tempat anda berkerja?

☐ Awam ☐ Swasta

1.7 Apakah nama universiti itu?

.....

1.8 Apakah jawatan anda?

Jika anda bekerja di Universiti Awam

☐ Timbalan Pendaftar Kanan ☐ Timbalan Pendaftar ☐ Ketua

Penolong Pendaftar ☐ Penolong Pendaftar Kanan ☐ Penolong
Pendaftar

Jika anda bekerja di Universiti Swasta

☐ Eksekutif Kanan ☐ Eksekutif ☐ Eksekutif Muda

BAHAGIAN 2

INTERNET AND PENGGUNAAN E-MEL

Bahagian ini memberikan maklumat berkaitan penggunaan internet dan e-mel anda yang lepas dan pada ketika ini.

Arahan:

Bagi setiap soalan, sila berikan jawapan anda dengan menandakan X pada satu kotak sahaja.

2.1 Berapa lamakah anda telah menggunakan komputer?

- ☐ Kurang daripada 2 tahun ☐ 2-4 tahun ☐ 5-7 tahun ☐ 8-10
tahun ☐ lebih daripada 10 tahun

2.2 Berapa kerapkah anda menggunakan internet?

- ☐ Tidak pernah ☐ Kira-kira sekali sebulan ☐ Beberapa kali
sebulan ☐ Beberapa kali seminggu ☐ Kira-kira sekali sehari ☐
Beberapa kali sehari ☐ Kerap setiap hari

2.3 Berapa lamakah anda telah menggunakan e-mel?

- ☐ Tidak pernah ☐ Kurang daripada 2 tahun ☐ 2-4 tahun ☐ 5-
7 tahun ☐ 8-10 tahun ☐ 10 tahun ke atas

2.4 Adakah anda mempunyai alamat e-mel rasmi?

- ☐ Ya ☐ Tidak

2.5 Jika ya, berapa banyakkah alamat e-mel rasmi yang anda miliki?

- ☐ Satu ☐ Dua ☐ Tiga ☐ Lebih daripada tiga

2.6 Adakah anda mempunyai apa-apa alamat e-mel peribadi?

- ☐ Ya ☐ Tidak

2.7 Jika ya, berapa banyakkah alamat e-mel peribadi yang anda miliki?

☐ Satu ☐ Dua ☐ Tiga ☐ Lebih daripada tiga

2.8 Berapa kerapkah anda menggunakan alamat e-mel rasmi anda?

☐ Tidak pernah ☐ Kira-kira sekali sebulan ☐ Sekali seminggu

☐ Sekali sehari ☐ Dua kali sehari ☐ 3-5 kali sehari ☐ 6-10 kali

sehari ☐ 11-15 kali sehari ☐ Lebih daripada 16 kali sehari

2.9 Berapa kerapkah anda menggunakan alamat e-mel peribadi?

☐ Tidak pernah ☐ Kira-kira sekali sebulan ☐ Sekali seminggu

☐ Sekali sehari ☐ Dua kali sehari ☐ 3-5 kali sehari ☐ 6-10 kali

sehari ☐ 11-15 kali sehari ☐ Lebih daripada 16 kali sehari

2.10 Apakah kategori e-mel yang anda pilih untuk digunakan di tempat kerja?

☐ E-mel rasmi ☐ E-mel peribadi

2.11 Berapa banyakkah mesej e-mel rasmi yang anda terima dalam sehari?

☐ Tidak pernah ☐ 2 mesej dan kurang ☐ 3-5 mesej ☐ 6-10

mesej ☐ 11-15 mesej ☐ 16-20 mesej ☐ Lebih daripada 20 mesej

2.12 Berapa banyakkah mesej e-mel rasmi yang anda hantar dalam sehari?

☐ Tidak pernah ☐ 2 mesej dan kurang ☐ 3-5 mesej ☐ 6-10

mesej ☐ 11-15 mesej ☐ 16-20 mesej ☐ Lebih daripada 20 mesej

2.13 Jika anda menerima mesej dalam e-mel rasmi, apakah kategori mesej yang selalunya anda terima?

- ☐ Berkaitan dengan kerja: terlibat (komunikasi lanjutan diperlukan)
- ☐ Berkaitan dengan kerja: tidak terlibat (tiada komunikasi lanjutan)
- ☐ Peribadi ☐ Lain-lain (sila nyatakan):.....

2.14 Jika anda menghantar mesej menggunakan e-mel rasmi, apakah kategori mesej yang selalunya anda hantar?

- ☐ Berkaitan dengan kerja: terlibat (komunikasi lanjutan diperlukan)
- ☐ Berkaitan dengan kerja: tidak terlibat (tiada komunikasi lanjutan)
- ☐ Peribadi ☐ Lain-lain (sila nyatakan):.....

2.15 Adakah pihak atasan anda berorientasikan komunikasi melalui e-mel?

- ☐ Ya ☐ Tidak

Arahan:

Bagi soalan 2.16-2.19, sila susun saluran komunikasi mengikut keutamaan dengan memilih nombor 1 hingga 4 dan diisikan pada kotak yang bersesuaian. Nombor 1 mewakili saluran komunikasi yang paling digemari diikuti nombor 2, 3 dan 4 sebagai yang paling kurang digemari.

2.16 Saluran komunikasi manakah yang paling digemari apabila berkomunikasi dengan pihak atasan anda?

- ☐ E-mel ☐ Bersemuka ☐ Telefon ☐ Jaringan Sosial dalam Talian- sila nyatakan (contohnya *LinkedIn, Facebook, Yahoo Messenger atau Twitter*)..... ☐ Lain-lain- sila nyatakan (contohnya SMS, surat atau Faks)

2.17 Saluran komunikasi manakah yang paling digemari apabila berkomunikasi dengan staf bawahan anda?

- ☐ E-mel ☐ Bersemuka ☐ Telefon ☐ Jaringan Sosial dalam Talian- sila nyatakan (contohnya *LinkedIn, Facebook, Yahoo Messenger atau Twitter*)..... ☐ Lain-lain- sila nyatakan (contohnya SMS, surat atau Faks)

2.18 Saluran komunikasi manakah yang paling digemari apabila berkomunikasi dengan rakan sekerja yang setaraf jawatannya dengan anda?

☐ E-mel ☐ Bersemuka ☐ Telefon ☐ Jaringan Sosial dalam Talian- sila nyatakan (contohnya *LinkedIn*, *Facebook*, *Yahoo Messenger* atau *Twitter*)..... ☐ Lain-lain- sila nyatakan (contohnya SMS, surat atau Faks)

2.19 Secara keseluruhannya, saluran komunikasi manakah yang paling digemari apabila berkomunikasi berkaitan dengan kerja anda?

☐ E-mel ☐ Bersemuka ☐ Telefon ☐ Jaringan Sosial dalam Talian- sila nyatakan (contohnya *LinkedIn*, *Facebook*, *Yahoo Messenger* atau *Twitter*)..... ☐ Lain-lain- sila nyatakan (contohnya SMS, surat atau Fax).....

BAHAGIAN 3

PENERIMAAN TEKNOLOGI DALAM PENGUNAAN E-MEL

Bahagian ini berkaitan e-mel dan bagaimana anda melihat kebergunaannya, adakah ia mudah untuk digunakan dan hasrat anda untuk menggunakan e-mel pada masa depan.

Arahan:

Dengan menggunakan skala di bawah, sila bulatkan hanya satu nombor sahaja (antara nombor 1 hingga 5) yang mewakili pandangan anda untuk setiap pernyataan.

1	2	3	4	5
Sangat Tidak Bersetuju	Tidak Bersetuju	Neutral	Bersetuju	Sangat Bersetuju

A. Dilihat Berguna (Perceived Usefulness, atau PU)

Menggunakan e-mel untuk kerja:

3.1	Membolehkan saya menyempurnakan kerja dengan lebih pantas.	1	2	3	4	5
3.2	Memperbaiki prestasi kerja saya.	1	2	3	4	5
3.3	Meningkatkan produktiviti kerja saya.	1	2	3	4	5
3.4	Meningkatkan keberkesanan saya.	1	2	3	4	5
3.5	Berguna dalam kerja saya.	1	2	3	4	5

B. Dilihat Mudah untuk Digunakan (Perceived Ease to Use, atau PEOU)

3.6	Belajar cara menggunakan e-mel mudah untuk saya.	1	2	3	4	5
3.7	Interaksi saya melalui e-mel adalah jelas dan mudah difahami.	1	2	3	4	5
3.8	Saya mendapati e-mel adalah sangat fleksibel.	1	2	3	4	5
3.9	Saya mendapati mudah untuk memastikan e-mel melakukan tugas yang saya kehendaki.	1	2	3	4	5
3.10	Secara keseluruhannya, saya mendapati e-mel mudah untuk digunakan.	1	2	3	4	5

D. Penggunaan (Usage, atau U)

3.11	Pada ketika ini saya kerap menggunakan e-mel di tempat kerja.	1	2	3	4	5
3.12	Pada ketika ini saya menggunakan e-mel lebih daripada saluran komunikasi yang lain.	1	2	3	4	5

BAHAGIAN 4 BUDAYA NEGARA

Bahagian ini berkisar pada aspek budaya negara yang termasuk Jarak Kuasa (PD), Individualisme/Kolektivisme (IDV), Mengelak Ketidakpastian (UA), Kelelakian/Kewanitaan (MAS), Orientasi Jangka Pendek/Panjang (LTO) dan Kenikmatan/Kekangan (IVR).

Arahan:

Dengan menggunakan skala di bawah, sila bulatkan hanya satu nombor sahaja (antara nombor 1 hingga 5) yang mewakili pandangan anda bagi setiap pernyataan.

1	2	3	4	5
Sangat Tidak Bersetuju	Tidak Bersetuju	Neutral	Bersetuju	Sangat Bersetuju

B. Jarak Kuasa (PD)

4.1	Pengurus perlu berhati-hati agar tidak terlalu kerap meminta pandangan orang bawahannya, jika tidak dia boleh kelihatan lemah dan tidak cekap.	1	2	3	4	5
4.2	Pengurus perlu membuat kebanyakan keputusan tanpa berunding dengan orang bawahannya kerana pengurus perlu dilihat berkuasa dan berwibawa.	1	2	3	4	5
4.3	Pekerja tidak sepatutnya mempertikaikan keputusan pengurus mereka.	1	2	3	4	5
4.4	Pekerja tidak sepatutnya menzahirkan perbezaan pandangan atau pendapat dengan pengurus mereka.	1	2	3	4	5
4.5	Kuasa membuat keputusan perlu kekal dengan pengurusan atasan dan tidak perlu diagihkan kepada pekerja di peringkat bawahan.	1	2	3	4	5

B. Kolektivisme (C)

4.6	Ganjaran individu tidak sepenting kebajikan kumpulan.	1	2	3	4	5
4.7	Kejayaan kumpulan adalah lebih penting daripada kejayaan individu.	1	2	3	4	5
4.8	Bekerja dalam satu pasukan adalah lebih baik daripada bekerja bersendirian.	1	2	3	4	5
4.9	Diterima sebagai ahli kumpulan adalah lebih penting daripada diberikan autonomi dan kebebasan di tempat kerja.	1	2	3	4	5
4.10	Lebih penting bagi seorang Pengurus untuk menerapkan aspek kesetiaan dan kebertanggungjawaban kepada orang bawahannya daripada menggalakkan inisiatif individu.	1	2	3	4	5

C. Mengelak Ketidakpastian (UA)

4.11	Adalah penting keperluan kerja dan arahan dinyatakan secara terperinci supaya pekerja sentiasa tahu apa yang sepatutnya merekalakukan.	1	2	3	4	5
4.12	Pekerja perlu mengelak daripada membuat perubahan kerana ia boleh merumitkan keadaan.	1	2	3	4	5
4.13	Undang-undang dan peraturan adalah penting kerana ia memaklumkan pekerja berkenaan harapan organisasi terhadap mereka.	1	2	3	4	5
4.14	Menghadapi situasiburukyangdiketahui adalah lebih baik daripada berhadapan dengan keadaan yang tidak menentuyang berkemungkinan lebih baik.	1	2	3	4	5
4.15	Bekerja di persekitaran yang berstruktur (undang-undang dan peraturan) adalah lebih baik daripada bekerja di persekitaran yang tidak berstruktur.	1	2	3	4	5

D. Kelelakian (M)

4.16	Mempunyai kerjaya profesional adalah lebih penting bagi lelaki berbanding wanita.	1	2	3	4	5
4.17	Lebih baik untuk lelaki memegang jawatan	1	2	3	4	5

	di peringkat atasan daripada wanita.					
4.18	Kebiasaannya lelaki menyelesaikan masalah dengan analisis logik, manakala wanita biasanya menyelesaikan masalah dengan gerak hati.	1	2	3	4	5
4.19	Menyelesaikan masalah organisasi biasanya memerlukan pendekatan paksaan aktif yang tipikal bagi lelaki.	1	2	3	4	5
4.20	Wanita tidak menghargai pengiktirafan dan kenaikan pangkat sebagaimana lelaki.	1	2	3	4	5
4.21	Terdapat beberapa pekerjaan yang lelaki sentiasa boleh melakukannya lebih baik daripada wanita.	1	2	3	4	5

E. Orientasi Jangka Panjang (LT)

4.22	Menghormati tradisi menjejaskan prestasi.	1	2	3	4	5
4.23	Bertukar-tukar pertolongan dan hadiah tidak diperlukan untuk cemerlang.	1	2	3	4	5
4.24	Mendukung imej peribadi hanya menyumbang perbezaan kecil dalam pencapaian matlamat.	1	2	3	4	5

F. Kenikmatan (I)

4.25	Memperuntukkan masa untuk bergembira adalah penting.	1	2	3	4	5
4.26	Penting untuk bersederhana mempunyai keinginan yang sedikit.	1	2	3	4	5
4.27	Saya seorang yang ceria di tempat kerja.	1	2	3	4	5
4.28	Tidak ada orang lain atau keadaan yang boleh menghalang saya daripada melaksanakan apa yang saya ingin laksanakan di tempat kerja.	1	2	3	4	5

BAHAGIAN 5 BUDAYA ORGANISASI

Bahagian ini berkaitan nilai dan amalan kerja anda.

Arahan:

Dengan menggunakan skala di bawah, sila bulatkan hanya satu nombor sahaja (antara nombor 1 hingga 5) yang mewakili pandangan anda untuk setiap pernyataan.

1	2	3	4	5
Sangat Tidak Bersetuju	Tidak Bersetuju	Neutral	Bersetuju	Sangat Bersetuju

A. Work Value (V) – Keperluan untuk Keselamatan

	Keperluan Keselamatan (Need for Security, atau NS)					
5.1	Pekerja takut untuk membantah keputusan pihak atasan.	1	2	3	4	5
5.2	Mempunyai sedikit ketegangan dan tekanan di tempat kerja adalah penting.	1	2	3	4	5
5.3	Diajak berunding oleh pihak atasan adalah penting.	1	2	3	4	5
5.4	Pekerjaan yang anda minati tidak sepenting pemajuan kerjaya anda.	1	2	3	4	5
5.5	Kebanyakan orang boleh dipercayai.	1	2	3	4	5

B. Amalan Kerja (P) - Berorientasikan Hasil, Berorientasikan Pekerjaan dan Sistem Tertutup

Di tempat kerja saya:

	Berorientasi Hasil (Results-Oriented, atau RO)					
5.6	Pekerja berasa selesa dengan situasi yang asing.	1	2	3	4	5
5.7	Setiap hari memberikan cabaran baharu kepada pekerja.	1	2	3	4	5
5.8	Pekerja mencurahkan sepenuh tenaga di	1	2	3	4	5

	tempat kerja.					
	Berorientasikan Pekerjaan (Job-Oriented, atau JO)					
5.9	Keputusan penting dibuat oleh individu.	1	2	3	4	5
5.10	Organisasi hanya berminat dengan kerja pekerja.	1	2	3	4	5
5.11	Terdapat hanya sedikit keprihatinan terhadap masalah peribadi pekerja.	1	2	3	4	5
	Sistem Tertutup (Closed System, atau CS)					
5.12	Hanya orang tertentu sahaja yang sesuai bertugas dalam organisasi.	1	2	3	4	5
5.13	Organisasi dan warganya adalah terhad dan perahsia.	1	2	3	4	5
5.14	Pekerja baharu memerlukan lebih daripada setahun untuk menyesuaikan diri di tempat kerja.	1	2	3	4	5

Sebarang cadangan atau komen berkaitan dengan penyelidikan ini sangat dihargai dan anda boleh menulis di ruangan yang disediakan di bawah.

Jika anda berhasrat untuk menerima salinan elektronik laporan kaji selidik ini, sila tuliskan alamat e-mel anda di ruangan yang disediakan di bawah.

E-mel:

**Terima kasih kerana memperuntukan masa anda untuk
melengkapkan borang soal selidik ini**

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from the Document provided by Client

JASMANI MARDI
Senior Executive
for and on behalf


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Reference No : 27-013
Date : 27/1/2

APPENDIX G
NOTIFICATION LETTER
MINISTRY OF HIGHER EDUCATION
MALAYSIA



JABATAN PENGAJIAN TINGGI
KETUA PENGARAH

ARAS 9, NO. 2, MENARA 2, JALAN P5/6, PRESINT 5,
PUSAT Pentadbiran Kerajaan Persekutuan 62200 PUTRAJAYA
Tel : (603) 8870 4090/6381 Faks : (603) 8870 6840 Web : <http://www.mche.gov.my>



☞ March 2012

TO WHOM IT MAY CONCERN

RE : MR. ANUAR SHAH BIN BALI MAHOMED

Kindly refer to the above mentioned matter.

2. Mr. Anuar Shah bin Bali Mahomed is a PhD candidate from the School of Management and Information Systems, Victoria University, Melbourne, Australia. He is currently doing a research entitled "Examining Email Usage Among Non-Academic Staff In Public And Private Malaysian Universities".

3. It would be appreciated if you could assist the person named above in accessing the information he may require from your esteemed institution. This is of course subject to whatever restrictions you may wish to impose upon him. Mr. Bali Mahomed has also agreed to share the findings and outcome of his research for the betterment of higher educational institutions in Malaysia.

Thank you for your kind support and cooperation.

Yours sincerely,

(DATO[®] PROF. DR. RUJHAN BIN MUSTAFA)

Director General
Department of Higher Education
Ministry of Higher Education Malaysia

APPENDIX H

DATA SCREENING

Table 1 Multi-variate outliers (Mahalanobis distance)

Observation number	Mahalanobis d-squared	p1	p2
196	94.511	.000	.003
1	89.198	.000	.000
402	82.522	.000	.000
201	75.721	.001	.001
327	73.123	.002	.002
399	71.001	.003	.003
141	65.933	.011	.139
140	65.886	.011	.070
394	64.125	.016	.177
218	64.043	.016	.109
41	63.864	.016	.070
401	62.374	.022	.187
362	62.014	.024	.169
56	61.351	.027	.210
385	60.321	.033	.359
287	60.142	.034	.309
77	60.126	.034	.228
44	60.062	.035	.170
221	59.552	.038	.209
269	59.154	.041	.231
297	58.978	.043	.203
368	58.910	.043	.157
220	58.348	.048	.223
138	58.224	.049	.190
211	58.221	.049	.137
289	57.143	.060	.363
226	57.120	.060	.296
93	57.020	.061	.259
397	56.940	.062	.220
182	56.908	.062	.174
299	56.781	.064	.155
164	56.487	.067	.177
335	56.442	.067	.142
193	56.368	.068	.117
210	55.812	.075	.205
69	55.810	.075	.158
231	55.790	.075	.123
31	55.670	.077	.112
60	55.651	.077	.085
225	55.602	.078	.067
194	55.472	.080	.062

Observation number	Mahalanobis d-squared	p1	p2
129	55.083	.085	.097
96	54.978	.086	.088
317	54.777	.089	.095
215	54.549	.093	.110
204	54.512	.093	.089
37	54.286	.097	.103
346	54.001	.101	.135
3	53.864	.104	.134
237	53.687	.107	.143
185	53.327	.113	.209
398	53.303	.113	.175
259	53.132	.116	.188
53	53.027	.118	.181
142	52.883	.121	.186
82	52.702	.125	.205
192	52.607	.126	.195
63	52.572	.127	.168
12	52.474	.129	.162
295	52.420	.130	.143
144	52.105	.136	.205
151	51.999	.139	.202
302	51.738	.144	.258
46	51.608	.147	.265
209	51.472	.150	.276
188	51.431	.151	.248
360	51.420	.151	.212
191	51.411	.151	.177
311	51.246	.155	.198
376	51.170	.157	.188
145	50.981	.161	.219
373	50.926	.163	.202
358	50.693	.168	.254
74	50.688	.168	.215
356	50.668	.169	.186
120	50.516	.172	.206
343	50.367	.176	.226
132	50.328	.177	.204
27	50.260	.179	.194
391	50.147	.182	.201
68	50.066	.184	.196
301	49.905	.188	.223
43	49.886	.188	.194

Observation number	Mahalanobis d-squared	p1	p2
270	49.859	.189	.171
206	49.826	.190	.152
278	49.772	.191	.140
171	49.633	.195	.156
134	49.496	.199	.173
16	49.454	.200	.157
288	49.379	.202	.153
214	49.265	.205	.162
342	49.133	.209	.179
348	48.935	.215	.223
180	48.915	.215	.197
263	48.857	.217	.187
246	48.841	.217	.162
4	48.829	.218	.139
72	48.550	.226	.211
240	48.540	.226	.183
186	48.339	.232	.232

Table 2 Assessment of normality (Group number 1)**Assessment of normality (Group number 1)**

Variable	min	max	skew	c.r.	kurtosis	c.r.
Actual_ Usage	3.000	7.000	-.951	-7.781	-.493	-2.018
U2	1.000	5.000	-.715	-5.850	.081	.330
U1	1.000	5.000	-.621	-5.081	.137	.563
PU5	1.000	5.000	-.472	-3.864	-.116	-.474
PU4	1.000	5.000	-.680	-5.564	.049	.199
PU2	1.000	5.000	-.473	-3.872	.104	.424
PU1	1.000	5.000	-.279	-2.282	-.486	-1.989
PEOU5	2.000	5.000	-.545	-4.458	-.399	-1.632
PEOU4	1.000	5.000	-.627	-5.131	.144	.588
PEOU3	1.000	5.000	-.347	-2.841	-.163	-.665
PEOU1	2.000	5.000	-.383	-3.133	-.575	-2.355
JO3	1.000	5.000	-.341	-2.794	-.421	-1.722
JO2	1.000	5.000	-.384	-3.141	-.415	-1.700
JO1	1.000	5.000	-.841	-6.881	.465	1.904
CS3	1.000	5.000	-.054	-.441	-.405	-1.656
CS2	1.000	5.000	.002	.018	-.327	-1.337
CS1	1.000	5.000	-.078	-.636	-.204	-.833
NS4	1.000	5.000	.107	.878	-.427	-1.746
NS3	1.000	5.000	.254	2.075	-.515	-2.109
NS1	1.000	5.000	.194	1.591	-.461	-1.885
RO3	1.000	5.000	-.301	-2.466	-.646	-2.642
RO2	1.000	5.000	-.150	-1.229	-.661	-2.705
RO1	1.000	5.000	-.054	-.439	-.269	-1.099
M4	1.000	5.000	-.386	-3.159	-.290	-1.187
M3	1.000	5.000	-.278	-2.275	-.631	-2.581
M2	1.000	5.000	-.234	-1.911	-.474	-1.941
LT3	1.000	5.000	-.421	-3.446	-.385	-1.576
LT2	1.000	5.000	-.351	-2.874	-.411	-1.684
LT1	1.000	5.000	-.406	-3.327	-.258	-1.056
I3	1.000	5.000	.398	3.258	-.366	-1.499
I2	1.000	5.000	.286	2.342	-.283	-1.158
I1	1.000	5.000	.263	2.155	-.207	-.849
UA4	1.000	5.000	-.436	-3.569	.241	.985
UA3	1.000	5.000	-.395	-3.235	.028	.113
UA2	1.000	5.000	-.355	-2.910	.052	.211
C5	2.000	5.000	-.091	-.747	-.688	-2.815
C4	1.000	5.000	-.641	-5.244	.207	.845
C3	2.000	5.000	-.426	-3.483	-.235	-.961
C1	1.000	5.000	-.401	-3.281	.024	.097

Variable	min	max	skew	c.r.	kurtosis	c.r.
PD5	3.000	5.000	.084	.685	-1.388	-5.682
PD4	3.000	5.000	.244	1.996	-1.242	-5.083
PD3	3.000	5.000	-.108	-.887	-.976	-3.996
Multivariate					31.835	5.250

APPENDIX I
CONFIRMATORY FACTOR ANALYSIS (CFA)

Table 1 Standardised Residual Covariances Matrix (SRCM) – Technology Acceptance Model (TAM)

	Actual_ Usage	U2	U1	PEOU5	PEOU4	PEOU3	PEOU2	PEOU1	PU5	PU4	PU3	PU2	PU1
Actual Usage	.000												
U2	-.083	.000											
U1	-.007	.054	.000										
PEOU5	.551	-.495	-1.009	.000									
PEOU4	.855	-.152	-.676	-.030	.000								
PEOU3	1.799	1.107	.423	-.139	.079	.000							
PEOU2	3.817	3.490	3.578	.305	-.943	.520	.000						
PEOU1	.241	-.858	-1.762	.200	.213	-.193	-.920	.000					
PU5	.651	-.444	-1.599	-.617	-.697	.289	2.387	.029	.000				
PU4	1.074	-.562	-.990	.331	-1.007	.490	2.413	-.136	.106	.000			
PU3	2.934	4.330	3.070	2.942	2.882	3.326	1.588	2.864	-.352	-.236	.000		
PU2	2.857	.544	.073	-.211	-.285	.846	3.411	-.128	-.268	.041	-.095	.000	
PU1	.134	-.662	-1.585	-.834	-1.486	.131	2.709	-1.036	.352	-.035	-.583	.083	.000

Table 2: Modification Indices (MI) – TAM

			M.I.	Par Change
e7	<-->	U	12.967	.093
e7	<-->	PEOU	13.383	-.086
e3	<-->	U	30.216	.128
e3	<-->	PU	31.368	-.112
e3	<-->	PEOU	21.358	.097
e3	<-->	e13	10.440	-.081
e3	<-->	e12	22.900	.070
e2	<-->	e13	26.650	.079

Table 3: Standardised Residual Covariances Matrix (SRCM) – National Culture (NC)

	I4	I3	I2	I1	LT3	LT2	LT1	M6	M5	M4	M3	M2	M1	UA5	UA4	UA3	UA2	UA1	C5	C4	C3	C2	C1	PD5	PD4	PD3	PD2	PD1
I4	0																											
I3	0.474	0																										
I2	0.29	0.058	0																									
I1	0.082	0.036	-0.02	0																								
LT3	1.243	0.317	0.816	1.04	0																							
LT2	1.358	1.658	-1.19	0.04	0.006	0																						
LT1	3.307	0.426	0.238	0.09	0.029	0.048	0																					
M6	2.176	0.179	-0.7	0.16	3.848	4.599	5.381	0																				
M5	1.253	0.299	0.148	0.55	-0.66	2.022	0.621	1.215	0																			
M4	0.507	0.978	-0.07	0.15	-0.99	0.072	0.303	-0.39	0.086	0																		
M3	0.504	0.565	-0.13	0.5	-0.48	1.62	0.541	-0.3	0.337	0.177	0																	
M2	0.438	0.24	-0.58	0.57	-1.72	0.49	0.187	0.137	0.205	0.049	0.155	0																
M1	0.331	-2.63	-2.76	2.73	1.514	2.819	2.306	2.399	1.174	1.305	0.325	0.524	0															
UA5	2.237	1.793	-2.88	1.76	2.277	2.299	3.057	1.243	0.679	2.159	1.972	1.903	2.126	0														
UA4	2.011	0.8	0.166	0.35	0.334	0.034	0.288	0.065	0.785	0.238	0.025	0.761	0.352	-0.13	0													
UA3	2.121	0.814	0.548	0.32	0.809	0.596	0.698	-0.13	0	1.477	0.683	0.3	-0.12	0.249	0.15	0												
UA2	2.589	0.698	-1.14	1.23	-0.7	0.019	2.011	-1.64	0.631	0.281	0.343	1.162	0.611	-0.78	0.13	0.002	0											
UA1	0.179	1.463	-0.23	1.58	1.795	1.402	1.149	-0.02	0.967	1.577	1.368	1.395	2.289	1.268	0.18	-0.67	0.44	0										
C5	0.065	0.208	1.412	0.55	0.532	2.107	1.364	1.255	1.259	0.559	0.085	0.537	2.426	3.355	0	-0.46	0.46	3.647	0									
C4	0.097	-0.3	1.18	0.42	-0.78	0.341	0.922	-0.27	0.694	0.008	0.649	0.066	0.778	1.368	0.57	-1.21	0.37	4.604	0.032	0								
C3	0.659	0.203	1.136	0.43	0.209	0.272	0.668	-0.06	0.987	0.293	0.857	0.292	1.354	0.766	0.21	-1.05	0.05	4.174	0.379	-0.08	0							
C2	0.014	1.217	-1.07	0.43	2.366	2.769	1.575	2.967	1.334	1.684	2.049	1.803	2.318	0.376	0.57	0.597	1.75	3.817	0.679	0.712	0.442	0						
C1	1.219	1.417	-0.81	1.32	-1.48	0.089	0.749	-0.96	1.237	0.128	0.756	0.087	1.775	1.581	0.18	-0.43	1.58	3.883	0.201	0.123	0.124	1.58	0					

	I4	I3	I2	I1	LT3	LT2	LT1	M6	M5	M4	M3	M2	M1	UA5	UA4	UA3	UA2	UA1	C5	C4	C3	C2	C1	PD5	PD4	PD3	PD2	PD1
PD5	-	1.371	0.868	0.58	-1.35	0.133	0.385	-0.34	0.619	0.101	0.699	0	0.426	1.809	0.62	-1.38	0.21	-1.2	-0.8	-1.07	-0.96	1.73	0.327	0				
PD4	-	1.235	-0.02	0.35	-0.48	1.614	0.881	0.474	0.513	0.053	0.736	0.22	-0.13	2.676	0.26	-0.74	0.65	-0.78	-0.57	-0.15	0.885	1.25	0.929	0.14	0			
PD3	-	0.582	-0.66	1.53	-0.66	0.377	0.455	0.463	1.501	0.224	0.404	-0.13	0.266	1.157	0.9	-0.01	2.08	-0	0.013	0.79	0.219	1.27	1.515	0.04	-0.1	0		
PD2	-	1.153	-0.2	-1.2	1.936	1.927	4.921	0.378	0.842	0.354	0.099	1.378	-0.72	1.012	0.09	1.963	1.03	0.698	0.622	-0.75	0.08	-0	1.12	0.15	-0.17	0.05	0	
PD1	-	4.592	-4.34	4.12	4.592	6.018	6.643	5.196	0.732	5.758	6.372	6.061	4.004	4.233	2.11	3.026	1.68	2.417	3.477	2.443	2.08	2.5	2.171	0.29	0.325	0.44	2.676	0

Table 4: Modification Indices (MI) – National Culture (NC)

			M.I.	Par Change
e22	<-->	e28	13.633	.075
e21	<-->	LT	28.504	.193
e16	<-->	e19	12.717	-.115
e12	<-->	e22	17.738	-.052
e11	<-->	C	25.814	.200
e10	<-->	e15	12.084	.120
e6	<-->	e7	14.629	-.113
e2	<-->	LT	10.028	.146
e2	<-->	e22	30.368	.172
e2	<-->	e13	13.380	.113
e1	<-->	I	11.806	-.130
e1	<-->	LT	23.651	.222
e1	<-->	M	25.471	.139
e1	<-->	e22	11.140	.103
e1	<-->	e21	13.817	.208
e1	<-->	e15	16.479	.311

Table 5: Standardised Residual Covariances Matrix (SRCM)- Organisational Culture (OC)

	JO3	JO2	JO1	CS3	CS2	CS1	NS5	NS4	NS3	NS2	NS1	RO3	RO2	RO1
JO3	.000													
JO2	.165	.000												
JO1	.008	-.172	.000											
CS3	-.836	-.273	.680	.000										
CS2	-.721	.022	1.073	.091	.000									
CS1	-1.098	-.234	1.420	.007	-.083	.000								
NS5	-.809	-.825	-.942	-.661	-.144	-.609	.000							
NS4	-.235	-.073	1.556	-.701	-.317	.131	-.157	.000						
NS3	-1.298	-.505	.539	-1.062	.093	.455	.136	.114	.000					
NS2	-.093	-.468	.710	.274	.118	-.276	.240	.069	-.259	.000				
NS1	-1.165	-.025	1.528	-.575	.403	1.343	.169	-.083	-.046	.245	.000			
RO3	2.807	.656	-.190	1.346	.455	-.131	.629	.469	.149	.223	-1.670	.000		
RO2	1.508	-.491	-1.341	.600	.514	.502	.513	1.111	1.358	.555	-.942	.145	.000	
RO1	.504	-1.052	-2.527	-.651	-.841	-1.886	1.208	.120	.381	-.286	-1.492	-.062	-.097	.000

Table 6: Modification Indices (MI) –Organisational Culture

			M.I.	Par Change
e14	<-->	RO	15.774	.072
e4	<-->	RO	14.138	-.063
e3	<-->	JO	10.121	.073

Table 7: Standardised Residual Covariances Matrix (SRCM) – Full Model

	A c t u a l _ U s a g e	U 2	U 1	P U 5	P U 4	P U 2	P U 1	P E O U 5	P E O U 4	P E O U 3	P E O U 1	J O 3	J O 2	J O 1	C S 3	C S 2	C S 1	N S 4	N S 3	N S 1	R O 3	R O 2	R O 1	M 4	M 3	M 2	L T 3	L T 2	L T 1	I 3	I 2	I 1	U A 4	U A 3	U A 2	C 5	C 4	C 3	C 1	P D 5	P D 4	P D 3		
Actual_Usage	.000																																											
U2	-.0082	.000																																										
U1	-.0006	.0053	.000																																									
PU5	.847	-.231	-.1402	.000																																								
PU4	1.268	-.353	-.795	-.0010	.000																																							
PU2	3.110	.813	.324	-.307	-.0005	.000																																						

	A c t u a l - U s a g e	U 2	U 1	P U 5	P U 4	P U 2	P U 1	P E O U 5	P E O U 4	P E O U 3	P E O U 1	J O 3	J O 2	J O 1	C S 3	C S 2	C S 1	N S 4	N S 3	N S 1	R O 3	R O 2	R O 1	M 4	M 3	M 2	L T 3	L T 2	L T 1	I 3	I 2	I 1	U A 4	U A 3	U A 2	C 5	C 4	C 3	C 1	P D 5	P D 4	P D 3						
PU1	. 3 6 8	- .4 0 7	- 1. .3 5 0	. 3 0 0	- .0 9 2	. 1 0 2	. 0 0 0																																									
PEOU5	. 6 7 2	- .3 6 3	- .8 8 6	- .3 6 5	. 5 8 5	. 0 9 8	- .5 3 8	. 0 0 0																																								
PEOU4	. 9 2 4	- .0 7 7	- .6 0 6	- .5 1 2	- .8 2 7	- .0 4 5	- 1. .2 6 1	- .1 5 5	. 0 0 0																																							
PEOU3	1. 9 7 5	1. 3 0 1	. 6 0 3	. 6 1 3	. 8 1 1	1. 2 2 9	. 5 0 0	- .0 7 8	. 0 4 9	. 0 0 0																																						
PEOU1	. 3 7 1	- .7 1 6	- 1. .6 3 2	. 2 9 7	. 1 2 7	. 1 9 3	- .7 3 0	. 1 8 4	. 1 0 6	- .1 1 4	. 0 0 0																																					
JO3	. 0 3 0	. 6 2 6	. 9 8 3	1. 3 6 1	1. 6 4 6	. 9 9 2	. 9 4 8	2. 2 7 0	1. 1 5 5	- .3 1 2	1. 0 1 8	. 0 0 0																																				

	A c t u a l _ U s a g e	U 2	U 1	P U 5	P U 4	P U 2	P U 1	P E O U 5	P E O U 4	P E O U 3	P E O U 1	J O 3	J O 2	J O 1	C S 3	C S 2	C S 1	N S 4	N S 3	N S 1	R O 3	R O 2	R O 1	M 4	M 3	M 2	L T 3	L T 2	L T 1	I 3	I 2	I 1	U A 4	U A 3	U A 2	C 5	C 4	C 3	C 1	P D 5	P D 4	P D 3						
JO2	- . 5 4 2	. 0 7 6	. 7 8 9	. 3 5 5	- . 0 6 1	. 6 6 6	. 5 8 2	1 . 4 4 4	. 7 6 3	- . 1 9 1	. 7 3 9	. 4 5 8	. 0 0 0																																			
JO1	- . 6 6 0	- . 7 0 4	. 2 1 8	- . 1 0 2 7	- . 1 3 5 0	- . 1 6 7 9	- . 1 2 8 8	- . 8 3 1	- . 1 3 6 2	- . 2 4 8 6	- . 1 4 0 3	- . 1 4 9	- . 2 3 1	. 0 0 0																																		
CS3	. 0 7 9	. 4 3 7	. 4 4 9	. 8 4 2	1 . 0 1 6	- . 2 2 6	. 7 2 6	1 . 0 0 7	1 . 0 8 4	1 . 1 4 5	. 6 7 6	- . 8 6 1	- . 2 6 4	. 5 3 1	. 0 0 0																																	
CS2	. 6 6 0	. 2 5 5	1 . 1 8 1	. 4 9 8	. 6 7 2	- . 1 6 4	. 8 3 5	. 6 4 2	. 5 5 4	. 9 1 2	. 2 9 6	- . 7 3 1	. 0 4 7	. 9 3 7	. 2 5 1	. 0 0 0																																
CS1	- . 4 6 6	- . 7 1 8	- . 3 6 2	- . 5 2 7	- . 6 7 4	- . 1 7 6 1	- . 3 3 4	- . 1 1 4 4	- . 1 0 2 1	- . 1 0 6 1	- . 1 3 5 5	- . 1 1 9 2	- . 2 9 5	1 . 1 9 4	- . 0 7 5	- . 1 2 1	. 0 0 0																															
NS4	. 2 6 5	- . 2 7 8	- . 1 0 2	. 5 5 4	. 8 3 7	. 1 7 5	- . 0 4 7	. 9 5 4	. 0 6 6	1 . 0 8 4	. 9 9 5	- . 2 7 2	- . 0 7 5	1 . 3 9 3	- . 6 8 2	- . 2 7 5	. 0 5 0	. 0 0 0																														

	A c t u a l _ U s a g e	U 2	U 1	P U 5	P U 4	P U 2	P U 1	P E O U 5	P E O U 4	P E O U 3	P E O U 1	J O 3	J O 2	J O 1	C S 3	C S 2	C S 1	N S 4	N S 3	N S 1	R O 3	R O 2	R O 1	M 4	M 3	M 2	L T 3	L T 2	L T 1	I 3	I 2	I 1	U A 4	U A 3	U A 2	C 5	C 4	C 3	C 1	P D 5	P D 4	P D 3										
M4	- . 1 1 3	. 6 9 3	. 3 9 4	. 6 7 9	. 2 1 9	- . 3 1 6	1 . 0 0 8	. 3 3 0	- . 1 0 0	. 4 9 0	- . 4 7 9	- 1 . 2 9 7	- . 7 0 3	- . 5 3 7	. 4 3 5	. 0 2 3	. 2 9 9	. 0 1 9	- . 3 1 7	. 3 3 2	. 5 4 0	- 1 . 0 1 4	- . 5 6 0	. 0 0 0																												
M3	- . 4 5 0	. 6 2 3	. 2 5 2	. 4 2 3	. 3 3 2	- . 5 2 8	. 6 2 4	. 3 2 8	- . 2 8 1	. 1 0 5	- . 6 1 6	. 8 6 1	. 0 8 8	. 6 0 5	. 2 7 8	- . 1 2 2	. 7 0 6	. 6 7 3	. 2 4 0	. 4 4 2	1 . 0 1 6	. 0 6 2	. 4 5 0	. 0 9 1	. 0 0 0																											
M2	- 1 . 5 4 0	- . 6 8 4	- . 5 2 4	. 0 0 7	- . 4 1 6	- 1 . 6 3 1	- . 1 1 4	. 6 1 3	- . 0 7 6	- . 1 9 0	- . 2 6 1	. 0 5 8	- . 0 5 8	. 9 5 0	- . 0 8 2	- . 5 8 8	- . 7 0 7	- . 2 3 2	- . 9 7 4	. 1 3 6	. 7 3 7	- . 3 0 7	- . 7 1 0	. 0 0 1	- . 0 8 7	. 0 0 0																										
LT3	- . 2 1 2	. 5 9 5	. 7 9 7	. 8 8 3	. 9 0 6	. 1 8 9	1 . 6 0 2	1 . 2 6 8	. 9 5 8	. 0 9 4	. 5 0 8	. 5 2 0	- . 3 1 2	- . 4 9 1	- . 3 0 5	- . 4 4 5	- 1 . 2 2 3	- . 4 8 0	- 1 . 6 2 8	- 1 . 3 7 0	1 . 5 7 7	- . 1 5 2	. 2 6 4	- . 8 1 6	- . 2 7 7	- 1 . 5 0 3	. 0 0 0																									
LT2	- 1 . 2 9 7	- . 2 4 2	. 5 7 1	- . 6 7 1	. 0 8 7	- 1 . 4 4 0	- . 7 2 6	- . 0 8 3	- . 9 6 3	- 1 . 1 0 8	- 1 . 0 1 6	1 . 1 1 9	. 4 2 4	1 . 4 6 1	1 . 2 2 9	. 6 0 8	. 4 0 4	2 . 1 0 1	. 4 2 2	. 4 7 6	. 1 1 9	- 1 . 7 7 8	- 1 . 1 5 7	. 2 4 7	1 . 8 2 2	. 7 0 4	- . 0 4 6	. 0 0 0																								
LT1	- 2 . 8 8 2	- . 0 7 0	. 1 0 7	- . 4 9 0	- . 2 7 3	- 1 . 7 4 8	. 5 4 0	. 5 5 0	- . 3 1 2	- . 2 7 8	- . 8 4 8	- . 7 6 5	- 1 . 3 9 3	- . 1 4 2	. 6 2 9	- . 1 1 4	. 2 5 4	. 7 4 7	. 1 8 0	. 9 3 3	. 9 4 3	- . 3 3 7	- . 2 1 6	- . 1 0 9	. 7 6 0	. 4 2 2	. 0 4 2	- . 0 0 3	. 0 0 0																							

	A c t u a l _ U s a g e	U 2	U 1	P U 5	P U 4	P U 2	P U 1	P E O U 5	P E O U 4	P E O U 3	P E O U 1	J O 3	J O 2	J O 1	C S 3	C S 2	C S 1	N S 4	N S 3	N S 1	R O 3	R O 2	R O 1	M 4	M 3	M 2	L T 3	L T 2	L T 1	I 3	I 2	I 1	U A 4	U A 3	U A 2	C 5	C 4	C 3	C 1	P D 5	P D 4	P D 3
I3	. 4 9 8	. 0 0 2	- . 0 7 7	- . 3 5 5	- . 8 3 6	- . 0 0 9	- . 2 9 2	- 1 . 5 2 5	- . 5 3 9	. 2 8 5	- . 5 9 7	. 3 1 0	. 3 4 7	- . 9 9 4	- . 3 5 1	. 1 6 4	- . 2 5 6	- 1 . 1 5 7	. 2 7 5	- . 4 8 1	- 2 . 3 2 5	- . 4 2 9	. 9 6 2	. 8 7 9	. 4 4 7	. 1 1 1	. 3 3 2	- 1 . 6 4 5	- . 4 1 8	. 0 0 0												
I2	1 . 0 2 5	. 1 7 5	. 0 0 2	- . 5 8 1	- . 6 6 2	- . 2 7 6	- . 9 6 1	- . 4 0 7	- . 6 2 2	. 0 8 3	. 0 1 4	. 7 5 8	. 1 9 7	- 1 . 2 1 6	. 6 9 9	. 2 6 7	. 4 4 0	. 3 8 8	1 . 8 1 6	. 3 2 6	- 1 . 0 8 1	- . 3 2 7	. 8 4 8	- . 1 6 2	- . 2 4 8	- . 7 0 3	. 8 3 3	- 1 . 1 7 1	. 2 4 8	. 0 6 7	. 0 0 0											
I1	. 5 0 7	- . 4 8 7	- . 5 4 9	. 9 7 4	. 8 8 0	1 . 3 9 7	1 . 0 7 2	. 7 5 5	. 8 5 8	1 . 4 1 0	. 8 3 4	1 . 2 6 6	. 9 8 0	- . 9 2 9	. 1 4 5	- . 2 8 0	- . 7 4 0	. 1 5 8	. 0 9 4	- 1 . 6 3 2	- . 1 8 9	. 5 8 5	2 . 1 0 4	. 0 5 9	. 3 9 2	- . 6 8 9	1 . 0 5 2	- . 0 2 4	. 0 9 5	- . 0 3 0	- . 0 4 5	. 0 0 0										
UA4	- . 9 7 9	- . 1 4 7	. 2 2 2	. 5 2 7	. 1 6 1	. 0 3 9	1 . 1 3 6	. 7 2 6	- . 0 7 5	- . 1 7 0	- . 4 2 1	- . 4 4 2	- . 4 0 6	. 1 2 0	- . 1 2 6	- . 7 0 6	- . 1 5 9	- . 2 5 3	- 1 . 0 9 6	. 9 8 2	1 . 3 0 9	. 5 0 9	- . 1 5 0	- . 1 9 1	. 0 6 3	. 8 6 5	. 4 0 9	. 1 0 8	- . 2 0 7	. 7 5 9	. 1 3 5	. 3 1 7	. 0 0 0									
UA3	. 2 4 4	1 . 3 0 2	1 . 7 1 8	. 7 2 9	1 . 0 5 6	. 6 3 0	1 . 8 5 1	1 . 8 9 6	. 9 2 1	. 5 8 5	1 . 0 1 3	- 1 . 0 1 3	- 1 . 2 0 5	- . 3 7 6	- . 3 8 0	- . 9 4 3	- . 4 7 2	- . 6 5 7	- 1 . 5 6 8	. 3 6 2	1 . 9 1 7	1 . 4 6 1	. 4 7 8	- 1 . 4 3 7	- . 6 0 5	. 3 9 5	. 8 8 1	. 6 6 7	. 7 7 6	. 7 8 0	. 5 2 5	. 3 0 1	. 3 1 4	. 0 0 0								
UA2	- . 1 6 0	- 1 . 5 1 7	- . 0 4 6	- 1 . 6 8 2	- 1 . 6 6 0	- 1 . 3 8 4	- 1 . 3 6 4	- . 6 0 7	- . 4 1 5	- 2 . 2 0 6	- 1 . 2 0 8	. 5 3 4	. 9 7 6	1 . 4 7 1	1 . 0 2 1	. 9 1 8	. 8 3 8	1 . 1 5 4	- . 3 1 7	1 . 4 6 7	- . 9 7 2	- 1 . 8 5 2	- 2 . 5 2 9	- . 3 2 6	- . 3 4 8	1 . 1 7 0	- . 6 5 3	. 0 3 1	- 1 . 9 5 4	- . 6 4 3	- 1 . 0 7 1	- 1 . 1 6 7	- . 2 1 2	- . 0 9 5	. 0 0 0							

	A c t u a l _ U s a g e	U 2	U 1	P U 5	P U 4	P U 2	P U 1	P E O U 5	P E O U 4	P E O U 3	P E O U 1	J O 3	J O 2	J O 1	C S 3	C S 2	C S 1	N S 4	N S 3	N S 1	R O 3	R O 2	R O 1	M 4	M 3	M 2	L T 3	L T 2	L T 1	I 3	I 2	I 1	U A 4	U A 3	U A 2	C 5	C 4	C 3	C 1	P D 5	P D 4	P D 3					
C5	-1 . 3 8 5	.8 2 2	1 . 0 8 1	.5 4 0	-. 1 3 2	.5 6 1	.3 9 8	1 . 4 0 9	.4 4 5	.3 4 3	.2 1 2	-. 2 7 7	-. 2 4 0	1 . 4 7 4	-. 1 6 4	-1 . 1 4 0	.3 0 0	.6 7 5	-1 . 0 7 9	.0 6 6	.8 1 6	.0 1 5	-. 5 8 6	.6 2 5	.1 6 8	.6 2 9	.5 7 6	2 . 1 5 0	1 . 4 0 9	-. 2 2 1	1 . 4 1 1	.5 5 3	.1 0 0	-. 3 7 2	.4 6 2	.0 0 0											
C4	-. 5 7 4	.3 9 3	.1 6 2	1 . 0 0 5	.2 8 3	.2 3 5	.5 9 0	.8 4 2	.4 9 3	-. 2 9 0	-. 3 1 4	-. 8 1 7	.2 1 1	.7 1 4	1 . 2 0 7	.4 5 7	1 . 0 6 5	.4 2 2	-. 5 6 8	.5 9 9	.5 5 3	.3 2 9	-. 6 3 6	.0 7 5	-. 5 6 6	.1 5 8	-. 7 3 3	.3 8 5	-. 8 7 5	-. 3 0 9	1 . 1 8 4	.4 2 9	-. 4 6 8	-1 . 1 2 1	.3 6 3	-. 0 3 3	.0 0 0										
C3	-1 . 1 2 7	.9 1 0	.3 6 4	1 . 6 0 3	.0 7 6	.6 0 0	1 . 4 0 7	1 . 6 6 4	1 . 8 5 4	1 . 0 6 4	.7 7 4	-1 . 1 0 0	-. 8 3 8	.5 8 9	-1 . 1 7 9	-2 . 2 4 1	-. 2 0 9	-. 9 2 0	-2 . 0 4 9	-. 1 6 1	.6 2 0	.9 2 5	-. 4 1 9	.3 7 0	-. 7 6 4	-. 1 9 1	.2 5 5	.3 1 7	.7 1 6	.1 5 6	1 . 1 0 3	.3 9 6	-. 0 8 3	-. 9 3 1	.0 7 2	.4 5 6	-. 0 0 6	.0 0 0									
C1	-2 . 5 8 6	-. 6 5 8	-. 3 6 8	-1 . 2 4 4	-1 . 3 5 8	-2 . 0 0 2	-. 7 2 0	-1 . 2 3 2	-1 . 1 3 4	-2 . 0 9 2	-1 . 6 6 9	-. 9 0 0	-. 7 9 2	1 . 1 7 5	.0 3 9	-. 1 6 3	.6 6 0	.5 0 8	.1 6 4	1 . 4 5 9	.0 3 9	.3 2 0	-1 . 4 1 3	-. 0 6 9	-. 6 8 0	.1 7 2	-1 . 4 3 8	-. 0 4 6	-. 7 0 3	-1 . 4 0 1	-. 7 7 9	-1 . 2 8 6	.2 5 5	-. 3 5 6	1 . 5 5 1	-. 2 5 0	.0 6 2	-. 1 0 3	.0 0 0								
PD5	-. 4 1 9	.3 4 3	1 . 1 6 6	-. 5 0 2	-. 3 9 8	1 . 4 1 9	1 . 1 5 7	.1 6 1	.3 3 3	.7 6 2	1 . 0 5 5	-2 . 1 1 1	-1 . 0 4 3	.4 7 9	-2 . 2 2 4	-. 5 9 0	.5 1 6	-. 8 8 4	-1 . 3 6 8	1 . 3 0 0	.1 5 6	1 . 0 6 0	.1 5 9	-. 0 3 0	-. 6 2 1	.0 8 3	-1 . 3 0 7	.1 6 8	.4 1 5	1 . 3 4 4	.8 5 3	-. 5 9 3	-. 6 4 5	-1 . 4 1 1	-. 3 1 7	-. 8 1 1	-1 . 0 8 8	-. 9 4 6	.2 9 3	.0 0 0							
PD4	-. 7 7 8	-. 1 3 6	1 . 3 8 8	-. 6 3 5	-. 4 2 4	.9 2 0	1 . 4 0 9	.0 6 5	-. 1 7 2	.3 9 1	.4 7 9	-1 . 5 6 1	.1 4 0	1 . 2 8 0	-1 . 9 0 5	-. 3 0 7	.4 2 2	-. 8 5 8	-1 . 4 4 2	.4 3 7	-. 0 0 5	.7 7 7	.4 6 4	.0 1 9	.8 1 4	.3 0 3	-. 4 3 9	1 . 6 4 9	.9 1 1	1 . 2 0 9	-. 0 3 2	-. 3 6 5	-. 2 8 2	-. 7 6 7	.5 4 1	-. 5 8 2	-. 1 7 0	-. 8 7 2	.8 9 4	.3 3 4	.0 0 0						

	A c t u a l _ U s a g e	U 2	U 1	P U 5	P U 4	P U 2	P U 1	P E O U 5	P E O U 4	P E O U 3	P E O U 1	J O 3	J O 2	J O 1	C S 3	C S 2	C S 1	N S 4	N S 3	N S 1	R O 3	R O 2	R O 1	M 4	M 3	M 2	L T 3	L T 2	L T 1	I 3	I 2	I 1	U A 4	U A 3	U A 2	C 5	C 4	C 3	C 1	P D 5	P D 4	P D 3
PD3	- 1 . 2 7 8	- . 6 7 3	. 4 4 2	- 1 . 3 4 7	- 1 . 2 1 9	- . 3 0 2	- . 1 6 4	- . 8 3 3	- . 8 4 5	- . 8 1 1	- . 3 3 1	- . 6 1 9	. 4 7 1	1 . 9 3 5	- . 1 4 1	. 8 3 5	2 . 1 2 8	. 5 8 7	- . 0 1 1	2 . 1 0 9	- . 7 6 9	- . 3 6 3	- 1 . 2 5 8	- . 1 7 3	- . 3 4 6	- . 0 6 8	- . 5 9 6	. 4 3 6	- . 4 0 0	- . 4 9 5	- . 5 6 1	- 1 . 4 3 3	. 7 8 6	- . 1 2 4	1 . 8 8 4	- . 0 9 8	. 6 7 0	. 1 3 3	1 . 3 7 3	- . 1 2 0	- . 1 9 0	. 0 0 0

Table 8: Modification Indices (MI) – Full Model

			M.I.	Par Change
e37	<-->	e42	23.587	.074
e35	<-->	e38	10.355	.035
e29	<-->	JO	12.583	-.060
e25	<-->	e42	11.046	.068
e23	<-->	e42	19.861	-.083
e22	<-->	e33	16.498	-.050
e20	<-->	e33	15.019	.036
e16	<-->	e17	10.467	-.046
e14	<-->	e42	33.756	-.109
e14	<-->	e41	10.350	.035
e13	<-->	e35	13.261	-.045
e13	<-->	e25	14.732	-.061
e13	<-->	e22	17.397	-.069
e11	<-->	U	10.244	-.048
e11	<-->	e25	20.396	.058
e11	<-->	e23	12.042	-.041
e8	<-->	e42	29.417	.091
e8	<-->	e41	28.984	-.053
e8	<-->	e14	18.759	-.053