UNIVERSITY OF MALAWI
THE POLYTECHNIC

THE RELATIONSHIP BETWEEN PERSONALITY AND COMPUTER TECHNOLOGY ACCEPTANCE FOR MANAGERS IN THE UNIVERSITY OF MALAWI

Thesis submitted to Faculty of Commerce, The Polytechnic, University of Malawi in partial fulfilment of the requirements for the award of degree of Masters in Business Administration

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MASTER OF BUSSINESS ADMINISTRATION THESIS

MAGANIZO MONAWE

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Declaration

I the undersigned hereby declare that this thesis is my own original work which has not been submitted to any other institution for similar purposes. Where other people's work has been used acknowledgements have been made.

Name: ……………………………………………………

Signature: ………………………...

Date: …………………………...

Certificate of Approval

We declare that this thesis if from the candidate's own work and effort. Where he has used other sources of information, it has been acknowledged. This thesis is submitted with our approval.

First supervisor's name: ....

Signature: ....

Date: ....

Second supervisor's name: ....

Signature: ....

Date: ....

Head of Department's name: ....

Signature: ....

Date: ....

Dedication

To my wife Patricia and daughter Thokozani for your love, patience and understanding for the two years I was studying, coming home late every evening.

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I wish to thank my supervisors, Dr. Harry Gombachika, Malawi Polytechnic Vice Principal, and Mr. Martin Thawani, Malawi Polytechnic Librarian for their tireless efforts in providing advice and guidance during the thesis exercise.

Abstract

Computers have become an integral part of today's work environment. While in the past, managers used services from their secretaries to perform most or all computer related assignments, today they are forced to check their own emails, type documents while away from the office, search for information on the Internet and make decisions on organization investments in computer technologies. It is therefore important to understand how ready and willing managers are to embrace computer technologies.

To better predict, explain, and increase user acceptance, we need to understand why people accept or reject computer technologies, a concept known as Computer Technology Acceptance. On the other hand, personality is one factor that affects Technology Acceptance. It is defined as cognitive and behavioral patterns that show stability over time and across situations.

The main objective of this study was to investigate if there is any relationship between personality traits and computer technology acceptance. Using available personality and Technology Acceptance measurement tools, a questionnaire (Appendix A) was used to collect data from a stratified random sample of managers in the University of Malawi.

The SPSS package was used to analyze the data. Cross tabulations and Chi-square tests were done to find out if there are any relationships between personality and computer technology acceptance. Results have shown that there is a relationship between some personality traits and technology acceptance.

The limitations of the research included the mobility of respondents who were not available during the study period. Most UNIMA staff members are very mobile people often travelling abroad for relatively long periods. The other limitation was the tendency by respondents to go with fashion by showing that they like computer technologies even though they may not.

Table of Contents

List of Figures

List of Tables

List of Abbreviations and Acronyms

BFI	Big Five Inventory
IS	Information Systems
PI	Personality Index
SAS	Statistical Analysis Software
SPSS	Statistical Package for the Social Sciences
TAM	Technology Acceptance Model
TIPI	Ten Item Personality Index
TRA	Theory of Reasoned Action
UNIMA	University of Malawi

CHAPTER 1: INTRODUCTION

1.1 Introduction

This research focused on the relationship between personality traits and computer technology acceptance. This introductory chapter gives background to the study environment which is the University of Malawi (UNIMA). It also explains the identified problem and the justification for the study. The objectives, limitations and scope of study are outlined towards the end of the chapter. The introduction also provides the research question and hypothesis of the study.

1.2 Background

UNIMA has five Constituent Colleges namely: The Polytechnic, Chancellor College, College of Medicine, Bunda College and Kamuzu College of Nursing. It has twelve faculties offering first, second and third degrees in Agriculture, Commerce, Built Environment, Engineering, Humanities, Medicine, Nursing, Education, Journalism and others.

The management structure of UNIMA reflects its federal nature. It has the central administration office with overall managers such as the Vice Chancellor, Pro-Vice Chancellor, Registrar, Finance Officer, Auditor and others. From the central management each college has a Principal who reports to the Vice Chancellor and also has other managers like the Vice Principal, Registrar, Finance Officer, Librarian and ICT Director. The managers at the central office and the college Principals, Vice Principals, Registrars, Finance Officers, Librarians and ICT Directors form the administrative management of the University. On the other hand, there are academic managers who are the deans of faculties and heads of departments.

The use of Computer Technologies in the University was revolutionalized in the early 1990's with the introduction of the first email system at Chancellor College. Since then the University has expanded in the use of Computer Technologies manifested by rapid growth of Local Area Networks in all its colleges and increased use of Computer based systems for its core activities.

The University has over the last few years increased investment in computer technologies in order to improve on the delivery of its services. Nowadays, many functions in UNIMA such as research, teaching and learning, finance, management of staff and student records are dependent on the use of computers.

1.3   Problem Statement

Despite significant investments in technology, there are concerns over the extent to which such expenditures have yielded the intended benefits (Dillon, 2001). One of these concerns revolves around the issue of whether or not any such technology is accepted by its intended users.

Davis, Bagozzi and Warshaw (1989) argued that to better predict, explain, and increase user acceptance of computer technologies, we need to understand why people accept or reject computers. The focus is to understand the human determinants of acceptance and ensuring new designs are adopted and implemented so as to minimize resistance. Many researchers have attempted to identify psychological variables that distinguish users who accept or reject technologies and have suggested that the most relevant user factors determining technology acceptance are cognitive style, personality, demographics, and user-situational variables (Dillon, 2001).

Furthermore, research has been conducted on the impact of personality on charismatic leadership (Bateman & Crant, 2000; Bozionelos & Leung, 2004), performance (Jenkins & Griffith, 2004) and purchase intentions during initial website visit. Similarly, research on technology acceptance has focused on two areas: Identifying the right models to use in measuring the levels of technology acceptance (Malhotra & Galletta, 2005; Davis 1993; Davis et al., 1989) and application of the models in measuring technology acceptance (Rose & Fogarty, 2006; Folorunso & Ogunseye, 2008).

Although research has been done to relate personality and computer technology acceptance (Devaraj, Easley and Crant, 2008), no focus has been given to managers in a university setting. As such Management in the University of Malawi does not know personality traits that are associated with better computer technology acceptance trends.

1.4   Justification

There is growing demand for managers in the University of Malawi to use computer technologies in order to improve delivery of services. Investment in such technologies must be done with anticipation that it shall be used.

Full utilization of technologies depends on whether or not users do accept such technologies. Without understanding user acceptance patterns, the university may end up investing a lot of money in technologies that may not be used or it may end up applying wrong measures in order to improve acceptance patterns.

Knowing personalities that are associated with better or poor technology acceptance will help the University put in place better approaches to introduce computer technologies considering different personality variations of its managers.

This study has therefore generated knowledge that will help organizations make informed computer technology investment decisions for their employees in management.

1.5   Research Question

This research was designed to answer the following research question:

Is there any relationship between personality and computer technology acceptance among managers of the University of Malawi?

The research question was answered by considering the main objective and three specific objectives given hereunder.

1.6   Objectives

1.6.1   Overall Objective

This research aimed at assessing the relationship between different personalities and their patterns for Computer Technology Acceptance. The relationship was determined by analyzing data that was collected by measuring the personalities of the respondents and their technology acceptance patterns.

The model that is used to determine the respondents' technology acceptance patterns is based on perception. According to Malhotra and Galletta (2005) the perceptions measured in technology acceptance determine the behavioral intention to use computers.

1.6.2 Specific Objectives

The specific objectives for this research were as follows:

(a.) To investigate the different personalities of management staff in the   University of Malawi

(b.) To investigate technology acceptance in the University of Malawi

(c.) To investigate attributes that best characterize technology acceptance with respect to different personalities in the University of Malawi.

1.7   Research Hypothesis

The following hypothesis was tested:

H$_0$:   There is no relationship between Personality and Computer Technology Acceptance

H$_a$:   There is a relationship between Personality and Computer Technology Acceptance

1.8   Assumptions and Scope of Study

This study covered management employees in the colleges of the University of Malawi found in the southern region namely Chancellor College, the Polytechnic, College of Medicine and Kamuzu College of Nursing, Blantyre campus. The southern region was chosen because four out of the five constituent colleges of the University of Malawi are found in this region. The total number of managers in these colleges provided a good representation of management in the University of Malawi which comprises heads of

departments, deans and deputy deans of faculties, Administration (Registrars and their assistants, Principals, Vice Principals, ICT Directors, College Finance Officers and their assistants and Librarians and their assistants) and Directors of Centers.

This was a cross sectional study. The study assumed that the personality and technology acceptance patterns measured in participants will be their consistent behavior at all times.

1.9 Limitations of the Study

The following were the limitations of the study:

(a.) Heads and deans in the University of Malawi are very mobile people. Although the response rate was high, it was affected because of staff that were not available mostly because they were away for a considerably long time.

(b.) The nature of the study was to show the extent to which management in the University accepts computer technology. Since lack of appreciation for technology is generally seen as backwardness this research was threatened by those who wished to portray a face of modernization

Inavailability of respondents meant that results were based on a smaller sample than planned. However, efforts were made to ensure that the response rate was high.

1.10 Definition of Terms Used in the Thesis

This study focused on two main concepts; namely, personality and technology acceptance.

Personality is defined by Guthrie, Coate and Schwoerer (1998) as "relatively stable precursor of behaviour which underlies an enduring style of thinking, feeling and acting". This agrees with Bozionelos and Leung (2004) who define personality as "cognitive and behavioral patterns that show stability over time and across situations". Cable and Judge (2003) identified five dimensions of personality known as personality traits. These

personality traits referred to as the Big Five are as follows: Extraversion, Agreeableness, Conscientiousness, Neuroticism (Emotional Stability) and Openness. Extraversion means ability to display high energy, positive emotions, and the tendency to seek the company of others. Agreeableness means the tendency to be compassionate and cooperative rather than suspicious and antagonistic towards others. Conscientiousness refers to the tendency to show self-discipline, act dutifully, and aim for achievement. Neuroticism refers to the tendency to experience unpleasant emotions easily, such as anger, anxiety, depression, or vulnerability. Lastly, openness means positive appreciation for art, emotion, adventure, unusual ideas, curiosity, and variety of experience.

Technology acceptance has been described as the tendency of people to either accept or reject computer technology (Swanson, 1988). Two dimensions of technology acceptance are perceived usefulness and perceived ease of use (Davis, 1989). Perceived usefulness is the tendency of people to use or not use a technology to the extent they believe it will help them perform their job better. It is the degree to which a person believes that using a particular system would enhance that person's job performance. Perceived Ease of Use is the degree to which a person believes using a particular system would be free of effort, and if the performance benefits of usage are outweighed by the effort of using the technology.

1.11   Organization of the Thesis

The thesis comprises six chapters. Chapter 1 gives the background against which this research was conducted. It also discusses problem statement, justification and limitations for the study. Furthermore, the chapter presents the research questions and objectives of study. The rest of the chapters are as follows:

Chapter 2 examines existing knowledge and critiques work on a similar theme that was done by other researchers. The chapter presents the conceptual framework and examines personality and technology acceptance which were the major concepts of the research.

Chapter 3 outlines the methods that were used in conducting this research. It mainly shows how the sample was chosen, how the data were collected, analyzed and interpreted. The chapter discusses the instruments used and how measurement was done. It also shows how contemporary issues in research especially ethical consideration were approached.

Chapter 4 presents results of the study and their discussion. Further, the chapter interprets the results.

Finally, chapter 5 outlines the conclusions that were drawn from the research and makes recommendations on how the research results can be used to improve acceptance of computer technologies. In addition, the chapter reflects on whether the results of the research have answered the research question and whether the objectives have been met. Finally the chapter gives guidance on directions for future research in a similar area.

CHAPTER 2: LITERATURE REVIEW

2.1   Introduction

This chapter provides the conceptualization and operationalization of this research. It examines some relevant literature to understand how other researchers have contributed to the relationship between personality and computer technology acceptance. The research has two main concepts: Personality and Technology Acceptance.

2.2   Conceptualization and Operationalization

Figure 1 presents the conceptual framework for this research. It shows the dimensions of the two main concepts of the research. Personality, which is the first concept, is represented by the following dimensions: Extraversion, openness to experiences, agreeableness, neuroticism and conscientiousness (Bozionelos, 2004). Technology acceptance, the second concept, is represented by the dimensions of perceived ease of use and perceived usefulness (Yousafzai, Foxall & Pallister, 2007)

The unit of analysis was the individual who responded to a self assessed questionnaire. The respondent characteristics (attributes) considered in this research are age, gender, level of education and college.

Figure 2.1: Conceptual framework

personality

Extraversion

Openness

Agreeableness

Neuroticism

Conscientiousness

technology acceptance

Perceived Usefulness

Perceived Ease of Use
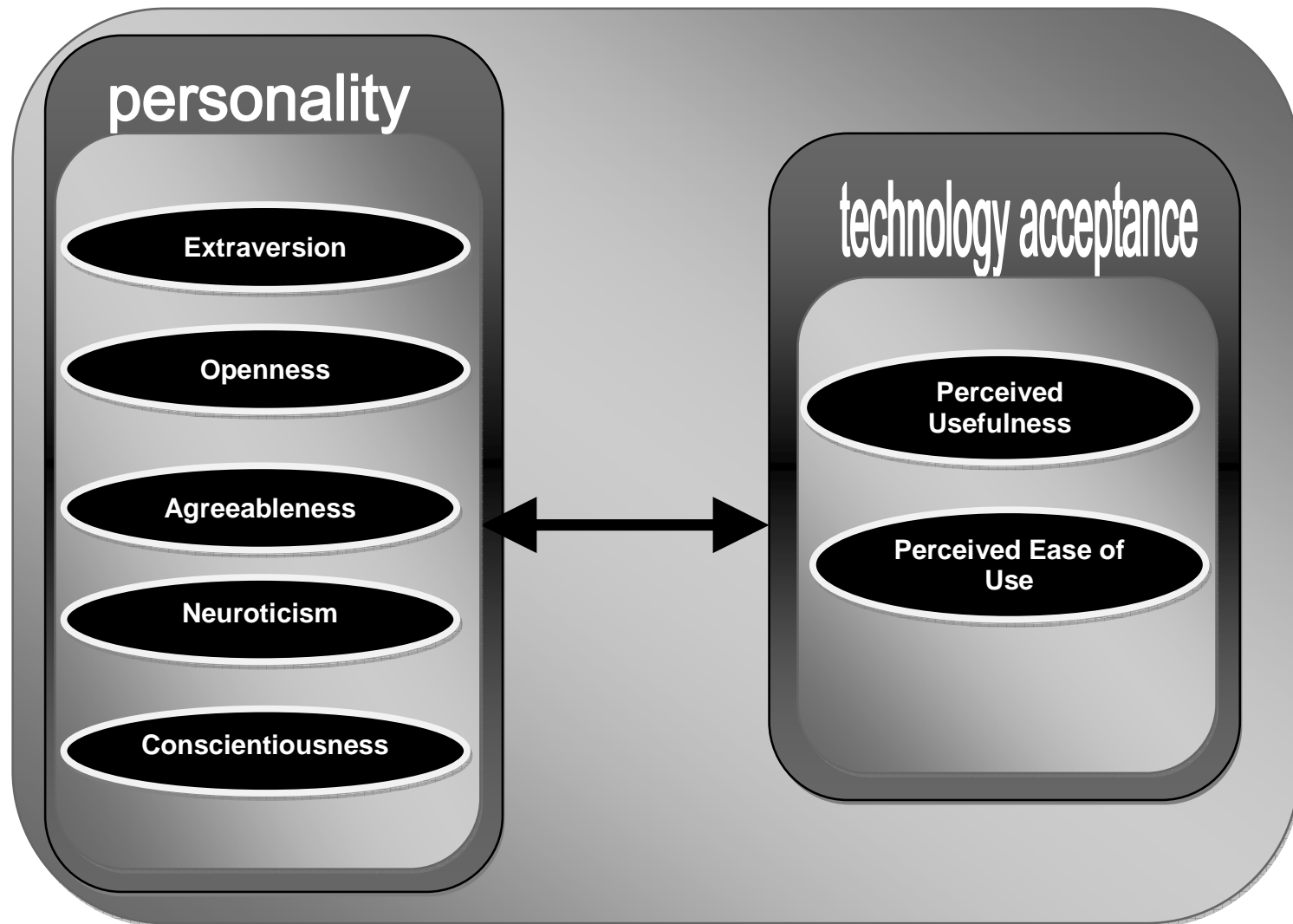
Source: Personality (Bozionelos, 2004), Technology Acceptance (Yousafzai, Foxall & Pallister, 2007)

2.2.1 Personality

Over the years researchers have looked at personality from different perspectives.

According to Allport (1961) personality determines the unique thinking and behaving patterns of an individual. Lawrie (1974, pp.307) identified three distinctive perspectives of the concept 'Personality'. He identified one perspective as "… that characteristic, or those characteristics, on account of which an entity is a person at all". In this perspective personality was distinguished from animality, vegitability or materiality. He identified the second perspective as "the mask or appearance which a man presents to others". According to him, "mask or appearance" implies something distinct from it, "having to do with reality rather than the mere appearance of the person concerned". The third perspective "… is applied in signification of the element of uniqueness in a person". This perspective holds that personality is special case of particularity or individuality which makes a particular person the person he is and therefore differentiates him from all other persons.

The definition from Allport and the three perspectives from Lawrie agrees well with modern researchers like Guthrie, Coate and Schwoerer (1998) who define personality as "relatively stable precursor of behaviour which underlies an enduring style of thinking, feeling and acting". Similarly, Bozionelos and Leung (2004, pp. 69) define personality as "cognitive and behavioral patterns that show stability over time and across situations". In addition, Robbins (2004, pp. 94) define personality as "… the sum total of the ways in which an individual reacts to and interacts with others."

The authors above agree in that every individual has a personality and that this personality affects their approach towards things. Cable and Judge (2003, pp. 198) extend the above definitions by identifying the dimensions of personality. They write:

"If a consensual structure of personality is ever to emerge, the five-factor model, or 'Big Five', is probably it. The Big Five model has provided a unifying

taxonomy for the study of personality, which is essential to the communication and accumulation of empirical findings."

They identify five dimensions of personality known as personality traits. These personality traits referred to as the Big Five are as follows: Extraversion, Agreeableness, Conscientiousness, Neuroticism (Emotional Stability) and Openness.

Following the definition by Robbins (2004, pp.94) which defines personality as "… the sum total of the ways in which an individual reacts to and interacts with others" and by extension of the three perspectives of personality discussed above we can also discuss personality in relation to two aspects: how personality affects the environment including the person and how personality is affected by the environment. In support of this view Born, Robie and Schmit (1995) found out that the environment or situation has significant impact on personality. For this reason, this study focused on identifying the relationship between personality and computer technology acceptance.

In their study on personality and charismatic leadership Bateman and Crant (2000) explored the impact of personality on charismatic leadership. Using a population of 156 dyads and the NEO Five Factor Personality Inventory they found that charismatic leaders have a proactive personality. Likewise, Bozionelos and Leung (2004) using a sample size of 101 and the Five Factor Personality index they found that high levels of extraversion, conscientiousness, agreeableness, emotional stability and openness were perceived as characterizing effective leaders. Although the studies of Bateman and Crant, and Bozionelos and Leung found positive relationship between personality and the environment which in their case was leadership, their research focused on cultures that are not Malawian.

In addition to the impact of personality on recruitment, particularly employee selection, prediction of employee performance has been extensively studied. Sanders (2008) looked into the significance of personality traits in the recruitment of good police officers using a sample of 96 police officers from different police stations in the non urban areas of Kentucky, USA. He built on previous literature which asserted

11

the usefulness of psychological tests for screening out extremely unsuitable and emotionally unstable applicants and use of personality scales in predicting good work performance (Jenkins & Griffith, 2004). Sanders (2008) found that the big five traits did not predict officer performance regardless of how performance was measured. His results agree with Nikolaou (2003) who used a mostly female sample of 227 drawn from 22 small and medium firms and found that none of the big-five dimensions is related to overall job performance for the total sample. He, however, found that for occupations involving interpersonal interactions agreeableness was positively related to overall job performance. These results are interesting because according to Jenkins and Griffith (2004), they contradict voluminous research which agrees that personality has impact on performance.

Gosling, Rentfrow and Swan (2003) identifies several instruments for measuring the big five in order to determine the personality of an individual. They write:

> "Several rating instruments have been developed to measure the Big-Five dimensions. The most comprehensive instrument is Costa and McCrae's (1992) 240-item NEO Personality Inventory, Revised (NEO-PI-R), which permits measurement of the Big-Five domains and six specific facets within each dimension. Taking about 45 min to complete, the NEO-PI-R is too lengthy for many research purposes and so a number of shorter instruments are commonly used. Three well-established and widely used instruments are the 44-item Big-Five Inventory (BFI); ..."

While conceding that these are good instruments to use, Gosling et al. (2003) also mention that these instruments have their disadvantages. They bring about long questionnaires which take long to complete. For this reason they may not be good because respondents may be put off or strained by the length of the questionnaire and therefore not able to respond with accuracy.

Due to the problems of the long item instruments, Gosling et al. (2003) recommend that alternative short item instruments like the Ten- Item Personality Inventory (TIPI)

can be used. They proved that the results obtained by either the short item instruments or the long item instruments are not very different.

This research used the Ten-Item Personality Inventory (TIPI) because it takes only about one minute to complete and it shows similar psychometric properties compared with longer instruments used to measure the Big-Five personality dimensions Gosling et al. (2003). TIPI is a self assessment tool developed by Gosling et al. (2003). It is used to measure the five personality traits. Each trait is represented by two questions against which the respondent provides a rating.

2.2.2 Technology Acceptance

Although computer systems cannot improve organizational performance if they aren't used, resistance to end-user systems by managers and professionals is a widespread problem (Davis et al., 1989).

In order to better predict, explain, and increase user acceptance, there is need to better understand why people accept or reject computer technologies. According to Swanson (1988), understanding why people accept or reject computer technology has proved to be one of the most challenging issues in Information Systems (IS) research.

Recent research on Technology Acceptance has focused on two areas: Identifying the right models to use to measure the levels of technology acceptance (Malhotra & Galleta, 1999; Davis, 1993; Davis et al., 1989) and application of the models in measuring technology acceptance (Rose & Fogarty, 2006; Folorunso & Ogunseye, 2008).

The Technology Acceptance Model (TAM) is described as the most dominant theoretical model in information technology acceptance (Davis, 1993) and is an adaptation of the Theory of Reasoned (Ajzen & Fishbein, 1980). The TAM's goal is to provide an explanation of the determinants of computer acceptance that is generally capable of explaining user behavior across a broad range of end-user computing technologies and user populations (Davis et al., 1989). Although strong

empirical support for the TAM has been established through numerous studies (Karahanna & Straub, 1999; Venkatesh & Davis, 2000; Venkatesh, Morris, Davis and Davis, 2003), the TAM has had several criticisms leveled at it, including not offering sufficient understanding to provide system designers with information needed for creating and promoting user acceptance of systems (Mathieson, Peacock and Chin, 2001), and its assumption that its use is volitional, which means that there are no barriers to prevent an individual from using a technology or a system if he or she chose to do so (Mathieson et al., 2001).

Davis (1989) identifies two dimensions of technology acceptance: Perceived Usefulness and Perceived Ease of Use, which are theorized to be fundamental determinants of computer technology use.

2.2.2.1 Perceived Usefulness

Perceived usefulness is the tendency of people to use or not use a technology to the extent they believe it will help them perform their job better. It is the degree to which a person believes that using a particular system would enhance that person's job performance (Davis, 1989).

According to Igbaria, Craig, Cavaya and Zinatelli (1997), the following items are used to determine Perceived Usefulness:

    a. Improvement in Performance;
    b. Increase in Productivity;
    c. Usefulness to Job; and
    d. Improvement in Effectiveness.

2.2.2.2 Perceived Ease of Use

Perceived Ease of Use is the degree to which a person believes using a particular system would be free of effort, and if the performance benefits of usage are outweighed by the effort of using the technology (Davis, 1989).

Yousafzai et al. (2007) identifies external variables as the major predictor of Perceived Ease of Use and Perceived Usefulness. Rose & Fogarty (2006) call these external variables Subjective Norms. They refer to Subjective Norm as motivating influence of our perceptions of what we think significant others (e.g., family) want us to do. Venkatesh & Davis (2000) found that subjective norms had a significant influence on perceived usefulness and behavioral intentions when use of the technology was mandatory. When technology use was voluntary, subjective norms still influenced perceived usefulness but did not have a direct influence on behavioral intentions.

According to Igbaria et al. (1997), the following items are used to determine Perceived Ease of Use:

      a. Easiness of learning computers;
      b. Easiness to Command Computers;
      c. Easiness of Computer Commanding Skills Acquisition; and
      d. Easiness to Use Computers.

2.3. Research Gap

Research has been done on personality and technology acceptance respectively. Bateman and Crant (2000) focused on the impact of personality on charismatic leadership. Using the NEO Five-Factor Inventory tool they found that personality was positively related to charismatic leadership. Similarly, Bozionelos and Leung (2004) also focused on the impact of personality on leadership. Using a youthful sample they found that High levels of extraversion, conscientiousness, agreeableness, emotional stability and openness were perceived as characterizing effective leaders.

Likewise Jenkins and Griffith (2004) explored on the impact of personality on performance. The research which focused only on a single profession, accountants and a small sample size of 53 found that it was necessary to perform personality based job analysis within a specific occupational category to properly select a personality measure to be used for selection process. Ranaweera, Bansal and

McDougall (2008) exploring the impact of personality characteristics (traits) during initial web site visit found that personality characteristics have significant moderating effects on online purchase intentions.

While other researchers have focused on the impact of personality on the environment, others have focused on the impact the environment has on personality. Born et al. (2001) carried a research to determine the impact environment or situation has on personality dispositions. Specifically, they were interested in ascertaining how much of the variance in personality responses is attributable to the person, how much is due to the situation or interaction with the situation and how much is due to measurement error. Using the NEO Five Factor Model they found that the situation or environment has significant impact on the dispositions by the different personality traits.

Recent research by Devaraj et al. (2008) focused on how personality traits can impact the relationship between the two technology acceptance dimensions and the final intention to use computers. Using a sample of 180 first semester MBA students at the University of Notre Dame in France, this study lacked diversity of educational specializations commonly found in university management. However, the researchers found that personality is related to attitude which is a major determinant of intention to use computers.

All the literature reviewed above has shown that none focused on investigating personality and technology acceptance for managers in a university environment. This research, therefore, focused on the relationship between personality traits and computer technology acceptance for managers from diverse disciplines in the University of Malawi.

2.4   Chapter Summary

This chapter has examined existing literature to establish what knowledge is already available and identify gaps. The major gap that has been identified is that no research

work has been done before to relate personality and computer technology acceptance. This research therefore focused on the relationship between personality and computer technology acceptance. The next chapter discusses the methodology used for this research.

CHAPTER 3: METHODOLOGY

3.1 Introduction

The previous chapter on Literature Review has examined and critiqued work done by previous researchers who explained the two concepts: personality and computer technology acceptance. This chapter presents the design and methods that were used for the research. It includes information on the design of the research, sample selection and size, data collection methods, data analysis and ethical considerations.

3.2 Research Design

This research was designed to determine whether or not personality is related to individual acceptance of computer technologies among University of Malawi administrators. This section discusses the philosophy, approach and strategy used in this research.

Two research philosophies dominate the literature; namely, positivism and phenomenology (Saunders, Thornhill & Lewis, 2000). Johnson & Christensen (2007) describe phenomenology as the descriptive study of how individuals experience a phenomenon or an incident. Further, they state that positivism asserts that the only authentic knowledge is that which is based on sense, experience and positive verification. Shepard et al. (1993) asserts that phenomenology is predominantly used in qualitative research while positivism is predominantly used in quantitative research. Since this research was quantitative in nature, it therefore used positivist philosophy.

Johnson & Christensen (2007) identify two main types of research approaches namely, deductive approach and inductive approach. They describe deductive approach as the process of drawing specific conclusions from general observations which are supported by scientific theory. Additionally, they describe inductive approach as reasoning from the particular to the general, which is the opposite of deductive approach. This study firstly developed scientific theory through general

review of the study area, then developed specific hypotheses which were tested to draw conclusions. This means that this study used the deductive approach.

According to Saunders, Thornhill and Lewis (2000), there are several research strategies which include survey, experiment, case studies, grounded theory, ethnography, and action research. Grounded theory focuses on development of theory, case study on detailed analysis of one or more cases, ethnography focuses on the discovery and description of the culture of a group of people. Further, Cvijikj and Györy (2010) define an experiment as a set of actions and observations, performed to verify or falsify a hypothesis or research, a causal relationship between phenomena. Lastly, survey is is the study of attitudes, beliefs, and behavior of people and their settings through questionnaires administered by mail, handouts, personal and, telephone interviews, and the Internet. This research used the survey strategy to gather quantitative data from respondents. A questionnaire was used to gather the data. The sample for the survey was drawn from all administrators, heads and deans in the University of Malawi constituent colleges in the southern region. The questionnaire that was used for the study has been provided as appendix A.

3.3 Area and Population of Study

The study covered managers in the University of Malawi. The University has five colleges and the central administration office. The study only focused on managers in the constituent colleges in the southern region of Malawi namely: Chancellor College, College of Medicine, Kamuzu College of Nursing, and The Polytechnic. This means four out of the five constituent colleges of the University of Malawi were represented in the study. Considering that these colleges have a mix of most of the departments that are found at the fifth constituent college, Bunda College, and that the two big colleges namely, Chancellor College and Polytechnic were included in the study, it was concluded that the total number of managers provided a good representation of management in the University of Malawi colleges.

The total established positions of managers in the University of Malawi's southern region constituent colleges are 120. This represents all Principals, Registrars and their assistants, Heads of departments, Deans of faculties, Directors of centers, Finance, and ICT Directors. All Directors of centers and deans of Postgraduate studies have been considered as academic staff in the sampling since centers are under academic faculties and dean of postgraduate studies is an academic office.

3.4 Sampling Method and Procedure

Using a Sample Size Calculator as shown in Figure 2 a sample size of 92 was selected from the population using the following variables:

Total Population: 120
Confidence level: 95%
Confidence Interval: 5
Sample Size: 92

Figure 3.1: Sample Size Calculation

Source: Creative Research Systems, n.d.

This sample was proportionally stratified according to the ratios of managers for each college as shown in Table 3.1.

Table 3.1: Sample Size Stratification by College

College	Chancellor College	College of Medicine	Kamuzu College of Nursing	Polytechnic
Total Number of Managers (120)	46	23	16	35
Percentage (%)	38.33	19.16	13.33	29.16
Sample Size Out of 92	**35**	**18**	**12**	**27**

The respondents were then randomly selected by college according to the number of managers from that college.

3.5 Data Collection

Based on the Ten Item Personality Index (TIPI) and the Technology Acceptance Model a questionnaire was constructed for data collection. The questionnaire is provided in Appendix A and has three sections. Section A is for collecting Biographic data, Section B is for collecting Personality data and Section C is for collecting Technology Acceptance data. The questionnaire was pilot tested on ten respondents to ensure that questions were framed right and that the right data were collected. The operational details of the TIPI and the Technology Acceptance Model used to construct the questionnaire are explained in the sections below.

3.5.1   Personality

To measure the five personality dimensions several rating instruments have been developed. The most comprehensive instrument is 240-item Personality Inventory which permits measurement of the five personality dimensions (Costa and McCrae, 1992). Other instruments include the 44-item Big-Five Inventory (BFI) and the 60-item NEO Five-Factor Inventory (Srivastava, 2010). Because the 240 Item Personality Inventory and the 44 Item Personality Inventory are long tools and take long time to complete, other researchers have attempted to develop shorter tools for testing the big five dimensions. Gosling et al. (2003) developed the Five Item

Personality Index (FIPI) and the Ten Item Personality Index (TIPI). Although they agree that long instruments tend to have better psychometric properties than short instruments, their comparative results showed a strong positive correlation between the 44-item BFI and the TIPI. The researchers, however, recommend the use of the TIPI in researches where personality is studied along with other factors, which in this research is technology acceptance. In a recent study to compare the performance of short and long tools used to measure the five personality dimensions, Hofmans, Kuppens and Allick (2008) found that the TIPI is a valid alternative for long instruments when overall personality dimensions, rather than the facets in each dimension are of interest.

The TIPI has ten paired questions (Gosling et al., 2003). Question 1 is paired with question 6, 2 with 7, 3 with 8, 4 with 9 and 5 with 10. The questions 2, 4, 6, 8 and 10 are reversed questions to check consistency with their respective pair questions and each reversed question is not next to its corresponding paired question. The responses for the reversed questions are reversed meaning that on the scale of 1 to 7 a response of 1 is substituted with 7, 2 with 6, 3 with 5, 4 remains 4, 5 with 3, 6 with 2 and 7 with 1. After reversing the responses to the reversed questions, an average of each of the two pairs is found to determine the score of the person in terms of the five personality dimensions namely: Extraversion, Agreeableness, Conscientiousness, Emotional Stability and Openness to Experiences. A final score of less than 4 means that personality trait is not prevalent in the person and a final score of greater than 4 means that personality trait is available in the person. The personality trait with the highest average is the main personality of the person.

The Ten Item Personality Index was therefore used for two reasons. Firstly, because short tools reduce item redundancy, increasing participant willingness to participate and provide accurate answers. Secondly because it is available for free (Srivastava, 2010). Part B of the questionnaire in Appendix I presents questions from the TIPI index.

3.5.2 Technology Acceptance

Based on the Theory of Reasoned Action (TRA) by Ajzen & Fishbein (1980), Davis et al. (1989) developed the Technology Acceptance Model (TAM) as a tool to be used to measure technology acceptance. TAM is one of the most widely tested models of technology acceptance (Yousafzai et al., 2007) and is well established in the information systems and computer technology research (Devaraj et al., 2008).

Based on Davis et al. (1989) there are 8 questions to measure the technology acceptance of the respondents. Four questions are for measuring Perceived Ease of Use dimension and four questions for Perceived Usefulness dimension. For each dimension the scores on a scale of 1 to 5 were averaged to find the determinant score.

The TAM was used in this study to measure technology acceptance because it is capable of explaining user behavior across a broad range of end-user computing technologies (Davis et al., 1989), it is widely tested (Yousafzai et al., 2007) and is well established in the information systems and computer technology research (Devaraj et al., 2008).

3.6 Data Analysis

Analysis of respondent data was done using SPSS. Although there are data analysis applications like Statistical Analysis Software (SAS), Matlab and others, SPSS was chosen because it has flexibility in allowing other programs to easily import data from it (Clark, 2009). This is important if in future there will be need to reanalyze the same data using other programs. Appendix B provides raw data as it was provided by respondents. Microsoft Excel was used to speed up the process of entering the data because its interface is more user friendly than the SPSS interface. Cross tabulations and Chi-square tests were used to find relationships between personality dimensions and technology acceptance dimensions.

Based on Gamble (2001) guide for choosing tests to use for nominal data, statistical analysis was done to measure descriptive properties of the respondents and to find the

relationship between the personality and technology acceptance. Descriptive statistics included Frequency distributions. Cross tabulations and Pearson's Chi-square test was carried out to measure the relationship between personality and technology acceptance. Further statistical analysis was done using the following respondent attributes: age, gender, position, and specialization.

3.7 Overcoming Limitations

Several approaches were used to overcome the limitations that were noted in the Chapter 1.

To remove bias of respondents identifying only with socially accepted personalities, the Ten Item Personality Index that was used to determine the personality of each respondent was designed with paired questions that were asked differently but measuring the same trait. And for technology acceptance, respondents were asked to rate several questions on each of perceived usefulness and perceived ease of use dimensions. On each dimension the questions were asked differently while focusing on getting the same answer.

The limitation caused by the mobility of staff was overcome by investing in follow-up to questionnaires that were distributed. This was reflected in the high response rate as provided in the results and discussion chapter.

3.8 Ethical Considerations

The following ethical issues were taken into consideration:

Firstly, the purpose of the research was explained to the respondent by the researcher in full upon distribution of the questionnaire. A covering letter to the questionnaire also explained the research in detail. Respondents were encouraged to ask questions for further clarifications of the research.

Secondly, all respondents were mature adults who were asked to participate in the research before the administration of the questionnaire.

Lastly, data that were collected have been treated in strict confidence.

3.9   Chapter Summary

The methodology chapter has discussed how the research was designed, the area and population of study, the sample size and sampling method, data collection and analysis, and how ethical issues have been managed. Furthermore, the chapter has explained how data collection and analysis were done.

The next chapter will present the results that were obtained. Additionally the chapter will discuss the results and highlight any implications to the management of technology in the University of Malawi.

CHAPTER 4: RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter presents the findings of the study from the analysis of the data that was collected. Furthermore, it discusses the results through the interpretation of the research findings in relation to the issues raised in literature.

The collected data were analyzed using SPSS. The data were first entered into Microsoft Excel and then imported into SPSS. The Microsoft excel was mainly used to speed the process of capturing data.

Firstly the chapter will present results on demographic data. This will be followed by results on personality and then results on technology acceptance. Finally results on the relationship between personality and technology acceptance will be presented.

4.2 Demographic Profile

As noted in Chapter 3, data were collected from a sample of 92 University of Malawi managers. Each respondent was given a questionnaire for self assessment. Out of the 92 possible respondents, 81 returned correctly completed questionnaires representing a response rate of 89%. This section characterizes the sample in terms of distribution by college, age, gender, level of education and field of specialization.

4.2.1 Respondent Age

Table 4.1 shows age distribution of the respondents. 14.8% of the respondents were aged between 18 and 34 years, 71.6% were aged between 35 and 54 years, and those older than 54 years were 12.3%. This means that most of the respondents were aged below 54 years.

Table 4.1: Respondent age distribution

Age	Frequency	Percent (%)
18 – 34	12	14.8
35 – 54	58	71.6
55+	10	12.3
Unrated	1	1.2
Total	**81**	**100**

4.2.2 Respondent Gender

Table 4.2 shows the distribution of the respondents in terms of their gender. The results show that most of the respondents (75.3%) were male while female respondents accounted for only 24.7%. This means that University management is dominated with males.

Table 4.2: Respondents gender distribution.

Gender	Frequency	Percent (%)
Male	61	75.3
Female	20	24.7
Total	**81**	**100**

4.2.3 Respondent Education

Table 4.3 shows the level of education for the respondents. The distribution shows that 30.9% are educated to PhD level, 49.4% are educated to Masters level and 14.8% are educated to the Bachelor's level. This means that the managers in the University of Malawi are highly educated with 80.3% of the managers educated to at least a Masters degree.

Table 4.3: Respondents education levels.

Education Level	Frequency	Percent (%)
PhD	25	30.9
Masters	40	49.4
Bachelors	12	14.8
Others	4	4.8
Total	**81**	**100**

4.2.4 Respondent distribution by College

In terms of respondent distribution by college, Table 4.4 shows that Chancellor College contributed almost half of the respondents (40.7%), followed by the Malawi Polytechnic (33.3%). College of Medicine and Kamuzu College of Nursing contributed 14.8% and 11.1%, respectively. This means that most of the respondents came from Chancellor College and the Malawi Polytechnic.

Table 4.4: Respondent distribution by college.

College	Frequency	Percent
Chancellor College	33	40.7
College of Medicine	12	14.8
Kamuzu College of Nursing	9	11.1
Malawi Polytechnic	27	33.3
Total	**81**	**100**

4.2.5 Demographic Profile Summary

These results generally mean that the respondents for the study were relatively young (18 – 54 years), mostly male (75%) and highly educated (80% educated to Masters and PhD Levels). The results also show that the respondents came from different areas of specialization from each college under study.

4.3   **Assessment of Managers' Personality**

The respondents were asked to rate their personality against a set of behavioral statements, whether they agreed or disagreed with the statements. Table 4.5 shows results of respondents' personality. The results show that out of the five personality dimensions four are predominant among the respondents with conscientiousness rating highly at 88.9% followed by openness to experiences at 85.2% and finally agreeableness and emotional instability at 80.2% each. Although extraversion rates more than half (64.2%) it is significantly lower than the other four personalities. In general the results mean that there is a significant presence of all the five dimensions of personality traits in managers in the University of Malawi.

Table 4.5: Respondent personality distribution.

	Disagree	**Neither Agree Nor Disagree**	**Agree**	**Total**
Personality	%	%	%	%
Extraversion	11.1	24.7	64.2	100
Conscientiousness	2.5	8.6	88.9	100
Openness to Experiences	2.5	12.3	85.2	100
Agreeableness	7.4	12.3	80.2	100
Neuroticism	2.5	17.3	80.2	100

Firstly, the score on extraversion means that more than half (64%) of the respondents are extroverts, suggesting that these managers are sociable, outgoing and assertive (Bozionelos & Leung, 2004). However, extroverts tend to think out loud and may not solve things in their heads. On the other hand, introverts tend to have an easier time solving things inside their head without help. A high presence of extrovert managers in the University of Malawi means that management team in UNIMA would explore new ideas including technologies in groups rather than as individuals.

Secondly, the high score on conscientiousness (88.9%) means that a significantly high number of the respondents have a high tendency to show self-discipline, act dutifully, and aim for achievement, planned rather than spontaneous behaviour. On the other hand high scores on openness to experiences (85.2%) means that managers in the University of Malawi have a high appreciation for art, emotion, adventure, unusual ideas, curiosity, and variety of experience.

According to Major et al. (2006) individuals high in conscientiousness are more achievement oriented and set very clear goals for themselves. They may engage in development to prepare for the future. Individuals high in openness, on the other hand, may be interested in learning for the sake of learning. For example, open individuals are more likely to learn and try new things. According to Vakola, Tsaousis and Nikolaou (2003) there is a positive relationship between openness to experience and utilisation of effective coping mechanisms in order to deal with stressful events in life such as learning new technologies. The Theory of Reasoned Action (TRA) states that the most important determinant of a person's behavior is behavior intent (Ajzen & Fishbein, 1980). High scores on conscientiousness and openness therefore imply that management staff in the University of Malawi are more likely to try out and learn new technologies in preparation for their future.

Thirdly, a score of 80.2% on agreeableness means that most of the respondents have a tendency to be cooperative rather than suspicious and antagonistic towards others. High levels of cooperation implies that management in UNIMA can easily collaborate and accept new ideas and suggestions from each other, an important attribute in today's technology driven world where one can learn or experience new technologies and share with or influence others to do the same.

Finally, the high score of 80.2% on neuroticism means that most of the respondents have a tendency to experience unpleasant emotions easily, such as anger, anxiety, depression, or vulnerability. They tend to be tense, moody and anxious. Since new technologies need extra effort to learn and sometimes have potentially annoying problems, these results imply that a significant number of management staff in

UNIMA would have problems learning new technologies since they can easily be upset and frustrated. Empirical evidence suggests that neuroticism is negatively related to the tendency to be goal-oriented (Bozionelos, 2003). This effect of neuroticism counteracts behavioral intent which is the major determinant of technology usage (Ajzen & Fishbein, 1980). This means that as UNIMA is introducing new technologies it should take into consideration measures that would compel people to overcome their frustrations.

In summary, there are significant traits of all the five personality dimensions among management staff in the University of Malawi with conscientiousness being dominant (88.9%) followed by openness to experiences (85.2%). Traits of agreeableness and neuroticism appear in equal measures at 80.2% for each. The least dominant personality is extraversion which is at 64.2%. This implies that when introducing new technologies only one approach cannot be used to encourage managers to adopt it, that is, one solution does not fit all. Several avenues should therefore be used which may include providing manuals so that those who wish can read on their own, providing formal workshops, and championing managers to experience the technology on their own.

4.4   Assessment of Managers' Technology Acceptance

To determine the respondents' acceptance of technology, respondents were asked to rate themselves against a set of technology statements, whether they agreed or disagreed with the statements. Table 4.6 presents results on the respondents' acceptance of computer technology. The results show that most respondents found computers easy to use and useful to their job related activities with no respondent score on "Neither Agree Nor Disagree". Only 4% of the respondents found computers not useful to their jobs while 10% considered computers not easy to use.

According to Anandarajan, Igbaria and Anakwe (2000), user acceptance of computer technologies is driven to a large extent by perceived usefulness. In addition, Davis (1989) found that perceived usefulness exhibited a stronger and more consistent

relationship with usage. The results in table 4.7, therefore, mean high levels of computer technology acceptance and high levels of usage of any computer technology.

Table 4.6: Acceptance of computer technology.

	Disagree	Neither Agree Nor Disagree	Agree	Total
Technology Acceptance Dimension	%	%	%	%
Perceived Usefulness	3.7	0	96.3	100
Perceived Ease of Use	9.9	0	90.1	100

4.5   Relationship between Personality and Technology Acceptance

To understand the relationship between personality and computer technology acceptance reference is made to the hypotheses of this study which are based on each of the dimensions of personality against each dimension of technology acceptance respectively. Using cross tabulations and chi-square tests the hypotheses were tested by examining each dimension of personality against each dimension of computer technology acceptance. Results of the examination are presented in the subsections that follow:

4.5.1 Relationship between Extraversion and Perceived Usefulness

A cross tabulation between extraversion and perceived usefulness was performed in order to test the following hypothesis:

H_0: There is no relationship between extraversion and perceived usefulness.
H_1: There is a relationship between extraversion and perceived usefulness.

Table 4.7 presents results of cross tabulation between extraversion and perceived usefulness.

Table 4.7: Cross tabulation between extraversion and perceived usefulness.

	Perceived Usefulness			TOTAL
	Disagree	Neither Agree Nor Disagree	Agree	
Extraversion				
Disagree	1	0	8	**9**
Neither Agree Nor Disagree	0	0	20	**20**
Agree	2	0	50	**52**
TOTAL	**3**	**0**	**78**	**81**

The results in table 4.8 show that 96% (50) of extrovert respondents view computers to be useful to their work. The results mean that there is high perception of computer usefulness for extrovert managers in the University of Malawi. Since extroverts are influential characters, for UNIMA this means that management can leverage this advantage to create an environment, when introducing new technologies, where these managers can take a leading role in motivating others to adopt the technologies.

Furthermore, the results show that there is no relationship between extraversion and perceived usefulness, $X^2(df =2, N=81) = 2.157$, $p > 0.05$. However, further analysis showed that there is a statistically significant relationship between extraversion and perceived usefulness for the 35 – 44 years old age group, $X^2(df =2, N=31) = 6.975$, $p < 0.05$. In addition, these results showed there is a significant statistical relationship between extraversion and perceived usefulness for administrative managers, $X^2(df =2, N=23) = 6.970$, $p < 0.05$.

The relationship between extraversion and perceived usefulness for the respondent attributes of age and position means that extrovert administrative managers or managers in the 35 – 44 years old age group view computers to be useful to their work activities.

4.5.2 Relationship between Extraversion and Perceived Ease of Use

A cross tabulation between extraversion and perceived ease of use was performed and the following hypothesis was tested:

H_0: *There is no relationship between extraversion and perceived ease of use.*

H_1: *There is a relationship between extraversion and perceived ease of use.*

Table 4.8 presents results of a cross tabulation between extraversion and perceived ease of use. The results show that 96% (50) of the extrovert managers view computer technologies to be easy to use. This means that there is high positive perception that computers are easy to use for extrovert managers in the University of Malawi. As discussed earlier on, since extroverts are influential personalities, UNIMA management can leverage this advantage when introducing new technologies by allowing these extrovert managers to take a leading role in helping others to adopt the new technologies.

Table 4.8: Cross tabulation between extroversion and perceived ease of use.

	Perceived Ease of Use			TOTAL
	Disagree	Neither Agree Nor Disagree	Agree	
Extraversion				
Disagree	1	0	8	**9**
Neither Agree Nor Disagree	5	0	15	**20**
Agree	2	0	50	**52**
TOTAL	**8**	**0**	**73**	**81**

Furthermore, Chi-square test results for the cross tabulation between extraversion and perceived ease of use of computer technology show that there is a statistically significant relationship between extraversion and perceived ease of use, $X^2(df =2, N=81) = 7.279, p < 0.05$. This means that extrovert managers are more likely to find computers easy to use.

Further analysis of this relationship using the respondent attributes show that this relationship exists mainly in the 35 – 54 years age group, $X^2(df=2, N=81) = 7.279$, $p < 0.05$ and among administrators, $X^2(df=2, N=23) = 6.206$, $p < 0.05$. This means that extrovert administration managers and aged between 35 – 54 years do perceive computers to be easy to use.

4.5.3 Relationship between Conscientiousness and Perceived Usefulness

A cross tabulation between conscientiousness and perceived usefulness was performed to test the following hypothesis:

H_0: There is no relationship between conscientiousness and perceived usefulness.

H_1: There is a relationship between conscientiousness and perceived usefulness.

Table 4.9 presents the results of a cross tabulation between conscientiousness and perceived usefulness. The table shows that 97% (71) of conscientious managers perceive computers to be useful in their work endeavors. Since conscientious personalities aim for achievement and that they perceive computers to be useful, these results mean that conscientious managers are more likely to successfully implement new computer technologies as they perceive computers to be useful to their jobs.

Furthermore, Chi-square test results for the cross tabulation between conscientiousness and perceived usefulness of computer technology show that the relationship between conscientiousness and perceived usefulness is statistically significant, $X^2(df=2, N=81) = 13.296$, $p < 0.05$. This means that conscientious managers in UNIMA are more likely to find computers useful.

Table 4.9: Cross tabulation between conscientiousness and perceived usefulness.

	Perceived Usefulness			TOTAL
Conscientiousness	Disagree	Neither Agree Nor Disagree	Agree	
Disagree	0	0	2	**2**
Neither Agree Nor Disagree	2	0	5	**7**
Agree	1	0	71	**71**
TOTAL	**3**	**0**	**78**	**81**

Further analysis of this relationship using the respondent attributes show that a relationship exists mainly among the 35 – 54 years age group, $X^2(df =2, N=58) = 9.644$, $p < 0.05$, among females, $X^2(df =1, N=20) = 9.474$, $p < 0.05$, among administrators and academics, $X^2(df =2, N=57) = 13.253$, $p < 0.05$ and $X^2(df =2, N=23) = 4.966$, $p < 0.05$ respectively. In addition, this relationship exists among those educated to PhD and Bachelor's level, $X^2(df =2, N=25) = 25.000$, $p < 0.05$ and $X^2(df =2, N=12) = 5.455$, $p < 0.05$ respectively. Furthermore, a relationship exists among managers at College of Medicine and Kamuzu College of Nursing, $X^2(df =2, N=6) = 6.000$, $p \leq 0.05$ and $X^2(df =1, N=5) = 5.00$, $p < 0.05$. These results mean that conscientious female academic or administrative managers who come from College of Medicine or Kamuzu College of Nursing, aged between 35 – 54 years, and are educated to PhD levels are more likely to find computers useful.

4.5.4 Relationship between Conscientiousness and Perceived Ease of Use

A cross tabulation between conscientiousness and perceived ease of use was performed in order to test the following hypothesis:

H_0: *There is no relationship between conscientiousness and perceived ease of use.*

H_1: *There is a relationship between conscientiousness and perceived ease of use.*

Table 4.10 presents the results of a cross tabulation between conscientiousness and perceived ease of use. The table shows that 91% (65) of conscientious managers perceive computers to be easy to use. Since conscientious personalities aim for achievement and that they perceive computers to be easy to use, then new computer technologies can successfully be implemented by encouraging conscientious managers to be early adopters. This can encourage other managers to adopt the new technology who become motivated by knowing that others are actually using the new technology.

Table 4.10: Cross tabulation between conscientiousness and perceived ease of use.

	Perceived Ease of Use			TOTAL
	Disagree	Neither Agree Nor Disagree	Agree	
Conscientiousness				
Disagree	0	0	2	**2**
Neither Agree Nor Disagree	1	0	6	**7**
Agree	7	0	65	**71**
TOTAL	**8**	**0**	**73**	**81**

Chi-square test results for the cross tabulation between conscientiousness and perceived ease of use of computer technology show that there is no relationship between conscientiousness and perceived ease of use of computer technology, X^2(df =2, N=81) = 0.374, $p > 0.05$. Further analysis shows that there is also no relationship between conscientiousness and perceived ease of use for any of the respondent attributes.

The Chi-square test between conscientiousness and perceived usefulness, and perceived ease of use has shown that conscientious managers found computers to be useful but not necessarily easy to use. This means that although conscientious managers are achievement oriented they may still need support in their learning process of the new technologies.

4.5.5 Relationship between Openness to Experiences and Perceived Usefulness

A cross tabulation between openness to experiences and perceived usefulness was also performed to test the following hypothesis:

H_0: *There is no relationship between openness to experiences and perceived usefulness*

H_1: *There is a relationship between openness to experiences and perceived usefulness*

Table 4.11 presents the results of a cross tabulation between openness to experiences and perceived usefulness. The table shows that 84% (68) of the respondents who are open to experiences view computers to be useful. Important attributes of open personality include appreciation for adventure, unusual ideas and high curiosity. Since there are also many managers with open personality in the University of Malawi these results mean that most of these can easily adopt new technologies.

Table 4.11: Cross tabulation between Openness and perceived usefulness.

	Perceived Usefulness			TOTAL
	Disagree	Neither Agree Nor Disagree	Agree	
Openness to Experiences				
Disagree	1	0	1	**2**
Neither Agree Nor Disagree	1	0	9	**10**
Agree	1	0	68	**69**
TOTAL	**3**	**0**	**78**	**81**

Chi-square test results for the cross tabulation between openness to experiences and perceived usefulness of computer technology show that there is a statistically significant relationship between openness to experiences and perceived usefulness, $X^2(df=2, N=81) = 14.114$, $p < 0.05$. This means that open managers are more likely to find computers useful.

Further analysis of this relationship show that this relationship exists mainly among the 35 – 54 years old age group, $X^2(df=2, N=31) = 31.000, p < 0.05$, females, $X^2(df=2, N=20) = 20.000, p < 0.05$ and administrators, $X^2(df=2, N=23) = 23.000, p < 0.05$. Furthermore, this relationship exists among those educated up to bachelors degree, $X^2(df=2, N=12) = 12.000, p < 0.05$ and those at Kamuzu College of Nursing, $X^2(df=2, N=5) = 5.000, p < 0.05$. This means that open female administrative managers from UNIMA, educated to Bachelors' degree level, and coming from Kamuzu College of Nursing perceive computer technology to be useful to their work.

4.5.6 Relationship between Openness and Perceived Ease of Use

A cross tabulation between openness to experiences and perceived ease of use was performed to test the following hypothesis:

> H_0: There is no relationship between openness to experiences and perceived ease of use.
>
> H_1: There is a relationship between openness to experiences and perceived ease of use.

Table 4.12 presents the results of a cross tabulation between openness to experiences and perceived ease of use. The table shows that 90% (73) of the respondents who are open to experiences perceived computers to be useful. As stated earlier on, these results mean that most of these open managers can easily adopt new technologies.

Chi-square test results for the cross tabulation between openness to experiences and perceived ease of use of computer technology show that there is no statistically significant relationship between openness to experiences and perceived ease of use, $X^2(df=2, N=81) = 5.305, p > 0.05$.

Table 4.12: Cross tabulation between openness and perceived ease of use.

	Perceived Ease of Use			TOTAL
	Disagree	Neither Agree Nor Disagree	Agree	
Openness to Experiences				
Disagree	1	0	1	**2**
Neither Agree Nor Disagree	2	0	8	**10**
Agree	5	0	64	**69**
TOTAL	**8**	**0**	**73**	**81**

However, further analysis reveals that within the attributes there is a relationship for some attributes between openness to experience and perceived ease of use. Firstly, it is found that there is a statistically significant relationship between openness to experiences and perceived ease of use for males, $X^2(df =2, N=61) = 9.887$, $p < 0.05$. Secondly, it was found that the relationship exists for academic members of staff, $X^2(df =2, N=57) = 10.664$, $p < 0.05$, and for level of education this relationship exists among those with Masters degree, $X^2(df =1, N=40) = 5.481$, $p < 0.05$. Finally, this relationship exists for managers at Chancellor College, $X^2(df =2, N=33) = 33.000$, $p < 0.05$. These results therefore mean that open academic UNIMA managers, who are educated to the level of Master's degree, and mainly from Chancellor College, do consider computers to be easy to use.

4.5.7 Relationship between Agreeableness and Perceived Usefulness

A cross tabulation between agreeableness and perceived usefulness was performed and then the following hypothesis was tested:

H_0: *There is no relationship between agreeableness and perceived usefulness.*

H_1: *There is a relationship between agreeableness and perceived usefulness.*

Table 4.13 presents results of a cross tabulation between agreeableness and perceived usefulness. The results show that 80% (65) of the respondents who are agreeable perceived computers to be useful. This means that most agreeable UNIMA managers can easily cooperate in efforts to adopt new technologies.

Chi-square test results for the cross tabulation between agreeableness and perceived usefulness of computer technology show that there is a relationship between agreeableness and perceived usefulness of computer technology, $X^2(df=2, N=81) = 22.119$, $p < 0.05$. This means that agreeable UNIMA managers are more likely to view computers to be useful.

Table 4.13: Cross tabulation between agreeableness and perceived usefulness.

	Perceived Usefulness			TOTAL
	Disagree	Neither Agree Nor Disagree	Agree	
Agreeableness				
Disagree	0	0	6	**6**
Neither Agree Nor Disagree	3	0	7	**10**
Agree	0	0	65	**65**
TOTAL	**3**	**0**	**78**	**81**

Further analysis of the relationship between agreeableness and perceived usefulness against each of the attributes reveals that a statistically significant relationship exists mainly in the 35 – 54 years age group, $X^2(df=2, N=58) = 12.420$, $p < 0.05$, among males, $X^2(df=2, N=61) = 15.952$, $p < 0.05$, and among academic and administrative managers, $X^2(df=2, N=57) = 14.805$, $p < 0.05$ and $X^2(df=2, N=23) = 6.970$, $p < 0.05$ respectively. Furthermore, the relationship exists among those with Bachelors and Masters degrees, $X^2(df=1, N=12) = 5.455$, $p < 0.05$ and $X^2(df=2, N=40) = 19.487$, $p < 0.05$ respectively. Finally, the relationship exists for managers at College of Medicine, Kamuzu College of Nursing and Malawi Polytechnic, $X^2(df=2, N=6) = 6.000$, $p < 0.05$, $X^2(df=1, N=5) = 5.000$, $p = 0.025$ and $X^2(df=2, N=37) = 11.648$, $p <$

0.05, respectively. This means that agreeable male administrative or academic managers in UNIMA within the 35 – 54 years age group, from College of Medicine, Kamuzu College of Nursing and Malawi Polytechnic do perceive computers to be useful.

4.5.8 Relationship between Agreeableness and Perceived Ease of Use

A cross tabulation between agreeableness and perceived ease of use was performed in order to test the following hypothesis:

> H_0: *There is no relationship between agreeableness and perceived ease of use.*
>
> H_1: *There is a relationship between agreeableness and perceived ease of use.*

Table 4.14 presents results of a cross tabulation between agreeableness and perceived ease of use. The results show that 72% (58) of the respondents who are agreeable perceived computers to be easy to use. This means that most agreeable UNIMA managers can easily cooperate in efforts to adopt new technologies.

However, Chi-square test results for the cross tabulation between agreeableness and perceived ease of use of computer technology show that there is no statistically significant relationship between agreeableness and perceived ease of use, $X^2(df = 2, N=81) = 0.716$, $p > 0.05$. Further analysis in terms of the attributes reveals that no relationship exists between agreeableness and perceived ease of use.

Table 4.14: Cross tabulation between Agreeableness and perceived ease of use.

	Perceived Ease of Use			TOTAL
	Disagree	Neither Agree Nor Disagree	Agree	
Agreeableness				
Disagree	0	0	6	**6**
Neither Agree Nor Disagree	1	0	9	**10**
Agree	7	0	58	**65**
TOTAL	**8**	**0**	**73**	**81**

4.5.9 Relationship between Neuroticism and Perceived Usefulness

A cross tabulation between neuroticism and perceived usefulness was performed in order to test the following hypothesis:

H_0: *There is no relationship between neuroticism and perceived usefulness.*

H_1: *There is a relationship between neuroticism and perceived usefulness.*

Table 4.15 presents results of a cross tabulation between neuroticism and perceived usefulness. The results show that 78% (63) of the respondents who are emotionally unstable perceived computers to be useful. Since neurotic people have a tendency to experience unpleasant emotions easily, such as anger, anxiety, depression, or vulnerability, they tend to be tense, moody and anxious. In addition, since new technologies need extra effort to learn and may generate frustrations along the process of learning this means a significant number of managers in UNIMA need due attention when introducing new technologies in order for them to successfully go through the adoption process.

Table 4.15: Cross tabulation between neuroticism and perceived usefulness.

	Perceived Usefulness			TOTAL
	Disagree	Neither Agree Nor Disagree	Agree	
Neuroticism				
Disagree	0	0	2	**2**
Neither Agree Nor Disagree	1	0	13	**14**
Agree	2	0	63	**65**
TOTAL	**3**	**0**	**78**	**81**

However, Chi-square test results for the cross tabulation between neuroticism and perceived usefulness of computer technology show that there is no relationship between neuroticism and perceived usefulness of computer technology, $X^2(df =3, N=81) = 0.887$, $p > 0.05$. Additionally, further analysis reveal that there is a relationship among PhD holders, $X^2(df =2, N=25) = 15.952$, $p < 0.05$ and those at College of Medicine, $X^2(df =1, N=6) = 6.000$, $p < 0.05$. These results mean that neurotic managers who are PhD holders at College of Medicine are more likely to find computers useful.

4.5.10 Relationship between Neuroticism and Perceived Ease of Use

A cross tabulation between neuroticism and perceived ease of use was performed in order to test the following hypothesis:

H_0: There is no relationship between neuroticism and perceived ease of use.
H_1: There is a relationship between neuroticism and perceived ease of use.

Table 4.16 presents results of a cross tabulation between neuroticism and perceived ease of use. The table shows that 73% (59) of the respondents who are emotionally unstable also perceive computers to be useful. Neuroticism means a tendency to experience unpleasant emotions easily, such as anger, anxiety, depression, or vulnerability. Neurotic people therefore tend to be tense, moody and anxious. New

technologies need extra effort to learn and they tend to generate unpleasant experiences along the process of learning. This means managers in UNIMA may require systematic efforts, like formal training, when introducing new technologies in order for them to successfully go through the adoption process of the new technologies.

Table 4.16: Cross tabulation between Neuroticism and perceived ease of use.

	Perceived Usefulness			TOTAL
	Disagree	Neither Agree Nor Disagree	Agree	
Neuroticism				
Disagree	0	0	2	**2**
Neither Agree Nor Disagree	2	0	12	**14**
Agree	6	0	59	**65**
TOTAL	**8**	**0**	**73**	**81**

However, Chi-square test results for the cross tabulation between neuroticism and perceived usefulness of computer technology show that there is no relationship between neuroticism and perceived usefulness, $X^2(df =3, N=81) = 0.653$, $p > 0.05$. Further analysis, though, reveals that there is a relationship among those at PhD level, $X^2(df =2, N=25) = 6.576$, $p < 0.05$. This means that neurotic managers in UNIMA who are at PhD level consider computers to be easy to use.

4.6   Chapter Summary

This chapter has presented the findings and the discussions for this research. The results show that managers in UNIMA are relatively young (25 – 54 years), mostly male (75%), highly educated (80% educated to Masters and PhD Levels) and come from different areas of specialization from each college under study.

It has also been found that management in the University of Malawi has significant traits of all the five personality dimensions. Furthermore, it has been found that people of all personalities perceive computers to be useful in their daily work

activities. The results also show that while many respondents have shown undoubted easiness at using computers, there is also a significant number of management staff (10%) who have problems with using computers. Chi-square tests have shown that there are relationships between extraversion and perceived ease of use, conscientiousness and perceived usefulness, openness to experiences and usefulness, and between agreeableness and perceived usefulness.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

5.1   Introduction

This chapter presents a summary of the outcome of this research. It also presents the recommendations on how the University of Malawi can achieve higher technology acceptance in light of the established personalities and respondent attributes. Finally the chapter provides hints on future direction of research in personality and computer technology acceptance.

5.2   Conclusion

The results of the study have successfully addressed the research hypothesis under investigation which was:

H_0:   There is no relationship between Personality and Computer Technology Acceptance

H_a: There is a relationship between Personality and Computer Technology Acceptance

The three objectives of the study have also been achieved. The objectives were:

(a.) To investigate the different personalities of management staff in the University of Malawi

(b.) To investigate technology acceptance in the University of Malawi

(c.) To investigate attributes that best characterize technology acceptance with respect to different personalities in the University of Malawi.

Through literature review, analysis of the data collected, the various personalities and computer technology patterns for managers in the University of Malawi were

established. Chi-square tests helped to identify the relationship between respondent attributes, personality traits and computer technology acceptance for managers in the University of Malawi.

The results from this study are important because for the first time, management in the University of Malawi is able to know the prevalent personality traits for the managers in its system. Since this is a first study of this nature in Malawi, managements from other universities within the country can also draw lessons from the results of the study as they endeavor to improve their services by introducing new computer technologies.

From the results it has been concluded that the most dominant personality is conscientiousness and the least though significant is extraversion. It has also been concluded that managers from all personalities do perceive computers to be useful and easy to use although there are few with opposite views.

Table 5.1 presents a summary of the major findings on the relationship between personality and computer technology acceptance. The results show that extraversion is related to Perceived ease of use only; and conscientiousness, openness to experiences and agreeableness are related to perceived usefulness only while neuroticism is related to neither usefulness nor ease of use.

Table 5.1: Summary of relationship between personality and Technology Acceptance

Personality/Attribute	Technology Acceptance	
	Perceived Usefulness	Perceived Ease of Use
Extraversion	No	Yes
Conscientiousness	Yes	No
Openness to experiences	Yes	No
Agreeableness	Yes	No
Neuroticism	No	No

Yes = There is a relationship   No = There is no relationship

The results agree with recent research in personality and computer technology acceptance by Devaraj et al. (2008) who found that in general personality has a bearing on acceptance and intention to use computer technologies. These results are credible because they were collected based on the tested personality index and technology acceptance model; and the respondents provided the data of their own will. The analysis has been done through the use of the Chi Square test at the significance level of 0.05.

5.3   Recommendations

From the results of the study, the following recommendations are made:

a. Need for policy to guide who decides the need for new technologies and approval to buy them.

Some personality traits such as neuroticism view computer technologies as neither useful nor easy to use. If people with such personalities have the sole responsibility to decide whether to invest in computer technologies or not, their institutions may suffer because they may not see the importance or they may think it is easier to maintain the status quo. Therefore, should the decision to invest in new technologies like buying new computers for departments rest in Heads of Departments or Deans of Faculty or on Administrative staff alone or should it be a collaborative process? A collaborative process proves useful as there are checks and balances among the decision makers. A policy will enforce a systematic approach to the process of decision making on which technologies to invest in.

b. Provide multiple modes of learning when introducing new technologies to facilitate acceptance.

The study has shown that the University has diverse personalities although some personalities are more prevalent than others. Some are creative and would like to explore new ideas on their own. Others are averse and would need formal arrangements in order to learn. In addition, the results show that it is easier for some people to use technologies than it is for others. The people who find it easy to use

computers may get bored if they are in a class where teaching of basic knowledge takes center stage.

When introducing new technologies UNIMA management should therefore take into account that managers in its colleges have different attributes requiring different approaches to enable them adopt new technologies. One solution does not fit all.

c. Emphasis on adequate training for any new or existing technologies

This study has found that some managers find it difficult to use computer technologies. To avoid rejection of these technologies, introduction of any new technology should be accompanied by adequate training so that management staff is exactly aware of how to perform necessary activities. There should also be regular training sessions for existing technologies so that members of staff are given an opportunity to improve their proficiencies. However management should take proper precautions since it has been found in this study that some members of staff have neurotic personality traits which make it easy for them to experience frustrations and stress.

d. Empowerment of college ICT departments to enhance adoption of new technologies

As for technology acceptance, it has been found that while some managers are very sure that computer technologies are useful for their work related activities, there are others who though agreeing, are not very sure of the usefulness of computer technologies. These being decision makers, they can be a hindrance to the introduction of new technologies in terms of their support for financing and priotizing of relevant resources. Considering that the world is now in the computer technology age, UNIMA should empower a rightful body within its structures which can ensure that such hindrances are addressed at the highest level. Since the decision making process in UNIMA is by committees, the ICT departments in the colleges should be given representation in such committees.

e. Provide incentives when introducing new technologies

Considering that the results show that personality is related to technology acceptance and neurotic personality is significant, incentive systems could be designed to target those people with a natural inclination to avoid using computer technologies. In cases where the personality traits of users might prevent them from using the computer technologies extensively, suitable reward systems might need to be in place to encourage them to start using the technology despite the frustrations and stress that it may bring along. Incentives are a powerful tool for changing behaviour and can induce people to engage in tasks that they would resist in the absence of an incentive system (Devaraj et al., 2008).

f. Administer personality tests to all new managers to determine the technology acceptance levels.

Since some personalities are not favourable towards technology use, UNIMA management may administer personality tests when recruiting new employees with the aim of identifying which employees will require assistance, for example training, in order for them to be productive in a technology driven environment. This will help to reduce costs and increase productivity since resources, which are limited, can be concentrated on people with personalities that are resistant to adopting new technologies.

5.3   Direction for future research

This research has dealt with aspects of personality and technology acceptance for managers in the University of Malawi. However, we cannot conclude that all aspects have been dealt with in this study considering that there were time and resource limitations for the research. This study was cross sectional which means that it was assumed that the responses received reflected the consistent behaviour of the respondents at all times. It is possible that the perceptions of people about their personality and their views on technology can change depending on the circumstances or period of time at which they are asked to comment. Further studies

51

can be done using a longitudinal approach so that the data are collected several times to obtain an overall view.

The research focused on only some colleges in the University of Malawi. Although the University of Malawi is the biggest institution of higher learning in the country and that the results of the study may be applicable to other institutions of higher learning, it would be interesting to have a similar study carried out at another university for comparative purposes.

Lastly, this research focused on the relationship between personality and technology acceptance. While it has been established that some personality dimensions are related to technology acceptance, it has not been established how such relationship varies with time as people experience more and more technologies. Researchers using TAM have proposed that an individual's experiences with a specific technology influence perceptions of ease of use and usefulness of that technology (Stoel & Lee, 2003). Further studies in this area could be very interesting. Also, apart from personality other factors can influence technology acceptance. Future research can focus on exploring such factors as prior experience in using computers and level of effort required to understand the new technologies.

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APPENDIX A (Questionnaire)

PART A: Demographic Data

(1) College ☐ Bunda College
☐ Chancellor College
☐ College of Medicine
☐ Kamuzu College of Nursing
☐ Malawi Polytechnic

(2) (a) Highest Qualification
☐ PhD
☐ Masters
☐ Bachelors
☐ Diploma
☐ MSCE
☐ Other _____

(3) Age ☐ 18 – 24 ☐ 25 – 34 ☐ 35 – 44 ☐ 45 – 54 ☐ 54+

(4) Position Academic ☐ Administrator ☐

(5) Gender Male ☐ Female ☐

PART B: Personality Index

Here are a number of personality traits that **may or may not apply to you**. Please **write a number next to each statement** to indicate the extent to which you **agree or disagree** with that statement. You should rate the extent to which the pair of traits applies to you, even if one characteristic **applies more strongly** than the other.

I See myself as:
1 = Disagree strongly   **4 = Neither agree nor disagree**
2 = Disagree moderately   **5 = Agree a little**
3 = Disagree a little   **6 = Agree moderately**   **7 = Agree strongly**

	1	2	3	4	5	6	7
(1) Extraverted*, enthusiastic *means likes company of others, outgoing	1	2	3	4	5	6	7
(2) Critical, quarrelsome	1	2	3	4	5	6	7
(3) Dependable, self-disciplined	1	2	3	4	5	6	7
(4) Anxious, easily upset	1	2	3	4	5	6	7
(5) Open to new experiences, complex	1	2	3	4	5	6	7
(6) Reserved, quiet	1	2	3	4	5	6	7
(7) Sympathetic, warm	1	2	3	4	5	6	7
(8) Disorganized, careless	1	2	3	4	5	6	7
(9) Calm, emotionally stable	1	2	3	4	5	6	7
(10) Conventional, uncreative	1	2	3	4	5	6	7

PART C: Technology Acceptance

Section A: Perceived Usefulness of Computer Technologies

1 = Strongly Disagree   2 = Disagree to some extent
3 = Uncertain   4 = Agree to some extent
5 = Strongly Agree

(1) Using Computers Improves my job performance	1	2	3	4	5
(2) Using Computers Improves my productivity on the job	1	2	3	4	5
(3) I find Computers useful in my job	1	2	3	4	5
(4) Using Computers enhances my effectiveness on the job	1	2	3	4	5

Section B: Perceived Ease of Use of Computer Technologies

1 = Strongly Disagree   2 = Disagree to some extent
3 = Uncertain   4 = Agree to some extent
5 = Strongly Agree

(1) Learning to use computers is easy for me	1	2	3	4	5
(2) I find it easy to get computers to do what I want them to do	1	2	3	4	5
(3 It is easy for me to become skillful at using computers	1	2	3	4	5
(4) I find computers easy to use	1	2	3	4	5

Serial	College	Education Level	Specialization	Age	Position	Gender	Extraversion	Conscientiousnes	Emotional Instability	Openness To Experiences	Agreeableness	Perceived usefulness	Perceived Ease of Use
1	5	2	99	2	1	1	5	6	4	6	3	5	5
2	5	3	4	3	2	2	4	7	4	7	7	5	5
3	5	2	7	4	1	1	5	6	4	7	5	5	4
4	5	2	3	2	1	1	7	7	5	7	5	5	4
5	5	4	2	4	2	1	4	7	4	7	5	5	4
6	5	2	5	4	2	1	5	6	4	7	5	5	4
7	5	3	5	2	2	1	5	7	6	7	4	5	4
8	5	2	8	3	1	1	5	7	6	6	7	5	5
9	5	2	6	4	1	1	7	7	7	7	6	5	4
10	5	2	2	2	1	1	6	6	6	6	5	5	4
11	5	2	6	4	1	2	7	6	5	6	3	5	4
12	5	2	2	3	1	1	5	7	3	7	6	5	5
13	5	2	3	3	1	2	4	7	5	7	7	5	5
14	5	1	2	4	1	1	5	7	5	7	6	5	4
15	5	2	99	2	1	1	5	6	6	6	7	5	5
16	5	2	3	2	2	2	5	4	5	7	5	5	5
17	5	2	2	3	1	1	3	3	7	4	6	5	5
18	5	1	1	4	2	1	7	6	6	7	3	5	4
19	5	2	4	3	1	1	6	6	6	7	6	5	2
20	5	2	4	3	1	1	4	7	7	7	6	4	4
21	5	1	2	4	1	1	6	7	7	4	4	5	5
22	5	3	3	3	2	1	5	7	5	7	7	5	4
23	5	3	3	4	2	1	4	7	7	7	7	5	1
24	5	2	2	5	1	2	5	7	6	7	5	5	4
25	5	3	1	3	2	1	3	7	5	7	7	5	4
26	5	3	3	3	2	1	4	4	5	5	7	5	5
27	5	1	1	3	1	1	7	5	6	7	6	5	5
28	5	2	4	3	1	1	7	7	4	7	7	5	4
29	5	2	7	5	1	1	4	7	6	4	5	4	2
30	5	2	2	5	1	1	4	7	7	7	5	5	4

31	5	2	3	2	1	1	6	7	7	7	7	5	5
32	5	2	99	3	1	1	4	5	4	4	5	5	4
33	2	1	5	5	2	1	4	7	7	7	7	5	4
34	2	2	2	2	2	1	7	6	6	7	4	5	5
35	2	1	1	5	2	1	5	7	7	7	5	4	4
36	3	1	1	3	1	1	4	3	7	4	6	5	5
37	3	5	9	4	1	1	4	7	6	6	5	4	5
38	3	6	9	3	1	2	6	7	5	4	3	5	5
39	3	1	1	4	1	1	7	6	6	5	5	5	5
40	3	1	9	4	1	1	5	4	4	4	4	2	3
41	4	1	1	4	1	2	7	7	7	7	7	5	5
42	3	1	9	5	2	1	4	5	7	6	6	4	2
43	4	2	1	3	1	2	7	5	4	7	6	5	4
44	4	2	1	3	1	2	4	7	6	7	6	5	4
45	4	3	99	3	2	2	2	4	6	2	4	1	4
46	5	2	99	4	1	1	7	6	7	6	4	3	5
47	5	3	1	4	1	1	4	7	6	7	6	5	3
48	4	1	6	4	1	2	4	7	5	7	7	5	3
49	5	2	1	4	1	1	4	7	7	7	5	5	4
50	5	2	4	4	2	1	5	7	6	6	5	5	4
51	5	2	2	3	2	2	6	6	5	7	6	5	4
52	2	1	99	4	1	2	7	7	6	7	4	5	4
53	2	1	6	3	1	1	7	7	7	7	4	5	5
54	2	1	2	3	1	2	7	7	7	7	4	5	5
55	2	3	99	3	2	2	6	7	7	7	6	5	5
56	2	3	1	2	2	1	3	7	4	6	5	5	4
57	2	2	2	4	2	1	7	4	6	7	7	5	4
58	2	1	6	5	1	2	1	7	7	6	5	5	4
59	2	3	1	1	2	2	7	6	4	7	5	5	5
60	2	3	99	3	2	1	5	6	5	6	6	5	5
61	2	2	2	4	2	1	6	7	7	6	7	5	5
62	2	1	6	5	1	1	6	6	6	4	6	5	4
63	2	1	6	4	1	1	2	5	4	3	7	5	3
64	2	2	6	5	1	1	4	6	6	6	6	5	4
65	2	2	99	3	1	1	4	6	5	6	6	5	4
66	2	1	99	3	1	1	5	7	5	6	5	5	4
67	2	2	99	4	1	1	6	6	5	7	7	5	4
68	2	2	99	4	1	1	5	5	6	6	3	5	5
69	2	2	6	3	1	1	6	7	7	7	7	5	4
70	2	2	1	2	1	2	3	7	7	7	6	5	4

64

71	2	2	5	3	1	1	5	4	3	5	7	5	4
72	2	1	1	3	1	1	6	7	5	7	5	5	5
73	2	1	10	4	1	1	7	5	5	7	6	5	5
74	2	1	99	3	1	1	2	7	4	7	4	4	4
75	2	1	99	5	1	1	3	5	6	7	5	5	4
76	2	99	99	99	99	1	5	4	4	4	3	4	5
77	2	2	4	2	1	2	4	7	6	7	6	4	4
78	2	2	4	3	1	1	7	7	7	7	7	5	4
79	2	1	2	4	1	1	6	7	6	7	7	5	4
80	2	1	4	4	1	2	6	7	6	4	6	5	5
81	2	2	4	3	1	1	6	7	7	7	6	5	4