AN INVESTIGATIVE STUDY OF THE IMPACT OF COMPUTER - AIDED AUDIT TECHNIQUES (CAATs) ON THE AUDITING PROFESSION: A SURVEY OF AUDITING FIRMS IN HARARE.

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DEDICATION

This dissertation is dedicated to my parents and my beloved sister Tanatsa and brother Tinotenda, whose support and love I treasure and whose prayers and encouragements remain my source of inspiration.
ABSTRACT

The emergence of information technology (IT) and computerized auditing, growth of financial reporting using the Internet, hardware and software developments and improved user data analysis capabilities have made traditional manual auditing redundant in many circumstances. Information technology remains accounting firms’ dynamic and growing sectors and the auditing profession has been greatly affected by these dynamics both in a positive and in a negative way. Traditional manual auditing takes place periodically and is essentially retrospective, offering limited relevance to users. Yet until recently, computerized auditing or the use of information technology during auditing has been considered too costly, and in many cases, impossible. This paper aims to investigate the benefits associated with adopting CAATs in auditing. The study also stresses on the global trend of adopting IT system (software/ hardware) in producing a more controlled environment in delivering the auditing process and spotlights the reason why auditors in Zimbabwe may not make use of computer assisted audit techniques (CAATs) on a larger scale. It also highlighted the role of CAATs on fraud detection. The researcher uses survey questionnaires, interviews and direct observations as data collection tools, the data were collected from twenty auditors representing the local firms (small accounting firms) and foreign firms (large accounting firms) operating in Harare. The results of the study observed that although auditors believe that CAATs have a positive impact on the audit function, CAATs are found to be underutilized. According to up-to-date theoretical and empirical literature, the results point out that that the major reasons for underutilization of CAATs is the lack of facilitating conditions and high costs.
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CHAPTER I

INTRODUCTION

1.0 Introduction
This chapter forms the bases of the investigative study of the impact of CAATs on the auditing profession. It introduces the background to the study, which in turn brings out the justification for carrying out the study. The chapter will go on to state the objectives of the study, significance, assumptions, delimitations and limitations related to the study. A summary of the chapter will also be provided.

1.1 Background of the study
The research has been necessitated by the fact that globally, Information Technology (IT) has made a huge impact on the business world (Schwab & Greenhill, 2012). Kling (1980) advocated that the introduction of IT in the business world has resulted in increased overall efficiency and effectiveness in many corporate organizations, therefore in order to keep in pace with the global increase in the use of IT, organizations need to equip themselves with the proper IT systems that meet their organizational needs. In light of this, the Auditing profession needs to be evaluated also on how they have adapted the IT transition.

The introduction of IT was greatly welcomed especially by the corporate world. IT came with many advantages that many organizations were quick to adopt it into their systems. Before the adoption of accounting information systems and computerized auditing techniques, manual systems and techniques were used. Receipt books and audit working papers were the order of the day for organizations and auditors. Due to the huge amount of paper work involved, a lot of mistakes were incurred in the day to day operations. Because of the increase of data volumes, massive transaction processing and computing in business operations, performing audits, without technology, is hardly an option (Sayana, 2003). As
for the auditors, large samples had to be picked so as to gather enough evidence on the truthfulness and fairness of financial information in order to come up with the correct opinion.

During these days of escalating technological advances, IT remains one of the Audit firms’ most dynamic and growing sectors. There have been global breakthroughs in relation to the advancement and upgrading of most organizational information technology and information systems. Owing to this, auditing procedures have been affected and this has seen the adoption of CAATs essential in the audit process.

Evolution of CAATs also came as a result of companies changing from manually processing transactions to using accounting software packages. Back in the days when manual systems were very common, auditors used to seek specialists in IT auditing when auditing in a computerized environment. During this IT era, many organizations have adopted computerized information systems and therefore the need for auditors to acquire skills and expertise on the use of CAATs as it is not economic to seek IT audit specialists on all their assignments.

1.2 Statement of the problem

Generally small Auditing firms in Zimbabwe have not exploited the use of computers in providing audit and assurance services to their clients. This is especially with small indigenous audit firms in Zimbabwe for example, Mazhandu and Company.

The above problem brings into light the following at stake within the audit and assurance sector in Zimbabwe:

- The introduction of IT has resulted in transactions which are complex and require auditors to change from their paper based approach to a more computerized approach that will be in line with the client’s demands.
- Increase in transaction volumes have led to more time taken in conducting an audit thereby leading to the reduction in efficiency
➢ Auditing around the computer no longer provides a reliable assurance on the audited accounts.
➢ Low IT proficiency in auditors

From the past researches, the impact of CAATs on the audit profession may not be totally clear. Therefore the study sought to bridge the gap by answering the question: can auditing firms benefit from adopting CAATs.

1.3 Objectives of the study
➢ To investigate the benefits associated with adopting CAATs in auditing.
➢ To determine the role of CAATs in fraud detection.
➢ To investigate the factors influencing the adoption of CAATs
➢ How the auditing profession can address the limitations imposed by Information technology and computer based auditing procedures.

1.4 Research question
➢ Can auditing firms benefit from adopting CAATs?
➢ What is the role of CAATs in fraud detection during an audit?
➢ What are the factors influencing the adoption of CAATs?
➢ Why is it that some firms have not yet adopted intensive use of CAATs in their Audit process?

1.5 Significance of the study
1.5.1 To the student
The student will be equipped with the research skills and will acquire more knowledge concerning the impact of IT and in particular CAATs on the auditing profession.

1.5.2 To the audit firms
The study aims to enlighten small audit firms in Zimbabwe on the benefits of CAATs. It also aims to highlight the rapid pace at which small audit firms should adopt CAATs due
to the modification of audit standards meant to address the adoption of CAATs in the auditing profession.

1.5.3 To the university
The research is set to enlighten on the technological developments that are set to affect the audit profession and how the university can incorporate this into the current curriculum thereby exposing students to computer audit software.

1.6 Assumptions
- Information from a branch of an auditing firm is the true reflection of their branches elsewhere in the country.
- All auditing firms have similar goals and objectives.
- The research method adequately addresses the issues at hand and correct conclusions are drawn.
- The respondents are willing to cooperate and provide accurate information.
- Most organizations in the global market have introduced IT within their accounting procedures.

1.7 Delimitations of the study
There are many audit firms in Zimbabwe but the researcher opted to use only auditing firms in Harare where he resides in order to reduce transport costs and save time. Since IT is dynamic the research covered the period between August 2013 to August 2014.

1.8 Limitations of the study
- Time constraint for there was need to quantify the data
- Lack of financial resources to examine all sources of data
- Other social and academic commitments
1.9 Summary
The need to adopt CAATs came about due to the increased volume of transactions being handled by businesses, which made it virtually impossible or tedious to apply manual auditing techniques. This chapter basically highlights the key issues to be discussed in this research in order to ascertain the impact of CAATs as objectives of the study have been set thereby ensuring valuable and reliable results can be obtained.
CHAPTER II

LITERATURE REVIEW

2.0 Introduction
This chapter involves the documentation of a comprehensive review of published and unpublished work from secondary sources of data in the areas of specific interest to the research. The chapter’s outline is guided by the research objectives. It studies CAATs and looks at their evolution.

Various literatures pertaining to the impact of CAATs on the auditing profession were brought under spotlight. It presents a well-defined discussion of the information and knowledge gathered by the researcher from various relevant literatures to bring the meaning to the subject of the research. Other scholars and various researchers’ views were scrutinized in order to shade more light into the subject of CAATs.

2.1 The history of information technology in auditing
According to Whittington & Pany (1992) the rapid growth of electronic data processing (EDP) for business use is having greater impact on public accounting than perhaps any other event in the history of the profession. Salehi and Alipour (2010) also stipulated that IT has changed the way that accounting data was stored, retrieved, and handled. These new systems led to radical different audit trails, if one at all. The revolution became a dynamic evolution as the computer industry sustained continuous, rapid, technical innovations. In addition to the introduction of computers to the business world, other IT-related events have also had a profound effect on the auditing profession and the way audits are conducted. These events as stated by Salehi and Alipour (2010) included:

- The commercialization of computers;
- The introduction of AUDITAPE;
The Equity Funding scandal;
The emergence of Information Systems Audit and Control Association (ISACA);
The systems, auditability, and control (SAC) studies by the Institute of Internal Auditors (IIA);
Constant emerging technologies.

The advent and evolution of information technology has benefited the audit profession, especially in developed countries which have historically have had more access to IT (Bagshow, 2004) “Some 20 years ago portable computers were made available to audit staff for certain assignments. These machines were the size and weight of large sewing machines and were only just portable, difficult to use, unreliable and very unfriendly. They had no colour screens, no window programs, no Internet, no e-mail and CD drives.” (Bagshow, 2004)

2.1.1 Early developments
Bagshaw (2004) wrote that Information technology has changed the ways in which most businesses have been conducted. Most modern audit systems and methodologies, including those used by the smaller firms, are highly dependent on computers and networks. It all started by the use of simple word processing software with templates, which enabled the more efficient production of audit plans, budgets, timetables, audit planning documentation, disclosure checklists and standardized working papers. When computers were first introduced, auditors had to adapt to the new tools at their disposal and that was not easy. “While everyone in the office had computers the technology was developing fast and firms wanted to keep abreast. So different technology was acquired at different times, and as result, there were significant problems with staff using different hardware and incompatible software, which generated its own inefficiencies” (Bagshow, 2004) Added to that were the problems of staff intimidated by the new technology and were reluctant to use it.
2.1.2 Integration
In the 1980s and 1990s computers became easier to work with. They were smaller, cheaper and more user friendly. They stored large amounts of data and the need to carry bulky and expensive audit manuals and specialized audit guidance was reduced. Well organized training became widely available and reliable. Commercially produced audit, accounts preparation, budgeting and scheduling for smaller firms began to appear. Scanning technology enabled standing information to be held electronically, reducing the need for storage space. (Bagshow, 2004)

Greater planning and control over the cost of IT was put in place and office intranets were developed. This made communication between offices and staff much easier and reduced the need for staff to travel with large documents like financial statements. Central databases providing specialized industry data, sample audit documentation and other large-scale information that could not easily be carried out allowed firms to speed up the audit process, exert greater control over (and make faster changes to) the application of their methodologies. (Bagshow, 2004)

2.1.3 The downside
Early problems arising as a result of lack of good training, technical support systems that lacked any sort of proper integration and simple problems of malfunctioning hardware and corrupted files have not disappeared. Security and control issues have compounded them, particularly since the use of Internet became widespread. The threat of loss, corruption or unauthorized interception of information and data has resulted in the whole industry dedicated to security and control issues. Such threats represent a very real risk to audit firms.

Ultimately, Rezaee & Reinstein (1998) stated that the use of information technology has changed what and how auditors design and perform their audit procedures. The use of the auditors’ professional judgment is still supported but has not been replaced by such technologies. There are very few areas of the audit that have not been affected with IT in recent areas.
2.2 Uses of computers as an audit tool
The use of computers as an audit tool improves the productivity of the auditor, reduces audit costs and limits audit risk (Marx & Der Watt, Dynamic Auditing, 2004). Computers and their associated communication software enable the auditor to use much powerful analysis, modeling, reporting and communication functions to improve the efficiency and effectiveness of the audit. Most large firms especially in developed countries have software available to assist in many of the mundane working papers and reporting tasks, like the preparation of trial balances, making and posting adjusting entries to generate financial statements.

Administration of computers as an audit tool
- Audit planning and scheduling – computers assist in the preparation of time budgets, staff allocation and dates of visits.
- Time recording - involves time recording per audit clerk and charge out rates for example through the use of e-time.
- Databases – computers facilitate the use of databases containing details of clients for example client contact persons.
- Maintaining statistics e.g. statistics for staff training, qualifications, salaries. Statistics for client staff, branches and divisions can also be maintained.
- Programmes such as power point can be used for client presentations.

Administration of the audit
- Computers could be utilized in the preparation of audit budgets in respect of time and monetary value, maintenance of permanent audit file, time schedules that is, time worked per staff member, per task; e-mail i.e. transmission of audit evidence or working papers.

Engagement activities
- Computers make it easier to revise and update engagement letters stored on disks.
Planning
This can be achieved by: Use of computerized planning programs for setting of materiality levels. Study and evaluation of internal controls incorporating; use of audit software for the preparation of systems flowcharts (graphics, systems descriptions, systems questionnaires and the use of audit software to identify weakness in internal controls (Marx & Der Watt, Dynamic Auditing, 2004).

Performance of audit tests
Development of audit software – previous year’s audit file can be kept on disk and adapted or altered for the current year circumstances. Standard audit programs can be prepared electronically which are also altered to cater for changes in client circumstances. In addition, computerized audit software generates audit programs based on the evaluation of control environment and the effectiveness of internal controls. The audit approach can also be formulated using the audit software. (Marx & Der Watt, Dynamic Auditing, 2004).

- Management letters can also be kept on disk detailing weaknesses in internal controls. These can easily be updated for any client changes on the internal controls or adjustments made on the previously identified weakness in internal control.
- Obtaining audit evidence in accordance with International Auditing Standards (ISA) 500, which states that, “The auditor should gather sufficient appropriate audit evidence in order to base his/her opinion on whether financial statements fairly present the financial position of an entity at a given date. Audit evidence can be obtained through: analytical procedures using spreadsheets, statistical computations, and confirmation letters on disk for example bank confirmations, debtor’s circularization, and management representations.
- Completion of the audit – After the completion of the audit field work, audit working papers can be computerized e.g. through the computerization of lead schedules, adjusting entries and cross referencing. Financial statements could be prepared on the computer and the audit software could be used to perform the final review of the annual financial statements.
2.3 Security in the use computers
As discussed above, the use of computers in the audit process may help to enhance the efficiency and effectiveness of the audit. However, the following security measures need to be considered if beneficial and fruitful results are to be achieved (Marx & Der Watt, Dynamic Auditing, 2004).

Limiting of client access
- Auditors should limit client access through the use of unique passwords and user ID.
- Auditors should switch off or lock away the computer when not in use at client premises.
- Files with client information must be encrypted and properly locked

Program and Data file security
- Update antivirus software to prevent corruption and deletion of programs and files.
- Establish policies in respect of the backups for example frequency of backups, number of backups
- Hardcopies of audit files should be printed and stored as a means of backup.

Security of client data
- Only audit staff members must work on the client’s data files
- Processing of client files must be done in the presence of Compute Information Systems (CIS) staff and use only “read” and not “write” audit software.

Staff Audit staff
- must be trained in the use of computers and responsibility must be assigned for computer equipment

2.4 Computer - aided audit techniques (CAATs)
2.4.1 CAATs critically defined
Different authors have come up with definitions of CAATs which basically illustrate the same thing. The following are some of the definitions: CAATs are computer tools and
techniques that an auditor (external or internal) uses as part of their audit procedures to process data of audit significance contained in an entity’s information systems (Singleton & Sangemi, 2003). A journal also describes CAATs as computer programs and data that the auditor uses as part of the audit procedures to process data of audit significance, contained in an entity’s information systems (Coderre & David, 2005).

Another definition of CAATs is the ability to review and analyze vast amounts of data using computer-assisted techniques. It involves an understanding of effective data analysis and the use of specialized software (Pyzik, 2007). According to The Institute of Internal Auditors (IIA), CAATs are computer-based tools and techniques that permit auditors to increase their personal productivity as well as that of the audit function. (Braun & Davis, 2003), CAATs can be broadly defined as any use of technology to assist the completion of an audit. In practice, however CAATs has become synonymous with incorporating data analytics into the audit process.

2.4.2 Methods (types) of CAATs
Regardless of the origin of the program, the auditor substantiates their appropriateness and validity for audit purpose before using them. Generally CAATs allow the auditor to have access to the client’s data without dependence on the client. Types of CAATs include General Audit Software, Customized Audit Software and Utility Programs, Test Data, Integrity test facility. The most common CAAT used in Zimbabwe by audit firms is the General Audit Software (Source: research done).

2.4.2.1 General audit software (off the shelf /GAS)
General audit software (GAS) is the most frequently used of all CAATs, it allows for data extraction and analysis (Braun & Davis, 2003). GAS is an automated package originally developed in-house by professional auditing firms. This software consists of generally available computer packages which have been specifically designed to perform a variety of audit procedures but they are not specifically designed to perform a variety of functions for audit purposes (Porter, Simon, & Hatherly, 2003). GAS can be used to test the reliability of the client’s programs as well as to perform many specific auditing functions; the software
is suited to verify the reliability of the IT based system. It facilitates the auditor in performing necessary tasks during most audit procedures but mostly in the execution and documentation phase (Whittington & Pany, 1992).

Basic features of a GAS are data manipulation (including importing, querying and sorting), mathematical computation, cross-footing, stratifying, summarizing and file merging. It also involves extracting data according to specification, statistical sampling for detailed tests, generating confirmations, identifying exceptions and unusual transactions and generating reports (Botz, 2002).

The key reasons for the widespread use of GAS include simplicity of use requiring less specialized information system knowledge and its adaptability to variety environments and users (Braun & Davis, 2003). GAS packages are more widely used due to their low cost, high capabilities and high reliability. Types of GAS include Case Ware IDEA, ACL, and Campus lite among others. Singleton said, “As many others have pointed out, using a GAS such as ACL means the auditor does not review a sample of the data, but rather reviews or examines 100 percent of the data and transactions.” (Singleton T., 2006). In short, GAS provides auditors the ability to access, manipulate, manage, analyze and report data in a variety of formats.

2.4.2.2 Purpose written packages / Customized audit software (CAS)
This is also known among other authors as Specialized Audit Software. These are custom made audit packages used to perform audit tasks in specific circumstances. This software comprises specially developed programs which are designed to perform audit tests in specific circumstances usually those pertaining to a particular entity (Porter, Simon, & Hatherly, 2003). CAS is generally developed when the system requirements make the use of pre-packaged software difficult or impossible.

These programs may be developed by the auditor, the entity being audited or an outside programmer engaged by the auditor. In some cases, the auditor may use an entity’s existing programs in their original or modified state because it may be more efficient than
developing independent programs (Whittington & Pany, 1992). CAS packages are generally used for clients in specialized industries such as banking or mining and in other desired cases. Development of such software is extremely expensive and is often beyond the expertise of the auditor (Porter, Simon, & Hatherly, 2003). Whenever CAS is to be developed, it is essential that the auditor is actively involved in designing and testing the programs. This is necessary to ensure that the auditor fully understands the operations (and limitations) of the software and also to ensure that it meets the requirements of the audit.

2.4.2.3 Test data

In the audit of manual accounting system, the auditor traces sample transactions through the records from their inception to their final disposition. In the IT based system, a comparable approach is the use of test data (Whittington & Pany, 1992). The test data technique is primarily designed to test the effectiveness of the internal control procedures which are incorporated in the client’s computer programs. In order to test programmed control activities, the test data should include significant exceptions that would affect the auditors’ assertion of control risk. Among these would be transactions with missing data, erratum such as online passwords which are designed to restrict access to specified data and programs to the authorized personnel. Alternatively, the data may comprise a set of transactions representing all types of transactions normally processed by the client’s programs incorporating a variety of errors. These transactions and errors are designed to ascertain whether the programmed control procedures are operating efficiently. Thus, it is essentially a compliance procedure (Porter, Simon, & Hatherly, 2003).

Test data generally involves the simulation of data by the auditor. It involves devising fictitious data and predicting the results that should be obtained if programmed procedures operate properly (Coopers & Lybrand, 1993). The data is then captured into the client’s computer systems for processing. The results of processing are then compared or checked by the auditor against prepared results (Marx & Der Watt, Dynamic Auditing, 2004). Test data can also be defined as data, which have been specifically identified for tests typically of a computer program (http://en.wikipedia.org/wiki/test data) some data may be used in a confirmatory way typically to verify that a given set of input to a given function produces
some expected results. Other data may be used in order to challenge the ability of the program to respond to unusual, extreme, exception or unexpected input.

2.4.2.4 Embedded audit routines

The results of using test data would in any case, be completely distorted if the programme used to process it were not the ones normally used for processing e.g. a member of the IT department might substitute a version of the programme that gives correct results, purely for the duration of the test and then replace it with a version that siphoned off the company’s funds into his own bank account. To allow a continuous review of the data recorded and the manner in which it is treated by the system, it may be possible to use CAATs referred to as embedded facilities. (Marx & Der Watt, Dynamic Auditing, 2004).

An embedded facility consists of audit modules that are incorporated into the computer system of the entity’s accounting system. Embedded audit routines refer to audit routines built into the client’s system, which forms part of the application software and runs at the same time as the client’s applications (CIMA, 2002). Embedded routines are usually installed at the time of system development and include:

2.4.2.4.1 Integrated Test Facility (ITF)

An ITF is a subsystem of dummy records and files built into the regular processing system. These dummy files permit test data to be processed simultaneously with regular (live) input without adversely affecting the live data files or output (Whittington & Pany, 1992). The auditor develops hypothetical data which is then processed against the client’s program (i.e. the one that is normally used), developing output as a result of processing and comparing the results with predetermined results (Lawrence & Vance, 2001). It involves creation of fictitious entity (e.g. department or customer) within the framework of the regular applications. Transactions are then posted to the fictitious entity along with the regular transactions. The results produced by the normal processing cycle are compared with what should have been produced. The information processed by ITF forms part of the client data but is coded separately for identification or retrieval. Example of the application of ITF - for payroll application, an ITF could be set up by including a fictitious department and
records for fictitious employees in the payroll master file. Input data for dummy department included with input data for actual departments. Auditors will monitor all output relating to the dummy department including payroll records, exception reports and payroll checks.

2.4.2.4.2 Snapshots
These embedded audit software routines capture the images of transactions at various stages of processing. This enables the auditor to track the processing of data and evaluate the processes executed on the data. (Singleton & Sangemi, 2003)

2.4.2.4.3 Systems Control Audit Review File (SCARF)
This involves embedding audit software modules within the system to provide continuous monitoring of transactions. SCARF selects transactions during processing based on an audit criterion. The SCARF technique is of particular use in testing on line real line systems because of the techniques’ ability to monitor controls as transaction details are entered and pass by specific processing points (Taylor & Kritzinger, 1967) SCARF could be used to test controls or substantive applications such as selecting samples.

2.5 CAATs for fraud detection
Fraud detection is not the main object of an audit unless it is a forensic audit. However, over the years it has been seen that auditors are expected to detect fraud if there is any when they are performing an audit. When auditors fail to detect fraud when it has occurred, users of financial statements lose confidence in the auditors thereby overlooking the fact that fraud detection is not a primary objective of the audit. A lot of pressure is then placed on the auditor to detect fraud where fraudulent activities have taken place (Coderre, 1999) put forward that CAATs are the perfect weapon for the detection of fraud in computerized accounting systems. He wrote as follows: “Computer technology gives auditors a new set of techniques for examining the automated business environment. In fact the detection of fraud is a perfect application for Computer Aided Auditing Techniques” (Coderre, 1999)

As early as 1982 CAATs have been powerful audit tools for detecting financial errors. In recent years, analytical techniques have become not only more powerful but also widely
used by the auditors. Audit software permits auditors to obtain a quick overview of business operations and drill down into the details of specific areas of interest (Coderre, 1999).

CAATs provide the auditors with tools that can verify unexpected or unexplained patterns in data that are indicators of possible fraud. Whether the CAATs are simple or complex, data analysis provides many benefits in the detection of fraud. Audit software can highlight those individual transactions that contain certain characteristics often associated with fraudulent activities. CAATs can assist auditors in detecting fraud by performing and creating the following (Coderre, 1999):

- **Analytical tests**: the evaluation of financial information made by studying plausible relationships among both financial and non-financial data to assess whether account balances appear reasonable. Good examples include evaluation of ratios and trend analysis.
- **Continuous monitoring**: an ongoing process for acquiring, analyzing and reporting on business data to identify and respond to operational business risk.

The techniques and types of data interrogations in modern audit software are almost unlimited. For example, audit software has many commands that support the auditor's requirement to review transactions for fraud such as the existence of duplicate transactions, missing transactions, and anomalies. Some examples of these commands include (Whittington & Pany, 1992):

- Comparing employee addresses with vendor addresses to identify employees that are also vendors;
- Searching for duplicate cheque numbers to find photocopies of company cheques;
- Searching for vendors with post office boxes for addresses;
- Analyzing the sequence of all transactions to identify missing checks or invoices;
- Identifying vendors with more than one vendor code or more than one mailing address;
- Finding several vendors with the same mailing address; and
- Sorting payments by amount to identify transactions that fall just under financial control on contract limits.

Audit software can be used to interrogate a company's data files and identify data patterns associated with fraud. Patterns such as negative entries in inventory received fields, voided transactions followed by "No Sale," or a high percentage of returned items may indicate fraudulent activity. Auditors can use these data patterns to develop a "fraud profile" early in their review of operations. The patterns can function as auditor-specified criteria; and transactions fitting the fraud profile can trigger auditor reviews. Systems can be built to monitor transactions on an ongoing basis. Continuous monitoring is a proactive approach to the early detection of fraud (Braun & Davis, 2003).

CAATs can help auditors focus their efforts on the areas of greatest risk. Auditors can choose to exclude low risk transactions from their review and to focus on those transactions that contain a higher probability of fraud. Audit software also provides auditors with the ability to extract information from several files, with different database management systems, in order to search for underlying patterns or relationships among data. For example, reviewing data from the accounts payable and the contracting databases may reveal a concentration of contracts with one vendor all initiated by the same contracting officer, leading to concerns about possible kickbacks (Coderre, 1999).

Today's audit software makes "what if" analysis easy to formulate and perform. Auditors can form an initial hypothesis, test that hypothesis, and revise it as necessary based on the results of interactive analyses. CAATs can assist the auditor in identifying symptoms early in the life of a fraud. This will serve to reduce the negative impact of many frauds before millions of dollars are lost or goodwill is destroyed. Automated routines that monitor key symptoms and track trends can be a major deterrent of fraud, preventing some fraudulent activities and identifying fraud almost as soon as it occurs (Coderre, 1999).
2.6 Considerations in the use of CAATs
When planning an audit, the auditors may consider an appropriate combination of manual and computer assisted audit techniques. In determining whether to use CAATs, the factors to consider include the following:

I.T knowledge, expertise, and experience of the audit team
ISA 401, "Auditing in a computer information systems environment" dealt with the level of skill and competence the audit team needs to conduct an audit in an IT environment. It provided guidance when auditors delegate work to assistants with IT skills or when the auditors use work performed by other auditors or experts with such skills. Specifically, the audit team would need to have sufficient knowledge to plan, execute and use the results of the particular CAATs adopted. The level of knowledge required depends on the complexity and nature of the CAATs and of the entity's information system. ISA 401 was however withdrawn in December 2004 when ISA 315, “Understanding the Entity and Its Environment and Assessing the Risks of Material Misstatement” and ISA 330, “The Auditor’s Procedures in Response to Assessed Risks” became effective. The replacing standards still act as a super substitution of ISA 401 though they generalize on the fact that when planning an audit engagement partners should ensure that engagement staff possess all the necessary skills and competencies, in this case skills to use CAATs effectively and efficiently.

Availability of CAATS and suitable computer facilities
The auditors consider the availability of CAATs, suitable computer facilities and the necessary computer-based information systems and data. The auditors may plan to use other computer facilities when the use of CAATs on an entity's computer is uneconomical or impractical, for example, because of an incompatibility between the auditors' package program and the entity's computer. Additionally, the auditors may elect to use their own facilities, such as PCs or laptops. (Marx & Der Watt, Dynamic Auditing, 2004). The cooperation of the entity's personnel may be required to provide processing facilities at a convenient time, to assist with activities such as loading and running of the CAATs on the entity's system, and to provide copies of data files in the format required by the auditors.
\textbf{Impracticability of manual tests}

Some audit procedures may not be possible to perform manually because they rely on complex processing (for example, advanced statistical analysis) or involve amounts of data that would overwhelm any manual procedure. In addition, many computer information systems perform tasks for which no hard copy evidence is available and, therefore, it may be impracticable for the auditors to perform tests manually. The lack of hard copy evidence may occur at different stages in the business cycle.

\textbf{Effectiveness and efficiency}

The effectiveness and efficiency of auditing procedures may be improved by using CAATs to obtain and evaluate audit evidence. CAATs are often an efficient means of testing a large number of transactions or controls over large populations by Analyzing and selecting samples from a large volume of transactions, Applying analytical procedures and Performing substantive procedures.

Matters relating to efficiency that auditors might consider include the time taken to plan, design, execute and evaluate a CAAT, Technical review and assistance hours, Designing and printing of forms (for example, confirmations) and Availability of computer resources. In evaluating the effectiveness and efficiency of a CAAT, the auditors consider the continuing use of the CAAT application. The initial planning, design and development of a CAAT will usually benefit audits in subsequent periods.

\textbf{Timing}

Certain data, such as transaction details, are often kept for only a short time, and may not be available in machine-readable form by the time the auditors want them. Thus, the auditors will need to make arrangements for the retention of data required, or may need to alter the timing of the work that requires such data.
2.7 General benefits of using CAATs in performing audits

Cost savings

Lanza (1998) stated that this can be achieved by replacing manual audit activities such as selecting statistical samples, or by analyzing large volume of data. Audit costs are set against the time taken in performing an audit task. If an auditor takes more time than budgeted on an assignment all other things constant, it is an expense to the audit firm. Use of CAATs assists auditors in time management and meeting deadlines.

Increased job satisfaction and auditor’s competence

With the use of CAATs, the time spend by auditors on mundane and repetitive tasks, such as chasing evidence, sample checking and ‘ticking and bashing’ will be reduced and this will enable them to focus on more interesting and rewarding areas were his specialized judgment is required. Moreover having the right technology, including CAATs, and using them the right way can facilitate staff in understanding client business and performing a more efficient audit. It also represents learning opportunities for staff. These lead to happier staff, which in turn leads to lower staff turnover (Heveron, 2007).

Improved results

The auditor can conduct a thorough analysis and test of transactions within a short space of time using CAATs. In little time, large volumes of data can be sorted, matched, recalculated, and analyzed to identify the causes of problems or errors. Log files maintained by modern audit software allow results to be easily reviewed for accuracy. Statistical sampling can be performed, limiting the amount of audit testing while maintaining valid, supportable results. Organizations gain assurance about the accuracy of transactional data, and the extent to which business transactions adhere to controls and comply with policies. (Pyzik, 2007).
Increased opportunities
New set of audit tools will enable auditors to provide new services to their clients for example, detailed fraud reviews or cash recovery audits, to help combat fraud, close controls gaps, reduce errors and recover cash even further. (Heveron, 2007)

Increased time for critical thinking
Saving time for thinking is probably the greatest benefit of CAATs (Will & Brodie, 2006). An auditor’s greatest asset is the ability to review information critically, determine cause and effect, and arrive at objective recommendations, which can be implemented and will address the problems at hand, not simply the symptoms. Audit recommendations can then address issues like restructuring the organization or any of its systems. CAATs relieve audit staff from tedious mechanical procedures, increase autonomy and enhance feelings of accomplishment.

Reduced risk
CAATs reduce risk by allowing testing data of the entire populations, sometimes eliminating the need for sampling and hence associated sampling risk. They also allow the use of new tests, which were not possible previously, thereby creating greater insight into clients’ financial and operational transactions. (Will & Brodie, 2006).

Less time away from home
Testing data with CAATs can be carried out at auditors’ offices rather than at clients’ sites, be they factories, stores or offices, resulting in less travel and expenses for you and less disruption for auditee. (Heveron, 2007).

Increased performance
Computers can do many tasks better, faster, and easier than a person can perform manually. Sorting, searching, performing repetitive calculations, aging, and so forth are ideally suited to automated tools. For an inventory audit, the average turnover was calculated for thousands of items of stock. Calculating the inventory turnover rate for all items in a warehouse could involve weeks of the auditor’s time and effort, but only minutes of
computer time. By identifying obsolete items, the audit reduces the overall inventory storage costs. In addition, once standard routines have been developed, they can be reused at minimal cost and with significant savings in time.

**Improved quality**
CAATs reduce human error and encourage their users to take a more consistent approach across different projects to improve quality. (Pyzik, 2007).

**Added value**
By acquiring a deeper understanding of the underlying records, control deficiencies and other issues are identified that would have been not recognised without using CAATs. This allows the auditors to provide more detailed findings in your report to the Audit Committee and more value to stakeholders across the business, through increased savings, reduced risk or cash recovery. (Lanza, 1998)

**Assists in audit planning**
Risk analysis and audit universe software can assist management in selecting areas to audit and in identifying and assessing initial risks and determining preliminary objectives (Will & Brodie, 2006). A proper risk analysis of the audit universe directs the scarce audit resources to the areas deserving the most attention. Decisions made at the planning stage often set the direction for the early part of the audit and are usually critical to the ultimate success of the project. The ability to easily reuse all or part of previous audit programs can significantly reduce the planning time, while maintaining high-quality audits. Software is used to perform analytical review procedures for example calculating financial statement ratios and to identify unusual fluctuations of items.

**Execution stage**
Audit procedures basically involve compliance tests, substantive tests, sampling, interviews, observation, computation and many others. The auditor adopts CAATs in sample selection or even conducts a 100% test within a reasonable space of time. CAATs
are used to sort and extract data for easy analysis of the data. Calculations and recomputations can be easily performed using CAATs (Coopers & Lybrand, 1993).

CAATs are generally applied more during the execution stage compared to other stages. They provide a means to be flexible and innovative in the performance of audits. The auditor is free to follow new lines of inquiry, often leading to unexpected findings. These capabilities maximize the auditor’s time, particularly during the execution stage of the audit. The use of technology supports improved data analysis, increased audit coverage, better use of audit resources, continuous auditing, and improved results. Using CAATs during the execution stage allows auditors to make better, more critical and informed decisions, while increasing their efficiency and effectiveness (Coopers & Lybrand, 1993).

**2.8 Reasons for underutilisation of CAATs**

- Cost constraints (Gascoyne, 1992). CAATs often take longer to use during the first year of implementation, since auditors need to take time to explain data needs to clients and understand the data. Many practitioners claim not to consider an extended budget period when evaluating the value of CAATs because prior experience has showed that savings are not realized in year two (KPMG, 2005)

- the misconception that CAATs are cost effective only for larger jobs, thus limiting their use to jobs “whose profiles demand it” (Gascoyne, 1992)

- Insufficient planning. Decisions regarding where to use CAATs are made too early in the audit process, and without adequately considering risk (Paukowits, 2000). Firms are simply looking to automate old tests (Gascoyne, 1992), and the use of CAATs is often limited to the more popular functions (Paukowits, 2000).

According to KPMG (2005), user resistance is no longer an issue, as today’s auditors are very technology savvy and readily accept most audit tools. If it were, training is effective at reducing staff’s unwillingness to be innovative with technology.
2.9 Ways to increase the use of CAATs among auditors

CAATs should be used whenever they lead to improved audit efficiency and audit quality. The following ways can increase the use to CAATs among auditors:

- To achieve cost savings, adequate training that includes real-life exercise with audit software is essential (Sayana, 2003).

- As auditors with shorter-term budget and evaluation periods are less likely to implement technology such as CAATs, evaluate the effectiveness of the use of CAATs using longer-term budget that is more than 2 years (KPMG, 2005). Budget for year one should be extended to accept a reasonable increase in time.

- External auditors need senior management support for CAAT use (KPMG, 2005), and internal auditors need support from audit committee, management, and the IT department.

- To decrease the time spent on data acquisition, audit managers should obtain the support of client superiors (KPMG, 2005). The audit team should define the output requirements, and document how reports or data extractions were obtained as well as the queries used (ISACA, 2008).

- Audit team should link CAATs with high risk areas during planning to take advantage of the ability of CAATs to test specific risks and audit 100% of large volume of data easily.

- Audit team should consider using CAATs for more than ad hoc tests and fraud procedures.

Ultimately, whether CAATs can improve audit efficiency and strength of audit evidence depends on the audit team’s understanding of the client’s business processes and experience with the audit tools.
2.10 Empirical evidence
Russel Jackson (2004) investigated the auditors approaches in utilizing the audit tools, software and how technology evolution affecting their practices. The author has illustrated the Internal Auditor's tenth annual software survey in discussing the issues associated with audit software in United States of America. The researcher observed that the limitation of implementing audit software is particularly concerned with cost implication, failure of software to meet audit department’s needs, and resistance in training to auditors. The author has cited the key note presented by several experts in the audit-related software who had various experience in implementing and maintaining the software inside the organization.

Janvrin, Bierstaker and Lowe (2009) investigated the factors influencing the use of computer-related audit procedures in the United States of America and reached a similar conclusion. Their results suggest that the complexity of a client’s Information technology system has an impact on the nature of the chosen form of audit testing. In complex Information technology settings, where auditors relied on controls, the auditors were more likely to use computer-related audit procedures. The results also suggest that auditors from the big 4 firms were more likely to use computer-related procedures than those from smaller or local firms.

Janvrin, Lowe and Bierstaker (2008b) applied unified theory for acceptance and use of technology (UTAUT) to investigate auditors’ acceptance and use of CAATs, based on a field-based questionnaire involving one hundred and eighty one auditors from the big four and national, regional and local Accounting Firms. Their results showed that performance expectancy and facilitating conditions were the most likely predictors of acceptance of CAATs, and they suggest that to increase usage, accounting firms management may need to look at training programmes to facilitate use, and may also need to boost their organisational and technical infrastructure supporting CAATs.

Deb receny et al. (2005a) qualitatively investigated the actual use of GAS in substantive testing in audits of banks in Singapore, using an in depth interview method. They sought to understand the possible reasons for limited usage of GAS in auditors’ substantive testing.
Their study concluded that IAs in banks use GAS, but only to a limited extent, for the purposes of the extraction of samples and the verification of the completeness and accuracy of data although GAS is frequently used in special investigation audits. Auditors were found to be more concerned about testing the compliance and effectiveness of IC compared to substantive testing. Difficulties in using GAS, along with concerns about its cost-effectiveness, were found to hinder its use. However, it was also found that external auditors tended not to use GAS due to the perceived inapplicability of GAS to the nature of investigating financial statement assertions or the extent or quality of computerised ICs maintained by banks in Singapore (Debreceny et al., 2005a).

Harrison and Datta (2007) compared the user perceptions of feature level usages and application level usages and found that users perceive a software application as a sum of features. According to Kim et al., (2009), Technology features have a large impact on technology acceptance in the internal audit profession as influencing system usage, perceived usefulness, and perceived ease of use. System usage, perceived usefulness, and perceived ease of use are high in basic features and low in advanced features. They concluded that technology features have a large influence on technology acceptance in other professions.

Mahdi Salehi and Reza Husini of the Islamic Azad University, Takestan Branch, Takestan, Iran (2010) carried on a study of the effect of information technology on internal auditing: Some Iranian evidence. The main objective of the study was to review the effect of information technology (IT) on internal auditing and the main question of the study was: How is the effect of information technology on internal auditing and each of its aspects including planning, internal control, investigation and reporting? The results of the study revealed that IT helps its users improve their performance. IT enables its users perform their duties with a higher validity. Those using IT say that it helps them focus and have a good feeling for their promotion.

of IT knowledge and IT training on the IT utilization among external auditors. This research aimed at investigating the level of IT utilization and the factors that influence the IT utilization among the audit practitioners in Yemen. The proposed model investigates the impact of IT knowledge, IT training and firm category on the IT utilization. The researchers use a survey questionnaire; the data were collected from 197 external auditors representing big four and non-big four firms operating in Yemen. The Partial Least Squares (PLS) Structural Equations Modeling Approach was employed to analyze the data and test the proposed model. The results showed that IT knowledge and IT training significantly contributed to IT utilization among the external auditors.

Abdelfatah Tumi investigated the reasons why auditors in Libya may not make use of computer assisted audit techniques (CAATs) or continuous auditing (CA) on a larger scale. The research was carried out by applying the unified theory for acceptance and use of technology (UTAUT) developed by Venkatesh et al. (2003) and utilising concurrent triangulation through questionnaires and interviews. In line with UTAUT, the results indicated that although auditors believe that CAATs and CA can have positive impact on the audit function, CAATs are found to be underutilised and CA is rarely used. The lack of facilitating conditions and high costs involved can be seen as major factors to preclude auditors from using CAATs, while the late appointment of the auditor and a lack of infrastructure are found to be the main reasons for the limited usage of CA.

Krishna Moorthy, Seetharaman Zulkiflee Mohamed, Meyyappan Gopalan and Lee Har San evaluated the role of information technology and how it affects internal audit process in the organization. The study focuses on the global trend of adopting IT system in producing a more controlled environment in delivering the auditing process. It also constitutes on how IT affects internal control and provides guidelines and best practices in evaluating techniques available to effectively perform auditing tasks internally. It also addresses how technology, Information system (IS) and electronic data processing (EDP) have changed the way organizations conduct its business, promoting operational efficiency and aid decision-making. It also spotlights many aspects of IT risks and controls and highlights whether the right people are overseeing IT risks to the degree they should.
2.11 Summary
The chapter revealed the history of information technology in auditing, the various uses of computers in the performance of the audit process as well as the use of CAATs as an application of computers in the audit process. Various methods of CAATs including GAS, CAS, SCARF, ITF and test data have been examined including the benefits attached to each method. The use of CAATs as a fraud detection tool has also been critically evaluated. The overall benefits of using CAATS were also discussed.

However, despite the problems associated with the first time deployment of the audit software, employing computers and analytical software to automate manual audit procedures can offer auditors numerous advantages. CAATs tools allow auditors to increase audit coverage, improve management and planning of the audit procedures, increase audit efficiency, saves time, reduces costs and enhances the effectiveness and efficiency of the audit. In the future it is anticipated that the expert systems based on artificial intelligence concepts will enhance the audit process even more as the auditor can draw upon the expert knowledge of others to make judgmental decisions.
CHAPTER III

RESEARCH METHODOLOGY

3.0 Introduction
This chapter dwells on the systematic process of problem identification, collection, presentation and analysis of data. Focus is placed mainly on the primary and secondary data sources that were used to collect information. It builds on the foundation laid in chapter two and provides a valid support base for the recommendations that will be given at the end of the project.

3.1 Research methodology
Methodology is merely an operational framework within which the facts are placed so that their meaning may be seen more clearly (Leedy, 1980). In order to get the specific type of information required, certain methodology aspects were recognized. Research methodology can be defined as the total strategy, from the identification of the problem to the final plans of gathering and data analysis (Burns & Grove, 1999). It necessitates a reflection on the planning, structuring and execution of the research in order to comply with the demands of truth, objectivity and validity (Brynard & Hanekom, 1997). The research methodology determines the effectiveness and representativeness of the research results.

3.2 Research design
A research design is a plan or structure for an investigation or a list of specifications and procedures for conducting and a research project. It helps the researcher to reduce error and also in obtaining empirical evidence on isolated variables of interest (Heppner et al.1992). The design constitutes the blueprint for the collection, measurement, and analyses of data (Philips, 1971). A poorly designed survey will fail to provide accurate answers to the questions under investigation.
This study used a descriptive research design that allowed the integration of literature review, in-depth interviews, direct observation and questionnaires as main procedures to gather data for this study. Both qualitative and quantitative research methods were used for the study.

This method was appropriate in the study because it is concerned with actually finding out the respondent’s remark on the impact of CAATS on the auditing profession. The descriptive research had an advantage with its unique data collection form of survey studies. The study allowed for the collection of data from written information such as research journals. Descriptive research provided insights into life experiences in a way that other research methods could not.

However, confidentiality was the major limitation of a descriptive research design. Participants assumed that the subjects questioned by the researcher were not truthful and instead would give answers that they felt that the researcher wanted to hear. In interviews, participants also refused to answer any questions that they felt were too personal or difficult. To overcome this problem, the researcher highlighted the issue of confidentiality.

3.3 Population design
Population is defined as any defined group of aggregates of individuals, groups, organisations, objectives, social artifacts or social interactions and events (Du Plooy 1997). Two types of population exist, the target population and the accessible population. Kaplan (1980) defines a target population as a collection of all elements or cases under study. The target population cannot be accessed due to time and cost constraints. The target population consisted of all Zimbabwean auditing firms. The accessible population refers to the population that is able to generalize the research results. The accessible population under study therefore constituted the Harare audit firm of Ernst and Young as well as selected Harare auditing firms.
3.4 Sample design
A sample is a subgroup or part of a large population. A sample reflects typical characteristics and the main features of a population. A large sample was used so as to decrease sample errors. “The safest procedure of sampling is using as large a sample as possible.” (Van Dalem 1979). When a sample is properly selected, what is true about it is also true about the population from which the sample was drawn. The sample size must be large enough to represent a population correctly. Unless 100% of the population is examined, there is always some chance that the sample results will mislead the researcher. This is called sampling error. A large sample decreases the risk of sampling error. According to Saunders et al. (1997), there are two ways of coming up with a sample.

3.4.1 Random or probability sampling
Random sampling is a procedure that ensures that each element in the population has an equal chance of being included in the sample. This sampling method gives all the population elements an even footing (Saunders, 2005).

3.4.2 Non-probability sampling
Rao (1995) defines non-probability sampling as, “a method of selecting samples in which the choice of selection of sampling units depends on the discretion or judgment of the sampler”.

Stratified random sampling was used to select the respondents. Lipsey and Chrystal (1963) stated that a random sample is chosen according to a rigidly defined set of conditions guaranteeing, among other things, that every member of the group from which we are selecting the sample has an equal chance of being selected”. Stratified sampling is the arrangement of a population or a sample in distinct layers/ strata for the purpose of classifying responses obtained according to each stratum.

3.4.3 Justification of sampling
- Data was obtained and analysed more quickly because of the smaller numbers involved.
Use of sampling was a cost effective technique and therefore possible costs of the research were significantly reduced.

It made follow ups to non-responses much easy.

3.4.4 Shortcomings of sampling

- A sample chosen may not be representative of the entire population, for not all samples will be alike.
- Sampling error may occur. Due to financial constraints data could not be obtained from all the accounting firms, therefore there is a possibility of sampling risk.

3.4.5 Layout of the sample

Table 3.1: Sample layout

<table>
<thead>
<tr>
<th>Population Stratum</th>
<th>Sample Size</th>
<th>Research Instrument</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audit Managers</td>
<td>6</td>
<td>Interviews</td>
</tr>
<tr>
<td>Audit Clerks and managers</td>
<td>20</td>
<td>Questionnaires</td>
</tr>
<tr>
<td>Mazhandu and co. Auditors</td>
<td>-</td>
<td>Observation</td>
</tr>
</tbody>
</table>

Six audit managers were interviewed and twenty audit clerks and managers were issued with questionnaires. Observations were also made of how auditors at Mazhandu and co. Auditors use computers in the audit process. Observations were made when the student was on industrial attachment and could easily recall events during the period of preparing the research.

3.4.6 Random sampling

Random sampling was used on auditors subjected to interviews and questionnaires. Auditors were randomly selected from various firms, and asked to fill in questionnaires, some copies were sent via email and some were hard copies distributed. Interviews were conducted with randomly selected audit managers from the various firms. Interviews were
carried out to supplement questionnaire responses. Interviews were done to detect and eliminate any ambiguous questions contained in questionnaires and also to further refine questions in order to obtain accurate responses by probing deeper into a response given by the interviewee.

3.5 Research instruments
A research instrument is a tool used to collect data (Kervin 1999). The researcher used both primary and secondary data. As mentioned above, the primary data was obtained from direct observation, interviews and questionnaires. The secondary tools involved the researcher reviewing literature by other authors on the research problem.

3.5.1 Primary sources of data
Primary data is the name given to data that is used for the specific purposes for which they were collected. (Francis, 2004) This is a method of collecting new data specifically for a certain purpose as to solve a particular current situation or problem. The primary sources of data in the research were collected from observation, interviews and questionnaires. According to Mc Daniel (1996), it is data gathered to solve the problem at hand.

3.6 Methods used
3.6.1 Direct observation
This is the collection of primary data through directly observing the respondent or processes in action. Observations are usually flexible and do not necessarily need to be structured around a hypothesis (a statement about what you expect to observe). In terms of “validity” observational research findings are considered to be strong. Trochim states that “validity” is the best available approximation to the truth of a given proposition, inference or conclusion (www.socialresearchmethods.net). Observational research is considered strong in validity because the researcher is able to collect a depth of information about a particular behavior. As mentioned earlier on, the researcher observed the uses of computers and related technology by auditors at Mazhandu and co when the student was on industrial attachment.
3.6.1.1 Advantages of direct observation
The respondents were generally not aware of being observed therefore they behaved in a natural way and this reduced the likelihood of bias in the data collected. Because the respondents were not aware that they were being observed, the risk that they could change their behaviour was eliminated.

3.6.1.2 Problems with observations
There was no opportunity to probe the subjects on reasons of the respondents’ behavior. There are problems with reliability and generalisability. Reliability refers to the extent observations can be replicated like seeing behaviours occurring over and over again are a time consuming task. Generalisability or external validity is described as the extent that the study’s finding would also be true for other people, in other places, and at other times. There are problems with researcher bias. It is often assumed that researchers “see what they want to see” However, this bias can often be overcome by training.

3.6.2 Questionnaires
Zikmund (2000) defined a questionnaire as an instrument for collecting data through carefully laid down questions. The researcher used both structured and unstructured questions to allow respondents to fully express themselves again without using much of their time in too many structured questions. A structured section consists of closed questions in which a question is asked and then the respondent is given fixed responses from which to choose. An unstructured questionnaire is made up of open-ended or free response questions. Questionnaires were issued to audit clerks and managers.

3.6.2.1 Advantages of questionnaires
Questionnaires were very useful and beneficial to the researcher during data collection because:

- They were very cost effective as compared to face to face interviews.
- Self-administered questionnaire offered respondents the flexibility of filling in the questionnaires at their own convenient times and have enough time to think about their responses.
They were familiar to most people. Nearly everyone has had some experience completing questionnaires and they generally do not make people apprehensive.

Questionnaires reduced bias. There was uniform question presentation and no middleman bias. The researcher’s own opinion did not influence the respondent to answer questions in a particular manner. There were no verbal or visual clues to influence the respondent.

They were less intrusive than telephone or face to face surveys. When respondents receive a questionnaire in the mail, they were free to complete the questionnaire on their own free timetable.

3.6.2.2 Limitations of questionnaires

The researcher was unable to probe responses. Questionnaires are structured questions; they allowed little flexibility to the respondent with respect to response format. In essence they often lose the “flavor of the response” i.e. respondents often want to qualify their answers. By allowing frequent space for comments, the researcher can partially overcome this problem. Comments are amongst the most helpful of all the information in the questionnaire and they usually provide insightful information that would otherwise have been lost.

Nearly 99% of all communication is visual. Gestures and other visual clues were not available with questionnaires.

3.6.3 Interviews

An interview is a purposeful discussion between two or more people (Kahn & Cannell, 2003). This involves collection of data through telephone or face-to-face question and answer sessions. Face to face interviews were carried out with Harare audit managers at various accounting firms.

3.6.3.1 Justification of using interviews

Interviews provided the researcher with detailed explanations which were not incorporated in the questionnaire.

Face to face communication yielded more qualitative data than any other instrument
- It also enabled the researcher to probe deeper into the response given by an interviewee.
- Interviews produced a high response rate

### 3.6.3.2 Shortcomings of interviews

- Interviews were very time consuming. They took a long time to set up and conduct.
- Moreover, since interviews were time consuming; the respondents were at times wary of long interview sessions and hence they limited answers to brief assertions.

### 3.7 Secondary sources of data

Secondary Data is data which already exists and which was originally collected for the purposes other than the problem at hand. (Francis 2004). Secondary data was collected from auditing textbooks, Practice Notes on International Standards on Auditing and Accounting journals as detailed in Chapter 2.

#### 3.7.1 Justification of secondary sources of data

- Data was easier and less expensive to collect since textbooks were found free of charge from the university library and the internet was also available free of charge at the university campus.
- Data obtained, was from reputable sources and could easily be verified.
- Large amounts of information were reviewed quickly.

#### 3.7.2 Disadvantages of secondary sources of data

- Obsolescence - Some of the data collected was out of date hence the researcher nullified them and kept on searching for current data.
- Some of the data was not totally specific to the target population
- Costly – access to the Internet through Internet cafes was very expensive. However the researcher used library and internet resources offered by the university.
3.8 Validity of instruments

Validity is the degree to which a test measures what it purports to measure. The term validity may also mean that an instrument measures what it is intended to measure, and that it measures this correctly. This therefore refers to the appropriateness and usefulness of a specific inference made from the test score. If the research technique is valid it is “sound, cogent, well grounded, justifiable, or logically correct.” In simple terms, validity ensures that data sets collected or items used are pertinent or relevant to the research. There are different types of validity.

3.8.1 Forms of internal validity (Stubbs, Discourse Analysis, 1983):

- Internal or face validity - the techniques directly relate to the intended outcomes and concerns of the research.
- Concurrent validity - the data collected is valid for the much wider population from which that sample is drawn.
- Predictive validity - provides data useful for making predictions about the future behavior of the research subjects in a causal or correlational manner.

In research techniques such as interviews and questionnaires the language should not be so complex, or hinder understanding and answering (responses).

3.8.2 Ways of ensuring validity are:

- Carrying out an initial investigation (a pilot study) - using intended data collecting instrument to check authenticity and relevance of the data produced.
- Delphi Approach - A panel of experts can be used to assess that the planned instrument really does measure what it purports to measure.

In performing the research, the researcher was concerned with two types of validity, namely content validity and sampling validity. Content validity is the degree to which test items represent the content that the test is designed to measure. Sampling validity is the degree to which the samples are an adequate sample of the total population.
3.9 Reliability of instruments
Reliability is defined as; “The extent to which a test would give consistent results if applied more than once to the same people under standard conditions” (Stubbs, Discourse analysis, 1993). Reliability is therefore the extent to which measures are free from errors. It is the level of consistency of the measuring instrument. This means therefore that when a measuring instrument produces different results each time it is used; it is not consistent and is therefore unreliable.

3.9.1 Methods of checking or assessing reliability
Using the “Test-retest” method.
This involves using an instrument (e.g. interview schedule) with a group on two separate occasions and analyzing how closely the two sets of results conform to each other (provided the two occasions are not separated by an excessive time-scale). A significant correlation should be observed between the two sets of results, with minor differences, as respondents are likely to change.

Split method
This involves splitting the results of a test or questionnaire into two halves and then measure how well the one correlates with the other. There are computer packages that carry out this procedure, such as SPSS, which works on the above principle.
Problems may still arise, however, for a test can be reliable but not valid. It is possible that a test may measure something other than what it is believed the test is measuring, in which case it is reliable but not valid because it would not be measuring what the researcher supposed it to be measuring.

3.10 Data analysis
According to an online business dictionary, data analysis is the process of evaluating data using analytical and logical reasoning to examine each component of the data provided. This form of analysis is just one of the many steps that must be completed when conducting a research experiment. Data from various sources is gathered, reviewed, and then analyzed to form some sort of finding or conclusion. There are a variety of specific data analysis
method, some of which include data mining, text analytics, business intelligence, and data visualizations (http://www.businessdictionary.com/definition/data-analysis.html). The data analysis section explores the overall procedures to be used to organize, describe and analyze the collected data. The process entails suggesting the manner in which findings are to be (a) presented to logical themes (e.g. tables, graphs and/or diagrams), (b) described to reveal their meaning.

These procedures should be clear, logical and justified. If the research has used a particular model, it should be described at length and justified. The data was captured manually through taking down notes during observations and interviews. Questionnaires were collected from respondents. Qualitative and quantitative data analysis was used. The research design provided the overall strategy for answering the research questions for this project. The Questionnaire responses were coded and then tallied, question by question. The researcher first cleaned the data to remove inconsistent response (checked for errors) and then tallied the response question by question.

3.12 Summary
This chapter outlined the research methodology selected and how research instruments were developed to carry out the research. The merits as well as the problems encountered in using the various research instruments were discussed. The analysis and interpretation of data will be done in the next chapter. The methodology chapter is the blueprint or roadmap that will shape the outcome of the entire project. Therefore, it is important to ensure that the right tools are used to ensure that correct results that are relevant to what the researcher sought out to discover, are generated. The chapter concluded with the method of analysing data.
4.0 Introduction
This chapter focuses on the presentation, analysis and discussion of data gathered from the field research through questionnaires, interviews and direct observations. The analysis tables, charts and graphs were used so as to reveal the salient message in the data and thus facilitate interpretation.

4.1 Questionnaire response rate
The researcher sent 25 questionnaires to organizations mentioned in the research methodology and was able to obtain a reasonable response that is, out of the 25 questionnaires sent, 20 questionnaires were completed and collected, meaning an 80% response rate was achieved. The response obtained from the questionnaires was sufficient to ensure the validity of the data obtained. Figure 4.1 below shows the questionnaire response rate.

![Response rate in percentages](image)

Figure 4.1: Response rate
4.2 Questionnaire results

4.2.1 Will computerised auditing eventually substitute traditional manual auditing techniques?

Table 4.1: Will computerised auditing eventually substitute traditional manual auditing techniques?

<table>
<thead>
<tr>
<th>Total No. Of Respondents</th>
<th></th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>7</td>
<td>35%</td>
</tr>
<tr>
<td>Agree</td>
<td>4</td>
<td>20%</td>
</tr>
<tr>
<td>Not sure</td>
<td>4</td>
<td>20%</td>
</tr>
<tr>
<td>Disagree</td>
<td>3</td>
<td>15%</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>2</td>
<td>10%</td>
</tr>
</tbody>
</table>

Respondents who agreed that computerized auditing will substitute manual techniques pointed out that work will be done much easier and faster on the computer and reviews can be done more quickly. The findings were almost similar to the literature of Bagshaw (2004) who stated that Information technology has changed the ways in which most businesses have been conducted therefore most modern audit systems and methodologies, including those used by the smaller firms, are highly dependent on computers and networks. Thus there will be need for auditors to substitute traditional manual techniques with computerized auditing.

In addition, they highlighted that most clients are computerizing their activities and therefore CAATs will be more utilized. They also highlighted that failure to computerize audit techniques may lead to loss of clients’ especially large companies. However, some respondents argued that manual procedures such as vouching of supporting documents will always be necessary and therefore will never be completely substituted. This has been
supported by the literature of Rezaee & Reinstein (1998) who proclaimed that that the use of information technology has changed what and how auditors design and perform their audit procedures. The use of the auditors’ professional judgment is still supported but has not been replaced by such technologies and there are very few areas of the audit that have not been affected with IT in recent areas

4.2.2 Computerised auditing increases the efficiency and effectiveness of an audit.

![Figure 4.2: Computerised auditing increases the efficiency and effectiveness of an audit.](image)

Based on the results presented above, it can be clearly shown that most respondents (80%) are agreeing that computerized auditing increases the efficiency and effectiveness of an audit. In support of their opinion they highlighted that CAATs saves time of going through a large sample of data especially in big organizations and also that effectiveness is achieved by the 100% test nature of CAATs. This is in line with the findings of Mahdi Salehi and Reza Husini, the results of their study revealed that IT helps its users improve their performance and enables its users perform their duties with a higher validity. Moreover, Marx & Der Watt (2004) also reviewed that the use of computers as an audit tool improves the productivity of the auditor, reduces audit costs and limits audit risk
However, 20% of the respondents were against the opinion that the use of computers increases the efficiency and effectiveness of audits. Respondents against the opinion commented that efficiency entails serving time and money which can be linked to human resources needed. They indicated that CAATs usually delay completion of audits as the work is usually delegated to IT giants who may take time to furnish them with results. They also believed the IT people are an extra expense to the work which could have been done manually by assurance auditors.

4.2.3 The use of computers in auditing increases the quality of audit work.

![Uses of computers v audit quality](image)

Figure 4.3: Uses of computers vs audit quality

The results show that the use of computers in auditing improves the audit quality. In support of their responses, the respondents pointed out that the use of computers increases the quality of the audit through the performance of a 100% test of the transactions and balances resulting in reduction of sampling risk. A 100% check of transactions increases the credibility of the audit to the users of financial statements. The findings of this question were further echoed by Pyzik (2007) who highlighted that “CAATs = GOOD DATA ANALYSIS”, good data analysis will thus improve the audit results therefore the audit quality.
However, 35% of the respondents were negative that the use of computers improves the quality of audit. Almost all of these respondents were found to be working manually during their audits and were all from Mazhandu and company, Harare Office which is a small indigenous firm.

4.2.4 The use of manual auditing techniques no longer provides reasonable assurance on fair presentation of financial statements.

![Figure 4.4: The use of manual auditing techniques no longer provides reasonable assurance on fair presentation of financial statements.](image)

Figure 4.4: The use of manual auditing techniques no longer provides reasonable assurance on fair presentation of financial statements.

Based on the data gathered and presented in figure 4.4 above, it is shown that 50% of the respondents were not sure whether the use of manual auditing techniques no longer provides reasonable assurance on fair presentation of financial statements. Only three respondents agreed that manual techniques no longer give reasonable assurance on fair presentation of financial statements. 35% of the respondents argued that manual technique still give reasonable assurance despite most companies (clients) having computerized their activities. Therefore, it implies that most of the firms are still giving credit to the use of manual techniques and might no eventually computerize their activities. Since only 15% of the respondents agreed that manual techniques no longer give a reasonable assurance on fair presentation of financial statements.
4.2.5 The use of computers in the audit work adds value to an audit.

From the above presentation, it can be noted that 30% of the respondents strongly agreed with the assertion that computers adds value to an audit whilst 30% only agreed. Only 10% of the total populations were not sure if the use of computers in the audit work could add value to the audit. Cited were the following ways in which audit firms and their clients benefit from the use of computers:

- Greater efficiency leads to lower costs for the firm and therefore lower fees for the client
- Greater accuracy in audit procedures gives greater audit assurance for the firm
- Auditors can identify certain problems in clients’ computer data and alert them in time.

In addition to the researcher’s findings, The Institute of Internal Auditors (IIA) advocated that CAATs are computer-based tools and techniques that permit auditors to increase their personal productivity as well as that of the audit function. Mahdi Salehi1 and Reza Husini (2010) also found out that IT helps its users improve their performance. IT enables its users perform their duties with a higher validity and this will add value to the audit since high validity will imply high value.
4.2.6 The use of computers in auditing increases the IT proficiency of auditors.

Table 4.2: Does the use of computers in auditing increases the IT proficiency of auditors.

<table>
<thead>
<tr>
<th>Total No. Of Respondents</th>
<th>20</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly agree</td>
<td>4</td>
<td>20%</td>
</tr>
<tr>
<td>Agree</td>
<td>12</td>
<td>60%</td>
</tr>
<tr>
<td>Not sure</td>
<td>4</td>
<td>20%</td>
</tr>
<tr>
<td>Disagree</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Strongly disagree</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

Findings were that the use of computers in auditing increases the IT proficiency and skills of auditors. This is supported by table 4.2 as it shows that 20% and 60% of the respondents strongly agree and agree respectively. However, 20% were not sure and none disagreed with this view. The respondents however pointed out that an increase in IT proficiency will be achieved through the maintenance of computers and formal and informal training of auditors.

The results shown in table 4.2 may be related to the research findings of Harrison and Datta (2007) who compared the user perceptions of feature level usages and application level usages and discovered that Technology features have a large impact on technology acceptance in the internal audit profession as influencing system usage, perceived usefulness, and perceived ease of use. System usage, perceived usefulness, and perceived ease of use are high in basic features and low in advanced features (Kim et al, 2009). They concluded that technology features have a large influence on technology acceptance in other professions.
4.2.7 The use of audit software enhances the quality and efficiency of an audit

Based on the results presented above, all the respondents were of the opinion that the use of audit software enhances the quality and efficiency of an audit. Respondents commented that audit softwares enhance 100% coverage of transactions and account balances, thereby allowing auditors to detect more misstatements.

As stated by Sayana (2003) the respondents further justified that Macros and preprogrammed routines (that are associated with audit softwares) can further enhance audit efficiency. Mahdi Salehi1 and Reza Husini also revealed that IT helps its users to improve their performance. IT enables its users perform their duties with a higher validity. Those using IT say that it helps them focus and have a good feeling for their promotion.
4.2.8 Have you attended any formal or informal training on the use of the audit software?

![Bar chart showing formal and informal training attendance]

All respondents affirmed that they received training on the use of the audit software. 30% received formal training, whilst 55% received informal training and 15% received both formal and informal training on the use of audit software. These results have been presented by figure 4.7 above. Respondents also commented that formal training is necessary if the quality of audit work is to be improved and encourages IT utilisation. This agrees the findings of Ali Ali Al-Ansi, Noor Azizi Bin Ismail & Abdullah Kaid Al-Swidi who found out that IT knowledge and IT training significantly contributed to IT utilization among the external auditors.
4.2.9 Is the firm’s investment in IT justified?

Figure 4.8: Justification of investment in IT

From the results shown in figure 4.8, we can safely conclude that investments in IT are justified since the majority of the respondents (85%) were positive towards such investments. Heveron, (2007) also justified investments in IT by stipulating that having the right technology, including CAATs, and using them the right way can facilitate staff in understanding client business and performing a more efficient audit. It also represents learning opportunities for staff. These lead to happier staff, which in turn leads to lower staff turnover. In addition, investment in IT may lead to good data analysis as outlined by Pyzik (2007) therefore investments in IT are justified. The results of Mahdi Salehi and Reza Husini also justified investment in IT by showing that IT helps its users improve their performance. IT enables its users perform their duties with a higher validity.

However, only 15% of the respondents were of the opinion that firms should not invest in IT because it is an expensive exercise in which there is a possibility of not fully recovering the costs involved.
4.2.10 Do you think you are exploiting the full potential of the information technology at your disposal?

From the above information it can be clearly seen that 85% of the respondents were of the opinion that that they were not exploiting the full potential of the information technology at their disposal. They highlighted that the extent to which IT is exploited in Zimbabwe is lesser when comparing with developed countries, the main reason being that their clients are yet to fully computerize so as to make CAATs compatible with their systems. They also argued that many sophisticated or customized audit software were not yet acquired in their firms and they have been using only the generalised audit software. Gascoyne (1992) argued that the reason for underutilisation of CAATs might be the misconception that CAATs are cost effective only for larger jobs, thus limiting their use to jobs “whose profiles demand it”.

A research by Russel Jackson (2004) also observed that the limitation of implementing audit software is particularly concerned with cost implication, failure of software to meet audit department’s needs, and resistance in training to auditors. All these might be the other reasons why the auditing firms might not be fully exploiting the full potential of IT at their...
disposal. Though IT is yet to be fully exploited, there is a trend for continuous and unlimited investment in IT.

4.3 Interviews with audit managers
Interviews were carried out with auditors from Ernst and Young and Mazhandu and company. The results on the use of computers are shown in table which follows:

Table 4.2: Use of computers

<table>
<thead>
<tr>
<th>Audit Firm</th>
<th>Uses computers</th>
<th>Works Manually</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ernst and Young</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Mazhandu and Co.</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

Both firms use CAATs at one point or the other in performing their audits. The selected firms are believed to be a good sample of the population and the results are good enough to give a reflection of the whole population. Because of time limitations the researcher picked one firm from the big firms and one from the small firms for this research. These local firms confirmed the benefits derived from the use of computers in auditing but however, cited lack of financial strength hindering them from investment in IT for audit purposes.

4.3.1 Can audit firms benefit from adopting CAATs?
The responses were affirmative and examples of benefits obtained were:

- Cost savings. This can be achieved by replacing manual audit activities such as selecting statistical sample or by analyzing large volume of data.

- Auditors may have the potential to detect more misstatements than sampling by achieving 100% coverage of transactions and account balances. This offers value to clients, and lowers risk of restatements. Auditors can also quantify misstatements
precisely instead of extrapolating misstatements from errors. This gives auditors more ground in requesting clients to adjust its accounts.

- Having the right technology, including CAATs, and using them the right way can facilitate staff in understanding client business and performing a more efficient audit. It also represents learning opportunities for staff. This will motivate workers leading to lower staff turnover.

This agrees with the literature of Lanza 1998 who also stated cost savings as a benefit of adopting CAATs. The findings of Mahdi Salehi and Reza Husini (2010) revealed that IT helps its users improve their performance and enables its users perform their duties with a higher validity.

4.3.2 Do you think that the use of IT in auditing offers you a competitive advantage over your competitors (other accounting firms)?

Respondents who were using computers said that the use of computers in the audit process was a major component of their sales pitch and gave the firm competitive edge over their competitors who were working manually. However, the firms’ audit fees tend to be higher than firms that audit manually. This problem caused potential clients to not have a full understanding of the benefits of computerized auditing over purely manual procedures as these would be lost to firms that audit manually and charge lower fees.

4.3.3 What are the difficulties in using audit software?

The following difficulties in using audit software were cited:

- Adapting and tailoring standard CAATs to suit specific clients’ needs, risks and requirements is not an easy exercise.
- Set up cost is high: set up cost is high as initially client procedures need to be investigated and understood thoroughly prior to the audit software that can be used to access and interrogate those files.
- Changes are costly: if there are changes to client system, this will require costly alterations to the audit software.
Not applicable to small installations: there may be no suitable audit software for use on mini or microcomputer installations. Client accounting system documentation may be incomplete so that it is difficult to identify all procedures. The cost of writing specific audit software that is used to test accounting systems may be difficult to justify against the possible benefit on the audit or possibility of recovering the cost of the software.

Overelaboration: tendency to produce overelaborate enquiry programs which are expensive to develop, time consuming in processing and reviewing. Hence audit cost goes up and it’s difficult to justify its use.

This is partly in line with the research findings of Russel Jackson (2004). He observed that the limitation of implementing audit software is particularly concerned with cost implication, failure of software to meet audit department’s needs, and resistance in training to auditors.

4.3.4 Is the firm’s investment in IT justified?

The respondents felt that the firm’s investment in computerized auditing was justified because whilst on one hand it is costly to adhere to global standards in terms of purchasing hardware and training, the benefit is seen in increased audit efficiency and more full-proof delivery of the audit. This reduces the cost to the client and gives a more legally sound opinion. Also, managers said that auditors were more motivated to work on computers than manually and gained valuable IT skills which benefited both the clients and the auditor (auditors get more IT skills which make them more competitive on global labor markets.)

4.3.5 What solutions would you propose to the hardware problems being experienced?

- Firms should employ highly qualified IT personnel who should timeously respond to any computer problem arising before the failure can delay the completion of the audit, thereby deterring clients.

- Auditors should also attend both formal and informal training on the use and maintenance of computers.
A strong IT policy should be developed by the firm. This will see the disposal or discard or replacement of old outdated machines and the purchase of new up to date machines to enable the firm to move in pace with the ever changing IT.

4.4 Direct observation (limited to Mazhandu And Company at UMP RDC)

4.4.1 The Use of Computers and Related Technology
Mazhandu and co uses computers and related technology mostly in the documentation, and review. They however use them in the entire audit process from planning, engagement activities, documentation, and review, finalization of the audit and preparation of financial statements in a few selected big clients. This is generally because most of the firm’s clients are just but small clients which at times do not even have a well computerized accounting system.

4.4.2 Audit Software
Mazhandu and co has a common audit approach and documentation and set of supporting methodologies that enable them to deliver consistency, seamless service everywhere its clients do business. These are deployed through state-of-the-art enabling technology which further leverages the time and amplifies the skills of its professionals. They use ACL.

4.4.3 Working papers
Electronic work papers including integrated word processing spreadsheets and graphics can be created by using Microsoft word and excel. A number of audit specific functions are also built into assist both the preparer and reviewer e.g. auditors can fully cross reference working papers, use tick-marks to annotate detailed schedules, note and deal with review queries and sign off working papers as preparer or reviewers.

4.4.4 File Interrogation
ACL provides fast and flexible file interrogation capabilities to deal effectively and efficiently with almost any computerized data. This software enables the auditor to summarize or extract records that meet certain criteria, select statistical samples and much more, and then to use the results directly in other analysis, trial balance reports. In many
cases ACL can perform tests on 100% of a population just as easily as on a sample - an obvious quality benefit.

4.4.5 Security of client data
Only qualified audit staff members work on the client’s data files. This is done in conjunction with the Entrepreneurial Risk Services Team, the branch of Mazhandu and co, which audit the client computer information system. Where possible copies are made of client files and audit tests done on these copies. Processing on client files is done in the presence of client’s CIS staff and only approved software is used. “Read” only and not “write” audit software is used and clients are required to make backup copies before processing.

4.4.6 Problems experienced in using computers in Auditing
The problems that were observed by the researcher are as follows:

- Damaged drives
- Shortage of network cards used to connect to the office intranet to transfer documents and access e-mail and internet services
- Shortage of laptop computers for each auditor. Junior assistants could end up working manually due to lack of computers.

4.5 Summary
This chapter focused on the data analysis and presentation of the research. In this chapter, raw data was processed into meaningful information, which was then analyzed and interpreted. It was found that computers are useful in the performance of the audit process. From the findings, it is contended that the above-analyzed data is enough to make conclusion and recommendations. Based on the analysis made in this chapter, research findings, conclusions and recommendations are presented in the next chapter. Chapter Five will summarize the study, state the major findings of the research and make recommendations.
CHAPTER V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction
This chapter seeks to attach meaning to the data presented in chapter four. Thus having discussed the findings vis-à-vis the research questions, outlined in chapter one, it will draw conclusions from the study and then recommendations would be made.

5.1 Analysis of objectives
Despite the various constraints that the researcher faced he managed to obtain all the objectives stated in chapter one though some of the objectives were not fully achieved. One of the objectives that the researcher had was to determine whether auditing firms benefits from adopting CAATs.

5.2 Summary major findings
The information was obtained mainly through questionnaires, observations and interviews conducted in field research.

- The researcher noted that the majority of the auditors are not yet fully utilizing the IT at their disposal during an audit and the majority of them have received either formal or informal training in the use of audit software.

- In line with the main or first objective of the research, the research revealed that computerized auditing increases the efficiency and effectiveness of an audit and improves the quality of audit work. Also it unveils that the use of computers in auditing increases the IT proficiency of auditors and add value to an audit.

- Results indicated that computerized auditing will eventually substitute traditional manual auditing techniques.
The research revealed that investment in IT is justified; the justification being that the use of IT will offer auditing firms competitive advantages over their rival competitors who are working manually.

In line with the last research objective, the researcher noted that high set up costs, adapting and tailoring standard CAATs to suit specific clients’ needs, risks and requirements which is not an easy exercise are the major difficulties among others in using audit software.

It was noted that the difficulties in using audit softwares can be mitigated by developing a strong IT policy, employment of highly skilled personnel who should timeously respond to any computer problem arising before the failure can delay the completion of the audit, thereby deterring clients.

5.3 Specific Findings – Mazhandu & Company

The entire audit process at Mazhandu & Company is computerised.

The firm has obtained the following benefits from the use of computers in the auditing process; reduced stationery cost due to less paper being used, reduced audit completion time and improved efficiency and quality of audit work

Problems faced by the firm include; the high costs of maintenance of the information technology resources and the breaking down of laptop machines which compromises the efficient time spent on audit work

The cost of the use of Information Technology is factored into audit fees

Auditors at the firm would like more training in the care of computer hardware and uses of audit software

CAATs are used at some clients of the firm depending on the significance of the Computer Information System environment of the client.

Mazhandu & Company does not have a formal IT policy pertaining to the purchase and disposal of computer hardware
5.4 Conclusions

- From the findings, the researcher noted that the majority of the auditors are not yet fully utilizing the full potential of IT at their disposal during an audit and the majority of them have received either formal or informal training in the use of audit software. He concludes that most auditors are skilled and knowledgeable in the use of audit software since they have all trained and most small companies have not yet computerized their accounting systems, making CAATs inapplicable.

- In line with the findings of the main objective of the study, the researcher concludes that firms must adopt CAATs in auditing since the benefits associated with adopting CAATs in auditing found in this research outweighs the costs associated with adopting CAATs and moreover some of the problems associated with CAATs can be easily solved or prevented for example, by staff training.

- Since most clients are computerizing their activities, computerized auditing will eventually substitute traditional manual auditing techniques and the researcher also concludes that resistance to adopt CAATs is no longer an issue, as today’s auditors are very technology savvy and readily accept most audit tools. He also concludes that IT has changed the ways in which most businesses have been conducted therefore most modern audit systems and methodologies, including those used by the smaller firms, are highly dependent on computers and networks.

- The findings revealed that investment in IT justified therefore all firms should keep abreast with the global trend of improvement in IT.

- Although accounting firms may face difficulties in using audit software, they should keep on adopting CAATs in auditing and look for ways to overcome such difficulties, many of which were outlined in this research.

5.5 Recommendations

Auditors should identify how Information Technology is affecting the way in which their clients operates i.e. the way they execute and record transactions as this will have a great impact on the audit procedures that the auditor has to carry out and thus the audit opinion
needs to be a true and fair opinion of the clients operations. It is therefore imperative that audit firms develop specialist Information Technology departments that will assist the auditors through their specialist computer knowledge.

It has generally been noted that in both firms selected for the purpose of this research the firms are not fully utilizing IT and CAATs in Audit. Continuing investment should be made in computer hardware to ensure that the firm obtains economies of scale from the use of computerised auditing. Since multiple benefits accrue from the use of computers firms should not hesitate to continuously invest in IT. This will help to ensure that it remains competitive in this ever escalating information technology.

Firms should undertake both on-the-job and off-the-job training for the benefit of its employees. Alternatively, firms can set up separate Enterprise Risk Services (ERS) comprising of computer auditors specialists meant to evaluate clients’ computer systems before a normal audit commences. The review of the systems will help to identify internal control weaknesses.

As most companies in Zimbabwe are computerizing their operations, audit firms in Zimbabwe should consider exploiting the use of computers in the auditing process lest they are kicked out of business or become incompetent in relation to world standards. Accounting firms should set up security measures in place to prevent the corruption, deletion and hacking of client’s confidential information during their use of computerized auditing. Firms should come up with proper and formalized back up policies in order to enjoy maximum benefits of computers without any interruptions for example, possible loss of data in the event of damaged drives and network failures. In planning the use of computers in auditing, the following points should be considered:

- A large financial investment will be required
- An IT department will be required to meet the needs of development and maintenance of computer hardware and software.
An IT policy is required in order to plan the replacement of machines when they have outlived their use.

All auditors in the firm should be trained on the use of computer hardware and software.

For auditing firms to obtain economies of scales from the use of computers and related technology, they need to commit themselves to an ongoing investment in the maintenance of the technology. A continuous update of the audit software should be carried out to enable compatibility with the ever changing client computers systems and packages.

The auditing profession through regulatory bodies such as International Standards Auditing Board and the Institute of Chartered Accountants In Zimbabwe should also keep pace with changes in Information Technology so that they provide a guideline to audit firms that is in line with changes in the global market in relation to Information Technology. As the regulatory bodies have the duty to provide a framework or guideline on how auditors should carry out their audits in various circumstances they should be able to provide a guideline to auditors who are operating in an environment subject to constant technological changes.

5.6 Future work
It is envisaged that a similar research focusing on the auditing profession be employed on a broader base including auditors operating in developed countries were the IT changes originate from. Also due to the rapid changes in Information Technology further studies should be carried out as current findings will be quickly outdated. Future researchers could also look mainly into the implications of Information Technology on the audit process specifically and not the auditing profession.
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APPENDIX I: RESEARCH QUESTIONNAIRE

Dear Respondent

I am Tedias Mubvakure, currently in my 4th Year of the Bachelor of Accountancy (Honours) Degree at the Bindura University of Science Education (BUSE). Please kindly fill in this questionnaire which is intended to gather data for my research project. The information thus obtained will be used solely for academic purposes.

RESEARCH TOPIC: An investigative study of the Impact of computer-aided auditing techniques (CAATs) on the audit profession in general: A survey of auditing firms in Harare.

Name of Respondent: …………………………………………………………………………………
Company: ……………………………………………………………………………………………
Department: ……………………………………………………………………………………………

SECTION A (Tick inside the box that matches your answer)

1. Computerised auditing will eventually substitute traditional manual auditing techniques.
   Strongly agreed  Agreed  Not sure  Disagreed  strongly disagreed

2. Computerised auditing increases the efficiency and effectiveness of an audit.
   Strongly agreed  Agreed  Not sure  Disagreed  strongly disagreed

3. The use of computers in auditing increases the quality of audit work.
   Strongly agreed  Agreed  Not sure  Disagreed  strongly disagreed

4. The use of manual auditing techniques no longer provides reasonable assurance on fair presentation of financial statements.
Strongly agree  Agree  Not sure  Disagree  strongly disagree

5. The use of computers in the audit work adds value to an audit.
Strongly agree  Agree  Not sure  Disagree  strongly disagree

6. The use of computers in auditing increases the IT proficiency of auditors.
Strongly agree  Agree  Not sure  Disagree  strongly disagree

7. The use of audit software enhances the quality and efficiency of an audit.
Strongly agree  Agree  Not sure  Disagree  strongly disagree

8. Have you attended any formal or informal training on the use of the audit software?
Formal  Informal  Both  None

9. Do you think that you are exploiting the full potential of the information technology at your disposal?
Yes  No

10. Is the firm’s investment in IT justified?
Yes  No
APPENDIX II: INTERVIEW QUESTIONS

1. Can auditing firms benefit from adopting CAATS?

2. Do you think that the use of IT in auditing offers you a competitive advantage over your competitors (other accounting firms)?

3. What are the difficulties in using audit software?

4. Is the firm’s investment in IT justified?

5. What solutions would you propose to the hardware problems that can be experienced during the audit process?

6. In your own opinion why might a firm be reluctant to use computers in the audit process?