THE EFFECT OF COMPUTER TECHNOLOGY ON THE EFFECTIVENESS OF AUDIT FIRMS IN UGANDA

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A RESEARCH REPORT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF A BACHELORS DEGREE OF COMMERCE OF MAKERERE UNIVERSITY

JUNE 2011
DECLARATION

I declare that this is my original piece of work which is as a result of my tireless effort into research so as to ensure reliability of information. It has been submitted for the award of a degree or diploma in any university or higher institution of learning except where references to other reports have been made.

Signature ……………………….                   Date …………………………………………

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APPROVAL

I the undersigned supervisor of this research report accept that it is adequate for the award of the degree of commerce of Makerere University and hereby forward it for examination.

Signature ……………………… Date ………………………………

MR.ERIC NZIBONERA
(SUPERVISOR)
DEDICATION

I dedicate this book to my dear parents, Mr. John Bange Atwooki and my beloved mother Mrs. Agnes Kairumba Abwooli who have been always supportive in every aspect. I am really grateful to you and may the Lord reward them abundantly.
ACKNOWLEDGEMENT

It has really been God’s grace that I have been alive to this present day and been able to meet whoever has impacted and touched my life, and provided me with moral and financial support. I can not underestimate the wisdom, courage, and strength you have given me to succeed.

My sincere gratitude and appreciation go to my supervisor Mr. Eric Nzibonera who provided me with constant guidance and advice with a committed mind and heart. May God bless you.

I would like express my sincere gratitude and a special appreciation to my beloved Mother Mrs. Agnes Kairumba Abwooli for the love, care, advice, moral and financial support since the day I was born until now. May the Almighty God bless you abundantly.

Appreciation and thanks go to my Brothers Richard, Gabriel and Sisters Joseline, Judith, Joan, Esther and others for your love, care, financial and moral support during my life at the University. May the Lord bless you all.

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# TABLE OF CONTENTS

Declaration ............................................................................................................................ i
Approval ................................................................................................................................. ii
Dedication ............................................................................................................................... iii
Acknowledgement ................................................................................................................ iv
Table of contents ..................................................................................................................... v
List of tables ............................................................................................................................ ix
List of abbreviations (acronyms) .......................................................................................... x
Abstract .................................................................................................................................... xi

**CHAPTER ONE** ................................................................................................................. 1
1.0 Introduction ....................................................................................................................... 1
1.1 Background of the study .................................................................................................... 1
1.2 Statement of the problem .................................................................................................. 2
1.3 Purpose of the study .......................................................................................................... 3
1.4 Objectives of the study ..................................................................................................... 3
1.5 Research questions .......................................................................................................... 3
1.6 Scope of the study ............................................................................................................. 3
1.6.1 Conceptual scope ......................................................................................................... 3
1.6.2 Geographical scope ....................................................................................................... 4
1.7 Significance of the study .................................................................................................. 4

**CHAPTER TWO** ................................................................................................................. 5
2.0 Literature review ............................................................................................................... 5
2.1 Introduction ....................................................................................................................... 5
2.2 Computer Audits ............................................................................................................... 5
2.3 Approaches to audit under computer ............................................................................. 5
2.3.1 Audit through computer ............................................................................................... 5
2.3.2 Audit around the computer .......................................................................................... 6
2.4 Areas where the computer can be used to assist the auditor ........................................... 6
2.5 Interrogations .................................................................................................................... 7
2.6 Computer Assisted Audit Techniques (CAATs) ............................................................... 7
2.6.1 Classification of Computer Assisted Audit Techniques (CAATs) ................................. 7
4.0 Introduction ........................................................................................................................................... 18
4.1 Characteristics of the respondents ........................................................................................................ 18
4.1.1 Characteristics according to positions of respondents ...................................................................... 18
4.1.3 Characteristics According to Age ...................................................................................................... 19
4.1.4 Characteristics According to Education Background ........................................................................... 20
4.1.5 Characteristics According to Time Respondents had worked with the audit firms. ...... 20
4.1.6 Characteristics according to marital status of the respondents ....................................................... 21
4.2 Nature of audit firms ............................................................................................................................. 22
4.3 Application of Computer Assisted Audit Techniques (CAATs) ............................................................ 22
4.3.1 Package programs (scalar versions) ................................................................................................. 22
4.3.2 Pastel Accounting software package .............................................................................................. 23
4.3.3 Test data ........................................................................................................................................... 23
4.3.4 Team asset software program ......................................................................................................... 23
4.3.5 Audit system 2 (In house system) ..................................................................................................... 23
4.3.6 Test desk ........................................................................................................................................... 23
4.3.7 Tagging and tracing ......................................................................................................................... 24
4.3.8 Integrated test facility ..................................................................................................................... 24
4.4 Possession of computer skills ............................................................................................................... 24
4.5 Roles of Computer Assisted Audit Techniques (CAATs) ...................................................................... 24
4.5.1 Search and retrieve ......................................................................................................................... 25
4.5.2 Perform basic calculations ............................................................................................................. 25
4.5.3 Selection of samples ....................................................................................................................... 25
4.5.4 Storage ........................................................................................................................................... 25
4.5.5 Job satisfaction ............................................................................................................................... 25
4.5.6 Data matching .................................................................................................................................. 25
4.5.7 Sequence Checking ........................................................................................................................ 26
4.6 Problems affecting computer technology in audit firms ....................................................................... 26
4.7 Effects of computer technology on the performance of audit firms .................................................... 27
4.8 Factors which influence the effectiveness of audit firms other than computer technology .................. 27
4.9 Relationship between computer technology and the effectiveness of audit firms .................. 28
CHAPTER FIVE

Summary of findings, conclusions and recommendations .................................................................29
5.0 Introduction .................................................................................................................................29
5.1 Summary of Major Findings ........................................................................................................29
5.1.1 Findings on Applications of Computer Technology used in auditing .............................29
5.1.2 Findings on the Effectiveness of audit firms .......................................................................29
5.1.3 Findings on the relationship between computer technology and effectiveness of audit firms .................................................................30
5.2 Conclusions to the study ..............................................................................................................30
5.3 Recommendations .......................................................................................................................30
5.3.1 Encourage refresher courses .................................................................................................30
5.3.2 Install the most appropriate software ....................................................................................31
5.3.3 Have technical support ...........................................................................................................31
5.3.4 Have power backup to minimize on power shortage ..........................................................31
5.3.5 Encouraging clients to have independent audit departments ...........................................31
5.4 Areas for further research ..........................................................................................................31
Appendix 1 .......................................................................................................................................33
References ..........................................................................................................................................33
Appendix II .......................................................................................................................................34
Questionnaire .....................................................................................................................................34
LIST OF TABLES

Table 1 Positions of respondents .................................................................18
Table 2 Gender Composition of respondents ................................................19
Table 3 Age Composition of Respondents .....................................................19
Table 4 Education Background of Respondents ............................................20
Table 5 Period of employment with the audit firms .......................................21
Table 6 Marital Status of the Respondents ....................................................21
Table 7 Nature of Audit Firms .......................................................................22
Table 8 Problems affecting computer technology ........................................26
Table 9 Effects of computer technology on the performance of audit firms ......27
# LIST OF ABBREVIATIONS (ACRONYMS)

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>CAATs</td>
<td>Computer Assisted Audit Techniques</td>
</tr>
<tr>
<td>COBAMS</td>
<td>College of Business and Management Sciences</td>
</tr>
<tr>
<td>ICPAU</td>
<td>Institute of Certified Public Accountants of Uganda</td>
</tr>
<tr>
<td>SA</td>
<td>Strongly Agree</td>
</tr>
<tr>
<td>A</td>
<td>Agree</td>
</tr>
<tr>
<td>NS</td>
<td>Not Sure</td>
</tr>
<tr>
<td>D</td>
<td>Disagree</td>
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<tr>
<td>SD</td>
<td>Strongly Disagree</td>
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ABSTRACT

This research report sets out to understand the relationship between computer technology and the effectiveness of audit firms in Uganda using four (4) Kampala-based audit firms: Price Waterhouse Coopers, KPMG, P.K.Bhemuka, and Ernst and Young. The research arose due to inefficient among audit firms to improve on the financial accountability of some organizations in Uganda.

The main objectives of the study were to establish the relationship the applications of computer technology as well as the relationship between computer technology and the effectiveness of audit firms. The researcher used descriptive and analytical research designs and the sample size was 40 respondents and the data was collected by use of questionnaire method. Secondary sources were also used.

The study revealed that the majority of the audit firms used computer applications (CAATs) in auditing and that if individuals who effectively understand these applications are involved in auditing, effective audit reports would be produced reflecting a true and fair view of the statements.

This implies that more efforts should be attributed to computer technology because it influences the effectiveness of audit firms to a large extent as compared to other factors.
CHAPTER ONE

1.0 INTRODUCTION
This chapter covers the background of the study, statement of the problem, purpose of the study, objectives of the study, research questions, area and scope of study, significance of the study and conclusion.

1.1 BACKGROUND OF THE STUDY
It is a requirement in the Companies Act of Uganda that every registered company must present its financial statements for auditing to an Audit firm registered by the Institute of Certified Public Accountants of Uganda (I.C.P.A.U). Auditing is a process whereby the accounts of a business entity are subjected to scrutiny so as to enable auditor to form an opinion as to whether the accounts show a true and fair view.
There has been inefficiencies among audit firms to improve on the financial accountability of some organizations in Uganda (Inspector General of Government, 2004). At the same time, auditors’ usage of computers has been reported to be poor (USAID / Uganda, 2000).

In the past before the introduction of computers, audit work was done manually as accounting systems were also manual. The first computer in Uganda was introduced in 1967 based in government treasury department (Maberi, 1999).

This computer introduction led to a transition of audit work from manual practice to computerized audits. Today both internal and external auditors have now adopted Computer Assisted Audit Techniques (CAATs) in carrying out their audit work. The use of computer Assisted Audit Techniques was intended to improve on the speed of audit work, accuracy, completion of the work, quality and generally the auditor’s effectiveness and efficiency.
Auditing effectiveness refers to the number and scope of deficiencies corrected following the auditing process. Auditing effectiveness goes hand in hand with audit efficiency as the two cannot easily be separated. Efficiency of audit firms relates to timeliness and accuracy in producing audits, ability to investigate thoroughly and to document audit work, ability to derive, summarize and report criticism effectively and constructively (page Wise, Inc., 2001)

The key to being able to meet the requirements of improved efficiency and increased efficiency lies with the promise of continuous auditing. Continuous auditing can be described as “a comprehensive electronic audit process that enables auditors to provide some degree of assurance on continuous information simultaneously with, or shortly after, the disclosure of the information” (Rezaee et al., 2002)

However, the introduction of computer technology in audit work has a lot of questions to be answered. First it is not clear whether the move will improve in the quality and accuracy of auditors firms as they carryout their work. Also there is a contradiction on whether this move has had any significant effect on quality of auditors work.

1.2 STATEMENT OF THE PROBLEM

Many organizations have transferred to the use of computers to do their work more effectively and efficiently. Auditing firms now have integrated computer techniques in their operations to improve on their effectiveness in terms of quality of both their auditing firms and audit work.

However, some audit firms have not taken up this move so serious. This is because it is not clear whether the investment in computer technology would have any significant effect on audit firm’s core objective of improving the quality of their work.

Secondly, there was a contradiction on whether the introduction of computer technology would have any substantial effect of the quality of auditors work. This research was intended to clarify on those unclear positions.
1.3 PURPOSE OF THE STUDY
The purpose of the research was to evaluate the impact of computer technology on audit firm’s work and to find out whether the quality of their work could positively be affected by the introduction of computer technology.

1.4 OBJECTIVES OF THE STUDY
In order to investigate the research topic, the researcher was guided by the following objectives:
1. To establish the application of computer technology by audit firms in Uganda.
2. To establish the effectiveness and efficiency of audit firms in Uganda.
3. To establish the relationship between application of computer technology and the effectiveness of audit firms in Uganda.

1.5 RESEARCH QUESTIONS
This study was guided by the following questions:
1. What are the computer technology applications used by audit firms in Uganda?
2. What is the effectiveness and efficiency of audit firms in Uganda?
3. What is the relationship between application of computer technology and the effectiveness of audit firms in Uganda?

1.6 SCOPE OF THE STUDY

1.6.1 CONCEPTUAL SCOPE
The study was restricted to computer technology and effectiveness of audit firm in Uganda. Computer technology was restricted to prominent computer assisted audit tools and techniques (CAATs) used in auditing and how they affect the quality of audit work.
1.6.2 GEOGRAPHICAL SCOPE

The research was carried out on Price Water House Coopers, P.K. Bahemuka, KPMG and Ernst and Young. The researcher concentrated on Kampala based audit firms because major firms are based in Kampala and it’s the heart of most public and private organizations and also believed that the results in the scope would adequately and effectively reflect the general picture of the purpose of the research in Uganda.

1.7 SIGNIFICANCE OF THE STUDY

The researcher was convinced that the study through its research findings would help to obtain the following:

- It would supplement on the existing body of literature on the use of computers and related audit techniques in the computer literate environment.
- It would also go far in helping audit firms that are still using manual systems to appreciate the importance of computer assisted audit techniques (CAATs) in the performance of audit work and eventually adopt them.
- Through the resultant interaction with respondents, the researcher hoped to improve on his ability and skill of the study in business situation.
- The study will help policy makers to come up with strategies of improving computer technology and effectiveness of audit firms in Uganda.
CHAPTER TWO

2.0 LITERATURE REVIEW

Under this chapter, the researcher was able to analyze and give critical reviews on issues that have been explored and studied both theoretically and empirically on literature that existed on computer audit with much emphasis on Computer Assisted Audit Techniques (CAATs), audit effectiveness, and the relationship between computer technology and the effectiveness of audit firms.

2.1 Introduction

A computer is a data processor that can perform substantial computations, including numerous arithmetic or logic operations without intervention by a human operator during the run (Brightman dimsdaleo, 1986). Correct implementation and efficient use of computers within a business can lead to substantial overall savings in time and money. They can also lead to greater management awareness and can open up opportunities that would otherwise go unnoticed (David Royal and Mike Hughes, 1991).

2.2 Computer Audits

ISA 401, Auditing in a computer environment provides that auditors should develop a basic understanding of the fundamentals of data processing and attain a level of computer knowledge and skills consume rate with the particular circumstance of the audit. Computer audits involve the use of files unlike the manual systems of auditing which use books.

2.3 Approaches to audit under computer

There are two audit approaches under computer audit (De Pala, 1988).

2.3.1 Audit through computer

Here the auditor should have the knowledge and adequate exposure to operations of the computers. He should have the knowledge of the computer hardware, software, computer
capabilities, processing systems, built in controls, methods of detection of errors in computer. The auditor should be capable of designing specific audit programs for verification with detailed checklists and procedures

2.3.2 Audit around the computer

This can be applied where the client’s accounting system is computerized. Auditing around the computer means that the internal software of the client’s computer is not audited. The auditor traces transactions recorded on source documents to the inputs to the computer and then simply agrees the input to the expected outputs from the computer. The auditor must be capable of knowing the data validation checks incorporated in the programs to find out the limitation in the accounting packages (Audit framework 1997). 

The overall objectives and scope of an audit does not change whether an audit was conducted in a computer information systems environment as defined by International Standard on Auditing (ISA) 401.

Woolf (1994) States that no single development within the past few decades has had a greater effect on accounting and business systems than the introduction of computers.

2.4 Areas where the computer can be used to assist the auditor.

1. Testing the analysis of accounts receivable and listing overdue accounts for follow up and evaluation.

2. Price testing inventories and listing significant differences between test counts and book records.

3. Stores and stock inventory analysis on the AB C return.

4. Verifying interest on investments against controlled accounts.

5. Selecting accounts receivables for confirmation, tabulating and analyzing confirmation results.

6. Flow charting the client’s systems.

7. Preparation of audit programs that is standard audit tests may be kept in a data base that is easily updated.

8. Evaluation of audit risk that is control, inherent and detection risks.
9. Preparation of audit working papers.

2.5 Interrogations

An interrogation program can be defined as a computer program under the control of an auditor to process one or more clients’ data files in order to produce totals, analysis and reports that can be used to meet specific audit objectives (David Royal and Mike Hughes, 1991).

2.6 Computer Assisted Audit Techniques (CAATs)

Woolf (1990) defines CAATs as the technique of processing a clients live files by the auditor computer programs.

Hall (2000) defines CAATs as any use of technology to assist in the completion of an audit. The definition encompasses both automated working papers and traditional word processing applications as CAATs.

2.6.1 Classification of Computer Assisted Audit Techniques (CAATs)

- Those CAATs which review data. These generally involve the extraction, examination and manipulation of data by programs. Such techniques can enable the auditor to gain an assurance as to the accuracy and integrity of the data being reviewed, by implication, the strength or weakness of control.
- Those CAATs which review controls. These look at the system rather than data and provide the auditor with an assurance as to whether or not controls exist and are functioning effectively.

2.6.2 Types of computer Assisted Audit Techniques (CAATs)

Hall (2000) identifies five types of CAATs advanced in popular audit literature namely;

- Test data
- Integrated test facility
- Parallel simulation
- Embedded audit module
• Generalized audit software

Test data, integrated test facility and parallel simulation directly examine the internal logic of the application while embedded audit module and generalized audit software examine the application’s logic indirectly as discussed below;

2.6.2.1 Test data

This method uses auditor-prepared input data to test the current version of a client-supplied copy of an application(s) within the client’s system. After the auditor data is processed, the system-generated results are compared to auditor expectations. Any departure from the expected results could be indicative of a logic or control problem.

2.6.2.2 Integrated test facility (ITF)

This technique requires that the auditor be involved in the system design such that audit modules are created within the system that allow “dummy” test data to be discriminated from actual “live” data in the system. Once established, test data can be placed in the normal transaction stream and the results can allow the auditor to evaluate application controls during normal operations.

2.6.2.3 Parallel simulation

In this type of CAATs, the auditors develop an application that is designed to replicate the results of the client’s application using client-supplied data. A comparison of the results of the two applications enables the auditor to make inferences about the quality of the process performed by the client’s application.

2.6.2.4 Embedded audit module

This technique involves the auditor inserting an audit module in the client’s application that will identify transactions that meet some pre-specified criteria as they are being processed. Transactions that are identified in this way can be reviewed by an auditor in real-time or in
batch. This technique may be particularly effective in identifying large transactions for substantive testing or for testing controls by identifying transactions processed in a manner inconsistent with policies and procedures. Often, the module is designed in such a way that they can be turned on and off, reducing costs but also coverage.

2.6.2.5 Generalized audit software (GAS)

This is the most frequently used type of CAATs which allow for data extraction and analysis. The key reasons for the widespread use of GAS include its relative simplicity of use requiring little specialized information systems knowledge and adaptability to a variety of environments and users. GAS consists of computer programs used by the auditor to process data of audit significance from the entity’s accounting system. It can be an off-the-self program or a bespoke (custom-made).

There are two specific types of GAS used in audit management and these are, Audit Command Language (ACL) and Interactive Data Extraction and Analysis (IDEA). Because ACL is the leading GAS tool in the market, all references to GAS were to ACL.

The audit software may carry out the following:

- Read computer files.
- Extract samples according to specified criteria for example randomly, over a certain amount, below a certain amount, of certain dates or periods for audit testing. It may obtain a stratified sample of receivables ledger balances to be used for confirmation.
- Perform calculations e.g. ratios or re-calculate net salaries.
- Check accuracy of calculations for example multiplications and additions.
- Create data files for example review the list of employees paid each month and print a list of employees who have not been paid for further investigation.
- Prepare and print reports in specified formats for example actual versus budget.
- Detection of violation system rules for example where employers have been amending their own gross pay.
- Follow up items through the computerized systems like orders, goods received and payments.
- Perform completeness checks for example check that there is an electronic record of all employees who clocked in.
- Produce letters to send out to the clients’ customers.

### 2.7 The effects of computerization on the Accounting systems.

Peter (1995) argues that the effect of computerization of the accounting system and the associated users will generally depend on the extent to which the automated system is being used to process accounting applications.

The type and significance of financial transactions being processed and the nature of filer and programs utilized in the application are other effects on the computerization of the accounting systems noted by Peter (1995).

### 2.8 Auditing Effectiveness

Auditing effectiveness is defined as the number and scope of deficiencies corrected following the auditing process. Auditing is effective if it meets the intended outcome it is supposed to bring about. Sawyer (1995) states that the auditors’ job is not done until defects are corrected and remain corrected.

Perhaps a key to being able to meet the requirements of improved efficiency and increased effectiveness lies with the promise of continuous auditing. Continuous auditing can be described as “a comprehensive electronic audit process that enables auditors to provide some degree of assurance on continuous information simultaneously with, or shortly after, the disclosure of the information” (Rezaee *et al.*, 2002). Given the constant desire for timely and reliable information, implementation of continuous auditing techniques combined with more frequent reporting can reap benefits to the financial markets which rely on this information. Furthermore, given the markets’ tendencies to react to strategically released earnings announcements in advance of audited financial results, continuous auditing may help to curb reported abuses by enabling detection of problems as they occur rather than at the end of a reporting period.

However, in order to be able to execute continuous auditing, it seems clear that auditors will not only have to increase their conceptual abilities in defining the techniques that are the foundation of the continuous auditing process but also their technical skills in implementing
these techniques. A likely path that audit managers could use to bridge the gap between the current technological skills of an auditor and the skills that would be needed in a continuous audit is to increase the usage and understanding of computer assisted audit tools and techniques especially generalized audit software.

For the audit firms to be effective, they have to follow International Standards on Auditing (ISA) which are administered and regulated through an independent body, the Institute of Certified Public Accountants of Uganda since it’s the one which ensures that all audit firms in Uganda are effective in their operations.

2.8.1 Factors which influence Audit effectiveness

Van Gansberghe (2005) identified the following factors which influence audit effectiveness;

- Perceptions and ownership
- Organization and governance framework
- Legislation
- Improved professionalism
- Conceptual framework
- Resources

2.9 The relationship between application of computer technology and audit effectiveness

If individuals who understand the nature of transactions are involved in performing data entry online, the data entry process is less prone to errors than when it is performed by individuals who are not familiar with the nature of the transactions. According to Lucy (1994), it is clear that organizations that have adopted the application of computer technology have improved performance by the auditing department.

Systems and Process Assurance (SPA) makes use of Computer-Assisted Audit Techniques (CAATs) which provide a means of accessing large amounts of data in a format that can
provide transparency not attainable through other auditing procedures. The use of CAATs increases audit effectiveness improves efficiency and decreases the audit risk.

With the use of a specialized software tool, our team can provide organizations with a unique and powerful combination of data access, analysis and integrated reporting. Using the specialized software tool our experts can access and compare enterprise data, flat files or relational databases, spreadsheets, report files, on PCs or servers, allowing the source data to remain intact for complete data quality and integrity.

In light of the increasing demand on auditors to make the audit more effective and efficient, the use of most prominent computer assisted audit tools and techniques (CAATTs) by auditors can increase audit efficiency and effectiveness (Braun et al., 2003)

2.10 Conclusion.

It is clear from the literature that in organizations, computer technology is related to audit effectiveness. Many authors have argued that using computer assisted audit tools and techniques is likely to improve audit effectiveness if the personnel involved in auditing are equipped with the necessary skills.
CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter gives a description of the various methods that the researcher used in collecting data and achieving the objectives of the study on the effect of computer technology on the effectiveness of audit firms in Uganda. The subsections beneath it include, research design, study population, sampling designs, sample size, sampling procedures, sources of data, data collection methods and instruments, data collection procedures, measurement of variables, data processing and analysis, ethical issues and limitations during the study. It provides a thorough description on how relevant information was obtained to enable the research to be successfully carried on. The findings of the study were assessed and conclusions drawn.

3.1 Research design

The research was designed in a way that enabled the researcher to effectively collect data that met the objectives of the study. A descriptive and analytical research designs were used in addition to the qualitative and quantitative approach to gather information regarding the effect of computer technology on the effectiveness of audit firms in Uganda. Qualitative approach involved the use of interviews while quantitative approach involved the use of structured questionnaires which were designed to capture data about respondents’ attitudes and behaviors from the field and to establish the relationship between the two variables. This enabled the researcher to obtain adequate information and making of an appropriate conclusion.
3.2 Study population
The study population involved administrators such as directors, managers, and other employees such as accountants and auditors from both computerized and manual audit firms of Price water house coopers, P.K. Bahemuka, KPMG and Ernst and Young.

3.3 Sampling

3.3.1 Sampling size and sampling procedures
Data will be collected from 40 respondents, of which 10 from each audit firm. Of the 10 respondents, 4 will be administrators (directors and managers) and 6 will be other employees (auditors and accountants).
The sampling procedures involved purposive sampling in which directors and managers who have the relevant knowledge to the purpose of the study were chosen.
Simple random sampling was used on other employees such as accountants and auditors. The procedures involved the researcher identifying few members and assigned numbers using papers that were mixed up and employees were required to pick recommended numbers from 1 to 6 to form the sample for the study.

3.4 Sources of data
The researcher gathered data from both primary and secondary sources of data.

3.4.1 Primary source
Primary data was raised from respondents through the questionnaires that were administered to them.

3.4.2 Secondary source
Secondary data was extracted from text books, and other related written literature such as research reports, journals, and magazines availed from leading libraries of some audit firms and computer schools. The internet source was also vital during the compilation of data.
3.5 Data collection instrument

The instrument used involved the use of a questionnaire to enable the capturing and analysis of data. These questionnaires were collected after a fortnight.

3.5.1 Questionnaire

The researcher used the questionnaire as a guide towards an in-depth research where views from different respondents were gathered.

This method involved the use of written down open-ended questions which required the respondent to individually respond in writing although where the researcher found the response lacking, direct interviews were conducted.

The method too involved close-ended questions where the respondent’s opinions were presented a scale and the respondent had to tick or circle between “yes” or “no”.

All these questionnaires were hand delivered to the respondents in their audit firms and computer schools.

3.6 Data collection procedures

The researcher got an introductory letter from Makerere University, COBAMS officials and was presented to the respondents who then kindly provided the researcher with the required information about their company.

The questionnaires were self-administered and respondents were guaranteed of confidentiality of the information given.

3.7 Measuring study variables

The study had both independent and dependent variables measured.

Computer technology was the independent variable and this focused on applications of CAATs used in audit firms as they carry out their audit work.

Quality of audit work was the dependent variable and this focused mainly on the effectiveness and efficiency of the audit work in terms of timeliness, accuracy of producing audits and their ability to investigate thoroughly and document audit work.
A five-point response scale ranging from very good, good, fair, poor to very poor was chosen to help in the assessment of these indicators through the various responses forwarded.

3.8 Data processing and analysis
Completed questionnaires were collected, organized, correctly examined, sorted, edited, coded and tabulated with the view of checking errors and thorough analysis to be made. Quantitative data analysis was done using computer programs like Ms Excel and Ms Word. The other statistical tools that were adopted were frequency tables for educational levels, social demographic characteristics that is, age and gender of the respondents and the various positions held by these decisions makers and policy implementers.

3.9 Data presentation and interpretation
The research was driven on all the relevant literature in view of the effect of computer technology on the effectiveness of the audit firms. The analyzed results were interpreted, presented and discussed in tables and narratives given in the final report.

3.10 Limitations of the study
1. Confidential information
The audit firms were in most cases reluctant at releasing some information more especially that relating to their competitive advantages such as clients, computer software programs which would otherwise have been important to the researcher.

2. Time constraint
By nature of the research carried, the time frame given was inadequate for such a research. Hence the researcher’s sample size was more limited. However, the researcher tried his level best to keep the quality of the output from the limited sample.
3. **Financial constraint**

The researcher found out that more funds were required which was not at his disposal. The researcher had to utilize the funds at his disposal as best as possible to transport, credit for phone calls, typing and printing questionnaires.

4. **Inaccessibility of some respondents**

A number of respondents were either very busy or with limited time which required a long period of time and several follow ups before getting the appropriate response from the respondents.

Despite all the hindrances and limitations of the study, the researcher set out and proceeded to come with this successful investigation.
CHAPTER FOUR

PRESENTATION AND DISCUSSION OF FINDINGS

4.0 Introduction

This chapter presents the findings of the study and their presentation. The interpretations and deductions were made on the basis of tabular and diagrammatic representations presented.

4.1 Characteristics of the respondents

The respondents were classified under six different categories to establish whether there was fair representation of the sample and to judge whether the respondents provided reliable data.

4.1.1 Characteristics according to positions of respondents

The data from respondents of the audit firms were collected, analyzed and presented to the following positions of the respondents as shown in the table below;

<table>
<thead>
<tr>
<th>Position</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directors</td>
<td>8</td>
<td>20</td>
</tr>
<tr>
<td>Managers</td>
<td>8</td>
<td>20</td>
</tr>
<tr>
<td>Accountants</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>Auditors</td>
<td>14</td>
<td>35</td>
</tr>
<tr>
<td>TOTAL</td>
<td>40</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Primary Data

The results in the table indicate that the highest proportion of respondents were Auditors 35% followed by Accountants with 25% and the least were Directors and Managers with each having 20%.
4.1.2 Characteristics According to Gender

The study also sought to establish the gender composition of respondents and the findings are presented in the table below;

Table 2 Gender Composition of respondents

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>28</td>
<td>70</td>
</tr>
<tr>
<td>Female</td>
<td>12</td>
<td>30</td>
</tr>
<tr>
<td>TOTAL</td>
<td>40</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Primary Data

From the above table, majority of the respondents were males who were 70% of the total number of respondents and female respondents represented 30% of the respondents. So the majority of the respondents were males and it goes without saying that they offered better decisions in the decision making process.

4.1.3 Characteristics According to Age

The study sought to establish the age composition of respondents employed in the audit firms and the findings are presented in the table below;

Table 3 Age Composition of Respondents

<table>
<thead>
<tr>
<th>Categories(Age)</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 – 30</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>31 – 40</td>
<td>22</td>
<td>55</td>
</tr>
<tr>
<td>41 – 50</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Above 50</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>TOTAL</td>
<td>40</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Primary Data

The most dominant age group in the table above was in the age bracket of 31 – 40 years of age constituting 55%, followed by age bracket of 20 – 30, with 25% and the age brackets of
41 – 50 and those above 50 years have the least respondents each consisting of 10%. This implies that most of the respondents were in the age bracket of 31 – 40, at such age, one is already a graduate and knowledgeable about the topic under study.

4.1.4 Characteristics According to Education Background

The respondents were asked to show their highest level of education attained and the findings revealed are shown in the table below;

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tertiary</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>University</td>
<td>24</td>
<td>60</td>
</tr>
<tr>
<td>Post Graduate</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Professional</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>40</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: Primary Data

From the above table, most respondents were Degree holders who represented 60% of the total respondents. This was followed by Professional qualification with 25%, Post Graduate with 10% and the least are tertiary institutions with 5% of the total respondents. So majority of the respondents in the sample were university graduates followed by professionals. It therefore implies that most of the respondents had knowledge in the research and were able to understand the instruments used and therefore, were able to give their perception on the study variables. It also further, implied that the data collected could be relied upon as it was from highly educated respondents.

4.1.5 Characteristics According to Time Respondents had worked with the audit firms.

The respondents were asked how long they have worked with the firms and the table below shows the summary of the responses.
Table 5 Period of employment with the audit firms

<table>
<thead>
<tr>
<th>Period</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 1 year</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>1 – 2 years</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>3 – 5 years</td>
<td>18</td>
<td>45</td>
</tr>
<tr>
<td>Above 5 years</td>
<td>8</td>
<td>20</td>
</tr>
<tr>
<td>TOTAL</td>
<td>40</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Primary Data

From the table above, table out of 40 respondents, 45% have worked with the audit firms for a period of 3-5 years, 25% have worked for a period of 1-2 years, 20% have worked for a period above 5 years and 10% for a period less than 1 years. This therefore implies that the audit firms have a steady and fairly labor turnover.

4.1.6 Characteristics according to marital status of the respondents

The respondents were asked to state their nature of marital status and the table below reveals the findings from the study.

Table 6 Marital Status of the Respondents

<table>
<thead>
<tr>
<th>Response</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>28</td>
<td>70</td>
</tr>
<tr>
<td>Married</td>
<td>12</td>
<td>30</td>
</tr>
<tr>
<td>TOTAL</td>
<td>40</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Primary data

The table shows that the majority of the respondents were married forming 70% and minority 30% are still single. The implication is that most of the respondents are married and are good at taking responsibility. The job entails making decisions and therefore the married are best suited than single people.
4.2 Nature of audit firms

Information gathered from questionnaires indicated that despite the present advance trend of technology and the use of computers, there were some audit firms that still used the manual system and therefore did not use computer techniques in auditing.

The table below analyses the information about the audit firms and their type of systems used.

**Table 7 Nature of Audit Firms**

<table>
<thead>
<tr>
<th>Audit firm</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual audit firms</td>
<td>1</td>
<td>25</td>
</tr>
<tr>
<td>Computerized audit firms</td>
<td>3</td>
<td>75</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>4</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

*Source: Primary data*

The above table gave the researcher the impression that the biggest number of audit firms used in the research used computer assisted audit techniques in their audit firms.

This implied that the questions regarding the use of computer technology were submitted to three audit firms forming a total number of 30 respondents.

4.3 Application of Computer Assisted Audit Techniques (CAATs)

The information gathered revealed that 75% of the respondents agree that they use CAATs in the computation of audit work in an effort to improve the quality of their audit work and 25% of the respondents did not use CAATs.

Those firms which use CAATs identified the following applications used in the computation of audit work:

4.3.1 Package programs (scalar versions)

These programs were found to be designed to perform data processing functions that is reading computer files, selecting information, performing calculations, creating data files and printing reports in a pre-specified format.
4.3.2 Pastel Accounting software package

This accounting package was found to perform quick audit of accounts, and quick link of customers, suppliers, items sold through a zoom screen and an on line help to ease breakdown in case of a systems failure.

4.3.3 Test data

Test data techniques were found used in conducting audit procedure by entering data for example a sample of transactions are put into a client’s computer system and comparing the results obtained with predetermined results. Test data were used to test specific control in computer programs such as on line password and data access controls. The test controls were used in the computerized systems of clients and it also helped to check the accuracy of input processing and output of data for computerized systems of clients.

4.3.4 Team asset software program

This software program was found to use the lotus program which is used to copy information into the file. The software methodology is used with the aid of Microsoft word and excel. The software program is quick and saves time although it was found to be expensive as regards training, purchasing of other related equipment and high maintenance costs.

4.3.5 Audit system 2 (In house system)

This was a new system to the researcher and was found to produce more effective and efficient audits, user friendly and impressive to big audit elements and potential clients as it was in line with the development of information technology.

The following are some of the CAATs that audit firms used to improve the quality of their audit work.

4.3.6 Test desk

Real data is simulated by dummy transactions (test data) that ideally include every possible type of condition. The list of simulated transactions should test for both valid and invalid conditions. The use of a test desk by an auditor is similar to controlled testing done by the systems analyst.
4.3.7 **Tagging and tracing**

With application of tagging and tracing routines in the programming logic any transactions and related data can be traced through the system that is used in the accounts. As each processing step is performed, the interaction of the selected transaction with other data related tests is displayed. Control and selection of tagged transactions can be specified by the audition through a terminal in his or her office. These transitions are processed as normal transactions by the programming logic. This technique if installed in programming logic while the programs are being developed requires relatively little extra time and cost and provides powerful techniques to obtain a comprehensive transaction trail.

4.3.8 **Integrated test facility**

This involves the establishment of a fictions entity such as customer, department, division, employee in the data base of the system against which test transactions unknown to the systems personnel can be processed as if they were regular line transactions. This approach integrates permanent test data into the system and permits the auditor to monitor continuously the performance of the system.

4.4 **Possession of computer skills**

The findings of the study reveal that all respondents (100%) disagree that all employees have computer skills that enable them to use computers to achieve the desired outcomes. However all agree that some employees have computer skills which can enable them to use computers. All respondents from the audit firms which use computers reveal that they are first trained in computer assisted audit techniques (CAATs) so as to produce effective audits.

4.5 **Roles of Computer Assisted Audit Techniques (CAATs)**

All respondents agree that CAATs have improved the standards of the audit firm and identified the following roles CAATs plays;
4.5.1 Search and retrieve
The auditor can have the program scan large files and retrieve specified data segments that have audit significance for instance it can search depositors accounts for unusual charges.

4.5.2 Perform basic calculations
The audit programs perform the arithmetic operations of additions, subtraction, multiplication and division. It also performs the logical operations of less than, greater than or equal to.

4.5.3 Selection of samples
The program can select a sample of records from a file population. Stratified sampling can be specified based upon upper or lower limits. Some programs can calculate and select a sample to meet desired statistical confidence level.

4.5.4 Storage
Better storage of facilities such as information and data related issues were ascertained by the researcher as well as increased reduction in the cost of production.

4.5.5 Job satisfaction
The workers themselves were found to be happier with their work while using CAATs and hence enjoyed what they were doing. The researcher also noticed that the existing clients were appreciative and therefore were more likely to appreciate fees and see the value of the use audit work done based on improved quality.

4.5.6 Data matching
Interrogations were fond to be used to compare data on two or more files. This function provides an efficient way to relate information used by several application systems and is particularly useful in complex accounting systems. The comparison of two master files from the same system at different dares was found to provide good audit evidence for testing of transaction or updates to the system.
4.5.7 Sequence Checking

The research also revealed that CAATs are used to identify where an expected complete sequence of data has missing items. In addition, duplicated data such as same purchase invoice paid twice could be checked for. They could also re-sequence data in a more useful order.

4.6 Problems affecting computer technology in audit firms

The respondents revealed that a number of problems lead to failure of computer technology to have a positive impact on the effectiveness of audit firms. These problems are presented in the table below;

<table>
<thead>
<tr>
<th>Problems</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expensive to acquire and maintain</td>
<td>9</td>
<td>30</td>
</tr>
<tr>
<td>Lack of computer skills</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Break down of the system</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>Lack of technical support</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>Unauthorized interruption</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>30</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: Primary Data

From the above table, the three (3) audit firms that use computers in auditing are mainly faced with the problem of high costs to purchase and maintain computers with 30% of the hindrances to computer technology, followed by break down of the system, lack of technical and unauthorized interruption with each having 20% and least is the lack of computer skills with 10%.

This reveals that despite all the advantages associated with the use of computer technology in auditing, some audit firms find it difficult to raise funds to purchase the required computers and related programs and software. In addition those can purchase them, find it expensive to employ technicians to repair and maintain.
4.7 Effects of computer technology on the performance of audit firms

The researcher was then able to determine after obtaining the benefits derived from the use of CAATs whether those firms using CAATs had an impact on the effectiveness of audit firms in terms of quality of audit work, speed rate and entry of new clients. Quality of audit work is evaluated in terms of their accuracy. The table below reveals the responses from the respondents.

Table 9 Effects of computer technology on the performance of audit firms

<table>
<thead>
<tr>
<th>Performance</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of audit work</td>
<td>18</td>
<td>60</td>
</tr>
<tr>
<td>Speed rate</td>
<td>9</td>
<td>30</td>
</tr>
<tr>
<td>Entry of new clients</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>TOTAL</td>
<td><strong>30</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

*Source: Primary Data*

From the above table, the respondents from computerized audit firms agree that the use of computers in auditing contributes to the Quality of audit work with 60%, Speed rate with 30% and Entry of new clients with 10%. This implied that using computers in auditing is likely to improve the quality of audit work in terms their accuracy and reliability of the produced financial statements.

4.8 Factors which influence the effectiveness of audit firms other than computer technology

Respondents from different audit firms identified the following factors which influence the effectiveness of audit firms besides the use of CAATs in auditing;

1. Supervision and monitoring of the services and practices of audit firms by the Institute of Certified Public Accountants of Uganda (ICPAU).

2. Employment of half baked auditors and accountants who are not fully equipped with the required skills to audit and come up with effective audit reports.
3. Unethical code of conduct of some auditors and accountants who accept to take bribes in order to change their opinion on what financial statements truly reveal.

4. Lack of proper documentation of transactions of some clients. Some organizations conduct business and receive revenues plus paying expenses without following the necessary procedures and documents and this in turn makes the work of auditors difficult to trace the origin of the items in the financial statements.

5. Lack of independent internal audit departments in some organizations. These departments assist auditors in providing the necessary information that they need to effectively audit and thus their lacking is likely to make the audit period long in trying to collect the necessary information.

4.9 Relationship between computer technology and the effectiveness of audit firms

All respondents (100%) agreed that there is a strong relationship between computer technology and effectiveness of audit firms. The reason given for this is that computerization speeds up and smoothen the audit process and where there is appropriate control, it minimizes fraud due to minimized occurrence of errors within the system.
CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction
This chapter is the final one in this report and it summarizes the major findings, make conclusions and recommendations based on the study objectives. The suggestion for further research is also covered.

5.1 Summary of Major Findings
The study was conducted on the effect of computer technology on the effectiveness of audit firms and the discussions of the major findings are presented as follows;

5.1.1 Findings on Applications of Computer Technology used in auditing
It was discovered that the audit firms used the applications of computer assisted audit techniques and these included, Test data, integrated test facility, Team asset software program, Test desk, Tagging and tracing, and Pastel accounting software program.

5.1.2 Findings on the Effectiveness of audit firms
It was discovered that using computers in auditing lead to the effectiveness of audit firms in terms of; improving the quality of audit work, accelerating the speed of delivery of audit reports and entry of new clients.
5.1.3 Findings on the relationship between computer technology and effectiveness of audit firms

The findings from the research revealed that there is a strong relationship between computer technology and the effectiveness of audit firms as all the respondents agreed that the relationship does exist.

5.2 Conclusions to the study

As revealed by the findings of the study, it can be concluded that many audit firms had adopted the use of computer assisted audit techniques (CAATs) whose major goals of increasing the quality of audit work, speed rate and expand their market share through acquiring new clients and generally improve the performance of auditors have been achieved. Otherwise those audit firms that still use manual system expressed their willingness to adopt the use of CAATs but highlighted the shortage of resources to fund the project as the major constraint to them.

5.3 Recommendations

After a detailed study on the applications of computer technology in auditing, and how it affects the audit work, the researcher identified a few issues on how the systems could be made more effective and contribute more on the general performance of the audit firms.

5.3.1 Encourage refresher courses

It is important that the users of the system should be given regular refresher courses so that they are up dated on the changes in the computer world. This will enable them not to be left behind and that they will continue to improve their skills in as far as the usage of computers is concerned.
5.3.2 Install the most appropriate software
The most appropriate software that is easily understood by all workers of the organization should be installed so that they achieve the desired results of producing effective audits.

5.3.3 Have technical support
The audit firms should have competent technical support staff on site to handle any related matters that can arise with in the computer system. This will ensure that breakdowns are handled expeditiously and that the system is maintained to the required standard to enable it function all the time it is planned to.

5.3.4 Have power backup to minimize on power shortage
There is need to have a strong power backup to protect the system against power failures and a standby generator to ensure that power cuts do not interrupt the usage of the computer system.

5.3.5 Encouraging clients to have independent audit departments
This will help both the clients and the audit firms to easily identify the required documents, books and accounts and this will accelerate the speed and the accuracy of the audit reports.

5.4 Areas for further research

The study should not be an end in itself. The study should provide a way forward towards research in other areas such as;

Further research should be conducted to establish the effect of computer technology on other variables such as marketing, finance, and human resource.
The study further recommends research on the effect of computer technology on the performance of employees.

The study further recommends that more research should be conducted to establish other factors which affect the effectiveness of audit firms.
APPENDIX 1

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Appendix 11:

MAKERERE UNIVERSITY
Questionnaire for B.Com Research Project

Dear Sir/Madam,

The researcher is a student of Makerere University conducting an academic research study on the Effect of computer technology on the effectiveness of audit firms in Uganda. The research is aimed at partial fulfillment of the award of a Degree of Bachelor of Commerce (Accounting option). You have been considered to be one of the respondents.

Please kindly spare a few minutes to answer the following questions in a manner you deem appropriate and these responses will be treated with utmost confidentiality.

Your cooperation is highly appreciated.

PART 1: Demographic Characteristics

Please tick in the box provided.

1. Gender
   
   Male ☐  Female ☐

2. Age group
   
   20-30 years ☐  31-40 years ☐  41-50 years ☐  above 51 years ☐

3. Education background
   
   Tertiary ☐  University ☐  Post graduate ☐  Professional ☐

4. How long have you worked with the audit firm?
   
   Less than 1 year ☐  1-3 years ☐  3-5 years ☐  above 5 years ☐

5. Position of respondents
   
   Director ☐  Manager ☐  Accountant ☐  Auditor ☐

6. Marital status

34
PART II: The following scale will be used in this section:

Strongly disagree (SD)
Disagree (D)
Not sure (NS)
Agree (A)
Strongly Agree (SA)

PART III: Computer Technology:

<table>
<thead>
<tr>
<th></th>
<th>SA</th>
<th>A</th>
<th>NS</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The firm uses CAATs in the computation of audit work</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Some firms use manual system in auditing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. All employees have computer skills</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. The firm offers training in relation to adaptation of CAATs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. CAATs have improved the standards of the audit firm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Computer technology affects effectiveness of audit firms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PART IV: Effectiveness of Audit firms

<table>
<thead>
<tr>
<th></th>
<th>SA</th>
<th>A</th>
<th>NS</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. The firm produces audit work in time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. The firm produces accurate audit work</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. The firm conducts thorough and comprehensive investigations to produce effective audits</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. The effectiveness of audit firms is affected by computer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
PART V:

Relationship between Computer Technology and the effectiveness of audit firms

12. There is a relationship between computer technology and the effectiveness of audit firms.

<table>
<thead>
<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Not sure</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
</table>

13. In your own opinion and view, how can computer technology be improved to achieve audit effectiveness in the audit firm?

…………………………………………………………………………………………………
…………………………………………………………………………………………………
…………………………………………………………………………………………………

14. What are the other factors which influence the effectiveness of audit firms in Uganda?

…………………………………………………………………………………………………
…………………………………………………………………………………………………
…………………………………………………………………………………………………

15. What problems are associated with the use of computer technology by audit firm?

…………………………………………………………………………………………………
…………………………………………………………………………………………………
…………………………………………………………………………………………………

Thank you.