

Technological Advancements in the Field of Forensic Accounting – A Case Study

BY
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Abstract

Technological Advancements in the Field of Forensic Accounting – A Case Study

Purpose: The primary objective of this study is to capture an in-depth understanding and evaluation of advanced technology within forensic accounting investigations in a local mid-tier firm. It attempts to explore the forensic accounting investigation process within the firm as well as the role of technology throughout the process. Moreover, it seeks to evaluate the effect and contribution of eDiscovery technology to the forensic investigation department within the mid-tier firm.

Design: To achieve these objectives, the researcher implemented a qualitative research approach. A total of six semi-structured interviews were conducted with key personnel within the mid-tier firm under review, one of which is a digital forensic expert. The findings were analysed and discussed with reference to relevant literature on the subject area.

Findings: This study deduced that the firm under review has invested in a strong eDiscovery technology, enabling it to be more efficient in its investigations and thus, more competitive in the industry. It also makes it more credible in the law court since technology maintains a clear chain of custody. However, technological advancements require the firm to update technology and upskill staff in becoming more IT literate. Additionally, since locally technological expertise in this area is lacking, being part of an international network is beneficial.

Conclusions: The study identified that although sophisticated technology is significantly important in forensic accounting investigations certain advanced technology pose challenges and need to be addressed by the firm accordingly.

Value: The study adds on to the current literature dealing with advanced technology in forensic accounting within mid-tier firms. If implemented, the proposed recommendations of this study can assist firms offering forensic accounting services and firms that are thinking of offering such services.

Keywords: *Forensic Accounting, Technological Advancements, Mid-tier firm, eDiscovery Technology*

*To my loved ones for their
encouragement, love and
support*

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List of Abbreviations

AI	Artificial Intelligence
AICPA	American Institute of Certified Public Accountants
CoC	Chain of Custody
DF	Digital Forensics
eDiscovery	Electronic Discovery
EDRM	Electronic Discovery Reference Model
ESI	Electronically Stored Information
FA	Forensic Accounting
FREC	Faculty Research Ethics Committee
FTK	Forensic ToolKit
IT	Information Technology
NIJ	National Institute of Justice
TA	Thematic Analysis
UM	University of Malta
US	United States

Chapter 1

Introduction

1.1 Introduction

This Chapter introduces the foundations for this study. As shown in Figure 1.1 below, Section 1.2 provides background information. Subsequently, Section 1.3 presents a description of the firm under review. Section 1.4 and 1.5 define the rationale behind the study and the research objectives, respectively. Finally, an outline of the entire dissertation is presented in Section 1.6.

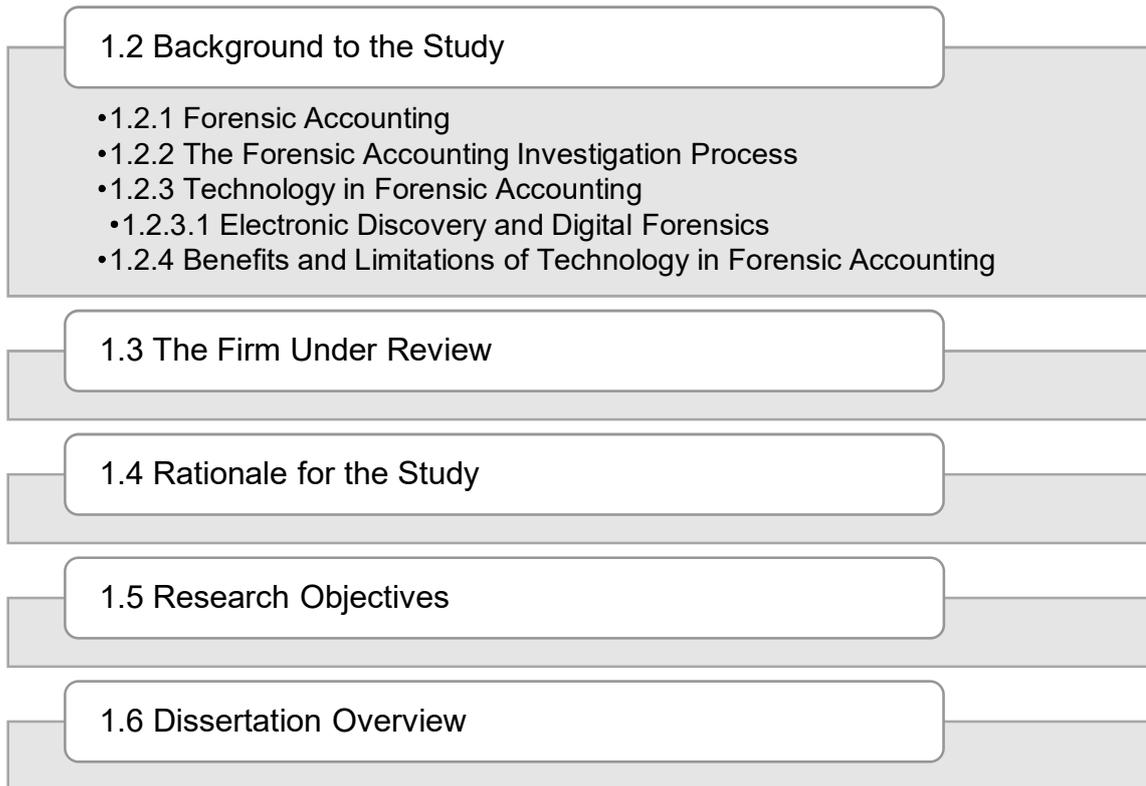


Figure 1.1: Chapter 1 Outline

1.2 Background to the Study

Over the past twenty-five years or so, the profession of forensic accounting (FA) has gained worldwide attention and has become a hot topic in the accounting world (Pearson, Singleton 2008). The need for FA has increased and gained attention due to the emergence of financial scandals that have impacted the global economy (Simeon 2018). Amongst the top five biggest scandals of all time there was Enron in 2001 and WorldCom in 2002 (Ballard 2018), where Pearson and Singleton (2008) explain to have had the greatest impact on the accounting

and audit industry. Technology has also received a considerable amount of attention in the field of FA as it is shaping the way it is being carried out (FNU 2020).

1.2.1 Forensic Accounting

The meaning of FA is rather extensive and there exist various definitions. The American Institute of Certified Public Accountants (AICPA) defines FA as the:

“services that generally involve the application of specialised knowledge and investigative skills possessed by CPAs to collect, analyse, and evaluate evidential matter and to interpret and communicate findings in the courtroom, boardroom, or other legal or administrative venue. More simply, in the context of litigation, the term forensic means to be suitable for use in a court of law. These resources are intended to assist practitioners in competently performing these duties while staying current on issues that impact their day-to-day practice.”

(AICPA n.d.)

FA, also called investigative accounting, involves the application of skills, knowledge and techniques of accounting, auditing, finance and investigation for the purpose of resolving financial issues in a court of law (Simeon 2018). Hence, forensic accountants must also be knowledgeable on certain areas of the law (Crain et al. 2015).

In the Statement on Standards for Forensic Services No.1 issued by the AICPA (2020), FA services are split into litigation services and investigative services. This dissertation will be based on the investigative services of FA. These services are needed when a matter of wrongdoing arises and the expert needs to perform procedures to collect, analyse, evaluate or interpret evidence to assist in reaching a conclusion (AICPA 2020).

The broad category of FA services encompasses a variety of investigative services provided by accounting companies, ranging from proactive to reactive ones (Van Akkeren et al. 2013). For the purpose of this dissertation, it is significantly important to make a distinction between proactive and reactive investigations in FA. A proactive investigation involves the process of carrying out a review to highlight possible areas of fraud in an organisation, by implementing

safeguards in everyday operations to prevent fraud. While reactive investigations take place when one is trying to prove or disprove that fraud or any illegal activity has taken place, or when significant losses occur (Crumbley et al. 2015). The focus of this study is on the latter.

1.2.2 The Forensic Accounting Investigation Process

Nortje and Bredenkamp (2020) and Bokolo and Senol (2022) identified that there exists no predefined FA investigation process that is acceptable in the court of law, however, previous literature addressed four or five distinct stages. According to the Chartered Professional Accountants of Canada (2006) the process can be separated into the engagement acceptance, planning and scope of work, information collection and analysis, file documentation reporting and expert testimony. While Silverstone et al. (2012) noted that the investigation process involves the initiation, planning, execution and prosecution stages. These are also similar to the phases set out by Krstić (2009), including, client and engagement acceptance, investigation, reporting and testifying phases.

1.2.3 Technology in Forensic Accounting

In today's globalised world, both individuals and institutions are dependent on technology for most of their activities, hence why the need for technology has increased (Simeon 2018). Technology plays an important role in modern business, even so in the field of FA (Ramaswamy 2005). The evolvement and accessibility of technology combined with the rapid technological advancements offers new opportunities to forensic accountants but also to economic and financial crime perpetrators (Simeon 2018). For the forensic accountant, technology increases efficiency and effectiveness in the FA investigation process. While for criminals, it increases the speed and ease to commit economic and financial crimes (Casey 2011). In fact, most financial crimes of any significance are involving computers and digital equipment (Pearson, Singleton 2008). A typical example of this is the Enron scandal, which according to Tsetini (2013) was considered to be a computer assisted crime since vast amounts of digital information was discovered. Casey (2011) further explained that digital tools and techniques has not only made it easier for criminals to cover their acts but even

outperform the knowledge and skills of certain experts to detect or investigate. Therefore, forensic accountants need not only use the latest technology in investigations, but must also be aware of evolving technological advancements to keep knowledge and professional skills updated (Portsmouth University 2016).

1.2.3.1 Electronic Discovery and Digital Forensics

Several of the FA services involve a variety of technology related activities such as digital forensics (DF) and electronic discovery (eDiscovery) (Van Akkeren et al. 2013). For the purpose of this dissertation, it is important to make a distinction between the two. These fields overlap each other to assist one another as they both deal with digital data. However, they are highly independent from one another (Krishnan, Shashidhar 2021). Since they are two independent areas which require different set of skills, organisations tend to focus on either eDiscovery or DF (Bokolo, Senol 2022). The firm under review provides forensic accounting services through the use of an eDiscovery software, therefore, this study will mainly focus on eDiscovery technology.

DF emerged in mid 1980s in the United States (US) to be utilised by law enforcement officers (Pearson, Singleton 2008). It is becoming increasingly important as society depends heavily on information technology (IT) (Valjarevic, Venter 2016). DF is the application of computer science to the investigation process. It involves a process where digital data is preserved, collected, validated, identified, extracted, analysed and documented, which is derived from digital sources in a manner that is admissible in court (Casey et al. 2009). The need to use DF in FA investigations is becoming critically important as most information encountered during financial investigations emanates from electronic devices, known as digital evidence (Seo et al. 2009), i.e., information which is stored or transmitted in a digital form that is relied upon in court (National Institute of Justice [NIJ] n.d.).

Conversely, eDiscovery is rather recent as it traces back to 2005 (Hill 2019). eDiscovery involves the process by which parties of the lawsuit can gather and exchange information in digital format for the purpose of using it as digital evidence (Krishnan et al. 2019). Such digital evidence, known as electronically

stored information (ESI) can be viewed, accessed and duplicated by both parties in the legal case (Krishnan, Shashidhar 2021).

1.2.4 Benefits and Limitations of Technology in Forensic Accounting

Technology in the field of FA brings with it various benefits. Technology primarily reduces time consumption as it makes searching, sorting and analysing of evidence more efficient. Utilising technology helps employees working on the same investigation to be able to share documents and working papers (Jewers 2020). Additionally, technology has the ability to handle large volumes of data hence the risk of missing out on certain documents is reduced. It also makes the process more secure. On the contrary, technology presents certain limitations to its users. This is because it is expensive to invest in technological tools and it requires skilled persons to further enhance its maximum potential (Maskokilima 2010). Thus, the application of technology requires persons in the FA field to have extensive training. It is highly important that digital data has robust security measures since it contains highly confidential information. This can be achieved by knowing how data is to be handled, where it will be stored and who has access to it (Deloitte n.d.).

1.3 The Firm Under Review

The firm under review, which will be referred to as 'the firm' throughout the study, is a local mid-tier firm. It is in an international integrated partnership and has been operating since 1998 as a leading professional services firm specialising in audit, advisory and tax, while also providing accounting, reporting, human resources and payroll services to business entities wishing to outsource such services. The forensic investigation services department within the company has been set up locally since 2019 and follows the standards and procedures which are implemented by the firm worldwide. The department involves four main team members, being the partner, senior manager, manager and senior. The partner joined the firm in 2004, highly specialising in forensics and investigation services. The senior manager joined the company since 2009 but has made the transition to the forensic investigation services department in 2019 along with the manager,

where both professionals are Certified Forensic Accountants. As the department progressed, a senior from within the company was employed in 2022. When the need arises the advisory director is involved with the IT infrastructure that is needed by the forensic investigation services department. If need be, external consultants mainly an IT expert or digital forensic expert is engaged on specific cases.

1.4 Rationale for the Study

Technology plays different roles in FA investigations and assists experts in the field in many ways. Thus, this study attempts to find out more about the roles of technology in the FA investigation process. As previously mentioned, the evolvment and rapid growth of technology has played a great role in simplifying the practice of FA. It has changed the way forensic accountants investigate and imposed developments in modern forensic techniques (Bechtel 2013). However, the use of technology brings with it certain limitations and requires assistance to be used efficiently and effectively (Alrawashdeh et al. 2021). Hence, this research will show how technology and the growing advancements of technology contribute to the FA investigation process and to the experts involved within the process.

The study will contribute to knowledge in the field as the researcher believes there is lack of importance on this field locally. Thus, it should enable an interested audience to acquire, understand and deliver knowledge on the effect that technology has on the process of FA investigations.

Additionally, since the study aims to address a firm operating in a competitive industry, it will highly benefit similar local companies if they were to start operating such a service. Thus, giving local audit companies an in-depth understanding of the subject matter.

There have been various previous local studies in relation to FA. For example, Borg (2010) and Agius (2016) both delved into FA education. Galea (2018) focused on '*Forensic Accounting for Matrimonial Disputes in Malta*'. Another study focused on the adoption of technology within a mid-tier audit firm (Micallef

2020), while the study by Sultana (2019) related to the application of digital forensic tools in Maltese gaming companies. However, no Maltese study researched on the field of FA in relation to technology. Therefore, this study provides a positive contribution to existing local literature on FA.

1.5 Research Objectives

The primary objective of this study is to obtain an in-depth understanding and evaluation of technology in the forensic accounting investigation process employed within a mid-tier firm. To meet this objective, the research will:

1. Explore the forensic accounting investigation process and the role technology has throughout the process.
2. Assess whether and how the technological tools contribute to the process as well as to forensic specialists employed in the mid-tier firm.
3. Evaluate the effect that technology has on the process within the mid-tier firm.
4. Provide necessary recommendations to the mid-tier firm on potential technological advancements.

1.6 Dissertation Overview

The structure of this dissertation is split into five chapters which are illustrated in Figure 1.2, below. Chapter 1 includes background information to the study and identifies the need for a Maltese study to be conducted on this research area. It also describes the research objectives, limitations and overview of the dissertation chapters. Chapter 2 provides a detailed review of relevant foreign and local literature on technology in FA and related aspects. Chapter 3 gives an explanation of the research methodology adopted for data collection and subsequent analysis. Chapter 4 analysis the findings of the field research and provides a critical interpretation of the results which are compared with literature review findings of Chapter 2. The final Chapter provides a summary and conclusion of the main findings along with recommendations and suggestions for further research.

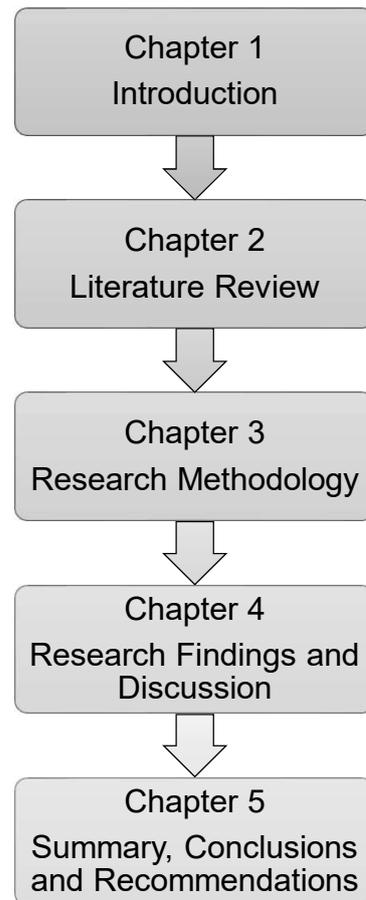


Figure 1.2: Dissertation Overview

Chapter 2

Literature Review

2.1 Introduction

This Chapter provides a thorough examination of previous literature pertaining to technology within the FA investigation process. As shown in Figure 2.1 below, Section 2.2 defines the FA investigation process. Section 2.3 highlights the technology in FA with specific reference to eDiscovery technology and its effect. Furthermore, Section 2.4 delves into the role of technology in the investigation process, the bases for deciding on which eDiscovery tool to choose, along with its advantages and challenges. Lastly, Section 2.5 examines the future developments of technology within the FA industry, and Section 2.6 concludes the Chapter.

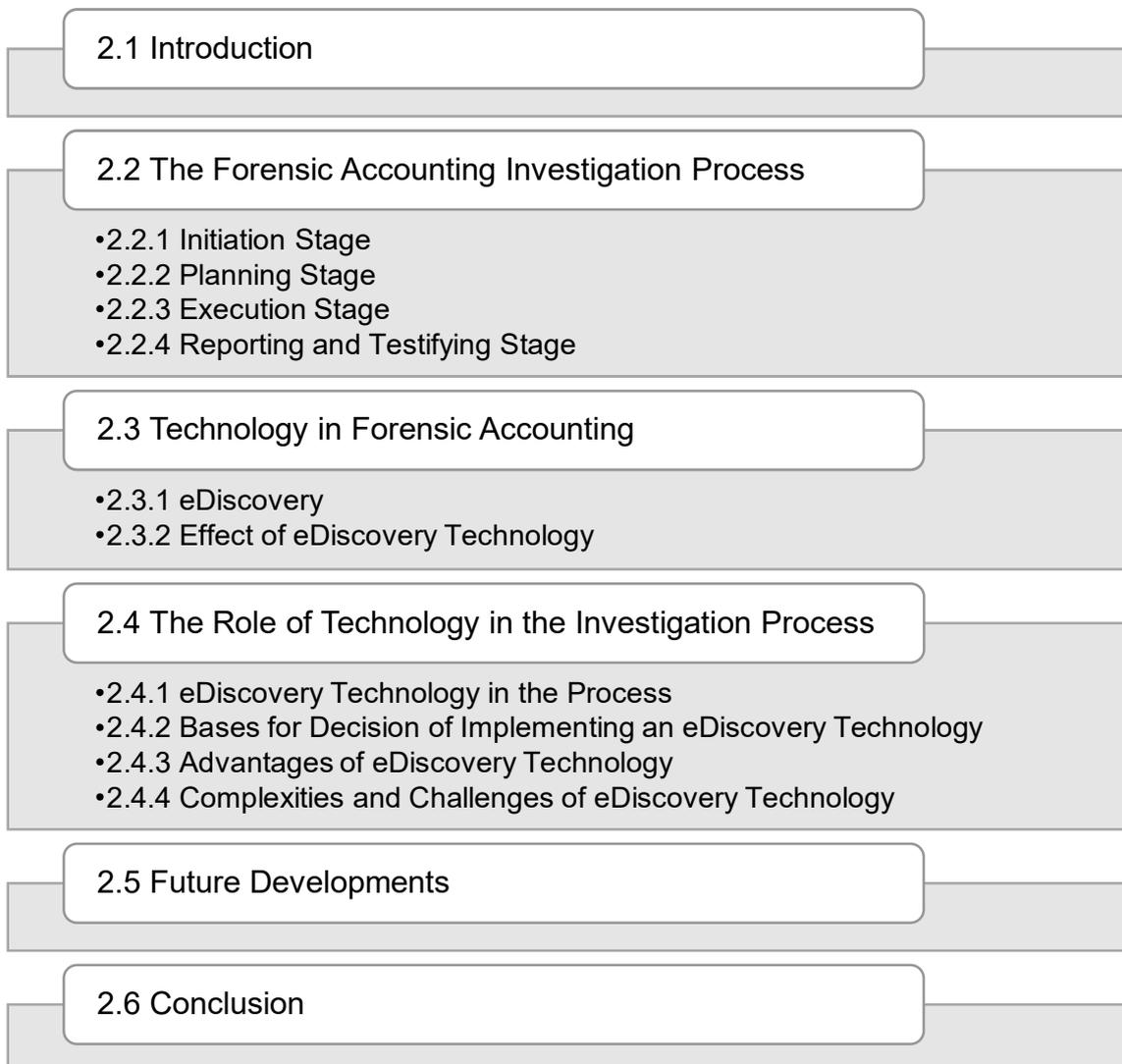


Figure 2.1: Chapter 2 Outline

2.2 The Forensic Accounting Investigation Process

In FA, every investigation is different (Nortje, Bredenkamp 2020, Rechtman 2020). Thus, FA investigators do not approach investigations equally, as long as the success of the investigation is ensured through proper execution. However, all investigations share similarities and must pass through common phases (Silverstone et al. 2012), in fact, general trends during forensic investigations can be identified (Nortje, Bredenkamp 2020). Section 1.2.2 has identified various processes identified by different authors, however, for the purpose of this dissertation the process follows the initiation, planning, execution and reporting and testifying stages.

2.2.1 Initiation Stage

When suspicion of financial wrongdoing surfaces, a FA team is appointed either privately by a client or else by a regulatory body or agency (Krishnan, Shashidhar 2021, Silverstone et al. 2012). Telpner and Mostek (2002) stipulated that FA experts may be hired solely as expert consultants or as experts who give opinion evidence and thus, act as expert witnesses. According to the Maltese Department of Justice, a forensic accountant can be appointed as a court expert on a case at the discretion of the judge or magistrate presiding over such case (Department of Justice n.d.). In either case of appointment, some form of prosecutorial authority will become involved as the end goal is for an offender to be prosecuted (Silverstone et al. 2012). Additionally, before accepting any type of investigation, the FA team must consider whether the firm has necessary experience and skills to accept the investigation (ACCA n.d.).

2.2.2 Planning Stage

The objectives of the investigation must be clearly identified in order to achieve what has been requested by the client (ACCA n.d.) and allow the investigators to assess the progress of the investigation (Silverstone et al. 2012). Subsequently, an investigation plan must be developed where the scope of the investigation is determined (Crain et al. 2015). Nonetheless, the strategy may be revised when new facts are uncovered and assessments are carried out (Driskell n.d.).

Planning is particularly critical when FA investigators need to successfully complete a complex investigation and failure in the planning stage can lead to cost overruns. Having a clear direction of the investigation will also help manage big data (Silverstone et al. 2012) thus, help guide the FA investigators to the data that is only relevant to the investigation (Crain et al. 2015).

At planning stage, key personnel are identified and the suitable investigation team is formed. The firm can consider to outsource experts when necessary, such as an IT expert (Crain et al. 2015, Rufus et al. 2015, Silverstone et al. 2012) specifically when technology is an integral part of the financial fraud investigation (Pearson, Singleton 2008, Silverstone et al. 2012). Co-ordination between all team members is consequential during this stage to save valuable time, effort and improve effectiveness in the subsequent investigation stages (Skalak et al. 2011). Once the planning stage is complete, the execution of the investigation will commence (Silverstone et al. 2012).

2.2.3 Execution Stage

The bulk of any FA investigation involves collecting evidence (Crain et al. 2015, Nunn et al. 2006). The forensic accountant must be aware of the various sources of digital evidence, as for every source available there is a specialised tool or technology which is able to extract digital evidence from it (Marcella 2022, Pearson, Singleton 2008). Crain et al. (2015) identified that digital forensic experts would be involved in the process of extracting data where forensic accountants are not capable. This is typically the case where ESI is not readily available and is complex to extract (Krishnan, Shashidhar 2021). Additionally, digital forensic experts would also be needed to retrieve data that has been erased or hidden from the computer's operating system (Bokolo, Senol 2022). Krishnan et al. (2019) and Skalak et al. (2011) further emphasised that forensic accountants are not typically the digital forensic experts extracting data from electronic devices as it requires specialised skills, forensically sound tools and proper procedures ensuring data is not being altered while being extracted. Thus, the reason for involving a digital forensic expert. Collection of evidence can be

done by either seizing the device and taking it to a DF lab for further processing or else creating a forensic clone of the target hard drive by forensically sound equipment (Crain et al. 2015, Skalak et al. 2011). The DF lab would meet specific requirements including, access security to the lab, special equipment and software, appropriate supplies, secure trash processing and adequate workspace (Crain et al. 2015).

Once electronic data is forensically acquired by the DF team, it is then forwarded to the eDiscovery team who then sort, analyse and make subsequent interpretations of the data collected. Hence, digital forensic experts may work alongside eDiscovery teams to forensically produce ESI during litigation (Krishnan, Shashidhar 2021). Further literature identified, that after all the data has been extracted and imaged, the FA investigators must evaluate and obtain relevant and useful data specific to the investigation through specialised forensic software tools, such as EnCase and Forensic ToolKit (FTK) (Crain et al. 2015, Marcella 2022, Skalak et al. 2011). Here familiarity with facts and circumstances of the case are crucial as they allow investigators to conduct specified keyword searches, exclude data that is irrelevant, filter by dates and times (Balogun, Zuva 2017, Marcella 2022), and review file content for patterns (Rufus et al. 2015). It further includes forensic accountants to find important records, redact sensitive information and code relevant and legally privileged documents (Degnan 2011). The analysis would therefore identify specific dates, times, locations, tools and individuals involved in the financial crime (Marcella 2022).

During the whole execution stage, a proper chain of custody (CoC) must be maintained and kept until the evidence is presented in court (Crumbley et al. 2015). Thus, the original, imaged and copied evidence should all be preserved and stored in a secure and climate controlled forensic environment (Crumbley et al. 2015, Rufus et al. 2015).

2.2.4 Reporting and Testifying Stage

Crain et al. (2015) indicated that a forensic investigation should always end with an expert report, which is accurate, precise, simple, timely, transparent, relevant,

fair and well-organised (Akinbowale 2018). The majority of expert reports would contain the following; background information about people that carried out the investigation including qualifications, a section outlining the original objective, methods and procedures used to compile the report, summary of the findings, conclusions made based on supporting evidence and finally, appendices that are supporting materials, exhibits, or even digital files (Akinbowale et al. 2020, Laykin 2013). The report is then presented to the judge or jury when appointed as an expert witness or else presented to the client (ACCA n.d.), indicating that the report would often end up as evidence in court (Laykin 2013).

Nortje and Bredenkamp's (2020) findings argue that a forensic investigation would end by testifying as an expert witness. However, ACCA (n.d.) and Ramaswamy (2007) contradicted this statement, indicating that a forensic accountant carrying out a forensic investigation may potentially act as an expert witness in legal proceeding. Thus, the forensic accountant may not always be called to provide their conclusions on the case based on the evidence collected.

2.3 Technology in Forensic Accounting

Rechtman (2020) indicated that technology is an emerging trend in the field of FA that points towards future developments, stating that forensic accountants are increasingly relying on and developing fresh applications for technology. The use of technology in the field of FA has become increasingly important due to the growth of electronic data in modern businesses. Most of the activities in the accounting profession have evolved from paper to electronic format (Marcella 2022). Therefore, as more transactions are documented electronically, assigning blame may be difficult by traditional methods (Silverstone et al. 2012).

In addition, recent advances in emerging technologies have made the combat against financial crime challenging as the majority of fraudsters are employing sophisticated technology and accounting methods to commit complicated frauds (Akinbowale et al. 2020, Krishnan, Shashidhar 2021). Kurnaz et al. (2019)

discovered that new techniques and application of technology used in fraud will require highly technological instruments to detect this fraud. Thus, it is necessary for forensic accountants to have cutting-edge technology to uncover fraud and be able to delve deep into the technological systems (Nunn et al. 2006).

2.3.1 eDiscovery

As indicated in Section 1.2.3.1 the main focus of this research will be on technology related to eDiscovery.

Bokolo and Senol (2022) identifies eDiscovery as a process that seeks out ESI in order to be used as evidence in legal cases. The proliferation of electronic data in today's world has made the usage of eDiscovery in FA increasingly necessary (Alruwaili 2021). There are many different types of electronic data, including basic documents stored on hard drives, archived data preserved on backup tapes and hidden metadata that contains details about electronic documents (Krishnan et al. 2019, Marcella 2022).

The eDiscovery process is an essential part in order to conduct a thorough and effective legal investigation. However, addressing an eDiscovery process can be an extensive and complex process. Vaidya (2013) discovered that the Electronic Discovery Reference Model (EDRM), illustrated in Figure 2.2¹ below, was designed to aid firms manage the process of eDiscovery and attain a systematic investigation of ESI.

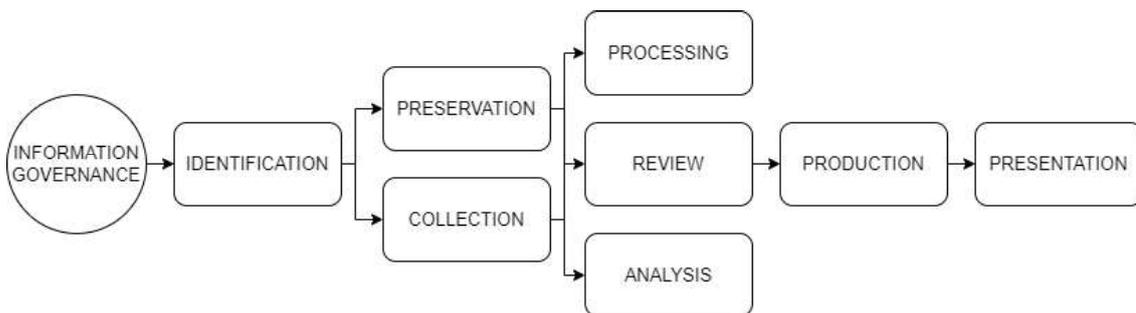


Figure 2.2: The EDRM Process

¹ Adapted from: <https://edrm.net/resources/frameworks-and-standards/>

The nine steps of the EDRM are described below.

- **Identification:** Locating potential sources of ESI and determining their scope, extent and depth.
- **Preservation:** Establishing safeguards for ESI to protect against inappropriate alteration and destruction.
- **Collection:** Gathering ESI to be used in subsequent stages.
- **Processing:** Condensing volumes of ESI and converting them into forms more suitable for review and analysis.
- **Review:** Evaluating relevant and privileged ESI.
- **Analysis:** Assessing ESI for content and context, including key patterns, topics, links, people and discussions.
- **Production:** Delivering ESI to relevant parties in appropriate forms and private delivery methods.
- **Presentation:** Displaying ESI before an audience (at trials, dispositions, hearings).

For a quicker and more efficient eDiscovery process, firms have the benefit of making use of eDiscovery software (Vaidya 2013). Thus, the eDiscovery process can be supported by eDiscovery software such as EnCase and FTK (Manson et al. 2007).

2.3.2 Effect of eDiscovery Technology

Businesses that embrace the latest technological advancements in the sector will expand more quickly and gain a competitive edge over businesses that are hesitant to change (Bigda 2017). According to Vick (2017), employing an eDiscovery software can aid firms stay competitive and provide assurance that they are at the forefront of new technologies. Additionally, having eDiscovery software, firms will gain more flexibility to deal with any tasks that are presented

to them with greater ease and speed. Thus, they will be able to take on additional work while being prepared to handle the growing client demand and will also be able to offer the best services available (Vick 2017). Furthermore, Alrawashdeh et al. (2021) discovered that IT tools facilitate the exchange of accounting data amongst working teams.

2.4 The Role of Technology in the Investigation Process

The firm has opted to install an eDiscovery which is an off the shelf software utilised in FA assignments and within this section its application in the process will be dealt with. Furthermore, analysing the advantages and disadvantages of utilising the eDiscovery software and the bases for decision will also be dealt with.

2.4.1 eDiscovery Technology in the Process

Krishnan et al. (2019) argued that almost always, processing of ESI entails a forensically sound search and extraction of the required files, metadata and text. This includes the application of eDiscovery software tools and techniques for keyword searches, email searches, verifying file signatures, identifying code pages, filtering, indexing and performing a comprehensive search (Vaidya 2013). The study by Krishnan et al. (2019) further discovered that most eDiscovery products, including FTK and EnCase, seem to have excellent features for indexing, searching and filtering (Qureshi, Tazilah 2015). eDiscovery teams may thus, search and examine amounts of data with the help of specialised programmes that are almost impossible to conduct manually. When forensic accountants deploy such tools, they are able to identify and extract relevant evidence to have a better understanding of what transpired (Lin 2022). This is done to reduce the volume of files being endorsed for review (EDRM n.d.). Therefore, without a proper eDiscovery software used to perform the investigation there cannot be a true forensic analysis (Seda et al. 2019).

eDiscovery technology is also useful for the presentation or data visualisation of the eDiscovery process (Vaidya 2013). Data visualisation is a method that enables users to study data graphically rather than using word searches (Skalak et al. 2011). Marcella (2022) identified that FTK, has a visualisation technology feature that displays data in timelines, pie charts, geolocation and cluster graphs to aid users get a clearer picture of the events. Timeline visualisations can identify important ESI files altered or removed and are a huge help to FA investigators dealing with large cases (Krishnan et al. 2019). Apart from aiding users, the use of data visualisation tools aid those who lack FA knowledge, such as magistrates and jury, to understand complex financial information or complex firm structures (Marcella 2022). This is considered very crucial during an investigation because *“if the material is not displayed properly in front of the jury, then all the effort is for naught”* (EDRM n.d.).

The court recognises that forensic technology and the evidence produced through such technology, must embrace the legal requirements of being admissible, authentic, complete, reliable and believable (Asuquo 2012, Marcella 2022). The admissibility of evidence is more strongly correlated with the presence of a clear CoC (Giova 2011). Therefore, when FA investigators handle electronic evidence, a CoC is required in order to be admitted in court (Skalak et al. 2011). The US NIJ defines a CoC as *“a process used to maintain and document the chronological history of the evidence”* (NIJ n.d.). This means presenting a chronological document of *what* was the evidence, *why* and *how* it was collected and analysed, *where*, *when* and *who* came into contact with the electronic evidence in each stage of the investigation process (Giova 2011, Prayudi, Sn 2015). Sadiku et al. (2017) identified the following forensic software techniques that ensure integrity of electronic evidence, including timestamp, cyclic redundancy check number, encryption, digital signature and watermarking. For example, the digital signature authenticates the person signing a document, therefore identifying the *who* in the CoC (Cosic, Baca 2010). Giova (2011) identified that certain modern forensic software allows for the identification of every file's location as well as its numerous properties, such as when it was

created, when it was last accessed and when it was deleted. These are types of timestamps which allow the investigator to create a meaningful timeline of events, thus identifying the *when* in the CoC.

Reitz (2012) identified that cloning the device is a common practice that allows data to be authentic. This involves having a software that produces bit-by-bit copies of the entire original data from the seized hardware (Bokolo, Senol 2022, Reitz 2012, Skalak et al. 2011). This procedure ensures that the copy is an identical replica of the original. FA investigators would then work on the cloned copy rather than the original, ensuring that the original data is secure and maintained in its original form (Bokolo, Senol 2022, Pearson, Singleton 2008, Skalak et al. 2011). If the clone is accidentally modified or ruined during analysis, a new clone can easily be made from the original. Thus, cloning a device will ensure that data is authentic, and the authentication of digital evidence for analysis purposes is key to maintain a CoC for evidence to be admissible for court presentation (Reitz 2012).

The majority of forensic tools used by forensic accountants are capable of preserving the integrity of data (Maskokilima 2010, Skalak et al. 2011). This is very important during the process of the investigation (Sadiku et al. 2017) because stating clearly that the evidence was not changed, is one of the requirements of maintaining a CoC that FA investigators must prove without reasonable doubt (Bechtel 2013).

2.4.2 Bases for Decision of Implementing an eDiscovery Technology

Firms face many challenges when it comes to choosing the most appropriate eDiscovery tool. There are numerous software options available on the market and each tool has its strengths and weaknesses that require thorough consideration before implementation. Firms must thoroughly assess their needs before choosing the right eDiscovery software required. They must understand the scope of the software, assess its capabilities and functionalities to ensure that each stage of the eDiscovery process is supported (Vaidya 2013). Investing in

the right technology can help expedite the eDiscovery process, reduce costs and improve accuracy (Krishnan et al. 2019) thus, companies can ensure they are responding to legal requests and litigations, quickly and effortlessly (Gonzalez 2010).

Amongst the various factors, cost is usually at the top of the list (Tredennick 2013). Firms must keep in mind the cost of the software and any associated recurring costs associated such as licenses. Industry leading eDiscovery software licenses are very expensive (Vaidya 2013) and software vendors have different pricing models (Bougnague 2023). A company must therefore, invest in a good eDiscovery solution that is affordable and guarantees a good return on investment (Vaidya 2013).

Another critical consideration includes choosing the right platform for eDiscovery services. eDiscovery applications that power the process can either be hosted on the cloud or else on-premise (Tredennick 2013). The latter requires the company to take into account the software, hardware and additional physical infrastructure as well (Socha 2021). A company may also decide to opt for a hybrid approach, having both cloud and in-house features (Vargas Rodríguez 2015, Socha 2021). Therefore, a firm must weigh the pros and cons of each type of platform and select the most appropriate (Tredennick 2013). Various literature argued that the main advantage of adopting the cloud is due to its cost-effectiveness (Krishnan et al. 2019, Skalak et al. 2011, Tredennick 2013, Vaidya 2013). The study conducted by Tredennick (2013) indicated that when comparing the total cost of ownership of cloud platforms to in-house systems, the cloud comes out on top, producing cost savings of 36%. The author is also convinced that cloud is the better option for large scale eDiscovery. Krishnan et al. (2019) indicated that cloud provides large storage volumes for extremely low prices, making it appealing to customers. The cloud offers the ability to swiftly ramp up as activity grows and terminate charges when the project is complete (Tredennick 2013). Therefore, one pays for storage fees according to how much storage is being utilised on the cloud. This is not the case with an in-house platform as when there is little activity on an internal platform, running costs are still incurred, thus there

is constant worry that the investment becomes loss making. Despite the widespread acceptance and use of the cloud among internet users, businesses continue to exercise caution due to security concerns (Vargas Rodríguez 2015). Krishnan et al. (2019) agreed, stating that the majority of eDiscovery software suppliers have not yet included rigorous security measures to protect ESI and their product architecture. Dykstra and Sherman (2012) particularly made reference to EnCase and FTK; the study's findings do not suggest employing them for remote forensics in the cloud since too much trust is required. However, Vick (2017) contradicts these authors as eDiscovery software in the cloud utilise reliable and highly-encrypted servers, thus, users can safely guarantee that critical files are well-protected.

When integrating technology, companies must make sure that the office undergoes a technological update with respect to the hardware infrastructure (Gelb 2014) such as having a rack-mounted server to store and process loads of data (Laykin 2013). However, Vaidya (2013) argued that the technology should easily fit within the firm's existing infrastructure without placing additional strain on the IT department.

Before implementing an eDiscovery software, it is critical to consider the security measures in place for each tool because eDiscovery involves handling and preserving confidential and sensitive information (Bougnague 2023). It is important to have both physical security such as locks and safes (Skalak et al. 2011) and also logical security tools including data encryption, data access controls and data loss prevention controls (Krishnan et al. 2019, Singleton, Singleton 2010). Storing electronic data in a secure physical location is crucial because it ensures integrity of data (Krishnan et al. 2019, Skalak et al. 2011). Even though having security is vital, security controls can be very expensive for a company (Krishnan et al. 2019).

eDiscovery software and tools can be complex to use, thus, it is crucial to take into account each tool's ease of use and learning curve. An eDiscovery tool should offer user-friendly interface and clear documentation (Bougnague 2023). It has been identified by Qureshi and Tazilah (2015) that having a user-friendly interface

will provide a faster learning experience. However, consideration must still be given towards the training and technical support provided by software vendors that is required in order to use the eDiscovery software in an effective and efficient manner (Bougnague 2023).

2.4.3 Advantages of eDiscovery Technology

FA investigators obtain various benefits from technology utilised in an investigation (Maskokilima 2010). Applying eDiscovery software primarily aids users to store, sort, and organise massive volumes of data quickly and efficiently (Crumbley et al. 2015, Gutts 2022), thus allowing for better management of ESI. Having organised files enables users to observe information clearly and identify critical information easily (Davis 2011, Vick 2017). Thus, allowing to easily review the data and connect the dots in the investigation (Qureshi, Tazilah 2015).

Bokolo and Senol (2022) and Hernandez (2016) outlined that eDiscovery tools enhance the efficiency of the discovery process. Akinbowale (2018) found that there is enough evidence to assert that the use of FA software reduces the time spent on the process of investigating suspected cases of fraud. William and Gurney (2016) suggest that efficiency has improved as less time is spent hunting for lost and misfiled documentation in physical boxes. When automated tools are utilised in the process, forensic accountants are not required to wait for the burdensome process of collecting evidence by traditional methods. Hence, the time and energy saved from that process can easily be directed towards more high value tasks and to more crucial stages within the process such as the analysis stage (Asuquo 2012). Qureshi and Tazilah (2015) and Tredennick (2013) identified that eDiscovery software like FTK, have fast searching functions which speed up the process of finding and producing relevant documents, in fact, the amount of time spent manually reviewing ESI can be reduced by up to 50% (Gutts 2022).

Asuquo (2012) mentioned that using technology during investigations will benefit forensic accountants in being able to analyse a large number of transactions, identify trends, spot documents that require further analysis and gain initial

insight. Additionally, Bokolo and Senol (2022) identified that time is reduced as eDiscovery tools involving artificial intelligence (AI) can swiftly separate relevant data. Thus, making it more convenient for users to analyse data exclusively to that investigation.

Hernandez (2016) and Vick (2017) indicated that sophisticated search tools within eDiscovery software, enable users to narrow the data down to a smaller set of documents that is within the scope of their search. This process is referred to as metadata analysis (Hernandez 2016). Users are therefore able to group documents and drill down into those classifications to get more specific data. For example, categorising emails by: Cc, From, To or date. These are known as metadata, hence the name metadata analysis. A forensic accountant is likely to drill down on the data in order to ascertain whether it is linked to the fraud (Singleton, Singleton 2010).

Furthermore, Singleton and Singleton (2010) argued that some electronic data that can be extracted might not be visible to the naked eye but can only be seen by sophisticated technology.

Vick (2017) further argued that humans are often prone to simple errors thus having an eDiscovery software, aids in ensuring that all data is accurate at all times. eDiscovery software tends to be more accurate than manual methods since it can identify and analyse more thoroughly (Bokolo, Senol 2022, Gutts 2022), such as identifying legally privileged information that might otherwise be missed (Davis 2011). Krishnan et al. (2019) recognised that manually performing the redaction process of legally privileged information is not feasible. Thus, using the right eDiscovery tools to censor sensitive content helps to ensure that firms are hiding sensitive information without altering the original documentation (Laykin 2013).

Sears (2007) identified that eDiscovery tools are highly secure because they provide a constant audit trail. The findings of Vaidya (2013) align, as it was indicated that EnCase has a comprehensive audit trail for defense with security access, which helps track user activity (Krishnan, Shashidhar 2021).

2.4.4 Complexities and Challenges of eDiscovery Technology

Technology is becoming very complex especially technologies around eDiscovery (Singleton, Singleton 2010). When the complexity of technology is added, new challenges arise to every individual involved in the forensic investigation process (Casey 2011). Al-Khateeb et al. (2019) identified that digital investigations face certain technical challenges represented by the development of new devices to address, new models to understand and prepare for (Cloud Computing), and increased volume of data to store and analyse (Big Data).

As eDiscovery technology is rapidly evolving into becoming more sophisticated and complex, the demand of having users with specialised expertise is increasing (Bougnague 2023, Maskokilima 2010). Thus, having the necessary knowledge and skill to see through technical aspects of the system in place is crucial (Singleton, Singleton 2010). Sheetz (2007) further emphasised that in order to understand the evolution of technology used in FA investigation, users have to know the machines themselves. Thus, to overcome this challenge, eDiscovery users must obtain continuous learning and training to help in understanding how to use the eDiscovery tools effectively (Bougnague 2023, Krishnan et al. 2019).

Furthermore, eDiscovery often requires legal teams, IT staff and outside vendors to co-operate and communicate collectively. If not present, delays and other problems can be brought on (Bougnague 2023).

Bringing in an eDiscovery technology into a firm is expensive to outsource especially when large volumes of ESI is involved (Krishnan et al. 2019). Zapproved (2022) identified that eDiscovery costs include investments in servers and software, hiring and training staff, IT department costs for support and maintenance, payments to outside vendors or data hosting sites and upgrading costs. William and Gurney (2016) highlighted that handling big data is a challenge in itself. However, the costs related to store and preserve big data are high. In fact, the total costs for eDiscovery software are directly and completely related to the amount of ESI a firm retains (Zapproved 2022). To overcome this challenge, firms can collaborate with eDiscovery service providers who offer flexible pricing

models (Bougnague 2023). However, the application of eDiscovery eliminates discovery related costs (Asuquo 2012, Bokolo, Senol 2022).

Carmichael and Graham (2009) revealed that certain tools may not be appropriate to certain tasks thus, limitations of software tools could delay the development of the investigation. Moreover, technological software used by forensic accountants may possess bugs just like normal software (Balogun, Zuva 2017).

2.5 Future Developments

A number of new concepts are having an influence on the industry in order to streamline the eDiscovery process, cut expenses and restore some sanity to the litigation process (Laykin 2013). According to Krishnan and Shashidhar's (2021) and Whitehouse's (2022) conclusions, the field of FA will be significantly impacted by advanced software, AI and the growth of cryptocurrency investment. In agreement, Bokolo and Senol (2022) indicated that there has been increased efforts towards the development and integration of AI within eDiscovery. AI-driven eDiscovery involves machine learning, predictive coding and technology-assisted review.

Even though these advanced AI tools reduce the reliance on human evaluation of documents (Laykin 2013), the human element is still crucial. Bokolo and Senol (2022) and Laykin (2013) indicated that professionals are still required to make validation efforts in order to ensure that the AI retrieves the appropriate documents. Additionally, technology cannot take the position of FA judgement and knowledge, nor can it replace document checks, interviews, and follow-up actions (Skalak et al. 2011).

The increased reliance on technology creates greater potential for fraud (Whitehouse 2022). Thus, FA investigators must keep one step ahead of tech-savvy fraudsters (Skalak et al. 2011) by staying up to date with the newest eDiscovery solutions to improve the process (Sears 2007). As criminals get

smarter, forensic accountants must also evolve their skills both with technology and human power (Whitehouse 2022). Marcella (2022) identified that software providers offer vendor-specific certifications which would include bootcamps and courses to help users expand their knowledge on the software. According to Asuquo (2012), in the 21st century, knowledge of technology equals power and it is nearly unavoidable in the effectiveness of accounting investigations. Therefore, forensic accountants must recognise that knowledge of complex software tools will bring value and quality to the investigation.

2.6 Conclusion

This Chapter has provided an evaluation of existing literature on the process that is involved during a FA investigation, the eDiscovery technology that is utilised for the process, followed by the advantages and disadvantages. It also explored future developments that these technologies may bring. The subsequent Chapter sets out the research methodology adopted to conduct this study.

Chapter 3

Research Methodology

3.1 Introduction

This Chapter describes the research methodology adopted to achieve an in-depth understanding and evaluation of technology in the FA investigation process employed within a mid-tier firm. Section 3.2 outlines the preliminary research undertaken. Section 3.3 discusses the different research strategies. This is followed by Section 3.4, which outlines the research instrument chosen for this study. Section 3.5 gives an overview of how data was collected. Subsequently, Section 3.6 depicts an explanation on the analysis of the data collected and Section 3.7 reveals the limitations of the study. Lastly, Section 3.8 concludes the Chapter. An outline of the research process utilised in this study is illustrated in Figure 3.1, below.

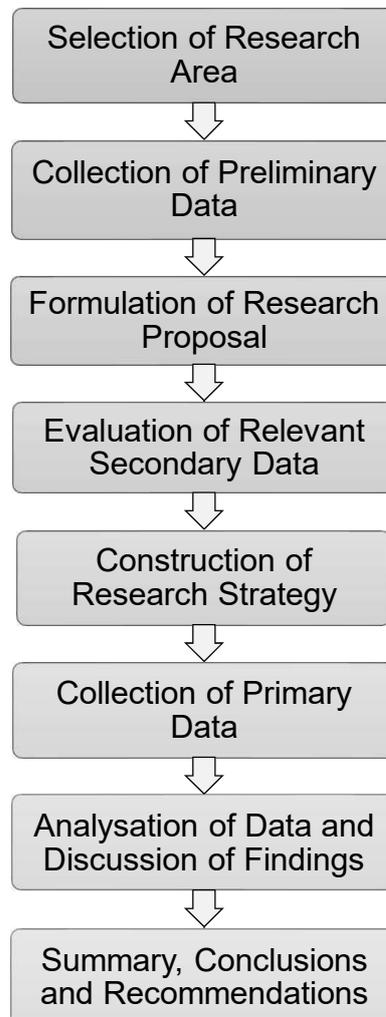


Figure 3.1: The Research Process

3.2 Preliminary Research

Former to developing the research proposal, knowledge and thorough understanding on the subject area was obtained to test the feasibility of the study. Primarily, past local dissertations carried out within the University of Malta (UM) were reviewed to highlight gaps in the literature. Foreign dissertations were also reviewed to gather further ideas. Additionally, an evaluation of peer-reviewed literature from books, articles, academic journals and internet searches was conducted. Most of this data comprised of foreign literature as local literature on this subject area was limited.

There was also the need to consult with lecturers at the UM to get preliminary feedback. Discussions with the supervisor were conducted to validate the feasibility of the proposed dissertation. Furthermore, the firm was contacted through email correspondence and brief meetings were held to confirm their involvement in the study. This gave the researcher a detailed background on the subject area as well as acknowledgment from the prospective participants of their possible contribution. The research area was further assessed in terms of the ability to gather adequate information in the limited time available and the ability to generate necessary findings.

3.3 Research Strategy

The research strategy in simple terms means a general direction to conduct business research. Researchers make the distinction between two research strategies: quantitative and qualitative (Bell et al. 2019), which follow positivist and interpretivist traditions respectively. There is no right or wrong approach, rather the researcher has to choose the approach that best fits the nature and objectives of the study. Hence, the researcher must consider the philosophical foundations of research for the best methodology to be utilised (Agius 2016).

The primary aspect to differentiate between quantitative research and qualitative research is numerical data and descriptive data respectively (Saunders et al. 2019). In quantitative research the emphasis is to collect and analyse data which

is quantifiable in order to form a trend (Queirós et al. 2017). While, in qualitative research, the aim is to provide rich descriptive information about a phenomenon which can be observed but not measured.

Quantitative research involves a deductive approach, where the researcher would put forward a theory, develop a hypothesis from it, put it to the test, then observe and analyse data to draw conclusions on whether to accept or reject the hypothesis (Almalki 2016). Strategies of inquiry for quantitative research include questionnaires, experiments and surveys. On the contrary, qualitative research emphasises an inductive approach, where through observations a pattern is found and a theory is generated (Saunders et al. 2019). Common strategies of inquiry for qualitative research include observation, case studies, grounded theory and ethnographies (Sekaran, Bougie 2013).

Quantitative research is designed in a way to examine relationships between variables. Such variables are measured numerically and analysed using a range of statistical and graphical techniques. This methodology often makes use of probability sampling techniques to ensure generalisability (Saunders et al. 2019). Hence, the methods used for data collection are sophisticated and reliable. Additionally, the researcher needs to remain objectively independent from the subject matter. This lack of attachment is desirable so that results are not affected (Bell et al. 2019). For a reliable and successful quantitative research, a large sample size is required. Therefore, small sample sizes would provide inaccurate analysis and also limits the capability to generalise study findings (Black 1999).

Qualitative research is subjective as the researcher explores participants' meanings, behaviour, values and beliefs. The primary aim of qualitative research is for the researcher to gain a better understanding of the phenomenon through the experiences of others that are directly involved in the phenomenon (Castleberry, Nolen 2018). From the interaction between the researcher and the participants a unique theoretical contribution is developed. A distinguishing advantage of qualitative research is the involvement and interaction of the researcher (Saunders et al. 2019). One significant limitation of qualitative research is that researchers have the tendency of becoming subjectively

immersed in the subject matter which increases biases (Sukamolson 2007). As an outcome, thematic analysis (TA) can be carried out to search for themes or patterns in relation to the objectives (Saunders et al. 2019). Thus, TA is a qualitative data analysis approach for:

“identifying, analysing and reporting patterns (themes) within data. It minimally organizes and describes your data set in detail. However, frequently it goes further than this, and interprets various aspects of the research topic.”

(Braun, Clarke 2006, p. 79)

A researcher may also opt to have a mixed method research approach. This integrates the use of qualitative and quantitative data collection techniques and analytical procedures in the same research study. In this type of research, the researcher may use a deductive, inductive or abductive approach to develop a theory (Saunders et al. 2019). The use of mixed methods will allow the researcher to have diversified views to be reflected in the study, however, this involves a very laborious approach.

3.4 Research Instrument – Case Study

With the intention of achieving the main objectives of this dissertation, a case study approach was considered to be the most appropriate research tool. According to Yin (2018, p. 15) a case study is:

“an empirical method that investigates a contemporary phenomenon (the “case”) in-depth and within its real-world context, especially when the boundaries between phenomenon and context may not be clearly evident.”

Therefore, the focus is on collecting profound information on the phenomenon being studied within a real-life setting.

A case study is more qualitative in nature but not exclusively as it can be both qualitative and quantitative (Sekaran, Bougie 2013). For the purpose of this dissertation a case study is viewed as qualitative research, thus, aiming to focus on meanings rather than measurable aspects. The rationale for taking this

approach is because it thrives to examine detailed experiences and opinions about the research area based on a limited number of individuals.

A case study gives the researcher valuable information and insight on the firm and its operations in relation to the subject area through key personnel. Therefore, the researcher develops different views of reality. Since a case study provides concrete and contextual experience, the researcher will benefit from increased research skills (Starman 2013). Additionally, an in-depth investigation on the firm allows the researcher to uncover issues that are potentially missed by quantitative or scientific approaches.

3.5 Data Collection

The collection of data can be either from primary or secondary sources of data. Secondary data involves the collection of data from pre-existing sources. While, primary data is the first-hand information obtained by the researcher (Sekaran, Bougie 2013).

3.5.1 Secondary Data

Secondary data is the data collected by other researchers which is made readily available to the general research community (Calantone, Vickery 2009). Such theoretical data can then be accessed by the researcher for further analysis to provide additional or different interpretations (Saunders et al. 2019). By making use of secondary data the researcher would be saving on time and money (Sekaran, Bougie 2013). However, secondary data has the drawback of being obsolete. It is therefore important that the researcher makes use of relevant and updated information. It is also essential that the secondary data chosen is methodologically correct; hence why secondary data must be obtained from reliable sources. The secondary sources used in this study include published articles, journals, books, business publications and websites. These were used to formulate a decent literature review in order to obtain an in-depth understanding of technology in the forensic investigation process whilst being careful in not influencing the eventual chosen research participants.

3.5.2 Primary Data

Primary data is data collected directly by the researcher specifically targeted to achieve the research objectives. Therefore, such empirical data is entirely owned by the researcher. When primary data is collected, new data is added to the community, which would be made available for use by other researchers and thus becoming secondary data (Hox, Boeije 2005). The data collection strategy of primary data is tailored to the research objectives, therefore ensuring that the information collected will definitely help to resolve the research problem and no data collected would be unnecessary. However, primary data is costly, time-consuming and labour intensive.

As previously mentioned in Section 3.4, a qualitative approach was considered to be the best approach for this dissertation. Therefore, semi-structured interviews consisting of open-ended questions were conducted as primary data. Semi-structured interviews involve verbal interaction between the researcher and the participants, where a mixture of both pre-determined questions and probe questions would be put forward (Longhurst 2003). Thus, allowing participants to not force out data but to allow flexibility in the way the issues are addressed, resulting in a deeper and natural conversation with participants. However, such flexibility will make it more challenging for the researcher to compare results.

Conducting semi-structured interviews with key personnel that are directly involved in the day-to-day running of the firm and the independent IT expert, gave the researcher significant and valuable information about the participants views on the research area in the local context. This allowed the researcher to have a thorough investigation on the technology utilised in the forensic investigation process employed within the mid-tier firm. Therefore, although semi-structured interviews are time-consuming, they are considered the most appropriate approach to understand the complexities of the subject matter.

3.5.3 Interview Structure

Prior to the commencement of the interviews, it was up to the researcher to get an approval from a high-ranking official of the firm. This approval allowed access

for the firm to be involved and for participants to be interviewed. The approval was granted on the condition that full anonymity was kept, where the identity of the firm and interviewees would remain confidential.

After the Faculty Research Ethics Committee (FREC) application for ethical clearance was submitted and approved, the participants were contacted by email. This included the letter of introduction to the study and the interview schedule. The interview schedule was designed in order to guide the discussion. This was slightly altered to cater for the respective positions held by the interviewees, annexed to Appendix A. The interview questions were objectively formulated to allow for freedom of speech without causing personal biases from the researcher. Probing questions were also applied to obtain deeper meaning of interviewees' views and get a better understanding on the research area.

The interviews were conducted face-to-face to ensure proper two-way communication. Before commencing the interviews, the participants were asked to sign a consent form in agreeing to participate voluntarily and free to withdraw unconditionally. Furthermore, they agreed to be voice recorded during the interview with possible follow-up meetings if this became necessary.

The chosen participants for this dissertation resulted in a total of six. Five of which were key personnel employed within the firm; however, since the firm does not employ an in-house IT expert, the researcher interviewed an independent IT expert. This is because the role of an IT expert in a forensic investigation process is significantly important. Table 3.1, below, depicts the positions held by key personnel employed within the firm and the independent IT expert.

	Number of Participants	Job Position Held	Participant Code
<i>Firm's Employees</i>	1	Partner	P1
	2	Senior Manager	P2
	3	Manager	P3
	4	Senior	P4
	5	Advisory Director	P5
<i>Independent Employee</i>	6	IT or Digital Forensic Expert	P6

Table 3.1: Participants' Job Position and Code

3.5.4 Ethical Considerations

Before the interview process was initiated, go ahead from the FREC had to be given. This included an application to be submitted together with the requested attachments, including the interview consent form, data management plan, sample interview schedule, letter of introduction, and emails containing the consent and support of participants. Following the ethical approval, the data collection commenced in November 2022 and were completed in February 2023, with each interview enduring on average forty-five minutes.

3.6 Data Analysis

TA was applied on the primary data collected. As previously mentioned in Section 3.3, TA is a common technique used to analyse qualitative data to reduce the large volumes of data by searching for themes or patterns across the data set (Saunders et al. 2019).

Primarily, the researcher had to accurately transcribe each recorded interview manually into word documents to make it easier for the researcher to analyse and interpret the data efficiently. The transcripts were read several times so that the researcher would become familiar with the information included in them and be able to compare and contrast the data gathered. As a result, common themes and patterns emerged from the data set, which were then categorised and coded. The coding of data is crucial in order to provide an in-depth description of the

area being studied. Additionally, during this analysis the researcher extracted key quotes which deemed to be effective for inclusion in the research findings. This process of coding data through the application of the constant comparative method allowed for comparability, interpretation and identification of key relationships.

3.7 Research Limitations

The primary limitation faced by the researcher was that both primary and secondary data collection were restricted due to time and word constraints. Moreover, when participants were interviewed, they might have responded in a biased manner. Additionally, the researcher cannot guarantee full honesty from interviewees thus impacting the analysis and results presented in the study. Another constraint in relation to interviewing participants was that they could have been restricted in providing certain information which is sensitive or confidential.

Moreover, since the forensic investigation services department of the firm has been recently set up and only a small amount of personnel is employed, the researcher was restricted when gathering primary data. Thus, the researcher had to resort to external parties namely the IT expert. Additionally, due to the above-mentioned time constraint the researcher was only able to interview the local compliment of staff. Although research is driven by analysis, the researcher was not able to interview foreign employees of the firm directly engaged in FA.

3.8 Conclusion

This Chapter gave a description of the research approaches and justified the most appropriate methodological approach for this study. The following Chapter will deal with the findings and detailed discussion of the data collected.

Chapter 4

Findings and Discussion

4.1 Introduction

This Chapter seeks to present the findings obtained from the interviews conducted and provide a discussion on these findings in accordance with the literature review presented in Chapter 2. As shown in Figure 4.1 below, Section 4.2 focuses on this study's first research objective, discussing the FA investigation process within the firm. Subsequently, Section 4.3 considers the need for eDiscovery technology in the local context and the effect it has on the firm, tackling the second and third research objectives. Section 4.4 then focuses on this study's first and second objectives, assessing the role of eDiscovery technology within the firm. Section 4.5 addresses the future developments of technology. Finally, Section 4.6 concludes this Chapter.

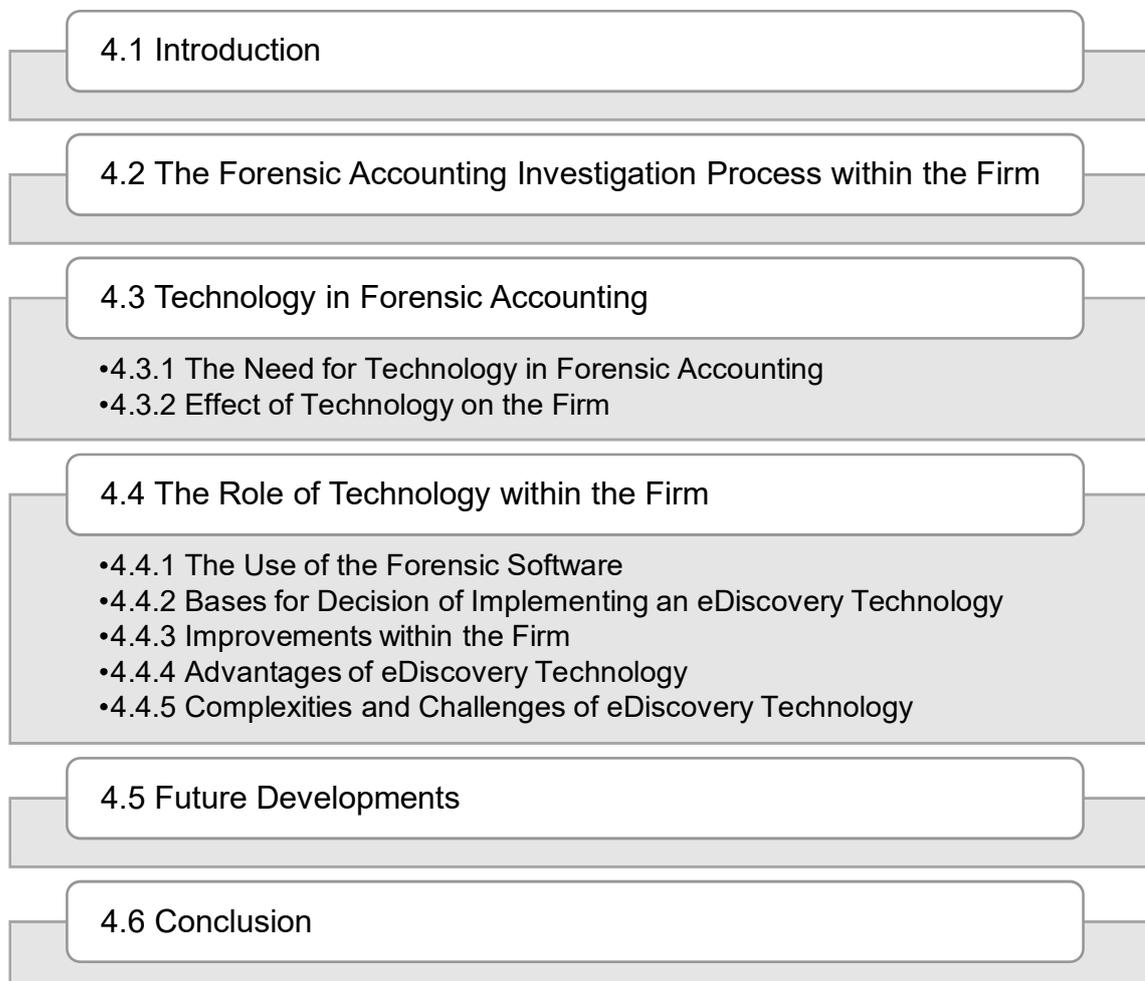


Figure 4.1: Chapter 4 Outline

4.2 The Forensic Accounting Investigation Process within the Firm

The findings of this study revealed that the investigation process employed by the firm may take two different approaches. The firm is either engaged in a judicial appointment or else approached by a private entity. Thus, the firm is called in to investigate a case when either a regulatory body or an organisation suspect financial crime. This is in line with the literature findings of Krishnan and Shashidhar (2021) and Silverstone et al. (2012). Findings indicated that in a judicial appointment the representing bodies of the firm within the forensic investigation services department are appointed as court experts. Therefore, they are appointed by an inquiring magistrate or by a magistrate at compilation of evidence stage to act as experts in the field to carry out any specific analysis of a particular case. When the firm is appointed by private entities such as the Malta Financial Services Authority, the Malta Business Registry or the Financial Intelligence Analysis Unit, the representing bodies are engaged as experts to assist the client in conducting or carrying out specific tasks in relation to an investigation. These findings are consistent with the literature made by Telpner and Mostek (2002) and the Maltese Department of Justice (n.d.), indicating that FA experts are either appointed as expert consultants for private clients or else as court experts or expert witnesses. In either case, the firm would follow more or less the same procedures to carry out an investigation.

Findings showed that once agreements have been entered into, the firm goes into the execution stage. P1 and P6 indicated that at this stage, one needs to have a thorough understanding of the type of evidence that is required and how such evidence is going to be obtained. This is crucial in order for the experts to be able to deploy the right tools and software needed for that specific investigation. These findings support the research delineated by Pearson and Singleton (2008) and Marcella (2022). Thus, being aware of different devices and types of digital evidence, will indicate which type of technology is needed for the collection of evidence stage. This further strengthens the need for proper planning before the execution phase, as specified in Section 2.2.2. Therefore, if adequate planning is done at the initiation of the investigation, proper key

personnel are appointed, proper technology is utilised and evidence to formulate a case is adequately attained, then a proper conclusion on the investigation would be made.

In the collection of evidence stage, the literature identified in Section 2.2.3 outlined that the involvement of digital forensic experts would be required for electronic data to be extracted where forensic accountants are incapable of doing so (Crain et al. 2015, Krishnan, Shashidhar 2021). Krishnan et al. (2019) demarcated that this is usually the case as forensic accountants are not typically experienced in the field of DF and do not have the required digital forensic tools. This is in agreement with the findings, as participants indicated that it is the digital forensic expert who is involved in the data extraction and processing of electronic data. P1 and P6 further indicated that the electronic evidence collected by the digital forensic expert is done through '*forensically accredited*' tools and software that only the digital forensic expert is in possession of. In fact, when interviewing the digital forensic expert_(P6), it was found that there exists a fully-fledged certified forensic lab where the extraction of evidence occurs. These findings are in agreement with literature identified by Crain et al. (2015), exhibiting that a DF lab is required for proper acquisition of electronic evidence containing forensically sound equipment and meets specific requirements. Thus, the results suggest that during a forensic investigation the involvement of digital forensic experts or IT experts is critical because FA experts do not have the required skills and sophisticated equipment to extract electronic evidence from digital devices. Additionally, where ESI is not readily available to the forensic accountants or else it requires complex techniques to be extracted, a digital forensic expert is required. This indicates that today, due to the complexity of technology that is being involved, forensic accountants have to rely on digital forensic experts or IT experts.

Comparable to Crain et al.'s (2015) and Skalak et al.'s (2011) research, participants indicated that after the extraction of electronic evidence is complete, the IT expert does a forensic clone of the electronic evidence. In line with Krishnan and Shashidhar (2021), the forensic clone is forwarded to the eDiscovery team. Participants emphasised that the image is then given to the

firm through an encrypted device which is uploaded on the firm's server and a copy of the image is made. This ties in with the literature found in Section 2.4.1, particularly with that of Bokolo and Senol (2022), indicating that FA investigators have to make a digital copy and work on the copy rather than the original. Thus, ensuring that the evidence is kept in its original form and if the copy is altered there is always a backup available. Participants indicated that once a copy of the original data is ingested into the eDiscovery software utilised by the forensic investigation services department, the forensic team would make their analysis and interpretations of that electronic evidence through the software. These findings corroborate with the conclusions made by Crain et al. (2015), Marcella (2022) and Skalak et al. (2011).

Participants_(4/6) identified that after the execution stage is complete, the expert is always required to prepare an expert report. P2 identified that the report would usually contain *'the work conducted, methodology, people involved, lines of investigation, findings and opinion based on facts'*. These items within the report are consistent with Akinbowale et al.'s (2020) and Laykin's (2013) findings. In line with ACCA's (n.d.) research, the report is then presented to the appropriate body that requested it. Therefore, as indicated earlier in this Section, the report is either presented in court or in front of a client. Findings showed that when the case is carried for a magisterial inquiry it is by definition that the report has to be presented in court. If the firm is appointed solely by a private individual, P2 indicated that the report might still end up in court. This is in line with Laykin's (2013) findings, indicating that the report would most likely end up as court evidence.

Consistent with ACCA's (n.d.) and Ramaswamy's (2007) study, participants identified that certain representing bodies of the firm may get called to testify as expert witnesses but this is not always the case. Thus, findings indicate that the final stage of the forensic investigation process has to always end with an expert report as indicated by Crain et al. (2015). However, the forensic accountant may not always be asked to give a witness statement in court as it depends on what the judicial authority requests.

4.3 Technology in Forensic Accounting

This study identifies the reasons behind the participants belief of why the need for advanced technology within the FA industry arises and the effect technology has on the firm.

4.3.1 *The Need for Technology in Forensic Accounting*

All participants agreed that the need for technology in the FA industry has increased drastically nowadays. The primary reason identified by all participants was that people have become more digital, *'everyone is dependent on IT'*^(P6). Therefore, there now exist a wider range of electronic data emanating from different devices and different formats that need to be reviewed by forensic accountants during investigations. This is in line with Marcella (2022), indicating that the rise of electronic data has increased the importance of technology in the field of FA. However, some participants^(3/6) mentioned that the need for technology is not required in all circumstances, as it depends on the type of assignment and the type of evidence one is involved with. Findings suggest that the necessity for technology during investigations would most likely arise where the evidence is in electronic format and were it is expected that big data is involved. Therefore, as more transactions are being recorded electronically, it is very likely that technology would be needed in order to perform automated tasks rather than having forensic accountants perform tasks using traditional methods such as analysing files manually. This notion is consistent with Silverstone et al.'s (2012) findings.

Additionally, P1 and P4 suggested that technology would be required where the type of electronic evidence is relatively unfiltered, meaning where there exists a lot of evidence yet it is unclear of what it contains. If the firm receives filtered data which is already organised and categorised then they would not require the technology to sort and filter the evidence for them. However, if the evidence received by the department is not sorted then they are required to use technology to aid them in sorting that evidence more efficiently so that it allows them to make a better analysis of that evidence.

The fight against financial crime has become more challenging as fraudsters are utilising sophisticated technology to commit frauds. In line with conclusions made by various literature found in Section 2.3, P3 believes that this is the reason why it is essential for forensic accountants to acquire and use highly developed technology to detect fraud. Thus, these findings have revealed that the need for advanced technology in FA has increased due to the growing complexity of financial crimes as it allows forensic accountants to delve deep into the investigation and therefore assign culpability accordingly.

Whilst some participants indicated that in certain cases technology is not required as much, from these findings it can be observed that in other circumstances the technology becomes a priority and needs to be continuously kept up to date.

4.3.2 Effect of Technology on the Firm

Employing eDiscovery technology allows firms to stay competitive in the industry. In line with Bigda's (2017) and Vick's (2017) findings, this study's findings deduced that having an eDiscovery software in place allows firms to gain a competitive edge over local firms that do not acquire such tools. P1 interestingly pointed out that *'I don't think you could be on top of the game as a forensic investigator without availability to such technological arrangements'*. The investment in technology and investment in people to use such technology, allows the firm to be able to compete with foreign firms that are brought from outside Malta. If the local firms demonstrate that there is the expertise and technological tools available then there would be less need or no need at all to employ foreign firms. Therefore, the fact that the firm employs advanced technology and, hence, being *'on top of the game'*, the firm will be able to maximise its bottom line. Additionally, when hiring a local firm instead of a foreign one, apart from giving local support to the firm, it is also benefiting the local economy as costs incurred locally would remain local. However, since Malta is small in size this causes problems of familiarity and local connections, and therefore, law courts might demand foreign sources to avoid this problem. As a result, the firm is more transparent in the eyes of the court since it collaborates with overseas colleagues.

In line with literature indicated by Nortje and Bredekamp (2020) and Rechtman (2020) in Section 2.2, P1 stated that each investigative case is distinct, with unique requirements and difficulties. Findings suggest that the power of an eDiscovery software allows the firm to have more flexibility as it is now more able to cater for different types of investigations that it may come across, even those that tend to be complex in nature. Therefore, what before were considered as 'uncharted territories'^(P3) in terms of investigations, they no longer are. Furthermore, P3 and P5 specified that investing in an eDiscovery software has allowed the firm to cater for a wider client base because less time is being spent on individual cases. These findings validate the conclusions reached by Vick (2017). Therefore, apart from being able to take on more complex assignments that are being presented, having an advanced technology in place also allows the firm to be able to take on more clients than before, and thus is more profitable.

P6 stated when experts are appointed by the court, the court questions them on the type of tools that are being utilised in their respective engagements. This is supported by the literature found in Sections 2.2.3, indicating that the forensic technology utilised must embrace certain legal requirements. Findings indicated that the tools utilised must therefore be forensically sound and unless one has these specialised tools, a company '*will not be considered by the court*'^(P5) and therefore, the firm's representing bodies will not be given the role as court experts. Thus, it is evident that having a forensically sound software makes the court aware that the firm is able to process electronic evidence which is admissible in court. This statement further agrees with the notion stated in the previous paragraph, indicating that having an advanced technology increases the firm's client base and thus, increase its profit figures.

The partner further suggested that eDiscovery software also acts as an interface between the forensic investigator and the IT expert. This is because the software utilised by the IT expert would be able to communicate with software utilised by the firm in a seamless manner. This is in line with Alrawashdeh et al.'s (2021) findings, observing that IT solutions make it easier for working teams to share accounting data. Thus, it can be suggested that the ease of transferring data

between different professionals allows for better communication and co-operation between experts involved in that engagement.

4.4 The Role of Technology within the Firm

In 2021, the firm installed its first forensic software. This software was superseded by a more forensically sound eDiscovery software one year later, i.e. 2022. The researcher sought to understand why the firm started using a forensic software, the bases for decision taken before changing to a new software and whether this change had any effect on the investigation process and operations of the forensic investigation services department. Additionally, the advantages and complexities of the new eDiscovery software are discussed.

4.4.1 The Use of the Forensic Software

Participants were asked why, in their opinion, technological tools and software are being extensively used in the FA industry. All participants were in agreement that eDiscovery software is being widely employed because it allows for greater efficiency during the investigation process. However, P3 argued that these tools *'are being used in so far as they have to be used'*. If something is already efficient and serving its purpose, the firm is not going to invest in technologies to replace their process. However, if something is involving a lot of manual work, and is taking a lot of time for the analytical process than there would be the need to invest in technology. Additionally, there needs to be this distinction between helpful technology and critical technology. It could be that technologies which were assisting the process as being just helpful, today they are seen as critical and one cannot carry out an assignment without it.

As indicated by Krishnan et al. (2019) and Marcella (2022), electronic data is received in various forms of media, devices and formats. P1 and P2 identified that the software is able to incorporate all the evidence from the different devices in order to have a whole data set on the software. Therefore, rather than reviewing the devices individually, users are able to search all through the different evidence emanating from different devices at one go through the eDiscovery software.

Furthermore, the eDiscovery software has the power to cut through multiple different formats and systems, '*formats that you would have never heard of*'^(P1), and present it to users in an easy format. Since the software gathers all the evidence coming from different devices, the whole data set would include duplicated information. However, findings indicated that the eDiscovery software is able to remove duplicated items, thus, making it easier for the users to search through evidence as there would be less amounts of data.

The majority of the participants^(5/6) claimed that the eDiscovery software is being utilised within the firm because it offers various functions allowing them to sort, filter, tag, label and search through vast amounts of electronic data. These findings corroborate with the conclusions made by Krishnan et al. (2019), Qureshi and Tazilah (2015) and Vaidya (2013), concluding that eDiscovery software have powerful functionalities. All participants indicated that without having these functions in hand, the electronic evidence cannot be analysed adequately thus these findings align Seda et al.'s (2019) results. Suggesting that a true forensic analysis cannot be performed without the usage of appropriate eDiscovery software during a forensic investigation.

For presentation purposes the vast majority^(4/6) of participants agreed that the eDiscovery software is very convenient. This is because the software helps to reproduce particular findings in a more presentable manner through visual aids including graphs, geolocation, charts and timelines. Thus, this aids users to analyse data graphically rather than using text (Marcella 2022, Skalak et al. 2011). Similar to the conclusion made by Krishnan et al. (2019), P2 and P3 identified that these tools are very helpful when the case structure is big and complex. This is because investigators can use such tools to make links between ownership structures or relationships between involved parties. Thus, making it easier for FA investigators to obtain a better understanding of the case and to delve deeper into the investigation and people involved in the fraud.

Additionally, some participants^(P2, P3) claimed that apart from being useful to the investigators, eDiscovery software aids in creating a clearer picture to those people who are non-technical. For example, members of the judiciary and other

court related personnel might not be so technical on certain matters; hence, they could possibly understand better complicated financial information and complex structures by looking at visual aids rather than reading texts. This finding is comparable to the conclusion drawn by Marcella (2022). For an investigation it is crucial that material is displayed properly especially when presented in court or else the end result would differ, in fact *“if the material is not displayed properly in front of the jury, then all the effort is for naught”* (EDRM n.d.). Results therefore suggest that eDiscovery software is useful to present evidence in a clear and captivating way both to users and to 3rd parties.

Interestingly, P1 pointed out that *‘eDiscovery tools allow for a clear chain of custody’*. P2 and P3 are also in agreement and further argued that the eDiscovery software helps to ensure electronic evidence is admissible because it records the metadata of each file. Particularly this records what has been imported, how it has been analysed, how it was extracted, who created the item, who accessed it, who altered it and when. This aligns with the research expressed by Cosic and Baca (2010), Giova (2011) and Sadiku et al. (2017). Suggesting that a proper audit trail is maintained and hence, court evidence is admissible.

Some participants^(3/6) emphasised the importance of working on evidence that is authentic. Since metadata can be easily altered, findings indicated that the digital forensic expert makes a forensic clone of the device which is then passed onto the firm, as indicated in Section 4.2, above. Therefore, the analysis being made by the FA investigators within the firm would be done on the identical replica of the original, i.e., *‘the chain of custody will not be broken’*_(P3). P2 and P3 believe that working on the forensic copy while having the original preserved is crucial in ensuring admissibility of electronic evidence as they are sure that the evidence they are working with has not been altered. This finding corroborates with various literature in Section 2.4.1, particularly with that of Reitz (2012) arguing that cloning a device makes it possible for data to be authentic. Thus, ensuring that the CoC is maintained and the electronic evidence is admissible in court.

Additionally, P2 and P3 stated that now because they have technology going through all that information, they have their mind at rest that the information is

complete and that no information is being missed. Having complete information indicates that integrity of evidence is in place and thus, a clear CoC is maintained. This notion is consistent with Skalak et al.'s (2011) research.

These results may suggest that as time goes by and as forensic technology continues to advance, eDiscovery tools will help forensic accountants to establish the authenticity and integrity of electronic evidence. Thus, ensuring that they have a clear CoC in a court case which is critical for the admissibility of evidence.

4.4.2 Bases for Decision of Implementing an eDiscovery Technology

A company must make a number of important judgements before deciding which eDiscovery software to implement (Vaidya 2013). However, findings showed that being part of an international group facilitated the choice made by the firm as there was reliance on the software that were being utilised at an international level. This ensured that the software had already been tried and tested by others. However, P1 noted that although the choice was facilitated, still there was not a standard eDiscovery software that was being solely used internationally. Thus, the firm had to carry out research and analyse different eDiscovery software in order to choose the right software that is most suitable in the local context.

The analysis of the interview responses revealed a number of factors that had to be taken into account before the most suitable forensic software is selected for the forensic investigations services department. P1 stated that the primary factor that was considered by the firm was the cost. This notion is in line with Tredennick's (2013) findings. Since technology is very expensive to implement and not all service providers offer the same pricing models, findings suggested that a thorough analysis had to be made in order to identify all the expenses involved and whether such expenses were within the firm's financial capacity.

Consistent with Tredennick's (2013) findings, another decision the firm had to make before implement the software, circled around whether to go for a cloud-based platform or an in-house platform. When it came to deciding between these two options, top management within the firm opted to go for an in-house platform

because it was felt that hosting court data on premises would be more secure since *'it would not be connected to the outside world'* (P1). Additionally, P5 indicated that in Malta:

'the courts are still under the impression that having it under your lock and key is safer than having it on the cloud.'

This reflects the current state of affairs at the law court locally. This ties in with the research literature conducted by Krishnan et al. (2019), emphasising that eDiscovery vendors have not yet included strict security procedures to safeguard ESI. Therefore, from a security point of view the cloud is still seen dubious and must be given serious consideration before it is implemented. On the contrary, Vick (2017) argued that eDiscovery in the cloud uses reliable and highly-encrypted servers thus, security is ensured. Locally, since the court is less in favour of using the cloud, this might affect the decision of the firm not to adopt it too. However, this also depends on the firm's capability of having strong security measures.

Moreover, P1 stated that having adopted a cloud-based platform would have been too expensive to host the volume of court data that they have. However, this contradicts the findings arrived at by various authors in Section 2.4.2, indicating that having an eDiscovery on the cloud is more beneficial for cost reduction. In fact, Tredennick (2013) identified that cost relating to storage on the cloud varies according to how much storage space is being utilised. This has been in fact argued by P5, emphasising that having a cloud-based platform would allow the firm to flexibly upscale or downscale accordingly and pay for storage costs depending on the amount of storage space that is occupied at that point in time. However, this is not what happens at the firm. Since the firm opted for an in-house platform, the data is stored physically at the office premises therefore the costs would still have to be incurred whether there exist small or large activities. Even though, the cloud-based platform is seen to be the superior option when large scale eDiscovery is involved, each firm will need to independently decide which platform is best, as can be seen by the firm.

In correspondence with the literature found by Socha (2021), since the firm was driven towards having an in-house platform rather than cloud-based, the hardware infrastructure required to host the software in-house was an important factor that had to be taken into consideration. Findings suggested that proper deliberation had to be made on the hardware infrastructure's size that is capable of storing current cases as well as potential future cases, while still remaining within the firm's budget.

Prior to implementing the eDiscovery software, security arrangements needed for the hardware infrastructure were also given a lot of thought, as specified by P1 and P2. This is in line with the study carried out by Bougnague (2023). Thus, having security measures in place is crucial as the firm will ensure that confidential and sensitive information of investigations is well protected. In line with literature identified by Krishnan et al. (2019) and Skalak et al. (2011), there should exist both physical and logical controls. In fact, findings suggested that the firm made sure that these were in place. The logical security measures considered by the firm included having a server not exposed to the internet and having an access control list, meaning it restricts the server to be accessible by limited number of people. The physical security controls within the firm included court evidence to be on a segregated court server, where the court server is situated in a server room which is locked up and has an access control key limited to two individuals only. Additionally, laptops of team members and eDiscovery software on the laptops are password protected. Therefore, these findings suggest that the firm is aware of the high security measures that is needed when working with sensitive information especially since such evidence can potentially be used in court.

Apart from having an eDiscovery software which is user-friendly, easy to use and not complex, training and support must be provided by the software provider (Bougnague 2023, Qureshi, Tazilah 2015). This was also an important consideration taken by the firm, where P1 indicated that the firm wanted to find a software provider where they would be given full support. Findings indicated that without such training and support from the vendor, the firm would not be able to fully utilise the software's capabilities.

Thus, from the findings specified above, having the right eDiscovery software and tools requires the firm's responsible parties to take cautious consideration of various factors, most particularly the costs, deployment options, hardware infrastructure, security, usability, training and support.

4.4.3 Improvements within the Firm

Interviewees were asked to comment on whether they have seen any changes from the previous software to the new software. P1 indicated that there have been 'big changes' and P3 emphasised that they have '*moved to a more modern and less painful technology*'. The first set up, of both the hardware and the software, was at entry level which could not cope with the volumes and sizes of data that was coming in. P1 stipulated that:

'Although we were having the ability to have an eDiscovery software platform and to access data through the eDiscovery software platform the performance of the system was not optimal, was low and as a result it reduced the effectiveness of the investigator.'

This showed that there was the need for this change as limitations were being felt. Following the change, immediate positive results occurred.

Two participants (P1, P2) also reported that they went from having a single user license to a multiple user license. Therefore, the firm is now able to manage and operate multiple cases in parallel with multiple users working on the same case. This finding is consistent with the findings observed in Section 4.3.2, where it was indicated that having cutting edge technology expands the firms' clientele. Furthermore, findings indicated that since the improved eDiscovery software allows users to work concurrently, a more '*harmonic process*' (P4) is promoted. P4 also indicated that the eDiscovery software allows the progression of work to be instantly updated and viewed by others. Therefore, these findings may suggest that through the use of this upgraded eDiscovery software team members can now collaborate and communicate more efficiently resulting in a more effective investigation process. This notion is in line with Bounague's (2023) conclusion found in Section 2.4.4.

P1 and P2 further specified that although the interface of the eDiscovery software is similar to the previous software implemented, new functions have been introduced such as optical character recognition, imagery, face recognition etc. Such findings may indicate that as new advances in technology are utilised by forensic accountants, it allows them to have a more effective investigation thus obtain an enhanced conclusion for the case.

All the above findings suggest that the fact that the firm has invested in the new eDiscovery software and hardware infrastructure, the process of the investigation within the firm can now be done properly in a more efficient and seamless way.

4.4.4 Advantages of eDiscovery Technology

When participants were asked to indicate what the advantages of utilising an eDiscovery software within their firm are, the majority of participants^(4/6) mentioned that the functions available in the software enables them to sort the data by what is most relevant and organise big data more efficiently. This is in line with research literature conducted by Crumbley et al. (2015) and Gutts (2022). Thus, both findings and literature suggest that eDiscovery software tools enable users to better sort, organise and manage large amounts of electronic data quicker and more efficiently. This suggests that with greater management of ESI, team members will benefit in the subsequent stages of the eDiscovery process, as it would be easier for them to review, process and analyse the electronic evidence. This ties in with Qureshi and Tazilah's (2015) findings.

The advantage that was mentioned by each and every participant was that the eDiscovery software enhances the efficiency of the forensic investigation process. This is consistent with Bokolo and Senol's (2022) and Hernandez's (2016) findings. This study's findings identified that the process of an investigation is done quicker because instead of having to manually review millions of electronic documents individually, this can now be done by the software. As discussed in Section 4.4.1, the functions within the software allow for faster searches. In fact, P1 specified that '*a task that could take months can now be reduced to weeks*' and P6 indicated that '*digitalisation improves speed*'. These findings tie in with the research conducted by Akinbowale (2018), concluding that

technologically based FA would significantly speed the process of generating relevant information that would serve as evidence support in suspected fraudulent cases. Thus, the introduction of technology has replaced the manual labour that investigators once performed resulting in a more efficient process. This is consistent with the results obtained by Gutts (2022), concluding that the time taken to review documents can be reduced by up to 50% if done by an eDiscovery software.

Furthermore, P3 revealed that since certain manual work can be avoided, human resources can be allocated elsewhere such as doing more thorough analysis. Equivalent conclusions were reached by Asuquo (2012). These results may thus imply that forensic accountants do no longer need to spend days rifling through boxes of paper, but can now focus more of their attention on the complexities of other more crucial tasks of the case in particular the analysis and interpretation of the collected evidence. Apart from that, it can be suggested that having certain automated processes that can replace manual work would reduce the problem of not finding enough work force in the firm.

The majority^(5/6) of participants indicated that the eDiscovery software provides various functions which enables to constrict data sets through keyword searches. In fact, P1 stipulated that *'being able to run searches on the eDiscovery software enables users to ensure that searches can be zoomed in'*. These findings are in agreement with Hernandez's (2016) and Vick's (2017) results. Thus, it can be identified that through the sophisticated eDiscovery search tools, team members are able to focus their searches to a more categorised group of documents. Participants^(5/6) are in agreement with Hernandez's (2016) findings that via eDiscovery software tools they are able to look at underlying metadata behind files, by filtering data by name, date, geolocation, Cc, Bcc etc. This enables them to narrow down searches to those which are relevant and ignore those that are irrelevant to the case, imposing a more robust analysis. Participants identified that the label function within the software allows them to mark evidence as relevant or irrelevant, thus making it easier to go back to that evidence with ease. These findings therefore suggest that eDiscovery software is beneficial in making specific searches that are exclusively relevant to that particular engagement and

thus, forensic accountants and FA investigators are ensured that they remain within the scope of that particular investigation.

Another advantage highlighted by four participants_(P1,P2,P3,P5) was that eDiscovery software limits the risk of missing out on critical information relevant to the investigation, therefore, it helps the firm to be more effective in the way team members investigate. In fact, P3 specified that electronic documents which are not immediately visible by the naked eye can be detectable through the software. The findings of this study are in line with the findings arrived at by Singleton and Singleton (2010). Thus, it can be concluded that since certain ESI can be hard to identify, the use of a sophisticated eDiscovery technology enables members within the firm to locate and access electronic data while also ensuring that the data being used for the investigation is complete. Furthermore, P2 specified that the eDiscovery software is able to mark a document as legal privilege. It has been argued that the legally privileged information is not deleted but it is simply hidden from the database. Therefore, ensuring that such sensitive information is not compromised in any way. This ties in with literature conducted by Krishnan et al. (2019) and Laykin (2013). It can be concluded that with the use of a dedicated eDiscovery software, the risk of missing out on legally privileged information is reduced. It is also less likely that team members make redaction mistakes when covering legally privileged information of investigations. They are also ensuring that sensitive information is well hidden while also confirming that the original documentation is not altered. This is believed to be very crucial by P2 because if the report contains any form of legally privileged information, it would be considered as inadmissible in court. This is because legally privileged information can never be exposed in court_(P2).

In accordance with research conducted by Vick (2017), three participants_(P2,P3,P5) believe that the use of eDiscovery is beneficial because the possibility of having human error is reduced and thus, data accuracy is promoted. It goes without saying that humans are more prone to make simple mistakes, thus findings suggest that employing an eDiscovery software which is capable of identifying and analysing data more thoroughly, benefits the firm in ensuring that all data is

accurate throughout the whole investigation process. This ensures that the right conclusion is reached in the final report.

Two participants believe that security features are present within the eDiscovery software. This is because it provides control on the permissibility to access the software and the cases within the software. This ensures that sensitive data is not exposed to persons who are not authorised. Furthermore, the eDiscovery software is highly secure as it provides for a constant audit trail_(P2). Findings indicated that this allows the activity of users within the eDiscovery software to be tracked. These findings are comparable to the conclusions arrived at by Krishnan and Shashidhar (2021), Sears (2007) and Vaidya (2013). Therefore, it can be concluded that users are less likely to temper with evidence and a clear CoC is maintained.

4.4.5 Complexities and Challenges of eDiscovery Technology

When participants were asked about the complexities and challenges they face when dealing with an eDiscovery technology, various were mentioned. It has been identified by two participants_(P1,P2) that due to the complexity and power of such software, it demands highly skilled persons to optimise its power. This view is reflected by various authors in Section 2.4.4. Therefore, it can be argued that the firm has to ensure that the forensic accountants are not only competent in their area but are also proficient in IT. The problem of finding adequate employees in Malta is already an issue and this would make it even harder for the firm to find employees to engage within this department.

It can be argued that in order to overcome this challenge, it requires ongoing training and learning (Bougnague 2023, Krishnan et al. 2019), which all participants stressed during their interview. Findings suggest that if the company delivers continuous education, it would aid users in having an in-depth understanding and knowledge of updated technology that can be utilised in order to make their job more efficient. However, P1 emphasised that at initiation, the firm lacked training and support from the software provider, however, being part of an international network aided the firm to resolve this issue. Thus, further accentuating the benefit of being part of an international group. P1 also revealed

that even though training is essential, budgets should be taken into account as training is highly expensive to obtain.

In line with Bougnague's (2023) results, three participants_(P1,P2,P5) emphasised that there must exist a good relationship between the forensic investigation services department, the vendor and IT department. Given that software vendors are located overseas, this might bring more challenges when it comes to immediate communication. If this co-operation and communication is not present, the firm would most likely face additional challenges such as lacking a proper IT infrastructure capable of processing the software_(P2).

The majority of the participants_(5/6) believe that the costs involved is a major limitation faced by the firm. This involves costs relating to the software, hardware infrastructure to host the software and training staff on the software. This is in agreement with the exhaustive list of eDiscovery costs indicated by Zapproved (2022). In line with previous international research, found in section 2.4.4, all participants argued that costs are not only present at initiation but are continuous. This is because finances are needed in order to update the software from time to time, to renew licenses and to provide for further training as the software progresses. Moreover, since eDiscovery technology is constantly evolving (Krishnan et al. 2019), half of the participants indicated that there is always something better to invest in. Thus, as indicated by P3 and P5, it is crucial to find a balance between being able to operate effectively while keeping within the firm's budget.

Nevertheless, these findings contradict the findings of Asuquo (2012) and Bokolo and Senol (2022), that deduced that eDiscovery tools make it possible for the process to be more affordable as overall discovery related costs are reduced. Since technology allows for a more efficient investigation process, as indicated in Section 4.4.4, it is argued that costs are saved. Additionally, as indicated in Section 4.4.2, expenditures can be decreased if the firm opts for an eDiscovery in the cloud.

Another complexity found relates to unpredictable technical limitations. The technical limitations mentioned by participants are plentiful and varied. Some of

these limitations identified by participants include; having issues when exporting data from the IT expert's software to the firm's software, software not accepting all files, software not recognising certain handwriting on PDF scans and software containing bugs. These results are comparable to research published by Carmichael and Graham (2009), indicating that because of software tool restrictions, some tools may not be suitable for all jobs, which might prolong the inquiry. In relation to this, P3 highlighted that although certain challenges may not seem too problematic, when pressed with time these small limitations will pose a lot of complexities and weaknesses to the investigation. Therefore, it might be suggested, that these technical limitations which are not always expected may affect the way the firm goes about an investigation. It can be argued that having a good co-operation and communication between the individuals participating in the investigation process along with the vendor and IT department would allow the firm to overcome these technical challenges quicker and more effectively.

It is possible to imply that despite the numerous advantages that eDiscovery technology gives to forensic accountants, it brings with it certain challenges which the firm must be aware of in order to overcome them. The challenges identified from this study include upskilling staff, co-operation between departments, vendors and IT experts, budgetary constraints and technical limitations.

4.5 Future Developments

As indicated by various literature in Section 2.5, new concepts like AI, machine learning and cryptocurrency are having a huge influence in the field of FA. In line with Krishnan and Shashidhar's (2021) and Whitehouse's (2022) findings, participants indicated that eDiscovery advancements, machine learning and AI will significantly impact the way they conduct investigations. However, participants believe that if they want to remain relevant with such developments, they should keep up with evolving eDiscovery tools and make sure that the technology held at the firm's disposal is still appropriate. Participants^(3/6) emphasised that the license purchased from the software provider allows the department to remain updated with such advancements. Additionally, participants

further mentioned that the firm should purchase additional software tools if it is felt that they are needed for a better investigation performance. However, P3 provoked a dilemma that if these extra tools would be needed for one off investigations, then:

'is there the need to purchase further upgrades or technologies if they are not going to be used that often? Would the forensic investigator be in a position to carry out these one-off tasks manually instead?'

Thus, it indicates that there has to be thorough consideration before making additional updates to the software to identify whether they are critical technologies and if they are within the company's budget. Participants indicated that if the software is upgraded, the hardware has to also be upgraded accordingly because the more powerful the software becomes, the more hardware is needed to support it.

As indicated in Section 4.3.2, fraudsters are utilising sophisticated tools and performing complex crime. In line with Sears's (2007) and Skalak et al.'s (2011) findings, P3 stated that remaining updated with advanced technology will aid FA investigators be one step ahead. Findings indicated that forensic accountants must always have constant training on updated software. This training would make them capable to utilise the software to its maximum. Therefore, there has to exist technical expertise on these new technologies to upskill staff and expand their capabilities. However, there might be the need to involve foreign expertise due to the lack of technical expertise locally.

Apart from having technical expertise, three participants_(P2,P3,P4) indicated that professionals in this field have to be forward thinking about future concepts by educating themselves on new things such as cryptocurrency. This is accomplished by getting exposure from attending conferences. Therefore, it is not just in the hands of the firm to upskill staff but it is also the responsibility of the professionals to attend and be part of conferences that occur locally. Additionally, there exist vendor-specific certifications which users could obtain (Marcella 2022). In agreement, P1 indicated that there should come a time where they attend bootcamps provided by the software vendor in order to acquire advanced proficiency on the software. Thus, it is suggested that it is unavailing

to have sophisticated and up to date technology if users are incapable of using advanced tools.

Participants^(5/6) identified that the forensic investigation services department has gone a long way in the past four years. However, they agreed that migrating to the cloud is a means to advance in the future. Investing in the cloud would also be a means for the firm to be more competitive, and thus being '*on top of the game*'^(P1). P5 interestingly pointed out that even though '*cloud is the future*', it depends on whether '*the courts are willing to accept cloud infrastructure as a processing centre*'. As a result, it may be inferred that although cloud-based eDiscovery is seen to be the future for the firm as it provides various benefits, mentioned in Section 4.4.2, it all depends on the Maltese court's understanding of the cloud environment.

Albeit the need for human examination of documents to be lessened by these cutting-edge AI techniques, it is still essential to validate the results obtained by AI (Bokolo, Senol 2022, Laykin 2013). Findings are in agreement as participants believe that although AI methods are progressively becoming engaged in aiding the investigations, they should not be considered substitutes. This is because even though the eDiscovery software allows for basic analysis, the discussions, interpretations and proper analysis have to be done by humans. P4 further identified that these human concepts are crucial in determining the '*way the case goes ahead*'. Most participants^(5/6) believe that it is very unlikely that technology will be able to replace FA judgement, especially when dealing with court cases. P2 and P4 stated that till now technology is not capable of interpreting court data and only humans have that '*gut feeling*'^(P4). This substantiates Skalak et al.'s (2011) findings. These results therefore conclude that although technology is becoming very powerful especially since AI is being included, human intervention will always exist in FA investigations and will not act as a replacement.

4.6 Conclusion

This Chapter highlighted the key findings emanating from a thorough analysis of the data collected from the semi-structured interviews as described in Chapter 3. The final Chapter of this dissertation will summarise the key findings, provide recommendations to the firm and suggest areas for further research.

Chapter 5

**Summary, Conclusions and
Recommendations**

5.1 Introduction

This Chapter concludes the research study. Section 5.2 summarises the scope of this study, while Section 5.3 identifies the key findings obtained in line with the research objectives. Section 5.4 presents a set of recommendations that could improve the local scenario regarding technology in the FA industry, followed by Section 5.5 which highlights possible areas for further research. Finally, the Chapter ends with concluding remarks in Section 5.6.

5.2 Summary

This dissertation aimed to acquire an in-depth understanding and evaluation of the technological tools employed within the forensic investigation services department of the firm under review. In doing so, a thorough examination of the FA investigation process, together with an assessment of the role of eDiscovery software in supporting the forensic investigation were needed. The lack of relevant local literature served as the impetus for this particular study concept.

The study's objectives were attained through a qualitative methodology. Semi-structured interviews were conducted with five key participants within the firm and independent IT expert, whose indispensable contribution accumulated a variety of findings that have been exposed throughout this study.

5.3 Conclusions

The first objective of this research aimed to explore the forensic investigation process employed within the firm. It was found that whether appointed by court or by private individuals, the firm would follow the same procedures throughout an investigation. These being, planning, collection, execution and presentation stages. The planning stage is crucial in order to deploy the appropriate tools and software for later stages, thus a thorough understanding of the type of evidence needed and process of obtaining it is required. It has been discovered that the firm does not extract electronic evidence from digital devices since doing so requires specialised knowledge and advanced tools that only digital forensic

experts would have the capacity in doing so. Therefore, forensic accountants have to rely on these specialised experts. Once such evidence is in firm's possession, a thorough analysis of the acquired evidence is carried forward utilising the eDiscovery software. Therefore, it can be stated that a proper forensic inquiry procedure cannot be completed without the contribution and communication of both parties. This challenge is overcome by the advanced technology utilised by both parties. Once the execution stage is complete, an expert report is prepared and presented to the client by the firm, which report may eventually result to be testified in court. Since the magistrate might not be technical in all areas, technology would aid in presenting the information in a more understandable way.

Findings revealed that the need for technology in the FA industry is on the rise due to digitalisation, particularly because of the increase in the use of technological complications utilised by fraudsters. To stay updated with fraudsters who are exploiting sophisticated technology and to detect intricate frauds, forensic accountants must now more than ever use cutting-edge technology. Furthermore, the type of assignment, as well as the form and volume of evidence, determines the degree of technological engagement.

The third objective of this research aimed to evaluate the effect that technology has on the firm. The technology implemented by the firm, particularly the eDiscovery software, allows itself to remain competitive within local firms and even be '*on top of the game*'. Additionally, it enables the firm to serve additional clients, especially those that were previously unattainable. Furthermore, the use of advanced eDiscovery technology allows the specialists involved in the inquiry to efficiently transfer evidence between themselves. Thus, allowing for more flexibility.

Another key finding is that eDiscovery technology aids forensic accountants within the firm in determining the reliability and validity of electronic evidence due to their advanced functionality of recording all the metadata behind files, thus allowing for an audit trail. In a court case, this will guarantee that forensic

accountants have a clear CoC, which is essential for the evidence to be admissible in court.

Findings indicated that prior to implementing an eDiscovery software it is very critical for a company to make appropriate decisions relating to the costs of the software, hardware and training, whether to go for in-house or cloud platforms, the hardware infrastructure needed, the security measures required, the complexity and if the software vendor provides for training and support. It was also discovered that being part of an international network has benefitted the firm greatly especially during the initiation stages. This also allows the firm to engage with foreign colleagues thus being more plausible in the court since the issue of having familiarity connections is reduced.

Moreover, it has been discovered that eDiscovery software tools have a critical role to play in the investigation process as it caters for relevant, accurate and timely information and reports information that is required to make quicker and more robust analysis by forensic accountants. These findings therefore meet the second objective of the first and second objective of the study aimed to explore the role and contribution of technology throughout the process. Thus, having an eDiscovery software, findings indicated that the forensic investigation process is done more efficiently and effectively. Despite the many benefits that technology offers FA investigators, it has a number of drawbacks that businesses have to deal with. The necessity to upskill users was highlighted as the biggest difficulty, amongst co-operation, expenses and technical difficulties. Even though upskilling staff is considered a challenge, it still remains a top priority for the firm in order to ensure that team members are IT literate.

The future of the firm in relation to the eDiscovery technology is to have a cloud-based environment rather than having a physical server at the office's premises. Various literature identified that going cloud based provides the firm with various added benefits mainly because it saves costs, storage space, allows for more flexibility and better collaboration between users. However, since it is on the cloud it is more prone to cyber-attacks which therefore requires the firm to implement more robust security measures. The fact that the local courts favor firms to have

physical evidence on the premise due to more security, would have an impact on the firm to consider using the cloud.

Finally, results also showed that while technology has become crucial to the investigation process, the involvement of humans cannot be eliminated. This is due to the fact that only humans are capable of making the required judgements and interpretations relating to each specific inquiry. However, having certain automated procedures that can take the place of manual labour will help the firm's workforce shortage issue.

5.4 Recommendations

In light of the findings analysed in this research, a number of recommendations to the firm are being presented:

a. In-house procedures manual for forensic investigation services assignments

It is recommended for the firm to have and follow a procedures manual when conducting a forensic investigation assignment. This would enforce a more structured and smooth process. Thus, ensuring that the firm is following set procedures in order to make sure that no critical steps are missed out. This will also minimise the bureaucracy that is found in many sectors.

b. Providing more in-depth hands-on training relating to the eDiscovery software utilised by the firm

The study has concluded that having a good understanding of the latest technological advancements is critical in order to ensure firms have the capabilities and resources to enhance the success of an investigation process. Thus, it is suggested that more eDiscovery software training is necessary as it is impossible for the software to perform to its full potential if users are unaware of its capabilities.

c. Collective co-operation and communication amongst team members, IT department and suppliers

It has been observed that for eDiscovery to function properly there must exist a collective co-operation and communication between the forensic investigation services department, IT department and supplier. Locally this is seen to be a problem due to the existing bureaucracy in all sectors including also the Maltese courts. Therefore, more emphasis must be placed by the firm to eliminate as much as possible this issue. This can be done by holding regular meetings with the IT department and the outside vendor to discuss matters, take decisions and remain updated on all issues and advancements.

5.5 Areas for Further Research

While conducting this research study, other areas that warrant more exploration were identified:

a. A replica case study on a similar mid-tier firm offering FA services

A possible area of research is to take a qualitative stance to research, where such a study is replicated on another mid-tier firm which is either thinking or will in the next 12-24 months be offering FA services.

b. A qualitative study on the perception of the legal profession on forensic accountants

A further possible area of research being suggested is to take a qualitative stance on a study which is carried out to identify the perspective of the legal profession including the judiciary towards forensic accountants as court experts.

5.6 Concluding Remarks

This dissertation contributes not only to the existing literature in the field, but also complements the previous empirical evidence related to the FA industry. This study has shed light on the use of technological advancements within the FA industry locally. The collation of relevant evidence on which forensic accountants

base their report would not be possible without proper technological equipment and could hinder the overall investigation outcome. Therefore, the use of technology is considered one of the most important aspects in the forensic investigation process.

The eDiscovery software serves multiple purposes for a firm involved in forensic investigations as it enhances the efficiency, effectiveness and performance analysis of professionals utilising the software allowing for a proper forensic investigation. However, several barriers that might hinder the use of technology have been identified in this study, which have to be taken into consideration and addressed accordingly.

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Appendix A – Interview Schedules

A-1: Interview Schedule with participant 1 – Partner

The forensic accounting investigation process:

- i) Can you describe the process?
- ii) What is your role? How are you involved in the process as a partner?
- iii) How is technology involved in the process? Where is the technological aspect involved in the process?

The technological tool/software:

- i) On what basis did you decide on the tool most suited for the department? What were the reasons for choosing such a software rather than another?
- ii) What advantages/contributions, post implementation did the software offer?
- iii) Do you think the technological advancements effect the forensic investigation process?
- iv) Have you seen any improvements from the previous software used? How has the technological aspect evolved?
- v) What challenges/complexities arose in relation to the technological tool?
- vi) What limitations/weaknesses did it present?
- vii) How can these limitations be improved looking into the future?
- viii) Do you think it is effective in achieving the goals of the company? How?
- ix) How do such software/tools aid forensic accountants and people involved in the process?

How do you think the advancement in technologies will have an impact on the department and on the process in the future?

What changes do you expect to come within your department because of these evolving technologies?

Have you considered investing in an IT expert to be employed in house?

Do you consider investing further in other software or perhaps upgrades in the existing software?

Do you think your firm will be able to keep up with the introduction and improvement of new technologies? How?

Why do you think the technological tools and software are extensively used in forensic accounting?

Do you think forensic accounting and forensic accountants are highly dependent on IT? Why?

Do you think forensic accountants will manage to keep up with the technological advancements? How?

How do you think forensic accounting will develop in the future due to these technologies?

A-2: Interview Schedule with participant 2 – Senior Manager

The forensic accounting investigation process:

- i. Can you describe the process?
- ii. What is your role?
- iii. Who else is involved?
- iv. How is technology involved in the process?

The technological tool/software:

- i. What technological tools or software are in place in your department?
How does it function?
- ii. Are the technological tools/software developed in-house or purchased from 3rd parties?
- iii. On what basis did you decide that chosen software was the tool most suited for the company?
- iv. How does it affect the forensic investigation process?
- v. What advantages, post implementation did the software offer?
- vi. Have you seen any improvements while using technological tools during the process?
- vii. How do they help forensic accountants and people involved in the process achieve better performance?
- viii. What challenges/complexities arose in relation to the tool?
- ix. What limitations/weaknesses did it present?
- x. How effective or ineffective is it in achieving the goals of the company?

What has been your experience in using this forensic tool so far?

How do you think the process will be affected in the future within your firm and department?

Why do you think the technological tools and software are extensively used in forensic accounting?

Do you think forensic accounting is highly dependent on IT?

A-3: Interview Schedule with participant 3 – Manager

The forensic accounting investigation process:

- i. Can you describe the process?
- ii. What is your role?
- iii. How is technology involved in the process?

The technological tool/software:

- i. How do you think the technological aspect (software and tools) effects the forensic accounting investigation process?
- ii. What advantages, post implementation did the software offer?
- iii. Have you seen any improvements while using technological tools during the process?
- iv. How do these technologies help forensic accountants and the people involved in the process achieve better performance?
- v. What challenges/complexities arose in relation to the technological tool?
- vi. What limitations/weaknesses did it present?
- vii. How effective or ineffective is it in achieving the goals of the company?

What has been your experience in using this forensic tool?

How do you think the advancement in technologies will have an impact on both:

- the department within your company and
- the forensic accounting profession in the future?

How do you think forensic accounting will develop in the future due to these technologies?

Why do you think the technological tools and software are extensively used in forensic accounting?

Why do you think technology is needed in the forensic accounting industry?

Do you think forensic accounting is highly dependent on IT? Why do you think so?

Do you think the use of technological tools will help detect financial frauds?

Or do you think because of these digital tools, financial frauds are becoming harder to detect?

Do you think forensic accountants will manage to keep up with the technological advancements? How can this be achieved?

How and has your firm been able to keep up with the introduction and improvement of new technologies?

What changes do you expect to come in the future within your firm?

How has technology effected the forensic accounting industry in Malta?

A-4: Interview Schedule with participant 4 – Senior

The forensic accounting investigation process:

- i. Can you describe the process?
- ii. What is your role?
- iii. How is technology involved in the process?

The technological tool/software:

- i. How does it affect the forensic investigation process?
- ii. What advantages, post implementation did the software offer?
- iii. Have you seen any improvements while using technological tools during the process?
- iv. How do they help forensic accountants and people involved in the process achieve better performance?
- v. What challenges/complexities arose in relation to the technological tool?
- vi. What limitations/weaknesses did it present?
- vii. How effective or ineffective is it in achieving the goals of the company?

What has been your experience in using this forensic tool so far?

How do you think the process will be affected in the future within your firm and department?

Why do you think the technological tools and software are extensively used in forensic accounting?

Do you think forensic accounting is highly dependent on IT?

A-5: Interview Schedule with participant 5 – Advisory Director

1. What is your role when it comes to the forensic accounting department? How are you involved in the process?
2. What technological equipment is used from your side to aid the department? How do they function?
3. What was your involvement in deciding what hardware was needed to install the forensic software?
4. What measures were taken to ensure the whole system/process is secure?
5. What are the advantages of having these in place?
6. How is the data collected stored? (the environment which stored in)
7. What measures are put in place to maintain security of collected data?
8. What are the key challenges and limitations that you encounter?
9. How do you maintain a proper IT infrastructure?
10. What changes had to be made in order to keep up with the technological advancements?
11. How does the IT infrastructure help forensic accountants and the forensic accounting department? Why is it important to have a good IT infrastructure?
12. Do you think it is effective in achieving the goals of the company? How?
13. How do you think the system will be affected in the future because of the increased technological advancements?
14. What changes need to be made in the future in order to keep up with the technological advancements?
15. Why do you think the technological tools and software are extensively needed in forensic accounting?

A-6: Interview Schedule with participant 6 – IT or Digital Forensic Expert

The forensic accounting investigation process:

- i. What is your role?
- ii. Can you describe the process?
- iii. How is technology involved in the process? [Role]

The technological tool/software:

- i. What technological tools or software are in place? How does it function?
- ii. Are the technological tools/software developed in-house or purchased from 3rd parties?
- iii. On what basis did you decide that chosen software was the tool most suited for you/company?
- iv. How does it affect the forensic investigation process?
- v. What advantages, post implementation did the software offer?
- vi. Have you seen any improvements while using technological tools during the process?
- vii. How do they help forensic accountants and people involved in the process achieve better performance?
- viii. What challenges/complexities arose in relation to the technological tool?
- ix. What limitations/weaknesses did it present?
- x. How effective or ineffective is it in achieving the goals of the company?

What has been your experience in using this forensic tool so far?

How do you think the process will be affected in the future within your firm/department?

Why do you think the technological tools and software are extensively used in forensic accounting?

Do you think forensic accounting is highly dependent on IT?